



Quantitative analysis of phase fraction and mechanical behaviour of friction stir processed carbon steels

Md Anwar Ali Anshari^{a,b,*}, Murshid Imam^a, Rajnish Mishra^a

^a Indian Institute of Technology Patna (IITP), 801103, India

^b Theem College of Engineering, Boisar, 401501, India

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ABSTRACT

Duplex phase microstructure was produced by friction stir processing (FSP) in two steel plates of low and medium carbon wt.%. FSP at the same rotational and traverse velocity resulted in two different combinations of micro constituent phases. For processed low carbon steel (PLCS), it is the combination of 65.9% Ferrite, 9.6% Bainite, and 23% Martensite and for processed medium carbon steel (PMCS), it is 21.7% Ferrite and 74.3% Martensite. Microstructure and X-ray diffraction analyses confirm the presence of Retained austenite in both cases. In addition, it reveals the effect of carbon wt.% of base material on martensitic transformation in the form of lath size, volume fraction, and strength of Martensite. Further, the tensile response (yield strength) is found to be in good agreement with rule of mixture for PLCS only. However, by fixing the volume fraction of Martensite (f_M) to 0.60 and neglecting the adverse effect of excess fraction of Martensite, contribution of micro constituent phases to yield strength satisfies the rule of mixture for PMCS too. Finally, yield strength contribution of different constituent phases is 43.5% by Ferrite, 29.4% by Bainite, and 31.2% by Martensite including an negligible error of 0.43% for PLCS, while it is 9.8% by Ferrite and 96.8% by Martensite including an error of 6.6% for PMCS.

1. Introduction

Low (0.08 wt.%) and medium (0.6 wt.%) carbon steels are considered vital structural materials due to their decent mechanical properties, corrosion, and wear resistance, and are widely applied in many industries Imam et al. [1]. These steels are widely used in industries to make forged and automotive components. It is because low and medium carbon steels are easily deformable due to their greater ductility as compared to high carbon steels. The steels with ultrafine-grained (UFG) microstructure produced by the severe plastic deformation (SPD) technique possesses superior mechanical properties Song et al. [2]. Friction stir processing (FSP) is one of the SPD techniques, developed on the lines of friction stir welding (FSW) requires lesser heat input, and produces steel samples with excellent mechanical properties and controlled microstructure. Today, with the progress of tool materials, almost all types of steel have been selected by the researchers to carry out FSP experiments [1,3–6]. FSP has emerged as one of the economical techniques in comparison to other conventional techniques that use additional alloying to enhance the mechanical properties of the steel. Aldajah et al. [7] considered 1080 carbon steel to improve tribological performance by carrying out FSP. Results revealed that FSP decreases

the coefficient of friction by 25% and wear rate by 4 times under lubrication conditions, thereby considerably improving the tribological properties. Hajian et al. [8] investigated microstructure as well as mechanical properties of AISI 316 L SS by performing FSP experiments. They concluded that elongation decreases whereas strength increases after performing FSP. The hardness of the friction stir zone increased due to grain refinement. Anshari et al. [9] studied strain hardening behaviour of FSPed EN8 medium carbon steel, which acts as a key element during the selection of stretching direction. Finally, they observed that texture has no effect on the strain hardening behaviour and suggested that the stretching direction of the blank must coincide with the longitudinal or along FSPed direction. Li et al. [10] considered reduced activation ferritic/martensitic steel to study the influence of FSP under various rotational speeds on microstructure, mechanical properties, and strain hardening performance. Their results conveyed that FSPed samples exhibit good strength and ductility at 150 rpm and 200 rpm respectively. Moreover, the strain hardening performance and the strain hardening exponent decrease with increasing rotational speed. On the other hand, Noh et al. [11] recommended that by applying FSP, the effect of anisotropy may be suppressed and the variation of nano-oxide particles diffusion analysis may be reduced in the case of oxide

* Corresponding author.

E-mail address: anwar.pme17@iitp.ac.in (M.A. Ali Anshari).

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dispersion strengthened steel. Beladi et al. [12] reported the evolution of microstructure having constituents of fine ferrite grains and low-temperature bainite in a low-carbon steel with a modest hardenability as a result of heat treatment process. The microstructure offered a good combination of ultimate tensile strength and ductility which can be associated with presence of ductile fine ferrite grains and hard low-temperature bainitic laths with fine films of retained austenite. Lan et al. [12] examined the variation of microstructure in a low carbon bainitic steel welded joint and concluded that weldment consists of acicular, granular as well as fine polygonal Ferrite microstructures. Javaheri et al. [13] studied the bending properties of medium carbon steel under hot rolled conditions followed by quenching. They observed no major changes in texture after bending. Quenched sample at 560 °C resulted in high ductility to fracture and strain hardening capacity, which led to the use of a smaller punch radius when compared to quenched sample at 420 °C. Fan et al. [14] evaluated the mechanical properties of acicular Ferrite (AF) as well as Martensite/Austenite steel at different cooling rates. Results revealed that due to AF grain refinement as well as an increase in dislocation density increases yield strength (YS), and yield strength (YS)-Acicular ferrite (AF) grain size follows the Hall-Petch relationship. Likewise, as the yield ratio increases work hardening behaviour decreases because of an increase in the cooling rate leading to microstructural growth. Dhua et al. [15] developed fine grained microstructure in low carbon bainitic steel with the help of hot rolling and air cooling methods. They observed that the developed steel shows high YS, ultimate tensile strength (UTS), and toughness respectively. Aktarer et al. [16] considered DP 600 steel to study the effect of FSP on the microstructure and mechanical properties. They concluded that FSF has produced a refined microstructure that comprises Ferrite, Bainite, Martensite as well as tempered Martensite that in turn increases strength as well as hardness by 1.5 times when compared to the parent material. J. Hu et al. [17] involved low carbon steel treated by warm rolling to obtain refined microstructure. Results predicted an amalgamation of high strength-elongation with good formability. Further, observed that strain hardening and formability increase due to a decrease in yield ratio. Since mechanical response of materials are solely dependant of microstructure. In case of steels, the mechanical properties vary over a range with the variation of soft and harder phases since the different phases (Ferrite, Bainite, Martensite, etc.) or the combination of phases produce different effects under loading condition.

The current study is all about the phases developed in the low and medium carbon steels at the same processing conditions, and the study of contributing effects of phases to the overall yield strength of the processed materials. It is because of there is a complete lack of study on the percent contribution of micro constituent phases to the yield strength after friction stir processing. In this study low and medium carbon steels are taken as the research objects because of its extensive industrial applications and ease of processing by FSP technique.

2. Experimental procedures

In this study, two plates of 2 mm thickness made of low and medium carbon steels were used. The chemical composition of steels are shown in Tables 1 and 2, respectively. Each plate was processed by friction stir processing (FSP) technique at a rotational spindle speed of 500 RPM and tool traverse speed of 80 mm/min [9] as shown in Table 3. The processing was done with a tungsten-carbide (WC) tool of 1.6 mm pin-length, 4 mm pin-diameter, and 12 mm tool shoulder diameter on a high strength friction stir welding machine (Model: FSW 50–500 CNC).

Table 1
Chemical composition of low carbon steel (LCS).

Element	C	Mn	Si	S	P	Fe
% age	0.09	1.650	0.950	0.18	0.012	Rest

Table 2
Chemical composition of medium carbon steel (MCS).

Element	C	Mn	Si	S	P	Fe
% age	0.40	0.80	0.25	0.05	0.05	Rest

Table 3
The friction stir processing parameters and the microstructural evolution.

Material	Rotational speed (rpm)	Welding speed (mm/min)	The volume fraction of phases in SZ (%)	The average grain size of the soft ferrite phase in SZ (μm)
PMCS	500	80	21.7 (F), 78.3 (74.1 M+4.2 RA)	6.7 (F)
PLCS	500	80	65.9 (F), 34.1 (23 M+1.5 RA+9.6 B)	8.1 (F)

During processing, an infrared (IR) camera was used for recording thermal history. After successful FSP, micro and Nano-level constituents in the metal matrix of the processed zone was analysed through microstructural characterization techniques such as (i) Scanning electron microscopy (SEM), (ii) Electron backscattered diffraction spectroscopy (EBSD), (iii) X-ray diffraction, (iv) Transmission electron microscopy (TEM), and (v) Selected area electron diffraction (SAED). To study the mechanical behaviour of bulk material tensile tests were conducted. Samples for analyses were cut from the processed zone using a Wire-cut EDM machine. For SEM analysis, samples were polished with different grades of emery papers (600–2000 grit size) followed by mirror polishing using diamond paste (3 μ , 1 μ , and 0.25 μ abrasive size), to obtain a smooth and scratch-free surface.

Finally, samples were etched with 3% Nital (3% Nitric acid + 97% Ethanol) solution for 20 s, to reveal the microstructure. For EBSD analysis to study the fraction of phases of microstructure, colloidal solutions of 0.04 μm and 0.02 μm size of silica colloidal particles were applied to obtain mirror-polished surface. The SEM analysis was conducted on Fe-SEM Gemini-500 machine at 15 kV. For TEM analysis, the samples were prepared using the Ion-milling technique to achieve electron transparent thickness (<200 nm). To confirm micro constituent phases, SAED was conducted on the same TEM machine (JEM – 2100 HRTEM). To observe peak positions and the peak shift resulting from FSP for the confirmation of phases in the processed materials, XRD analysis was carried out at and scan rate of 3°/min in the 2 θ (2-Theta) range of 40°-120° on the XRD machine (BRUKER, AXS D8 Quest System). For tensile testing, samples were cut along the transverse direction of the processed zone with 5 mm gauge length, 1 mm width, and 1.5 mm thickness (from the top). The tensile sample dimensions were decided based on literatures [9,18]. A 25 kN micro-UTM Nano-Biss machine was used for tensile testing at a crosshead velocity of 0.02 mm/sec. To observe the repeatability of results, three samples for each case were tested.

3. Results and discussions

3.1. Microstructural analysis

The friction stir processing has influenced the microstructure of the parent materials through thermo-mechanical effect i.e. hot deformation and recrystallization because of the stirring mechanism. The schematic of FSP is shown in Fig. 1a. The stir zone/processed zone can be clearly seen in the optical micrographs as shown in Fig. 1(c and d) for PMCS and PLCS respectively where very much refined microstructure can be observed as compared to the base material. Fig. 1b shows the schematic of different processing zones i.e. stir zone (SZ), thermo-mechanical

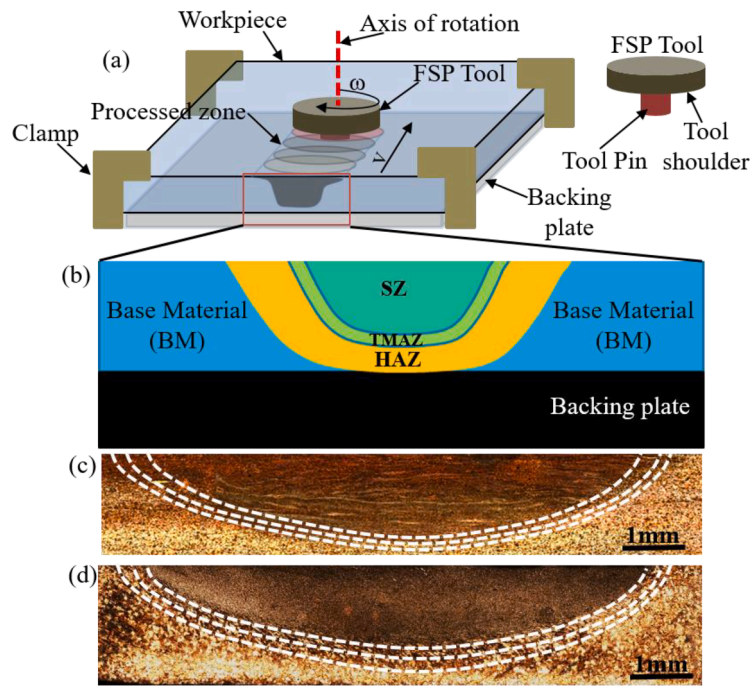


Fig. 1. (a) Schematic of FSP, (b) Schematic of processing zones, (c, d) Optical micrographs of cross sections of PMCS and PLCS, respectively.

affected zone (TMAZ), and Heat affected zone (HAZ) where different grain structures form in different zones in accordance with the effect of stirring and temperature distribution. The study of micro-constituents confirms that the processing temperature is likely to be in the temperature range of phase transformation from ferrite-pearlite to austenite and recrystallization temperatures. As received material consists of Ferrite and pearlite structures as presented in Figs. 2a and 3a, which are formed at a very slow cooling after the austenite temperature [19, 20].

Fig. 2 presents SEM images of processed/stir zone of MCS. Fig. 2a shows cementite (Fe_3C) lamella with ferrite producing pearlite structure in base material. The Ferrite grain size of base material is measured to be $12\ \mu m$, which is further refined to $6.7\ \mu m$ by FSP. The grain size was calculated by planimetric method using ImageJ software. After FSP, the processed zones as shown in Fig. 2(b–d) are observed to have emerged surfaces composed of needle-like structure known as martensite. This

type of structure is resulted from rapid cooling of steels [21]. Rapid cooling from austenite temperature to room temperature limits the time to insufficient for the diffusion of carbon atoms in the soft ferrite matrix. Apart from this, a small amount of Retained austenite is also present in the microstructure as presented in Fig. 2(b–d). The existence of Retained austenite might be due to the incomplete transformation of austenite into Martensite during cooling.

Fig. 3 presents LCS microstructure before and after friction stir processing. In Fig. 3a, It consists of a combination of Ferrite and pearlite of an average grain size of $20\ \mu m$. However, microstructure is transformed into a combination of Ferrite, Bainite, and Martensite after FSP. It is noteworthy that the microstructure is dominated by 65.9% Ferrite by volume. It is also observed that the microstructure consists of 24.5% Martensite and 9.6% Bainite, and carbide particles. In comparison with PMCS, presence of Bainite phase is extra in PLCS. The Bainitic transformation takes place at the cooling rate between pearlite and

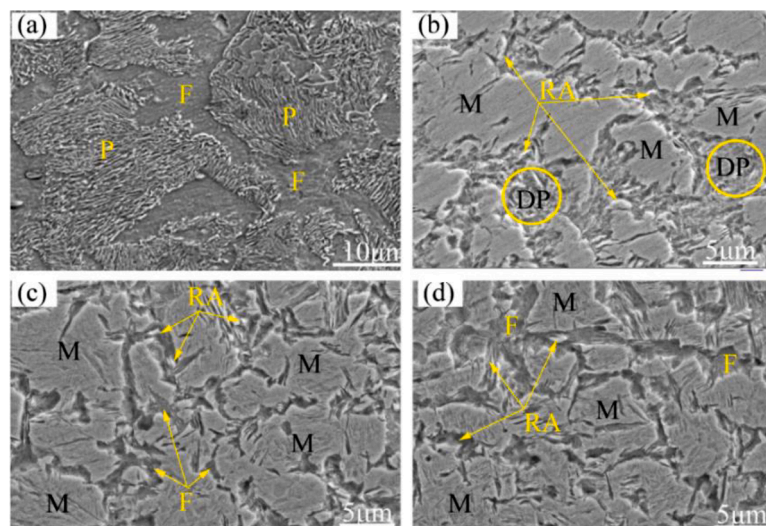


Fig. 2. (a) The microstructure of base material (MCS), (b, c, d) The microstructure evolved after FSP (PMCS).

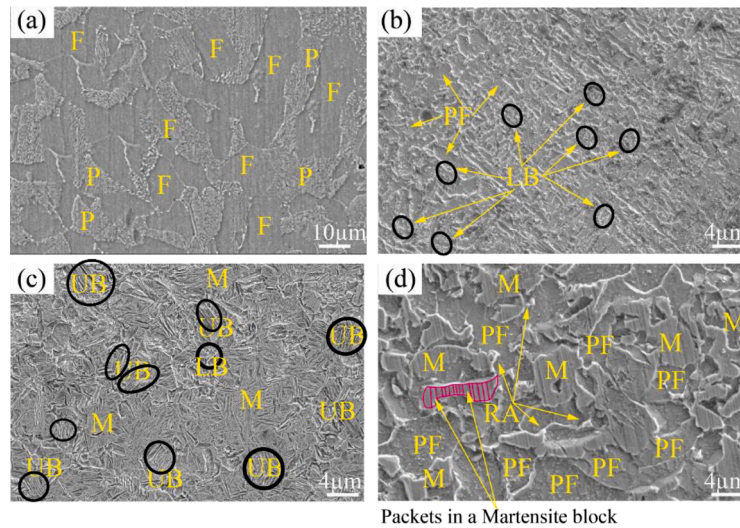


Fig. 3. (a) The microstructure of base material (LCS), (b, c, d) The microstructure evolved after FSP (PLCS).

Martensite. Since air cooling was used, cooling rate may fall to $3.3^{\circ}\text{C}/\text{s}$ resulting in the transformation of granular Bainite phase in case of low carbon steel, similarly reported by Guofang Liang and Kang et al. [22, 23]. The bainitic transformation in PLCS is in line with the report of Rees and Bhadeshia [24] which expresses that the region of lower carbon content produces nucleation sites for Bainite transformation. The phase fraction was calculated from SEM micrographs by using Image-J software and the same is presented in Table 3. The volume percentage of Martensite and Ferrite in PMCS is found to be 74.1, and 21.7 respectively with 4.2% Retained austenite present in the matrix while the volume percentage of Ferrite, Martensite, and Bainite in PLCS is found to be 65.9, 23, and 9.6 respectively with 1.5% Retained austenite. Martensitic transformation and Retained austenite depend on the Martensite start temperature (M_s). For low carbon steels, M_s is higher while it decreases with an increase in carbon percentage. The M_s is higher for the LCS which provides a wider range of temperature for martensitic transformation during quenching, while it is lower for the MCS. Depending upon the M_s , the morphology of Martensite and the fraction of Retained austenite both differ in PLCS and PMCS. Higher M_s results in the almost complete transformation of Austenite into Martensite, whereas lower M_s results in the entrapment of Retained austenite between the Martensite blocks [25]. This is the reason that the presence of Retained austenite is a little in the case of PLCS while it is significant in the case of PMCS.

In the case of steel, it is fact that the microstructural evolution is very much sensitive to cooling rates. The cooling rates during FSP depends on the peak temperature i.e. higher the processing temperature higher may be cooling rate [26]. Generally, the temperature does not exceed 1040°C throughout the heat treatment process for steels assuming pressure invariable. During FSP, material undergoes a rise in temperature due to the frictional effect between work piece and tool. The frictional effect is the function of processing parameters (rotational speed, transverse speed, axial force, etc.). The increase in temperature follows parametric correlation as shown in Eq. (1) [9].

$$\frac{T_p}{T_m} = K \left(\frac{\omega^2}{v \times 10^4} \right)^\eta \quad (1)$$

Where T_p denotes peak temperature, T_m - melting point temperature, (K) and η - constants depending on material properties, ω - rotational speed, and v - transverse velocity.

Proper selection of processing parameters ensures sufficient temperature rise. The extent of temperature rise is very important for microstructure evolution since it decides the degree of austenization. The degree of austenization is the function of carbon. According to the

carbon concentration, the transformation occurs over various ranges of temperature since increasing wt.% of carbon lowers the transformation temperature. Based on pre-existing phases (α -Ferrite, Bainite, γ -austenite, cementite, and/or graphite) and temperature, different microstructures (Pearlite, Bainite, and/or Martensite) are formed after processing, similarly reported by Kang et al. [27]. The presence of laths of Martensite, and Retained austenite in MCS, and Bainite morphology in LCS are clear indications of achieving processing temperature above recrystallization point, i.e. above A_1 temperature-transformation line, during FSP. From theoretical calculation, temperature rise in the stir zone was observed to be around 900°C , which is in line with the experimental value, recorded by IR camera as shown in Fig. 4(a and b).

Fig. 5 shows different constituents present in the SZ of PMCS observed through transmission electron microscopy. The micro constituents include laths of Martensite and carbides. The Martensite laths of blocks are almost 200 nm wide with an average length of $2 \mu\text{m}$. The

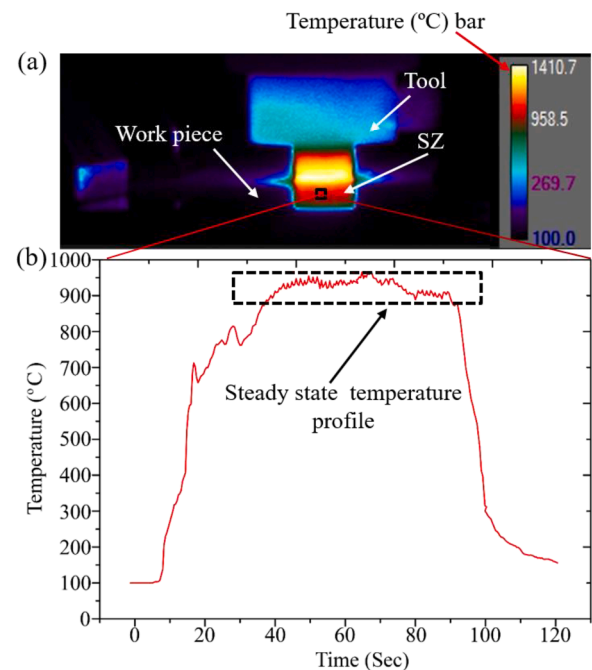


Fig. 4. (a) Temperature recording by IR- camera, (b) The Time-Temperature plot for a particular location in the friction stir processing zone/SZ.

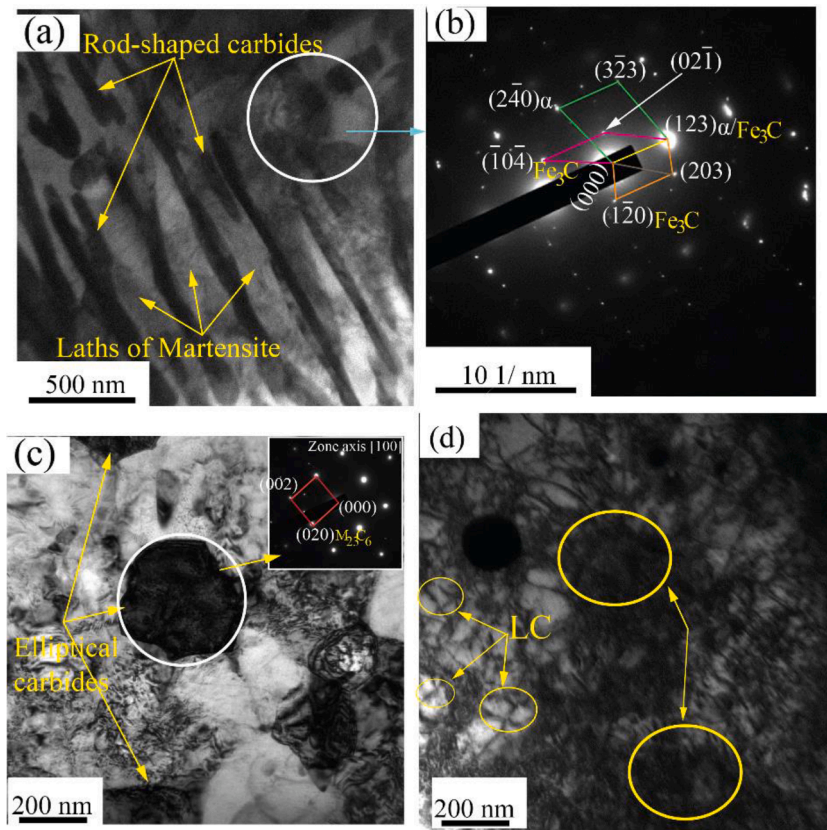


Fig. 5. TEM images showing (a) Laths of martensite and carbides, (b) SAED pattern to confirm the carbide, (c) Coarser carbide particles, and (d) Lomer-Cottrell types of dislocations.

carbides are observed to be of different shapes like rod, circular type that contributes to the strengthening. Fig. 5c shows coarser carbide particle. The particle based on the corresponding SAED (refer to the insert in Fig. 5c) pattern is identified as $M_{23}C_6$ carbide which is in good

agreement with the previous work as reported by Hou et al. [28]. The evolution of such coarser carbide particles suggests occurrence of continuous dynamic recrystallization (CDRX) in the temperature range of 600–700 °C, similar observation in case of hot deformation of

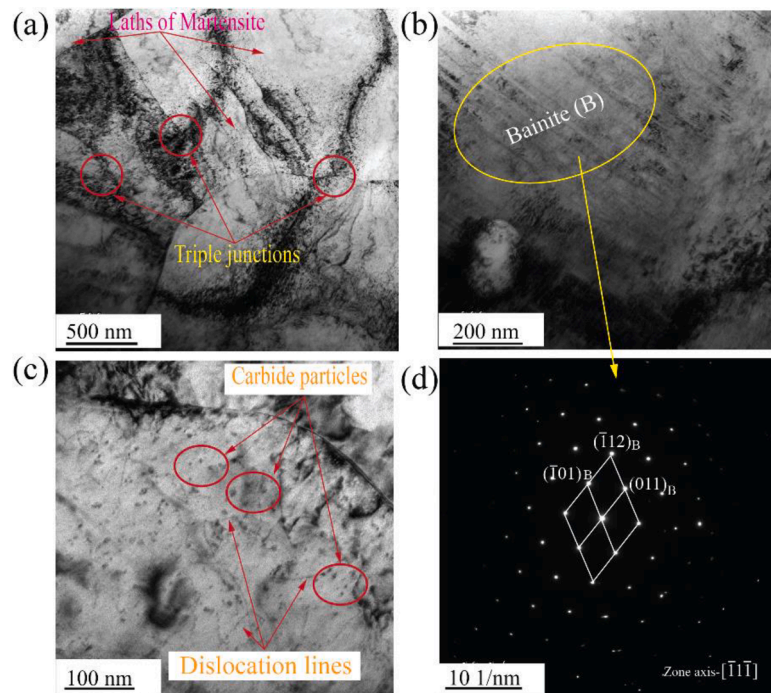


Fig. 6. (a, b, c) TEM images of processed low carbon steel (PLCS) showing morphologies evolved, (d) The SAED pattern confirming the bainite structure.

Ferrite-pearlite material in the same temperature range was presented in previous works [2,29]. The size of carbide particles is found to be around 50 - 100 nm in width and 500 nm in length throughout the metal matrix and is mainly observed at the boundaries of laths of Martensite. The SAED pattern as shown in Fig. 5b confirms the formation of M_3C type of carbide. Fig. 5d shows highly entangled Lomer-Cottrell (LC) types of dislocations inside the grain.

Fig. 6 shows the laths of ferrite, Bainite, carbide particles in PLCS. The ferritic laths are coarser with around 500 nm width, which is about 10 times larger than martensitic laths of PMCS. Lesser carbide particles are observed in Fig. 6c as compared to PMCS. It is because of the effective suppression of carbide formation due to the presence of silicon and phosphorus [30]. Further, the presence of triple junctions is observed in PLCS unlike PMCS and triple junctions are relatively loose structures containing higher free volume compared to grain boundaries. These type of junctions are formed during recrystallization process due to locking phenomenon of three crystallization fronts at a junction [31].

XRD analysis as shown in Fig. 7 is the confirmation of presence of BCC/BCT along with FCC phase structure. (110), (002), (121), (022) and (031) are correspond to BCC (α and β) and/or BCT (α') phases while less intense peaks (200), (220), (113) confirm the presence of FCC (austenite) in both PLCS and PMCS. The intensity of peaks of FCC is low which the indication of lower fraction of such phase.

3.2. Mechanical behaviour and the microstructure correlation

Fig. 8 represents the tensile behaviour of steel plates before and after friction stir processing. It clearly distinguishes between strength and ductility for both LCS and MCS. At same crosshead velocity, there is a drastic change in the mechanical response of two steel plates of different carbon percentage. After friction stir processing, strength increases as compared to base materials for LCS and MCS both. Ductility also improves in case of PLCS though it is adverse in case of PMCS. The yield strength improves by 2.2 times base metal for PLCS while 1.8 times for PMCS. The ultimate tensile strength also improves by 1.5 times for PLCS and 2.1 times for PMCS. One important observation in case of PMCS is multistage hardening, which is caused by the site transfer of stress concentration from soft Ferrite to Martensite/Retained austenite and finally during plastic deformation in the fully developed elastic and elastoplastic region, similarly discussed by Anshari et al. [9].

After friction stir processing, the Lüder band characteristics of base materials disappeared. The Lüder band formation is characteristic of low and medium carbon steels only, which is caused by many reasons. Regarding the characteristic, some researchers have proposed some models like the Cottrell-bilby model [32], Rooyen model [33,34], and Hahn [35], etc. Cottrell-bilby model makes the solute interstitials of carbon or/and nitrogen atoms responsible for the formation of the Lüder band which comes into the picture when the plastic deformation of steel starts after reaching the upper yield point. It means that moving dislocations come in contact of carbon atoms intermittently till the pile-up of

dislocations starts resulting in strain hardening. T. R. Jacobs et al. reported that nucleation during stretching of sample results in nucleation at the one end of the sample after elastic deformation which continues propagating through the entire gauge length during yield point elongation resulting in Lüders band formation [36]. However, after friction stir processing, Lüders band disappears. This may be due to microstructural factors including Ferrite grain size, working temperature, strain rate, and percentage of carbon. The effect of carbon% concentration is clearly observed from Fig. 9a where the length of serration for LCS is 4.1% whereas it decreases to 1.4% for MCS. This shows that the size of Lüders band decreases with increase in carbon percentage, similarly reported by Tsuchida et al. [37]. Since the carbon percentage of respective steels and temperature of tensile tests were remain similar before and after FS processing, other factors may be taken into consideration such as lack of sufficient number of free carbon atoms between Ferrite matrix since base material undergoes austenitizing temperature during friction stir processing (~ 900- 950 °C) due to which, carbon dissolves and is entrapped in Martensite during transformation via cooling to room temperature. Since Martensite captures the carbon atoms, number of free carbon atoms decreases. Elimination of Lüders band is a good outcome of friction stir processing, since Lüders band formation is an undesirable phenomenon for industrial fabrication.

During tensile tests, ductile failure was observed for base materials as observed in Fig. 9 (a and c), while mixed (ductile+brittle) failure was observed for friction stir processed samples as shown in Fig. 9 (b and d). The dimples on the fracture surface of LCS are homogeneous and larger than others. The average size of dimples for LCS is found to be ~2.1 μm which is reduced to 1.2 μm with an area fraction of 0.60 after FSP. In place of dimples, planar facets are observed for PLCS as shown in Fig. 9b which is an evidence of brittle failure and it is obvious since the microstructural analysis shows the presence of harder phases i.e. Martensite and bainite. According to the effect of dimple size on ductility as reported by Qin et al. [38], ductility increases with an increase in the mean diameter of the dimple, similar is observed for PLCS. This preservation of ductility may be associated with TRIP (transformation induced plasticity) effect of Retained austenite, as reported by Hidetoshi Fujii et al. [39]. It is important to note that TRIP effect is the transformation of retained austenite into martensite during loading. The transformation is accompanied by local shear strain and volume expansion in the material. It results in producing dislocations and compressive stress in the austenite matrix due to which strain hardening is enhanced. The improved strain hardening thus imparts higher ductility. Dong et al. [40] has reported a similar observation. Another reason for improvement in ductility might be the presence of triple junctions in the metal matrix of PLCS as shown in Fig. 6a, as it results in increasing plastic strain that leads to enhancement of ductility, similarly observed by Ovid'Ko et al. [41]. It is also fact that the Ferrite size and the nature of Ferrite results in the primary control over the ductility as reported by R.G Davies [42].

On the other hand, ductility of MCS reduces significantly by 11.3%, after FSP. This can be associated with the formation of larger fraction of harder phase of Martensite, which was found to be 0.743. Though there was significant amount of Retained austenite in PMCS, the TRIP effect was insignificant on ductility. It indicates the dominant effect of Martensite blocks on the strength and ductility, since Martensite is very brittle. In case of MCS, the dimple size (1.4 μm) was smaller as compared to that of LCS (2.1 μm) that means the loss of ductility, which is associated with higher carbon content. It is noteworthy that the strength of martensite is the function of carbon content [43]. Carbon atoms produce substitutional strengthening in martensite by occupying the interstitial octahedral sites of martensite. Due to occupancy of these sites by carbon atoms, dipole distortions start in the neighbouring atoms of iron. This distortion creates strong strain field in the matrix which resist the dislocation motion during interaction. From Fractographs of PMCS, the dimple size and its fraction were 0.5 μm and 0.30 as compared to base MCS. About 70% area of the fractured surface was covered with planar

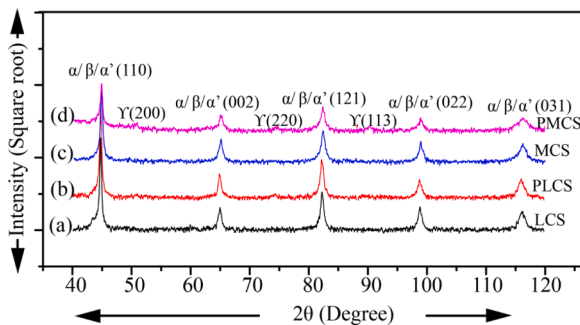


Fig. 7. 2 The XRD peaks confirming the presence of constituent phases in (a) LCS, (b) PLCS, (c) MCS, and (d) PMCS.

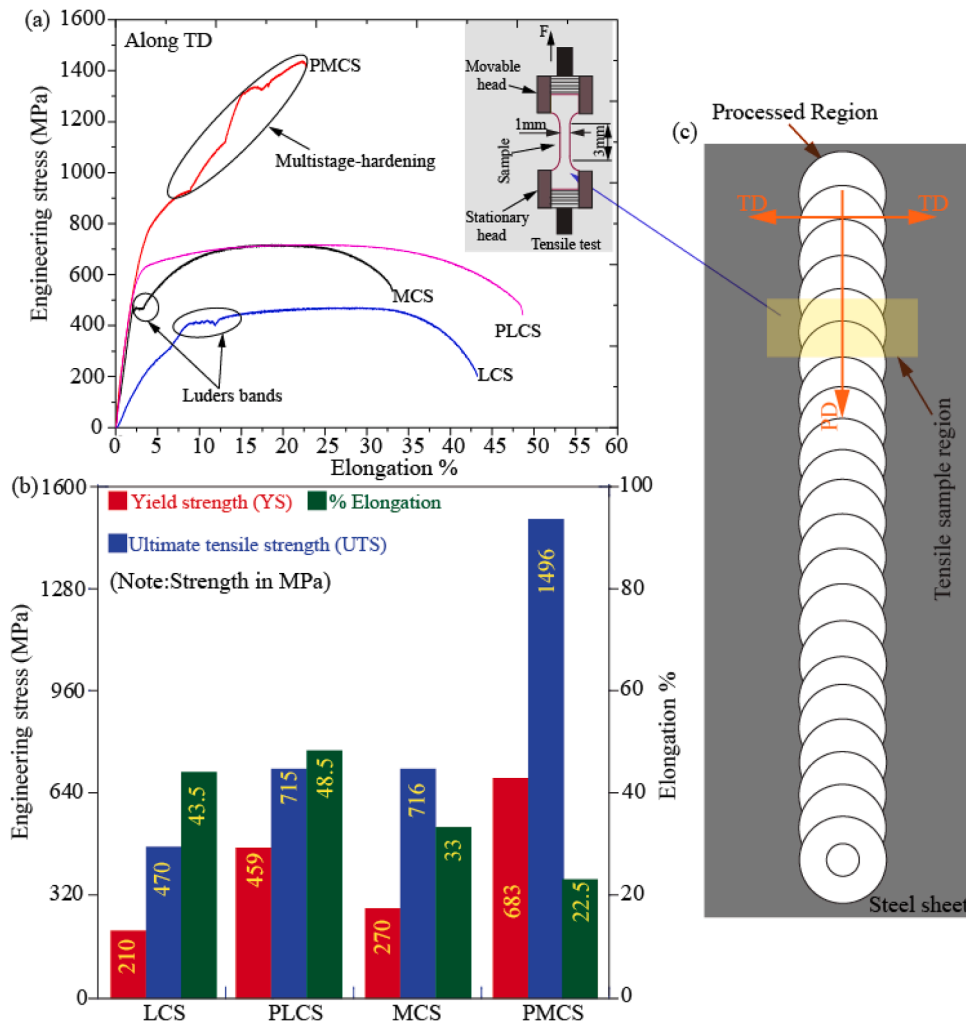


Fig. 8. (a) Tensile plots of base as well as processed materials, (b) Bar graph of yield strength, ultimate tensile strength and elongation, (c) The Schematic of processed material and tensile sample location.

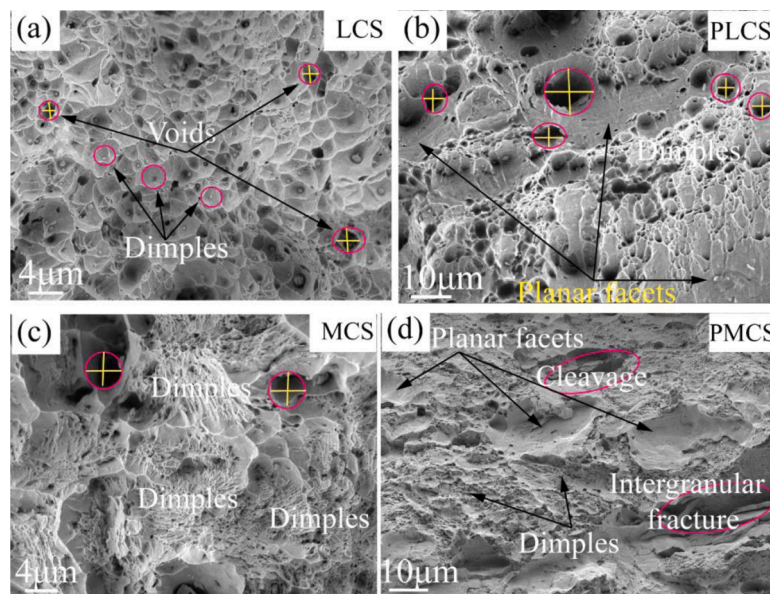


Fig. 9. Fractographs of (a) LCS, (b) PLCS, (c) MCS, (d) PMCS.

facets and cleavages revealing brittle fracture, which occurs due to large stress concentration at the Ferrite-Martensite interface resulting from dislocation pile up that leads to martensitic cracks. For observing the effect of dimple size on the ductility, a correlation between dimple size and grain size can be seen as expressed in Eq. (2), reported in previous works [38,44–46].

$$D_d = 0.422\sqrt{D} \quad (2)$$

Where D_d dimple size and D is grain size in micron. The correlation shows that the dimple size is directly proportional to the square root of grain size. It is known that strength is inversely proportional to the square root of grain size. Though there is no direct correlation between dimple size and ductility but based on these two statements, it can be concluded that strength is inversely proportional to dimple size. It means that decrease in dimple size results in improved strength and decrease in ductility because strengthening generally occurs at an expense of ductility.

However, while focusing on the strengthening mechanism, the difference in yield strength (σ_y) and ultimate strength (σ_{um}) for both LCS and MCS after processing can be linked to other factors such as (i) Carbon percent (%C), (ii) degree of grain refinement (grain size, D), (iii) phase fraction (f_{ph}), (iv) size of martensitic blocks (D_M), (v) dislocation density (ρ), and can be expressed as Eq. (3);

$$\sigma_y \text{ or } \sigma_{um} = f(\%C, D, f_{ph}, \rho) \quad (3)$$

On comparing the mechanical strength of low carbon and medium carbon steel plates fabricated by cold-rolling process, it is found that carbon plays a vital role in strengthening. It can be linked to the more obstacles offered by the larger number of carbon atoms against the movement of the dislocation motion. It is related to the concept of solid solution strengthening which reduces plastic deformation through hindering dislocation movement [47]. It is well known that the behaviour of medium carbon steel falls in between low and high carbon steel [48]. The solid solution effect of carbon content in the strengthening can be correlated to the following Eq. (4) [49]:

$$\sigma_{ss} = 32.24[Mn] + 83.16[Si] + 360.36[C] + 354.2[N_f] \quad (4)$$

Where σ_{ss} stands for solid solution strength and $[Mn]$, $[Si]$, $[C]$, and $[N_f]$ denote weight percentage of alloying elements (manganese, silicon, carbon, and nitrogen, respectively) dissolved in the matrix of Ferrites.

The effect of free nitrogen is neglected in this study since it is not observed to be inherent in the material. From the Eq. (4), it is clear that carbon plays a vital role in strengthening with a coefficient of 360.16. The carbon content not only influences the solid solutioning it also affects the phase transformation since an increase in % carbon reduces the austenitizing, bainitic, and martensitic transformation temperatures, as observed from previous studies [50,51]. Since microstructure is a combination of Ferrite, Bainite, and Martensite, and yield strength for all individual phases has different values, hence overall yield strength can be correlated with the combined effect by following rule of mixture as given by Eq. (5);

$$\sigma_y = \sum(\sigma_{yij}) = \sigma_{yF}f_F + \sigma_{yB}f_B + \sigma_{yM}f_M \quad (5)$$

where j stands for ferrite (F), Bainite (B), and Martensite (M) and f stands for a volume fraction.

If the grain size and its fractional effect are focused, according to the Hall-Petch relation the yield strength can be expressed as Eq. (6);

$$\sigma_y = \sum\left(\sigma_{ij} + \frac{K_j}{D_j^{1/2}}\right) \quad (6)$$

where $j = F, B$, and M

Where σ_i and σ_y stand for material stress just before the start of

dislocation motion, and yield strength of the matrix respectively, while K and D stand for the strengthening coefficient and grain size/block size, respectively.

Initially, base material comprises of Ferrite and pearlite where the average grain size was found to be 20 μm for LCS while 12 μm for MCS. After FSP, the soft Ferrite got refined and found to be 6.7 μm for PMCS and 8.1 μm for PLCS. Considering the refinement effect of Ferrite and assuming that the ferritic strength is independent of carbon content in the metal matrix [52], the yield strength of pure Ferrite was calculated by using the Ferrite grain size versus yield strength relationship [53] best known as Hall-Patch relation as expressed with Eq. 7;

$$\sigma_{yF} = 88.3 + \frac{573.4}{\sqrt{D_F}}, \text{ for } f_F = 1.0 \quad (7)$$

From the above equation, yield strength of Ferrite in PLCS and PMCS was found to be 289.77 MPa and 309.824 MPa respectively. In this way, contribution of Ferrite to the yield strength, depending on its volume fraction 0.659 in PLCS and 0.217 in PMCS is calculated to be 190.96 MPa for PLCS and 67.23 MPa for PMCS.

Concerning Martensite, they are of different types depending upon the processing temperature, cooling rates, and their volume fraction in steels. The contribution of Martensite to yield strength was calculated based on the volume fraction. The yield strength of Martensite is generally a combination of five contributions [54]: (i) Friction stress for pure Iron (σ_o), (ii) Solid solution strengthening (σ_{ss}), (iii) Precipitation hardening (σ_p), (iv) Hardening by dislocations (σ_d), and (v) strengthening by Martensitic lath or plate size ($K_{HP}d^{-1/2}$). The martensitic yield strength can be expressed as Eq. (8);

$$\sigma_{yM} = \sigma_o + \sigma_{ss} + \sigma_p + \sigma_d + K_{HP}d^{-1/2} \quad (8)$$

By using references i.e. [55] for PLCS and [56] for PMCS, the yield strength of Martensite was calculated. It is noteworthy that the Martensite morphology strongly depends on the carbon wt% of the pre-processed material and the volume fraction of Martensite after FSP. It obeys the rule of mixture by following the Eq. (9) [57].

$$C_S = C_M f_M + C_F f_F \quad (9)$$

where C_S , C_M , and C_F stand for total carbon in steel, carbon in Martensite, and carbon in Ferrite after processing, while f_M and f_F stand for fractions of Martensite and Ferrite, respectively after processing.

From Eq. (9), Martensite was found to have 0.306 wt% C in PLCS and 0.533 wt% C in PMCS, if carbon solubility limit in Ferrite is considered 0.02 wt%. Further, Eq. (10) gives Hollomon expression for tensile flow behaviour;

$$\sigma_T = k(\epsilon_p)^n \quad (10)$$

Where σ_T , k , ϵ_p , and n are true stress, strength coefficient, true plastic strain, and work hardening exponent respectively.

By using Eq. (10) at the yielding point and maximum load for pure Ferrite structure ($f_F = 1.0$), the following expression was considered;

$$\frac{\sigma_u}{\sigma_y} = \frac{k(\epsilon_u)^n}{k(\epsilon_o)^n} \quad (11)$$

Where σ_u , σ_y , ϵ_u , and ϵ_o stand for ultimate tensile strength, the yield stress, the uniform plastic strain, and plastic strain, respectively, all expressed in true value.

By using the expression established by P.C. Chakraborti et al. for DFM (duplex Ferrite and Martensite) steels [56] as expressed by Eq. (12);

$$\sigma_{u,DFM} = 240 + (380 + 2585 C_M)f_M \quad (12)$$

If $f_M = 0$, then the tensile strength (σ_u) of pure Ferrite structure ($f_F = 1.00$) is 240 MPa. If $\epsilon_o = 0.002$, and $\epsilon_u = n = 0.31$ values from a report of Davies [42] are kept in the Eq. (11), the yield strength of pure Ferrite is

obtained equal to 50.26 MPa. After calculating the yield strength of Ferrite for DFM steel, the yield strength of Martensite is calculated by rule of mixture by using Eq. (13);

$$\sigma_{yM} = \frac{\sigma_y - \sigma_y f_F}{f_M} \quad (13)$$

The values of σ_y , f_F and f_M for the particular DFM steels reported by [56] were as follows;

$$\sigma_y = 395 \text{ MPa}, f_F = 0.3220, f_M = 0.6780 \text{ for } C_M = 0.31\% \text{ while}$$

$$\sigma_y = 457 \text{ MPa}, f_F = 0.6133, f_M = 0.3867 \text{ for } C_M = 0.54\%$$

By substituting the above values in Eq. (13), the yield strength of Martensite (σ_{yM}) is calculated to be 558.72 MPa and 1102.08 MPa. It is observed that the effect of carbon concentration on yield strength for Martensite is significant. An increase in the carbon content in martensite results in improved strength of martensite. A similar observation is reported by Dong et al. [58].

Since obtained Martensite in the current study consists of carbon content similar to the reference article [56] i.e. 0.306% for PLCS and 0.533% for PMCS, the above-calculated values of yield strength of Martensite can be considered as base values for further calculations. The volume fractions of Martensite in PLCS and PMCS are found to be 0.245 and 0.743 respectively. Therefore, yield strength contribution of Martensite is obtained 136.89 and 818.85 MPa respectively.

Apart from Martensite, PLCS also contains 9.6% Bainite in the matrix. Since Bainite does not capture carbon unlike Martensite, therefore, it is noted that Bainitic strength does not depend strongly on carbon concentration. Regarding the effect of Martensite and Bainite fraction on yield strength, it was reported by Abbas et al. [59] that the bainitic yield strength was 1304 MPa and 1385 MPa for 100% upper, and 100% lower Bainite, respectively. By considering, the average value of Bainite strength, contribution of Bainite to the yield strength of PLCS is calculated to be 129.07 MPa. The overall theoretical contribution of phases to yield strength after friction stir processing of steels are presented as bar graphs as shown in Fig. 10a.

From theoretical calculations, it is observed that the contribution of the micro constituent phases to the yield strength of PLCS matrix was found in good agreement with the rule of mixture, while it was not same for PMCS where the theoretical yield strength was ~30% higher than experimental as can be observed in Fig. 10a (PMCS). The difference might be mainly due to excess martensitic fraction. According to the

study conducted by Bag et al. [60], the highest peak of yield strength for duplex phase steel was observed at a volume fraction of 0.55, however after this limit, strength decreased. Similarly, a report by Nakagawa and Thomas [61] also confirms the decreasing trends of yield strength after a maximum martensitic volume fraction of 0.60. The decline in yield strength might be due to a combination of Ferrite-Martensite up to a certain limit of martensitic volume fraction maintains the continuity of slip planes as well as slip directions across the duplex phase interface due to the same crystallographic orientation of both phases assisted by fine distribution of elongated phase constituents, low interfacial energy, and homogeneous deformation of phases altogether. Since the Martensite volume fraction of more than 0.60 does not reach its ultimate tensile strain during bulk necking while being tensile loaded, the experimental value of the contribution of Martensite to yield strength does not satisfy the theoretical value [52]. Hence dual-phase (F+M) matrix with a higher fraction of Martensite i.e. > 0.6 does not follow the rule of mixture. However, if the potent fraction of Martensite was considered 0.60 upto which the yield strength was proportional, then the martensitic contribution to yield strength was calculated to be 661.20 MPa.

The excess fraction of martensite can be assumed ineffective in the improvement of yield strength. It is because more than 0.60 vol fraction of Martensite results in stress 'built-up' in softer Ferrite. Thus the stress built-up in Ferrite lowers down its hardening capacity, as observed by Chakraborty et al. [56]. Hence, contribution of ferrite and martensite to the overall yield strength falls in good agreement with rule of mixture if the martensitic volume fraction is confined to 0.60. Finally, the contribution is presented in Fig. 10b and Table 4.

It is noteworthy that the percentage of contribution was calculated by considering the experimental yield strength as a reference value. The microstructure and yield strength correlation can be expressed as below;

$$\sigma_y = \sigma_y f_F + \sigma_y R f_F + \sigma_y M f_M \text{ for } f_M \leq 0.60$$

Table 4

The contribution of different phases to the yield strength of processed materials for taking $f_M \leq 0.60$.

Material	The% contribution of phases to the overall yield strength			Error
	Ferrite	Bainite	Martensite for $f_M \leq 0.60$	
PLCS	41.61	28.10	29.83	0.46%
PMCS	9.80	-	96.80	6.60%

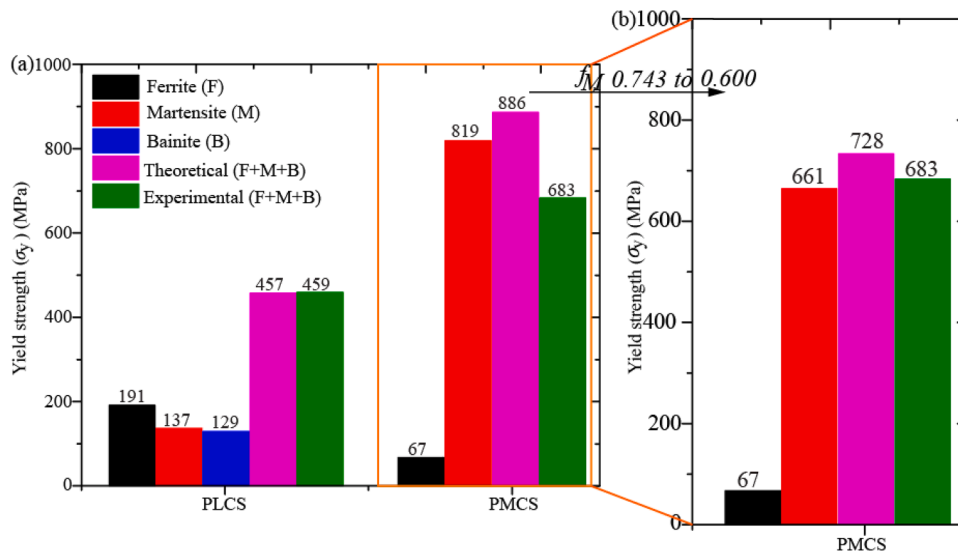


Fig. 10. The bar graphs showing the contribution of different phases of the metal matrix to the overall yield strength (a) For the actual fractions of phases, (b) For the limiting value of Martensite fraction i.e. 0.60 for PMCS.

$$\sigma_y = \sigma_{yF} + \sigma_{yR} + \sigma_{yM} * 0.60 - X \text{ for } f_M > 0.60$$

Where X stands for loss of strength due to an excess fraction of Martensite, which is not studied in the current article.

4. Conclusions

This study deals with investigation of microstructure evolution and percent contribution of micro constituents of phases to the overall yield strength resulting from friction stir processing of low and medium carbon steels. From this study, following conclusions are drawn as discussed below;

- i A significant effect of carbon concentration of the base material is observed on the evolution of microstructure during FSP. For the same heat input/processing parameters, the low carbon steel (0.09%C) microstructure comprises of a mixture of Ferrite, Bainite, and Martensite that is dominated by Ferrite with a volume fraction of 0.659. However, the medium carbon steel (0.40%C) is dominated by Martensite with a volume fraction of 0.743.
- ii Martensitic morphology is vastly affected by its volume fraction, as higher the volume fraction of Martensite, lower is the carbon concentration in Martensite affecting its strength and ductility. At individual level, Martensite with higher carbon concentration (0.533% C for PMCS) is found to be stronger than lower concentration (0.304% for PLCS) because entrapment of larger number of carbon atoms provides more resistance to dislocation motion.
- iii In the duplex phase microstructure of friction stir processed steels, the smaller laths of Martensite (~50 nm width) are observed in PMCS while it is larger (~500 nm) in the case of PLCS for similar processing conditions. This might be due to the higher carbon content in the PMCS that reduces the Martensite start temperature and produces more nucleation sites for the martensitic transformation. Due to lowered Martensitic start temperature, the lesser time is available for the growth of martensitic laths, and hence the size of laths is confined to smaller.
- iv The resultant yield strength is found to be in good agreement with rule of mixture for Martensite volume fraction ≤ 0.60 . However, an increase after the limit, martensite results in a decrease in the yield strength.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests.

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PREFACE

The objective of conference is to inspire engineers, academicians to explore, integrate and evolve in the research direction through a forum. As all of us know that Technology is always a progressive phenomenon, the research can bring the remarkable transformation to cater for the society needs. To achieve this precious goal a national conference “Trends in Engineering Excellence and Metamorphosis-2022” has been scheduled on 10th, 11th June 2022 at Theem College of Engineering, Boisar providing the best avenue for the publication of research and development.

The THEEM- 2022 Conference will surely facilitate the participants to present, discuss and publish their recent research results and approaches which can develops new ideas to achieve the needs of emerging industry.

Without an effective coordination and support from many individuals and institutions, it is not possible to organize such kind of facilitation center for the researchers though which they can present the genuine research work. I would like to express my hearty and sincere thanks to the speakers of invited talks and contributory paper presentations. I wish to acknowledge the time and efforts taken by the expert reviewers of the journal for carrying out review of papers. I also acknowledge to all the members of different committees and co-conveners who carried out a lot of work to make this conference, THEEM-2022 a grand success. I wish all participants fruitful and effective interaction at the conference.

Thanks a lot

DR. SHAH AQUEEL AHMED

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NEEDS OF PROFESSIONAL COMMUNICATION IN ENGINEERING**Khushi Rupesh Gupta, Md Zarkham Kalim Shaikh, Shahid Hamid Khan and Yaman Abdul Subhan Khan**

Students, First Year Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

Conventional engineering curriculum is strongly focused on the development in students for technical knowledge and skill. Recognition is one of the most important factor in which communicative skills plays an important role. The purpose of the paper to portray the Impact of English Communication on Rural Area Engineering Students and provide remedies to overcome the problems. Based primarily on the review of some relevant literature available the present article reveals the fact that professional communication is one of the most important parts in the communicative field all over the world and it has a basic tool which is English language.

Keywords: Engineering, Technical Knowledge, Communication Skills, Professional Communication

I) INTRODUCTION

Communication, a process of exchanging ideas and facts for common understanding, helps the participants to share their ideas, thoughts, experience and feelings with each other. It is one of the most important tries of the human being, without this, it is almost impossible for any human being to survive in this complex world. Communication uses a common language as the most important medium and it can be taught to create common understanding among the people. People according to their community, culture and the nature of their professions use different varieties of language as well as professional skills to get success in it.

In the arena of corporate world, especially in the field of engineering, English is used as a global language and it can be the only convenient language in the means of professional communication. The main aim of this paper is to highlight the importance of Professional Communication in engineering and needs of English for communicating to the people of the world. The paper broadly encompasses a wide range or sub headings such as definition of professional communication, communication in workplace and institutes' professional for execution of engineering jobs respectively.

II) LITERATURE REVIEW

The survey of other literature related to this research helped us to bring some related terms to complete the paper. On the review of some relevant literature available the present article reveals the fact that professional communication is one of the most important part any profession. In the communicative field all over the world, professional communication has a basic tool named as English language. Learning this language, helps you to lead yourself in the world and explore your views, ideas and thoughts internationally. The paper which were guided us to define the following points:

- 1) Developing an awareness of social justice and ethics, teamwork and conflict resolution are must for industry professionals.
- 2) Promoting these among the engineering students helps to build their recognition on the importance of Professional communication in engineering.
- 3) Language, Paralanguage and Body language are complement each other in professional communication in order to provide meaningful information (Zimmerman & Uecke, 2012).
- 4) The quality of life and survival data provided for those who use the technology.

III) What is Communication?

Any professional individual needs the art of good communication skills for enabling him or her to perform the job in a most effective and attractive manner. Professional Communication skills determines the employment opportunity and the sustenance of their job. In engineering jobs, this skill plays an important role and absence of quality communication skills can affect effectiveness of their performance as well as their job maintenance.

As the engineer have international job market, they need to prove that they are deserving candidate for grabbing those job opportunities. Just completing the academic syllabus and scoring marks are insufficient. Multilingual skills are considered as a salient element in the makeup of the new global engineer. Even the candidate who have secured distinct throughout the academic career in engineering may be unsuccessful in executing their job unless they process the high level of expertise in communication in English

IV) Characteristics of Effective Communication

To ensure understanding between the communicators, they have to apply the 7 Cs of Effective Communication which are as follows:

Sr. No.	7 Cs of Effective Communication	Definition
1	Clear	The main ideas to be easily identified and understood
2	Concise	Present the centre point without using unwanted words or images
3	Concrete	Give the specific explanation or examples
4	Correct	Provide information with suitable words and proper grammar
5	Coherent	Present the information in a logical sequence
6	Complete	Give sufficient information thus the audience can understand
7	Courteous	Use polite and professional tone to show your respect and value

V) What is Professional Communication?

Professional Communication includes oral, written, visual and digital forms of delivering information in the context of a workplace. As engineering is considered professional skills, engineers should have the knowledge of being effective communicators, effective in groups while engaging, considering, listening to the others and asking questions and responding accordingly. They must have the quality of the nature of speak clear, confident and gracious in their interactions. Listening other people’s ideas, being able to communicate clearly and effectively can help them building a positive working relationship, team works and more productivity. Their poor communication may lead to creating problems and serious failure in Effective Professional Communication.

VI) Needs of Professional Communication in Engineering

Engineering students, in order to enhance both community engagement and career success, need to acquire the professional communication skills in addition to technical skills. The educated and industry professionals have increasingly articulated it for developing an awareness of social justice and ethics, teamwork and conflict resolution because they improve students’ communicative competence in both academic and professional success. Over the past decades, nationally and internationally, a number of tertiary institutions recognized that the examination of interdisciplinary approaches are important in relation to that the interactive approaches for engineering also important for workplace success therefore, they involved this study in engineering education.

In this respect, in engineering, teaching and learning of oral and written communication skills have been examined through teamwork and professional writing skills and their communicative competence is specifically motivated. For example, the ability of writing report, proposal and research articles and presenting individually or group prepare students themselves to go ahead in both technical and non-technical preparation and presentation to become expert in exploring an excellent standard in oral and written skills. It is said that oral communication and presentation skills are “career enhancers” and they are considered as the biggest single factor in determining students’ career success or failure.

V) Professional Communication Skills for Workplace



No matter what industry you work in, but the ability to communicate effectively with superiors, colleagues and staff is essential. In the era of digital, workers must know how to effectively present and receive messages in person or via phone, email and social media. The following 10 things are must at workplace communication: 1) Listening, 2) Non-verbal Communication, 3) Clarity, 4) Friendliness, 5) Confidence, 6) Empathy, 7) Open-mindedness, 8) Respect, 9) Feedback, 10) Picking the right medium. Let us look into a short glance of each:

1) **Listening:** If you are not a good listener, it is going to be hard to explain what you are being asked to do so, being a good listener is one of the best ways to be a good communicator. No one likes communicating with someone who cares only about putting in her two cents and does not take the time to listen to the other person.

2) **Non-Verbal Communication:** Your body language, eye-contact, hand gestures and tone of voice all colour the message you are trying to express. Eye-contact demonstrates that you are focused on them while conversing but make sure not to stare at the person because it can make him or her uncomfortable.

3) **Clarity:** Do not talk too much or too little because saying just enough is good verbal communication. So, try to express your message in a few words and say it clearly and directly. Either in person or on the phone, do not ramble on otherwise your listener will tune you out or will be unsure of exactly what you want.

4) **Friendliness:** It is important to be polite with simply a smile and friendly in nature at your workplace communication because that encourage your co-workers or the other person to engage in open and honest communication with you. This is important in both face-to-face and written communication to make the receiver feel more appreciated.

5) **Confidence:** It is important to be confident in your interactions with others. Confidence shows your co-workers and colleagues that you believe in what you are saying and will follow through. Of course, be careful not to sound arrogant or aggressive. Be sure you are always listening to and empathizing with the other person.

6) **Empathy:** Using phrases as simple as helps to demonstrate that you have been listening to the other person and respect their opinions. Active listening can help you tune in to what your conversational partner is thinking and feeling, which will, in turn, make it easier to display empathy.

7) **Open-Mindedness:** A good communicator should enter into any conversation with a flexible, open mind to listen and understand the other person's point of view rather than simply getting your message across. It helps you get easily connect to your audience views and be able to have more honest, productive conversations.

8) **Respect:** People will be more open to communicating with you if you convey respect for them and their ideas. Simple actions like using a person's name, making eye contact, and actively listening when a person speaks will make the person feel appreciated.

9) **Feedback:** Being able to give and receive feedback appropriately is an important communication skill. Managers and supervisors should continuously look for ways to provide employees with constructive feedback. Similarly, you should be able to accept and even encourage feedback from others. Listen to the feedback you are given, ask clarifying questions if you are unsure of the issue and make efforts to implement the feedback.

10) **Picking the Right Medium:** It is important that you should think about the person with whom you wish to speak and know what form of communication to be used in person. If they are a very busy person like your boss, or CEO, you might want to convey your message through email. People will appreciate your thoughtful means of communication and will be more likely to respond positively to you. This situation is like "Give respect take respect".

VI) How It Can Be Done?

1. Developing student's ability to construct foster the ability to communicate problem identification, formulation and solution to diverse audiences.
2. Use development in communicative ability as a vehicle for fostering students insight into and perspective on engineering practice in the community including the sound, cultural, political, international and environmental context of professional engineering pattern and present logical argument discursively.
3. Encouraging the students for participation in curriculum activities to such as class discussion hosting and response to formative feedback.
4. Foster language development from sentence level skill to large document written and oral communication.

VII) CHALLENGES AND OUTCOMES

This empirical evidence indicates that the engineering students are poor communicators. One of the fact is when students undertaking engineering studies, they belief that there is no need of English language skills. Therefore, the courses like discussion and conversation exercises are designed to encourage students to participate and practice skills and learn be flexible in their approach. To develop confidence, their ideas and contribution are respected to build on the strengths and group discussions as well as workshop exercises are used throughout the courses to ensure students regularly practice the skill of communication.

Students are encouraged to form cross cultural groups during classes, so that a greatest understanding of diversity and its value in engineering is promoted. At the same time, students must also undertake practical mood in developing effective teamwork skill in order to be able to complete tasks and class based exercises. Students discuss and at times challenge the characteristics of English for academic and professional purposes. In doing so, students become increasingly aware of how purpose and socio-cultural factors shape the kind of language used in different contexts rather than viewing language incorrect as simply correct or incorrect.

VII) CONCLUSION

The conclusion of the paper defines that Engineers with the ability to clearly communicate can easily and confidently share their ideas to decision-makers in presentations, meetings, and reports. This statement highlights that the communication skills has equal importance as technical knowledge for engineers which will help them be successful over the course of their career. Learning and practicing excellent communication skills is one of the best ways for engineering managers that brings them value to their companies and building their own career. The study suggest that engineering students should be encourage to train discussion, conversation, participation and practice as well as learn be flexible in their approach.

The Educated and Industry

Although engineering is a technical field, professionals have increasingly articulated development professional communication for awareness of social justice and ethics, teamwork and conflict resolution. So, professional communication in engineering is essential to promote business communication and to succeed in marketing and life-long relationships. They should even adapt ethics to add more colour in their business through engineering design presentation. At the end, the research concludes by using J Paul's quote, "Communication the human connection is the key to personal and career success."

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IMPACT OF ENGLISH COMMUNICATION ON RURAL AREA ENGINEERING STUDENTS

Shirodkar Janvi Satyavan, Mishra Anurag Rinku, Mishra Saurabh Sanjay and Mishra Nikhil Anil
Students, First Year Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

Coming from a upper class, well to do family, from a tier 1 town, studying in an top rated engineering college, life looks like a cakewalk but it isn't the same for everyone. Here, using our research paper as a medium, we have tried to portray what obstacles students coming from other side of what we think is "good life" face when they first enter engineering colleges with a ray of hope in their eyes to bring their family out of poverty, to uplift their society! The biggest hurdle that they have to jump through is facing the English language. They need to understand its importance and include it in their lifestyle which is a tough job but once they make themselves comfortable then life will be good! English has its importance spread throughout life likewise it has its share due in engineering both in academics and in workplaces. One needs to understand and apply themselves to gather the knowledge that the beautiful language has to offer. Students coming from not well to do families, rural areas, underdeveloped cities are not comfortable speaking the language due to numerous reasons mainly less exposure, lack of practice but there are lot of ways one can face the language, one can increase their grip in speaking in English and this is what we have tried to explain through our paper.

Keywords: English Communication, Obstacles, Rural Engineering Students, Comfort to Speak in English

1) INTRODUCTION

Basically, we study English language since schooling but one question that really comes in our thought is "Where does it come of? What is the use of this language? and What is its background?" It is studied that the English is originally a language of the people from England only spoken by some troops but in the present century, this language is become an International Language. It is also said that over 18% of the world population speaks English. Are they really sound and comfortable speaking in English? The answer is 'not everyone' but some really hesitate to speak or express their thoughts in English. The reason behind it is lack of basic knowledge of the language such as grammar, insufficient exposure to vocabulary, and lack of confidence.

English language has the highest importance in the professional fields. Similarly, in the engineering field, English is considered as one of the high profile language to show your personality. An engineer should have English fluency and accuracy with good communication skills to excel in his/her profession. These skills play very important roles in engineers' life to build their team and leadership. Hence, a various measures have been taken for improving this, there are various bridge courses has been declared by the government and various universities declared English as their main language, the pressure to improve English Language Education (ELE) has been steadily increasing.

There are some other measures have also been taken by the students for example, students communicate most probably in English no matter at first they may face grammatical errors but they keep learning. Schools and college teachers should only communicate in English language with students. Vernacular mediums should also give preferences to teach English and many more efforts should be taken place.

2) LITERATURE REVIEW: The survey of other literature related to this research helped us to bring some related terms to complete the paper. The paper which were referred has given many views and thoughts as given below:

- 1) Understood that this problem has not raised suddenly but it has been passed on from generation to generation.
- 2) This problem also depends on what level of society one comes from, the geographical location where a student is helped in a way for example, as people from south are relatively good English speakers compared to people from north in the same way people from north east have a good hand on the language compared to people from west.
- 3) Understood how this can be solved too.

3) IMPORTANCE OF ENGLISH LANGUAGE IN ENGINEERING

Engineering people think all about building big sculptures, huge monuments, crazy tech, humanlike robots all in all taking humankind to a better tomorrow. Talented engineers can make these things and make our world a better place to live. The challenge in this is how to amplify one's invention to the whole world. How the globe will notice what will make in a corner of my drawing room. It is a big question. The answer to this is a paper

and a pen. It is rightly said “Pen is Mightier than Sword” so to magnify our knowledge, our inventions, we engineers must use English as a tool. It helps us to explore places where we could never be in real life. It takes us to places where we could not imagine even in our wildest dreams! English language has importance in both academic as well as work place and also plays a vital role in engineers’ life.

4) IMPORTANCE OF ENGLISH IN ACADEMIC PLACE

The students who pursue engineering take a very bold step in their life. Engineering being one of the most appealing and promising sector not only in our country but around the world attracts an ocean of students.

When we are entering our engineering colleges most of us would have recently turned adult and we would have gone through rigorous studies, preparations for our entrance exams and that impact our communication skills a lot. One could have got selected in any college around the world or country on the basis of their marks. They may have to go to place they would have never heard of completely opposite, no similarities in culture, no similarities in food but in such cases the savior for students is English language.

The beauty of this language is that this language is spoken across the globe and in India from Kashmir to Kanyakumari, from Gujrat to Arunachal Pradesh. It helps students to communicate with their classmates coming from different places having their different local languages. A catalyst is a substance that speeds up chemical reaction similarly, English language helps in giving an adrenaline rush to the academics and social life in college and educational institutions. Being fluent in English adds an extra confidence in a person and he/she gets a motivation and hence it get reflects in their academics.

5) IMPORTANCE OF ENGLISH AT WORKPLACE

Speaking English in one’s workplace is a new ball game altogether. It begins even before we enter a company right from the interview process. We are selected based on our fluency in English language, our clarity, our confidence, the words we use, the way we use them, our pronunciation, our enunciation. The way we speak English plays a vital role whether we shall get into a respected organization or not!

In our workplace, we are member of various teams and hence communication skills that we possess are checked here, the way we speak the way we present ourselves will decide whether we shall be taken seriously or not. The English we speak in offices is completely different from the one we speak with our friends and peers. One needs to train themselves in suitable manner to outstand in their workplace. Arranging seminars, taking interviews, meetings, giving presentations all require great communication skills which in turn requires knowledge and practice of the language English!

6) IMPORTANCE OF ENGLISH FOR RURAL AREA ENGINEERING STUDENTS

To study engineering degree is not only taken by the urban students but also by the rural students. Many students from rural areas are also eager in pursue engineering but the only problem they faced is communicating in English. After coming at institute level, there is no differentiation in any language, only English language is given the most preference.

Students coming from rural areas are definitely more familiar with their vernacular language as compare to English language which makes them difficult to communicate in English and henceforth they lay behind. Their understanding level is similar to students of urban areas but the only differentiation is English communication. For example, if any derivative is explain to them they can easily admit it if it is in their own vernacular language but if the same is taught to them in English language they might get some difficulties to adapt it.

7) PROBLEMS FACED BY RURAL ENGINEERING STUDENTS

Basically, 75 percent of the engineering students are from the rural areas and from the underdeveloped cities. These students find barriers and discomfort while speaking English. Maybe this is because of their steady growth in a regional language medium school or any other reasons. There is no doubt that they are not talented as they have qualified in an engineering college, but at every walk of life and career, English becomes an obstacle for rural engineering students. The first problem that a rural engineering student might face English as a trouble.

8) SOCIO ECONOMIC BACKGROUND OF FAMILY

Classroom of a college contains the students from different states of the society who poses grasping power and English communication competence. It is found that the English communication competence of the students belonging to the literate parents or higher middle class family is better than that of the students belonging to the illiterate parents or poor family. The actual fact behind this situation is that the literate parents can provide more facilities and more exposure towards their child to English as they are aware about the importance of English competence in the society. The literate parents give proper guide and care to their children to perform

better in their life in fact these all things never happened in second group due to the lack of parental supervision and guardians from the higher education department

9) LACK OF SKILLFUL TEACHERS

The other important factor that should be taken in consideration at first is the education system. Here, there is lack of skillful teachers, there are many untrained teachers, that all learning groups are unaware about current trend and advanced techniques of English language teaching. The same condition is there at the primary, secondary and higher secondary schools of rural or semi urban areas. This type of education creates exam-oriented students to their technical subject than to the English communication competent. The teachers have not been scared lead to a poor quality of education.

10) EDUCATION SYSTEM

The Other important factor is practically and cultural system of the college which affect the learning of English language. For learning English language it requires four skills that is listening, speaking, reading and writing (LSRW). The present education system is strange to the students that they have no chance to listen, speak, reading and writing and these LSRW activities are neglected and ignored. Let us take an example of language it is in bio baby start speaking the words which it listens frequently our system neglect the importance of listening with results in the lack of scale of speaking.

11) LACK OF EXPOSURE TO THE ENGLISH COMMUNICATION

The student living in the rural areas lack the exposure to English communication in the society as well as in colleges. Even the meritorious, gold medalist, feel to achieve a success during personal interview but due to the lack of English communication skills, lack of confidence they have inferiority complex and fear of others. As a result, students of rural background keep themselves lonely and do not have the same common sense with all other people.

12) LANGUAGE REDUCED AS THE SUBJECT

The language English is taught for and learnt as one of the subject for examination. Most of the students focus on the writing skills and grammar because the examination process of Boards and Universities. English subject based on writing skills and students' basic concern is to score good marks in examinations not gain knowledge. This attitude of the children reduces their interest in learning English language and the beauty of language is also got lost.

13) MEDIUM OF TEACHING

Medium of teaching English subject in rural areas is most dangerous because they use mother tongue to explain the lessons which creates confusion among students. The construction of sentences in English and in Indian language is different that makes rural students critical to improve English.

14) REMEDIES

14.1. Development of Inner Urge: It is generally observed that the engineering students mainly focus on their technical subjects because they think that the only thing require to get a job is knowledge. While pursuing the other subjects and development of technical skills are totally neglected. Students' communication skills, which is the only one of the greatest aspect for getting jobs, is neglected. Considering the scenario of corporate world, if the candidate has good knowledge and best communication skills, he/she is suitable for that field. So, the engineering students should develop their communication skills to progress in their personal and professional life.

14.2. Need to Enrich Vocabulary and Sentence Construction: Language consists of words and sentence structures. Each day, they must learn at least 5 or more than 5 words and try to use them while having conversation with their friends families or having conversation with themselves by standing in front of mirror and starting a conversation.

14.3. Listening: Listening skills of students must be developed. A habit of careful listening of English news, lectures and explanations during tutorials, practical, seminars, technical presentation, academic discussion, and academic interactions, and zone. Before being a good communicator or speaker, they must have art of being a good listener. One must also have proper knowledge on the language that can only be achieved by listening.

14.4. Speaking: Speaking skills are very important for a person's professional survival and group. It gives image of how could you are at your profession and also boost confidence in speaking. The rural students should be given a chance to have conversational activities, discussion, and question and answer sessions in order to remove their fear and open to accept challenges. It will become a center of attraction or avoids the fun of their mistakes. Opportunities must be given to them to raise their opinions, agreement, disagreement and suggestions.

The credit should be given for participating discussions, making presentation of projects, products, graph, table, charts, plans, maps. As doing these, they will not only make their moral boost but also they won't hesitate to stand out from others. We must be ensured that speaking skills are the single most important criteria in hiring.

14.5. Reading: Like listening and speaking, the reading is also crucial for good communication skills. Students need to read technical and business documents, reports, magazines, articles, lattice and instructions manuals. They must also read out biography of successful people. It is hard to imagine any academic professional or business work that does not require analysis and efficient reading skills.

14.6. Writing: It is said a reading makes a complete man, speaking makes ready man and writing make a perfect man. Writing is very important for students because it is one way to communicate. Writing skill is seen everywhere in academics and also in professional field. Student should practice writing projects reports, lab reports, summary, synopsis, abstracts, and subject notes.

As they go higher post in the profession, they will require writing business letters, emails, messages, professional summary, and so on. They can also develop their skill by doing a small exercise daily such as reading books for 5 to 10 minutes and then writing down the point that the book contains. It will help enhancing your writing skill as well as memorizing power. Both professional and students need excellent writing skills to survive because there is no profession or academic that does not require writing skills.

15) CONCLUSION

This research concludes that there is a huge difference in the lifestyle of people coming from different places. Students that are from urban cities have an upper hand over ones coming from villages and areas that are deprived of basic facilities. These students have to understand that the English will act as a catalyst and can boost their academics and their confidence once they go to any workplace. Once they understand the importance of the language, in the early stage of their learning period, they may face lot of difficulties, this may be due to numerous reasons that we have mentioned in our paper and can be solved if one has the will.

It is rightly said, "Where there is a will there is a way". In today's time, nothing is impossible for anyone irrespective of where they are coming from. As it is the information age, the boundaries that used to separate people, countries and societies have been diluted by the internet and if a student identifies his urge to master the language, then with his hard work, perseverance and dedication he will master it.

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NEEDS OF ETHICS IN ENGINEERING

Rojalin Maheshwar Behera, Ajay Maurya, Prapti Narendra Chaudhari and Bhargav Mohan Bagade
Students, First Year Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

This paper emphasizes the “Needs of Ethics in Engineering” and educates engineering students the importance of it for building life-long relationships with stakeholders, suppliers and customers to achieve their goals in personal and professional life. The study also focuses on why people connect Ethics to Engineering and why Engineers should enhance Ethics. The study also highlights the corporate skills such as Personality Development, Communication Skill, Soft Skills, Leadership Skills and views on importance of Values and Ethics and its importance. The conclusion of the study is presented with explanation of Ethics and Benefits and its results.

Keywords: Ethics, Engineering, Life-long Relationships, Corporate Skills, Personality Development, Communication Skill, Soft Skills, Leadership Skills

I) INTRODUCTION

The main objective of this research article is to educate engineering students the “Needs of Ethics in Engineering”. Earlier, it is believed that the engineers should have Techno-oriented knowledge and skills to develop their creativity and productivity. In the present years, the universe emphasizes that the engineers should have not only the technical sciences concepts but also the knowledge and experience in communication skills, soft skills, leadership skills and views on importance of Values and Ethics. This article studies the reason of these demands and presents its essences to engineering students.



Fig. 1: Value of Ethics

The study depicts the truth that these skills are important to the engineers because they help them communicate effectively to their stakeholders, suppliers and customers which leads them to build good and life-long relationships with them to achieve their goals in business and in social life. The study exclusively focuses on Ethics and why people connect Ethics to Engineering and why Engineers should enhance Ethics. By the end of this article, the engineers will be familiar with or get the better ideas about the Ethics and applying it in the field of Engineering to get benefits of the Ethics.

II) LITERATURE REVIEW

The literature survey of this research work guided a lot for knowing the value of ethics in social and professional life. It provided more knowledge about it as well as system of engineering in production as well as business. The survey has helped us to target the following points:

- Recognizing the context ethics with a sound knowledge of its usage
- The function of human communication and its importance in personal and professional are clearly understood
- Code of Ethical Conduct in Engineering is learnt
- Professional Communication and Ethics help to promote moral authority to society and to maintain Creativity and Conflict Resolution
- Improves engineers' attributes, presentation skills and life-long relationships
- Implementing ethics leads to gain the skill of assessing the engineering ethics and education reforms and learning achievement of goals

III) Importance of Ethics in Engineering

A) Definition of Ethics

- Ethics is the moral principles that control or influence a person’s behavior or a system of moral principles or rules of behavior.
- Overall ethics is a branch of philosophy or specification moral philosophy that studies that evolution of concept such as right and wrong behavior.

B) Significance of Ethics in Engineering

- As engineers rely heavily on engineering to provide people safe and reliable goods and services, they must perform under a certain standard of professional behaviour such as the highest principles of ethical conduct.
- Mistakes made by unethical and incompetent engineers do not just cost money, they could cost lives.
- Several notorious cases, that have received a great deal of media attention in the past few years, have led engineers to gain an increased sense of their professional responsibilities.
- These cases have led to an awareness of the important of ethics within the engineering profession as engineers relies how their technical work has far reaching impacts on society.
- The work of engineers can affect public health and safety and can influence business practices and even politics.

C) Engineering Ethics

“Ethics” Has No Standard Use Either in Ordinary Language or in Philosophy.

- In both, “ethics” can be used in at least one of three senses:
 - 1) As a mere synonym for ordinary morality (“universal ethics”);
 - 2) For the special (ostensibly) morally-binding standards of some group (“Hopi ethics”); or
 - 3) For a field of philosophy (“Aristotle's ethics”).
- Every discussion of engineering ethics should, I think, include a clear statement about the sense or senses of “ethics” used.

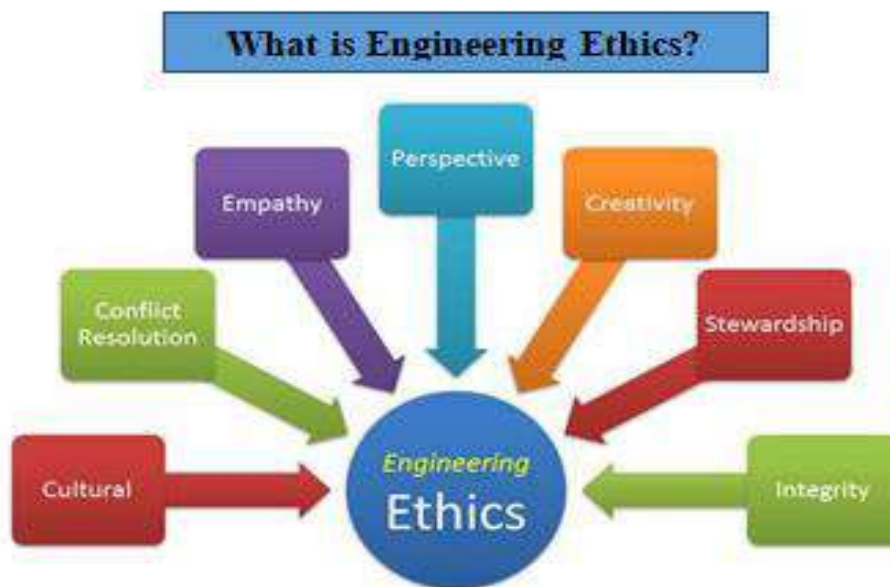


Fig. 2: Engineering Ethics

Philosophers can, of course, agree that “engineering ethics”, when used for a field of applied (or practical) philosophy (a specification of my third sense), is concerned with understanding--and helping to make--certain moral choices arising in the practice of engineering. Philosophers evaluate arguments, their own or those of others. Agreement among philosophers on that will, however, not give “ethics” a standard use, even in philosophy for at least two reasons:

1. One reason is that application this agreed-upon definition of “ethics” is sensitive to theoretic commitments. For a teleologist (whether utilitarian, virtue theorist, or other consequentialist), “ethics” is primarily about “the good life”.
2. The (moral) right is a function of the (non-moral) good. For deontologists, however, especially for a Kantian like me, the reverse is true: the right is conceptually prior to the good. Individuals may well disagree about what the good life is and yet agree on standards of conduct. Morality does not presuppose any single theory of the good. “Ethics” merely attempts to understand morality as a **rational** undertaking of those who may share no conception of the “good life”.

D) Professional Approach to Engineering Ethics

The professional approach to engineering ethics are as follows

- 1) Resembles the social insofar as both recognize a certain arbitrariness in what may turn out to be “ethical”.
- 2) The professional approach differs from the social in placing that arbitrariness in the profession’s decision rather than in society’s.
- 3) For the professional approach, society (like morality or the nature of engineering) is (generally) a mere “side constraint”, not the primary (or equal) party in determining the content of engineering ethics.
- 4) Individuals have a moral right to join a profession because humans have a moral right to associate in any morally permissible way; they do not need “society’s” permission.
- 5) Association in a profession creates moral obligations for those so associated insofar as they exchange commitments--either explicitly by promise or oath or (more often) implicitly by claiming the (morally permissible) benefits of membership in the profession.
- 6) The both social and professional approaches require standards beyond what law, market, and ordinary morality set everyone, both face a problem of explaining why those special standards are, though special, morally binding.
- 7) The social approach looks to society for the moral authority to add to an individual's moral obligations.
- 8) The professional approach looks to the individuals themselves, their power to add to their own moral obligations by express or tacit commitment.
- 9) The last approach "professional" to emphasize the distinctive place it assigns the profession.

E) Ethics In Engineering

- To begin by establishing a position with respect to technology and society, there are people who are considered as critics of technology who take a very dim view of the whole enterprise.
- Listening to them, one-might feel that the world would be better off if we could only return to some pastoral utopia that may have existed in the 13th century.
- I want to disassociate myself at the outset from that point of view.
- There are also people who consider that there is an inexorable movement of technology over which mankind has no control: that is -
 - each development proceeds from each preceding development;
 - our scientific knowledge advances in sequence as discoveries are made;
 - There is a natural order of these developments that we cannot control.
- There is a sense that if it is possible to make percent something it. Will be made if it is possible to put something into production, it will be put into production.

Some More Examples: The study presents here some examples of the ABM defence 11system, which was on track in this country around 1970 but as a to doom result of serious discussions was abandoned. Now course we are witnessing a resurgence of the same issues in another form, and I think we are going to see that debate come up again. It seems clear that these situations could have gone either way in the United States.

The SST might well have been built or the ABM might have become a major defence system, but because some people raised sufficiently strong objections they were not carried out. I think this gives us an indication that we have- at least some control over what is going on. If you do not make the assumption that one can control what is going on, then obviously we will not control what is going on. It is a self-fulfilling prophecy. If we do not

believe we can do anything about it, then we will not. Even if you are in doubt about whether you can change the course of events, I believe it is more fruitful to assume you can and then just do the best job possible. I take this position: that it is possible to control technology and its applications.

The next point I want to make concerns the responsibility of engineers in the process of controlling technology for the benefit of mankind. We could of course broaden the discussion to consider other kinds of people or to other responsibilities of engineers such as doing a good job for their employers and treating their colleagues ethically, etc., but I am going to focus on the idea of controlling technology for the benefit of humanity.

It is probably not necessary to dwell on the fact that technology has great benefits to bestow or that there are great problems that can also arise due to the misuse of technology in many ways. We only have to look at examples of collapsing bridges and buildings or crashing airplanes to see one aspect of the bad side. As far as the good side goes, all that should be necessary is to compare our lives with those of, people living several hundred years ago, where just staying alive in the winter was no simple matter. They also did not have the leisure that is available to us today, let alone such miracles as television, which of course has its down side.

As an aside, I think this is an example of a misuse of technology for which engineers are in no way responsible. It is clear to me that there are other institutions in our society that are to blame for misusing this miraculous invention by reducing it to a vehicle for selling toiletries and for showing programs that dull the minds of those who watch them.

Achieve and maintain professional competence is not always thought of as an ethical point but in this instance it really is ethical. It does not matter whether a building collapsed because an engineer took a bribe and used inferior materials or because the engineer made an error in specifying the size of a beam. Incompetence and other forms unethical behaviour can have in general indistinguishable results, so competence becomes an ethical point.

If you accept these as three underlying precepts that are not going to be debated by anybody, and it is difficult to see how anybody would argue that these are not important moral points or that each by itself should not be violated without strong counter-arguments based on other considerations, then we can formulate some useful ethical rules. For example, engineers shall regard their responsibility to society as paramount and shall:

- 1) Inform themselves and others, as appropriate, of the consequences, direct or indirect, immediate and remote, of projects they are involved in. This addresses itself primarily to the question effects. One has an obligation to do a reasonable amount of work, although there are limits as to how far one can go in trying to foresee all possible consequences.
- 2) Endeavour to direct their professional skills toward conscientiously chosen ends they deem, on balance, to be of positive value humanity; declining to use those skills for purposes they consider, on balance, to conflict with their moral values. Engineers make their decisions on their own set of moral values, which means different engineers could arrive at different conclusions with respect to particular projects. What they are obliged to do is to make the effort. What would be unethical would be to work on a project without having given any thought as to whether on balance it is a good thing.
- 3) Hold paramount the safety, health, and welfare of the public, speaking out against abuses of the public interest that they may encounter in the course of professional 13 22 activities in whatever manner is best calculated to lead to a remedy.

F) CONCLUSION

There are many interesting and pressing ethical topics that engineering and technology give rise to. This special issue features authors who all make an effort in identifying problems and offering possible solutions. The authors have various backgrounds: moral philosophers, philosophers of science and engineers who have devoted research on ethical aspects of their work. The basis is there for an interdisciplinary, international research community.

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IMPACT OF SPEECH ANXIETY ON STUDENTS PUBLIC SPEAKING SKILLS**Tanmay Deepak Rale¹, Prapti Santosh Patil², Shruti Rajesh Sankhe³ and M. S. Balasubramani⁴**^{1,2,3}Students and ⁴Assistant Professor, Theem College of Engineering, Boisar, Maharashtra**ABSTRACT**

Public Speaking Skills are important aspect of students in higher education. They have to present their works in the form of assessment and enhance verbally engaged experiential learning in small and large group settings. This research evidences that many students experience speech anxiety and also sought further insight into the six themes namely: fear of being judged, physical symptoms, uncertainty about the topic, negative effect on university experience, practice and preparation, and more needed practical support. The second objective was to determine whether their fear affected their experience in higher education or not. The results of this survey identify the differences between Trait-anxiety, State-anxiety, and Scrutiny fear in public speaking. It provides evidence of the overall negative effect on their higher education experience and suggests that the higher education institutions should admit the presence of speech anxiety among students and guide them by providing more support in oral presentation and assessments for overcoming the issue.

Keywords: Speech Anxiety, Public Speaking Skills, Experiential-learning, Overcome the Fear of Presentation and Assessment

A) INTRODUCTION

Students are very common among them but their performance level is different. Before they begin the practical tasks or activities, why do they feel that they won't be able to deliver a speech or presentation well! They start to feel what people think about me! They are interested in me or not, due to their speech anxiety, stage fear, lack of confidence and negative thoughts in mind. All these start to creep them from inside and leading them to low participants or failure or rejection.

The main purpose of this study is to identify the cause behind the impact of speech anxiety known as glossophobia on students' public speaking skills and to investigate finding a solution to it. "As soon as the fear approaches near, attack and destroy it"- Chanakya.



Fig.1: Speaker Thinks on People's View

B) OBJECTIVES

Simply learning what to say is not Effective Public Speaking but developing how to say with confidence so, the study aims to examine the following:

- Understanding the nature of Speech Anxiety (SP) and dealing with it to build your brand
- Analyse objectively the formation of students' habitual frame
- Understand the importance of personal preparation and routine practice in your topic
- Apply Cognitive Restructuring (CR) techniques to create a more positive frame to minimize your anxiety

C) LITERATURE REVIEW

In today's world, many people do not have the potential to speak in front of the public. Some people have stage fear or shyness, some have a lack of confidence and some have inferiority complex and anxiety so the experts considered it a Social Anxiety Disorder. People's level of anxiety is not the same in every person because speech anxiety affects every seven out of ten people and as much as 77% of the population. The National Institute of Mental Health report says that the reason for speech anxiety in 73% of the population is a judgment or negative evaluation by others.



Fig.2: Level of Anxiety

To study more of the above points, a number of other literature and articles are referred for exploring the reality of students' anxiety. Here you can see the views and ideas of them:

1. In the year 2012, Weissman's review presents the reasons of some speakers' fast speech: 1. they come in front of an audience, 2. the pressure of the situation prompts them to rush and 3. when time wrap that causes them to do it.
2. J. Davidson's book "The Complete Guide to Public Speaking" (2003) covers every aspect from preparation and execution to issues and provides complete guidance to public speaking with professional advice.
3. "Speaking with Confidence" (2011) by Ronald P. Grapsy deals with Communication Apprehension (CA) means the fear of public speaking which is common in our society and it guides to conquer the nervousness associated with public speaking, factors that lead to this anxiety and then take specific steps to overcome this communication apprehension.
4. "Communication Apprehension" can impact many diverse areas; from one's level of self-esteem (Adler, 1980) and how you are perceived by others (Dwyer & Cruz, 1998), to succeed in school, achieving high grade-point averages, and even landing job interview opportunities (Daly & Leth, 1976).
5. Morgan's review (2008) provides tips that hold great importance during speech or presentation:
 - ✓ Intent to be passionate about your topic
 - ✓ Intent to connect with audience
 - ✓ Intent to listen to your audience
 - ✓ Intent to open with your audience

D) HYPOTHESIS

1. **Factor 1: Students Face Failures** - In institutions, most of the students are nervous so they face failures in making projects and explanations. These activities require careful planning which is felt like an unpleasant task for them. Speaking in front of peers and higher authorities is the most difficult task and stressful for them which make their presentation skills negative impact and inefficient. Here, students need to realize that they are not the only ones who may go through these emotions but also every speaker. According to Lucas (2011), "Many people who converse become easily in all kinds of everyday situations become frightened at the idea of standing up before a group to make a speech."
2. **Factor 2: Students' Fear and Nervousness** - Many education level staff prepare many types of activities, presentations, demonstrations, etc. to develop students' personalities. Students generally avoid these opportunities due to their fear and nervousness. It can be a serious issue that act as hurdle for developing public speaking skills, and achieving goals both personal and professional. Professionals to have direct contact with the speaker and the audience are expected to regularly keep on improving their communication skills.

3. **Factor 3: Speech or Communication Anxiety** – Communication Anxiety (CA) or Glossophobia is the fear of public speaking which makes one feel alone in the struggle. It is spread worldwide and become an obstacle to higher education and professional success. McCroskey (1976) indicates that 20% or more of the U.S. population has a high degree of communicative anxiety. When people have higher levels of CA, they avoid interaction in personal important classrooms, professional relationships and social situations which results from miscommunication and misunderstanding. One must conquer it by taking specific steps to recognize the factors of the anxiety and overcome that. “I learned that courage was not the absence of fear, but the triumph over it.” – Nelson Mandela.
4. **Factor 4: Classification and Symptoms of Speech Anxiety** - Speech Anxiety includes fear, shyness, nervousness, feelings and worries. The most common mental health disorders symptoms encountered by public speakers are: shaking, trembling, sweating, dry mouth, creaky voice, dizziness, butterflies in the stomach, shortness of breath and rapid heartbeat.
5. **Factor 5: Negative Impact of Glossophobia** - Many students can't express their emotions even though they deliver speeches on daily basis. They may still experience anxiety about talking in front of others. Generally, the glossophobia students feel isolated and have a higher than normal risk of developing anxiety disorders which can make them become hindered by their thoughts on what to say, how to say, how to attract an audience, how to keep the audience's interest and how to gain their interest of hearing and be calm.
6. **Factor 6: Cognitive Reformation** - Cognitive Reformation means nurturing a change in attitude by self-reflective routine and it has three steps internal process: 1. Identify objectively what you think 2. Identify any inconsistencies between perception and reality 3. Replace destructive thinking with supportive thinking. These are very easy to understand but the execution is possibly a bit difficult! An individual who follows three steps of cognitive restructuring can deliberately adjust how one perceives an action or experience (Mattick et al., 1989).

E) METHODOLOGY

- 1) **Introduction:** A fieldwork is undertaken by studying 20 engineering fellow classmates and investigating their cognitive reformation before and after the activities of the subject Professional Communication & Ethics-I (PCE-I). It deploys analysis and assessment of the way students can understand their speech anxiety and find a solution to overcome it. Nelson Mandela said, “The brave man is not he who does not feel afraid, but he who conquers that fear.”
- 2) Students habitually adopt some kinds of behaviour later it could be very difficult to break so the research methodology educates them by inculcating the knowledge of understanding the differences among Trait-anxiety, State-anxiety, Scrutiny fear and Cognitive Reformation which help them deal with their “personal brand” of Communication Anxiety. It also guides them to conquer their fear and become brave by providing the knowledge - the importance of paralanguage in the flow of speech, tips for improving public speaking skills, fight against glossophobia and the benefit of cognitive behavioural therapy.
- 3) The knowledge of the above employing cognitive reformation helps them to know about how people develop habitual frames of reference, the way they approach an anticipated experience and change habits into counterproductive and delivering effective presentations. They were investigated in the following ways:
 - a) Trait Anxiety
 - b) State Anxiety
 - c) Scrutiny Fear
 - d) Cognitive Reformation

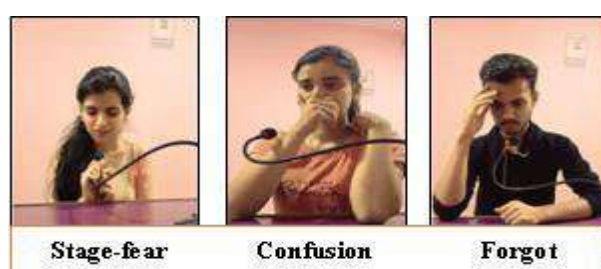


Fig.3: Trait-Fear Reactions

- a) **Trait-Anxiety:** It is associated with an individual’s personality that makes a person feel “shy” and leads to frequently avoiding interaction with others and becoming undefined on perception and persuasion. Researchers say generally this type of judgement is not difficult but it becomes a pattern of behaviour expressing themselves publicly with disbelief and hesitation. The above figure presents the anxiety of students: stage fear, confusion and forgot at the stage performance.
- b) **State-Anxiety:** Individuals find the state anxiety themselves from the external situation. In this image, everyone has a good eye-contact except the girl due to some personal trait or social anxiety associated with scrutiny and negative evaluation or experience at an early age like forgetting a line in a speech on poorly performing in a play in front of their class which result a bit of public awkwardness.



Fig.4: Avoid Eye-contact (State-anxiety)

- c) **Scrutiny Fear:** A scrutiny fear sprouts out while undertaking an activity in a situation. Students often worry more about their grade rather than what is contained in their presentation where one is being observed or one see himself or herself as being watched. Students usually develop a combination of personal and witness from student-oriented experiences which are considered as a habitual frame of reference that involves not interacting with other people. Studies have even shown that the possibility of a negative experience can lead many students to skip assignments or drop a class – even when that class is required for graduation (Pelias, 1989).
 - d) **Application of Cognitive Reformation (CR):** Everyone is unique. Each case of speech anxiety is personal and different. To deal effectively with CA, the first step is finding its primary cause and recognising different forces connected to different situations and then minimising the cause means overcoming the condition. Cognitive Reformation helps you effectively address the both presence of state anxiety and the appearance of scrutiny fear and alert the experience. It involves the development of one’s skills as a speaker and one’s attitude about the situation either “presenting” to a public audience or to a small group of close friends or both.
- 4. Importance of Paralanguage in Flow of Speech:** Action speaks louder than words like that Paralanguage is the component of spoken communication that uses non-verbal cues to reveal emotions and sentiment. It involves voice variation accompanying words to make the audience fully understand the essence of speech. The four major elements of the paralanguage are presented in this figure which makes your presentation interesting:

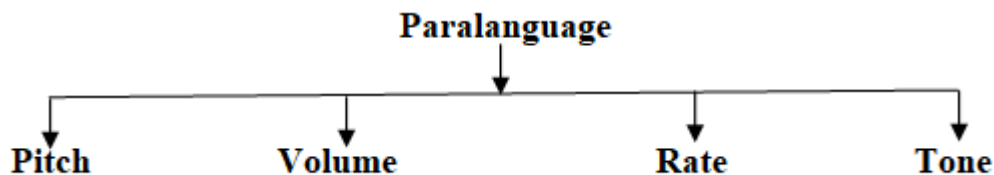


Fig. 5: Major Elements of Paralanguage

The following points help you present your topic in a very understandable manner:

Table 1: Description of Four Major Elements of Paralanguage

Four Major Elements of Paralanguage	Descriptions
1. Pitch	It represents the high and low of your voice. It is used according to the topic in public speaking, if you handle it perfectly; it makes your speech effective.
2. Volume	It represents how loudly or softly you can speak in public speaking. Your

	loud voice makes audience irritated and soft voice not listen anything. So, it is important to manage your volume to make audience listen clearly and understand your speech.
3. Rate	This represents the speed at which you speak. Your too fast speech make your audience not understand anything and your too slow speech make them. So, it is important to manage your speed of speech depend on topic.
4. Tone	It represents how pleasant or unpleasant your voice which means you need to follow better rhythm of speech for effective public speaking.

5. Tips for Improving Public Speaking Skills: The fear of public speaking is a common form of anxiety that make many people suffer through shaking hands and a quavering voice and avoid the public speaking situation. It can range from slight nervousness to paralyzing fear and panic. The main question is, “How can you overcome your fear of public speaking?” You can overcome your speech anxiety by the following points:



Fig. 6: Tips for Improving Public Speaking

- **Understand of the Topic:** The how better you understand what you have to talk about is very important. It helps you make less mistakes and if you get off your track, you will be able to recover quickly.
 - **Be Organized:** It is a manner of carefully planning what you want to present it and how you want to present. The more organized makes you less nervous. Visit the venue and review available equipment before your presentation.
 - **Practice more and More:** The several time’s hands-on practice keeps you in your comfort zone and afraid sometimes leads you to overestimate and bad things to be happen. List your specific worries and then identify the possible alternatives to overcome it by doing a speech in front of a mirror or with family and friends and asking for feedback. Make a video of your speech, watch it to work on your mistakes and bring modifications. All will help you to present who are less familiar.
 - **Think Positive:** Imagine the positive thought like your presentation will go well. It can help you decrease your speech anxiety and negativity at some level and can improve your social performance. Here, when you are before the podium, take a deep breath which can make you very calm and relaxed.
 - **Focus on Your Presentation, not on Your Audience:** Usually, people look for new information only not how it is presented. So, don’t fear losing track or start to feeling nervous if you do, your mind goes blank and makes you silent. In that case, just take a few slow, deep breaths. Your audience may not notice your nervousness even if they do notice, they may root for you and want your presentation to be a success.
 - **Recognize your success:** Everyone makes mistakes so after speaking, look at any mistakes you made as an opportunity to improve your skills. Join a group that offers support and focuses on training people in public speaking and leadership skills.
- 6. Cognitive Behavioral Therapy:** It is a skills-based approach used for reducing the fear of public speaking and resulted as a successful treatment. People become nervous when they do public speaking which is called Performance Anxiety. It happens because of the mistakes done by people in previous speech which is called a habitual frame of reference. To solve this issue, we can use cognitive behavioural therapy or medications sometimes both. Students’ habitual frame of reference is given in the following table:

Table 2: Cognitive Behavioural Therapy for Habitual Frame of Reference

Habitual Frame of Reference	Descriptions
1. Fear of being judged	Fear of being judged means students when deliver a public speech worried about what people will think about them and they are interested on them or laugh at them and then they are not able to make eye-contact, shy to talk in front of a large number of audience and many more things which result the speech anxiety.
2. Physical symptoms	When students feel anxiety while speaking it can be seen physically by shaking hand and tongue tied speech which directly affect their confidence low.
3. Uncertainty of the Topic	It emphasizes the understanding of the topic well and fluency in speech avoid mistakes while speaking and forgetting some parts that need to say.

7. Tips For Fight Against Glossophobia

Some experts say that glossophobia is remarkably common as much as 77% of the population. To overcome this, they have to follow these steps:

Table 3: Steps to Overcome Glossophobia

Sr. No.	Steps to be Followed
1	Know your topic
2	Get organized
3	Practice, and then practice some more
4	Challenge specific worries
5	Visualize your success
6	Do some deep breathing
7	Focus on your material, not on your audience
8	Don't fear a moment of silence

Process Results: One of the basic ways of maximizing performance is becoming aware of going into any activity with a positive attitude. The study started with 20 first-year engineering students over eight-weeks practice. It conducted a workshop and provided training for on-stage personalities such as dressing and grooming, body language (eye contact, facial expression, gesture and posture), walking towards the dais and back to the seat, handling card and cardless microphone on the podium, etc. Each student has got hands-on practice to overcome stage fear while presenting the following activities: dialogue, speech, role-play and case study. The mentor tested students’ Cognitive Reformation and assessed each of the respondent’s flow of speech, language, body language and paralanguage. The findings draw the conclusion and presented the tailored data in table 1:

Table 4: Impact of Cognitive Restructuring

Sr. No.	Various Training & Practical Activities	Before Cognitive Restructuring	After Cognitive Restructuring
1	Walking towards dais and back to seat	Each one feared coming to dais and positioning at the centre	Each one recognizes that it attracts audience to pay attention to the speaker.
2	Handling card and cardless microphone on podium	Don’t have idea about it and worried to use it.	Each one recognizes that audio provides clear and loud sound to audiences that lead to get success.
3	Body language (eye-contact, facial expression, gesture and posture)	One is worried about being judged harshly about making an embarrassing mistake.	One recognizes that audiences look at who is speaking and understand the communication to become a success.
4	Use of three approaches: language, body language and paralanguage	Each one worried about how to use these in proper ratio.	Each one recognized the proportionate of these three approaches makes effective communication.

Treatment of Results: Students identified and analyzed the benefit of this practice and realized the importance of each case. Results reflect the relative strength and the relative importance of the different approaches of training and hands-on practice and different methods of sharing ideas and information. The findings are

classified according to the number of respondents chose an option and the critical reviews are analyzed and reviewed to draw the conclusions on whether the hypothesis is valid or not.

RESULTS AND DISCUSSION

1. Many students have a humble nature and they tend to feel uncomfortable while speaking in front of others due to the habitual frame of reference.
2. This habit leads them to gain a lack of confidence which is the most common reason for fear of public speaking.
3. Burgess (2013, October 30) reports that according to a survey on common phobias, fear of public speaking was found to be a more pressing concern than death.
4. The study discovered that students who had a good command over debates and speeches performed better in presentations.
5. Even if a student fears public speaking, he can perform well in it through continuous rehearsal and tremendously improve upon this skill.
6. The mentors play a major role in giving support and confidence to the students and they can help them to overcome speech anxiety.

CONCLUSION

This study carried out the information about the speech anxiety of the students which is very common among people. The research proves that public speaking is a learning skill and the fear of public speaking can be overcome by doing rehearsal and hands-on practice. It concludes that students' cognitive reformation helps them to gain all the required skills that lead them to get success in their personal and professional life.

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APACHE ZOOKEEPER AN OPEN SOURCE SERVER

Vaishnavi Desai, Shivam Thakur, Priyanka Sahu, Manali Patil, Aliraza Koke and Ahamad Husen
 Computer Engineering, Diploma, Theem College of Engineering, Boisar East, Chillhar Road, Thane,
 Maharashtra

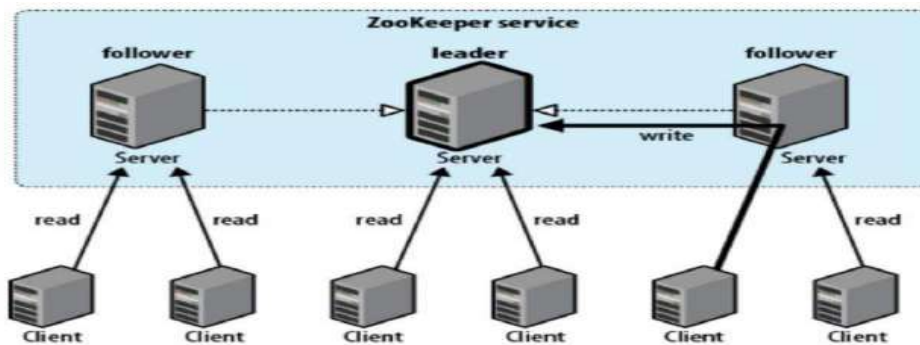
ABSTRACT

The main purpose of this paper is to introduce apache application and give some information about it. For the readers who are not familiar with Apache Zookeeper, We hope that this paper will be a useful map for researchers who are going to explore further about Apache Zookeeper, an open server, although some parts of the map are very rough and other parts are empty, and waiting for the readers to fill in.

I. INTRODUCTION

In the Hadoop ecosystem, Apache Zookeeper plays an important role in coordination amongst distributed resources. Apart from being an important component of Hadoop, it is also a very good concept to learn for a system design interview.

In very simple words, it is a central data store of key-value using which distributed systems can coordinate. Since it needs to be able to handle the load, Zookeeper itself runs on many machines. Zookeeper provides a simple set of primitives and it is very easy to program to.

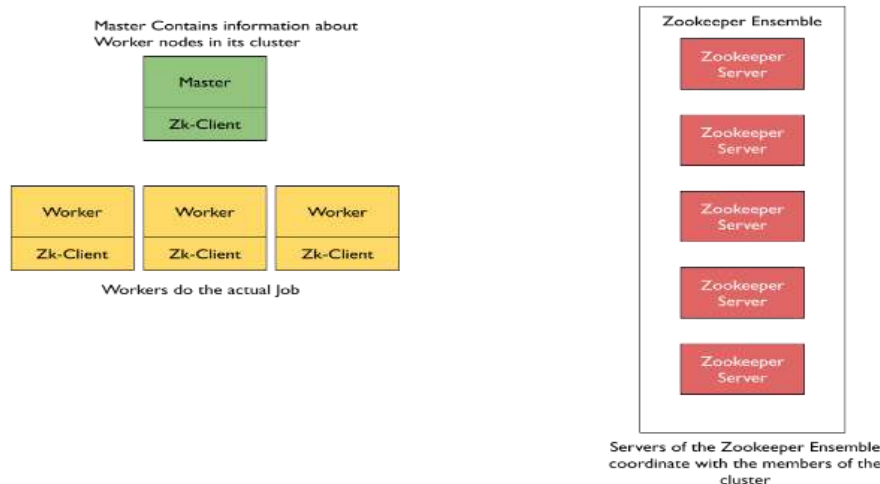


II. Zookeeper Coordination

Say, there is an inbox from which we need to index emails. Indexing is a heavy process and might take a lot of time. So, you have multiple machines which are indexing the emails. Every email has an id. You can not delete any email. You can only read an email and mark it read or unread. Now how would you handle the coordination between multiple indexer processes so that every email is indexed? If indexers were running as multiple threads of a single process, it was easier by the way of using synchronization constructs of programming language.

But since there are multiple processes running on multiple machines which need to coordinate, we need central storage. This central storage should be safe from all concurrency-related problems. This central storage is exactly the role of Zookeeper.

III. Zookeeper Architecture



Zookeeper Architecture within the Cluster

In standalone mode, it is just running on one machine and for practical purposes we do not use standalone mode. This is only for testing purposes as it doesn't have high availability.

In production environments and in all practical use cases, the replicated mode is used. In replicated mode, zookeeper runs on a cluster of machines which is called an ensemble. Basically, zookeeper servers are installed on all of the machines in the cluster. Each zookeeper server is informed about all of the machines in the ensemble.

The zookeeper client is installed with the machines in the cluster, and each of the clients gets connected with one of the servers in the zookeeper ensemble.

These clients request and get response from the zookeeper servers they are connected to. Also, these clients keep sending signals(technically known as heartbeats) to mark their presence to the zookeeper servers. If one or more machines are not active(or they fail), they would no longer be able to send their heartbeats. This is an indication for zookeeper that those machine(which didn't send heartbeats) have failed and there is a need for backup. In such a case, zookeeper notifies a responsible component(like YARN) so that the necessary actions could be taken and make the cluster resilient and highly available.

So basically, Zookeeper acts as a monitoring tool which keeps with it all the configuration data of the cluster.

IV. Zookeeper Data Model

The way we store data in any store is called a data model. In case of zookeeper, it uses a data model like a directory tree. Think of the data model as if it is a highly available file system with few differences. We store data in an entity called znode. The data that we store should be in JSON format which Java script object notation. The znode can only be updated. It does not support append operations. The read or write is an atomic operation meaning either it will be full or would throw an error if failed. There is no intermediate state like half-written. znode can have children. So, znodes inside znodes make a tree like heirarchy. The top level znode is "/". The znode "/zoo" is child of "/" which top level znode. duck is child znode of zoo. It is denoted as /zoo/duck. Though "." or ".." are invalid characters as opposed to the file system.

V. Election & Majority

As soon as the zookeeper servers on all of the machines in ensemble are turned on, the phase 1 that is leader selection phase starts. This election is based on Paxos algorithm. The machines in ensemble vote other machine based on the ping response and freshness of data. This way a distinguished member called leader is elected. The rest of the servers are termed as followers. Once all of the followers have synchronized their state with newly elected leader, the election phase finishes.

The election does not succeed if majority is not available to vote. Majority means more than 50% machines. Out of 20 machines, majority means 11 or more machines. If at any point the leader fails, the rest of the machine or ensemble hold an election within 200 milliseconds. If the majority of the machines aren't available at any point of time, the leader automatically steps down.

The second phase is called Atomic Broadcast. Any request from user for writing, modification or deletion of data is redirected to leader by followers. So, there is always a single machine on which modifications are being accepted. The request to read data such as ls or get is catered by all of the machines.

Once leader has accepted a change from user, leader broadcasts the update to the followers – the other machines. [Check: This broadcasts and synchronization might take time and hence for some time some of the followers might be providing a little older data. That is why zookeeper provides eventual consistency no strict consistency.]

When majority have saved or persisted the change to disk, the leader commits the update and the client or users is sent a confirmation. The protocol for achieving consensus is atomic similar to two phase commits. Also, to ensure the durability of change, the machines write to the disk before memory.

If you have three nodes A, B, C with A as Leader. And A dies. Will someone become leader? Either B or C will become the leader.

If you have three nodes A, B, C with C being the leader. And A and B die. Will C remain Leader?

C will step down. No one will be the Leader because majority is not available.

As we discussed that if 50% or less machines are available, there will be no leader and hence the zookeeper will be readonly. Don't you think zookeeper is wasting so many resources?

The question is why does zookeeper need majority for election?

Say, we have an ensemble spread over two data sources. Three machines A B C in one data center 1 and other three D E F in another data center 2. Say, A is the leader of the ensemble. And say, The network between data centres got disconnected while the internal network of each of the centers is still intact.

If we did not need majority for electing Leader, what will happen?

Each data center will have their own leader and there will be two independent nodes accepting modifications from the users. This would lead to irreconcilable changes and hence inconsistency. This is why we need majority for election in paxos algorithm.

VI. Sessions in Zookeeper

Lets try to understand how do the zookeeper decides to delete ephermls nodes and takes care of session management.

A client has list of servers in the ensemble. The client enumerates over the list and tries to connect to each until it is successful. Server creates a new session for the client. A session has a timeout period – decided by the client. If the server hasn’t received a request within the timeout period, it may expire the session. On session expire, ephermal nodes are deleted. To keep sessions alive client sends pings also known as heartbeats. The client library takes care of heartbeats and session management.

The session remains valid even on switching to another server. Though the failover is handled automatically by the client library, application can not remain agnostic of server reconnections because the operation might fail during switching to another server.

VII. Application of Zookeeper

Let us say there are many servers which can respond to your request and there are many clients which might want the service. From time to time some of the servers will keep going down. How can all of the clients can keep track of the available servers?

It is very easy using ZooKeeper as a central agency. Each server will create their own ephermal znode under a particular znode say “/servers”. The clients would simply query zookeeper for the most recent list of servers.

Lets take a case of two servers and a client. The two server duck and cow created their ephermal nodes under “/servers” znode. The client would simply discover the alive servers cow and duck using command ls /servers.

Say, a server called “duck” is down, the ephermal node will disappear from /servers znode and hence next time the client comes and queries it would only get “cow”. So, the coordinations has been made heavily simplified and made efficient because of ZooKeeper.

VIII. Zookeeper APIs

You can use the ZooKeeper from within your application via APIs – application programming interface. Though ZooKeeper provides the core APIs in Java and C, there are contributed libraries in Perl, Python, REST.

For each function of APIs, synchronous and asynchronous both variants are available. While using synchronous APIs the caller or client will wait till ZooKeeper finishes an operation. But if you are using asynchronous API, the client provides a handle to the function that would be called once zooKeeper finishes the operation.

IX. Benefits of ZooKeeper

Here is the list of various Advantages of using Apache ZooKeeper:



a. The Simple Distributed Coordination Process

The coordination process between all nodes in Zookeeper is very simple.

b. Synchronization

Working of Zookeeper is highly synchronized, that means there is mutual exclusion as well as co-operation between server processes. Basically, this synchronization helps in Apache HBase for the purpose of configuration management.

c. Ordered Messages

Zookeeper track with a number, by denoting its order with the stamping of each update, through all the messages are ordered here.

d. Serialization

According to specific rules, Zookeeper encodes the data. Additionally, it ensures that our application is running consistently or not. Though, in MapReduce, we use this method (Serialization) to coordinate queue to execute running threads.

e. Speed

In the cases where 'Reads' are more common, it runs with the ratio of 10:1, which is great speed.

f. Scalability

Furthermore, it is possible to intensify the performance of Zookeeper by deploying more machines.

g. How is the Order Beneficial?

As we know, Messages in Zookeeper is in perfect order. So, in order to implement higher-level abstractions that order is required. That's how the order is beneficial for us.

h. ZooKeeper is fast

In the cases of "read-dominant" workloads, Apache Zookeeper works very Fast.

i. Reliability

Also, we can say that Zookeeper is very reliable. It is because as soon as it applies the update until a client overwrites the update, that will persist from that time forward.

j. Atomicity

There are only two cases possible, either data transfer succeed or rather fail completely. Though there is no case of the partial transaction.

k. Timeliness

In simple words, up-to-date, that means in some definite time amount, system's client's view is up-to-date or on time.

X. Limitations of Zookeeper

Since, every coin have two sides, in the same way after so many advantages of Zookeeper there are few disadvantages also. So, here is the list of several Cons of Zookeeper:

a. Adding New ZooKeeper Servers Can Lead to Data Loss

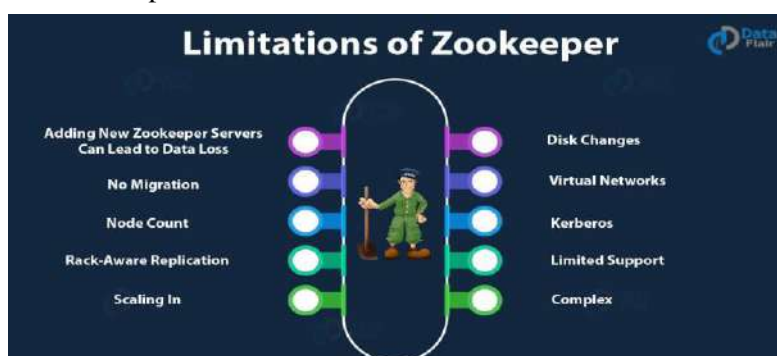
In existing server, Data Loss occurs at the time when the number of new ZooKeeper servers exceeds the number which already exists in the ZooKeeper service. At the same time, the Start command is issued to the ZooKeeper service, and the new servers can form a quorum.

b. No Migration

Without user intervention, the ZooKeeper server cannot be migrated from version 3.4 to 3.3, then back to 3.4.

c. Node Count

Make sure that only 3 or 5 ZooKeeper nodes are allowed.



d. Rack-Aware Replication

Currently, it does not supports Rack placement and awareness.

e. Scaling In

The service does not support reducing the number of pods, to prevent accidental data loss.

f. Disk Changes

Also, the service does not support changing volume requirements after initial deployment, to prevent accidental data loss from reallocation.

g. Virtual Networks

One more loss is the service may not be switched to host networking without a full re-installation when the service is deployed on a virtual network. In addition, for attempting to switch from host to virtual networking their is the same case.

h. Kerberos

On virtual networks, it does not support enabling Kerberos, currently.

i. Limited Support

There is such limited support for cross-cluster scenarios. However, no CP system will support cross-cluster all the way. Though we can say consul seems to do better at this.

j. Complex

Moreover, we can say for the faint of heart, ZooKeeper is not right. Since it pretty heavy that's why also it will require us to maintain a fairly large stack.

So, this was all in Apache ZooKeeper Pros and Cons. Hope you like our explanation.

XI. CONCLUSION

In Conclusion, we briefly understood some of the nitty-gritty details on various concepts included in the Zookeeper technology. Thus, our understanding of zookeeper with the help of a case study where will be able to appreciate the significance of zookeeper in a given distributed computing scenario.

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ODERISTA: ONLINE FOOD ORDERING WITH QR CODE**Shaikh Rukhsar, Alema Raza, Sarvesh Pandey and Prof. Iqbal Shaikh**

Department of Computer Engineering, Theem College of Engineering, Boisar, Palghar, Maharashtra, India

ABSTRACT

The purpose of this project is to develop an online food ordering system. It is a system that enables customer of Food to place their order online at any anytime at any place.

The reason to develop the system is due to the issues of facing by Food Industry. These issues are such as peak hour-long queue issues, increase of take away than visitors ,speed major request of Food management , limited promotion, and quality control of food management.

Therefore this system enhances the speed and standardization of taking orders from the customers and display it to the staff in the kitchen accordingly.

Since the onset of the COVID-19 pandemic, restaurants and other small businesses worldwide have looking for ways to adopt contact-free strategies that cultivate a healthier and safer dining Experience.

Since the onset of the COVID-19 pandemic, restaurants and other small businesses worldwide have been looking for ways to Adopt contact free statergies that cultivate a healthier and safer dining experience QR codes that take customers to a personalized menu where they can peruse their options, order directly from their smartphone and pay, all from their phone. This kind of contact-free technology will completely alter how we view experience as a whole, not just during this global pandemic but also beyond it.

It's going to change the trajectory of how we approach restaurants and restaurant technology at its Core.

This kind of contact-free technology will completely alter how we view the restaurant experience as a whole, not just during this global pandemic but also beyond it.

It's going to change the trajectory of how we approach restaurants and restaurant technology at its very Core.

Keywords:

INTRODUCTION

Food ordering system means it an application which will help restaurants to optimized and control over their restaurants. And my project "Food ordering system" {Oderista} is also based on the same point.

Through this website user can do a lot of things from anywhere from home, from office, from train and many more places.

User can order his/her favourite food from desired restaurant and enjoy them with his/her loved ones. and through this website only the admin who has the contraption power of this website can look up to every activities of user and can guide or help them whenever a user is needed for help.

As you open the website Oderista animated page will load and it will have two options one i.e log-in and other i.e sign-up.

If a user is new to the website then he has to sign-up first then he will get a user id and password , through which he can then

Login into the website easily, and if he has that user id and password from previously so he can direct switch on to login area.

After login the user will be redirected to home page where he will get to see a navbar containing options like about section, menu section , cart section, contact section, logout section .

Scrolling down there he will get option to explore our website. Then if he want to book order for food then he will get option of verities of foods options user have to go down the website where the option will be available.

User can book his favourite foods and can cancel it also , after booking the page will redirect to add to cart he will get a message that his order has been placed after that it will lead to the payment option , where user has to pay the required amount through Cash on Delivery or Wallet.

And all these activities can be controlled by admin he will get notification whenever any user will login into the website and place any order. Admin can add, delete and update foods and drinks option and can handle the database options also.

All over the world wide, the food delivery account for the 93 milion, the one percent is form total food market and including the 4 percent restaurant and fast food chains in many countries this no growth rate will continually to increase at 3.5 percent in the next five yrs.

Most of the restaurant in India still use the waiter to take customer orders. This method is still consider efficient if the restaurant are not crowded, but however if the restaurant are crowded with the customers, it will arise a lot of human error that made by the waiter such as missing of order papers, mistake in jot down the order, did not have a waiter to take the order from customers and others. Therefore, this project proposes a Food Ordering System Using QR Code (FOSuQC) to address the stated problem.

This application will be use a mobile application for the customers and web application for the staff of the restaurant. The customers need to use their phone with the application that has been installed to scan the QR code from the menu. Then, the customers must submit the order to make a confirmation and it will directly send to the kitchen. The staff at the restaurant can manage the menu such add a new items, delete the items of the food or update the menu easily.

By using this system, the staff of the restaurant can make a change of the menu easily. Besides, the ordered menu list also will be view in this system. The staff will prepared the food based on the ordered menu that will be listed out on the screen

I. LITERATURE REVIEW

In [1] an automated food ordering system is proposed which will keep track of user orders smartly. Basically, they implemented a food ordering system for different type of restaurants in which user will make order or make custom food by one click only. By means of android application for Tablet PCs this system was implemented. The front end was developed using HTML ,CSS, Javascript and at the backend MySQL database was used. In [2] Customer using a Smartphone is considered as a basic assumption for the system. When the customer approach to the restaurant, the saved order can be confirmed by touching the Smartphone. The list of selected preordered items shall be shown on the kitchen screen, and when confirmed, order slip shall be printed for further order processing. The solution provides easy and convenient way to select pre-order transaction form customers. In [3] there was an attempt to design and implementation of digital dining in restaurants using android technology. This system was a basic dynamic database utility system which fetches all information from a centralized database. This application improved the accuracy and efficiency of restaurants as well as human errors. Earlier drawbacks of automated food ordering systems were overcome by this system and it requires a onetime investment for gadgets. In [4] an application of integration of hotel management systems by web services technology is presented. Ordering System Kitchen Order Ticket (KOT), Billing System, Customer Relationship Management system (CRM) are held together by the Digital Hotel Management. Add or expand of hotel software system in any size of hotel chains environment was possible with this solution. In [5] research work aims to design and develop a wireless food ordering system in the restaurant. Technical operations of Wireless Ordering System (WOS) including systems architecture, function, limitations and recommendations were presented in this system. By providing higher quality customer service and reducing human errors to improve the management aspect for restaurants, pervasive application will be a valuable tool due to the high demands of handheld devices such as PDAs. In [6] along with customer feedback for a restaurant a design and execution of wireless food ordering system was carried out. It enables restaurant owners to setup the system in wireless environment and update menu presentations easily. Smart phone has been integrated in the customizable wireless food ordering system with real-time customer feedback implementation to facilitate real-time communication between restaurant owners and customers.

In Paper [7], the purpose of this study was to investigate the factors that influence the attitude of internet users towards online food ordering in Turkey among university students. A Technology Acceptance Model (TAM) developed by Davis in 1986 was used to study adoption of Web environment for food ordering. Trust, Innovativeness and External Influences are added to the model as main factors along with TAM. In Paper [8], the research work aims to automate the food ordering process in restaurant and also improve the dining experience of customers. Design implementation of food ordering system for restaurants were discuss in this paper. This system implements wireless data access to servers. The android application on user's mobile will have all the menu details. Kitchen and cashier receives the order details from the customer mobile wirelessly. These order details are updated in the central database. The restaurant owner can manage the menu

modifications easily. In Paper [9], this research works on efforts taken by owners of restaurants to adopt information and communication technologies such as PDA, wireless LAN, costly multi-touch screens, etc. to enhance dining experience. This paper highlights some of the limitations of the conventional paper based and PDA-based food ordering system and proposed the low-cost touch screen-based Restaurant Management System using an android Smartphone or tablet as a solution.

PROJECT DESIGN AND IMPLEMENTATION

3.1 Overview

Food ordering system means it an application which will help restaurants to optimized and control over their restaurants. And my project “Food ordering system” {Oderista} is also based on the same point.

Through this website user can do a lot of things from anywhere from home, from office, from train and many more places.

User can order his/her favourite food from desired restaurant and enjoy them with his/her loved ones. and through this website only the admin who has the contraption power of this website can look up to every activities of user and can guide or help them whenever a user is needed for help.

3.2 Proposed System

To overcome the restrictions of above system, based on Internet of Things an Online Food Ordering System is proposed. The use of mobile technology has revolutionized as the Android devices have gained popularity in the automation of routine task in wireless environment.

For mobile devices such as smart-phones and tablets android is a Linux built operating system. As a general Objective of the study to develop a reliable, convenient and accurate Food Ordering System is considered. As an objective, a system that will surely satisfy the customer service will be considered.

To design a system that can accommodate huge amount of orders at a time and automatically compute the bill is one of the key objectives. One of the important objective is to evaluate its performance and acceptability in terms of security, user-friendliness, accuracy and reliability. One of key objective is to improve the communication between the client and customer.

II. TECHNOLOGY STACK

Technologies Used

Front End

1. Html

Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

2. Css

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language like HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, and reduce complexity and repetition.

3. Javascript

JavaScript is a high-level, interpreted scripting language that conforms to the ECMAScript specification. JavaScript has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions. Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web. JavaScript enables interactive web pages and is an essential part of web applications. The vast majority of websites use it, and major web browsers have a dedicated JavaScript engine to execute it. As a multi-paradigm language, JavaScript supports event-driven, functional, and imperative (including object-oriented and prototype-based) programming styles.

Back End**1 Php**

PHP is a server side scripting language that is used to develop Static websites or Dynamic websites or Web applications. PHP stands for Hypertext Pre-processor, that earlier stood for Personal Home Pages. PHP scripts can only be interpreted on a server that has PHP installed. The client computers accessing the PHP scripts require a web browser only. A PHP file contains PHP tags and ends with the extension ".php".

Database

Database A database management system (DBMS) is computer software designed for the purpose of managing databases, a large set of structured data, and run operations on the data requested by numerous users.

Typical examples of DBMSs include Oracle, DB2, Microsoft Access, Microsoft SQL Server, Firebird, PostgreSQL, MySQL, SQLite, FileMaker and Sybase Adaptive Server Enterprise. DBMSs are typically used by Database administrators in the creation of Database 24 systems. Typical examples of DBMS use include accounting, human resources and customer support systems. SQL Structured Query Language (SQL) is the language used to manipulate relational databases. SQL is tied very closely with the relational model. In the relational model, data is stored in structures called relations or tables

1. Mysql

My SQL is an open source relational database management system (RDBMS) based on Structured Query Language (SQL). It is one part of the very popular LAMP platform consisting of Linux, Apache, My SQL, and PHP. Currently My SQL is owned by Oracle. My SQL database is available on most important OS platforms. It runs on BSD Unix, Linux, Windows, or Mac OS. Wikipedia and YouTube use My SQL. These sites manage millions of queries each day. My SQL comes in two versions: My SQL server system and My SQL embedded system.

Testing

Testing is the process of executing a program with the intent of detecting an error. Testing is a critical element of software quality assurance and presents ultimate review of specification, design and coding. System testing is an important phase. Testing represents an fascinating anomaly for the software. Therefore, a series of testing are performed for the proposed system before the system is ready for stoner accepting testing.

A good test case is one that has a high probability of chancing an undiscovered error. A successful test is one that bare an as undiscovered error.

The primary objective for test case design is to derive a set of tests that has the highest livelihood for expose defects in the software. To accomplish the objective two different categories of test case design techniques are used. They are

- White box testing
- Black box testing

III. CONCLUSION AND FUTURE SCOPE

Oderista (Food ordering System with QR scanner) has been computed successfully and was also tested successfully by taking "Test Cases". It is user friendly, and has required options, which can be utilized by the user to perform the desired operations.

Food ordering System is developed using HTML, CSS, JS as front end and PHP, My SQL as back end on windows environment.

Finally, in Online Food Ordering system, we have developed secure, user-friendly food ordering Management System. This System can take care of each member whether it is an Administrator or Customer. This System will help them to properly manage the meals of the customers, the delivery boy's data and help in growth without creating any hassle. In Education, replicating the voices of literal numbers offers new chances for interactive tutoring and dynamic liar. For illustration, on November 22, 1963 President Kennedy was on his way to give a speech in Dallas when he was assassinated. We can now hear that speech in his own words using this technology.

The epidemic sparked a surge in content consumption. One of the mediums that availed from this boom was podcasting, which has grown exponentially year of year and reaching indeed broader, more different cult. In addition, synthetic voice is formerly being used to help restate content in demand into different languages. Advertisers seeking voices that reverberate with their target followership, synthetic voices help advertisers produce further engaging content without having to coordinate as numerous moving pieces similar as trip and studio time.

Customize orders: Allow customers to customize food orders Enhance User Interface by adding more user interactive features. Provide Deals and promotional Offer details to home page. Provide Recipes of the Week/Day to Home Page Payment Options: Add different payment options such as PayPal, Cash, Gift Cards etc. Allow to save payment details for future use.

Allow to process an order as a Guest Order Process Estimate: Provide customer a visual graphical order status bar Order Status: Show only Active orders to Restaurant Employees.

Order Ready notification: Send an Order Ready notification to the customer Restaurant Locator: Allow to find and choose a nearby restaurant Integrate with In store touch screen devices like iPad

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WEATHER APPLICATION**¹Ms. Nandani Thakur, ²Ms. Sadhana Kumari Chaudhary and ³Muhib Lambay**^{1,2}BE Students and ³Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India**ABSTRACT**

We aim to create a mobile application specifically for real-time weather checking status across the globe. Mobiles are handy and load with different features. Thus, Mobile application gain the popularity and its popularity is increasing day by day. We have use Flutter as our front-end and Android Studio to edit the code. The results show that even if the advances in mobile communication technologies could, in principle, improve the effectiveness of weather communication enormously, the expectations created around weather forecasts appear to be inconsistent with current forecasting capabilities, particularly with their inherent uncertainties in space and time, as well as in the nature of the predicted weather events.

Weather is the state of the atmosphere at a given place and time in regards to heat, cloudiness, dryness, sunshine, wind, and rain. Of all the geophysical phenomena weather is the most significant one that influences us. Weather can vary greatly and largely depends on climate, seasons and various other factors. The chief goal of this work is to get the weather forecast of any city throughout the world through an application. This paper aims at creating a web application using Flutter.

I. INTRODUCTION

In recent times, the advancement in the wireless technology and the growth in market potentials have led to an increase in the number of mobile device users. The emergence of this technology has given rise to rapid development of mobile e-commerce technologies. This brings on-the-go Internet access to the general online market world without geographical and time constraints.

Mobile application development is the process to making software for smartphones and digital assistants, most commonly for Android and iOS. The software can be preinstalled on the device, downloaded from a mobile app store or accessed through a mobile web browser. The programming and markup languages used for this kind of software development include Java, Swift, C# and HTML5. Mobile app development is rapidly growing.

From retail, telecommunications and ecommerce to insurance, healthcare and government, organizations across industries must meet user expectations for real-time, convenient ways to conduct transactions and access information. Today, mobile devices— and the mobile applications that unlock their value—are the most popular way for people and businesses to connect to the internet. To stay relevant, responsive and successful, organizations need to develop the mobile applications that their customers, partners and employee demand.

The app consists of a single screen, on which the user can enter the name of a city. The weather for the current day is displayed and a 3-day daily forecast. The app appearance also adapts for day-time and night-time weather conditions.

The motivation for doing this project was that A weather app can bring you the latest conditions, any breaking alerts, and forecasts for what to expect next. A weather app can bring you the latest conditions, any breaking alerts, and forecasts for what to expect next. There's a lot of competition among the best weather apps, which deliver extensive forecasts, radar images of weather patterns and lots of data to study. It allows users to see the conditions, forecast, temperature, and other related metrics of the device's current location, as well as a number of other cities. Locations can be added or removed by pressing the list icon in the bottom right corner of the application, which allows the user to type in the city's name, ZIP code or postal code or airport code.

For each city, the app will display the current, highest, and lowest temperatures, a 10-day forecast, time of sunrise and sunset, current wind direction and speed, rainfall measurements, current humidity, outdoor visibility range, and barometric pressure. In some locations, the app will also display an air quality report and show next-hour precipitation when raining or snowing.

In this project, we design and development mobile application for a Weather app. The application provides exact information for users, while offering a way of knowing their weather report. With this application, users can directly search any city, town and country name. We can enable users to search for nearby areas or their selective locations. They can also search the area that they want to read next, based on different areas and region. User will be provided with enough description of the weather report, there will also be a report search functionality. User might also be able to bookmark their favorite places. In nutshell this app will be a total blast for those who like to know the weather before heading off somewhere.

II. RELATED WORK

- III. A weather instrument is equipment used to acquire weather information. Some examples of weather instruments are thermometer, to measure temperature, barometer, to measure atmospheric pressure, and anemometer, to measure wind speed. The gathering of those instruments in a same equipment constitutes a weather station [1]. The data collected by weather stations are used in many different areas, like agriculture, aviation, navigation, construction, sports and recreation.
- IV. It's given the name Free Software to every software that ensures that the end users have freedom in using, studying, sharing and modifying that software [2]. Free hardware or open-source hardware is a term for tangible artifacts — machines, devices, or other physical things — whose design has been released to the public in such a way that anyone can make, modify, distribute, and use those things [3].

Weather is generally the change in atmospheric conditions in a short period of time which affects human activities. It is usually thought of in terms of temperature, humidity, precipitation, cloudiness, brightness, visibility, wind, and atmospheric pressure, as in high and low pressure. Weather is also composed of sunshine, rain, cloud cover, winds, hail, snow, sleet, freezing rain, flooding, blizzards, ice storms, thunderstorms, steady rains, and heat waves all of which will last for a few minutes to a few hours.

'Mausam' is available both on Google's Play Store and Apple's App Store. The app will offer different services. It will provide current weather information, including temperature, humidity, wind speed and direction, for 200 cities. The information will be updated eight times a day.

Earth Sciences Minister Harsh Vardhan on Monday launched a mobile application which will provide city-wise weather forecasts, nowcasts and other warnings. The mobile application, 'Mausam', has been designed and developed jointly by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the Indian Institute of Tropical Meteorology (IITM), Pune and the India Meteorological Department (IMD).

Speaking at the event, Vardhan said huge financial investments are needed, at least twice the present budget, to augment observational networks, replace old ships and procure new computing resources.

AccuWeather Forecasts for Android Devices Including Nexus 7. AccuWeather released an update to its free AccuWeather for Android weather app today that includes an even more informative home screen widget featuring severe weather notices, current and two-day forecasts for saved home locations, and a convenient time clock.

AccuWeather for Android forecasts for 2.7 million locations. It includes pushed severe weather alerts for U.S. locations and severe weather notices for inclement weather worldwide. It also has forecasts for the next 15 days updated every hour, weather videos, lifestyle forecasts, and weather radar for all of North America with worldwide satellite overlaying interactive Google Maps.

Dark Sky became one of the top weather apps by predicting imminent local weather conditions using current data readings and clever algorithms, but it also offers longer-term forecasts and can cover a range of geographic areas.

Flicking between radar views, daily and weekly forecasts, temperature and wind levels, and other meteorological data is straightforward, and we really like the time machine feature that lets you explore weather conditions at a specific point in time in either the past or future

But where Apple's recent acquisition really impresses is with its short-term forecasts and alerts about approaching storms. Use it, and you'll always know how long it's going to be before the next bout of showers.

PROPOSED METHODOLOGY

A system architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

A system architecture can consist of system components and the sub-systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture, collectively these are called architecture description languages.

In our Weather Application there are four screen which is very user interactive and has four different weather icon that will be very understandable by anyone for example children and old person. The user needs to install the application in his/her mobile for better experience of our App. By clicking on the app, they will be able to see the home page of the App where they have to allow access of the location for the App. By default, the app

will take GPS location of the user mobile. After that they can see the temperature, humidity, speed of winds, 24 hours of temperature in the interval of 1 hour each and next seven days temperature on their mobile screen.

The cool feature of our app is that if temperature is hot or sunny then the app will recommend or show that is it is ice-cream time to user. Likewise for cold and rainy days.

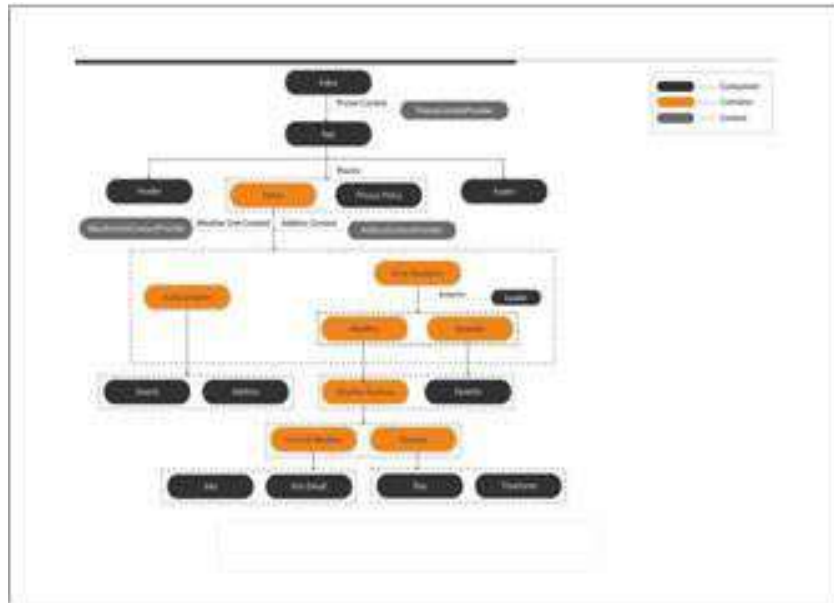


Fig. 1: Proposed architecture

Data Flow Diagram

Data Flow Diagram (DFD) is a pictorial representation, which shows the data passes various stages one by one during the processing. DFD has some in defined symbols using, which we can denote input, data flow and storing database files.

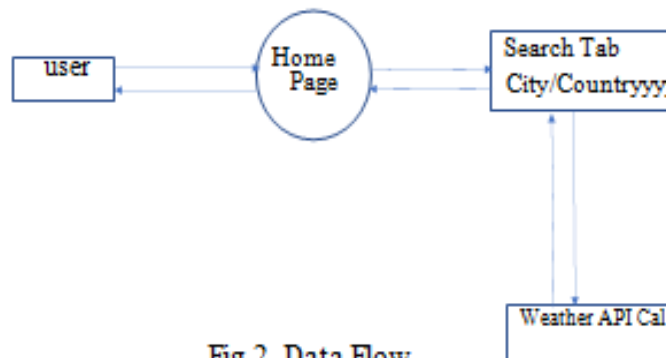


Fig 2. Data Flow

User Case Diagram

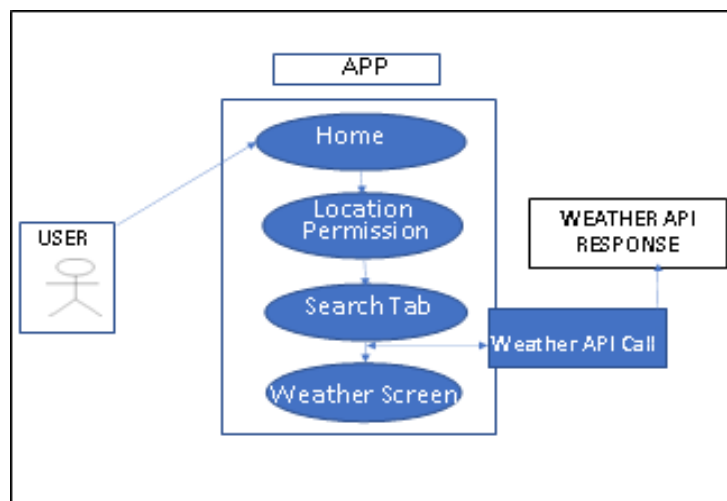


Fig 3: UCD – Weather App

Live Implementation Uses and Advantages

1. Home Page



Fig 4: Home screen

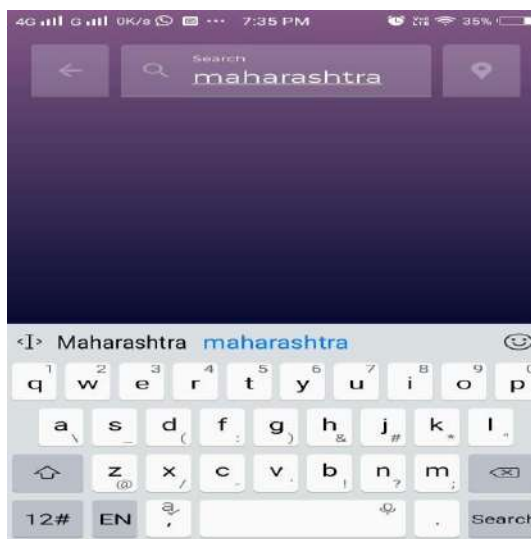


Fig 5: Search page of app



Fig 6: Output of user's query

Uses and Advantage

- Instant information availability
- Improved Weather forecast
- Easy Flow of Information
- Widget Support
- Interactive Maps for better weather information
- Free availability

This interactive UI will display the different, different climate while loading or opening the home page. Then the home page of the app which will ask your GPS location of Mobile for first from the user who is opening this APP for the first time. It will take the current GPS location of Mobile and display the weather details on the screen. Fig 5 is screenshot of search tab where user can search by country or city name and get the weather details of the searched country or city. Fig 6 is the UI that will show detailed information of weather posed by user or search by user in search field.

PROJECT SCOPE

In some Ways it needs further more enhancements in this project. The Security, Password authentication should be more enhanced.

There are some features that are still need to be added in this project such as; recommend user for weather related news, update user for his/her surrounding data, etc.

PROBLEM STATEMENT

In this project, we design and development mobile application for a Weather app. The application provides an exact information for users, while offering a way of knowing their weather report. With this application, users can directly search any city, town and country name. We can enable users to search for nearby areas or their selective locations. They can also search the area that they want to read next, based on different areas and region. User will be provided with enough description of the weather report, there will also be a report search functionality. User might also be able to bookmark their favorite places. In nutshell this app will be a total blast for those who like to know the weather before heading off somewhere.

CONCLUSION

The project was carried out to develop a mobile application for a weather application. The goal of the project was to create mobile application that would allow users to register an account, login, search for particular area of interest, reading a particular report. In addition, users can log out from the online report and can even recommend the application to friends within the application. The objectives of the project were achieved by observing software development procedures and principles for software designs and implementation. In achieving the goal of this project, three major parts were designed and implemented, Firstly, the design of the UI is attractive, intuitive, responsive and with good user experience in mind. This was achieved and implemented by following the Android design guidelines for Android devices. Secondly, the design. Thirdly, the implementation of actual project with all functionalities. In conclusion, it is important to know that this application could still be improved upon by adding more interesting features.

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TRAFFIC SIGN RECOGNITION**Prajyoti Gaikwad, Anandhu Pillai, Ashish Bangera and Dr. Najmuddin Aamer**

Department of Computer Engineering, Theem College of Engineering, Boisar, Palghar, Maharashtra, India

ABSTRACT

There are a few unique kinds of traffic signs like speed restricts, no access, traffic lights, turn left or right, youngsters crossing, no going of substantial vehicles, and so forth. Traffic signs order is the way toward recognizing which class a traffic sign has a place with. You more likely than not found out about oneself driving vehicles in which the traveler can completely rely upon the vehicle for voyaging. Yet, to accomplish level 5 self-sufficient, it is vital for vehicles to comprehend and adhere to all traffic rules. In the realm of Artificial Intelligence and progression in advancements, numerous specialists and huge organizations like Tesla, Uber, Google, Mercedes-Benz, Toyota, Ford, Audi, and so on are taking a shot at self-governing vehicles and self-driving vehicles. Along these lines, for accomplishing precision in this innovation, the vehicles ought to have the option to decipher traffic signs and settle on choices likewise. The exact acknowledgment rate and normal preparing time are particularly improved. This improvement is critical to diminish the mishap rate and upgrade the street traffic wellbeing circumstance, giving a solid specialized assurance to the consistent advancement of astute vehicle driving help. Many scientific methods of traffic signs recognition involving digital image analysis have been proposed. Most of them are appearance-based approaches, employing template matching. In most cases they work on color images (or videos) and deal with all types of signs, regarding their shape and color. On the other hand, commercial systems, installed in higher-class cars, detect only the round speed limit signs and overtaking restrictions found all across Europe. The main disadvantage of visual recognition of traffic signs is associated with difficult conditions of image acquisition and hence problems with noise, blurring, scale and orientation changes should be solved.

Keywords: Convolution Neural Network (CNN), Tensorflow, Traffic Sign Recognition, Machine Learning, Tkinter.

IV. INTRODUCTION

There are several different types of traffic signs like speed limits, no entry, traffic signals, turn left or right, children crossing, no passing of heavy vehicles, etc. Traffic signs classification is the process of identifying which class a traffic sign belongs to. Each individual, regardless of whether a traveler, driver, walker would have seen 8along the side of the road different sign board that fill significant needs. These significant street gear help us as course aides, admonitions and traffic controllers. As control gadgets for traffic, signs need complete consideration, regard and suitable driver's reaction.

With the approach of mechanized traffic and its expanding pressure on street, many have received pictorial signs and normalized their signs to encourage global travel, where language contrasts would make hindrances. In unfavorable rush hour gridlock conditions, the driver may not see traffic signs, which may cause mishaps. In such situations, programmed street sign recognition becomes effective.

Road and traffic signs considered in this thesis are those that use a visual/symbolic language about the road(s) ahead that can be interpreted by drivers. The terms are used interchangeably in this thesis, and elsewhere might also appear in combination, as "road traffic signs". They provide the driver with pieces of information that make driving safe and convenient. A type of sign that is NOT considered in this thesis is the direction sign, in which the upcoming directions for getting to named towns or on numbered routes are shown not symbolically but essentially by text.

Road and traffic signs must be properly installed in the necessary locations and an inventory of them is ideally needed to help ensure adequate updating and maintenance. Meetings with the highway authorities in both Scotland and Sweden revealed the absence of but a need for an inventory of traffic signs.

An automatic means of detecting and recognizing traffic signs can make a significant contribution to this goal by providing a fast method of detecting, classifying and logging signs. This method helps to develop the inventory accurately and consistently. Once this is done, the detection of disfigured or obscured signs becomes easier for human operator.

LITERATURE REVIEW

The first research on traffic sign recognition can be traced back to 1987; Akatsuka and Imai [2] attempted to make an early traffic sign recognition system. A system capable of automatic recognition of traffic sign could be used as assistance for drivers, alerting them about the presence of some specific sign (e.g. a one-way street) or some risky situation (e.g. driving at a higher speed than the maximum speed allowed).

Shihavuddin c, Muhammad Abul Hasan [1] describe the A novel lightweight CNN architecture for traffic sign recognition without GPU requirements. Author focused on Main challenges in detecting traffic signs in real time scenarios includes distortion of images, speed factor, motion effect, noise, faded color of signs. Training only on grayscale images gives average accuracy.

YuefengSonga [2] describe the efficient convolutional neural network for small traffic sign detection. In this paper, researcher focused on issues for small object detection and proposed efficient convolutional neural network for small traffic sign detection and compared accuracy against R-CNN and Faster R-CNN.

Ghica et al. [26] carried out recognition by a neural network which consisted of three sub-networks, a classification sub-network, winner-takes-all sub-network (Hopfield network), and a validation sub-network.

Kellmeyer and Zwahlen [57] used back propagation neural network to recognize warning signs. The input to the network which was a 10x10 boundary square representing the yellow region inside the warning sign, is fed to a 100 neuron input layer. The output-layer contains two outputs either "sign" or "non-sign". A hidden layer of 30 nodes was used.

Sandoval et al. [43] developed a method to detect traffic signs by using angle dependent edge detection. The method is based on the generation of position dependent convolution mask, which uses the angular position of the pixels under consideration. The method is applied as a filter and used to detect circular edges.

Debasis Sarkar, Deepak Muddegowda, Phanish Hanagal [3] describe the Traffic Sign Detection and Recognition using a CNN Ensemble. Proposed system in this paper is divided into two modules detection and recognition and it is evaluated on Belgium Data Set and the German Traffic Sign Benchmark. Detection involves capturing images of traffic sign and locating object from image and in recognition stage convolutional neural network ensemble is used which will assign label to detected sign.

Ohara et al. [54] used a small and simple neural network (NN) to detect the colour and the shape of road signs. The original colour image is first treated by a Laplacian of Gaussian filter (LOG). A colour NN classifier is then used to segment the image according to the colour under recognition in RGB colour space.

DomenTabernik; DanijelSkoaj [4] describe the Deep Learning for Large-Scale Traffic-Sign Detection and Recognition. In this paper convolutional neural network (CNN), the mask R- CNN is used for traffic sign detection and recognition. Authors used CNN for full feature extraction rather than Hough transform, scale invariant feature transform, local binary patterns. In order to solve real time problems of traffic sign appearance and distortion they also implemented data augmentation method. Swedish traffic-sign dataset (STSD) is used for evaluation of Faster R- CNN and Mask R-CNN.

PROJECT DESIGN AND IMPLEMENTATION**3.3 Overview**

A system to detect and recognize road and traffic signs should be able to work in two modes; the training mode in which a database can be built by collecting a set of traffic signs for training and validation, and a prediction mode in which the system can recognize a traffic sign which has not been seen before. A system to recognize road and traffic signs is depicted. It consists of a number of modules which work together to perform this recognition.

Traffic Sign Recognition ensures that the current speed limit and other road signs are displayed to the driver on an ongoing basis. Automatic recognition functions through a link between images captured by a camera and the speed limit information stored in the navigation system. In this way, even speed limits that are not explicitly visible, like within a city, will be displayed to the driver.

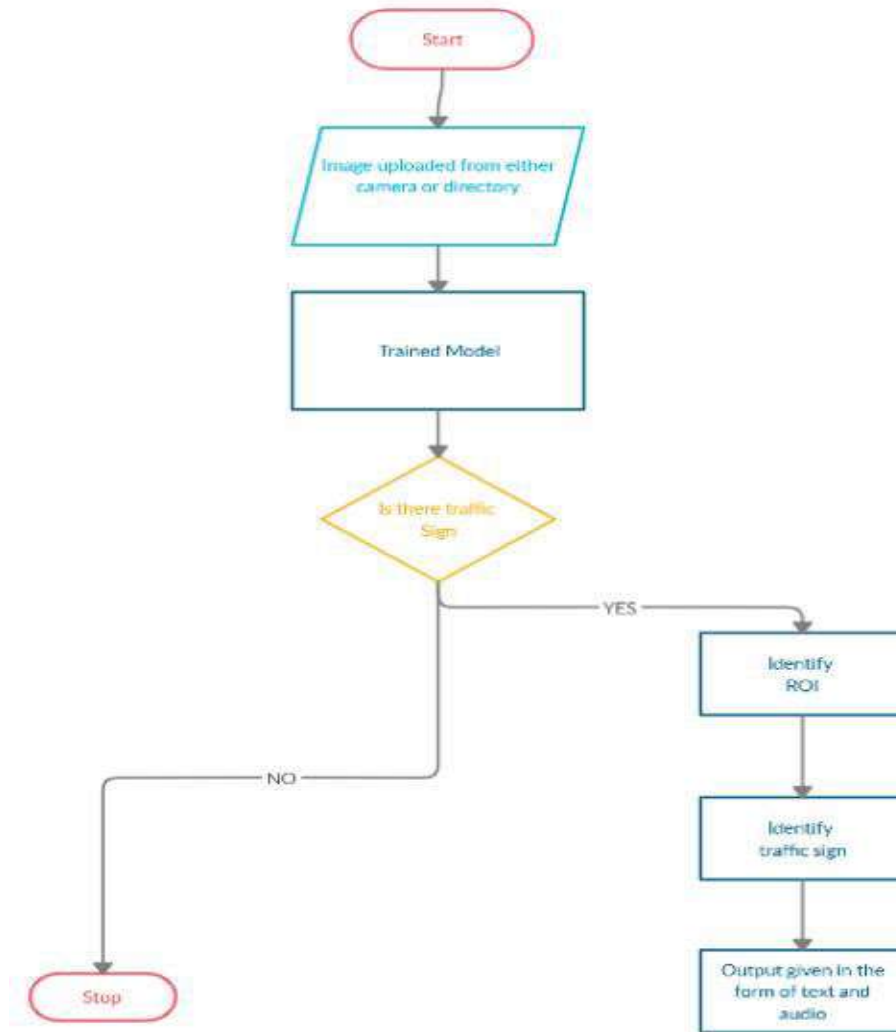


Fig 3.1 Flow Chart of Traffic Sign Recognition

3.4 Existing System

For making auto-working and smart vehicles lot of efforts are already made in form of convolution network trained models with different proposed methodologies for detection and recognition. A recent approach having wide applications for traffic sign detecting and recognizing intelligent transportation systems that informs driver about precaution measures and sign related information, uses color, shape and ML algorithm-based methods, and provided comparative information on the same. Color space, segmentation method, features, and shape detection method are the terms considered in the review of the detection module. The paper presents a comparison between these methods and used datasets from different countries. In the area of traffic sign detection and recognition, a considerable amount of work has been put forward. As two global characteristics of traffic signs, several authors concentrated on the color and shape attributes of image for detection. These features can be used to detect and trace a moving object in a series of frames. This approach is helpful when the target to be identified is a special color that is distinct from the background color. To detect an object with a certain shape, object borders, corners, and contours may be used. However authors only focused on the detection and recognition measures, ignoring the voice feature, which is an essential driver warning system. In addition, hyper parameter tuning has received less attention. As a result, the proposed system would concentrate on different parameters of the CNN algorithm in order to improve accuracy without requiring additional computing resources.

3.5 Proposed System

We will build a deep neural network model that can classify traffic signs present in the image into different categories. With this model, we are able to read and understand traffic signs which are a very important task for all autonomous vehicles. We will build a model for the classification of traffic signs available in the image into many categories using a convolutional neural network (CNN) and Keras library. The

framework we proposed is categorized into three stages: Detection and feature extraction and recognition. The detection stage is just used to find a road sign. At the point when a vehicle is travelling at a specific speed, the camera catches the road sign in nature, and our calculation verifies whether a sign is available in that outline or not available in that perimeter. Distinguishing the traffic sign depends on shape and color. In the feature extraction stage, the proposed calculation characterizes the distinguished road sign. This is accomplished with the assistance of "Convolutional Neural Network" algorithm which classifies the image into sub classes.

The steps followed in this work, right from the dataset preparation to obtaining results are presented. The paper includes a tested approach along with a suggested approach for traffic sign detection and recognition.

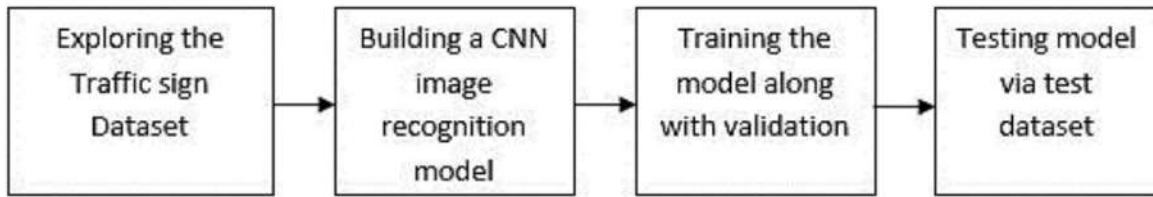


Fig 3.3 Steps followed for obtaining results

3.4 System Architecture

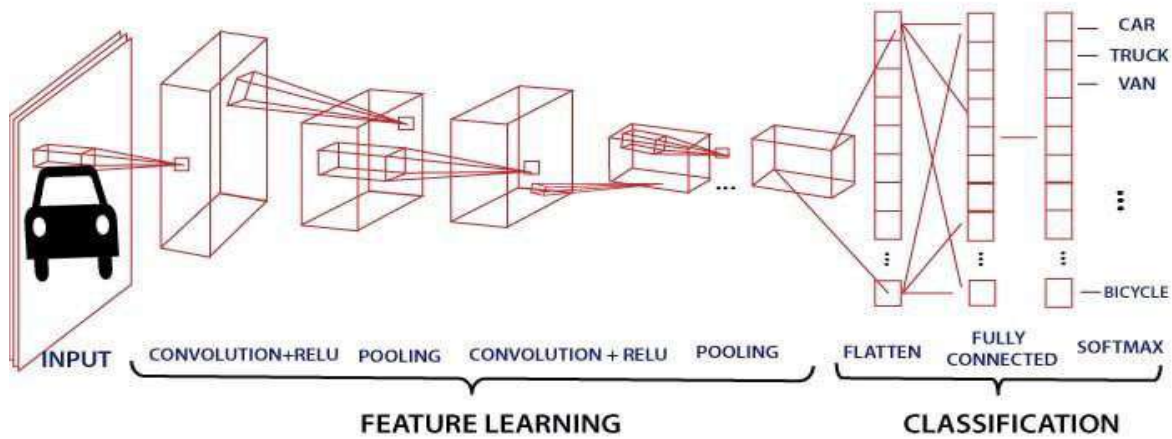


Figure 3.4 System Architecture

3.5 Traffic Sign Classifier Graphical User Interface:

We are build a graphical user interface for our traffic signs classifier with Tkinter. Tkinter is a GUI toolkit in the standard python library. Make a new file in the project folder and copy the below code. Save it as gui.py and you can run the code by typing python gui.py in the command line. In this file, we have first loaded the trained model 'traffic_classifier.h5' using Keras. And then we build the GUI for uploading the image and a button is used to classify which calls the classify () function. The classify() function is converting the image into the dimension of shape (1, 30, 30, 3). This is because to predict the traffic sign we have to provide the same dimension we have used when building the model. Then we predict the class, the model.predict_classes(image) returns us a number between (0-42) which represents the class it belongs to. We use the dictionary to get the information about the class. Here's the code for the gui.py file.

Algorithm

1. Upload the image either from camera or from directory.
2. The uploaded image will be sent through trained model.
3. Analyze the image for required parameters and classify the image accordingly.
4. If it is a traffic sign, it will identify the particular traffic sign and the output will be given in the form of text and voice notification will be given.
5. Else it will not give the output.

V. TECHNOLOGY STACK

We created a CNN model to identify traffic signs and classify them with 95% accuracy. We had observed the accuracy and loss changes over a large dataset. GUI of this model makes it easy to understand how signs are classified into several classes. Convolutional neural networks or ConvNets or CNN's are very important to learn if you want to pursue a career in the computer vision field. CNN help in running neural networks directly on images and are more efficient and accurate than many of the deep neural networks. ConvNet models are easy and faster to train on images comparatively to the other models.

Technologies used

1. **Python 3.10:** Python 3.10.0 is the newest major release of the Python programming language, and it contains many new features and optimizations. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.
2. **Matplotlib:** Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python. Matplotlib makes easy effects easy and hard effects possible. Matplotlib is a putting up library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-acquainted API for rooting plots into operations using general-purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK. There's also a procedural "pylab" interface grounded on a state machine (like OpenGL), designed to nearly act that of MATLAB, though its use is discouraged. SciPy makes use of Matplotlib. Pyplot is a Matplotlib module which provides a MATLAB-suchlike interface. Matplotlib is designed to be as usable as MATLAB, with the capability to use Python, and the advantage of being free and open-source.
3. **Tensorflow:** TensorFlow is Google Brain's second-generation system. Version 2.8.0 was released on 3rd March 2022. While the reference implementation runs on single devices, TensorFlow can run on multiple CPUs and GPUs (with optional CUDA and SYCL extensions for general-purpose computing on graphics processing units). TensorFlow is available on 64-bit Linux, macOS, Windows, and mobile computing platforms including Android and iOS.
4. **Scikit-Learn:** Scikit-learns (formerly scikits.learn and also known as sklearn) is a free software machine literacy library for the Python programming language. It features colorful bracket, retrogression and clustering algorithms including support-vector machines, arbitrary timbers, grade boosting, k-means and DBSCAN, and is designed to interoperate with the Python numerical and scientific libraries NumPy and SciPy. Scikit-learn is a community trouble and anyone can contribute to it. Colorful associations like Booking.com, JP Morgan, Evernote, Inria, AWeber, Spotify and numerous further are using Sklearn .
5. **Pillow:** Python Imaging Library is a free and open-source another library for the Python programming language that adds support for opening, manipulating, and saving numerous different image train formats. Development of the original design, known as PIL, was discontinued in 2011. Latterly, a successor design named Pillow branched the PIL repository and added.
6. **NumPy:** NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-ranking accurate functions to operate on these arrays. The ancestor of NumPy, Numeric, was firstly created by Jim Hugunin with benefactions from several other inventors. NumPy addresses the slowness problem incompletely by furnishing multidimensional arrays and functions and drivers that operate efficiently on arrays; using these requires rewriting some law, substantially inner circles, using NumPy.
7. **Keras:** Keras is an open-source neural-network library written in Python. Keras is one of the most widely used frameworks for deep learning. It's a vast and central system within Tensorflow for machine learning workflow, training done on hyper parameters and deploying various problems with solutions. Some functions of Keras include classification of image and text, support during data loading and providing a range of utilities for converting raw data into a proper dataset, accurate feature normalization and, rescaling images and applying transformations on them. It is capable of running on top of TensorFlow, Microsoft Cognitive Toolkit, Theano, or PlaidML. Designed to enable fast experimentation with deep neural networks, it focuses on being user-friendly, modular, and extensible.

Dataset

The CIFAR-10 dataset used was collected by German data scientists and is found to be containing more than 45,000 images which are collection of different traffic signs in various size and clarity ranges. A reasonable

amount of varying nature is noticed in the dataset as some traffic signs are provided with many images as compared to others having fewer images in the records. Images are classified in different classes in our folder from where data is extracted into our Python module with Tensorflow background environment. ETL (Extract, Transform, and Load) tools are used here, by virtue of which, the data is converted into suitable format for transforming sample raw data into understandable format. The train dataset used consists of 43 folders within the range of 0-42 over which iteration is done using OS module. The function of conversion of image content into array is provided by the Python Imaging Library (PIL), in which all labels associated which images are appended in data lists. One-Hot Encoding and conversion to categorical labels of train and test dataset is done by the keras.utils packages. The shape of dataset is (39209, 30, 30, 3) signifying the number of images, their height x width values and RGB (red, green and blue) notations respectively. Splitting is done via train_test_split() method provided by Sklearn package. If image data is normalized by making pixel values ranging in mid of -1 and +1, numerical instabilities are reduced. For better model performance, some transformations can also be performed on the generated augmented and finely refined data, by changing the brightness, rotation of image etc., by using OpenCV library.

RESULT



Fig Result

CONCLUSION AND FUTURE SCOPE

A traffic sign recognition method on account of deep learning is proposed, which mainly aims at circular traffic signs. By using image preprocessing, traffic sign detection, recognition and classification, this method can effectively detect and identify traffic signs. Through this work, a model for traffic sign recognition system is successfully implemented using convolutional neural networks, needed for vehicles as a measure for ensuring road safety. The whole task is implemented using Python programming for machine learning and its strong libraries of deep learning. The parameters of the designed neural network model are finely tuned in order to get good accuracy results with precision of 97.8% and recall to be 98.06%. Accuracy on training set was 95% and 90.3% on testing set. Important point to be noted is that taking a large number of CNNs can increase learning rate of model and images for training are generally augmented but real time image capturing can't be augmented much fast so quick reliability is needed. This research has given us an insight into how well deep learning can be utilized to create intelligent systems.

As a part of future work, we were planning on integrating our model into a real time camera, which would further improve its functionality and application. This can further be included in industrial level products such as driverless cars in the future, provided we integrate our research work into a real time system. From the perspective of traffic sign acknowledgment exactness and calculation tedious, the proposed traffic sign identification and acknowledgment calculation has astounding points of interest.

While the model proposed in this system does bring a step closer to achieving the ideal Advanced Driver Assistance System or even a completely driverless system, there is a lot that can be improved. For identification of a sign, this system depends on color and shape of the sign. This is a problem if there is a reflection on the sign which impacts its color. Similarly, if the sign is chipped or cut off, the shape of the sign is impaired, thus resulting in no detection of the sign.

Another important issue to consider is detection in the night. If the camera is not able to capture the environment in the night due to the darkness, the sign, cannot be detected and classified. A text to speech, module can also be added to this application. In the current application, the driver would have to read the text printed on the classified sign, but with the help of a, voice module, more comfort is guaranteed. The overall performance could also be improved and customized, with the help of more datasets and from different, countries.

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STUDENT ATTENDANCE SYSTEM USING FINGERPRINT

Paras Kushwaha¹, Ashay Gawane², Ajit Dubey³ and Snehanka Gupta⁴^{1,2,3}Student and ⁴Assistant Professor, Information Technology, Theem College of Engineering, Boisar**ABSTRACT**

A student attendance system using fingerprint is a hand-held device that aims to automate the attendance procedure of an educational institution using biometric techniques. This will save time spent on calling out roll no., and names and it gives a fool-proof method of attendance marking. This system operates on a rechargeable battery. This system can be passed to students during lecture time to mark their attendance in the class. The system communicates with the host computer with the help of a USB interface. The system is connected with a GUI application to manage the system and attendance tracking. The fingerprint scanning, retrieving data, and attendance checking management platform were established on the teacher's computer, and the attendance information was stored in the database whichever can be inquired about on the server. The test results show that the attendance system can manage the student's attendance conveniently, and the system is stable.

Keywords: Biometric techniques, GUI, Hand-held device, MySQL Database, Server

I. INTRODUCTION

The traditional attendance system in which the teacher calls out the name of each and every student and marks their attendance was causing a waste of time during the lecture hours. It takes around 10 - 15 minutes. This situation gets more time-consuming when there are more students in a class. Managing a large amount of data is also very difficult. Students may also mark fake or proxy attendance of absent students which is another disadvantage of the traditional system. In the last few decades, student enrollment in schools, colleges, and universities has increased and is continuously growing. In view of the above problems and the needs of college teachers for the attendance system, the system implemented a special attendance management system for college students based on fingerprint identification. The system completes fingerprint information storage, transmission, check-in information query, statistics, and other functions, which through fingerprint collection, comparison, identification, database establishment, data transmission, and the design of upper and lower computer interfaces.

II. LITERATURE SURVEY

[1] L. X. LI Jian-po, ZHU Xu-ning, and Z. Chi-ming, "Wireless fingerprint attendance management system based on Zigbee technology," in 2nd International Workshop on Intelligent Systems and Applications (ISA), May 2010, pp. 1 – 4. The author created a database in a remote system and the fingerprint data is transmitted to the host using Zigbee wireless technology. But if the classroom is not in the range of Zigbee, the device was unable to access.

[2] Z. C. A. Kassem, M. Hamad, and S. E. Dahdah, "An RFID attendance system for university applications," in 17th IEEE International Conference on Electronics, Circuits, and Systems (ICECS), 2010, pp. 851 – 854. The users have to carry RFID tags to mark attendance. The database was introduced on the computer and students have to carry the RFID tags to the reader. Because of this system, students can also mark proxy or fake attendance of absent students with RFID tags.

[3] L. Kamelia, E. A. D. Hamidi, W. Darmalaksana and A. Nugraha, "Real-Time Attendance System Based On Fingerprint and Global Positioning System(GPS) in the Smartphone," 2018 4th International Conference on Wireless and Telematics (ICWT), Nusa Dua, 2018, pp. 1-4. To prevent proxy attendance marking, the author implemented a real-time attendance system using GPS technology. If a student is located on the premises of a school or college, then only the attendance will be marked, or else it will reject the entry. One of the main issues of using GPS is to detect employees' locations; attendance can be done by sending MMS messages between users and the system is accurate to identify the real-time locations.

[4] S. B. Oo, N. H. M. Oo, S. Chainan, A. Thongniam, and W. Chongdarakal, "Cloud-based web application with NFC for employee attendance system, " 2018 International Conference on Digital Arts, Media and Technology (ICDAMT), Phayao, 2018, pp. 162-167. The author proposed Near Field Communication (NFC) technology which is integrated with the user's device rather than RFID tags. The issue with this technology is that they proposed their NFC time attendance system based on a web application that can be accessed at any time showing the arrival time, leave, and many other report fields

III. METHODOLOGY

The student attendance system consists of three parts, the Student's fingerprint information collection, and attendance, the login interface, and the design of the database. Information collection is divided few processes, fingerprint template collection, feature extraction, and fingerprint recognition. Fingerprint template collection is to collect a user's fingerprint image by fingerprint instrument, extract fingerprint information from the fingerprint image to form a fingerprint template, and store it in a database. Fingerprint identification consists of two processes, the registration process, and the identification process. In the process of registration, users need to collect fingerprints first, and then the computer system will automatically extract the information which one will save as Id in the database. The information compared with the template of the database and the comparison results will be given. The procedure is general-purpose, which is applicable to all biometrics. In the beginning, the teacher opens the teacher's login interface and enters the correct account number and password. After that, enter the student fingerprint collection or attendance interface. Next, students fill in personal information according to the prompt information which includes student number, name, gender, major, and class. After giving in, three fingerprint acquisitions are combined to form a string template. A text box pops up in the interface to prompt "registration succeeded", and the corresponding student information is written into the MySQL database to complete fingerprint acquisition

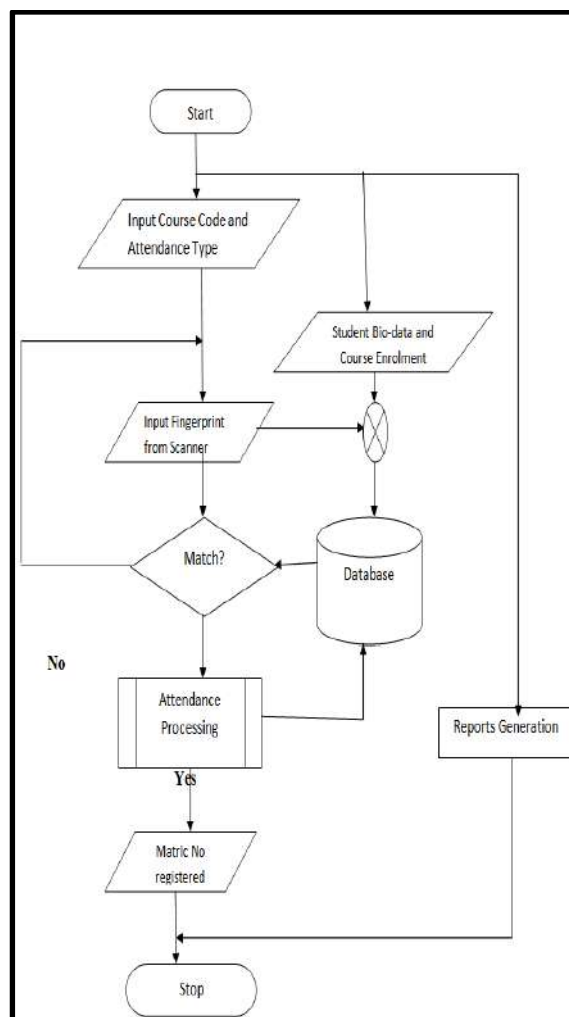


Fig 1: Flowchart of the proposed system

IV. RESULTS

At the initial stage, you have to register a student in the system. So for this, the user has to provide details such as course details, student name, roll number, etc. After providing the details, the data will get stored in the database. Then, you have to register your fingerprint with the help of a fingerprint sensor. The fingerprint will get stored in the database with a particular code. The data stored in the database is used to match and mark users' attendance. SO after registration, just verify that your details are stored by marking his/her attendance. If it fails to do so, then the user has to repeat the above steps again. After the registration process, the student just has to mark their attendance by providing their fingerprint to the system and marking their attendance.

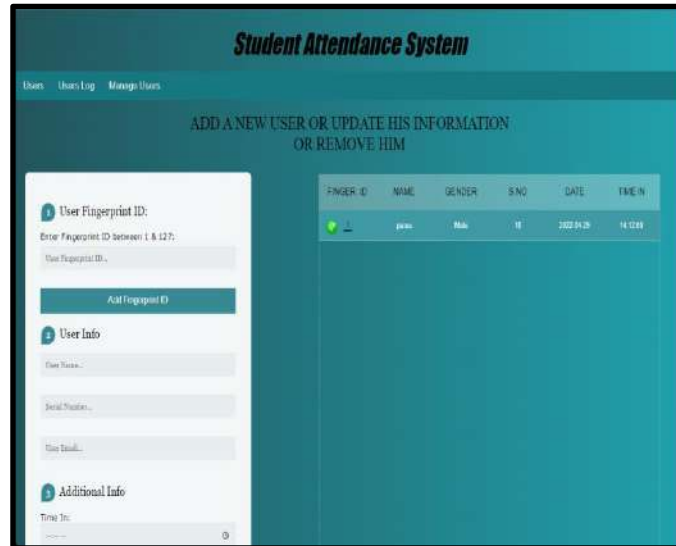


Fig 2: GUI of the registration page

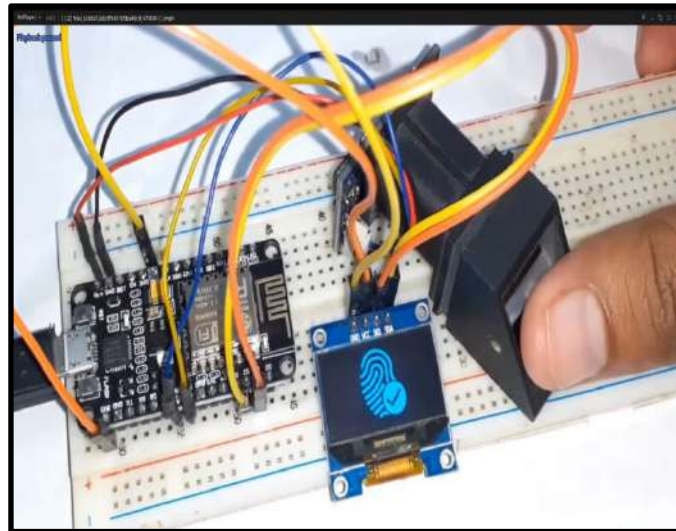


Fig 3: Connection of fingerprint sensor

V. Applications & Advantages

A. APPLICATIONS

The system can be used by schools, colleges, or universities for taking down attendance.

It can also be implemented in firms and organizations for attendance purposes.

B. ADVANTAGES

Teachers do not need to waste their time, approximately 15min of 1hour for taking attendance of students. Students will be more motivated in attending their classes since there will be no password or no attendance sheet signature required, so no friend or any other student can mark attendances of others as fingerprints are unique for each and every one. This system will be helpful to the faculty to easily find out defaulters. Students can easily get the attendance history of a particular student.

VI. CONCLUSION

This system meets the needs of college teachers and designs a class attendance system composed of a fingerprint instrument, upper computer, and lower computer. Students only need to scan their fingerprint information once, and then they can carry out fingerprint attendance for permanent. The academic affairs office can easily query and manage the student's attendance problems that save the teacher's manual roll call in class and report attendance after class, which is also convenient, faster, and time-saving. Strength, greatly enhancing the supervision of students. The system has the advantages of strong practicability, a wide range of use, easy expansion, low cost of installation and maintenance, and has a long-term development prospect. The original system is compact, portable, and easy to operate. So that, It can be widely used in many fields, such as public security, banking, computer network information security, and so on.

VII. FUTURE SCOPE

The GLCD can be replaced by a touch screen GLCD so that buttons can be removed. So, pushbuttons can be removed. A feature may be provided to download whole fingerprint templates to the computer from the device. So, the students need not register for another semester. We can reduce the size of the device by using SMD components.

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SOCIAL MEDIA WEB FILTERING**Khan Kariz¹, Hashim Sayyed², Jasir Shah³ and Sharique Ahmed⁴**^{1,2,3}Students and ⁴Assistant Professor, Department of Information Technology, TCOE, Maharashtra, India**ABSTRACT**

With the continuous uprising of social media, users especially adolescents are spending significant amount of time on various social networking sites to connect with others, to share details, and to pursue common interests. OSNs gives minimum support to prevent undesirable messages on user walls. A main part of social network content is formed by short text, a notable example are the messages permanently written by OSN users on particular public or private areas, called in general walls. With the lack of classification or filtering tools, the user receives all messages posted by the users he follows. In most cases, the user receive a noisy stream of updates. More security mechanisms need to be developed for various communication technologies, especially social networks. Therefore, the main task of modern social networks (OSNs) is information filtering.

This web application is designed to be provided free of charge to its users. This allows you to control who has access to your information and who has access to your application's principle statements. Being personally involved in the online space is our main goal. Our site avoid undesirable messages from being written to the user's wall. System selects detailed items based on the correlation between the content of the items and the user preferences as opposed to a collaborative filtering system that chooses items based on the correlation between people with similar preferences.

Keywords: Online Social Network(OSN); Offensive words; Lexical Syntactic Feature(LSF); Bag of Words (BoW); ngram algorithms; data filtration; short text classification.

I. INTRODUCTION

With the continuous uprising of social media, users especially adolescents are spending significant amount of time on various social networking sites to connect with others, to share details, and to pursue common interests. OSN gives minimum support to prevent undesirable messages on user walls. A main part of social network content is formed by short text, a notable example are the messages permanently written by OSN users on particular public or private areas, called in general walls. With the lack of classification or filtering tools, the user receives all messages posted by the users he follows. In most cases, users will receive a noisy update stream. More security mechanisms need to be developed for various communication technologies, especially social networks. Therefore, the main task of online social networks (OSNs) today is information filtering.

This web application is designed to be provided free of charge to its users. Consistent with your app's statement of principles, you should provide control over who has access to information and who has access to it. Personal participation in the online space is the main goal. Our site avoid undesirable messages from being written to the user's wall. Unlike collaborative filtering systems, which select items based on correlations between people with similar preferences, this system selects items of information based on correlations between item content and user preferences. The system provides advanced image captcha that prevents spammers from registering on the site.

Provides automatic filtering for users via administrator to automatically control spam messages between users. We will implement a filtering rule (FR) in our system. A blacklist (BL) is also maintained in this system. A sophisticated filtering system includes multi-level text classification that automatically classifies posts into partial topic categories. There is a filter graph showing how many bad words each user used.

II. LITERATURE SURVEY

Ying Chen, Yilu Zhuo, "Detection of Aggressive Language in Social Media to Protect Youth Online Safety", International Conference on ASE/IEEE Social Computing, 2012 on the detection of aggressive language at the often flawed message level Existing research Unable to accurately identify objectionable content. On the other hand, user-level detection of abusive behavior appears to be a more realistic approach, but is an area that has not been studied much. To fill this gap, we propose a Lexical Syntax Function (LSF) architecture to detect offensive content on social media and identify potential aggressive users. Experimental results show that our LSF structure outperforms traditional secure content detection methods. Detecting offensive sentences achieves 98.24% accuracy and 94.34% recall, and detecting user abuse achieves 77.9% accuracy and 77.8% recall. Therefore, you can refer to the ngram method based on this article.

Marco Vanetti, Elisabetta Binaghi, Elena Ferrari, Barbara Carminati, and Moreno Carullo, "OSN User Wall Spam Filtering System", IEEE Transactions on Knowledge and Data Engineer, February 2013. One of the fundamental problems of modern online social networks (OSNs) is to provide: Users have the authority on the messages posted in their personal space to prevent displaying inappropriate content. Up to now, OSNs provide little support to this requirement. To fill the gap, in this paper, we propose a system allowing OSN users to have a direct control on the messages posted on their walls. This is achieved through a flexible rule based system that allows users to customize the filtering criteria to be applied to their walls, and a Machine Learning based soft classifier automatically labelling messages in support of content based filtering concept, therefore we can refer Machine learning based short text classifier.

Ramnath Balasubramanyan, Aleksander Kolcz, "wOOT! Feeling great today!" Chatter in Twitter: Identification and Prevalence", IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, 2013. Microblogging services like Twitter are used for a wide variety of purposes and in different modes. Here, we focus on the usage of Twitter for "chatter" i.e., the production and consumption of tweets that are typically non-topical and contain personal status updates or conversational messages which are usually intended and are useful only to the immediate network of the producers of the tweets. We study the prevalence of chatter tweets in Twitter and present techniques to detect them using machine learning techniques that require minimal supervision. From this paper we have referred the following concept taking example of twitter as a "chatter", we are able to study or classify tweets as per their ranks and then filtering out the ones that are of high relevance.

Filtering unwanted messages from osn walls 2016 1st International Conference on Innovation and Challenges in Cyber Security (ICICCS 2016) today various social networking sites are available which Make people remain in constant touch with each other. Sharing any type of data has become easy. There are great advantages of such social networking sites excepting a few minor drawbacks like poor security which create huge problems to people when they were active on such sites. As we have seen Facebook allows users to post comment on another user's wall even when they were unknown to each other. But if that comment is a vulgar one then it may cause serious problem to user reputation. To avoid such a problem Information filtering is used to filter the content of the message. So we have analysed various Information filtering methods like content based filtering, policy based filtering, and collaborative filtering in this paper. The content-based filtering method is superior to any other filtering method because it filters out bad or non-nervous words from the entered posts and only posts pleasant comments on the bulletin board. This will help us avoid unwanted messages and permanently damage our most important reputation in the socialized world

III. DESIGN AND IMPLEMENTATION

In our proposed system, there are three methods: message filtering by administrator, message filtering by user, and short text classifier. When you filter messages in the manager's way, the messages are filtered by the manager, who sets the categories of words. When filtering messages by user, messages are filtered by user and the user sets the category of words. In short text classifiers, short text words are set by the administrator of the database. Message Filtering This module filters out unwanted messages. Other users who can send vulgar messages to OSN users have been temporarily blocked by OSN users. If a user sends more than a specified threshold of vulgar messages that match a filter pattern specified by an OSN user, that user is not permanently friended.

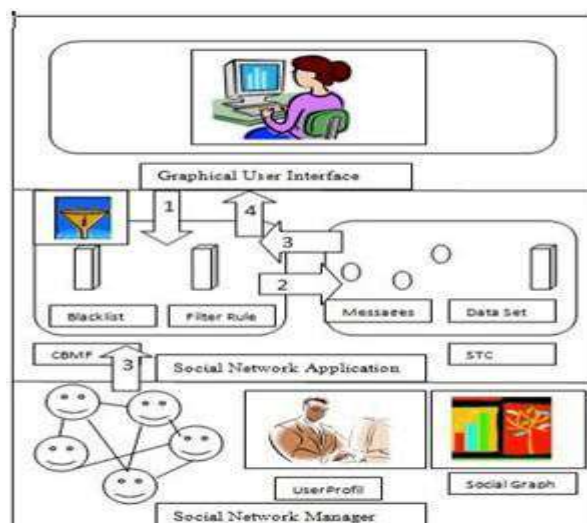


Figure 1: Block diagram of Social Media Web Filtering

Process of Filtration

There are three main questions to consider when identifying the Filtering Process FR. First of all, in online platforms where we communicate with each other in our daily life, the exact word may have different meanings depending on the context. Derivatives allow users to form conditions that restrict text producers. Manufacturers can choose based on a variety of benchmarks. This means the status, the depth and importance of the relationship to the classification. The input message goes through word classification properties to classify words based on bad, forbidden, and valid words. This will further filter out bad words and provide the correct word format in the output.

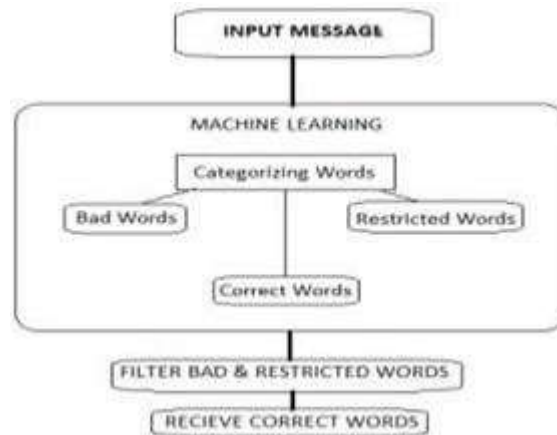


Figure 2: Filtration process diagram

Blacklisting Process

The Filtering process is moved to a future Blacklisting process. An additional part of this system is a BL (blacklist) mechanism that can ignore texts from unrecognized manufacturers. Obscene and unwanted words are blacklisted and only the rest of the message is displayed. These rules are not defined by the NPS and are not intended to be used as high-level guidelines for the entire community. Instead, I decided to provide the user myself. Clarify the rules for the owner of the wall, base camp management, and how long and for how long they must be expelled from the wall. In this way, the user is excluded from the wall and can post to another wall at the same time. As with MRF, our rules create owner walls. Like the filtering rule, the blacklist rule makes the wall immune to unwanted words.

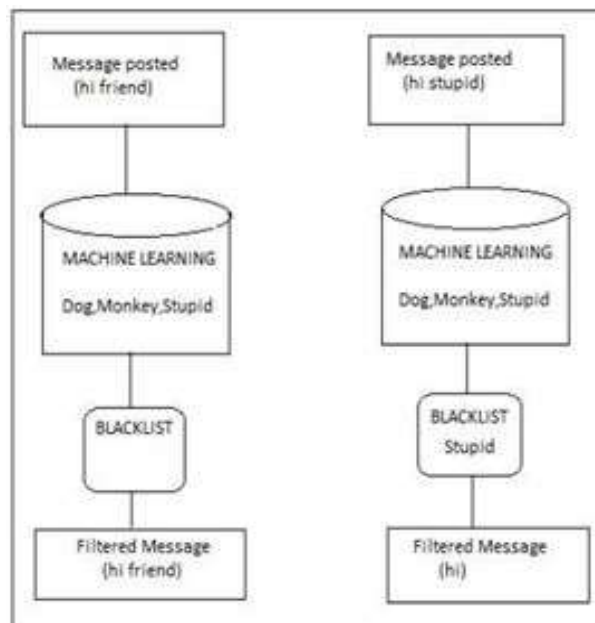


Figure 3: Blacklisting Process

Algorithm

Main algorithm:

Step 1: Run Application

Step 2: User posts text, image to online platform.

Step 3: The user adds a comment to the user's post.

Step 4: Each and every part of the user post and the comment on it will be processed using NLP.

Step 4: If the machine after processing found out that the comment or the posts resemble any kind of vulgar attribute then go to step 6.

Step 5: if after processing it is found out that there is no objectionable content then it will be posted as an output on the wall.

Step 6: Using blacklisting process it will filter out each and every words which indulges in any kind of vulgar act.

Step 7: Stops the process. NLP is an arrangement which learns and formulate on the data it reads and on this basis it will draw conclusion. Like it filters out the spam or non-spam content from the email inbox.

IV. RESULT

The Web Application

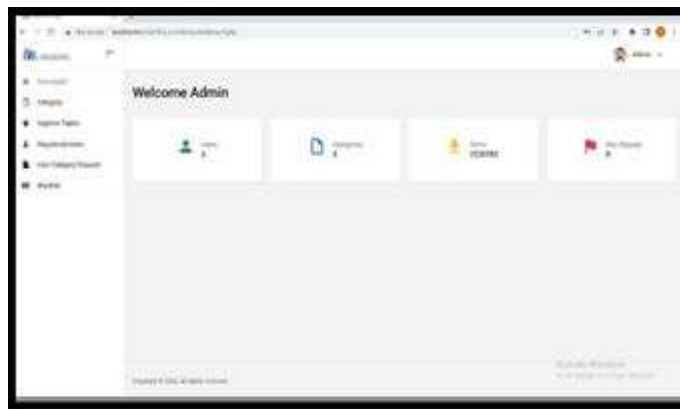


Figure 4: Admin Panel



Figure 5: Blacklisted Words.

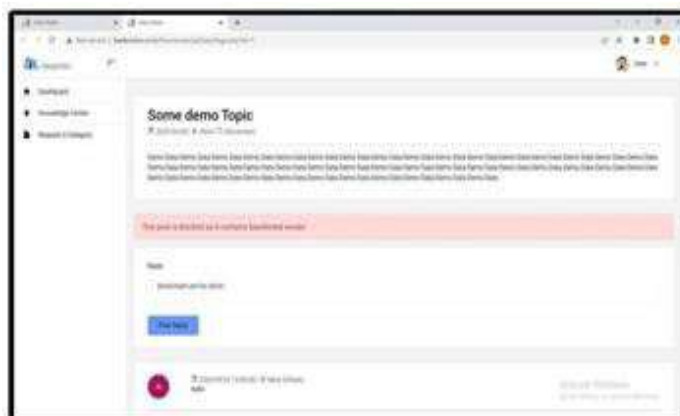


Figure 6: Blocked posts

1. The User would Login/Signup to the web page.
2. After login the user will come to the home page where he can read the various articles available on the web page.
3. User can also suggest custom category of his liking.
4. After the request is accepted by the admin the new category will be shown on the knowledge and the user can further ask for sub topics related to it.
5. The user can then browse through the accepted topics and categories available on the website.
6. After reading the contents on our webpage user can also post a comment.
7. You cannot comment on a post that contains indecent or unethical content..
8. A list of categories and topics appears on the admin panel.
9. The Administrators will also have data about the number of registered users on the site.
10. Administrators can also disable users.
11. There is a place where admins can set up a list of blacklisted words that users cannot post when used in comments.

V. CONCLUSION

Every aspect of social technology usage should be traceable back to an objective which supports a meaningful goal. The objective is "to give people the power to share and make the world more open and connected. It believes that increased connection between people through their site will lead to better understanding between disparate groups. The site has ability to produce beneficial results from social technology usage which is highly correlated with the ability to create meaningful goals and objectives. This web application is designed to be free for its users; it should give them control of their information and who can access it, according to the application's statement of principles. Being personally involved in the online space is our main goal. Our site prevents unwanted messages from being written to the user's wall. Unlike collaborative filtering systems, which select items based on correlations between people with similar preferences, this system selects items of information based on correlations between item content and user preferences. Automated control of spam messages between users by providing automatic filtering for users through the administrator. We will implement a filtering rule (FR) in our system. Blacklisting (BL) is also supported on this system. A sophisticated filtering system includes multi-level text classification that automatically classifies posts into partial topic categories. There is a filter graph showing how many bad words each user used.

So basically it can be said that his app is useful for ordinary people who post unwanted messages like vulgar, political, sexual posts on their wall from third parties and don't want OSN default access control.

VI. REFERENCES

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FRAUD MINER: CREDIT CARD FRAUD DETECTION USING FREQUENT ITEMSET**Sakshi Singh¹, Swapnali Sinalkar², Yogendra Sharma³ and Prof. Sneha Sankhe⁴**^{1,2,3}Students and ⁴Assistant Professor, Department of Information Technology, TCOE, Maharashtra, India**ABSTRACT**

Now-a-days, as we are going through pandemic condition, 90% of people prefer to do online transaction for any purpose. Such as online shopping, bank to bank transaction, etc. As credit card hold large share of these transaction. So, Most of time there is possibility of Fake or Fraud transaction using credit card, which can cause a large amount of financial loss to financial institutions as well as individual. The fraud people do not use same techniques for stealing money or conducting fraud each time. As new technology are getting introduced, frauds also switch to new patterns everytime. So most of the financial institutions and banks use credit fraud detection system to reduce losses. In credit card fraud detection, both supervised and unsupervised learning is used. But in this system, we are going to use unsupervised learning technique to understand the different fraud patterns. The aim of this system is to classify the normal transaction and fraud transaction and stop the fraud one. It uses auto-encoder and other deep learning algorithms to detect fraud transaction. The auto-encoder compress the available data and convert it into small representation and then algorithms such as random forest algorithm, logistic regression and many other algorithms on compressed data to carry on detection process.

We load the data in the data frame of pandas. Pandas is open source package of python. It also provides high performance to use the data structure and data analysis tools. We have also created app which is going to detect fraud and normal transactions. Django is used to make app for its interface and logic. This app has many more features like getting analysis of transactions and many more.

Keywords: Autoencoder, Django, Fraud Transaction, Normal Transaction, Pandas.

I. INTRODUCTION

Due to developing modernization, people also get switch to new technologies, which are more efficient, comfortable and make our life easy. In past, people use to do all business, money transactions, payments, buying and selling and shopping using cash. But now there is change. Every country has their own currency, such as dollar, pound etc. So people find it difficult to use cash. Now a day and as now covid condition is there, people avoid to give and take cash. Due to this most of the people fuse to do online transaction using cards for online shopping account to account transfer, etc. In this online transaction, 25% of online transaction is done using Credit cards. Credit cards is mostly used credit payment instruments as they allow you to easily avail an instant line of short term credit while making transactions. This help us to Increase our purchasing power and also provide us benefits like ease of use, reward Points and cashbacks. So transactions using credit card are an rapid speed.

But as use of credit cards is increasing for money transaction, the credit cards frauds is also increasing day-by-day. There are many types of credit cards frauds. In this fraud person, use your information and issue a credit cards on your name and use it and for that you have to pay. Another way is stealing others credit card details such as credit card number, expiration date and three digit security code and use it for online transaction. This act will increase your credit card bill even though you have not spend single rupee. Some credit card fraud cause huge amount of losses to many financial institution, banks as well as individual. This also causes damage to the reputation of credit card companies.

According to a survey, credit card fraud raise by 44.7% over 2019 and 3,93,207 credit card fraud complaints were filled. So to avoid this, almost all financial institution, banks credit cards companies use advance credit cards companies use advance credit card fraud detection system such that they can classify between genuine transaction and fake transaction to avoid their own as well as customer losses. Credit card fraud detection system use first only supervised learning which was based on only assumptions. But now due to new advance technology fraud switch from one fraud techniques to another. So to tackle this problem, we use unsupervised learning in this credit card fraud detection system. The supervised learning technique help the found detection system to find anomalies. This credit card fraud detection system also use on auto-encoder. It is a main part of the system. Autoencoder is basically a technique which is used to compress vast data into small one.

Auto-encoder has two important component that is encoder and decoder. Encoder is used to compress large data into smaller representation, where as decoder is used for reverse process means converting the compressed the data into decoder original one. In this credit fraud detection system, the auto-encoder compress the vast of

credit card transaction and later on this compress small data various deep learning algorithm are applied in different ways to detect fraud transactions.

Deep learning algorithms are also very important part of this system. Deep learning is basically a part of family of machine learning method based on artificial intelligence. Deep learning is mostly used for accurate classification. This deep learning technique are most famous than other as it perform better than other machine learning algorithm. The deep learning algorithm include logistic regression , linear discriminant analysis multiple discriminant analysis, k-nearest neighbour, decision tree, random Forest classifier, etc. All this algorithm help us to classify between normal and fake transactions. The main aim of deep learning is extracting important feature from each.

Available data for this extraction and data transformation. purpose, the deep learning uses cascade of multiple layer of uses non-linear processing units. Deep learning algorithms considered as robust algorithm for credit card fraud detection system.

II. LITERATURE SURVEY

Today, credit card fraud has become a great threat which cause fall down of economy in all parts of world . So, lot of research is done on the credit card fraud detection system. Many advanced techniques are generated to avoid credit card fraud. Many people have introduced new strategy to control credit card fraud and reduce loses and some are mention below.

- 1) Karl Tuyls and Sam Maes proposed credit card fraud detection technique which was done using Bayesian and Neural Network. In this, the basic concept was that, they provide set of training data of financial transaction to the computational learner which is uploaded to the system in which we want to perform fraud detection. After this process, the program will be able to classify normal transaction and fraud transaction. In this method, the advantage was that the 68% of fraud transaction was recognized accurately without any error but it detects 10% of genuine transaction as fraud transaction.
- 2) Salvatore J. Stulfo, David W. Fan, Wenkee and Andreas L. Prodramidis and Philip K Chan introduced a credit card fraud detection technique which uses meta-learning to detect fraud transaction. This techniques consist of local Fraud detection agent that detect fraud and provide intrusion. Detection service than meta-learning system bring together the knowledge gathered by local agent. This meta-learning system enables financial corporation to share their models of fraudulent transactions by exchanging agent in secured infrastructure. This technique give meta- classification hierarchy that has given best performance. But still here we do not able to recognize current selection metric for selecting classifier agent for meta-learning technique.
- 3) K.R. seeja and masoumeh zarcapoor has proposed a credit card fraud detection system which was based on frequent itemset mining. The technique consist of vector support machine which classifies between normal and anomalous transaction by using different algorithms. The technique has ability to handle the imbalance data. But this technique is no longer effective now as user and fraudulent behaviour is changing.
- 4) Anuruddha thennakoon, chee bhagyan, sasitha premadasa, shalitha mihiranga , nuwan kuruvitaarchchi introduced a new real time credit card fraud detection using machine Learning. In this technique focus on predictive analysis which is carried out through implemented machine learning model and an API modules to recognize fraud and genuine transaction. These technique tell us the best algorithm to stop credit card fraud in various areas. But still this system have only average level of accuracy

II. DESIGN AND IMPLEMENTATION

In this experiment we are using various modules like Data Loading, Class wise analysis, Data modelling, Model training, Build the model, model evaluation. There are various Deep Learning Algorithms, but we are specifically going to use Auto encoder. Auto encoder is category of feed forward neural networks which is use to learn efficiency of the training data. In first stage, the proposed model an auto encoder it is trained by using same transaction attributes. It produces encoded representation of attributes. Representative features are smaller dimension than original features. In second stage classifier is trained with labelled transaction where we represent each transaction by Z for testing.

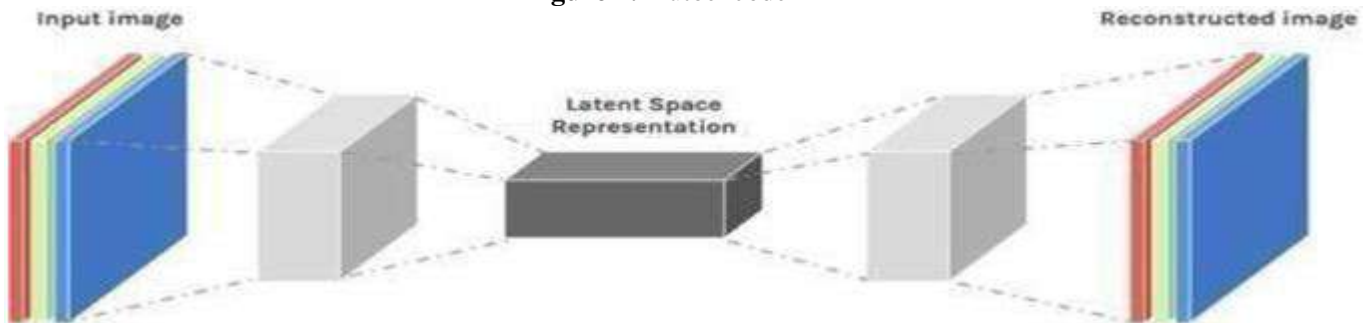
Autoencoders

The size of the input is reduced into smaller unit.

Autoencoder has two parts that is encoder and decoder they can be defined as Φ and Ψ . It compresses the data into smaller size. Four parameters are required before starting or training the auto encoder:

- 1) Code size: nodes in the middle layer.
- 2) Number of layers: It has many layers.
- 3) Number of nodes per layers: Number decreases in care of encoder and increasestowards decoder.

Figure 1: Autoencoder



Algorithm:

The basic algorithm that will be implemented for working of this proposed system is as follows:

Step 1: Start.

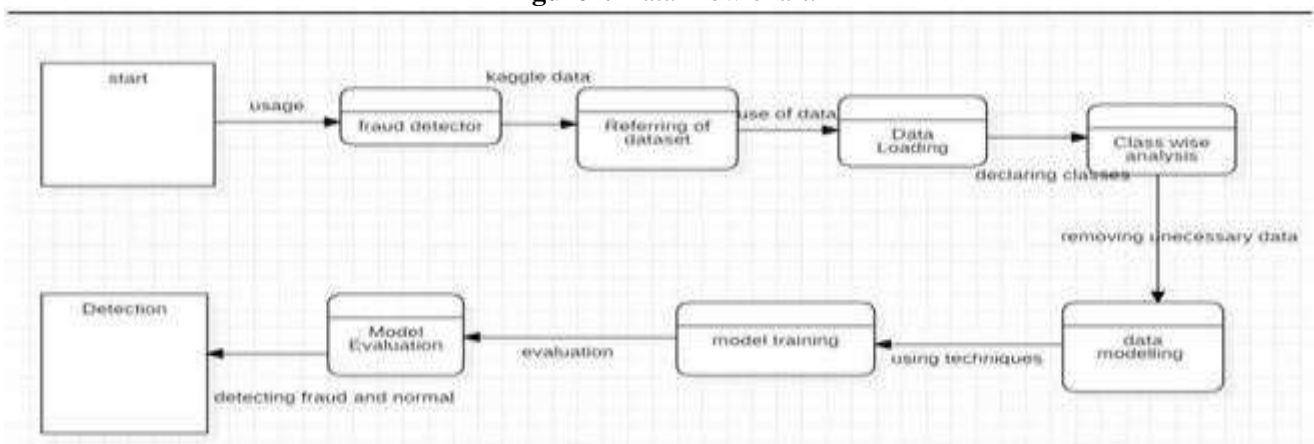
Step 2: Load the dataset **Step 3:** Class wise analysis

Step 4: class is created as fraud and normal **Step 5:** data modelling

Step 6: model training **Step 7:** model evaluation

Step 8: Use of Autoencoder **Step 9:** Result is displayed **Step 10:** Exit

Figure 2: Data Flow chart.



1) Data Loading

Our dataset is loaded. It has various attributes but we have considered only 3 attributes that is time, Account class.

Dataset is loaded in data frame of pandas python. As it is a package of python which gives high Performance.

2) Class Wise Analysis

The class is divided into two class that is fraud and normal. In this we also display number of fraud and normal cases.

Bag, graph is made for Time vs Amount using Matlab library of python.

3) Data Modelling

It removes, unnecessary data like time is not needed for classification of fraud and normal. It also divides the data for training and testing. In this 80% is used for training and 20% for testing.

4) Model Training

In this the input is encoded or compressed into vector 'h'. It is the lower dimension vector than the input later it is passed through networks. The data is given by decoder layer. It gives output dimension = input dimension.

5) Building the Model:

Auto encoder uses 4 fully connected Layer with 14, 7, 17 and 29 number. First two layer used by encoder. Last two Layer is used by decoder. Later on the model is trained for 100 epoch and 32 Sample Best model is Saved.

6) Model Evaluation:

Various algorithms, are used in this section. Some terms used here are adopted by credit card fraud detection researcher to calculate the accuracy of different approaches.

III. Result

The Credit Card Fraud Detection System Home page:

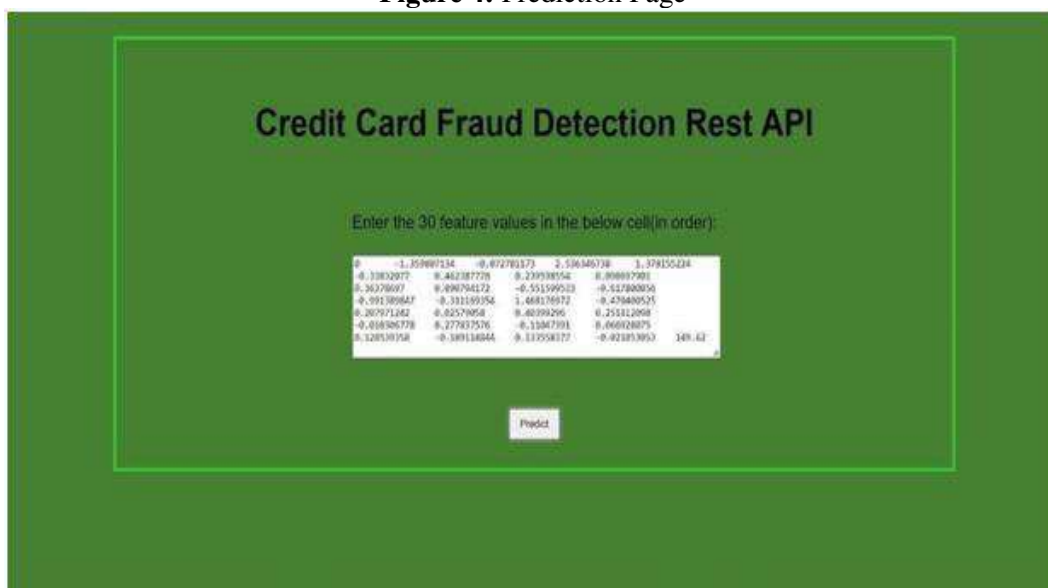
Figure 3: Home Page



This is the home page of credit card fraud detection web application which is displayed after the user get access by entering correct user name and password. It consist of various tabs such as about,contact, login, dashboard and fraud detection.

The Detection Page:

Figure 4: Prediction Page



This is mainly for classifying whether the credit card transaction as fraud or normal. On clicking this, we go to web page which contains a text area and ask for transaction details. In this after, putting 28 attributes of credit card transaction, when we click on predict button someanalyses take place in backend and result is printed on the screen that whether the transaction is normal or fraud and if transaction is fraud, credit card is block and transaction is not allowedto take place and if transaction is normal, it is allowed to continue.

Figure 5: Validation Page



This page display the result that whether the transaction is fraud or valid.

IV. CONCLUSION

In this project we have prepared fraud detector which detects whether the transaction is fraud or normal .We have used various modules like data modelling ,class analysis , build model , model evaluation etc. For dataset we have used Kaggle dataset .Dataset is the one which consist of all attributes .Attributes are class time, amount ,etc. We have also made confusion matrix and bar graph. Bar graph is made for time versus amount . There are various technique that can be used to detect fraud .Genetic algorithm, Artificial neural network , etc can be used .But in this we have used Autoencoder . we proposed a Real-time model for credit card fraud detection, for a real-life dataset of Credit Card transactions, using Autoencoder.Deep Neural Network with Auto-encoder has very promising results,with the best F1 score.The autenocoder model has more accuracy as compared to others .It can remove noise like unwanted data to get necessary parametres.Evaluation is also checked for this algorithm .Precision recall,accuracy ,FP,NP and many parameters are indentified and performed in deep.

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PROMOTING HEALTHCARE IN RURAL AREAS

Darshan Sura¹, Pradyuman Gupta², Ashpak Shaikh³ and Sneha Sankhe⁴^{1,2,3}UG Student and ⁴Professor, Department of Information Technology, TCOE, MU, Maharashtra, India**ABSTRACT**

Today's healthcare environment encourages patients to take an active role in their health management. Young adults are seeking health information online and regard it as a reliable source of health advice. Due to this, health care institutions are making significant restructuring and coordination to meet the growing demand for access to quality care and cost savings. Urban areas have medicine and medical facilities that differ from rural areas in medical terms. Accessibility to health services is a major concern in rural areas since they are more difficult to reach. In the Covid-19 crisis, health care in rural areas is inefficient and feels useless. Web-enabled information technology can increase the accessibility and effectiveness of Health Services Integration in the event of a lack of heterogeneous resources. Blogs have become an excellent content medium for healthcare institutions to demonstrate their knowledge, and understanding, it also increases awareness of current issues which affect the general population. There are many advanced technologies for web building. One of them is the MERN stack which is a Javascript-based technology. It increases security, and scalability and improves the UI of the website. We came up with developing a healthcare website that provides various services like video calling, chat app, doctor's appointments, and blogs on MERN stack technology.

Keywords: Healthcare, Blogs, Rural areas, Awareness, MERN.

I. INTRODUCTION

The global Internet continues to grow exponentially, providing innovative ways to act, communicate, learn, connect and transform almost every aspect of our daily lives. Also, with the use of medical information on the Internet, the expansion of health information on the Internet is affecting the relationship between doctors and patients. With the rapid development of smartphones and mobile devices, it is becoming more and more common for people to access information in this flexible way. The Internet can change a user's information-seeking behavior and attitude. People are looking for ways to get information about their health by searching online for information that will help them decide whether to see a doctor in the post-pandemic world. The public healthcare system in rural India has a great impact on rural society due to its cost-effectiveness and availability. We have developed a website that provides various medical services. It's easy to use and low in cost. It's built on the MERN stack which makes it secure and responsive. MERN (MongoDB, Express, React, and NodeJS) Stack is a collection of powerful and robust technologies, used to develop scalable master web applications comprising backend, front-end, and database components. JavaScript is used to build full-stack web applications faster and easier. MERN Stack is a technology that is a user-friendly full-stack JavaScript framework for building applications and is dynamic and secure.

II. LITERATURE SURVEY

In June 2021, [1] Jahnvi Gupta, Vinay Singh, and Ish Kumar, in this research, explained how chatbots may predict user's diseases. This research will utilize the RASA framework to create a chatbot. The chatbot, like any other person, can connect with others and acquire the user's symptoms. It will then determine the most likely disease and predict it, as well as the treatment options.

In July 2007, [2] D.S. Venkateswarlu, K.S. Verma and K.S.R.A. Murthy, this paper examined healthcare issues in India and potential solutions from the standpoint of information and communication technology (ICT). It starts with the needs of the rural population, the elderly, chronic patients, and accident victims, and then moves on to. Healthcare requires an integrated solution to convey voice, video, and other data.

In August 2010, [3] Zui Chih Lee, Jenniffer, Yurchisin, and Chih Te Lin, In this paper we evaluated how to make a website more attractive and trustworthy. The causes of consumers' willingness to purchase from apparel retail websites, such as website attractiveness, consumer website identification, and website trustworthiness, were investigated in this research study. Theories developed from social identity theory and earlier research on online customer behavior were tested using a structural equation model.

In September 2020, [4] Ajay Rana, Nitin Pandey, Vinod Kumar Shukla, and Lekha Athota, in this paper we evaluated how healthcare chatbot is important. Healthcare is critical to a healthy lifestyle. But, getting a doctor's appointment for every health issue is quite tough. The concept is to use Artificial Intelligence to construct a medical chatbot that can diagnose diseases and provide basic information about them before contacting a doctor. The use of a medical chatbot will help to minimize healthcare expenses and enhance access to medical knowledge.

In April 2021,[5] Mohammad Monirujjaman Khan and Rezaul Karim, In this paper, looked at how significant healthcare chatbots are. The construction of a smart e-health system for the Covid-19 pandemic is presented in this research. It's a cutting-edge Telemedicine technology that allows patients to consult with doctors from the comfort of their own homes. Opentok, Twillo, and 7 WebRTC were used to test video calling APIs. The key features are real-time online doctor-patient contact and prescription. Due to the growing popularity of online systems and the need to save time, people from far away will readily take advantage of this.

In December 2018, [6] Ashley Williams and Austen Rainer, in this article, identified benefits and challenges to the use of blogs, considered quality criteria, and described methodology, based on the case survey, to gather and analyze blog-based evidence. To ensure that large volumes of higher-quality blog content can be used effectively in research.

III. Proposed System

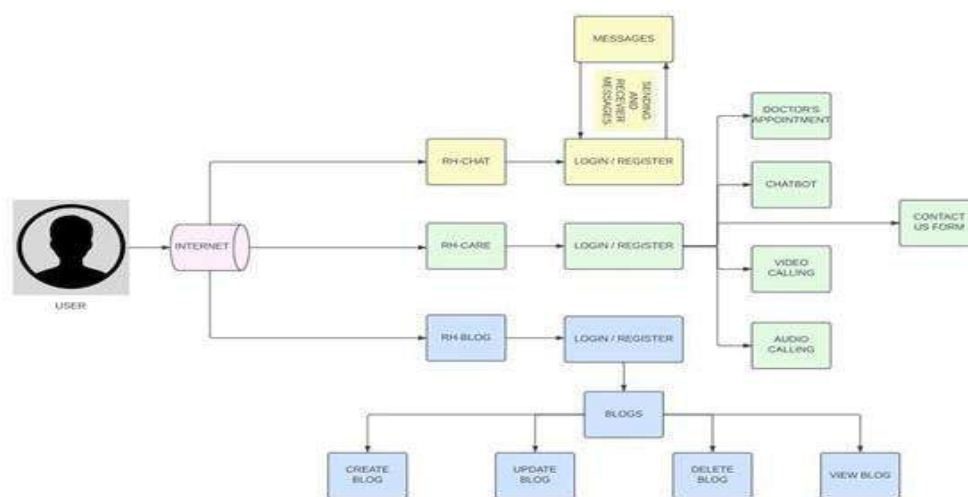


Fig 1: Proposed System

There are medical and health care facilities in urban areas, which are different from rural areas in terms of medical care. Health services in the rural areas are the most concern for its residents since accessibility is quite challenging. In the Covid-19 crisis, health care in rural areas is inefficient and feels useless. So, we have come up with a website, which is RH-Care and it provides basic health information and services. On our website, a user is required to login or register. After that, users can use various features. Users can also talk to chatbot and chatbot will help users by predicting whether the user is positive for that disease or not. After that users can book an appointment with a doctor. Doctors will use our inbuilt video calling app and send a link to that video call to the user. Users will get the link through our inbuilt chat app which is RH-Chat. We also have RH-Blogs in which users can create, update, delete and view blogs. The RH-Blogs categories section is also available. The blogs will also have free health camp updates, diseases and symptoms, and other healthcare information for awareness.

IV. TECHNOLOGY USED

The website is developed using MERN technology and python. Javascript Stack MERN Stack enables faster development of full-stack web applications. There are four technologies comprising MERN Stack, which are MongoDB, Express, React, and Node.js. It is designed to streamline the development process. This powerful combination of technologies provides a complete framework for developers to work with, contributing to the development of web applications.

MongoDB: - For the backend we used MongoDB which is a NoSQL database. MongoDB is a document-type database that is easy to use and understand.

Express:- Using Express, you can develop both web and mobile applications with a robust set of Node.js features. Node-based Web development can be done more quickly with Express. In our system, the express acts like a middleware. Express simplifies and simplifies writing back-end code.

React: - Our frontend is built with React, a platform that supports JavaScript and allows users to create components in UI.

Node.js:- A back-end JavaScript runtime environment running on the V8 engine, Node.js helps to execute JavaScript code outside of a web browser. Developers can use JavaScript to write command-line tools and to

run server-side scripts to produce dynamic web page content before the page is sent to the user's browser. We also use Bcrypt, which is a Node.js library, for encrypting the user password.

V. RESULT AND DISCUSSION



Fig 2: Login Page

Login Page consists of Email-Id and Password, forget password and register if the users do not register.



Fig 3: RH-Blogs Page

The RH-Blog homepage displays various blogs with their author name, date, and time. There is also a section about us on this site that gives a few details about RH-Blogs. In the write section, a user can also create a blog by adding an image, title, and description. After that, the user is required to click on submit.

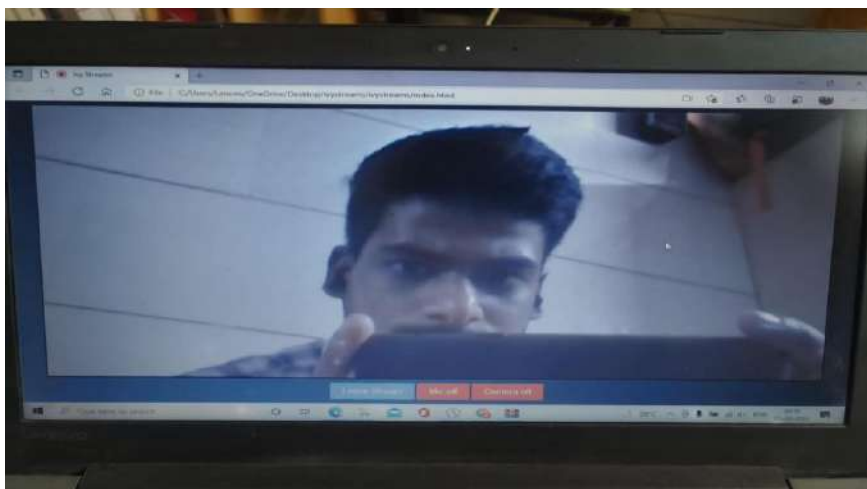


Fig 4: Video-Calling Page

The Video-Calling page consists of a mute/ unmute button, an End meeting button, a Turn on /off camera button, and a user's screen. A doctor can send the meet link to the patient.

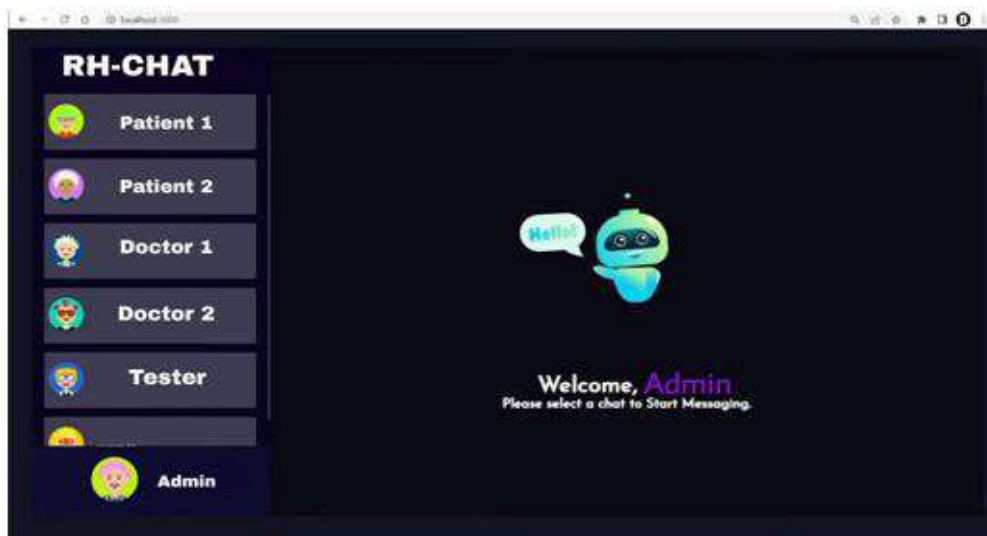


Fig 5: RH-Chat page

In RH-Chat a user needs to first Register or Login to access the Chatting Page. Patients and doctors can communicate through RH-Chat, where reports and prescriptions can be shared.

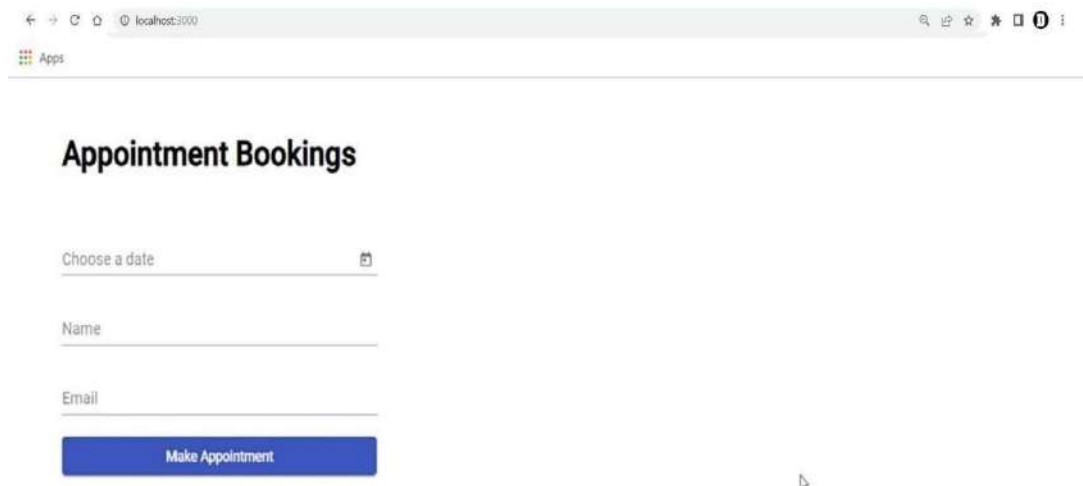


Fig 6: Doctor's Appointment Page

When booking the appointment with a doctor, the patient must select the date and enter the details such as his name and email address. Patients' appointments can be viewed by physicians in the appointment view section.



Fig 7: Contact Us Page

On the Contact Us page, the user is asked to enter its query along with its name and email address.

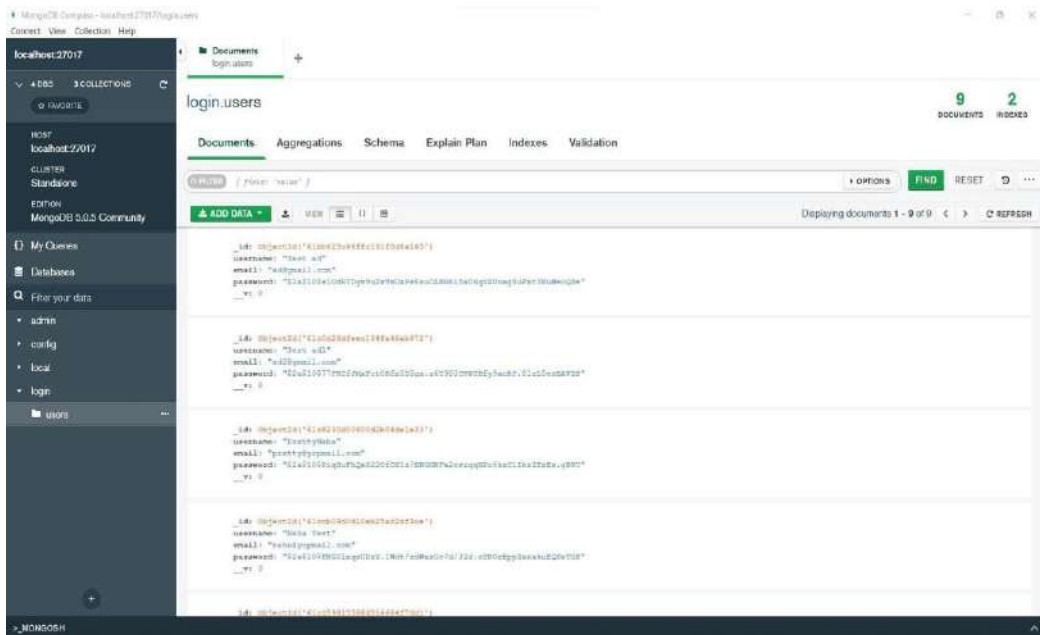


Fig 8: Login Database

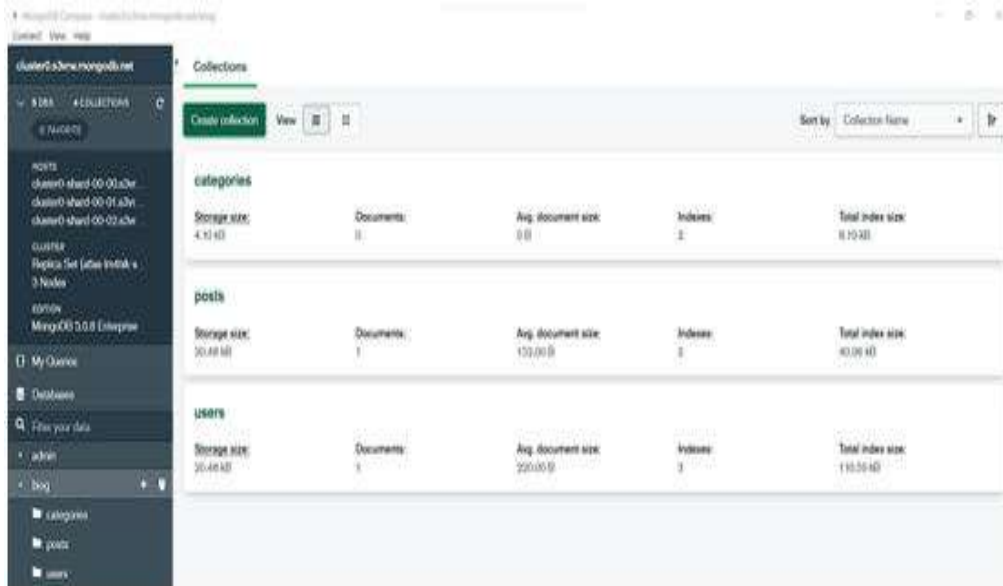


Fig 9: RH-Blogs Database

In the above two figures, you can see the Login/Register page and RH-Blogs database. However, the user password is in hash form, so even the admin can see it which improves the protection of the user password.

VI. CONCLUSION

In the Covid-19 crisis, health care in rural areas is inefficient and feels useless. So, we came up with the idea of developing a healthcare website. We develop the website using MERN stack technology. RH-Care, RH-Chat, and RH-Blogs are 3 major components of our website. It will reduce the gap between the doctor and the patient. RH-Care fills the gap between a doctor and patient by providing services like video calling, doctor’s appointments, and contact us. RH-Blogs help users get aware of various health issues in the general population. RH-Chat helps users to communicate with their doctor via chat. Through this, we have tackled some issues and reduced the gap between the patient and doctor.

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ORGAN DONATION APPLICATION AND WEB SERVICE**Suvankar Biswas¹, Sneha Sankhe², Hrishikesh Sankhe³ and Mehtab Ali Chaudhary⁴**^{1,3,4}Students and ²Assistant Professor, Department of Information Technology, TCOE, Maharashtra, India**ABSTRACT**

This Application acts as a vital role in saving the lives of individuals and that is additionally its main aim is to assist the user to urge the desired organs at the right time. And it's a mobile-based Application developed within the Android Studio. This Android Studio application provides a simple and quick thanks to look for organs. This app permits users to search out organs in an emergency. Users have to register with the application that is accessible on the app. And also, they'll get transient data on the donor's contact details including their location. The Objective of this Mobile Application is to style associate Android Studio Application to take care of necessary data of the Patients, Donors, and report details for any bio-related organization. Project Organ Donation App was developed in order that users will read the knowledge concerning registered Organ donors like Name, Address, and different such personal details in conjunction with their details of people and different Medical Details of the donor. This Mobile Application conjointly incorporates a login page wherever the user is needed to register and solely then they'll read the supply of organ, if he/she needs to the most aim of developing this Application is to scale back the time to an excellent extent to avoid outlay time in looking for the correct donor and therefore the convenience of organ needed.

This Android Application will store the details of the donor in firebase and allow patients to see the available donors. It also provides high performance of the health of donors.

Keywords: Android Studio, Donor, Firebase, Organ, Donation, Web application.

I.INTRODUCTION

The demand of the organ has increased year by year and this has caused a lot of problems because of the common sense that the organ cannot be harvested like plants. An organ should have been used by a human to get confirmation that the organ is good to use in another human. But human are confused that are they good donor to give organ and which organ can be donate. Humans are going lazy day by day and this makes them fail to understand what good deeds can be done if they work a little more. In the case of organ donation if humans find out how this organ donation works and what are the steps. They will be making a big change in people's minds and life.

It is said that on an average day, there are nearly 300 deaths every day Roughly 5 lakh people die annually in India due to lack of an organ donor but with less than one per million people opting to donate, the organ donation rate in the country is one of the lowest in the world, according to estimates in India the statistics are even worse as quite 8000 people suffer per annum without the right acquisition of a donor, why do these fallacies occur? These mistakes occur as a scarcity of proper connection between a willing donor and a needful patient, however this also hasn't stopped the illegal processes of organ transplants, where certain organizations kidnap people and perform organ trafficking, there has always been a requirement to place a check of control on of these issues. The Transplantation of human organ act (THO) was passed in India in 1994 to monitor and coordinate organ donation and transplantation activities, there are certain higher authority bodies that were commissioned thereunder , Appropriate Authority (AA): inspects and grants registration to hospitals for transplantation, Advisory Committee (AC) : consisting of experts within the domain who shall advise the acceptable authority , Medical board (Brain Death Committee): Panel of doctors responsible for brain death certification. The main idea of this proposition is to possess a mobile application that provides people the selection to be a donor when a hospital near them is in need of an organ, the application named as ' Organ Donation App' will be able to fetch the authorizations from the above-mentioned bodies, and connect the donors with the most needful patient of the hour. The application is about bent start as an Android based one, but eventually aimed toward reaching bent devices of all types , the appliance allows any normal civilian user to register, but only the authorized admin from the opposite end can validate the credentials and user information before they will tend to the necessity of a patient, in case of an organ donation, the hospital sends request for the particular blood type and waits for a potential donor to respond.

Looking at the people who need help humans on the other side of the wall want to help these people with the imagination of a new future taking part with more humans who want to come to the other side of the wall where people are healthy with no physical drawbacks. So when they are on this side of the wall they will help others as one did to them. People want to help others in need in the hope that they might be doing good even after they are dead. But in most cases people have a lack of knowledge of how it is done or where to go for such things and lots more.

II. LITERATURE SURVEY

Solid organ transplantation is one among the foremost remarkable and dramatic therapeutic advances in medicine during the past 60 years. This field has progressed initially from what can accurately be termed a "clinical experiment" to routine and reliable practice, which has proven to be clinically effective, life-saving and cost-effective. This remarkable evolution stems from a serial confluence of: cultural acceptance; legal and political evolution to facilitate organ donation, procurement and allocation; technical and cognitive advances in organ preservation, surgery, immunology, immunosuppression; and management of infectious diseases. A number of the main milestones of this multidisciplinary clinical science are reviewed during this article [1].

This study sought to gauge the effectiveness of Project ACTS: About Choices in Transplantation and Sharing, which was developed to extend readiness for organ and tissue donation among African American adults. Nine churches were randomly assigned to receive donation education materials currently available to consumers or Project ACTS educational materials. The first outcomes assessed at 1-year follow-up were readiness to precise donation intentions via one's driver's license, card, and discussion with family. Results indicate a big interaction between condition and time on readiness to speak to family such participants within the intervention group were 1.64 times more likely to be in action or maintenance at follow-up than were participants within the control group ($p = .04$). There have been no significant effects of condition or condition by time on readiness to be identified as a donor on one's driver's license and by carrying a card. Project ACTS could also be an efficient tool for exciting family discussion of donation intentions among African Americans although additional research is required to explore the way to more effectively affect written intentions [2].

The importance of choosing more human leukocyte antigen (HLA)-compatible recipients for deceased donor kidneys has declined because the donor and recipient demographics have changed, and because the await transplants has grown in recent years. Although the general difference in 10-year graft survival rates between the simplest and worst matched kidney transplants remains at about 18%, only about 15% of candidates can expect to receive a HLA-matched kidney. Larger gains in survival are often realized by matching donors and recipients more closely for age and other factors that are projected to extend the years of graft function for every deceased donor kidney. For several patients, however, who are sensitized against HLA antigens by pregnancies or previous graft failures, a more histocompatibility organ is that the only option for transplantation [3].

III. DESIGN AND IMPLEMENTATION

There are many people within the world facing issues which will only cause two ways: Death or Cure. The cure is removing the organ and replacing it with a working one. But this will happen only some is prepared to offer. Organ donation takes healthy organs from one person and transplants them into another person, allowing the recipient a far better quality of life

The application asks you to enter your medical records and therefore the report has been created by us which mention the social information of the user. It also mentions the organ or a part of the organ which may be donated. After the results collected, it's uploaded to the user account then the user is given a form to fill certain the confirmation of Donation with the acceptable

User Information

- User registration: the appliance shall allow users to register and make a profile
- User authentication: When registering, the appliance shall allow users to authenticate using their username and password.
 - o User Log in
 - o Users shall be able deactivate their account
 - o Users shall be able sign off

• Profile Management

The profiles of users shall contain the following:

First name, Last name, telephone number, Location, Email ID

The organ the donor decides to donate.

Algorithm

1. The application starts with Registration.
2. If the user is new, then he will be following the Sign in Page

3. Once he has entered the valid credential, the user will be directed to the Login page.
4. After filling the form, user will be directing to Data Review page.
5. After review page, they will be directed to Dashboard
6. Dash board is where user can choose to update information if gets wrong or review the Data review page.
7. If the user is existing user then they will be directed to the dash board.
8. Step 6 again
9. This loop can only be close if user decide to click on log out button in the dashboard.

There is also an information page where the user is motivated in to donate their organ, in form of text as well as videos from celebrities explaining why it is important.

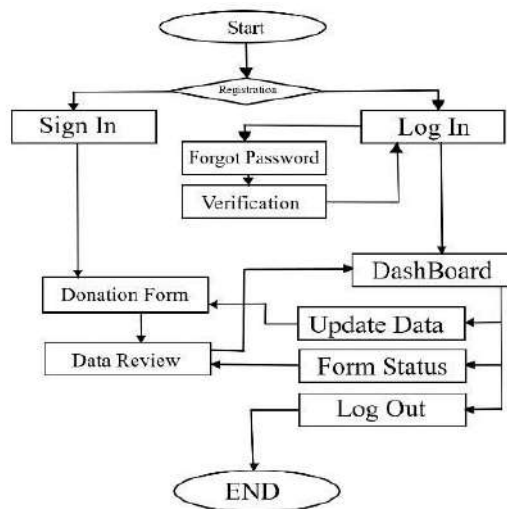


Figure 1: Data Flow chart.

The above diagram represents the way how the application is used in order to collect information from the user and save it in the database. The application also provide user to change or update the filled form in situation of incorrect information.

IV.Result

The Android Application

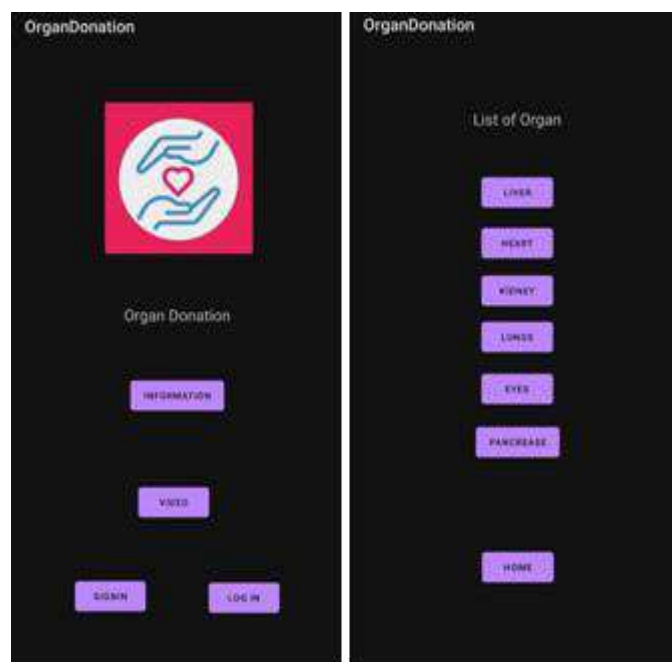


Figure 2: Home and Information page

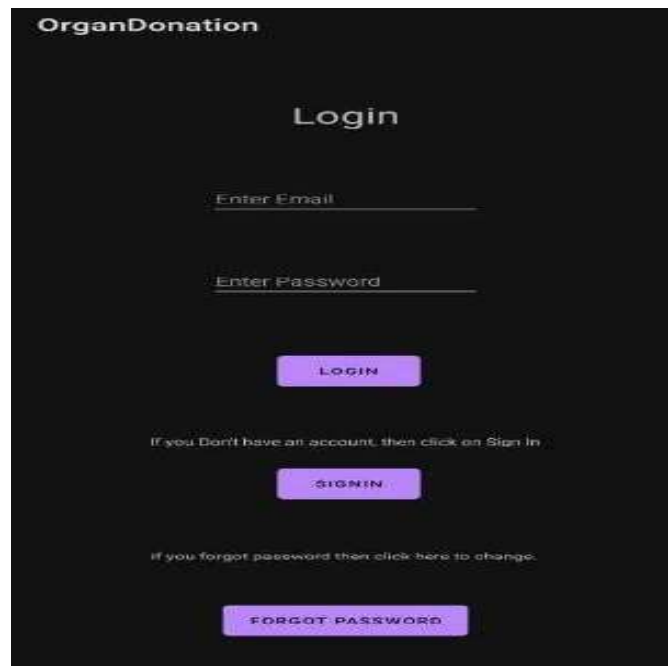


Figure 3: Login page.

The Web Application

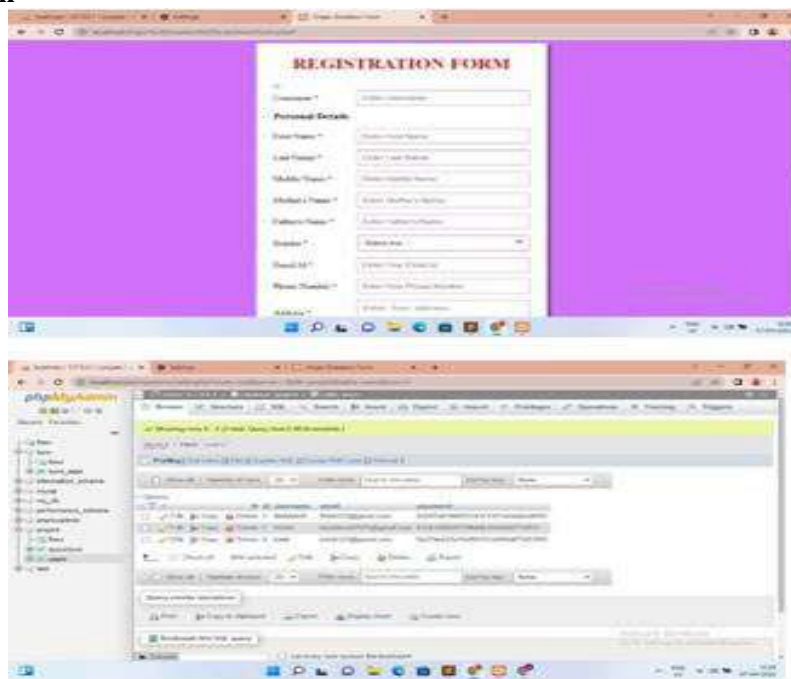


Figure 4: Form and Database Page.

V.CONCLUSION

We trust that the use that is grown on account of these ideas hopeful advantageous and adept in today's realm, and would to serve those in utter need of tools.

Finding the nearest hospital and donor banks through an android app helps in increasing the chance of saving the patient's life especially in rural areas.

There is a phase in every human's life where they think about doing something good and pure. And during this phase they sometimes think of donating their organs. This is the time our application covers the maximum distance to make things clear and easy. It is user-friendly to work with users. They will be educated and a small path will be shown in order to make them a donor. After the application of the donor is completed and verified, they will receive a Donor card.

This will be the motto of our application to inspire and make sure to add new people to fill up for organ donation and help others with related doubts.

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CREDIT CARD SCAM DETECTION USING MACHINE LEARNING**Nancy Pathak¹, Namira Shaikh², Saniya Shaikh³ and Sonali Karthik⁴**^{1,2,3}Student and ⁴Assistant Professor, Department of Engineering, Theem College of Engineering, Boisar, India**ABSTRACT**

Credit cards are the most convenient means of payment in today's society, both online and offline. It contributes to cashless buying all across the world, every people are using ATM cards and credit cards, so fraud is also increasing. Fraud occurs only when making an online payment since the credit card information is sufficient to conduct the transaction, which will be on the credit card. Frauds tend to follow a pattern. It's tough to analyze each credit card transaction separately when there are billions of them. We have used a machine learning-based algorithm, predictive algorithms that can assist in the detection of fraudulent transactions. Due to confidentiality issues, the dataset of credit card transactions is sourced from European cardholders containing 284,807 transactions. We employed random forest algorithms to analyze and predict fraud events, and so determined the number of fraud transactions. The random forest algorithm's accuracy and amount of errors have been calculated. This work is implemented in Python using the Tkinter framework and streamlit done by the implemented machine learning model.

Keywords: Credit Cards, Machine learning, Predictive, Python, Random forest, Streamlit, Tkinter

1. INTRODUCTION

As credit card usage is rising all over the world such as in government offices, finance, and corporate industries, and many other organizations, fraud is also increasing. Mostly the online transaction takes place under bank operations through credit cards or debit cards. There are many different types of credit card fraud that occur when the credit card information of the individual is stolen and used to make unauthorized purchases and or withdrawals from the original holder's account and, account takeover, misplace card, account bankruptcy, device intrusion, application fraud, counterfeit card, telecommunication fraud. all banks and financial institute needs a system to detect scam transaction because the credit card is issued by the financial institute and people used credit card funds for any purpose if unknown people use a credit card then additional charges are added to the cardholder's account. it is important that credit card companies should be able to recognize which transaction is fraudulent and which is legitimate so that customers are not charged for items that they do not purchase.

In credit card fraud detection systems many data mining and machine learning algorithms are used to solve this fraud detection problem. In this project, we are exactly going to use a machine learning algorithm deployed to analyze all the authorized transactions and fraud with high accuracy. Using a Kaggle dataset of nearly 284,800 credit card transactions dataset is labeled then it comes under a supervised learning-based algorithm, supervised algorithms consist of a predetermined set of data that is provided for training the system and the system tries to predict the results based on the previous examples or training data. Also, using metrics such as Accuracy, precision, recall, and F1 scores. In addition, we will explore the use of data visualization techniques common in data science, such as correlation matrices and confusion matrices, to gain a better understanding of the underlying distribution of data in our data set. We implement a model using the Random forest algorithm, which is a supervised classification algorithm. It is used for both regressions as well as classification kinds of problems. For user convenience, we create a Graphical User Interface (GUI) to analyze and check the accuracy of the legitimate and fraudulent transactions of the given dataset and predict the transaction using Web App (Streamlit).

2. LITERATURE SURVEY

In a survey of many papers, all authors have focused on pre-processing and analyzing data sets as well as the deployment of multiple anomaly detection algorithms such as Local Outlier Factor, Isolation Forest algorithm, Random Forest algorithm, Adaboost algorithm, Support Vector Machine, Naive Bayes, K-Nearest Neighbor, and Logistic Regression. To detect frauds, they compared one of two algorithms for better accuracy. On the basis of better outcomes, they worked with that algorithm. In most of the papers participants using a Kaggle dataset that is depending on the numeric value of probability between 0 and 1, a transaction will be classified into one of the following categories: Non-Fraudulent, Doubtful, Suspicious, and Fraudulent on the PCA transformed Credit Card Transaction data.

In [5] they have researched two techniques for credit card fraud detection as random forest algorithm and the Adaboost algorithm. They have concluded that both give the same accuracy, but they consider the precision,

recall, and the F1-score the Random Forest algorithm has the highest value than the Adaboost algorithm. Paper [1] and [6] both have mentioned two algorithms that are local outlier factor and the random forest algorithm. In [3] they have investigated the comparative performance of Naïve Bayes, K-nearest neighbor, and Logistic regression models in the binary classification of imbalanced credit card fraud data, these three techniques are due to the less comparison they have attracted in past literature. In paper [2] they have highlighted real-time credit-card fraud detection by using predictive analytics and an API module the end-user is notified over the GUI the second a fraudulent transaction is taken place, they also focused on location-based fraud detection in a future enhancement. Paper [7] consider the histogram of each parameter, they have implement two algorithms that is Isolation forest and local outlier factor to do anomaly detection. they specially focused on importance of understanding the data and precision. All authors have worked on some king of machine learning algorithm to get the better accuracy of the system.

3. SYSTEM DESIGN

In designing, we implement a Graphical User Interface (GUI) using Integrated Development Environment (IDE) that provides a user-friendly environment understood by a non-technical person such as a bank manager and authorized person in the banking system. A credit card fraud detection system is a project based on supervised learning, supervised learning is the learning in which we teach or train the machine by using some data which is well labeled which means some data is already tagged with the correct answer. In the supervised machine learning technique, we have calculated the different machine learning algorithms such as Logistic Regression, Decision Trees, and Random Forest, to determine which algorithm gives suits best and can be identifying fraud transactions. For credit card fraud detection, we implement different types of diagram which represents the whole project in a better and easier way. It focused on the input and output of the system which provides a high-level overview of major system components, key process participants, and important working relationships. We need to determine the main features and the framework. When we are constructing the framework, we determine the main purpose of our system.

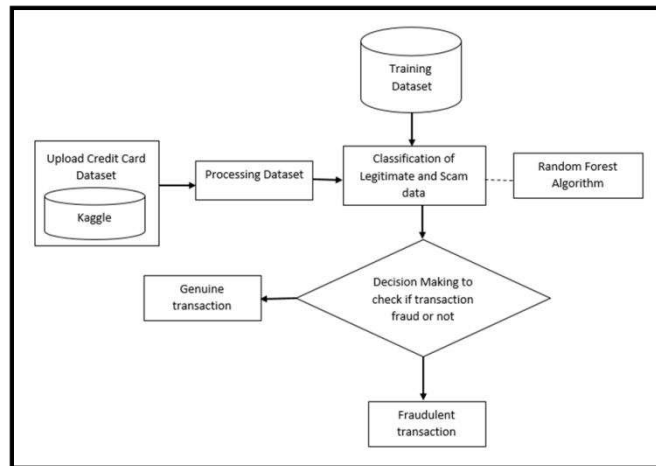


Fig – 1: System Block Diagram

In the collection of data, we need to see from where we can collect the data and what is the various feature in this data set. so, in this system, we had used a data set from Kaggle which contains transactions made by the credit cards by European cardholders. The dataset contains numerical input variables as PCA (Principal Component Analysis) transformation. Due to confidentiality, conversion is done so that the user’s personal details remain hidden and the user’s security is maintained. Columns having heads as V1 to V28 show PCA transformed numeric values but time, amount, and class features show their real values. After the data collection, Data Pre-Processing observe that the data is highly unbalanced. For balancing this dataset, we used the under-sampling technique. under-sampling is a technique to balance uneven data sets by keeping all of the data in the minority class as it is and decreasing the size of the majority class. Here, we will build a sample data set from the original data set which contains a similar amount of normal transactions and fraudulent transactions. Here we have 492 fraudulent transactions and almost more than 2 lakh legitimate transactions, For the balancing dataset, we take 492 fraud transactions as it is and take randomly 492 legitimate transactions from that 2 lakh. so now our data set will become balance data set because we have 50% fraudulent transactions and 50% legitimate transactions. When data is balanced, we split data into training data and testing data. Training is 80% of our data whereas 20% is testing data. We feed this training data to our machine learning model and once we trained our model, we will evaluate our model or find the accuracy of our model by testing it with test data. Once we split the data we will feed our training data to our random forest model. After that, we filled different

evaluating parameters like precision, Accuracy, Recall, and F1-Score. Lastly, we draw a confusion Matrix for our model. A confusion matrix is structured data (table) that is used to describe the overall performance of a classification model (or "classifier") on a set of test data for which the true values are known.

A. Random Forest Algorithm

The random forest is a supervised machine learning algorithm that built different decision trees instead of relying on one decision tree the random forest takes the prediction from each tree and based on the majority votes of predictions and it predicts the final output. It uses more t trees to reduce the risk of overfitting. There are two assumptions in a random forest, there are some actual values in feature variables of the dataset, and prediction from each tree must have a very low correlation. The decision tree is constructed by the source test and is split into subsets based on an attribute value test. For each and every derived subset, this process is repeated. When splitting no longer adds value to the predictions, recursion is completed.

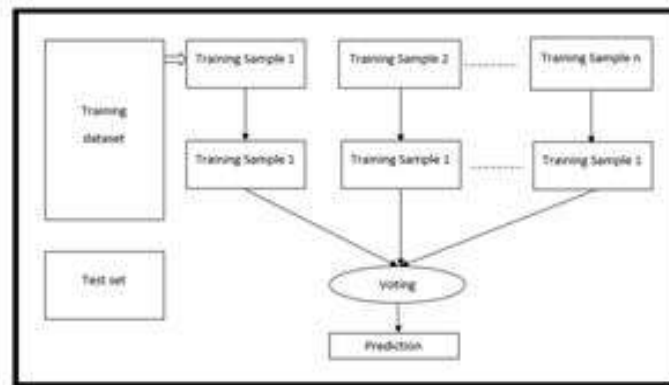


Fig – 2: Random Forest Algorithm

The basic algorithm that will be implemented for working of this proposed system is as follows:

1. Take the random dataset that is trained and randomly select some data points from training set.
2. Using the randomly created sample data now build the Decision Trees that are used to classify the cases into the fraud and legitimate cases.
3. The Decision Trees are formed by splitting the data points, the data points which have the highest Information gain make it as the root node and classify the fraud and non-fraud cases.
4. Now the majority vote is performed and the decision Trees may result in 0 as output which includes that these are the legitimate cases.
5. At last, we find the accuracy, precision, recall, and F1 -score for both the fraud and legitimate cases.

4. SOFTWARE IMPLEMENTATION

First of all, we upload our dataset from the local repository in the CSV format. The dataset contains 31 columns out of which 28 are named V1-V28 to protect sensitive data. The other columns represent Time, Amount, and Class. Time represents the gap between the first transaction and the following one. The amount is the amount of money transacted. Class 0 represents a legitimate transaction and 1 represents a fraudulent one. After uploading the dataset, System give us permission to analyze the data, in the analysis GUI displayed the total number of transactions, counts of frauds and normal transactions, and percentage of fraud transactions.

Time	V1	V2	V3	V4	V5	V6	V7	V8	V9	V11	V19	V20	V25	V26	V27	V28	Amount	Class	
0	-1.35981	-0.02270	2.53654	1.37025	-0.33831	0.462380	0.239199	0.098098	0.361787	-1	0.401991	0.251412	#	0.128339	-0.18911	0.133558	-0.02105	149.42	0
0	1.101857	0.305131	0.18544	0.840124	0.600018	-0.68236	-0.4780	0.055102	-0.23543	1.6	-0.34370	-0.09908	#	0.16717	0.122805	-0.00890	0.014791	2.69	0
1	-1.35425	-1.49116	1.778209	0.37979	-0.5012	1.800999	0.753401	0.247678	-1.51405	0.6	-2.26186	0.52498	0	-0.32794	-0.1191	-0.03539	-0.02975	378.86	0
1	-0.96427	0.18533	1.792093	-0.39429	-0.10101	1.247203	0.237909	0.377436	-1.38702	0	-1.21262	-0.20804	#	0.847378	0.22239	0.062723	0.001490	123.5	0
2	-1.15823	0.877737	1.548718	0.401034	-0.40713	0.105521	0.523041	-0.27053	0.617759	-1	0.051407	0.408542	#	-0.26926	0.502292	0.219422	0.25153	69.99	0
2	-0.42357	0.962523	1.341109	-0.16825	0.420587	0.02573	0.478201	0.263114	-0.54897	1.3	-0.0119	0.094968	#	-0.22279	0.15915	0.253844	0.00138	3.67	0
4	1.229458	0.143084	0.045371	1.202163	0.110381	0.272708	-0.00516	0.081113	0.464936	-1	-0.04558	-0.21653	#	0.750137	-0.25724	0.034037	0.005160	4.59	0
7	-0.64427	1.417954	1.07918	-0.4832	0.548934	0.438118	1.106631	-3.80786	0.615375	-1	0.334505	-0.15678	2	-0.41527	-0.05163	-1.20953	-1.00534	40.8	0
7	-0.89429	0.286137	-0.11119	-0.27153	2.689599	3.721818	0.370145	0.851084	-0.39075	-1	0.576128	0.052786	#	0.173305	-0.38416	0.011747	0.042404	93.2	0
9	-0.31826	1.119599	1.048367	-0.22129	0.489916	-0.24676	0.623383	0.089538	-0.71673	1	0.451773	0.203711	#	-0.06979	0.094196	0.246219	0.083870	3.68	0
10	1.449044	-1.17634	0.91186	-1.37957	-1.97318	-0.62815	-1.42124	0.048458	-1.72041	1.2	-0.22137	-0.38728	#	0.251367	-0.12648	0.04265	0.082631	7.8	0
10	0.304978	0.616109	-0.8743	-0.29402	2.504584	3.317027	0.470451	0.516247	0.53889	0	0.707964	0.125962	0	-0.78791	0.85221	0.042472	-0.05431	9.99	0
10	1.289999	-1.22184	0.38393	-1.2349	-1.48542	-0.75523	-0.6894	-0.22749	2.49471	0.2	-0.68119	-0.10279	#	0.191135	-0.19599	0.029418	0.045422	121.5	0
11	1.089104	0.287722	0.628813	2.71262	-0.1784	0.317544	-0.09872	0.119882	-0.22038	-1	-0.948291	-0.15842	#	0.948395	0.104984	0.021195	0.022295	27.5	0
12	-1.79135	0.32777	1.64175	1.767473	-0.12653	0.007596	-0.42291	-1.90711	0.755713	0.8	2.221868	-1.58212	1	-0.23275	-0.23556	-0.18478	-0.01015	58.8	0
12	-0.75242	0.345485	2.057023	1.48084	-1.15839	-0.07785	-0.68588	0.009801	-0.41617	-1	0.412535	0.263451	0	-0.07942	-0.06709	-0.181	0.129394	15.99	0
11	1.101215	-0.0403	1.267913	1.389091	-0.716	0.280369	-0.58600	0.18938	0.382933	0	-0.57368	-0.11191	#	0.364290	-0.38226	0.093809	0.037051	12.99	0
11	-0.43491	0.91996	0.52491	-0.77722	0.915679	-0.12767	0.707642	0.087642	-0.66527	0.1	0.025436	-0.04700	#	-0.34241	-0.04903	0.079652	0.130304	0.89	0

Fig – 3: Kaggle Dataset

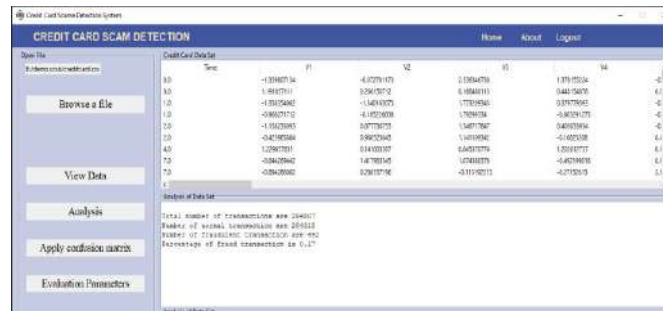


Fig – 4: Data Analysis

After analyzing data using GUI, we plot a heatmap to get a representation of the data and to study the correlation between our predicting variables and the class variable. This heat map is shown below:

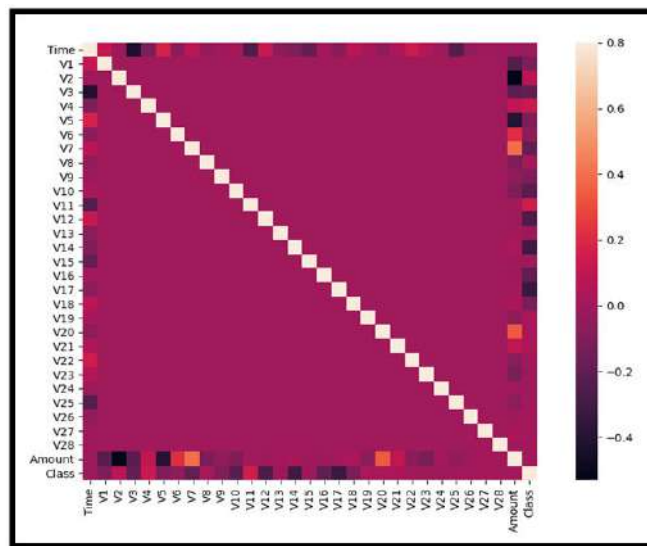


Fig – 5: Showing correlation matrix with a heat map

This heat map shows that the majority of the features do not correlate with one another. The dataset is now formatted and processed. The time and amount column are consistent and the Class column is eliminated to ensure fairness of evaluation. The following module diagram explains how these algorithms work together, this data is fit into a model and the following algorithms are a part of sklearn. The ensemble module in the sklearn package includes ensemble-based methods and functions for classification, regression, and outlier detection. There is some python library using NumPy, SciPy, and matplotlib modules that provides a lot of simple and efficient tools which can be used for data analysis and machine learning, and it is free and open source. we have used Python (Tkinter framework) to make a GUI. Jupyter Notebook platform to make a program in Python to predict the approach that this paper suggests. This program can also be executed on the cloud using the Google Collab platform which supports all python notebook files. To predict the individual transaction, we have used a Streamlit library to show the normal transaction and fraud transactions.

6. RESULTS

The confusion matrix derives basic performance measures; it contains four outcomes for a 2 by 2 matrix table. To evaluate the result of the classification algorithm there are various parameters

Such as Accuracy, recall, precision, and F1 score. There are some following 4 important terminologies that will help us in determining the metrics we are looking for:

- In True Positives (TP), the actual value is Positive and the predicted is also Positive.
- In True negatives (TN), the actual value is Negative and the prediction is also Negative.
- In False positives (FP), the actual is negative the prediction is Positive.
- In False negatives (FN), the actual is Positive but the prediction is Negative.

A. Accuracy: In accuracy, the number of correct predictions is divided by the total number of input samples.

$$Accuracy = \frac{TP+TN}{TP+FP+FN+TN}$$

B. **Confusion Matrix:** In the confusion matrix, the classification model performs on a set of test data for which true values are known in a table format.

		Actual Values	
		Positive(1)	Negative(0)
Predictive Values	Positive(1)	TP	FP
	Negative(0)	FN	TN

Fig – 6: Confusion matrix table.

C. **Precision:** In Precision, the number of correct positive outcomes is divided by the classifier’s projected number of positive findings.

$$\text{Precision} = \frac{TP}{TP + FP}$$

D. **Recall:** In recall, calculated by dividing the number of correct positive results by the total number of relevant samples.

$$\text{Recall} = \frac{TP}{TP + FN}$$

E. **F1-score:** In F1-score, unify precision and recall into one measure, we take their harmonic mean.

$$\text{F1score} = \frac{2 * (\text{Recall} * \text{Precision})}{(\text{Recall} + \text{Precision})}$$

Our system obtained a confusion matrix for the random forest classifiers are as follows:

```
The model used is Random Forest classifier
The accuracy is 0.9995611109160493
The precision is 0.9866666666666667
The recall is 0.7551020408163265
The F1-Score is 0.8554913294797689
```

Fig – 7: Output of the confusion matrix

From the confusion matrix, the model was correctly able to classify 56861 records as valid and 78 records as fraudulent. However, it incorrectly identified a valid transaction as a fraudulent transaction 3 times and incorrectly identified a fraudulent transaction as a valid transaction 20 times.

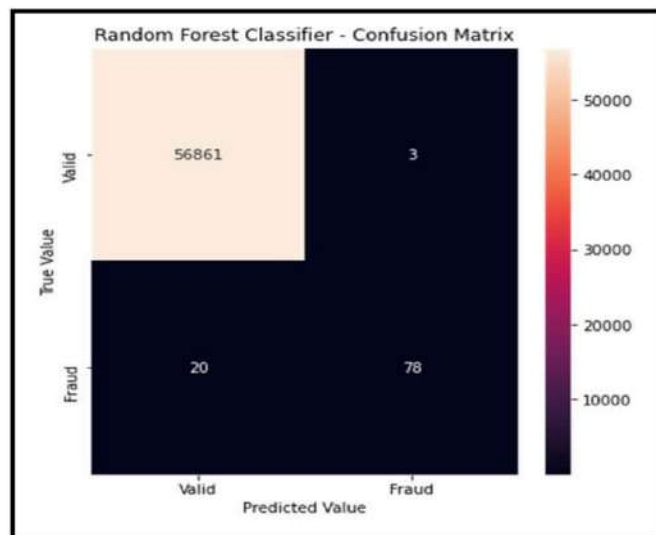


Fig – 8: Confusion matrix for random forest algorithm

After creating the confusion matrix, we got the accuracy as well as the error rate that is 0.3% only. To predict the individual transaction, we have used a Streamlit library to show the normal transaction and fraud transactions.

7. CONCLUSIONS

From our analysis, we can conclude that the accuracy of the Random Forest algorithm is best compared to another algorithm. When we consider the precision, recall, and the F1-score the Random Forest algorithm has the highest value than the Adaboost algorithm. Credit Card Fraud Detection systems have become essential for banks and financial institutions, to minimize their losses. By comparing other methods, we found that a random forest classifier with boosting technique will be the best technique for classification. If these algorithms are applied to bank credit card fraud detection systems, the probability of fraud transactions can be predicted soon after credit card transactions.

8. FUTURE SCOPE

This model can further be improved with the addition of features like real-time detection of frauds. The model should be able to detect fraud before doing any transaction. While we could not reach our goal of 100% accuracy in this system. We did end up creating a system that can, with any such projects, there is some improvement here. We will also include the alarming system when an unauthorized person accesses a credit card. This model can be improved with the addition of more algorithms into it.

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AI BASED VIRTUAL KEYBOARD**¹Mr. Faraz Ahmed, ²Mrs. Komal Jadhav, ³Mr. Akshay Jadhav and ⁴Ruchi Rahi**^{1,2,3}BE Students and ⁴Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India**ABSTRACT**

A keyboard requires a great deal of resources and is restricted by its physical features. Additionally, discarded keyboards also inevitably contribute to environmental pollution. Consequently, the touch screen is designed to replace the physical keyboard and thus reduce these flaws. However, the internal digital keyboard on the touch screen takes up a substantial amount of space, which causes some content to be covered. Moreover, the touch screen can be dirtied by fingerprints and become worn over time by human fingernails through frequent use. Hence, it is necessary to develop a new type of environment-friendly virtual keyboard with fewer flaws. The user's fingertip has remained on a key for a long time; the program will regard this key as an input. Typing without touching the keyboard is fulfilled to ignore obstructions covering the paper keyboard.

Keywords: Hand Motion; Vision; Webcam; Finger recognition; gesture based;

I. INTRODUCTION

In this day and age, the PCs have become a significant part of life and are utilized in different fields notwithstanding, the frameworks and strategies that used to collaborate with PCs are obsolete and have different issues, which will talk about somewhat later right now. Consequently, an extremely new field attempting to defeat these issues has developed to be specific Human Computer Interactions (HCI). Despite the fact that, PCs have made various progression in the two fields of Software Hardware, Still the essential manner by which Humans collaborate with PCs continues as before, utilizing fundamental pointing gadget (mouse) and Keyboard or propelled Voice Recognition System, or possibly Natural Language handling in truly propelled cases to make this correspondence progressively human and simple for us.

Our proposed venture is the Hand motions acknowledgment framework to supplant the essential pointing gadgets utilized in PC to portray hand motions. Last, the affirmation of hand movements is rehearsed by evaluating the closeness of the component data. The input devices giving the main picture information fuses standard camera, sound framework camera, and ToF (time of flight) camera. The sound framework camera and ToF camera likewise give the significance information so it is definitely not hard to parcel the hand region from the establishment to the extent the significance map.

A virtual keyboard is software that is used to emulate a standard keyboard. To control machines, we generally need a controller equipped with a number of keys. As we all know, a keyboard takes up a large amount of space. In order to improve portability, an alternative to the physical keyboard must be found. A touch screen virtual keyboard is the most popular solution for portable devices such as iPads and smart phones. A picture of a keyboard is displayed on a computer screen and the user points and clicks on the pictures of keys to enter text. But our project is based on AI we will use a camera which will detect your hand and by clicking on the keyboard on the screen you can easily type what you want. This will help to reduce the space required for keyboard and it will be easy to use

Virtual keyboards are commonly used as an on-screen input method in devices with no physical keyboard, where there is no room for one, such as a pocket computer, personal digital assistant (PDA), tablet computer or touch screen-equipped mobile phone. Text is commonly inputted either by tapping a virtual keyboard or finger-tracing. Virtual keyboards are also used as features of emulation software for systems that have fewer buttons than a computer keyboard would have.

AI is much more about the process and the capability for super powered thinking and data analysis than it is about any particular format or function. Although

AI brings up images of high-functioning. AI has become a catchall term for applications that perform complex tasks that once required human input such as communicating with customer's online or playing chess. The term is often used interchangeably with its subfields, which include machine learning and deep learning. There are differences, however. For example, machine learning is focused on building systems that learn or improve their performance based on the data they consume. It's important to note that although all machine learning is AI, not all AI is machine learning.

II. RELATED WORK

Most recent advancements in augmented reality (VR) innovation give amazing number of uses about wellbeing, amusement, restoration, instruction, and furthermore account. The main idea behind these

Applications is to boost the Sagayam et al [10] propose some movement acknowledgment systems were concentrated on accessible movements with emphasis. Additionally, Hidden Markov model and variable classifier procedures over hand motion were given. Over the world, for conveying, gesture based communication is generally utilized by the hard of hearing network. For the hard of hearing individuals who experience the ill effects of hearing misfortune, it is extremely hard to speak with hearing individuals. In this manner, gesture based communication acknowledgment (SLR) was introduced to improve the correspondence.

Hassan et al. [11] explains Arabic SLR (ArSLR) was taken a shot at with Modified k-Nearest Neighbor and Hidden Markov Models (HMMs) methodology. In like manner, with Polhemus G4 development tracker and a camera, two new ArSLR datasets that have 40 Arabic sentences were gathered. Sign sentences assembled by development tracker were differentiated and sentences accumulated by sensor gloves on portrayal precision. As per the correlation, their grouping precision were fundamentally the same as. In Hasanuzzaman et al. [12], day by day exercises and medicine admission of elderly individuals was observed with radio recurrence ID (RFID) sensors and a camcorder at home. RFID perusers observed jugs. A camcorder checked the move of making medication with utilizing face discovery, foundation subtraction, action location and mouth identification. Another logical classifier was introduced to delineate vector to a character together with incline varieties identification in air- composing through a fingertip or deliver Mohammadi et al. [13]. Close by motion acknowledgment, neural systems are generally utilized for hand joints-based motion acknowledgment

In Mary gladence et al [16], A new model called (L, M, S, K) based on the Flexible and Accurate Motif Detector (FLAME) was introduced. FLAME is a versatile suffix- tree-based algorithm which can be used with a variety of meanings to find frequent patterns.

V. PROPOSED METHODOLOGY

Picture handling is a technique for conducting such procedures on a picture in order to get an improved picture or to retrieve any useful data from it. It is a kind of sign handling where information is a picture and yield may be image or attributes / highlights relevant to that picture.

Right now, against robbery gadget which would be sufficiently proficient to recognize burglary utilizing movement detecting camera utilizing AI and caution the proprietor with ready message alongside the caught picture of that occasion of movement. The Haar Cascade calculation is utilized to prepare information. The gadget will be a continuous framework alongside simple to utilize interface, which will be demonstrated helpful as far as security of individuals just as their important things/objects. Haar Cascade is an AI object discovery calculation used to distinguish protests in a picture or video.

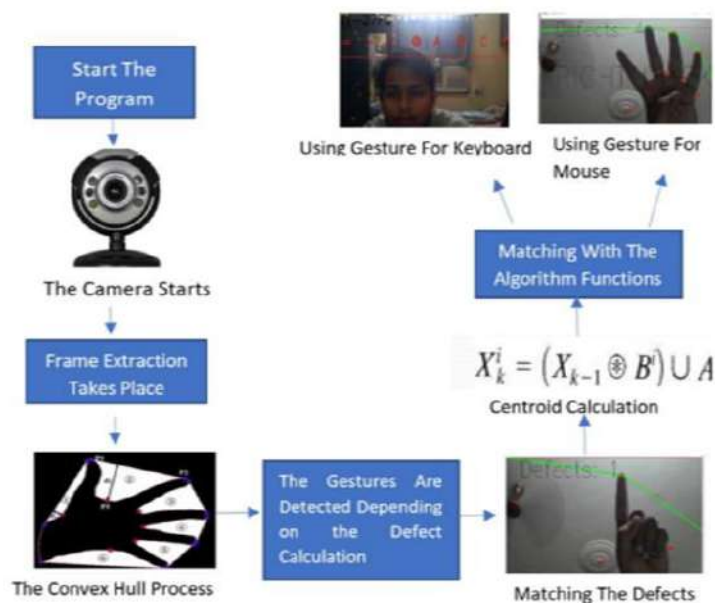


Fig. 1: Proposed architecture

In Ma et al. [14], to build up the precision close by signal acknowledgment from loud datasets, a settled interim unscented Kalman channel (UKF) together with long momentary memory (NIUKFLSTM) organize was introduced. Along these lines, the commotion in the consecutive hand skeletal information was rethought and the acknowledgment exactness was created. In the computer generated reality region, interoperability of virtual articles in augmented reality can be furnished by a Leap Motion with Interfacing over an augmented simulation head-mounted Presentation (VR HMD). Since Leap Motion can distinguish hand motions or precise finger positions. In any case, for an augmented experience application, it is uncomfortable to decide the specific situation of the real client's hands. Hence, mistakes develop during the cooperation of genuine client's hands and the virtual hands. In Park et al. [15], a strategy was introduced for organizing and planning the yield territory in VR HMD and detecting region in Leap Motion.

In Sivasangari et al. [15], The proposed architecture consists of a large convolutionary neural system (DCNN), where photographs and sketches are used to link exchange learning to enable the system to be comfortable with the connection between the two modalities.

METHODOLOGY

Problem Description The aim of this paper is to implement a computer application which uses alternative methods to control keyboard and mouse cursors for rehabilitation of people who are suffered from stroke so that they can recover the side effects. Therefore, we propose a new keyboard and mouse cursor control system based on vision and color recognition technique, utilizing hand gestures recorded from a webcam.

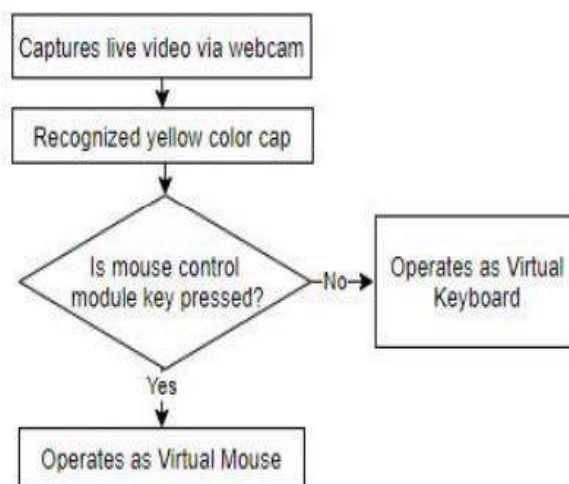


Fig. 1. Overview of proposed interactive computer system

Figure 1: shows the overview of the process of interactive keyboard and mouse controlling system. This work aims at creating a system that recognizes the colors

Working of Keyboard

We used the following procedure to type on virtual keyboard using our fingertip:

Step 1: Capturing real time video using computer's webcam

Step 2: Processing individual image frame from the captured video

Step 3: Converting image frames into HSV format

Step 4: Creating a filter which can create the mask for yellow color

Step 5: Draw contours from the mask. We will loop through all the contours and put a rectangle over it for object tracking

Step 6: Find position of yellow color object over the virtual keyboard

Step 7: Print the character which is pointed by yellow colored cap

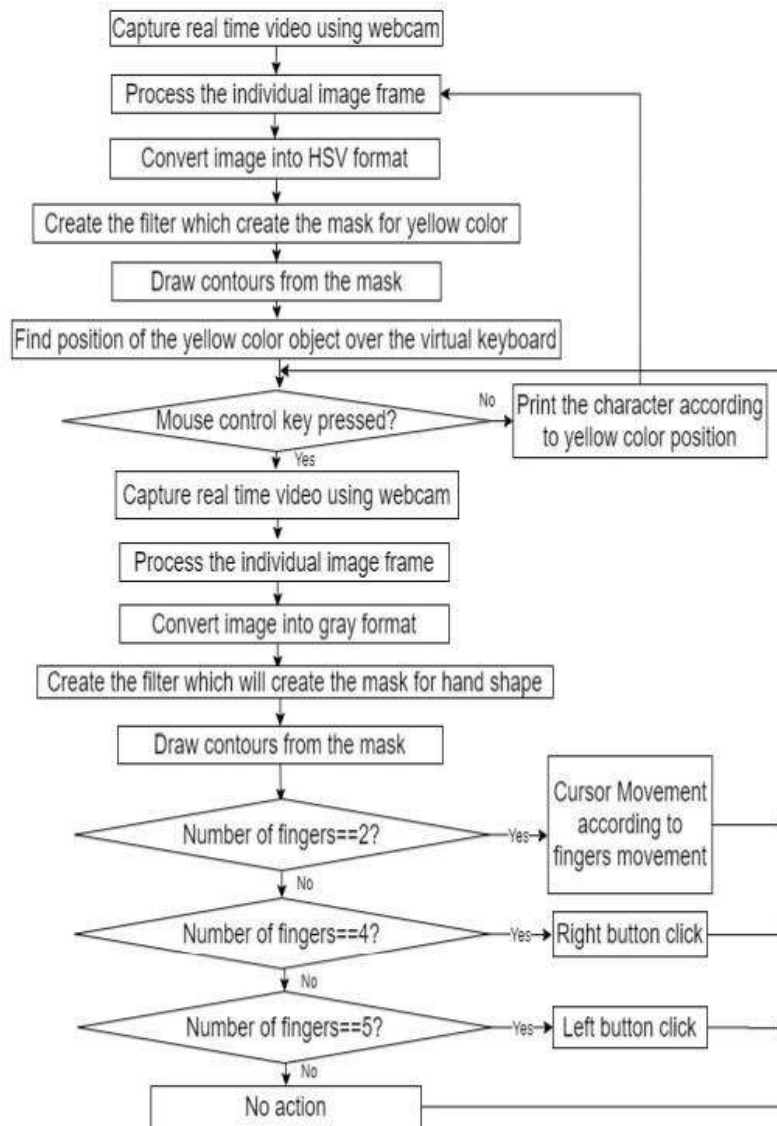


Fig. 2. Procedure of gesture-based mouse and keyboard

LIVE IMPLEMENTATION

USES AND ADVANTAGES



Figure 3: displays a live demonstration of typing using fingertip

The mask creates some specific region of the image according to certain rules.

Instead we draw contours from the mask. For object tracking, we loop through all the contours. Convex hull of a set X of points in any space is defined as the smallest convex set that contains X. Any deviation of the object from this convex hull can be considered as convexity defect. The convex hull of a finite point set S can be defined as the set of all convex combinations of its points. To find the contours in the image, we have used cvFindContours () function of OpenCV which uses an order finding method to detect edges. We are interested in extracting the hand contour in the contour extraction process so that shape analysis can be done to determine hand gestures. The hand contour convexity defects were measured using OpenCV’s cvConvexityDefects() function. Convex hull of an object can be defined using the convex combination of all its points.

Convexity defects are identified when there is any deviation of the object from its convex hull [9]. After the convexity defects are acquired, two major tasks are considered to determine mouse control functions:

- Identifying fingertip and
- Counting number of fingers from the number of convexity defects
- If it detects two fingers, it will move the mouse cursor in the four directions (left, right, up and down) according to the movement of the fingers

USES AND ADVANTAGE

- It can be used on any platform Like Word, Excel, Different internet search engines.
- Can be Accessed On any device.
- Using the Software Is Easy we have Converted the python program into an executable file.
- Which makes it more convenient and easy to use

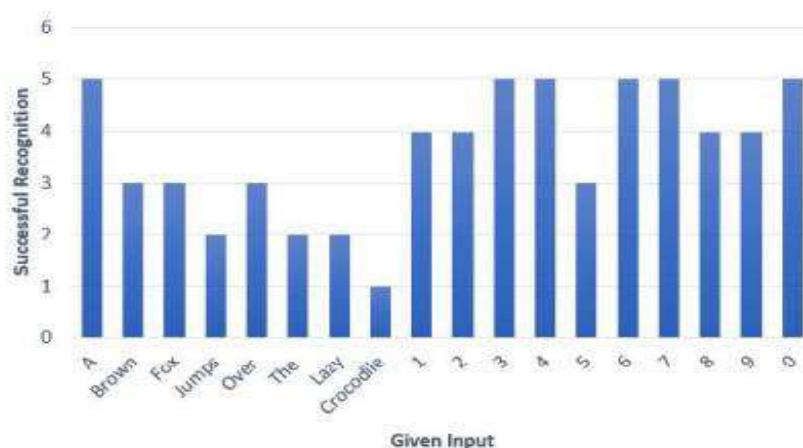
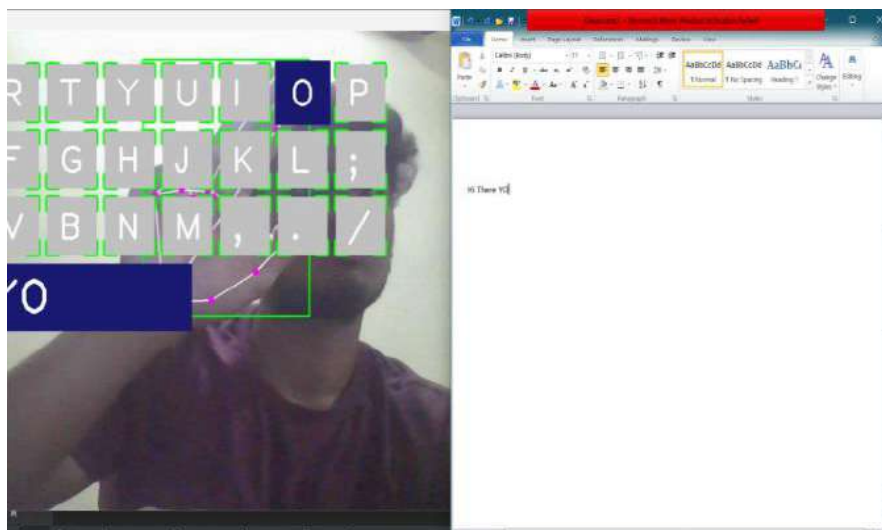


Fig. 8. Experimental result of virtual keyboard

The above figures shows that the how the gestures has been used for control the video player. By using Background subtraction method implementing the several filters to get the features of the original image. By showing single finger to the webcam of the computer the action of the video player will be backward. BY showing Two fingers the action is volume decreased by showing three fingers the video will play forward and by showing five fingers the volume will be increased.

PROJECT SCOPE

In some Ways it needs further more enhancements in this project. The Distance from webcam and us should be appropriate that needs to be fixed. It should be much more stable. It require some additional feature such as remembering the last word used and recognize proper spelling which can be improved by using Natural language processing.

PROBLEM STATEMENT

In today's world technology is more advanced. All the things are done digitally with help of devices like mobile phones, laptops, computers etc. But today also to access the device like laptops, computers we used standard keyboards that required space and also the cost of maintains is high. These keyboards can be easily getting damaged. To use the technology and find solution to replace the standard keyboard we try virtual keyboard that is quite better solution to solve these problem. with the help of virtual keyboard we can achieve goals that we want in today's world with help of our technology.

CONCLUSION

The vision based cursor control utilizing hand motion framework was created in the C++ language, utilizing the OpenCV library. The framework had the option to control the development of a Cursor by following the client's hand. Cursor capacities were performed by utilizing distinctive hand motions. The framework has the capability of being a practical trade for the PC mouse, anyway because of the imperatives experienced; it can't totally supplant the PC mouse. The significant requirement of the framework is that it must be worked in a sufficiently bright room. This is the principle motivation behind why the framework can't totally supplant the PC mouse, since it is normal for PCs to be utilized in open air situations with poor lighting condition. The precision of the hand motion acknowledgment could have been improved, if the Template Matching hand motion acknowledgment technique was utilized with an AI classified. Here, what did is, simply open our content document it will consequently dispatch a video player. Here picked VLC Media Player. At that point content stops execution for predefined time to stack the media player. After video document is being played then framework summons the instruments that required to run it for example OpenCV, Camera, pyautogui.

Presently, prepared to do simply kick back and control without utilizing any conventinal technique.

ACKNOWLEDGMENT

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CANCER PREDICTION USING NAIVEBAYES

Samruddhi Nayak¹, Drashti Desai² and Sonali Karthik³^{1,2}Student and ³Assistant Professor, Department of Engineering, Theem College of Engineering, Boisar, India**ABSTRACT**

Cancer is the greatest cause of death worldwide. By the time of the pandemic, an estimated 1,735,350 additional cancer cases had been diagnosed in just one country. In just one year, 609,640 people died as a result of the sickness. Cancer comes in a variety of forms, including: Cancers include skin melanoma, lung bronchus cancer, breast cancer, prostate cancer, colon cancer, and rectum cancer. Bladder, kidney, and renal pelvis cancers, to name a few. With the prevalence of so many different types of cancer on the rise, it's critical to be well-informed and knowledgeable about it. Cancer affects a significant number of people and has a large number of victims. It has progressed in the field of research.

Keywords: Bayes Theorem, Cancer, Data Mining, Naïve Bayes, Predictive.

1. INTRODUCTION

Cancer has been characterized as a heterogeneous disease consisting of many different subtypes. The early diagnosis and prognosis of a cancer type have become a necessity in cancer research, as it can facilitate the subsequent clinical management of patients. The importance of classifying cancer patients into high or low risk groups has led many research teams, from the biomedical and the bioinformatics field, to study the application of machine learning (ML) methods. Therefore, these techniques have been utilized as an aim to model the progression and treatment of cancerous conditions. In addition, the ability of ML tools to detect key features from complex datasets reveals their importance. A variety of these techniques, including Artificial Neural Networks (ANNs), Bayesian Networks (BNs), Support Vector Machines (SVMs) and Decision Trees (DTs) have been widely applied in cancer research for the

development of predictive models, resulting in effective and accurate decision making. Even though it is evident that the use of ML methods can improve our understanding of cancer progression, an appropriate level of validation is needed in order for these methods to be considered in the everyday clinical practice. In this work, we present a review of recent ML approaches employed in the modelling of cancer progression. The predictive models discussed here are based on various supervised ML techniques as well as on different input features and data samples. Given the growing trend on the application of ML methods in cancer research, we present here the most recent publications that employ these techniques as an aim to model cancer risk or patient outcomes.

2. LITERATURE SURVEY

[1] Rajshree Dash; "A hybridized K-means clustering approach for high dimensional dataset"; International Journal of Engineering, science, and technology; 2010; Volume 2 As a first phase for K-means clustering, the Principal Component Study (PCA) method will facilitate the analysis and presentation of multi-dimensional data sets. We've also developed a novel way for locating the initial centroids in order to improve the algorithm's effectiveness and efficiency.

[2] AdaandRajneet Kaur; "Using some data mining techniques to predict the survival year of lung cancer patient"; International Journal of computer science and mobile computing; 2013; Volume Due to the nature of cancer cells, where the majority of the cells are overlapped with each other, early diagnosis of lung cancer is a difficult challenge. This study explains how to use a feature extraction procedure and a neural network classifier to determine whether a patient's condition is normal or abnormal at an early stage. Following that, we use the retrieved features to forecast a patient's survival rate.

[3] Zakaria Sulimanzubi; "Improves treatment programs of lung cancer using data mining techniques"; Journal of software engineering and applications; 2014 Although lung cancer is a fatal disease, there is a good chance that the patient will be cured if the disease is detected early enough. At first glance, lung X-ray chest films appear to be the most reliable method for early detection of lung cancers. However, due to serious errors in some diagnosing cases that result in poor outcomes and death, computer aided diagnosis systems are required to assist medical personnel in achieving high capability and effectiveness.

[4] Charles Edeki; "Comparitive study of data mining and statistical learning techniques for prediction of cancer survivability"; Mediterranean journal of Social sciences; 2012; Volume 3 These methods are employed in the domains of computational biology and bioinformatics. Computational biology and bioinformatics combine components of biology, computer science, mathematics, and other disciplines to tackle biological problems (Adams, Matheson & Pruim, 2008).

[5] A Sahar; “Predicting the severity of breast masses with data mining methods”; Data mining is the process of sifting through vast data sets to discover patterns and develop links in order to solve problems through data analysis. Cancer is one of the most common causes of death worldwide. The early detection and prevention of cancer is critical in reducing cancer-related fatalities. The identification of genetic and environmental variables is critical in the development of new cancer detection and prevention approaches.

3. SYSTEM DESIGN

Here we proposed a system to make it visibly hand able and easy to use for even a first time user to predict the result in the manner that will not make it difficult to understand for both our entities the amin and the user. This system is proposed to create awareness as well as the motive to make it accessible to the patient with cheap alternative system which provides a high-level overview of major system components, key process participants, and important working relationships. We need to determine the main features and the framework. When we are constructing the framework, we determine the main purpose of our system.

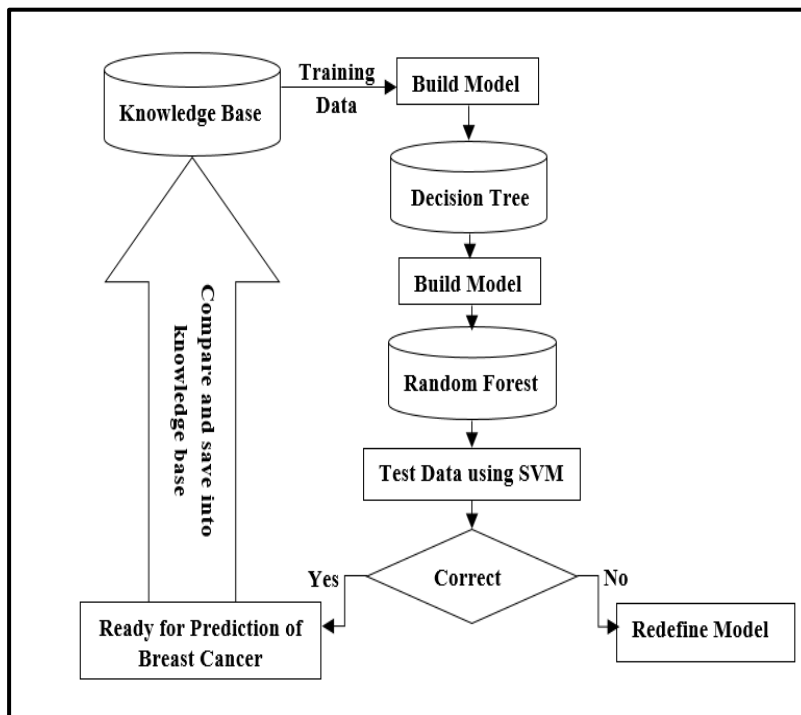


Fig – 1: System Block Diagram

Cancer is named the most unpredicted and dangerous disease existing till date. It’s detection and prediction in early stage can help a lot for avoiding death rates. Symptoms can help to clear a view of such disease that may lead to death. Therefore, a technique of naive bayes is used to get a predicted result for cancer. With the help of symptoms like blood clots, breast size, Headache, Vomiting, Stomach pain Memory loss, Through rashes, Body aches (the symptoms are analyzed by the registered doctor). Further the cancer cluster of symptoms are bifurcated into various frames of cancer by the technique of data mining. The data fed in the form will be analyzed later by an expert doctor or specialized we trained our model, we will evaluate our model or find the accuracy of our model by testing it with test data. Once we split the data we will feed our training data to our random forest model

A. Navie Bayes Algorithm

The Naive Bayes classification algorithm is a probabilistic classifier. It is based on probability models that incorporate strong independence assumptions. The independence assumptions often do not have an impact on reality. Therefore, they are considered as naive. You can derive probability models by using Bayes' theorem (credited to Thomas Bayes). Depending on the nature of the probability model, you can train the Naive Bayes algorithm in a supervised learning setting. Data mining in Info the Naive Bayes classification algorithm is a probabilistic classifier. It is based on probability models that incorporate strong independence assumptions. The independence assumptions often do not have an impact on reality. Therefore, they are considered as naive. You can derive probability models by using Bayes' theorem (credited to Thomas Bayes). Depending on the nature of the probability model, you can train the Naive Bayes algorithm in a supervised learning setting.

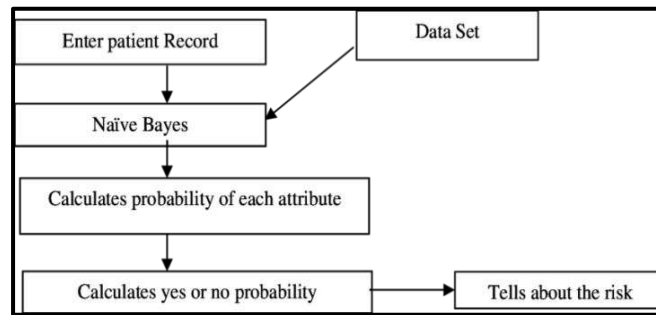


Fig-2: Navie Bayes Algorithm

The basic algorithm that will be implemented forworking of this proposed system is as follows:

1. User has to enter necessary data into the applications fields like symptoms and personal information.
2. Then combine user input and Data set to get the accurate results.
3. Then Navie bayes Algorithm will be applied on to the user data and dataset.
4. Then with the help of the algorithm it will calculate the probability of having cancer to the user.
5. Then finally the result will show to the user.

4. SOFTWARE IMPLEMENTATION

SMSS: Microsoft SQL Server is a relational database management system developed by Microsoft. As a database server, we have used it as a software product with the primary function of storing and retrieving data as requested by other. Here we have used it our priority to make datafetching easy.

Visual Studio2019: Microsoft Visual Studio is an integrated development environment (IDE)from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps. Visual Studio supports 36 different programming languages and allowsthe code editor and debugger to support nearly any programming language.

First of all, we upload our dataset from the local repository in the CSV format.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
1	Name of Cancer	Age	Gender	Breast Size	Irritation	BloodClot	Urnation	Chest Pain	Cough/Blood	Mouth Pain	Red-White Patch	Chewing	Headache	Vomit	Memory Problem	Skin Patch	Patch Size	Heart Burn	Stomach Bloating	Shoulder Pain	Weight Loss
2	Bladder Cancer	45	1	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Skin Cancer	60	1	0	0	0	6	0	0	0	0	0	0	0	0	15	2	0	0	0	0
4	Bladder Cancer	48	1	0	0	1	12	0	0	0	0	0	0	0	0	0	9	0	0	0	0
5	Bladder Cancer	50	1	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Bladder Cancer	58	1	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Bladder Cancer	55	1	0	0	1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Skin Cancer	35	1	0	0	0	5	0	0	0	0	0	0	0	0	15	2	0	0	0	0
9	Skin Cancer	35	1	0	0	0	5	0	0	0	0	0	0	0	0	12	3	0	0	0	0
10	Skin Cancer	40	1	0	0	0	5	0	0	0	0	0	0	0	0	20	1	0	0	0	0
11	Skin Cancer	45	1	0	0	0	5	0	0	0	0	0	0	0	0	10	2	0	0	0	0
12	Bladder Cancer	35	1	0	0	1	10	0	1	0	2	1	0	2	1	54	0	1	1	3	0
13	Skin Cancer	48	1	0	0	0	5	0	0	0	0	0	0	0	0	12	3	0	0	0	0
14	Oral and Oropharyngeal Cancer	40	1	0	0	0	5	0	0	1	10	1	0	0	0	0	0	0	0	0	0
15	Oral and Oropharyngeal Cancer	45	1	0	0	0	5	0	0	1	15	1	0	0	0	0	0	0	0	0	0
16	Oral and Oropharyngeal Cancer	43	1	0	0	0	5	0	0	1	15	1	0	0	0	0	0	0	0	0	0
17	Oral and Oropharyngeal Cancer	45	1	0	0	0	5	0	0	1	10	1	0	0	0	0	0	0	0	0	0
18	Oral and Oropharyngeal Cancer	50	1	0	0	0	5	0	0	1	15	1	0	0	0	0	0	0	0	0	0
19	Brain Tumor	60	1	0	0	0	5	0	0	0	0	0	2	3	1	0	9	0	0	0	0
20	Brain Tumor	50	2	0	0	0	5	0	0	0	0	0	3	4	1	0	0	0	0	0	0
21	Brain Tumor	55	1	0	0	0	5	0	0	0	0	0	2	3	1	0	0	0	0	0	0
22	Oral and Oropharyngeal Cancer	60	1	0	0	0	5	0	0	1	6	1	0	0	0	0	0	0	0	0	0
23	Oral and Oropharyngeal Cancer	50	2	0	0	0	5	0	0	1	5	1	0	0	0	0	0	0	0	0	0
24	Bladder Cancer	50	1	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	Bladder Cancer	45	2	0	0	1	12	0	0	0	0	0	0	0	0	0	9	0	0	0	0
26	Lung Cancer	35	1	0	0	0	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0
27	Lung Cancer	50	2	0	0	0	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0
28	Lung Cancer	40	1	0	0	0	5	2	1	0	0	1	0	0	0	0	0	0	0	0	0
29	Bladder Cancer	35	1	0	0	1	10	0	1	0	2	1	0	2	1	54	0	1	1	3	0
30	Liver Cancer	40	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2

5. RESULTS



Fig- 3: Login Page

Login page: There are two logins on our website one is admin and another is user. This grants access to the doctor as well as the patient to add their details and make a clear perspective towards this login.

The most convenient way to use it is for the doctor to check the patients detail report for prediction.

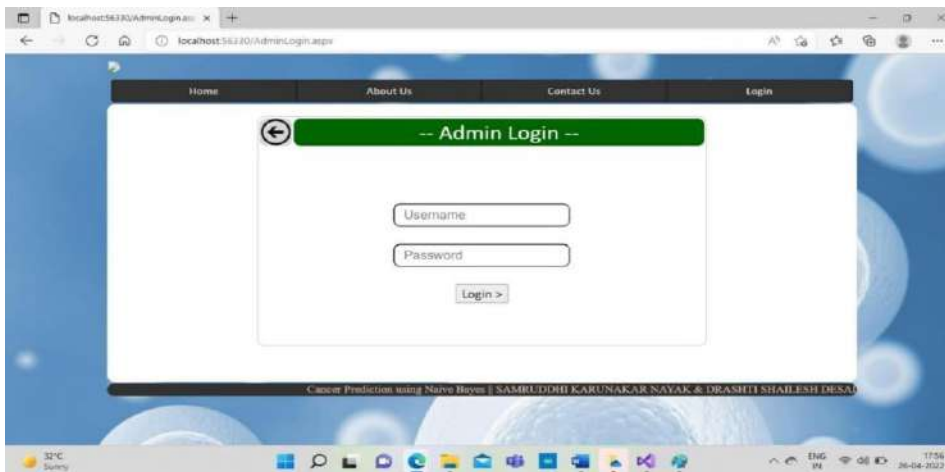


Fig-4 Admin login.

Admin Login: Here it is the outlook and login for the doctor that will further give access to admin to make a prediction looking at the entered data from the user.

Following is the examples of what is inside admin login page.

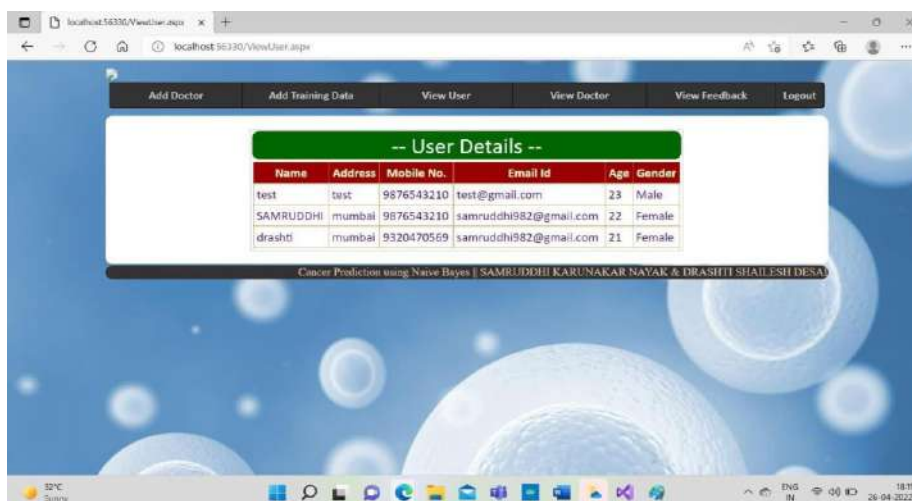


Fig 5: Users details

In user detail user can fill the data like name, address, contact number etc. and then user can login for the further process.

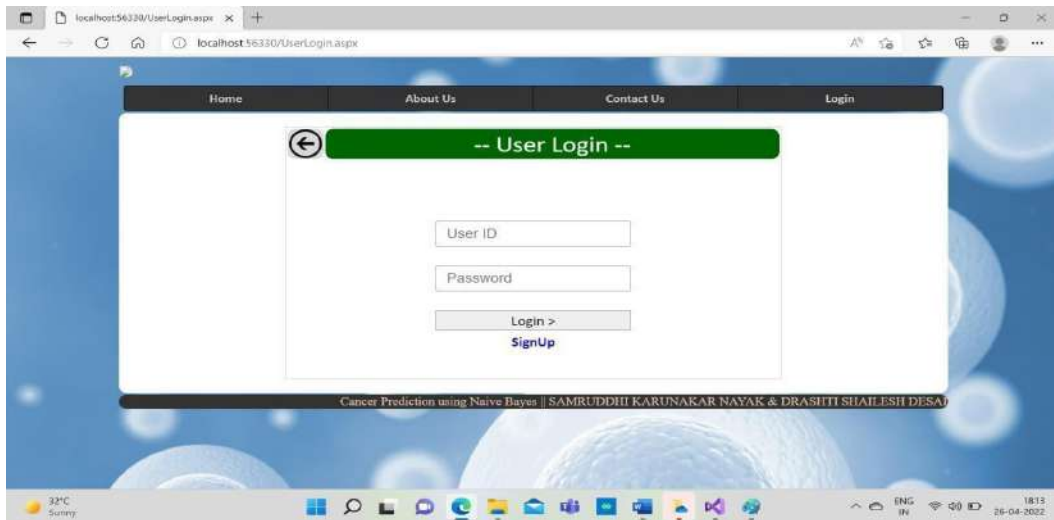


Fig 6: User login.

Here we have the details to be filled by the user to track the details of his /her inputted data that will be verified by the doctor/ amins present in our webpage for the prediction of the cancerous disease.

There are details to be filled for the data that will be in common with the symptoms the user will be facing.

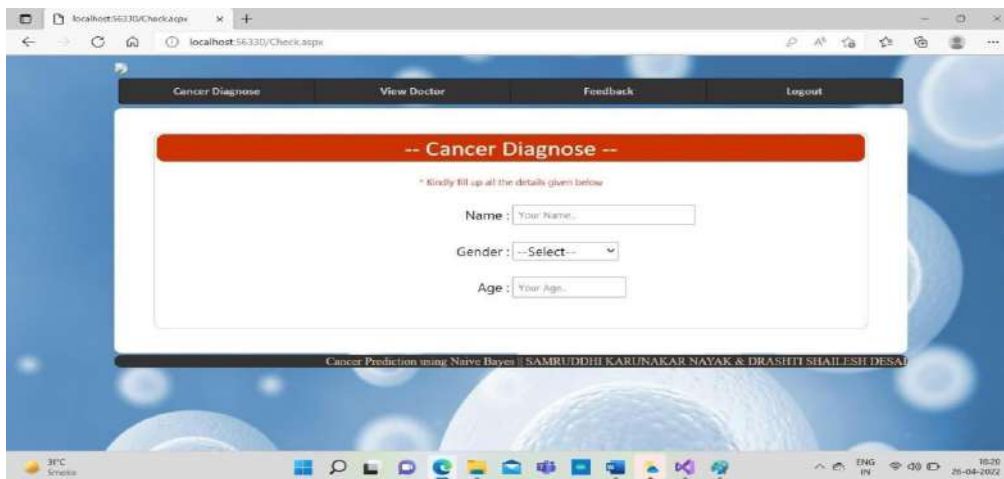


Fig 7: diagnosis form

In diagnosis form user can feel their data like name, age, gender. after submitting these detail symptoms detail page is open where user can feel their diagnosis details.

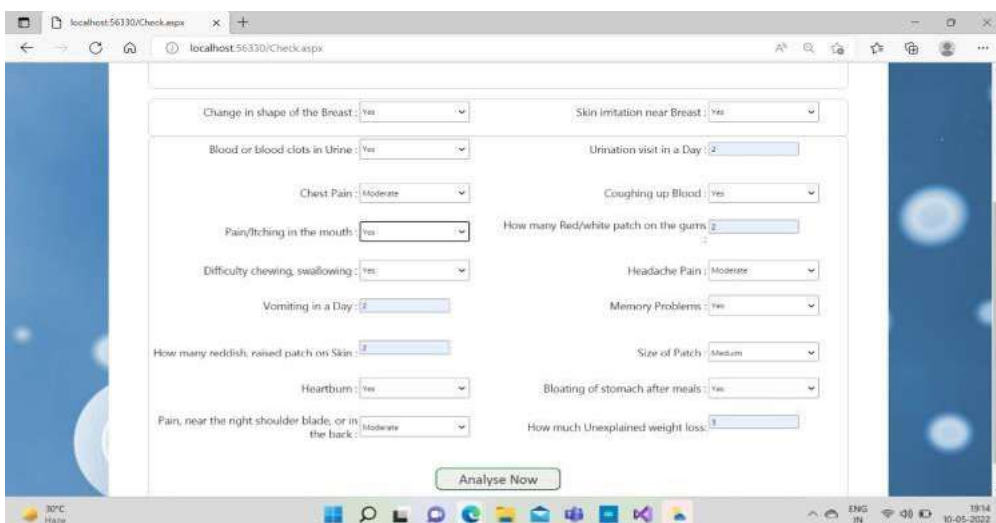


Fig 8: Symptoms Details

In Symptoms Details user put their diagnose Symptoms details like Chest pain, itching in mouth, Stomach pain, headache, etc. after submitting these details then result will show

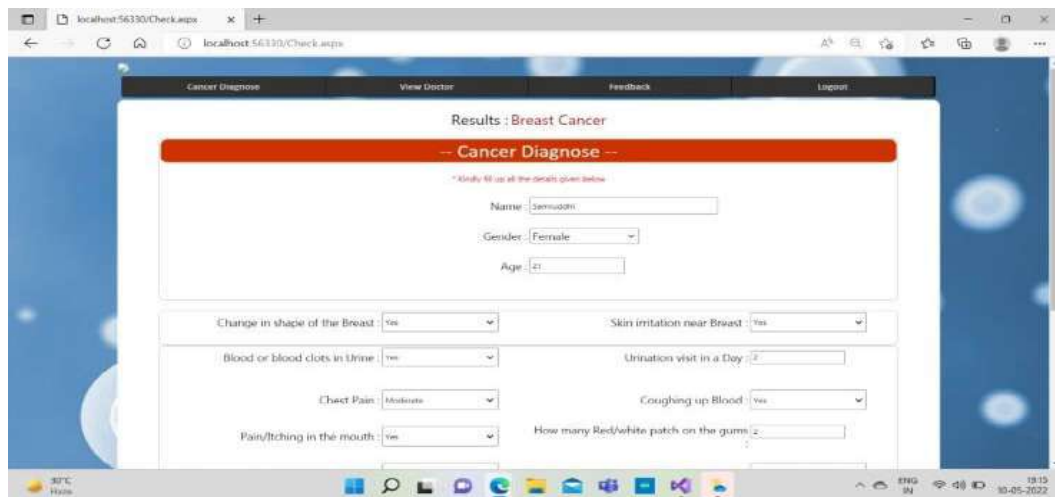


Fig 9: Result of Symptoms

If the user entered details are matched with predefined dataset it gives the positive result otherwise it will give negative result

6. CONCLUSION

Our investigation focuses on the current cancer situation in hospitals and its flaws. It exhibits how the meaning of the word "prediction" and the sense of assisting in the conception of the medical outcome of this prediction. The research underlines the shortcomings of existing cancer prediction and the need to understand them in depth in order to avoid unfavorable cancer outcomes. We encourage researchers to think about a cancer prediction system as a whole and develop behaviour prediction and improved sensing characteristics that can help to identify and avoid skilled and critical malignant disorders in the future. Security is critical for the proper installation and development of cancer prediction systems. Furthermore, it provides a sense of security to hospital patients.

7. FUTURE SCOPE

This project is created with the motive to make it easy and cheap delivery of medical services and it has to be the all over motive for this project.

We are planning to add the feature where the user might be able to schedule the appointment and personal or virtual meeting with the designated doctor as per the patient's preference or as the web page suggest the patient as per the doctor's specification.

Might add the feature where the precaution of doctor can be added in detail prognosis and also make it available for the user as prescribed data for medication.

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MENTAL HEALTH AWARENESS & POSITIVE LIFESTYLE APPLICATION**¹Sofiya Sheikh, ²Sneha Sankhe, ³Manisha Choudhary and ⁴Priyanka Agre**^{1,3,4}Students and ²Assistant Professor, Department of Information Technology, TCOE, Maharashtra, India**ABSTRACT**

Today technology has made medical health very accessible to people. Mental health applications are a convenient method to improve your mental well-being. These applications are not intended to diagnose a disorder or to replace professional mental health care. They, however, can help with your general mental wellness. Apps are a convenient way to obtain extra help in between therapy sessions or office visits, and they can also provide ongoing support once you've completed therapy. Apps for mental health can give daily tasks, encouragement, and other strategies. Many types are evidence-based interventions based on research and therapy practices. According to Statista, one of the most popular categories in smartphone applications is "health and lifestyle". According to a credible study published in 2018, mental health apps may aid in the monitoring and management of mental health conditions. As a result, our software would be useful in advising and assisting users with their overall health management as well as offering access to appropriate expert assistance. Our software has the potential to improve self-management, cognition, skills training, social support, and symptom tracking by offering mental health interventions. The user can self-assess their own mental wellbeing as well as access professional help through our software.

Keywords: Coping Skills, Emotions, Healthcare, Journaling, Mental Health, Mood Tracker, Productivity, Self-care.

1. INTRODUCTION

"Having a mental disorder isn't easy, and it's even tougher when others assume you can just get over it," according to a mental health care portal.

That is correct. It is the persistent stigma that prevents sufferers from seeking appropriate therapy for their mental health problems. However, by offering many mental health apps, today's technology is helping to de-stigmatize psychological illnesses.

These apps are simple to use for anyone dealing with mental health issues, and they are even thought to be beneficial in tracking the therapy process of people with various mental health diseases. According to the National Institute of Mental Health, technology-based mental health solutions can help with a number of psychological issues.

This is where these applications come in handy, whether it's for information, self-improvement, or access to mental health treatment. Many users also use apps to educate themselves with the terminology of mental health wellbeing, which helps them gain confidence in seeking out established therapy and counselling providers.

1.1 PROBLEM STATEMENT

With people's lives becoming increasingly stressful and hectic, a system that can alert them to their physical and mental health for their well-being is needed.

One of the most effective and favored methods of coping with mental health has been self-assessing and tracking emotional well-being. Our application would make it simple to attain this goal.

To be able to assist and guide users in managing their overall health and to provide them with appropriate expert assistance.

1.2 LITERATURE SURVEY

- Rozita Yati Masri, Hajar Mat Jani, Alicia Tang Yee Chong [1] presented a proposal regarding an Expert System Approach in Diagnosing Mental Health.

Because the intended Expert System (ES) will be utilized to serve the Malaysian public, a survey of the general public was conducted to gauge public perceptions of mental health and mental disorders in the country. Interviews and a survey for psychotherapists are now being used to look at the prevalence, severity, and treatments of stress-related, psychotic, and neurological disorders among Malaysian mental patients. The proposed ES will be utilized by psychotherapists to assist them in the same way that a true expert would.

- Ariel Teles; Ivan Rodrigues; Davi Viana; Francisco Silva; Luciano Coutinho; Markus Endler; Ricardo Rabêlo published a paper for the topic Mobile Mental Health: A Review of Applications for Depression

Assistance. The author's goal in this research is to discover, analyze, and characterize the current state of mobile applications dealing with depression. They did this by conducting a comprehensive review of depression support apps. Following the application of the inclusion and exclusion criteria and a quality review of the results, 216 apps were chosen for the data extraction phase, where they highlighted their merits and limits while also identifying gaps and trends. The findings of this study revealed an increase in the variety of app uses, including chatbots, online therapy, educational tools, mood trackers, testing, and self-help.

- Jamie M Marshall, Debra A Dunstan, and Warren Bartik published an article on the topic “Effectiveness of Using Mental Health Mobile Apps as Digital Antidepressants for Reducing Anxiety and Depression: Protocol for a Multiple Baseline Across-Individuals Design” in the year 2020 amidst the COVID- 19 pandemic, a time when mental health was getting downhill day by day as time passed. The purpose of this study was to determine the efficacy of five apps (Destressify, MoodMission, Smiling Mind, MindShift, and SuperBetter) in reducing symptoms of anxiety and/or depression. These apps were chosen because they are freely downloadable, have published proof of efficacy, and are publicly available. Their study concluded that the evidence base for mental health apps that offer treatments for anxiety and depression is currently lacking.

2.1 OBJECTIVE

The Aim of this application is to bring forward the awareness and importance regarding issues related to mental health. To be able to help and guide user with their overall health management as well as providing access to adequate professional help to them. The impact it could bring into the lives of people, change their lifestyle into a healthy one and help organize their daily life, is what we aim through our project.

2.2 REQUIREMENTS

i) Software Requirements

- A. Operating system: Any windows will be optimal enough for running this project.
- B. Programming languages: JAVA
- C. Front-end: XML
- D. IDE: Android Studio
- E. Backend Database: Firebase

ii) Hardware Requirements

A. System:

A pc with minimum 4 GB RAM

Intel Pentium and above processor.

B. Disk Space: A minimum of 750MB free disk space.

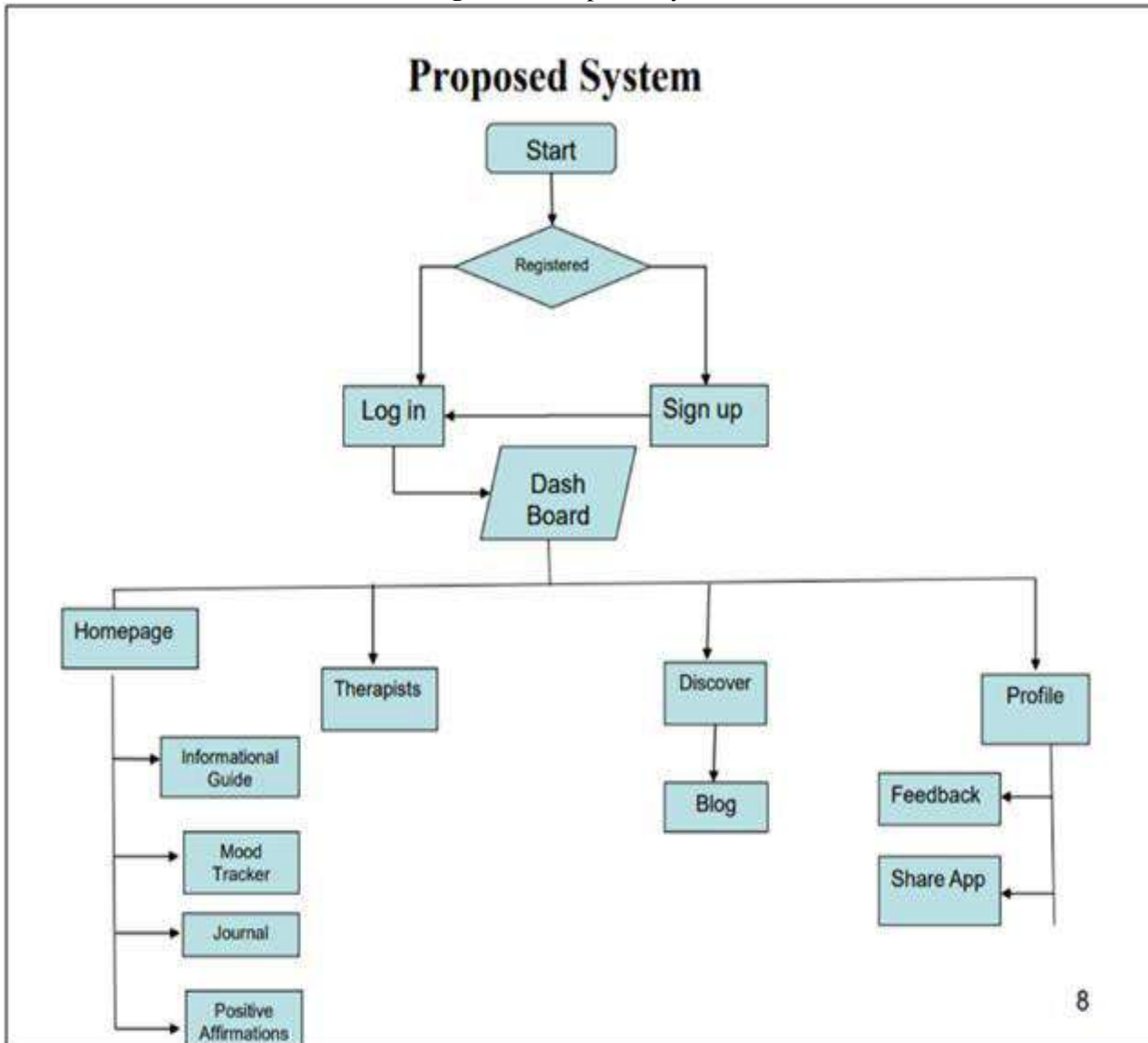
2.3 Design & Implementation

This project is based on maintaining the user’s mental health and guiding the user with accurate knowledge. The application keeps track of the user’s mental well-being by tracking their moods, providing positive affirmations, maintaining the gratitude journal and providing professional help. The application uses Firebase as its backend database to maintain the applications’ functioning and requirements.

1. The User downloads and opens the application.
2. The User then would be prompted towards the Login Page. First time users must register on the Registration Page or can login themselves through their Google account.
3. The User would then land up on the Dashboard which consists of the Main/ Home Page first. The Home page consists of the Informational Guides (consisting of various types of authentic data and media) the 4 main categories in Mental Health — Healthy Diet, Physical Wellbeing, Emotional Wellbeing and Activities.
4. The Home Page also consists of a Gratitude Journal / Diary. The user can write their thoughts and emotions and it gets saved in the database.
5. The User then can also can feel better by going through the Positive Affirmations page. There they can see many positive thoughts and uplifting emotional sayings.
6. The User can also track their emotions using the Mood Tracker which will keep their emotional wellbeing in check.

7. Then navigating through the dashboard the user will land up in the second page i.e. the Therapists page which will be providing the user with professional help to the user.
8. The third page consists of inspirational stories and blogs the user can go through.
9. The final page consists of User’s Settings where they can share the application and can send feedbacks for the application.

Fig 1.0 the Proposed System



The above mentioned Fig.1.0 describes the

Proposed System for the application

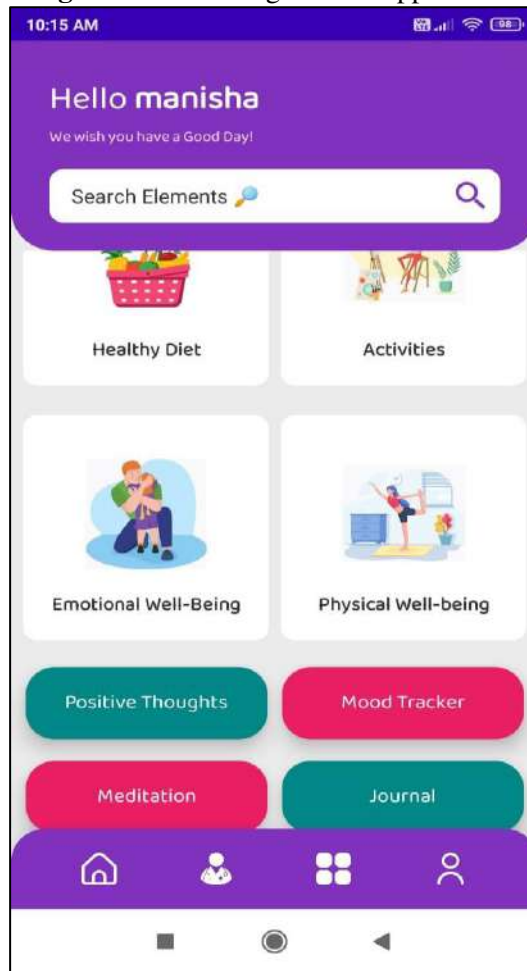
3. CONCLUSION

The application tracks human behaviors and emotions, allowing users to gain insight into what they may be experiencing. This will aid in the maintenance of their emotional well-being.

These applications are easily accessible to anyone struggling with mental health issues, and they are even thought to be effective in tracking the therapy process of people suffering from various types of mental health disorders. According to the National Institute of Mental Health, technology-based mental health solutions are beneficial for a wide range of psychological issues due to anonymity, 24-hour services, and lower costs. To fully grasp the potential of smartphones for the treatment of mental health illnesses, creative use of their new capabilities is required. The goal of this research is to look at the link between mental health and human behavior. It will also be designed with the goal of contributing to society.

4. RESULTS

Fig 2.0 the Main Page of the Application



The above mentioned Fig. 2.0 describes the main page of the application which consists of the navigation bar through which the user can access various other modules of the Application

Fig 3.0 the Blog Page of the Application

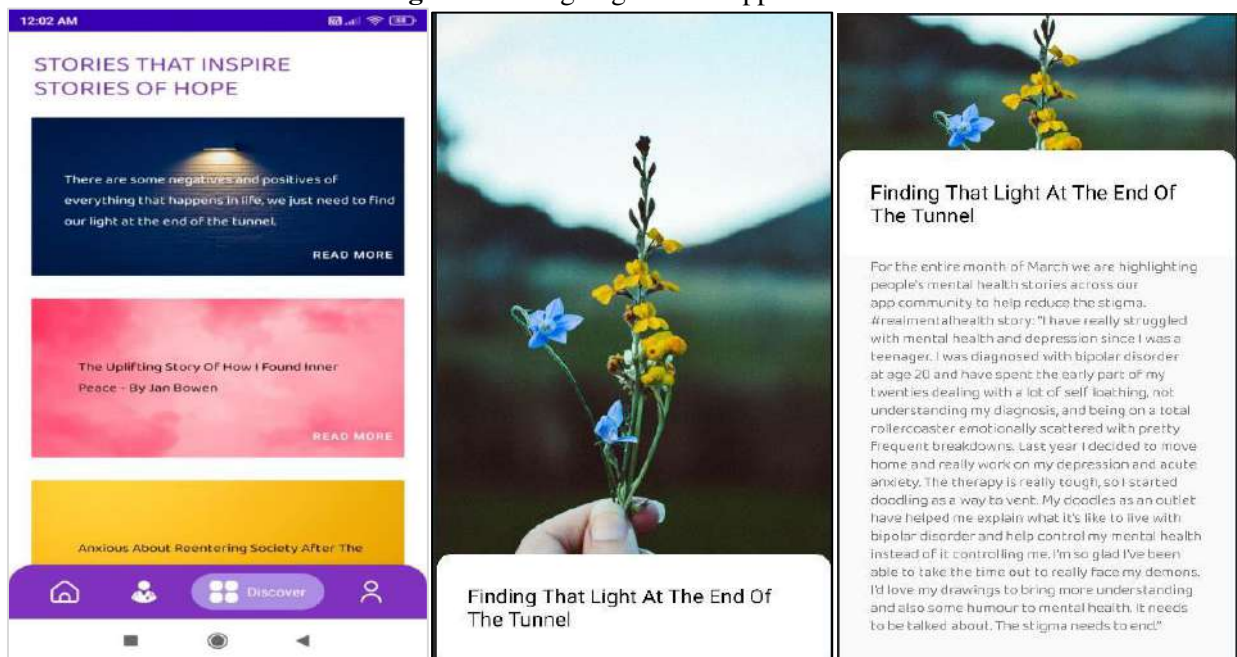
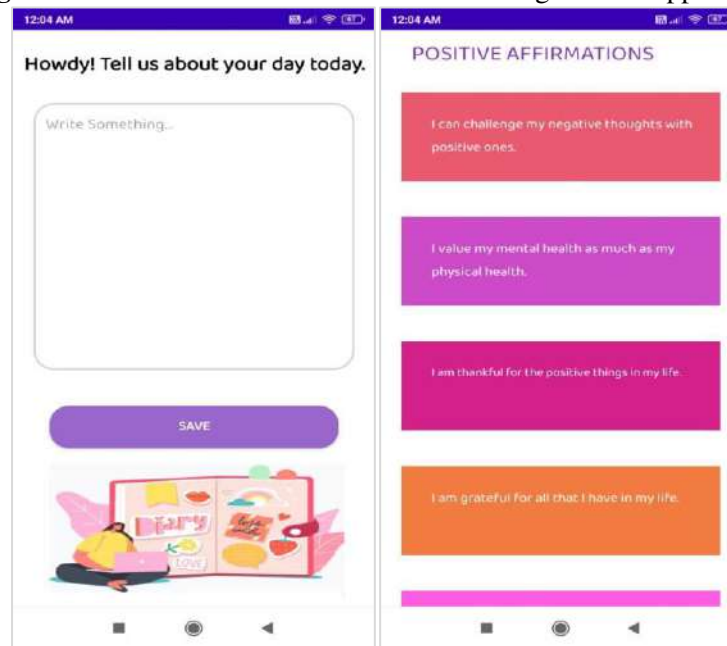


Fig 3.0 the Gratitude Journal & Affirmations Page of the Application

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ANIMAL DETECTION USING DEEP LEARNING

Akash Tripathi, Prathamesh Hadalgekar and Piyush Shah

Department of Computer Engineering, Mumbai University, Theem College of Engineering, India

ABSTRACT

Efficient and reliable monitoring of wild animals in their natural habitat is essential. This project develops an algorithm to detect the animals in wildlife. Since there are large number of different animals manually identifying them can be a difficult task. This algorithm classifies animals based on their images so we can monitor them more efficiently. Animal detection and classification can help to prevent animal-vehicle accidents, trace animals and prevent theft. This can be achieved by applying effective deep learning algorithms.

Keywords: Animal Detection and Classification, Camera-trap images, Deep learning Algorithm, DSNN features, SVM, etc. weather, rains, etc. Also, the natural camouflage of animals poses

1. INTRODUCTION

Nowadays, huge data on wildlife activity and behavior can be obtained over larger space and time domain. Camera-trap methods and many other digital technologies can be used in wildlife monitoring and analysis due to relatively low cost and easy to-use. With the growth in data on wildlife, the study related to wildlife has become more convenient such as studying the effects of climate change on wildlife, alterations in habitat, impact of human intervention on animals and biodiversity over different seasons, areas and species. For monitoring wildlife, sensor cameras are placed on trees in a region creating a stationary camera-trap network. The camera traps are activated; each time motion is sensed, and a short video of animals activities are recorded with details about the surroundings (illumination levels, humidity, temperature, and location). Camera-trap networks are vital for acquisition of wildlife data without any disturbance. Moreover, camera trap networks are economically feasible, easy to deploy at larger space and have low maintenance cost; as a result, they are widely used for wildlife monitoring. We can easily obtain data about the visual aspects of animal from the camera-trap images, that help to know the behavior and biometric features of species along with the relevant features related to wildlife habitat and surroundings. Recently, a huge set of camera-trap images have been acquired which challenges the capability of manual annotation and image processing. There is a dire need to design multiple tools for automated processing of these huge camera-trap images such as animal identification, segmentation, extraction, and tracking. In this work, we propose a method to detect wildlife animal using CNN based on camera-trap images. Object segmentation and detection from the background based on the motion of object are a necessary step for automated analysis from image sequences. Several studies are based on background and foreground modeling for object detection, however, challenges are involved with complex dynamic scene modeling. The image sequences captured by camera traps consist of natural and dynamic scenes that are challenging to analyze using existing techniques. The natural scenes are usually highly cluttered with swinging trees, waving water, shifting shadows, changing another difficulty for analyzing natural scenes. The prime challenge for wildlife detection is to design models that can handle complex backgrounds and efficiently detect animals from dynamic scenes. Conventional approaches based on motion are inefficient with dynamic scenes. Lately, techniques based on deep neural networks are employed for object detection such as Region-based Convolutional Neural Networks (RCNN), Fast- RCNN, and Faster-RCNN. Generally, the object detection can be divided into two steps: first; the detection of image regions using region proposal methods that may contain desired object and second; classification step that detects whether the regions contain the desired object or not. Object detection in terms of animal detection deals with problem of accuracy and speed due to the highly dynamic and highly cluttered image sequences obtained from camera traps. The available region proposal approaches create a huge amount of candidate regions. We observe that DCNN is computationally comprehensive and also requires performing region classification multiple times for all candidate regions. Hence, it is important to study the distinct characteristics of camera-trap image sequences in spatiotemporal domain to model an efficient region proposal approach that creates a small number of candidate regions. Hence, we used the camera-trap image sequences that are analyzed using Iterative Embedded Graph Cut (IEGC) technique to create a small group of Wild Animal Detection Using Deep Convolutional Neural Network.

1.1 Algorithm Overview

Reliable and robust wildlife detection from highly dynamic and cluttered image sequences of camera-trap network is a challenging task. Hence to gain high performance, images need to be analyzed at pixel or small region level. However, due to low contrast and cluttered images, it becomes difficult to identify whether a particular region or pixel based on local information represents animal or background. Hence, we need to

analyze global image features also. For example, the region of an animal body may be counted as background region. In such case, local information processing will not be sufficient, leading to requirement of global processing (to extract global image features) to detect animal. For example, recognize whether an animal is present or not, one should also identify body parts like head, legs etc. rather than body only.

1.2 Dataset

We have used the standard camera-trap dataset [3] for experimentation and assessing the system performance. Camera-trap images allow assessing the system for wildlife detection even in highly dynamic and highly cluttered natural images. The dataset contains 20 species of animals with around 100 image sequence for each species. The available images are present in both daytime format and nighttime format, resulting in wildlife monitoring system for both daytime and nighttime. Camera-trap networks provide complex images with highly cluttered natural videos and also high-resolution images. The images obtained vary in resolution from 1920×1080 to 2048×1536 . The number of images in each sequence varies from 10 to 300 and more. The number of images in an image sequence depends on the period of action by animal. A total of 1110 patches are extracted from the dataset using the given bounding boxes and their locations.

1.3 Experimental Setup

Tenfold cross-validation, whole feature dataset is divided into ten uniform folds. The primary reason for using tenfold cross validation is to ensure that results remain unbiased to given partitioned data. Out of ten folds, nine are considered as training data and remaining one used as test data. Hence, 90% data is used for training and 10% data is used for test purpose. The process is then repeated ten times so that each sample is used as test data. The final outcome is the average of all the ten results. We use 1110 images as positive samples from the camera-trap images and randomly choose background images from the Web. The camera-trap database used here has bounding boxes around animal regions in the natural scenes. We have used multiple state-of-the-art machine learning algorithms such as Support Vector Machine, K-Nearest Neighbor and ensemble classifiers and its variants. SVMs are

3. CONCLUSIONS

In this paper, we have proposed a reliable and robust method for animal detection in highly cluttered images using DCNN. The cluttered images are obtained using camera-trap networks. The images in camera-trap image sequences also provide the candidate animal region proposals done by multilevel graph cut. We have introduced a verification step in which the proposed region is classified into animal or background classes, Thus, determining whether the proposed region is truly animal or not. We applied DCNN features to machine learning algorithm to supervised learning model; they can be used for both linear and nonlinear classification. We have used linear SVM with linear kernel function giving linearly separable planes. Also, we have used quadratic and cubic SVM that uses quadratic and cubic kernel functions and automated kernel scale. The medium Gaussian SVM uses Gaussian kernel function with kernel scale as 32. The training time and prediction speed vary for each SVM. KNN is an instance-based algorithm widely used in various areas such as medical imaging, pattern recognition, information retrieval.

2. RESULT ANALYSIS AND DISCUSSION

The results and performances of our system show that it provides an efficient and robust mechanism for wildlife detection and analysis. The animal detection has shown accuracy up to 91% with F1-measure up to 0.95. We observe that our system is robust to pose as we have taken images of animals from different views for animal-background verification. Moreover, the system works well in both daytime and nighttime as our database contains both categories of images, i.e., daytime images and nighttime images. Since the database used is camera-trap images, the system is also invariant to dynamic nature of natural scenes and invariant to cluttered images of animals. We have obtained accuracy of 91.4% with weighted KNN and DCNN features which outperform the work in the researchers have performed animal detection using deep learning and HOG-based features for patch verification. They claimed F-score 0.839, which is lower than our study i.e. 0.951. Similarly, in the researchers have applied graph cut for object classification and object verification for animal detection with F1-measure 0.8695, which is also lower than this work.

Achieve better performance the experimental results shows that proposed system is efficient and robust wild animal detection system for both daytime and nighttime.

ACKNOWLEDGEMENT

I take this opportunity to express my profound gratitude and deep regards to my teachers and project guide Prof. Najmuddin Amer for their exemplary guidance, monitoring and constant encouragement throughout the course of this project.



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TWITTER SENTIMENT ANALYSIS USING MACHINE LEARNING

Ayushi Singh¹, Affan Shaikh², Archana Patil³ and Sneha Sankhe⁴^{1,2,3}Students and ⁴Assistant Professor, Department of Information Technology, TCOE, Maharashtra, India**ABSTRACT**

The Sentiment analysis does the identifying and classifying sentiments of source text. Social media is a place with vast amount of sentiment rich data in different form such as tweets, status updates, blog posts etc. Sentiment analysis generated by user's data is very useful in knowing the opinion of the group of people. Twitter is one of the most widely used social media platform used by the people to express their thoughts and opinions. Its sentiment analysis is difficult compared to general sentiment analysis due to the presence of slang words and misspellings. The maximum characters limit that we can use in Twitter is 140. Knowledge base approach and Machine learning approach are the two strategies used to analyze sentiments in text data. In this paper, we try to analyze the twitter posts about a specific topic defined by the user using Machine Learning approach. By doing sentiment analysis in specific field, it is possible to identify the effect of field information in sentiment classification. We present a new feature for classifying the tweets as positive, negative and to get people's opinion about that topic.

Keywords: Sentiment analysis, Social media, Naive Bayes, Real Time Data Streaming, Data Cleaning, Model Evolution, Per-Processing, machine Learning. *Abbreviation:* GUI (Graphic User Interface) KNN (K-Nearest Neighbors Algorithm), UML (Unified Modeling Language), SVM (Support Vector Machine Language), TXT (Text), NLP (Natural Language Processing).

I. INTRODUCTION

This Sentiment analysis is the automated process which involves identifying and classifying subjective information in text data. This might be judgment, opinion or feeling about a particular topic or product feature. It is extremely useful in social media monitoring as it allows to gain an overview of the wider public opinion behind concerned topic. With increasing capabilities in technology domain, analysis is becoming a more utilize tool for business Like it can be used by an organization if they want to know the review of the product. It can also be used to know the results of the upcoming election. Many researchers have worked on it by using various machine learning and deep learning algorithms. In machine learning algorithms like naive bias, decision tree and SVM have given a great accuracy depending on data. Even random-forest and KNN is used for classification when data is not classified into 0 and 1 i.e. (true and false or positive and negative). Sentiment analysis is that the machine-controlled method of distinctive and extracting the subjective data that written language. This could be an opinion, a judgment, or a sense a few specific topics or subject The leading common variety of sentiment analysis is known as 'polarity detection' and consists in classifying a press release as 'positive', 'negative' or 'neutral'. For example, allow us to take this sentence: "I don't realize the app useful: it's extremely hard and crashing". A sentiment analysis model would mechanically tag this as Negative or an analysis model would may tag this as positive. A sub-field of tongue process, sentiment analysis has been obtaining attention of many in recent years because of its several exciting apps in a various fields, starting from business to political studies.

II. LITERATURE SURVEY

We present a sequential and brief description of the research works carried out on this domain till now. Since Supervised Machine Learning Techniques is used in Sentiment Analysis (Naive Bayes or other algorithms) is an evolving trend over the past two decades or more, and is a vividly rich topic to explore, hence we explained some researches related to this.

Till now, research works have been considered on the aspect of sentiment classification based on categorization study, with the help of positive and negative This research discusses about sentimental analysis of text for political affiliation using machine learning. In this study, the NLTK and the VADER analyzer were applied to conduct a sentiment analysis of Twitter data and to categorize tweets according to a multi-classification system .it is written by Shihab Elbagir and Jing Yang in 2019[1].

This another research of M. D. Sykora, T. W. Jackson, A. O'Brien, S. Elayan and A. V. Lunen is fined grained emotional reactions to significant events are discussed brevity of messages textual content commonly encountered on social media is often not grammatically proper not even constructed properly and contains large scale use of slang, short-hand syntax, incorrect spelling, repeated letters, repeated words, inconsistent punctuation, odd Unicode glyphs, emoticons and overall a high proportion of terms. Hence it has been

suggested that a retrained NLP pipeline for sparse, informal text is necessary to effectively process such language. Essentially the approach has two parts and is based on a custom Natural Language Processing (NLP) pipeline, which parses tweets and classifies parts-of-speech tags, and an ontology, in which emotions, related phrases and terms and linguistic analysis rules are represented and matched against [2].

The next model of K Sreelakshmi, P C Rafeeqe is for sarcasm detection is created which tackles various features that characterized sarcasm in text data like incongruity, topic, context, pragmatic, lexical and sentiments. Decision Tree and SVM are used for modeling the proposed system and both obtained good results. For dataset tweets are extracted from twitter. Tweets with #Sarcasm are added to sarcastic dataset and tweets without #Sarcasm are added to non-sarcastic dataset. 701 sarcastic and 299 non sarcastic tweets are there in dataset. The types of features that are given weightage are Lexical Features, Pragmatic Features, Incongruity features, sentiment Features, topic features. Support vector machine with Radial Basis Function kernel and decision tree both classifiers are compared on performance. The paper somehow shows that SVM with RBF is more efficient than Decision Tree algorithm [3].

This last research of Tony Mullen discusses about sentimental analysis of text for political affiliation using machine learning. It uses the traditional right/left and other distinction and the naive Bayes text classifier Rainbow (McCallum 1996) classification scheme. Using a combination of verbatim self-descriptions and hand-made general classes, it arrived at a classification including: centrist, liberal, conservative, democrat, republican, green, libertarian, independent, l-fringe [4].

III. PROPOSED SYSTEM

The starting task performed by the system is data collection. For data collection, data is collected from Twitter and Twitter API is used. To access to Twitter API we need a Twitter application to be generated All requests made by the application to API are authenticated by the access tokens issued while app generation. Tokens contain Consumer Key, Consumer Secret, Access Key and Access Secret of the user. The tweets are filtered and collected on the basis of the keyword given by the user. The collected dataset of tweets consists of much other information also. Therefore, it requires being pre-process with a dataset which includes all the pre-processing techniques discussed in next section. After this process and sorting, data becomes completely fitting for sentiment analysis. After this, it is used for the sentiment model built in previous phases to have real-time discernment of data. The model classifies each tweet as positive or negative and accordingly the results are displayed to user. At the same time, the data is stored in TXT file separated by two columns i.e., Tweet and its polarity. After collecting all the labeled data, it is used to present the prediction graph.

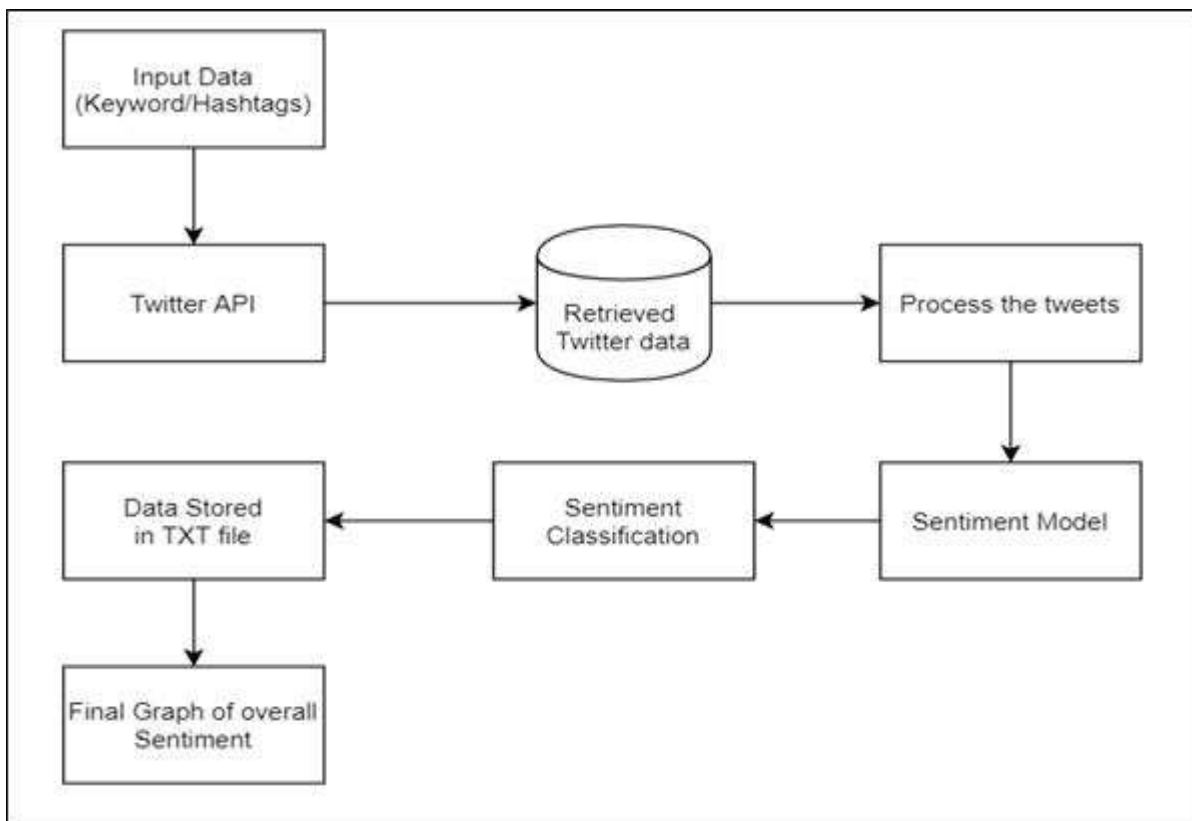


Chart –III.1: Proposed System

IV. SYSTEM IMPLIMENTATION

1. Data Cleaning and Pre-processing

In this process there are different stages and at every stage here the data is prepared to become data that is ready to be analyzed. There are several stages in this pre-processing, including cleaning, convert emoticons, case folding, tokenization, filtering stopword and lemmatization.

- i. Cleaning: Cleaning is a stage was characters and punctuation that are not needed are removed from the text.
- ii. Convert Emoticon: Emotion is a facial expression represented by a combination of letters, punctuation, and numbers.
- iii. Case Folding: In the tweet it might contain both uppercase and lowercase letters. This stage is used to make the letters uniform by converting all the letters to lowercase.
- iv. Tokenization: A process carried out to cut or break sentences into parts or words. The result which is obtained by deduction is called a token. In some cases, the tokenization process is also carried out by removing punctuation that is not needed.
- v. Filtering: Filtering is the stage of eliminating words that appear in large numbers but is considered to have no meaning (stopwords). Basically, the stopwords is a list that contains a set of words which are widely used in various languages.
- vi. Lemmatization: In this stage, we remove the endings of the words in order to detect their lemmas, i.e., their root forms in a dictionary.
- vii. Weighting Word: Weighting Word is a mechanism to give a score on the frequency of occurrence of a word in a text document. Among the methods of weighting words TF IDF (Term Frequency-Inverse Document Frequency) is one of the most famous methods.

2. Machine Learning Algorithm Used

The sentiment analysis in the proposed model is done by applying a mass of algorithms which algorithm shows the best result and is more suitable and accurate.

- i. Logistic Regression: Logistic regression is an algorithm which provides great result when it comes to binary classification i.e., the output variable can be 0 or 1(binary from). The reason for this is it uses sigmoid function. It's a mathematical function with the property of being able to map any real value to a number between 0 and 1, formed like the letter "S".

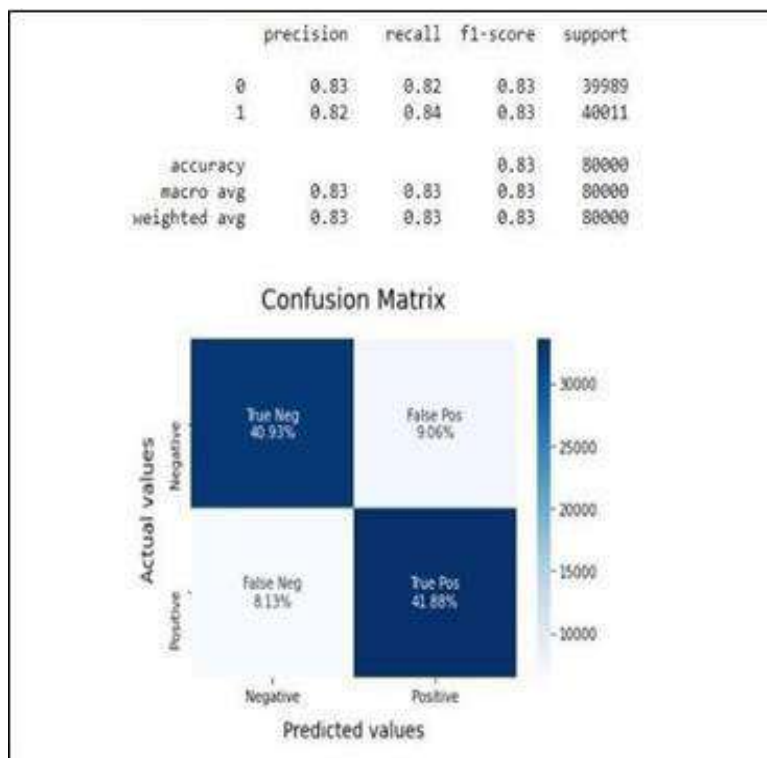


Fig IV.2.i Confusion Matrix for Logistic Regressions

- ii. Bernoulli Naive Bayes: It functions on the Bernoulli distribution and is used for discrete data. Bernoulli Naive Bayes' key characteristic is that it only supports binary values for features such as true or false, yes or no, performance or failure, 0 or 1, and so on. The Bernoulli model and the multinomial model have the same time complexity.

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

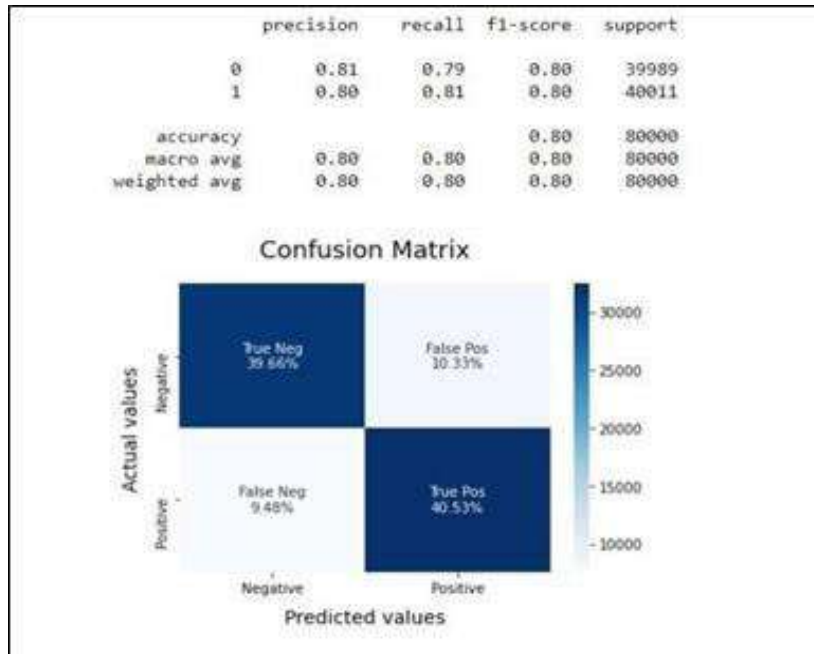


Fig IV.2.ii: Confusion Matrix for Bernoulli Naïve Bayes

- iii. Multinomial Naive Bayes: The Bayes theorem is the foundation of Naive Bayes, which states that features in a dataset are mutually independent. The occurrence of one feature has no bearing on the likelihood of the occurrence of the other.

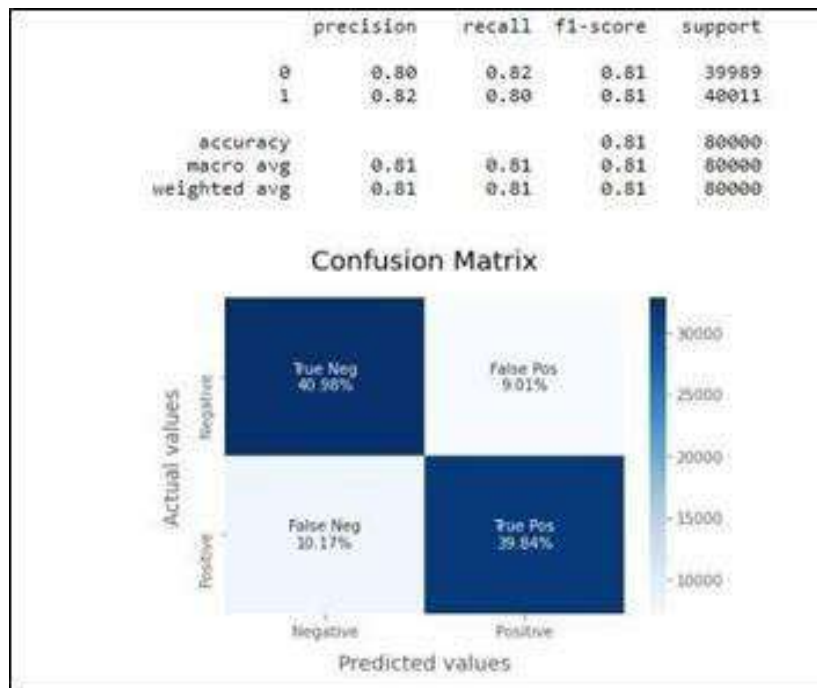


Fig IV.2.iii: Confusion Matrix for Bernoulli Naïve Bayes

V. RESULT AND DISCUSSION

Our results in two topic model evolution first present our results for the objective/subjective and positive/negative classifications and next will be real time. These results will be the first step of our classification approach. We will only show the short-listed features for both of these results.

1. Model Evaluation

Given below is the comparison table of the Accuracies of the implemented models:

From this table we could clearly see the accuracy of different algorithms that we have implemented. From this we get to know that logistic regression outperformed every other algorithm. And this is the reason we pickled this model.

Table V.1: Model Comparison

Sr. No.	Model Accuracy Comparison Table	
	Model	Accuracy
1.	Random Forest	75%
2.	Linear SVC	82%
3.	Multinomial NB	81%
4.	Bernoulli NB	80%
5.	Logistic Regression	83%

2. Real Time Data Streaming

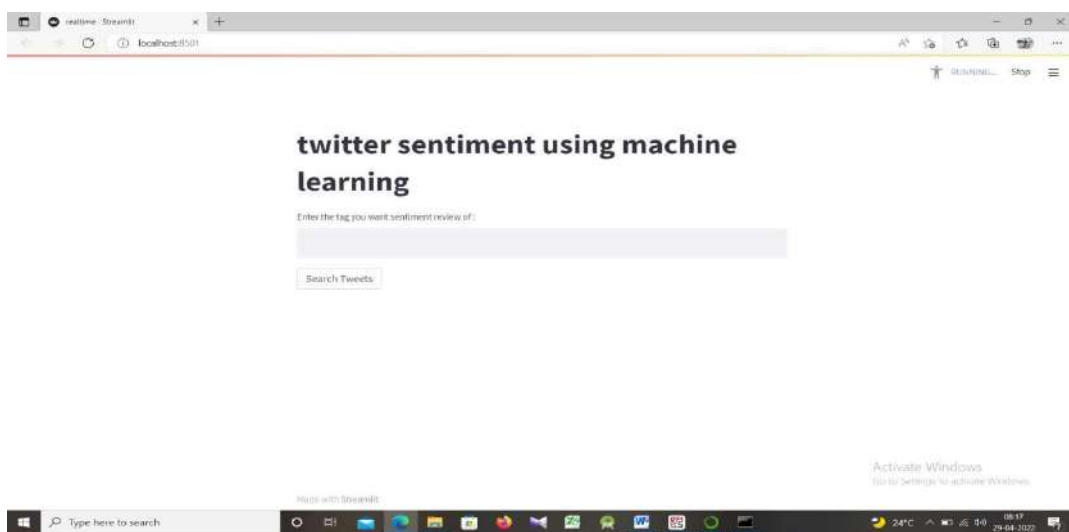


Fig V.2.1: GUI of the Project

This is the main GUI which we have created for the Twitter Sentiment Analysis. We created this GUI to get popular tweets as an output with their analysis. We put tags which we want to analysis and by clicking on the start button it will give popular tweets with their sentiments as output.

1. Here are Popular Tweets Related to Samsung with their Sentiment:

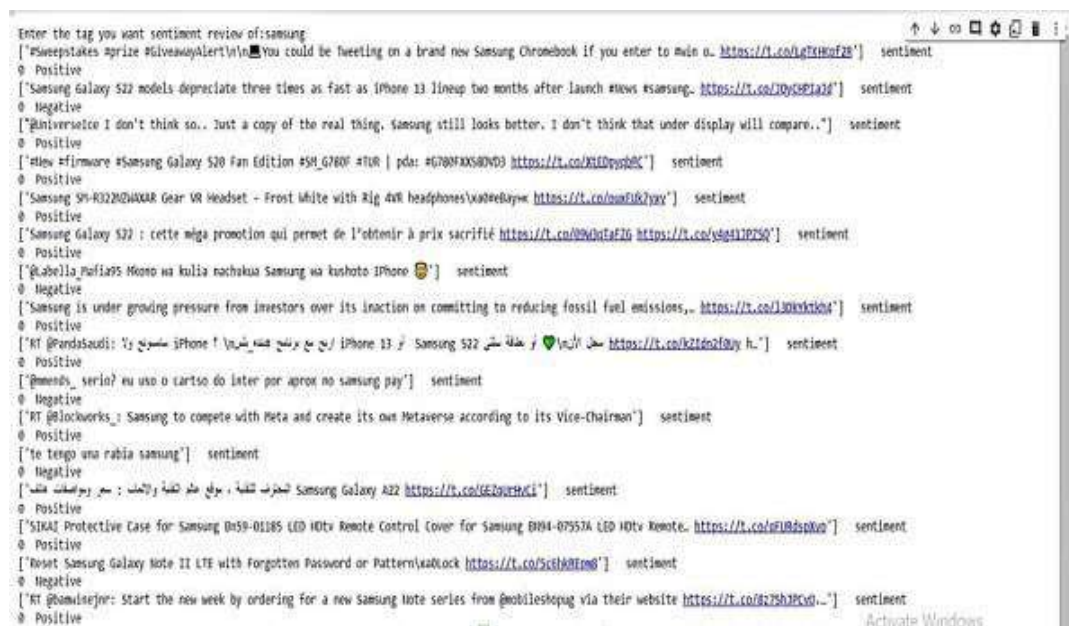


Fig V.2.2: Output for Samsung

2. Here are Popular Tweets Related to India with their Sentiment:



Fig V.2.3: Output for India

3. Here are Popular Tweets Related to Ukraine with their Sentiment:

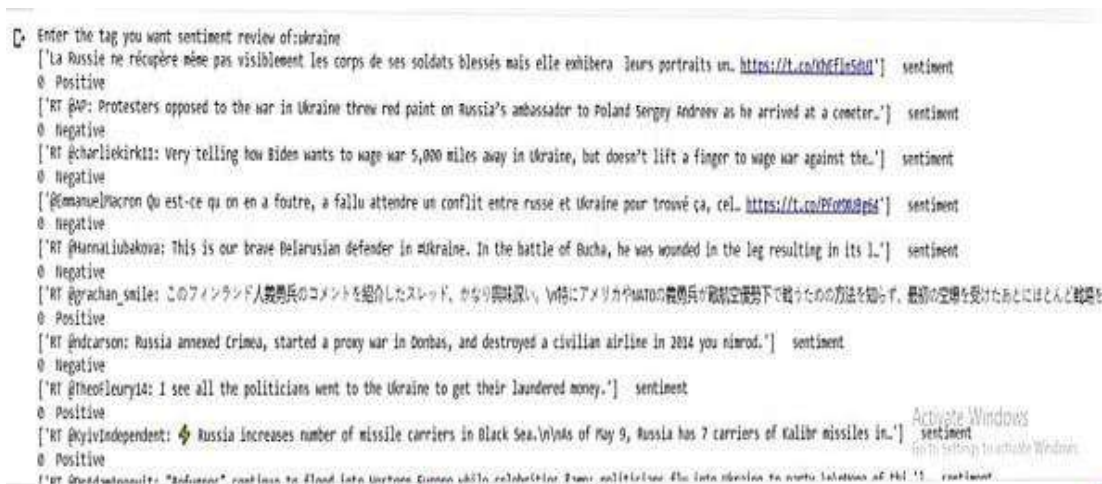


Fig V.2.3: Output for Ukraine

VI. CONCLUSION

In this paper, an attempt was made to classify the analysis sentiments from tweets on Twitter based on the keyword input given by the user. To summarize the sentiment analysis the six machine learning algorithms used are Logistic Regression, Decision Tree, Random Forest, Linear SVC, Multinomial Naïve Bayes and Bernoulli Naïve Bayes. The result shows the Accuracy of the Logistic Regression, Random Forest, Linear SVC, Multinomial Naïve Bayes and Bernoulli Naïve Bayes of 83%, 75%, 82%, 81%, and 80% respectively. So, it can be concluded that among the six algorithms used on this dataset logistic regression is the best which provides the highest accuracy of 83%. The model has been tested in real-time and can capture live streaming tweets by filtering through keywords and then perform immediate classification.

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ATTENDANCE SYSTEM USING ANDROID

Yasir Attar¹, Saad Gahlot², Hussain Sayed³ and Sheetal Solanki⁴^{1,2,3}Student and ⁴Assistant Professor, Department of IT Engineering, Theem College of Engineering, Boisar, India**ABSTRACT**

Student pursuit is a crucial issue for observation student performance within the room and in their studies. It becomes a matter of concern as a result of the university official adheres to the rule that one student will solely visit the communicating if his or her group action is higher or adequate many p.c (60%, seventieth or eightieth etc.) otherwise. the normal group action arrange needs the scholar to sign a group action sheet on every occasion for every category. This takes uncalled-for time to spot and tag the student's name on the group action sheet. It conjointly happens that some students might accidentally or voluntarily mark a student's name as a representative. A backup copy of the travel document could also be lost. By employing a smartphone as associate automaton technology the topic teacher are ready to simply access our mobile app designed and save the quantity of attendees on the phone and server and may read percentages and may print as a tough copy. victimization the info, the system is ready to tag attendees, mark attendees, proportion attendees statistics, send emails, and send SMS to caregivers to stay them hip concerning their child's presence at the middle. The designed system has net access from anyplace and anytime which will dramatically facilitate a topic teacher keep track of his or her students' presence.

Keywords: Mobile Application, Student's Attendance, Smartphone, SQLite Database, MySQL Database

I. INTRODUCTION

Mobile attending system is that the system of tacking the attending of the coed on basis of presence at school. Winning industries, schools, universities begin by partaking students and ensuring that they're going to come back frequently that the attending rate become important. The attending is very important as a result of students ar a lot of doubtless to achieve teachers once they attend category systematically. It's troublesome for the lecturer to make students' skills and progress if an outsized variety of scholars ar oftentimes absent. owing to the advancement of technology nowadays has immersed itself towards education.

The presence of technology has reached its most of providing property technology towards quality education through delivery and effective learning and sensible devices became how of life particularly in education educational fields be ready to develop their system into sensible attending. The mobile computing and mobile primarily based application process ar being well-liked all told environments and it's not exceptional to educational establishment too. the {traditional|the standard} and traditional mode of attending management system (AMS) leads heap of paper work and it's arduous to take care of for an extended amount of your time.

Due to the character of manual work, it's arduous to perform the activities associated with the management of attending, once there's a necessity in taking reports of specific interest and there's an opportunity of committing error in recording the information and data on the records. The computerised automation of educational attending management system obtainable|is out there|is on the market|is obtainable|is accessible|is offered} within the kind of pc primarily based application and available in varied computing platforms. the varied topologies equipped, computer {based|based mostly|primarily {based|based mostly|primarily primarily based}} management applications ar running economical and effective manner in several establishments and ar being within the class of either net based applications or computer network based applications.

The first class of net primarily based management applications; the system at backend is in would like of live server readying of its info server. The second class of computer network primarily based management applications; the system at backend is enforced among the native network as native info server. This automation of management systems provides the organization or establishment to manage their academic/administrative activities in effective manner and is accessed by their all types of system users in conjunction with the support of 24/7. The system with quality within the kind of movableness provides abundant accessibility. The mobile application primarily based educational management system provides paper less activities, comparison with ancient and private laptop primarily based computations. during this projected, "design and development of mechanical man primarily based educational Management System" (AAMS), the properties supported computer code engineering like simple use, effective user interface, versatile in accessibility, and using MIS principles ar thought-about.

II. EXISTING SYSTEM

Now each day the faculty takes attending in paper. completely different school conjointly takes attending in paper therefore it's the wastage of paper wastage of cash. currently each day the faculty ought to use associate degree mechanical man attending system. the faculty attending is store during a server. it's simple to oldsters they got notifications although they transportable kid ar gift or absent. within the gift system all work is completed on paper. the full session attending is keep in register and at the top of the session the reports ar generated. we tend to don't seem to be inquisitive about generating report within the middle of the session or as per the necessity as a result of it takes longer in calculation. At the top of session the scholars UN agency don't have seventy fifth attending get a notice.

In the detail position usually perform is completed on paper. the entire course of study assistance is targeted to see and at the time of study the reports ar generated. we tend to don't seem to be caught in generating reveal within the heart of the study or as victimization the stipulation currently it takes a lot of anticipate in calculation. At this moment system isn't addict friendly as a result of the retrieval of announcement is virtually slow and story isn't maintained with efficiency. Existing system needs portion of freed from value work. Loss of at some future time a bingle register/record interested in problem as a result of all the papers ar incomplete to originate the reports.

Every perform is completed manually therefore we tend to cannot bring round one data tell within the heart of the session or as by the agency of the article as a result of it's so time overwhelming. we tend to demand a lot of calculations to inspire the report therefore it's generated at accomplishment of the session. and therefore the students not shooting iron what's coming back to 1 one expose to recover their attending

.PROPOSED SYSTEM

Se is to get the report mechanically at the top of the session or within the between of the session mistreatment mechanical man Studio. Mechanical man software system mechanical man could be a code platform and software system for mobile devices, supported the UNIX operating system kernel, and developed by Google and later the Open telephone set Alliance. It permits developers to jot down managed code within the Java language, dominating the device via Google-developed Java libraries. There are over three hundred million Androids in use and over 850,000 devices activated a day. Mechanical man is one of the foremost used mobile software systems with a market share of forty-eighth and Over four hundred,000 applications obtainable in Google play.

User Friendly: - This code is user-friendly because it is easy to use, and therefore the user doesn't want any special coaching to use this code. Knowledge analysis, knowledge storing, and retrieval is straightforward and doesn't want any serious calculation or methodology. The UI is easy and straightforward to know.

Easy and Quick Report Generation: Reports are generated mechanically quickly in a simple method once every month for the teacher to stay a track of the scholars attending records and give notice to the scholars with minimum attending to attend categories.

Minimal paper work there's no paperwork needed. Knowledge is kept mechanically within the system. the Analysis is finished mechanically. Thence it's value-effective too.

Time Saving: knowledge storing, knowledge retrieval, and knowledge analysis is finished at a minimum time thence it's time-saving manufacturing knowledge with borderline errors.

III. FEASIBILITY STUDY

Economically Feasibility: The program developed is economical in relation to the idea of a School or College. It is expensive in the sense that you have completely removed the paperwork. The system also works on time because the calculations are automatically done at the end of the month or at the user's request. The resulting result contains less error and is more accurate as data is required.

Technical Feasibility: The technical requirement for the system is economic and it does not use any other additional Hardware and software.

Behavioural Feasibility: The system working is quite easy to use and learn due to its simple but attractive interface. User requires no special training for operating system

IV. FEATURES OF THE APPLICATION

Taking attending Statistics and proportion All student attending against every subject is classified on the premise of sophistication attending. If the length of the category is in line with the desired time, then attending

is indicated 'Current'. The presence of scholars WHO had left the schoolroom throughout category is marked as 'Absence'. There's no chance to duplicate the record within the system. proportion calculations ar mechanically generated at the request {of every of every} student's mobile enrolment in each listed study to be enclosed within the take a look at. If the calculated proportion is a smaller amount than the desired proportion then the scholar can suffer. B. Emailing System and electronic messaging System within the case of an occasional proportion, associate email is shipped to the scholar caregiver together with proportion data and a warning. With this, the student's folks are going to be mechanically updated regarding their child's progress. By causing the Short Message Service (SMS), the mobile application is employed. Whenever a student gets an occasional proportion, associate SMS is shipped to his or her caregiver to update him or her on the Progress of his or her kid just in case he or she is unable to envision his or her email.

V. IMPLEMENTATION

Modular Design our proposed system is divided into four distinct modules described as follows:

A. User Authentication

Initially, once a coach uses the app for the primary time, associate degree login screen can seem which will tell the teacher to enter the username and positive identification required for authentication. The teacher are given a novel username which will be a mix of alphamerical characters. as long as the teacher enters the proper username and positive identification, a "success" message are displayed and therefore the teacher are approved and redirected to consequent screen.

B. Calling of Web Service

In this module, the teacher can have to be compelled to choose details like the name of the topic that the lecture is being taken, time of lecture and therefore the specific semester that the lecture is conducted. When doing therefore, the teacher has to decision the online service by clicking a button provided on the screen. the online service so invoked would come the list of names of all the scholars happiness to a specific semester and branch as per the input provided.

C. Marking Attendance

After the list of students has been displayed the teacher needs to begin the process of marking the attendance of students. For this purpose our application would be providing checkboxes against each student's name that will allow the teacher to mark the student either present or absent. Accordingly, the details of the student will be sent to the remote database and the attendance will be marked for that particular day.

D. Display Information of Student

Once the number of attendees has been successfully marked, the teacher can at any time view the student's attendance record by entering a unique number assigned to each student. The information displayed in that way includes the percentage of student attendance, the number of talks the student attended in a particular subject, the number of missed talks, and the total attendance.

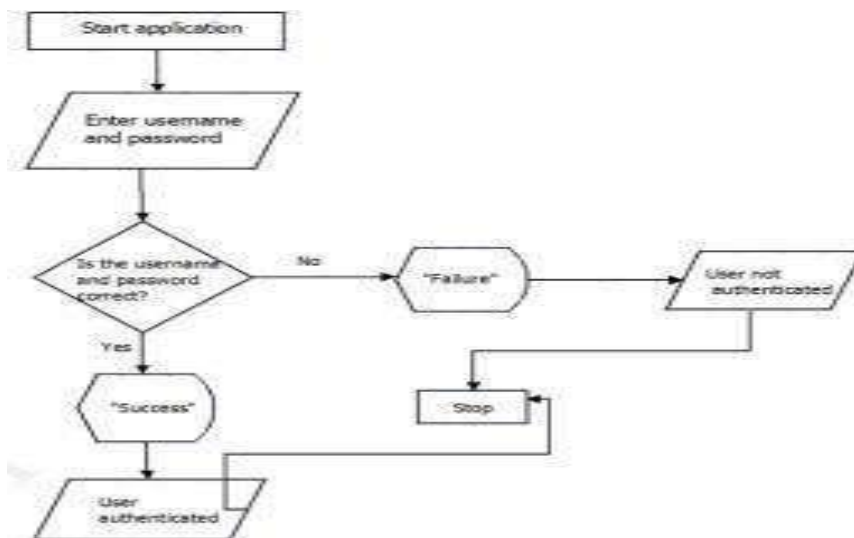


Fig 1: System Flow Chart

E. User Authentication Process

This is the initial method of the system. The teacher must enter the username and positive identification. Consequently, counting on whether the teacher is genuine, a "success" or "failure" message can.

VI. CONCLUSIONS

With this program marking group action and coverage are created easier. There's very little likelihood that skilfulness exists. The system has reached a solid-state wherever all distractions are removed. The system works with a high level of potency and every lecturer and user related to the system perceives its advantages. It absolutely was meant to resolve as a process demand. In the future, this technique might be wont to build multiple instructional systems and will be engineered across a platform. This project aims to switch the digital register with the recent system of associating existing registers which will demonstrate its quality for its options and easy use. In time, we tend to aim to determine a reference to the faculty server to succeed in out and update the faculty group action.

VII. FUTURE SCOPE

The scope of the project is that the system on which the package is put in, i.e. the project is developed as a desktop application, and it'll work for a selected institute. However, afterward, the project may be changed to work it online.

In the future, our system plans on together with an SMS notification feature whereby each student is going to be sporadically notified concerning his/her group action record for a particular period. The main advantage of SMS notification is that the scholars will apprehend their group action by causing SMS from any place. Students send an SMS to the server with their register range. If it's an incorrect format, the server can replay the group action of the corresponding student through SMS. Otherwise, sends a mistake message.

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EMAIL SPAM PREDICTOR

Sagar Battula¹, Sharique Ahmad², Abhay Yadav³ and Amit Yadav⁴^{1,3,4}Students and ²Assistant Professor, Department of Information Technology, TCOE, Maharashtra, India**ABSTRACT**

Spam emails are known as unrequested capitalized emails or deceptive emails transferred to a specific person or a company. Spams can be detected through natural language processing and machine knowledge methodologies. Machine knowledge styles are generally used in spam filtering. These styles are used to render spam classifying emails to either ham (valid dispatches) or spam (unwanted dispatches) with the use of Machine Learning classifiers. The proposed work showcases discerning features of the content of documents. There has been a lot of work that has been performed in the area of spam filtering which is limited to some disciplines. Exploration on spam dispatch discovery either focuses on natural language processing methodologies on single machine learning algorithms or one natural language processing fashion on multiple machine learning algorithms. In this Design, a modeling channel is developed to review the machine learning methodologies.

Keywords: Machine Learning, Spam, NPL, Web application.

I. INTRODUCTION

Of all the different medium communication, dispatch is extremely important medium now a days. It has been used extensively for formal online communication. It can be penetrated from any part of the world just with the help of internet connectivity. According to D Tschabitscher, number of active dispatch accounts was 5 billion in 2017 and is adding exponentially. He also stated that, everyday further than 270 billion Emails are changed, but the worst part of that is, out of that roughly 57 emails are of no use as they're spam emails. Spam emails are creating a serious problem to the stoner as spammers submerge the stoner's system with spam emails which results in storehouse problem, consumption of bandwidth and leads to drop in performance of system.

Spam emails are called as junk emails or unasked communication which is set by spammer through dispatch. To make the dispatch more secure and effective, applicable dispatch filtering is essential. Several types of inquiries have been done on dispatch filtering, some acquired good delicacy but the progress is demanded in this field. In order to avoid discovery, spammers came with a new approach for transferring spams to other druggies. It's included in the announcements as the part of an embedded image train attachment in the form of gif, jpg, png, etc. rather than body of the emails, hence by passing textbook- grounded spam filtering ways. As we know that there are numerous ways formerly there for dispatch spam discovery, our design aims for questing and assaying the effectiveness of the vital fashion used for spam dispatch discovery from images and PDFs using Multinomial Naive Bayes' algorithm.

II. LITERATURE SURVEY

- G. Mujtaba),L. Shuib,R.G. Raj,N. Majeed,M.A. Al-Garadi Proposed the introductory three way which are common in every bracket process. The first step is pre-processing in which the given textbook is converted into commemoratives and this step is also used for junking of stop words. The alternate step is learning process and, in this point, set is erected which is veritably important necessary for the bracket of emails. The last step is bracket of dispatch as ham or spam by using effective algorithm. Algorithms like support vector machine, logistic retrogression, retrogression trees and arbitrary timber are considered for bracket. They used the Phishing Corpus dataset and with the help of Bag of words as point birth approach classified the dispatch as ham or spam. In his study, they didn't mention the different tools for reduction styles for dispatch bracket.
- S. Ajaz,M.T. Nafis,V.Sharma They collected dispatch dataset from the online available websites and used Naïve Bayes for filtering of emails. He proposed a mongrel approach using secure hash system and Naive Bayes to sludge dispatch data but couldn't give information regarding the abuse of storehouse coffers and network bandwidth. By using Secure Hash Algorithm, the dispatch is considered as a communication M due to a generated function. The communication M is farther classified into S and L where L stands for ham dispatch or genuine dispatch and on the other hand S stands for spam dispatch.
- N.F. Rusland, N.Wahid, S.Kasim, H.Hafit Performed analysis on dispatch bracket on two different dataset by using Naïve Bayes algorithm grounded on the Accuracy, Precision, F- Measure and Recall. It predicts whether the given textbook is ham or spam. By using Spam data Dataset, the author achieved a delicacy of 91.13% and for the other Spam Base dataset, delicacy achieved was 88. By his analysis, the author concluded that the performance of NaïveBayes algorithm is better on Spam data dataset compared to Spam Base.

- Prachi Gupta, Ratnesh Kumar Dubey, Dr. Sadhna Mishra In this, they have compared the performance of Naive Bayes and Support Vector Machine algorithm for classification of emails. The dataset they have used consists of 5574 rows and 2 columns. One column is used for storing emails and other is used as label (Ham or Spam). Accuracy obtained by using Naive Bayes was 99.49% and it was 86.35% by using Support Vector Machine. So, the author concluded that Naive Bayes algorithm performed exceptionally well as compared to SVM for classification of emails.

SCOPE OF PROJECT

In moment's world, spam filtering is a must to cover your business. Spam isn't going down. It's estimated that 70 percent of all dispatch transferred encyclopedically is spam, and the volume of spam continues to grow because spam remains a economic business. Spammers get ever more sophisticated and creative in their tactics to get their dispatches into your inboxes and inflict their annihilation. Spam filtering results must continually be streamlined to address this evolving trouble.

A spam filtering result cannot be 100 percent effective. Still, a business dispatch system without spam filtering is largely vulnerable, if not unworkable. It's important to stop as important spam as you can, to cover your network from the numerous possible pitfalls contagions, phishing attacks, compromised web links and other vicious content.

Spam filters also protect your servers from being overloaded with non-essential emails, and the worse problem of being infected with spam software that may turn them into spam servers themselves should be rescued safely and quickly.

Naïve Bayes Classifier Algorithm

Naïve Bayes algorithm is a supervised knowledge algorithm, which is predicated on Bayes theorem and used for working type problems. It's mainly used in text type that includes a high-dimensional training dataset.

Naïve Bayes Classifier is one of the simple and utmost effective Bracket algorithms which helps in erecting the fast machine knowledge models that can make quick prognostications. It's a probabilistic classifier, which means it predicts on the base of the probability of an object. Some popular samples of Naïve Bayes Algorithm are spam filtration, Mawkish analysis, and classifying papers.

Why is it Called Naïve Bayes?

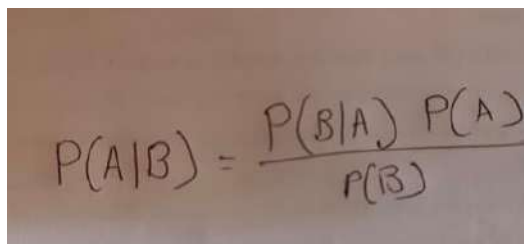
The Naïve Bayes algorithm is comprised of two words Naïve and Bayes, Which can be described as Naïve It's called Naïve because it assumes that the circumstance of a certain point is independent of the circumstance of other features. Similar as if the fruit is linked on the bases of color, shape, and taste, also red, globular, and sweet fruit is honored as an apple. Hence each point collectively contributes to identify that it's an apple without depending on each other.

Bayes: It is called Bayes because it depends on the principle of Bayes' Theorem

Bayes' Theorem:

Bayes' theorem is also known as Bayes' Rule or Bayes' law, which is used to determine the probability of a hypothesis with prior knowledge. It depends on the conditional probability.

The formula for Bayes' theorem is given as



$$P(A|B) = \frac{P(B|A) P(A)}{P(B)}$$

Where,

$P(A|B)$ is Posterior probability: Probability of hypothesis A on the observed event B.

$P(B|A)$ is Likelihood probability: Probability of the evidence given that the probability of a hypothesis is true.

$P(A)$ is Prior Probability: Probability of hypothesis before observing the evidence.

$P(B)$ is Marginal Probability: Probability of Evidence.

DESIGN AND IMPLEMENTATION

Ultramodern spam filtering software continuously struggles to orders the emails rightly. Unwanted spam & promotional communication is the toughest of them all. Spam communication algorithms must be dinned continuously since there's an ongoing battle between spam filtering software and anonymous spam & promotional correspondence senders. Naive Bayes Algorithm in data analytics forms the base for textbook filtering in Gmail, Yahoo Mail, Hotmail & all other platforms.

Like Naive Bayes, other classifier algorithms like Support Vector Machine, or Neural Network also get the job done! Before we begin, then's the dataset for you to download Dispatch Spam Filtering Using Naive Bayes Algorithm This would be a zipped train, attached in the dispatch. Please allow druggies to download this data

Algorithm

1. Take Subject of Email type it on Web App.
2. Click on process and it will start processing it.
3. Compare the input mail to the database-stored key word.
4. It will classify between Spam and ham mail.
5. It will show result that it is spam or ham mail.
6. User can take action accordingly.

IV. Result

The Web Application

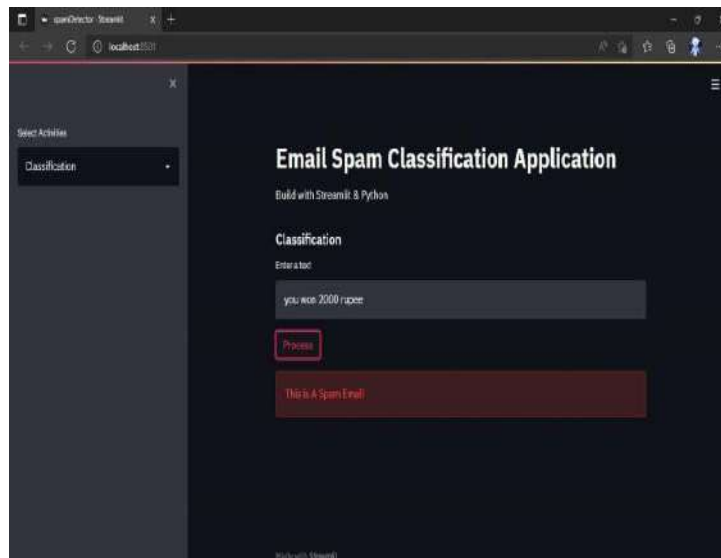


Figure 1: display its spam mail or not

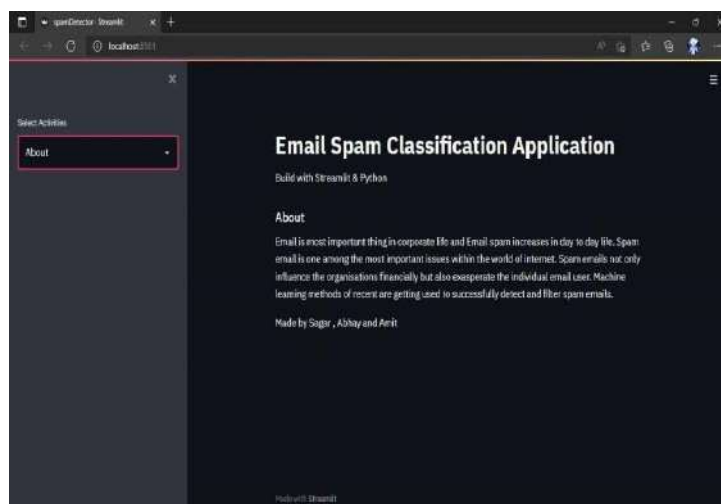


Figure 2: About section

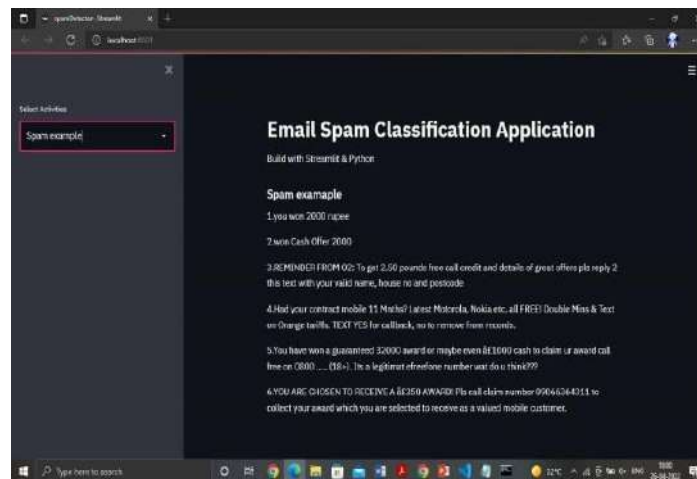


Figure 3: Example Page

V. CONCLUSION

In this study, we reviewed machine learning approaches and their operation to the field of spam filtering. A review of the state of the art algorithms been applied for bracket of dispatches as either spam or ham is handed. The attempts made by different experimenters to working the problem of spam through the use of machine literacy classifiers was bandied. The elaboration of spam dispatches over the times to shirk pollutants was examined. The introductory armature of dispatch spam sludge and the processes involved in filtering spam emails were looked into. The paper surveyed some of the intimately available datasets and performance criteria that can be used to measure the effectiveness of any spam sludge. The challenges of the machine learning algorithms in efficiently handling the imminence of spam was refocused out and relative studies of the machine learning technics available in literature was done. We also revealed some open exploration problems associated with spam pollutants. In general, the figure and volume of literature we reviewed shows that significant progress have been made and will still be made in this field. Having bandied the open problems in spam filtering, farther exploration to enhance the effectiveness of spam pollutants need to be done. This will make the development of spam pollutants to continue to be an active exploration field for preceptor and assiduity interpreters probing machine literacy ways for effective spam filtering. Our stopgap is that exploration scholars will use this paper as a spring board for doing qualitative exploration in spam filtering using machine literacy, deep leaning and deep inimical literacy algorithms.

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VIRTUAL ASSISTANT FOR THE VISUALLY-IMPAIRED**Sakshi Padhye¹, Bhushan Mahale², Smruti Bhandarkar³ and Sneha Sankhe⁴**^{1,2,3}UG Students and ⁴Professors, Department of Information Technology, TCOE, MU, Maharashtra, India**ABSTRACT**

The field of AI has progressed to colourful virtual sidekicks similar to Google Assistant, Microsoft Cortana, Siri, etc. Indeed, after such a development, veritably little has been done for the operation of this technology for visually disabled people as visually disabled people don't have perfect or indeed near-perfect vision. Relating people or identifying objects can be simple for common people but can be delicate for people who are incompletely or fully eyeless. In this design, we reviewed the current state of assistive technology using voice recognition with the help of AI technology and will be developing an AI- grounded voice-controlled desktop operation model on the Microsoft Windows platform, especially which would be veritably useful for visually bloodied persons to reduce their problems for using a computer and penetrating colourful features handed by the computer. This adjunct can be used for posting task operations, media playback, etc. This is veritably useful as the development in technology is harmonious and desktops or laptops are one of the main platforms for it. We generally make use of the keyboard for every command but using voice-grounded software the command input would be done fluently. This will be helpful not only for normal people but also for visually disabled people. This is why we need a voice adjunct that will take command and execute the instruction by giving affair as voice or any other means. We aim to profit visually disabled people and to help them pierce the computer using a voice adjunct. In addition, indeed normal people can also use the installations handed by the operation and use them as virtual assistants.

Keywords: Python Script, speech recognition, voice assistant. **Abbreviation:** API (Application program interface), NLP (Natural Language Processing), TTS (Text to speech), STT (Speech to text).

[I] INTRODUCTION

As we all know the use of virtual assistants is increasing day by day. There are various features in the desktops and mobile phones which can be used more conveniently and in a faster way by using a virtual assistant. An AI personal assistant maybe a piece of software that understands verbal or written commands and completes tasks assigned by the client. It is an example of weak AI that's it can only execute and perform quests designed by the user. In this project, we give voice commands as input using a microphone which is converted into electrical energy. The understanding of the audio signal would be done through Google API. The voice assistant acts like a companion which will help the user with their day-to-day tasks. This assistant will work with minimum effort and will give daily updates. This has inspired the project which will perform tasks from playing music, sending emails, etc. We would use python language with the help of pyttsx3 which is a text to speech conversion library in python and speech recognition APIs. The software would repeat the commands that will be useful for visually impaired people to know what command they have inserted. Browsing the command through the internet and displaying the results through audio as well as the output would be printed on the screen. The visually impaired person would be free from remembering complex braille keyboard commands or the hassle of typing, he/she can simply voice out his/her command and the software will execute it. The system also has the functionality of providing a summary of the content on the website and answering questions asked by the user concerning the summary using a BERT model trained on the Stanford Question Answer Dataset. The main purpose of this project is to help the users who are visually impaired to give them a voice assistant which would help them use laptops and desktops.

[II] LITERATURE SURVEY

[1] MallapaD.Gurav, Shruti S. Salimath, Shruti B. Hatti, Vijayalaxmi I.Byakod, ShivaleelaKanade "A Reading aid for the Blind People using OCR and OpenCV"

Optical character recognition (OCR) is used to sight written or typed characters victimization photoelectric devices and laptop software. It converts footage of typed or written communication into machine-encoded text from scanned documents. throughout this analysis, these written communication square measures regenerate into audio output. OCR is employed in machine techniques like psychological feature computing, text to speech, key info and text mining. it's primarily used inside the sector of research in Character recognition, AI and pc vision. For pattern recognition and to perform Document Image Analysis (DIA) we tend to use data in a grid format in virtual digital library's vogue and construction. They promote Python programming as the main programming language in their system.

[2] "Natural human-computer interaction for virtual personal assistant systems", WilliamC.DeLeeuw

A data processor designed to require audio input, distort the audio input to produce a variety of distorted audio variations, and perform speech recognition on the audio input and also the distorted audio variants is one in all the technologies for natural language interactions with virtual personal assistant systems. Based on contextual info, the data processor chooses a result from a huge number of doable voice recognition results. The data processor could use an eye pursuit detector to assess whether or not the user is visually centered on the Associate in Nursing avatar rendered by the virtual personal assistant to assess the user's level of engagement.

[3] "Next- generation of virtual personal assistants Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home", Veton Kepuska

The development of natural interaction between humans and 17 machines is one of the aims of computing (AI). In recent years, the quickest developing topic in AI has been dialogue systems, generally referred to as interactive colloquial systems. several companies have used dialogue systems technology to form several varieties of Virtual Personal Assistants (VPAs) supported their applications and areas, like Microsoft's Cortana, Apple's Siri, Amazon's Alexa, Google Assistant, and Facebook's

[III] METHODOLOGY

The system consists of a client-server distributed architecture. The system communicates with the system using the speech-to-text interface. The Google API library is used for speech-to-text in python. There will also be a beep so that the user will know when to give the command. The input given from the user has been repeated for the user to confirm the intended input. The understanding of the audio signal would be done using API. The voice assistant acts like a companion which will help the user with their day-to-day tasks. This assistant will work with minimum effort and will give daily updates. This has inspired the project which will perform tasks from playing music to sending emails. Pyttsx3 is a text to speech conversion library in python and speech recognition APIs.

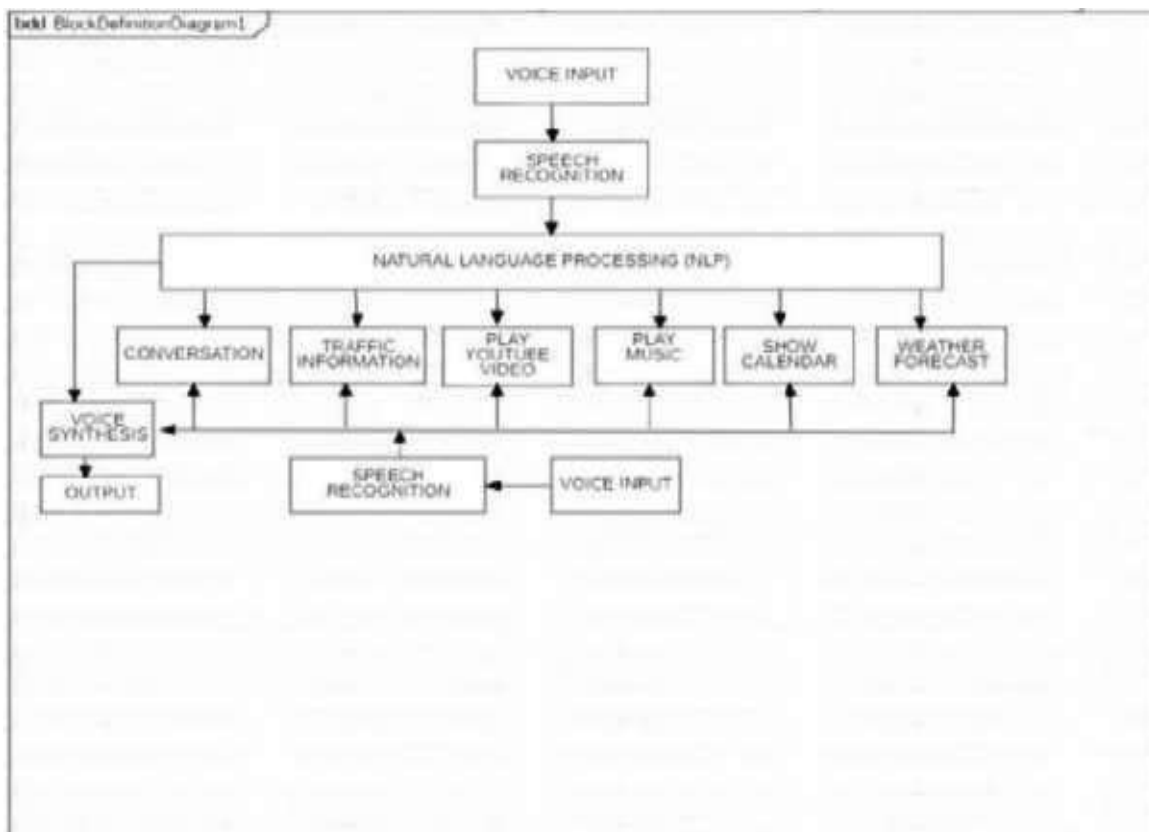


Chart -1: Block diagram

[IV] PROPOSED SYSTEM

- [1] The software will take input as speech through the microphone.
- [2] The audio is interpreted and converted into text.
- [3] The software compares the input with predefined commands.
- [4] Gives output in the form of voice or other means.

The above steps include input taken in the form of speech through the microphone. The collected data is transformed into texted data using NLP. The resulting data is processed through a python script where it is compared with the predefined command. The last step is generating the output which is in the form of the next or converted from text to speech using TTS.

[V] RESULT

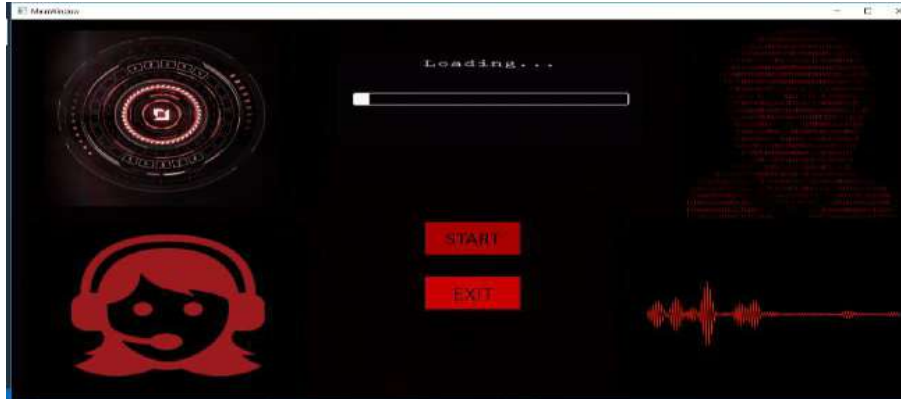


Fig: GUI of the Project

This is the main GUI which we have created for the virtual assistant. By clicking on the start button the assistant will start listening and will respond to the given command. The GUI is made to make our project user friendly and for better interaction.

- 1) When the user says the input as YouTube our assistant processes and gives the output by opening the YouTube video.

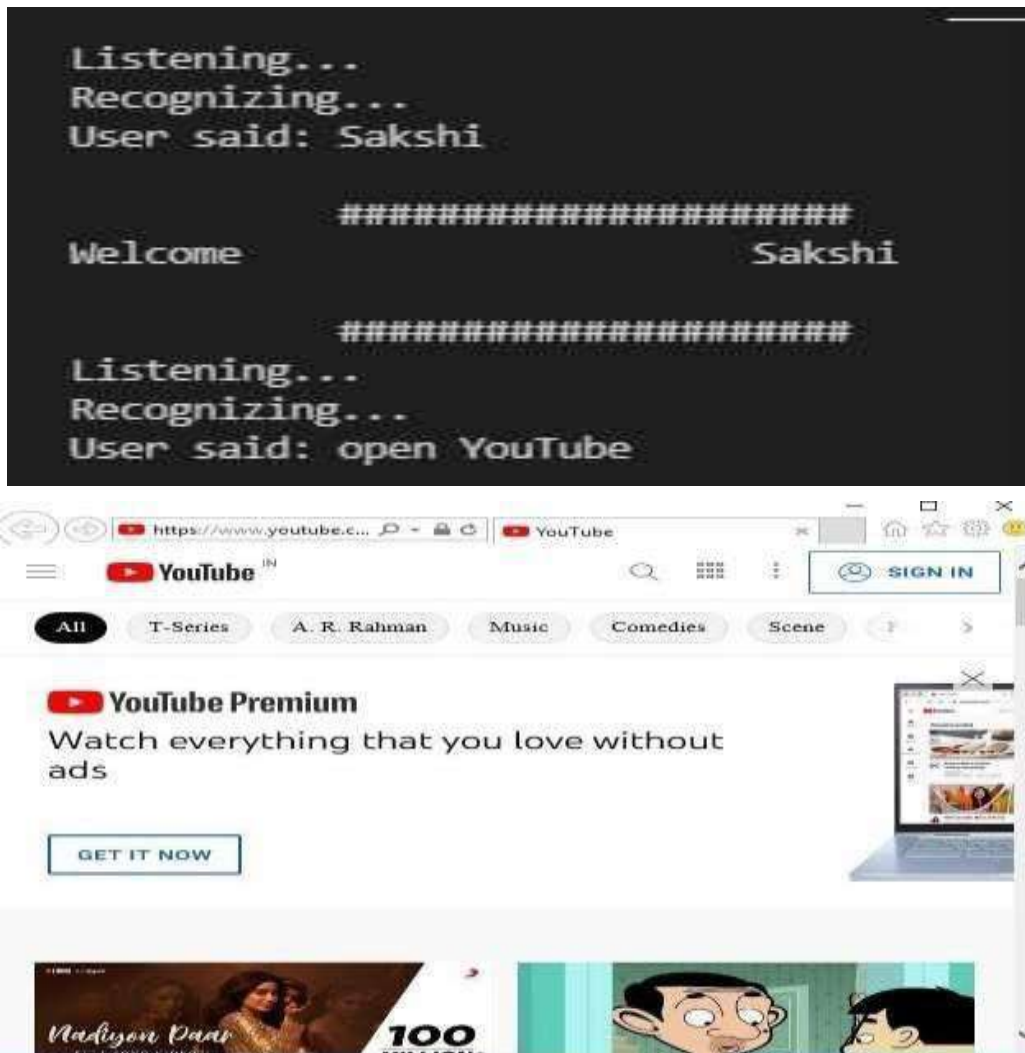


Fig: Output of the command YouTube

2) When the User Says Open Google the Google Window is Opened.

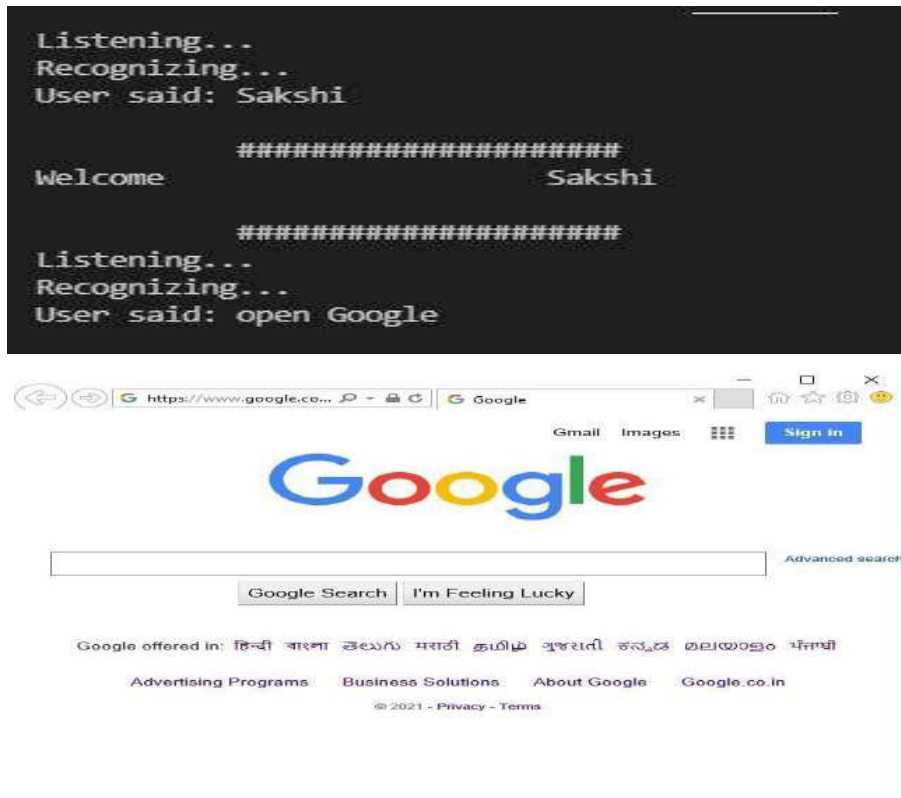


Fig: Output of command Google search

3) When the User Says Play Song it redirects to the Song Folder and Plays Songs.

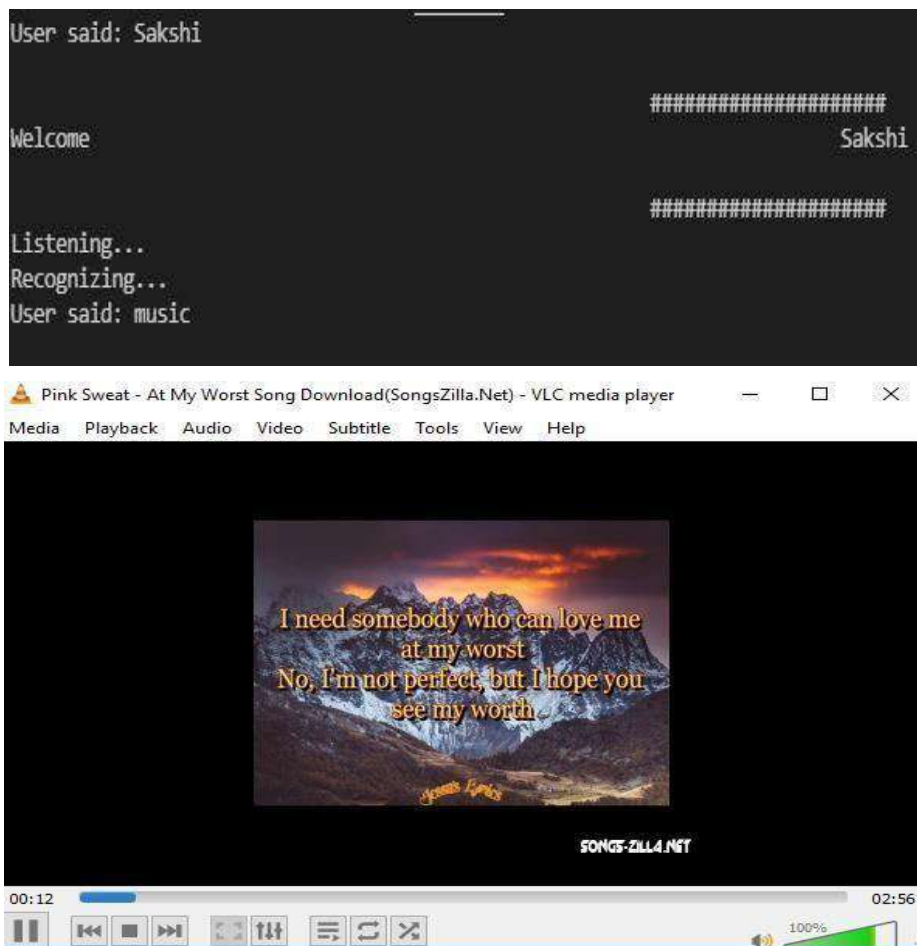


Fig: Output for command music play

[VI] CONCLUSION

The project is a voice assistant for visually impaired people for them to use the computers effectively. It does not require keyboard input for them to run some commands. With the help of speech to text and text speech, the user can interact with the customized system. The features like news, music, video player, read/write an email, etc. It eliminates the need for remembering complex keyboard commands. It is not only useful for the visually impaired but also for other people too. It will get the work done easily and with certain perfection.

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THREE LEVEL AUTHENTICATION SYSTEMS

Shaheem Shaikh¹, Zaid Shaikh², Usaamaraza Shaikh³ and Sheetal Solanki⁴^{1,2,3}UG Student and ⁴Assistant Professor, Department of Information Technology, TCOE, MU, Maharashtra, India**ABSTRACT**

Despite many efforts taken nowadays still security threats can be seen everywhere. And from the start, we are using just single-level password authentication factors, which is not sufficient to give more security. To be more secure we can think of a Three-Level Password Authentication System. So this is an idea to implement three levels of password authentication for true users. In short, we can say, this is to implement three levels of security. The First level password constitutes of simple text-based password and double encrypted with a custom caesar cipher and AES algorithm this effort is taken to resist shoulder surfing attacks through the text password. In the Color Combination password, where users can set different combinations of colors using hex color codes according to their choice just by clicking on those colors forms the second level of authentication. The third level uses a Random File as a Password there at first user has to select a file to use as a password. These three levels are used as a key for custom substitution cipher algorithms.

Keywords: Authentication, Text Based Password, MySQL, JavaFx, Hex Color Code, JDBC, Eclipse, AES algorithm, Caesar cipher.

I. INTRODUCTION

As the ever-changing digital world provides us with a lot of perks and ease in everyday work, there are also security issues and challenges that arise daily, and one of these issues is authentication. Authentication is a very important part of any digital or software application, for a basic level of authentication we use text-based passwords but with time even they became vulnerable, so to increase the security two-factor authentication was introduced. In two-level authentication the second level of security is used as a biometric, captcha, etc which increases the complexity for hackers and makes the system more secure, thus to further increase the security we have used Three Level Authentication. This project gives more security to the user and validates users for accessing the system only when they have input the correct password. The project involves three levels of user authentication. This project contains three logins which include three different kinds of password systems. The password difficulty increases as the authentication level increases. Users have to enter or input the correct password for a successful login. Users will have the right to set passwords according to their wishes. This project comprises text passwords i.e. passphrase, color combination, and graphical password for the three levels respectively. Along these lines there would be immaterial odds of a bot or anybody splitting passwords regardless of whether they have broken the principal level or second level, it is difficult to break the third one. While making the innovation the accentuation was put on the utilization of inventive and untraditional techniques. Numerous clients locate the broadest text-based secret key frameworks hostile, so on account of the three-level secret key, we had a go at making a straightforward UI and giving clients the best possible comfort in solving passwords.

II. LITERATURE SURVEY

User Authentication: A Three-Level Password Authentication Mechanism by Gouri Sankar Mishra, Pradeep Kumar Mishra, Parma Nand, Rani Astya, Amrita. published by: International Journal of Engineering Research and Technology IJERT in 2020: In this paper, they have used three levels of authentication and in that the first level is a textual password where the user will have to set up a password at the time of registration and at login the same password needs to be entered to clear the level. The second level of authentication is a color pattern in which the user needs to select the same color pattern that he chose at the time of registration. The last level of authentication is OTP, where the user needs to enter an OTP that is sent at the time of login to the registered mail. [1]

3 Level Security System: A 3 Level Security System by Anaswara Davis, published by IJERT inn 2015 . Here the first level of this is the text-based password that the user needs to enter while login same as registration, then the second level comes as an image-based password where the user needs to select the same three images from three grids that they chose at the time of registration and lastly, they need to verify the third level of authentication which is an OTP sent to their registered email.[2]

Three Level Security System Using Image-Based Authentication: A Three-Level Security System Using Image-Based Authentication by S Gopalkrishna, M Aparna, C.M. Anjushree. Published by IJARCCCE in 2018. In this,

the first level of authentication is the text-based password that is set at the time of registration and while the login user needs to enter the same, the second level of authentication is image-based authentication where the user needs to select images at the time of registration from a grid and later at the time of login user needs to select the same images from the grid in the same sequence. the third level here is OTP validation where the one-time password is sent to the user during login and the user needs to enter that correctly to clear the authentication process.[3]

3LAS (Three Level Authentication Scheme): A 3LAS (Three Level Authentication Scheme) by Kunal mulwani, Saurabh Naik, Navinkumar Gurani, Dr. Nupur GirI, Prof Sharmila Sengupta. published by IJETAE in 2013 . In this a graphical method is used for authentication, as textual passwords are used commonly nowadays and day by day new methods are invented to crack the textual password. Whereas a graphical password is more secure and can also overcome drawbacks of textual passwords like shoulder surfing, key logging etc.[4]

III. PROPOSED SYSTEM

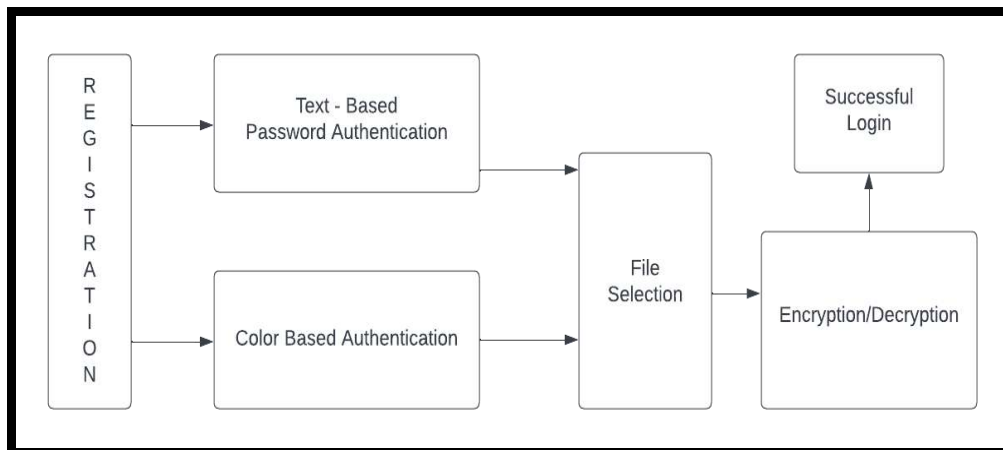


Fig 1: System Block Diagram

The implementation phase of the Three Level Authentication System includes three phases the first phase will be the text-based password, the user will have to enter a textual password at the time of registration and the password should be greater than eight characters and must include numbers and special symbols with at least one caps letter. This password is saved in the database with encryption, later at the time of logging in the user needs to enter the exact password to clear through the first phase of authentication. The second phase consists of a color pattern that means the user will be presented with a color grid from which the user has to choose colors and those colors are saved in the database, and at the time of login to the second phase, the user will have to select the same color codes as during the time of registration to clear that phase. The last level of authentication has a file selection method, here at the time of registration the user can choose any file from the system and there's no restriction to the number of files that can be chosen, the name of the file is saved to a database along with the extension to increase security, later at the time of authentication the user needs to choose the same files with same chronology to successfully access the system. After this, the user can encrypt any of his files using the encrypt button and decrypt using the decrypt button.

IV. TECHNOLOGY USED

Java: Java is used for our frontend. Java is rarely used in frontend development. Java is perfect for writing whole apps with complicated logic, large or complex data sets, and desktop-style interfaces. Custom algorithms, Javafx, and AES algorithm packages are used.

MySql: SQL is a language programmers use to create, modify and extract data from the relational database, as well as control user access to the database.

Advanced Encryption Standard (AES): Advanced Encryption Standard (AES) is a specification for the encryption of electronic data established by the U.S National Institute of Standards and Technology (NIST) in 2001. AES is widely used today as it is a much stronger than DES and triple-DES despite being harder to implement.

- AES is a block cipher.
- The key size can be 128/192/256 bits.
- Encrypts data in blocks of 128 bits each.

That means it takes 128 bits as input and outputs 128 bits of encrypted cipher text as output. AES relies on substitution-permutation network principle which means it is performed using a series of linked operations which involves replacing and shuffling of the input data.

Working of the Cipher

AES performs operations on bytes of data rather than in bits. Since the block size is 128 bits, the cipher processes 128 bits (or 16 bytes) of the input data at a time.

The number of rounds depends on the key length as follows:

128 bit key – 10 rounds

192 bit key – 12 rounds

256 bit key – 14 rounds

Creation of Round keys:

A Key Schedule algorithm is used to calculate all the round keys from the key. So, the initial key is used to create many different round keys which will be used in the corresponding round of the encryption.

Encryption:

AES considers each block as a 16-byte (4-byte x 4 bytes = 128) grid in a column major arrangement.

[b0 | b4 | b8 | b12 |
| b1 | b5 | b9 | b13 |
| b2 | b6 | b10 | b14 |
| b3 | b7 | b11 | b15]

Each round comprises 4 steps:

Sub Bytes

Shift Rows

Mix Columns

Add Round Key

Decryption:

The stages in the rounds can be easily undone as these stages have an opposite to it which when performed reverts the changes. Each 128 blocks goes through the 10,12 or 14 rounds depending on the key size.

The stages of each round in decryption are as follows:

Add round key

Inverse Mix Columns

Shift Rows

Inverse Sub Byte

With AES algorithm, a custom algorithm is also used as a two-level security.

V. RESULT AND DISCUSSION



Fig 2: Registration Level 1

In the first level of registration, the user will be prompted to enter some details and a textual password that can be used at the time of login

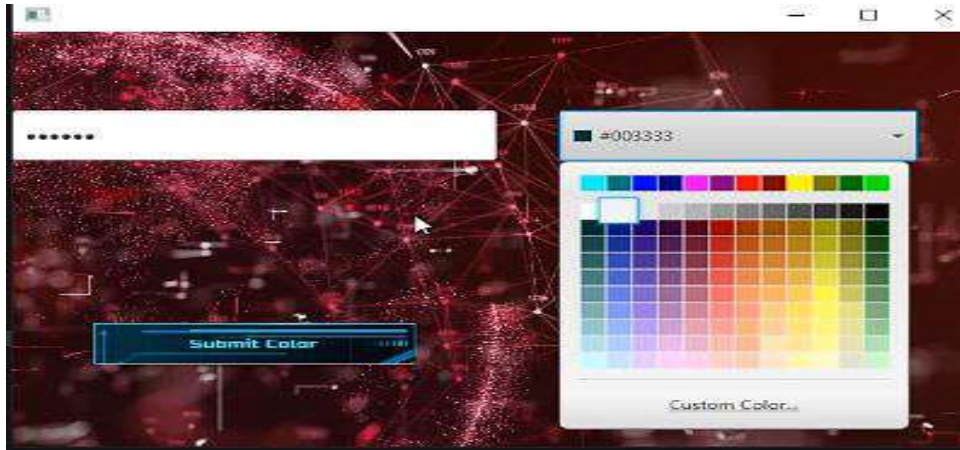


Fig 3: Registration Level 2

In the second phase of registration, the user can select colors from a color grid that will be on the screen, and later at the time of login same color codes needs to be selected to clear the phase.

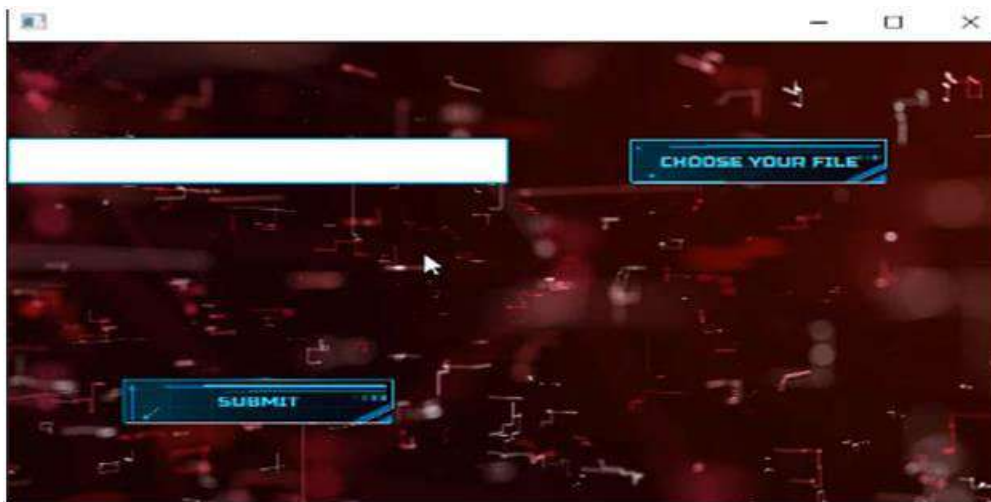


Fig 4: Registration Level 3

In the last phase of registration, the user can choose a file of a number of files and the name of a file with its extension is saved to the database, later at the time of logging in the same file needs to be selected in the correct order to clear the authentication.

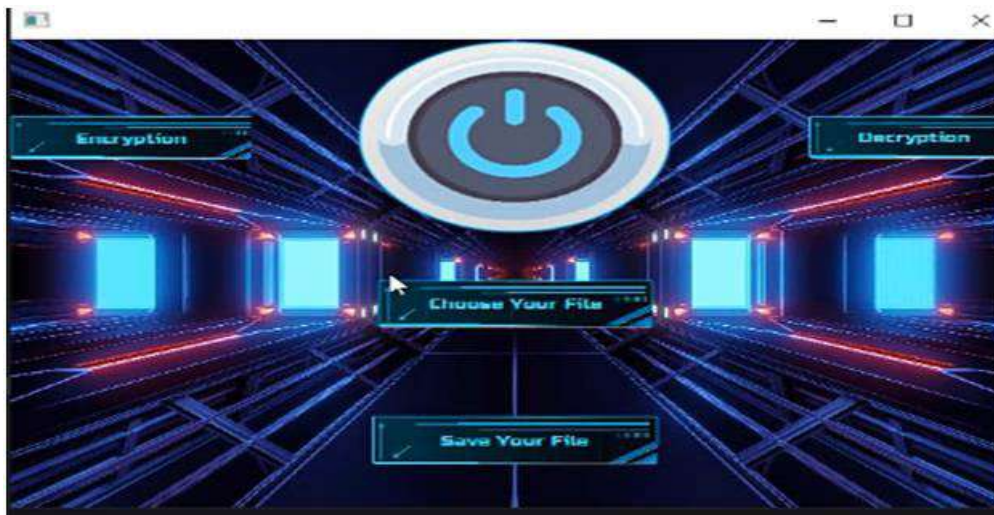


Fig 5: Encryption/Decryption

Here the user can use encrypt/decrypt button to perform the encryption or decryption of the selected file.

VI. CONCLUSIONS

Three levels are efficient because users need to go through three different authentication phases with increased difficulty. Firstly, we have a simple basic authentication using a text-based user id and password. With the benefit of having three-level password authentication, we can check a bot and user security code so we cover all three major security fields. However, time complexity can be high but security is also high and there are regions where you can compromise with a little bit of time complexity but not at all with data security.

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MOVIE RECOMMENDATION SYSTEM USING SENTIMENT ANALYSIS**Saloni Tandel¹, Shoumik Nath², Abhishek Nair³ and Sonali Karthik⁴**^{1,2,3}UG Students and ⁴Assistant Professor, Department of Information Technology, TCOE, MU, Maharashtra, India**ABSTRACT**

Recommendation system has become an essential part of E-commerce and Digital Marketing. It is difficult to filter out options for an Individual based on personal preference and it is a major challenge for the recommendation system. Many users keep wondering what would be the next best thing to watch in their limited free time. A good recommendation helps solve the issue. The proposed system is built on the Content-Based Recommendation System. Users will receive user preference-based results, as well as an analytical version of a set of reviews, saving them from having to read through a lengthy paragraph of review. The user will learn the simplest meaning of it by just two keywords: good and bad. Sentiment Analysis is used to perform this analysis. In the Movie Recommendation System machine learning algorithms are implemented to solve this issue. This system works on the individual's rating and would suggest certain options based on the user's previous watch. As it calculates the similarity between different users' taste and rating given by them for further Recommendations.

Keywords: Bad, Content-Based, Good, Movie Recommendation, Machine Learning Reviews, Sentiment Analysis.

I. INTRODUCTION

In today's world, entertainment is the most important element of one's lifestyle. As OTT grows in popularity as a result of the digital revolution, more and more people are turning away from traditional concrete block movie theatres and toward monthly subscription-based OTT. Users are enrolled to multiple OTT services, however, because corporates are competing to acquire major titles and publish them under their banner. As more content becomes available to the user, the user's perplexity about what to watch grows. A consumer spends more time perusing the catalogue than actually watching the content. Users should have a good number of recommendations from past material so that they can simply choose what to watch next. The goal of the movie recommendation system is to make the catalogue browsing experience more user friendly and easy to analyze for the user in order to reduce buffer time.

II. PROBLEM STATEMENT

We've all been in the situation when, instead of viewing something significant at lunch, we just keep scrolling through the vast catalogue of movies and shows, and before we know it, our time is gone. Instead of navigating through the sea of options, we may just check the recommendations for the genres we enjoy watching. As a result, this system is built on the Recommendation System, which provides consumers with a variety of choices from which to choose. Users will be recommended movies by this method. This system is based on the individual's rating and would recommend certain options based on the user's previous viewing history. As it computes the similarity between different users' tastes and ratings for future recommendations.

III. LITERATURE SURVEY

- 1) Bagher Rahimpour Cami, Hamid Hassanpour, and Hoda Mashayekhi proposed a Content-based Movie Recommender System Based on Temporal User Preferences. It implements the Temporal Preference Model, which is trained with three primary elements in mind: interest extraction, preference inference, and prediction. The dataset of movies is gathered from IMDB and then separated into these three key elements depending on the plot, rating, and genre. The suggested system provides consumers with reliable results based on the content seen, as well as recommendations for new movies connected to the content.
- 2) B Venkatesh and Subramanyam Kuniseti introduced Content-Based Movie Recommendation System Using Genre Correlation. The objective of this system is to give consumers with material based on a dataset that has been partitioned into two portions. One part offers a list of movies as well as the genres into which they have been classified. The other section of the dataset comprises a list of movie ratings given by the user on a scale of 1–5, with 5 being the highest. The rating has been converted to binary values for ease of use. It compares the similarity of the values.
- 3) Minjae Kim, SungHwan Jeon and Heeseong Shin proposed Movie Recommendation Based on User Similarity of Consumption Pattern Change. The proposed system is to forecast and propose a movie based on user movie consumption behaviours. Because it calculates user similarity based on movie rating data and

classifies users with similar movie preferences. The system uses RNN to learn movie consumption patterns of comparable user groups and then forecast or recommend movies based on those patterns. They use a collaborative filtering algorithm to demonstrate the system's usefulness. To demonstrate the prediction, they employ simple RNN and modified RNN on the dataset.

- 4) Sai Rohit, Vishwas Sathish, Tanya Mehrotra, and Bhaskarjyoti Das introduced Applications of Optimal Stopping Algorithm for Social Graph Based Recommendation. This system has proposed Basic item-based recommendation algorithms were enhanced to take into account the effect of a user's social circle when making recommendations. Depending on a person's social network. The things to be recommended were chosen by the user. Apart from that, as a result of this, his past movie ratings were deemed to be inadequate. Acquire a sense of his tastes, which were then combined with the preferences of this ego-network to get a list of suggestions.

IV. OBJECTIVE

The system's major goal is to give users with a movie recommendation system in order to save the users' time.

To give movie data to users, such as the release date, genres of the movie discussed, release date, director's details, actor details, and so on.

Users to have insight with reviews of the specifically sought movie, analyze the reviews using sentiment analysis, and provide a positive or negative result to the user.

Help users with suggestions depending on the movie they have looked for, and to strive to deliver as accurate recommendations as possible based on the movie.

V. REQUIREMENTS

i) Software Requirements

A. Operating system: Any windows will be optimal enough for running this project.

B. Programming languages: Python

C. **Front-end:** HTML, CSS

D. **Framework:** Flask

E. **API:** TMDB

ii) Hardware Requirements:

A. **System:** A pc with minimum 4 gb ram, intel Pentium and above processor.

VI. ALGORITHMS

Cosine Similarity

The proposed outcomes were implemented with the help of cosine similarity. The output is based on the similarity scores. It is a numerical value that runs from 0 to 1 and is used to determine how similar two items are on a scale of 0 to 1. By analysing the text details of both items, the similarity score is calculated. This is accomplished through the use of cosine similarity. The advantage of cosine similarity is that even though the items are plotted far apart by Euclidean distance, there is a chance they will be plotted closer together in cosine similarity. As a result, the output is better streamlined.

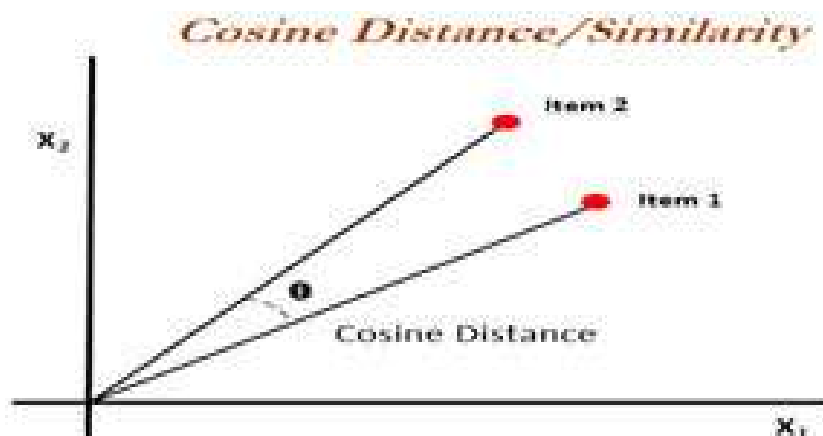


Chart -1: Cosine Distance/Similarity

Naive Bayes Algorithm:

It's a classification method based on the Bayes theorem and the assumption of predictor independence. The presence of a given feature in a class is assumed by a Naive Bayes classifier. The Naive Bayes theorem allows us to calculate probability. The data is transformed into a frequency table, and a likelihood table is constructed, giving us a yes/no probability. It is the result of the input given. Naive Bayes outperforms other algorithms like logistic regression, and it requires less training, which is a plus.

VII. METHODOLOGY

The movie recommendation system uses cosine similarity and the naive bayes algorithm, as well as the TMDB API and beautifulsoup4 to scrape data from the IMDB site for reviews. For the years 2018, 2019, and 2020, the data sets used were the IMDB 5000 Movie Dataset, The Movies Dataset, and a list of movies from Wikipedia. When a user conducts a movie search, the results are sent to the database for filtering. Following the filtering, the user is supplied with movie data, which includes the title, overview, rating, genre, release date, runtime, and status of the film. The user is also given information about the movie's cast. The user can click on a certain cast member to learn more about that person's personality.

For sentiment analysis, the reviews from IMDB are fed through a trained model using the Naive Bayes algorithm. The output is generated as a consequence of a good/bad review analysis, which allows the user to save time that would otherwise be spent reading the review. We also present recommended movies based on the searched movie, which we collected using cosine similarity, which helps compare and provide similar results.

1. The User will visit the System.
2. It will Search for the movie.
3. The Search result will be then given to the database for filtering.
4. After the Filtering the Recommended list is given to the user.
5. The list will also show the reviews which have been also segmented with sentiment analysis (asa "Good" or "Bad" Review).

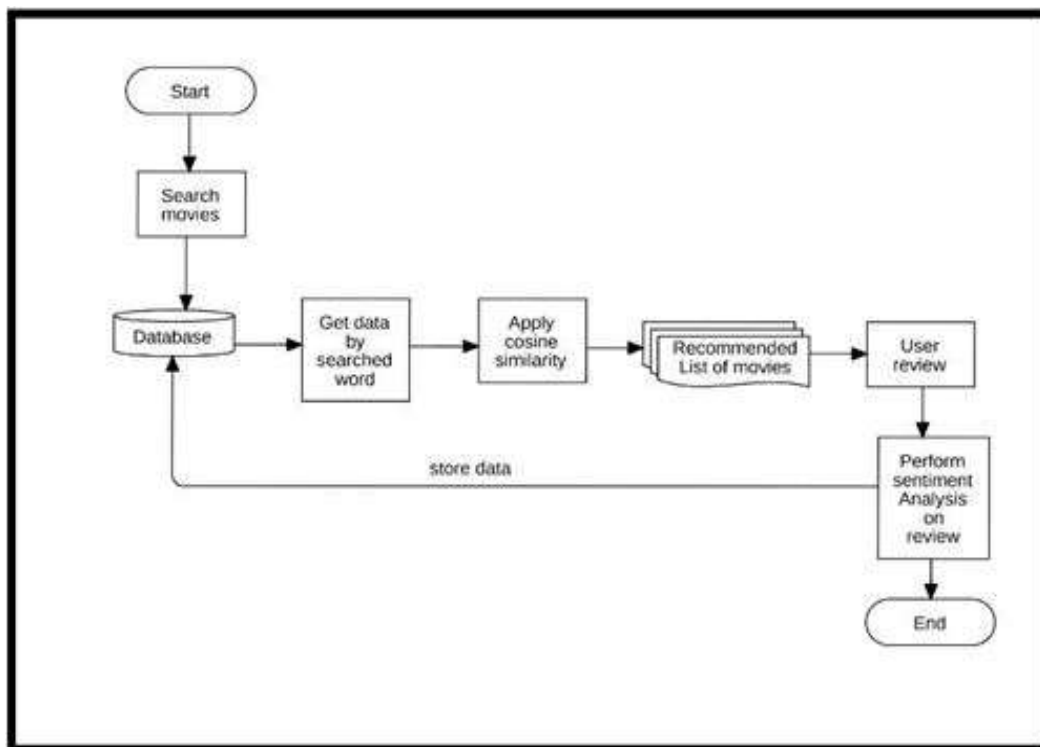


Chart -2: Methodology Used

VIII. RESULTS

When a user searches for a movie title, cosine similarity determines the distance closest to the result. As a result, when the user searches for a movie title, 10 recommendations linked to the same genre appear. The title that was searched will also display an overview, run time, and release date. The cast members' bios were included with the cast details.



Fig 1: Home page

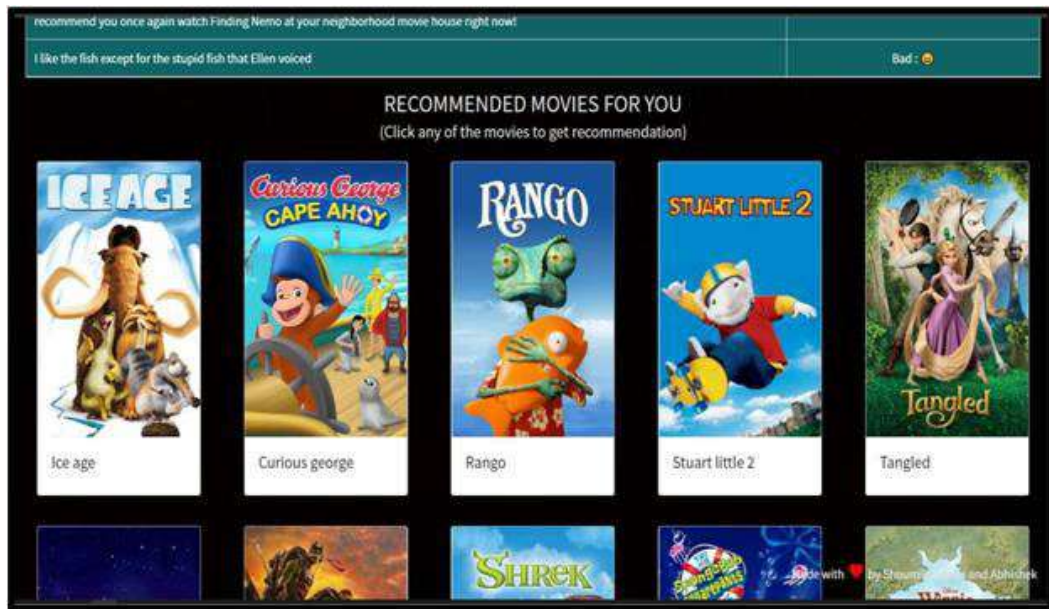


Fig 2: Recommendations

After the recommendation part, the user is provided a table where a long monologue of a review is delivered by a watcher, and this monologue is translated to a simple response of “Good” or “Bad” via sentiment analysis with naïve bayes. We have made it easier for users to choose a movie by doing so.

USER REVIEWS	
Comments	Sentiments
This movie is just gorgeous to look at, really the animation is just stunning, with the blue backgrounds and colorful characters. My only criticism is that although there are some very funny moments, like Doreen speaking whale (Ellen DeGeneres was born to speak whale, really she was) and Barry Humphries's shark, I don't think it is as laugh-out loud funny as Toy Story. Finding Nemo is definitely the most beautiful visually of the Pixar movies, I would certainly pick it over Cars. The music by Thomas Newman was just beautiful, and I always look out for this in a movie, and it was a delight hearing "Beyond the Sea" over the end credits. The characters are genuinely memorable, especially Doreen and Bruce. And who can forget the girl Darla, with the Psycho music (that is really terrifying) The voice talents are very good indeed, especially Ellen DeGeneres, and I liked Willem Dafoe's Gil. Albert Brooks made a wonderfully paranoid father figure, and I loved the plot about Marlin's son Nemo being taken by divers and Marlin (a clown fish) racing to find him. That is simple, but we meet characters like the turtle, so the film is filled with fun, enough to satisfy the fuzziest child. In conclusion, 9/10 for the visuals and the characters. Outstanding! Bethany Cox	Good : 😊
Clown fish Marlin and Coral start a new brood. Coral battles and loses to a barracuda. Only Marlin and one egg survive. Respecting Coral's wish, he names him Nemo and becomes an overprotective parent. Nemo sees a boat in the open waters. After being berated and belittled by Marlin, Nemo swims out and is captured by scuba divers. Marlin tries desperately to follow them with the help of turtles and Dory with short term memory lost. Meanwhile Nemo finds himself in the dental office aquarium and he must organize a break-out. The animation is great and the story is terrific. It's Pixar after all. The best thing is Ellen DeGeneres as Dory. She is hilarious and she's does great voice work. The short term memory lost is insanely funny.	Good : 😊
Pixar brings it on. This wonderful trip to the bottom of the sea is worth watching again and again. It centers around a misbehaving clownfish who gets himself taken away to a faraway place, with little hope of ever seeing his father again. The characters along the way are priceless, with clever dialogue, quirky sensibilities, and, ultimately, love for one another. The creators were able to capitalize on the innate, somewhat stereotypical, qualities of the individual sea denizens by using some of our current comic geniuses (like Ellen DeGeneres) and make them charming. If you've not seen this, make time. You don't even need the kids.	Good : 😊
The very first computer animated film made, and by Walt Disney Pictures and Pixar was Toy Story, and since then we've had A Bug's Life, Dinosaur, Toy Story 2 and Monsters, Inc. This was one of the most successful Disney films at the cinema to date. It is the underwater story of a young clown fish named Nemo (Alexander Gould) taken by divers and put into a tank. The idea is obviously his Dad, Marlin (Albert Brooks), and new friend Dory	Good : 😊

Fig 3: Review Analysis

IX. CONCLUSIONS

Our system mainly focuses on making a unique experience for the user as it gives user content related to the searches and also gives more recommendations to explore around. The paper points out certain outcomes for the recommendation systems as the system only tends to provide user content based on the rating the user has provided to a certain genre of movies as basis on which the recommendation list is provided to the user. As in this project we try to overcome some aspects. As our system gives insight regarding the movies as users also explore the review section. At times reading or analyzing the review can get tricky for users. We have also taken care of that aspect. As we have applied sentiment analysis on given reviews so the system can distinguish whether the content was pleasing or not for the user. Though users can analyze how many users have liked the movie and disliked it through the review section.

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FORGE: A VOICE MIMICKING TECHNOLOGY

Sabihanaz Shaikh¹, Zakirullah Siddiqui², Ankita Singh³ and Iqbal Shaikh⁴^{1,2,3}Student and ⁴Guide, Department of Computer Engineering, Theem College of Engineering, Boisar, Palghar, Maharashtra, India**ABSTRACT**

Technological advancement has continued to develop over the once two decades impacting how we engage with each other. Text-to- speech has been a crucial area of focus for software inventors in recent times, especially those working in fields similar as developing AI for smart machines, deep- literacy, and NLP. We present a neural network- grounded system for textbook-to- speech (TTS) conflation that's suitable to induce speech audio in the voice of different speakers, including those unseen during training. Our system consists of three singly trained factors a speaker encoder network, a sequence-to- sequence conflation network grounded on Tacotron 2, an bus-accumulative WaveNet- grounded vocoder network. We demonstrate that the system is suitable to transfer the knowledge of speaker variability learned by the discriminatively trained speaker encoder to the multi-speaker TTS task and is suitable to synthesize natural speech from speakers 'unseen during training. We quantify the significance of training the speaker encoder on a large and different speaker set in order to gain the stylish conception performance. Eventually, we show that aimlessly tried speaker embeddings can be used to synthesize speech in the voice of new speakers different from those used in training, indicating that the model has learned a high- quality speaker representation. As similar, the thing of this design was to produce a tool for generating natural speech from textbook for a variety of speakers. The result of this design demonstrates the capability of neural network to be useful in this task.

Keywords: Voice cloning, voice recognition, Deep learning, Speaker Encoder, Synthesizer, Wavenet , vocoder, Text-to-speech.

I. INTRODUCTION

Forge is an implementation of Transfer Learning from Speaker Verification to Multi-Speaker Text-to-Speech synthesis with a vocoder that works in real- time. It's a deep literacy frame in three stages. In the first stage, one creates a digital representation of a voice from a many seconds of audio. In the alternate and third stages, this representation is used as reference to induce speech given any arbitrary textbook.

It consists of three independent factors which is introduced to give an effective result to the multi-speaker adaption during speech conflation. These factors videlicet Speaker Encoder, Synthesizer and Vocoder are deep literacy models that are trained singly of each other. It allows creating a numerical representation of a voice from a many seconds of audio and to use it to condition the model to induce new voices.

The thing of this work is to make a TTS system which can induce natural speech for a variety of speakers in a data effective manner. We specifically address a zero- shot literacy setting, where a many seconds of un transcribed reference audio from a target speaker is used to synthesize new speech in that speaker's voice, without streamlining any model parameters. Similar systems have availability operations, similar as restoring the capability to communicate naturally to druggies who have lost their voice and are thus unfit to give numerous new training exemplifications. They could also enable new operations, similar as transferring a voice across languages for further natural speech-to- speech restatement or generating realistic speech from textbook in low resource settings.

Synthesizing natural speech requires training on a large number of high- quality speech- paraphrase dyads, and supporting numerous speakers generally uses knockouts of twinkles of training data per speaker. Recording a large quantum of high- quality data for numerous speakers is impracticable. Our approach is to uncouple speaker modeling from speech conflation by singly training a speaker-discriminational embedding network that captures the space of speaker characteristics and training a high- quality TTS model on a lower dataset conditioned on the representation learned by the first network. Divorcing the networks enables them to be trained on independent data, which reduces the need to gain high quality multi-speaker training data. We have trained the speaker embedding network on a speaker verification task to determine if two different utterances were spoken by the same speaker. In discrepancy to the posterior TTS model, this network is trained on un transcribed speech containing reverberation and background noise from a large number of speakers. We demonstrate that the speaker encoder and conflation networks can be trained on unstable and disjoint sets of speakers and still generalize well.

II. LITERATURE REVIEW

There has been significant interest in end-to-end training of TTS models, which are trained directly from text-audio duos, without depending on hand framed intermediate representations. Tacotron 2 (6) used WaveNet (11) as a vocoder to invert spectrograms generated by an encoder-decoder framing with attention, attaining naturalness approaching that of natural speech by combining Tacotron's prosody with WaveNet's audio quality. It only supported a single speaker.

Gibiansky et al. (5) introduced a multispeaker variation of Tacotron which learned low-dimensional speaker embedding for each training speaker. Deep Voice 3 proposed a completely convolutional encoder-decoder architecture which gauged up to support over speakers from LibriSpeech.

These systems learn a fixed set of speaker embeddings and thus only support conflation of voices seen during training. In discrepancy, VoiceLoop (10) proposed a new armature grounded on a fixed size memory buffer which can produce speech from voices unseen during training. Attaining good results needed knockouts of twinkles of registration speech and reiterations for a new speaker.

Recent extensions have enabled many-shot speaker adaption where only a many seconds of speech per speaker (without reiterations) can be used to induce new speech in that speaker's voice. Neural voice cloning by Sercan O Arik et al. (2) Extends Deep Voice 3, comparing a speaker adaption system analogous to VoiceLoop, where the model parameters (including speaker embedding) are fine-tuned on a small quantum of adaption data to a speaker garbling system which uses a neural network to prognosticate speaker embedding directly from a spectrogram. The ultimate approach is significantly further data effective, carrying advanced lightheartedness using small quantities of adaption data, in as many as one or two utterances. It's also significantly further computationally effective since it doesn't bear hundreds of backpropagation duplications.

Nachmani et al. (7) also extended VoiceLoop (10) to use a target speaker garbling network to prognosticate a speaker embedding. This network is trained concertedly with the conflation network using a contrastive trinity loss to insure that embeddings prognosticated from utterances by the same speaker are near than embeddings reckoned from different speakers. In addition, a cycle-thickness loss is used to insure that the synthesized speech encodes to a analogous embedding as the adaption utterance.

An analogous spectrogram encoder network, trained without a triplet loss, was shown to work for transferring target prosody to synthesized speech. In this paper we demonstrate that training a analogous encoder to distinguish between speakers leads to dependable transfer of speaker characteristics. Our work is most analogous to the speaker garbling models in Neural Voice cloning by Sercan O Arik et al. (2) and befitting new speakers grounded on untanscribed sample by Eliya Nachmani et al. (7), except that we use a network singly-trained for a speaker verification task on a large dataset of untranscribed audio from knockouts of thousands of speakers, using a state-of-the-art generalized end-to-end loss by Li Wan et al (4).

Eliya Nachmani et al. (7) incorporated a analogous speaker-discriminational representation into their model, still all factors were trained concertedly. In discrepancy, we explore transfer literacy from apre-trained speaker verification model.

Doddipatla et al. (8) in DNN grounded speech conflation used a analogous transfer learning configuration where a speaker embedding reckoned from apre-trained speaker classifier was used to condition a TTS system. In this paper we use an end-to-end conflation network which doesn't calculate on intermediate verbal features, and a mainly different speaker embedding network which isn't limited to a unrestricted set of speakers. Likewise, we dissect how quality varies with the number of speakers in the training set, and find that zero-shot transfer requires training on thousands of speakers, numerous further than were used in Speaker adaption in DNN grounded speech conflation using d-vectors.

III. PROJECT DESIGN AND IMPLEMENTATION

3.6 Overview

This system aims to resolve real time voice replicating challenges by offering a technology which will synthesize voice from text while retaining its naturalness. With technologies developing every day in such a fast pace, the need for better system that can give best possible result is high. Text to Speech Synthesis is a problem that has operations in a wide range of scripts. They can be used to read out pdfs loud, help the visually crippled to interact with text, make chatbots more interactive etc. Historically, numerous systems were erected to attack this task using signal processing and deep literacy approaches. As numerous positive, instigative use cases for voice cloning are arising, Forge has marked a huge scope for voice mimicking and can be used in promoting the development of this technology.

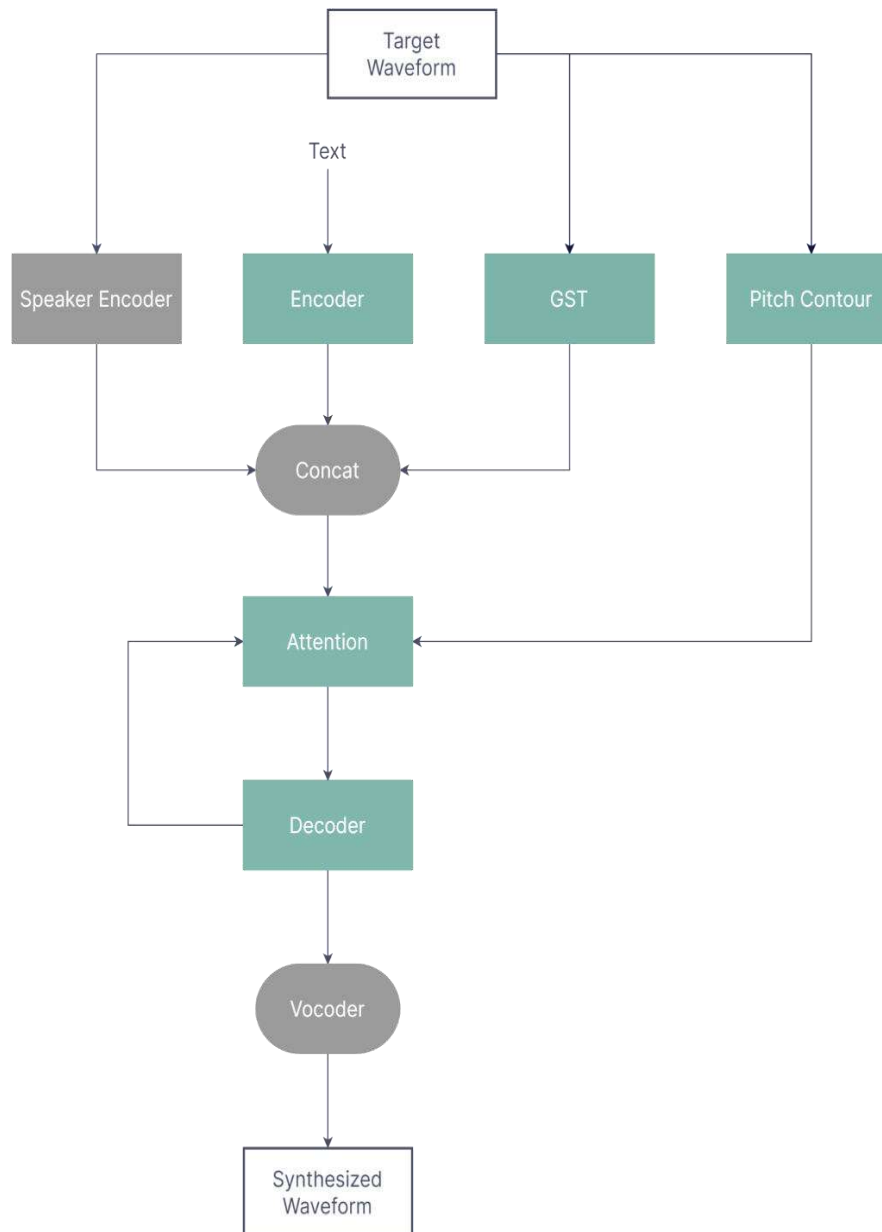


Fig 3.1 Flow Chart of Forge

3.7 Existing System:

There has been some advance development in the field of voice cloning in the past several times. One correspondent is WaveNet by google where ae.g. Genuinely large database of short speech fractions is recorded from a single speaker. Also these fractions are recombined to form the complete utterances. The strike of this approach is that you'll need a completely new database of audio samples if you want to make minor tweaks to the voice, like altering the emphasis or emotion. Also, the audio samples generated by this approach are really unnatural, glitchy and robotic. A debit of autoregressive models like WaveNet is that they tend to learn original structure much better than global structure. It's further conspicuous when modeling high-dimensional distributions.

Another similar development would be Deep Voice. Deep Voice is a TTS system developed by the experimenters at Baidu. Its first interpretation, Deep Voice 1 was inspired by the traditional textbook-to-speech channels. It adopts the same structure, but replaces all factors with neural networks and uses simpler features. First, it converts the textbook to phonemes and also uses an audio synthesis model to convert verbal features into speech. The rearmost interpretation of this design is Deep Voice 3, which uses a completely-convolutional character-to-spectrogram armature. Two approaches were took up by Baidu's experimenters Speaker adaptation and Speaker encoding. Both approaches can deliver good performance with minimum audio input data and both of them can be integrated into the deep voice system without demeaning the quality of the system.

3.8 Proposed System

Our system describes a neural network-based system for text-to-speech (TTS) synthesis that is able to generate speech audio in the voice of different speakers. It is composed of three independently trained neural networks, illustrated in Figure:

- (1) A recurrent speaker encoder, which computes a fixed dimensional vector from a speech signal,
- (2) A sequence-to-sequence synthesizer, which predicts a Mel spectrogram from a sequence of grapheme or phoneme inputs, conditioned on the speaker embedding vector, and
- (3) An autoregressive WaveNet vocoder, which converts the spectrogram into time domain waveforms.

It takes a clean audio sample and text from the user as input and produces speech in the exact voice which was given as input saying the exact text as output.

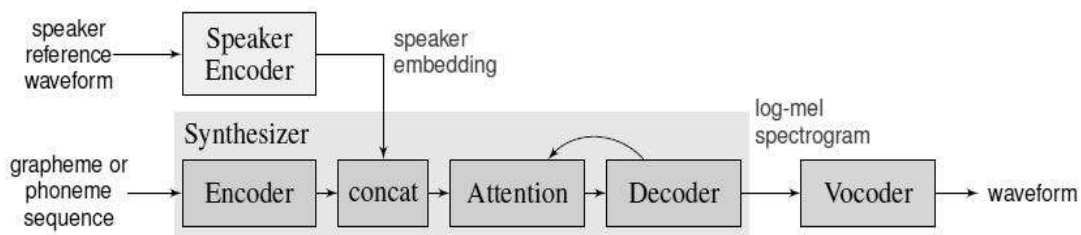


Figure 1: Proposed System

Algorithm

1. Input a small audio sample of the voice we wish to use .
2. Encode the voice waveform into a fixed dimensional vector representation.
3. Input a piece of text
4. Encode the text into a vector representation too.
5. Combine the two vectors of speech and text and decode them into a Spectrogram
6. Use a Vocoder to transform the spectrogram into an audio waveform that we can listen to.

IV. TECHNOLOGY STACK

We describe a neural network- based system for text-to- speech (TTS) synthesis that's suitable to produce speech audio in the voice of numerous different speakers, including those unseen during training. Our system consists of three singly trained factors (1) a speaker encoder network, trained on a speaker verification task using an independent dataset of noisy speech from thousands of speakers without transcriptions, to produce a fixed-dimensional embedding vector from seconds of reference speech from a target speaker; (2) a sequence-to- sequence conflation network based on Tacotron 2, which generates a Mel spectrogram from text, conditioned on the speaker embedding; (3) an bus-accumulative WaveNet-based vocoder that converts the Mel spectrogram into a sequence of time sphere waveform samples.

We demonstrate that the proposed model is suitable to transfer the knowledge of speaker variability learned by the discriminatively- trained speaker encoder to the new task, and is suitable to synthesize natural speech from speakers that weren't seen during training. We quantify the significance of training the speaker encoder on a large and different speaker set in order to gain the best generalization performance. Eventually, we show that randomly tested speaker embeddings can be used to synthesize speech in the voice of new speakers different from those used in training, indicating that the model has learned a high-quality speaker representation. Following is the detailed description of each individual factors.

1. **Speaker Encoder:** The voice data from each speaker is encrypted in an embedding generated by a neural network trained using speaker verification loss. The Speaker verification loss is calculated by predicting whether two voice samples are from the same user or not.
2. **Synthesizer:** Synthesizer is the core component of the Text-to-Speech Synthesis. The sequence of phonemes is taken as inputs to produce a spectrogram of the corresponding text input. Phonemes are tiny units of a sound of words. Each word gets broken down into the phonemes and sequence input is created for the model. This model also requires Speaker encodings to support multi-Speaker voices.
3. **Vocoder:** A sample-by-sample autoregressive WaveNet model is used as a vocoder to invert synthesized Mel spectrograms emitted by the synthesis network into time-domain waveforms. In this model, Mel Spectrogram is taken as an input to produce time-domain waveforms.

Technologies used

1. **PyTorch:** PyTorch is an open- source machine learning framework based on the Torch library, used for operations similar as computer vision and natural language processing, primarily developed by Facebook's AI Exploration lab (FAIR). It's free and open- source software released under the Modified BSD license. Although the Python interface is more polished and the primary focus of development, PyTorch also has a C interface.
2. **Matplotlib:** Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python. Matplotlib makes easy effects easy and hard effects possible. Matplotlib is a putting up library for the Python programming language and its numerical mathematics extension NumPy. It provides an object- acquainted API for rooting plots into operations using general- purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK. There's also a procedural "pylab" interface grounded on a state machine (like OpenGL), designed to nearly act that of MATLAB, though its use is discouraged. SciPy makes use of Matplotlib. Pyplot is a Matplotlib module which provides a MATLAB-suchlike interface. Matplotlib is designed to be as usable as MATLAB, with the capability to use Python, and the advantage of being free and open- source.
3. **Librosa:** Librosa is a python package for music and audio analysis. It provides the structure blocks necessary to produce music information reclamation systems. Librosa is principally used when we work with audio data like in music generation (using LSTM's), Automatic Speech Recognition.
4. **Scikit- Learn:** Scikit- learns (formerly scikits.learn and also known as sklearn) is a free software machine literacy library for the Python programming language. It features colorful bracket, retrogression and clustering algorithms including support-vector machines, arbitrary timbers, grade boosting, k- means and DBSCAN, and is designed to interoperate with the Python numerical and scientific libraries NumPy and SciPy. Scikit- learns is a community trouble and anyone can contribute to it. Colorful associations like Booking.com, JP Morgan, Evernote, Inria, AWeber, Spotify and numerous further are using Sklearn .
5. **Pillow:** Python Imaging Library is a free and open- source another library for the Python programming language that adds support for opening, manipulating, and saving numerous different image train formats. Development of the original design, known as PIL, was discontinued in 2011. Latterly, a successor design named Pillow branched the PIL repository and added.
6. **NumPy:** NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high- ranking accurate functions to operate on these arrays. The ancestor of NumPy, Numeric, was firstly created by Jim Hugunin with benefactions from several other inventors. NumPy addresses the slowness problem incompletely by furnishing multidimensional arrays and functions and drivers that operate efficiently on arrays; using these requires rewriting some law, substantially inner circles, using NumPy.

Dataset

- **LibriSpeech:** The LibriSpeech corpus is a collection of roughly hours of audiobooks that are a part of the LibriVox design. Utmost of the audiobooks come from the Project Gutenberg. The training data is resolve into 3 partitions of 100 hr, 360 hr, and 500 hr sets while the dev and test data are resolve into the 'clean' and 'other' orders, independently, depending upon how well or challenging Automatic Speech Recognition systems would perform against. Each of the dev and test sets is around 5 hr in audio length. This corpus also provides the n-gram language models and the corresponding textbooks excerpted from the Project Gutenberg books, which contain 803M commemoratives and 977K unique words. LibriSpeech dataset is SLR12 which is the audio recording of reading English speech. The train format of data is in the form of FLAC (Free Lossless Audio Codec) without any loss in quality or loss of any original audio data. It's used in numerous operations similar as speaker recognition and automatic speaker verification.
- **VoxCeleb:** VoxCeleb is an audio-visual dataset conforming of short clips of natural speech, uprooted from interview vids uploaded to YouTube. VoxCeleb contains speech from speakers gauging a wide range of different races, accentuations, professions and periods. All speaking face- tracks are captured "in the wild", with background chatter, horselaugh, lapping speech, pose variation and different lighting conditions. The dataset consists of two performances, VoxCeleb1 and VoxCeleb2. Each interpretation has its own train/ test split. For each we give YouTube URLs, face findings and tracks, audio lines, cropped face vids and speaker meta-data. There's no imbrication between the two performances.

- **VCTK CSTR’s:** VCTK Corpus (Centre for Speech Technology Voice Cloning Toolkit) includes speech data uttered by 109 native speakers of English with colorful accentuations. Each speaker reads out about 400 rulings, utmost of which were named from a review plus the Rainbow Passage and an elicitation paragraph intended to identify the speaker's accentuation. The review texts were taken from The Herald (Glasgow), with authorization from Herald & Times Group. Each speaker reads a different set of the review rulings, where each set was named using a greedy algorithm designed to maximize the contextual and phonetic content. The Rainbow Passage and elicitation paragraph are the same for all speakers. This corpus was recorded for the purpose of structure HMM- grounded textbook-to- speech conflation systems, especially for speaker-adaptive HMM- grounded speech conflation using average voice models trained on multiple speakers and speaker adaption technologies.
- **PyQt:** PyQt is a Python list of the cross-platform GUI toolkit Qt, enforced as a Python draw- heft. PyQt is free software developed by the British establishment Riverbank Computing. It's available under correspondent terms to Qt performances older than4.5; this means a variety of licenses including GNU General Public License (GPL) and marketable license, but not the GNU Lesser General Public License (LGPL). PyQt supports Microsoft Windows as well as colorful flavours of UNIX, including Linux and MacOS (or Darwin).

Testing

Testing is the process of executing a program with the intent of detecting an error. Testing is a critical element of software quality assurance and presents ultimate review of specification, design and coding. System testing is an important phase. Testing represents an fascinating anomaly for the software. Therefore, a series of testing are performed for the proposed system before the system is ready for stoner accepting testing.

A good test case is one that has a high probability of chancing an undiscovered error. A successful test is one that bares an as undiscovered error.

The primary objective for test case design is to derive a set of tests that has the highest livelihood for expose defects in the software. To accomplish the objective two different categories of test case design techniques are used. They are

- White box testing
- Black box testing

System Test Plan

Sr. No.	Test Case Description	Expected Result	Actual Result	Test Case Criteria (P/F)
1	Upload audio sample successfully	Audio uploaded successfully	Audio uploaded successfully	P
2	Synthesis of vector embeddings	Embeddings created successfully	Embeddings created successfully	P
3	Input Text uploaded successfully	Input Text uploaded successfully	Input Text uploaded successfully	P
4	Successful synthesis of Mel spectrograms	Mel Spectrogram synthesized successfully	Mel Spectrogram synthesized successfully	P
5	Successful Vocoding	Vocoded successfully	Vocoded successfully	P
6	Successful Audio synthesis in real-time	Audio synthesized successfully	Audio synthesized successfully	P
7	Lag in audio (Native American English audio sample)	No lag found in audio	No lag found in audio	P
8	Lag in audio (Indian English audio sample)	No lag found in audio	Lag found in audio	F
9	Successful export of synthesized audio	Audio exported successfully	Audio exported successfully	P

Mean Opinion Score

The quality of text-to- speech systems can be effectively assessed only on the base of reliable and valid listening tests to assess overall system performance. A mean opinion score (MOS) has been the recommended measure of synthesized speech quality.

The most broadly used direct approach of particular quality evaluation is the order judgment methodology in which listeners rate the quality of the test signal using a five- point numerical scale, with 5 indicating “excellent” quality and 1 indicating “wrong” or “bad” quality. This system is one of the styles recommended by the IEEE Subcommittee on particular styles as well as by ITU. The measured quality of the test signal is attained by comprising the scores attained from all listeners. This average score is generally appertained to as the Mean Opinion Score (MOS).

The MOS test is administered in two phases training and evaluation. In the training phase, listeners hear a set of reference signals that illustrate the high (excellent), the low (bad) and the middle judgment orders. This phase, also known as “anchoring phase”, is veritably important as it's demanded to equate the private range of quality conditions of all listeners. That is, the training phase should in principle equate the “virtuousness” scales of all listeners to insure, to the extent possible, that what's perceived “good” by one listener is perceived “good” by the other listeners. A standard set of reference signals need to be used and described when reporting the MOS scores. In the evaluation phase, subjects hear to the test signal and rate the quality of the signal in terms of the five quality orders (1-5).

Detailed guidelines and recommendations for administering the MOS test include:

- 1. Selection of Listening Crew:** Different number of listeners is recommended depending on whether the listeners had extensive experience in assessing sound quality. Minimum number of non-expert listeners should be 20 and minimum number of expert listeners should be 10. The listeners need to be native speakers of the language of the speech materials tested, and should not have any hearing impairments.
- 2. Test Procedure and Duration:** Speech material (original and degraded) should be presented in random order to subjects, and the test session should not last more than 20 minutes without interruption. This step is necessary to reduce listening fatigue.
- 3. Choice of Reproduction Device:** Headphones are recommended over loudspeakers, since headphone reproduction is independent of the geometric and acoustic properties of the test room. If loudspeakers are used, the dimensions and reverberation time of the room need to be reported.

For the above reasons – and due to several other contextual factors influencing the perceived quality in a subjective test – a MOS value should only be reported if the context in which the values have been collected in is known and reported as well. MOS values gathered from different contexts and test designs therefore should not be directly compared. It is not meaningful to directly compare MOS values produced from separate experiments, unless those experiments were explicitly designed to be compared, and even then, the data should be statistically analyzed to ensure that such a comparison is valid.

Due to the human tendency to avoid perfect ratings (now reflected in the objective approximations), somewhere around 4.3 - 4.5 is considered an excellent quality target. On the low end, call or audio quality becomes unacceptable below a MOS of roughly 3.5.

Rating	Speech Quality	Level of distortion
5	Excellent	Imperceptible
4	Good	Just perceptible, but not annoying
3	Fair	Perceptible but slightly annoying
2	Poor	Annoying but not objectionable
1	Bad	Very annoying and objectionable

V. CONCLUSION AND FUTURE SCOPE

Forge acts as a perfect resolution to various text-to- speech synthesis and voice cloning challenges and surely has a lot further to offer in incubating this experimental technology.

The scope of Forge tracks down the adaption of different voice replicating results and services used by several end- user verticals similar as IT & telecommunication, BFSI, educational institutions, healthcare,etc.

The use cases for synthetic media are still arising, but we're seeing a lot of areas where people and associations can advantage from this technology, some of which we've mentioned then. Voice replicating tools can be useful

for various degenerative ails like Motor neuron complaint (MND), Amyotrophic side sclerosis (ALS). These tools can also be helpful for critical operations similar as a laryngectomy, which can lead to the loss of speech. With the help of a speech-generating tool, a case can hear to his voice, which was replicated from their preliminarily recorded voice.

In Education, replicating the voices of literal numbers offers new chances for interactive tutoring and dynamic liar. For illustration, on November 22, 1963 President Kennedy was on his way to give a speech in Dallas when he was assassinated. We can now hear that speech in his own words using this technology.

The epidemic sparked a surge in content consumption. One of the mediums that availed from this boom was podcasting, which has grown exponentially year of year and reaching indeed broader, more different cult. In addition, synthetic voice is formerly being used to help restate content in demand into different languages. Advertisers seeking voices that reverberate with their target followership, synthetic voices help advertisers produce further engaging content without having to coordinate as numerous moving pieces similar as trip and studio time.

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ALCOHOL DETECTION WITH ENGINE LOCKING SYSTEM

Askand Tiwari¹, Diksha Pawar², Abid Khan³ and Snehanka Gupta⁴^{1,2,3}Student and ⁴Assistant Professor, Information Technology, Theem College of Engineering, Boisar**ABSTRACT**

Drink and drive is the reason behind most of the deaths, so the Alcohol Detection with Engine Locking Using Raspberry Pi aims to change that with automated, transparent, noninvasive alcohol safety check in vehicles. System uses alcohol sensor with raspberry pi along with dc motor to demonstrate as vehicle engine. System constantly monitors the sensitivity of alcohol sensor for alcohol detection. If driver is drunk, the processor immediately stops the system ignition by stopping the motor. If alcohol sensor is not giving high alcohol intensity signals or values, system lets engine run. The raspberry pi processor constantly processes the alcohol sensor data to check the presence of alcohol and operates a lock on the vehicle engine accordingly. So, by providing this solution the accidents can be prevent.

Keywords: Alcohol Sensor, DC motor, Ignition, Processor, Raspberry Pi

I. INTRODUCTION

The current scenario shows that the most of the road accidents are occurring due to drink and drive cases. The drivers who drink alcohol are not in a stable condition and so, rash driving occurs on highway which can be risky to the lives of the people on road, the driver inclusive. The laws in India are currently prohibiting drivers to drink and drive so that the fine imposed on them can stop them to drink and drive. Therefore, there is the need for an alcohol detection system that can function without the restriction of space and time. This project comes with the solution that, when an alcohol is detected around the sensor, the sensor will send the command to processor to immediately stop the engine of vehicle. Simultaneously it will also track the location with the help of GPS module and will send it to Raspberry pi and then the raspberry pi will click the picture of drunk person and will send all the information to the telegram bot of the registered person. This method is very effective in not only lifesaving of particular person but the life of others also who are driving nearby the drunk person. It will also save the loss of vehicle done due to accidents. This application is more useful for those people who gives their vehicles on rent for driving.

II. LITERATURE SURVEY

[1] L. A. Navarro, M. A. Diño, E. Josen, R. Anacan and R. D. Cruz, "Design of Alcohol Detection System for Car Users thru Iris Recognition Pattern Using Wavelet Transform," 2016 7th International Conference on Intelligent Systems, Modelling and Simulation (ISMS), Bangkok, 2016, pp. 15-19. The author has put forward a technique which utilizes GPS and GSM to ascertain alcohol but this technique is very expensive, but the expenses can be cut off to a great extent. In this project a siren is being used which is most highly economical, and can keep people in close proximity vigilant.

[2] Mugila.G, Muthulakshmi.M, Santhiya.K, Prof. Dhivya.P- Smart Helmet System Using Alcohol Detection For Vehicle Protection [International Journal of Innovative Research in Science Engineering and Technology (IJIRTSE) ISSN: 2395-5619, Volume – 2, Issue – 7. July 2016]. Composite health monitoring and sensors based on infrared is utilized to ascertain alcohol as talked about by writer but the chance of false alarm can't be avoided in this system, because minute changes in some situations can result in false alarm but in our project use of required technology makes it more authentic.

[3] Dhivya M and Kathiravan S, Dept. of ECE, Kalaignar Karunanidhi Institute of Technology- Driver Authentication and Accident-Avoidance System for Vehicles [Smart Computing Review, vol. 5, no.1, February 2015]. To prevent the mishap of drunken driving author have used PIC16F877A microcontroller which is an outdated system and expensive one also which restrains its use to only certain class of society whereas we are using Arduino Uno microcontroller which is advanced as well as economical.

[4] Babor, AUDIT: The alcohol use disorders identification Test: Guidelines for use in primary health care. 1992, Geneva, Switzerland: World Health Organization.

Worrying about the drunken driving the author suggests the system to overcome the issue but using mQ2 alcohol sensor has come flames .MQ2 alcohol sensor is not authentic and raises the chances of false alarm while we have used MQ3 which is highly authentic.

[5] D. S. a. A. Chowdhury, "A Real Time Embedded System Application for Driver Drowsiness and Alcoholic Intoxication," International Journal of Engineering Trends and Technology (IJETT), vol. 10, no. 9, Apr 2014.

There are many works carried out on the driver’s drowsiness detected. A large number of road accidents takes place due to fatigue of drivers due to alcohol consumption. An embedded system with UNO and open CV is developed. Where the Alcoholic drivers are detected in real time using the driver’s drowsiness and intoxication, since large number of road accidents takes place due to alcohol drinking. In computer vision concept is used which has an alcohol gas sensors combined with the Raspberry pi micro-controller and embedded systems.

[6] J. Dai, J. Teng, X. Bai, Z. Shen and D. Xuan, "Mobile phone based drunk driving detection," 2010 4th International Conference on Pervasive Computing Technologies for Healthcare, Munich, 2010, pp. 1-8, 2010. Dai et al. proposed a system to detect and alert dangerous driving triggered by drunk-driving in real-time using mobile phone. It requires placing the mobile phone alongside accelerometer and orientation sensor in a vehicle. With the phone, accelerations can be read and compared with the pattern behavior of drunk-driving. Once the pattern is detected, the mobile will automatically alert the driver or even call police before accident occurs.

[7] N. L. J. J. Jain and C. Busso, "Modeling of Driver Behavior in Real World Scenarios Using Multiple Noninvasive Sensors," IEEE Transactions on Multimedia, vol. 15, no. 5, pp. 1213 - 1225, 2013. The intentional accidents have become more in recent years due to the development of new in-vehicle technology. The driver’s scenario like eye blink is collected and drivers were dictated on how to drive through their mobile phones. It analyses the behavior of the driver and classifies it and avoids the accidents through the metric obtained.

III. METHODOLOGY

The Alcohol Detection with Engine Locking system helps to reduce the accidents which are occurring due to drunk driving. MQ-3 sensor detects the presence of the alcohol in the surroundings. The sensor provides the output on the basis of the concentration of alcohol, if the alcohol concentration is higher the conductivity of MQ-3 sensor increases which in turn gives the reading to Raspberry pi. If the reading is greater than the threshold level, Raspberry pi will stop the DC motor. Nodemcu will fetch the location with the help of GPS module of vehicle and will send it to Raspberry pi. The camera module will click the picture of driver and then all these details will be sent on the telegram bot of the registered number.

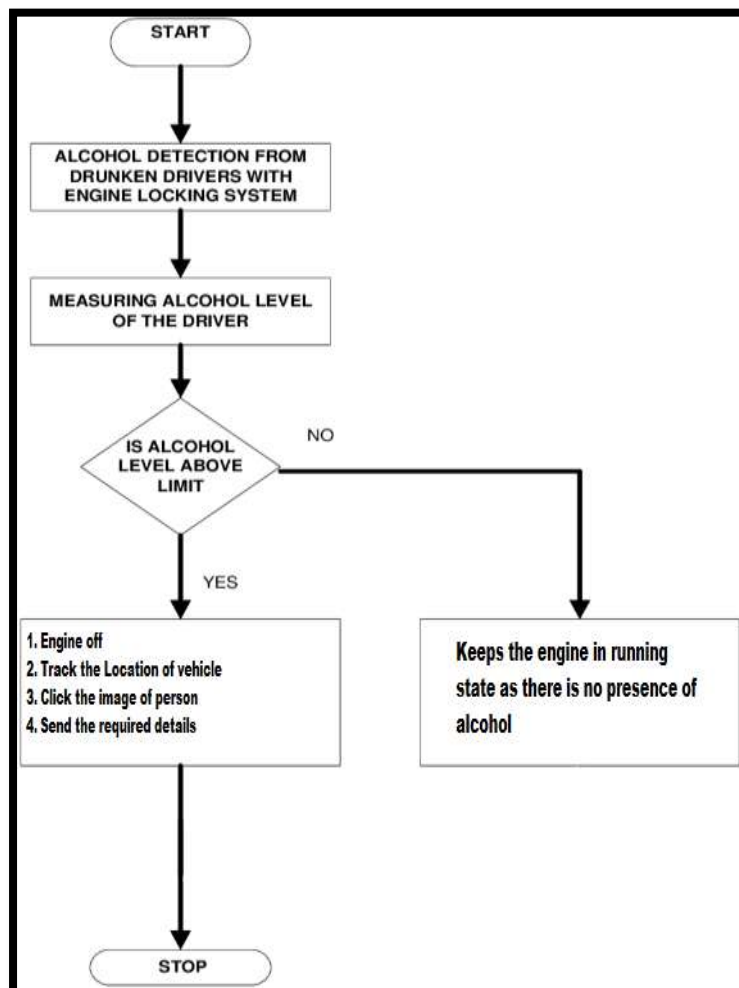


Fig 1: Flowchart of system

IV. RESULTS

If alcoholic person tries command on vehicle, then the alcoholic sensor determines the existing of alcohol and shut down the vehicle engine and sound alarm by which the nearby people will exchange the seat or can get alert. We can avoid any kind of loss by using this system. All equipment's are totally tested and connected as required thereby giving us the much-needed result as shown in the image below:

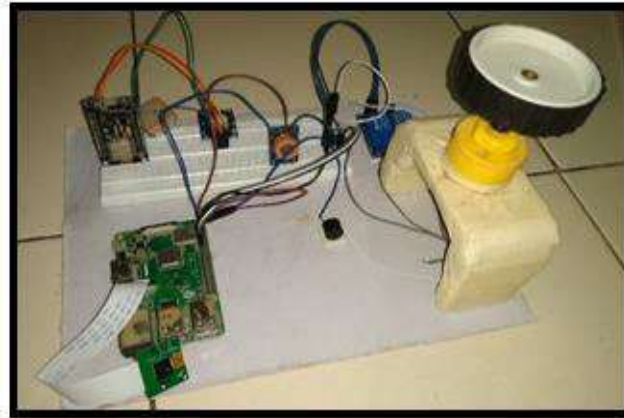


Fig 2: Alcohol Detection with Engine Locking System

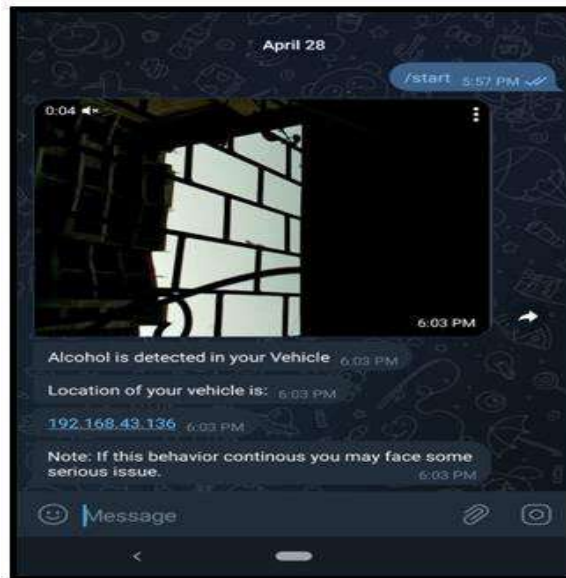


Fig 3: GUI of telegram bot



Fig 4: GUI of Vehicle tracking system

V. APPLICATIONS & ADVANTAGES

Applications

"Alcohol detector project" can be used in various vehicles for detecting whether the driver has consumed alcohol or not.

This can be used in ola & uber as well as other taxis given on rent.

This system can be very helpful for police department also.

Advantages

To prevent accident due to drink and driving.

Easy and efficient to test the presence of alcohol content in the body.

Helpful for police and provides automatic safety system for cars and other vehicles as well.

The alcohol detection with engine locking system provides automatic safety system for cars and other vehicles.

VI. CONCLUSION

We have provided a very effective solution to develop an intelligent system for the vehicles for alcohol detection. Since sensor has fine sensitivity range around 25 to 500 ppm, it can suit to any vehicle and can easily be hidden from the suspects. As growing public perception is that vehicle safety is more important, advances in public safety is gaining acceptance than in the past. The main aim of this system is to control the accidents caused due to alcohol consumption. This system improves safety of human being. With the help of all the technologies used in this system many lives can be saved. And hence providing the effective development in the automobile industry regarding to reduce the accidents caused due to alcohol consumption.

VII. FUTURE SCOPE

We can implement a live fine system so that if driver does the crime, he/she can be fined on the basis of crime.

We can implement heart rate pulse variability to accurately identify the driving behavior of drivers and to assist them.

We can use GSM module along with the system so that if any incidents occur it will get notified to concerned person or nearby police station.

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CRYPTOGRAPHY BASED MESSENGER APP**Pradeep Vishwakarma¹, Rajkumar Yadav², Ritwik Shukla³, Sonali Karthik⁴**^{1,2,3}Student of B.E and ⁴Assistant Professor, Information Technology, Theem College of Engineering, Maharashtra**ABSTRACT**

With the advancement of technology, communication has taken a big step. A number of messenger applications are designed to exchange data once information online. This data is also very confidential could be in danger of a security attack. Therefore, it must be protected with certain encryption techniques to keep the information confidential and away from unauthorized access. In this paper, we propose an efficient cryptography algorithm based messenger app. Symmetric and asymmetric algorithm is used in this application. This application is more secure and makes use of private communication between sender and receiver.

Keywords: Cryptography, Encryption, Decryption, AES, DES, RSA, MD5, Secure messenger application.

1. INTRODUCTION

Technology is used in all areas of life, and people are more dependent on smartphone technology that contains powerful computer processors to exchange information and data. This is due to the necessity of our multimedia documents to be protected from unauthorized people. Therefore, the daily use of cryptography in our life greatly increased. The Messaging System is a text or instant messaging service component of telephone, web or mobile communication systems worldwide. But is it really safe to use? In public instant messaging systems, messages are sent by from the client to the server and back to the second client. This data could potentially be seen by an eavesdropper anywhere along its Internet path or in the network. So at any time information can be passed on to others. For this reason, this project involves the event of the secure messaging system using cryptographic technology.

Secure messaging is developed to guard sensitive data from unauthorized access. it's confidential and authenticated exchange by any internet user worldwide. Brute force attacks are made to interrupt the encryption and that they are growing so faster. These attacks are the most drawbacks of older algorithm. But with feature this algorithms are going to be replaced by other techniques which will provide better protection. during this paper we are getting to proposed a secure messaging system that's implemented by an encryption technique which is more faster, better resistant to attacks, more complex, easy to encrypt and lots of more advanced security feature included.

2. LITERATURE SURVEYS

- In this paper Rohan Rayarikar [1] introduced a method running on the Android environment that encrypts messages before being sent by the user over the network allowing the encrypt messages before sending them over the network. The AES algorithm has been used to encrypt and decrypt data and this method can run on any mobile running the Android system environment.
- SMS Encryption by using Android Operating System by Asst. Prof. Dr. Jane [2] is based on the RSA algorithm to encrypt a message and the length of 160 characters and after using the algorithm to encrypt the message in the Android environment is sent via the recipient's phone number by the sender and the application is programmed using the language of Java.
- The authors Jayeeta Majumder [3] in this paper used application is based on the AES algorithm to encrypt SMS message and sending a message encrypted in the Android environment over the network the application is programmed using the language of Java.

3. PROBLEM STATEMENT

Malicious users are always interested to hack servers and reveal information about users in a certain system including celebrities and this happens almost every day in the introduction Internet world. Unfortunately, instant messaging applications are not an exception. There are many mobile chat applications available for users. Many of these applications claim that they are providing confidentiality, integrity and availability of user's information. However, daily hacking news prove that many developers do not consider security as the primary goal of their applications. On the other hand, governments are keen on tracking their citizens and forcing more service providers to reveal profiles of their users in the hands of their agents. Furthermore, chat applications providers misuse information of their users. For example, while many chat applications are free to use, they equip the application with built-in processes which track every single movement. There must be careful with what is going to be published on social networks.

4. PROPOSED METHODLOGY

There are a number of algorithms for performing encryption and decryption. The most successful algorithms use a key. A key is simply a parameter to the algorithm that allows the encryption and decryption process to occur. The modern field of key-based cryptographic algorithms can be divided into two classes, such as symmetric-key cryptography and asymmetric cryptography or publickey cryptography. Symmetric-key cryptography refers to encryption methods in which both the sender and receiver share the same key. This was the only kind of encryption publicly known until June 1976. The public-key cryptography is cryptography in which a pair of keys is used to encrypt and decrypt a message so that it arrives securely. Another cryptographic algorithm is cryptographic hash function that uses a mathematical transformation to irreversibly “encrypt” information.

In our application the user first select the one of the algorithm as per the user’s choice. After that it will enter the text which he is want to encrypting or decrypting it and than set the key. Finally he will get his encrypted text or decrypted text.

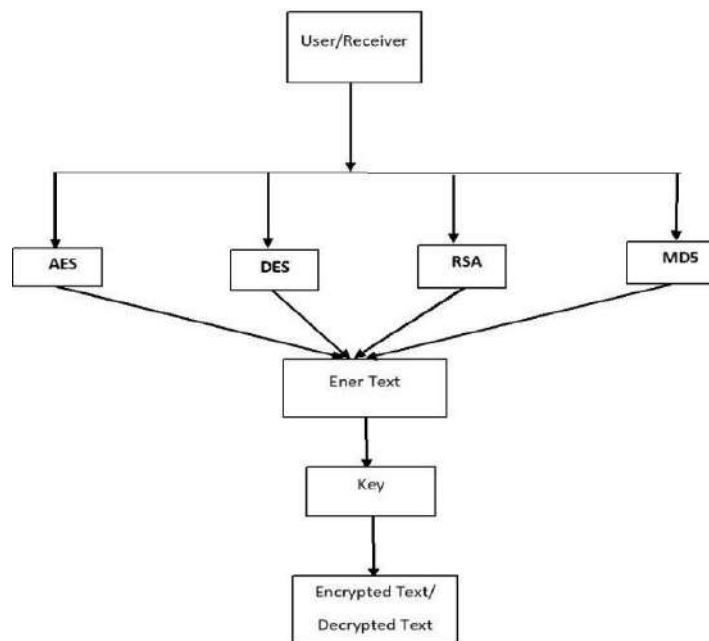


Fig 1: Architectural Diagram

5. ALGORITHM USED

There are a number of algorithms for performing encryption and decryption. The most successful algorithms use a key. A key is simply a parameter to the algorithm that allows the encryption and decryption process to occur. The modern field of key-based cryptographic algorithms can be divided into two classes, such as symmetric-key cryptography and asymmetric cryptography or public key cryptography.

In this project we have used AES, RSA and DES algorithm for encrypting and decrypting the text. We have provide different user interface for different algorithms. The workings of all above algorithm in this project are as follows:

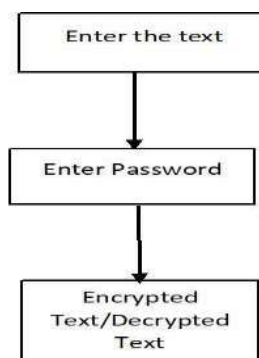


Fig 2. Encryption and Decryption of different algorithm

To use this algorithm is very simple for user. The only need to user enter the text and set the correct password for encryption and decryption. Then finally he/she will get encrypted text or decrypted text.

We have used MD5 algorithm in this project for making secure password. With this secure password user can use this for encryption and decryption process. Because MD5 algorithm can not decrypt the text, only it will encrypt the text through hashing.

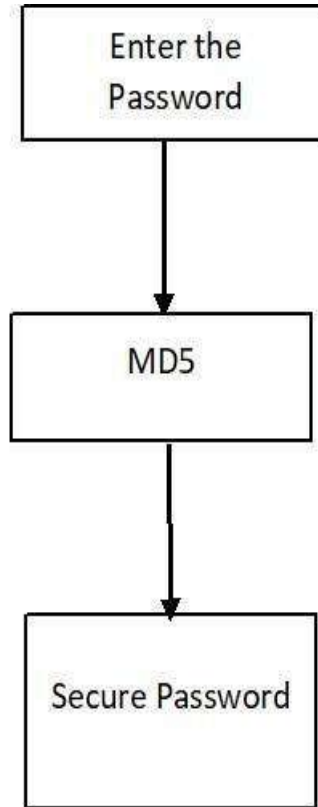


Fig 3: Flow of MD5 Algorithm for messenger app

6. IMPLEMENTATION AND RESULTS

Implementation involves the following steps:

Step 1: Algorithms module

In this interface the application is showing different algorithm for encryption and decryption. User can select any of the algorithms for encrypting and decrypting the text.

Step 2: Key Selection

In this module sender or receiver can set our key and also can change the existing key with the new key.

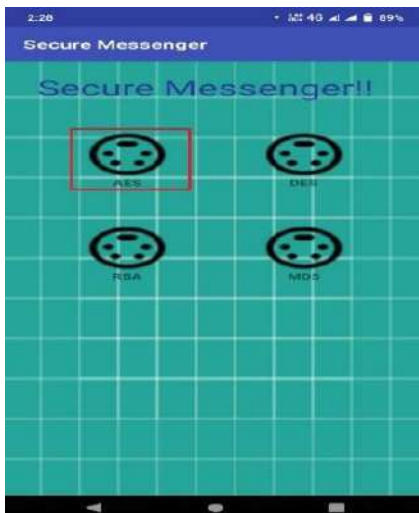


Fig 4: Algorithm Module

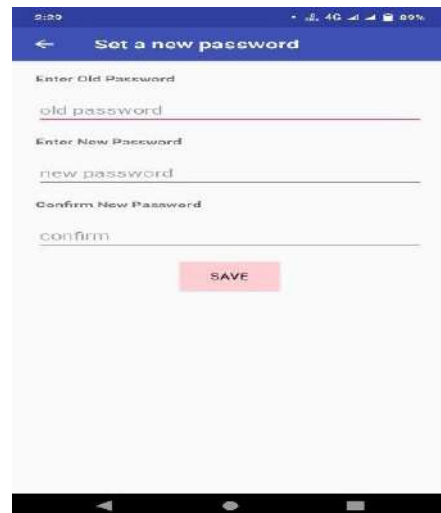


Fig 5: Key Selection

Step 3: Encryption Module

In this phase sender can enter the text for encryption process and simply by clicking the encryption button after setting the required key he will get his encrypted text.

Step 4: Decryption Module

In this module the same process will follow as followed in encryption module. In this receiver can enter the encrypted text or cipher text and by adding required key he can get the original text.



Fig 6: Encryption Module



Fig 7: Decryption Module

Step 5: Voice Recognition Module

In this module, we have added the feature of voice recognition. If users want to enter long text for encryption process he can use this feature for entering the text.

Step 6: Send Module

After encrypting the original text sender can send the encrypted text to receiver with the use of this send button. The user can send encrypted text all the message sending application which are available in sender's phone.



Fig 8: Voice recognition module



Fig 9: Send Module

7. CONCLUSION

The main objective of the proposed system is to transfer message in a communication system securely. Android-based applications for secure messaging have been developed using cryptographic algorithms for the users to send their message between users on any organization securely. Encryption and decryption of message are done by using AES, DES and RSA algorithms. Obviously encryption and decryption is one of the best ways of hiding the meanings of a message from intruders in a network environment.

The proposed secure messaging can be used in many areas with personal and company-wide sensitive data exchanges. For example, financial institutions, insurance companies, public services, health organizations and service providers rely on the protection by Secure Messaging.

The proposed system has been designed and developed with easy integration and modification to take full advantage of future technologies. There are some limitations in the current system to which solutions will be provided as a future development; such as, sending encrypted text within this application, so the user don't have to send manually through other applications. In future, a public-key encryption scheme will be implanted in this secure messaging system.

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STOCK MARKET PREDICTION USING MACHINE LEARNING

Sanath Waghela¹, Ved Narkar², Mosir Khan³ and Shahe Gul⁴^{1,2,3}UG Students and ⁴Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Mumbai University, Maharashtra, India**ABSTRACT**

Algorithmic trades (AT) and their activity in the esteem revelation process on the S&P 500 summary associations are being assessed. Extraction of the association tickers and their individual stock data is being done. Gotten some answers concerning different AI classifiers and their importance in Algorithmic Trading. Algorithmic trading act purposely by checking the market for liquidity and deviations of expense from focal regard. Algorithmic Trading chooses the three fundamental conditions of the securities trade whether to buy, sell, or hold a stock. Different data controls were done and numerous abilities were made which were mapped to different names and using classifiers endeavoured to anticipate the three conditions of the securities trade. Overall, budgetary trade estimate is an extraordinarily confounding system, to control stocks as demonstrated by your necessities, incorporates cumbersome data of stocks and how these stocks can change their advancements and by the sum they will climb or down in light of some financial circumstances. Issue is that, can a Machine foresee these advancements and devise a sort of trading strategy according to the given data using particular AI models.

Keywords: Stock market; Prediction; Machine learning; Artificial neural network

I. INTRODUCTION

The Stock market check is an exceptionally fascinating errand which joins high substances of how the budgetary exchange limits, and what unconventionalities can be prompted in a market in light of different conditions. While a few venders may battle that the market itself is functional, and that if there is new check or any assortment from the standard in a market it charms it by auditing itself, thusly making no space for conjectures, while several vendors may battle that on the off chance that the information is orchestrated well, by then machine can make a sort out of procedure that is persuading can affect high continue exchanging or HFT, which is just conceivable through Algorithmic Trading Systems or Automated Systems of Trade. Money related authorities think about the expression, buy low, move high yet this does not give enough setting to settle on proper Endeavor decisions. Before an investigator places assets into any stock, He should realize how money market continues. Setting assets into a wonderful stock regardless at a horrible time can have awful results, while vitality for a common stock at the fortunate time can hold up under focal points. Cash related monetary pros of today are going toward this issue of trading as they don't for the most part understand concerning which stocks to buy or which stocks to offer with the authentic objective to get impeccable focal points. Envisioning whole game plan estimation of the stock is commonly clear than foreseeing on day-to-day premise as the stocks change rapidly reliably subject toward events.

The answer for this issue requests the utilization of instruments and advances identified with the field of information mining, design acknowledgment, machine learning and information forecast. The application will foresee the stock costs for the following exchanging day. The necessities and the usefulness of this application corresponds it to the class.

II. RELATED WORK

[1] Stock Market Prediction Using Machine Learning Techniques Mehak Usmani, Syed Hasan Adil et al [3] proposed the main objective of this research is to predict the market performance of Karachi Stock Exchange (KSE) on day closing using different machine learning techniques. The prediction model uses different attributes as an input and predicts market as Positive & Negative. The attributes used in the model includes Oil rates, Gold & Silver rates, Interest rate, Foreign Exchange (FEX) rate, NEWS and social media feed. The old statistical techniques including Simple Moving Average (SMA) and Autoregressive Integrated Moving Average (ARIMA) are also used as input. The machine learning techniques including Single Layer Perceptron (SLP), Multi-Layer Perceptron (MLP), Radial Basis Function (RBF) and Support Vector Machine (SVM) are compared. All these attributes are studied separately also. The algorithm MLP performed best as compared to other techniques.

[2] Gursean et al. (2011) describe ANN as one of the best techniques to model the stock market, because it does not contain standard formulas and may be easily adapted to market changes. ANN have the ability to learn by example and make interpolations and extrapolations of what they learned. The use of ANN in the solution of a

task initially involves a learning phase, which is when the network extracts the patterns, thereby creating a specific representation of the problem (Braga, Carvalho, & Luderman, 2007). The first model for prediction of stock price based on ANN was developed by White (1988). The author used a feed forward network to detect unknown regularities in stock price changes. The goal was to analyse the daily returns of IBM stock in order to test the efficient market theory, proposed by Fama (1970), which states that stock prices follow a random walk. Although he has not obtained good predictive results, the research stressed the potential for such analysis. Since then, a large number of researchers have actively participated in the development of predictive models that may be reliably applied in the stock market.

[3] Stock Market prediction has been one of the more active research areas in the past, given the obvious interest of a lot of major companies. In this research several machine learning techniques have been applied to varying degrees of success. However, stock forecasting is still severely limited due to its non-stationary, seasonal and in general unpredictable nature. Stock Market Prediction Using Hidden Markov Models Aditya Gupta, Non-Student Member, IEEE and Bhuwan Dhingra, Non-Student member, IEEE T Predicting forecasts from just the previous stock data is an even more challenging task since it ignores several outlying factors (such as the state of the company, economic conditions ownership etc.)

III. EXISTING SYSTEM

Money related trade judgment making is a strengthening and difficult errand of fiscal data guess. Figure about securities trade with high exactness improvement return advantage for examiners of the stocks. In perspective on the snare of budgetary trade financial data, expansion of productive models for forecast conclusion is very difficult, and it must be precise. This consider attempted to make models for guess of the securities trade and to pick whether to buy/hold the stock using data mining and AI techniques. The AI framework like Naive Bayes, k-Nearest Neighbors (k-NN), Support Vector Machine (SVM), Artificial Neural Network (ANN) and Random Forest has been used for progressing of gauge model. Particular pointers are resolved from the stock prices set up on timetable data and it is used as commitments of the proposed guess models. Ten years of securities trade data has been used for sign gauge of stock. Based on the instructive accumulation, these models can make buy/hold signal for monetary trade as a yield. The rule target of this errand is to deliver yield signal(buy/hold) as per customers essential like mean be contributed, time term of endeavour, least advantage, most prominent hardship, using data mining and AI frameworks.

Compared to the existing work, this project analyses the stocks trading decisions utilizing the technical conduct of the trading patterns within the context of the changeable economic and business environment.

The objective function is to maximize medium to longer term profits based on S&P500 stock market index. The inputs are the technical pointers data and the economic indicators data. Three models (neural network, soft max logistic regression, decision forest) are then used to predict the buy/sell decisions.

IV. PROPOSED SYSTEM

As debated overhead stock market forecast is a huge subject and has a lot parts on which we can investigation upon, but one object all models have in common is their check on correctness of how well the model's practical can fit to a given dataset and is it identical the results and forecasting correctly or not. Still each model has a few effects in common, they all need a list of companies of any stock exchange to forecast upon the three basic situations of market buy, hold, and sell and to do this the stock market data for each company against their tickers was stored in machine (to avoid larger accessing time) and data manipulations were performed in order to prepare the dataset for additional machine learning classifiers which will ultimately forecast the marks and deliver the output.

V. METHODOLOGY OF BUILDING A PREDICT MODEL

General steps of building and predicting the value by using Long Stort Term Model in the Neural Works Predict.

1. Building a Predict Model: To make predictions from data if target outputs can be any value in a Continuous range of numeric values or a discrete ordered range of numeric values.
2. Selection of model: Long Stort Term Model (LSTM) is selected to predict the stock value.
3. LSTM Input training data
4. LSTM Output training data
5. LSTM Training data characteristics
6. LSTM Network parameters

7. Reviewing parameters and training the model
8. Saving the model
9. Training statistics
10. Testing a predict model
11. Specifying data sets for testing
12. Interpreting test results
13. Running a LSTM predict model

VI. RESULTS

As it can be grasped in the figure given underneath, one side it demonstrates the forecast counter spread of the company future prices, and additional figure demonstrates the graph of the company at that particular time of year in terms to the forecast and it can be detected that much of the outcomes are precise. As it can be perceived that the data spread is habitually saying buy the stock, it can be incorrect on the hold condition because the teaching data will never be perfectly stable ever, so supposedly if the model forecast buy then this would be 1722 correct out of 4527 which is still good and a better score than it attained, and it still is getting the above accuracy mark of 33% which is decent in a stock market analysis. Many situations will static be there which machines can miss out, supposedly this has circumstances to buy, sell, hold and sometimes the model can be penalised, say the model predictable a 2% rise in the following seven days, but the growth only went up to 1.5% and departed 2% the next day, then the model will forecast (buy, hold) rendering to the 1.5% rise in the seven days and give the predictable spread.

A model can also be penalised if supposedly the growth went 2% up and then suddenly falls 2% short the next day, this sort of outcomes in real trading would be thoughtful and same goes for the classical of it turns out to be highly precise. Now observing at the spread and the graph of the company notice around the era of 2017 the company was growing in the market so therefore there were actually more buys, which rapidly fallen in 2018, but the data we mined was till 31, December 2017 and it displays that at the starting of the year it had lot of buys, hence 1722 out of 4527 which speedily was sold just in a tiny time hence a lot of sells more than the holds, giving 1424 out 4527, the model may not be perfectly accurate but has a very close range of decisions which can be accepted in real trading or using algorithms to trade.

Closing Price vs Time Chart

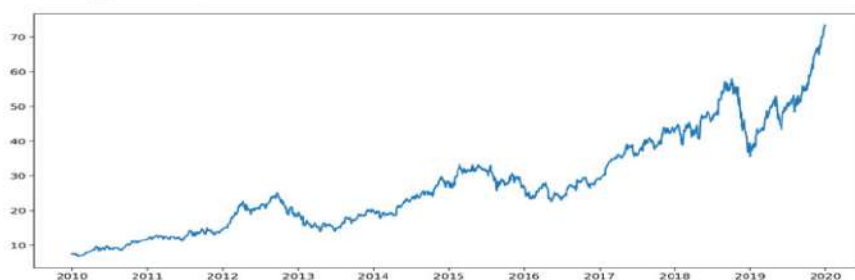


Fig 3 :(A)

Predictions vs Original

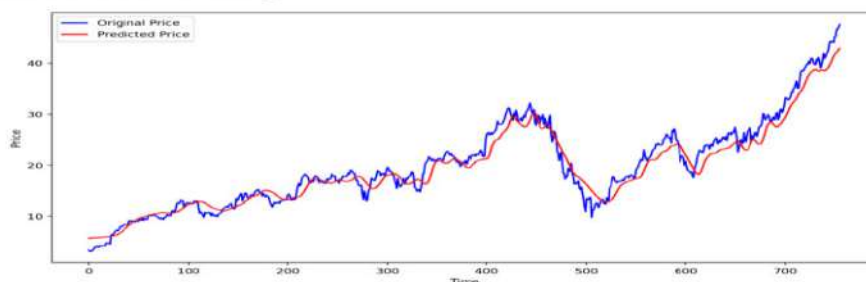


Fig 3 :(B)

In Fig 3(A) &3(B) shows the prediction graph using neural network. The data is of Tata Motors whereas in fig 3(A) shows the opening price from the Jan 2010 till Jan 2020. And the fig 3(B) shows the closing price of Tata Motors.

VII. CONCLUSION

Hereby, it can be proposed that no trading algorithm can be 100% effective, not only 100%, it will typically never be close to 70% but to attain even an accuracy of 40% or 35% is still good sufficient to get a good forecast spread. Although extreme attained accurateness was 39%, it was still able to closely forecast the predictable outcome and have coordinated against the company graph. To make our expectation more efficient, it can be done by including bulky data sets that have millions of entries and could train the machine more powerfully. Different activities of stocks can lead to diverse raises or lows in the forecast price, use these movements to magistrate whether a company should be traded in or not. No training Data can ever be stable, hence there are always some unevenness which can be seen in the above data spread, but to still forecast close to a consequence will also lead to a good approach if it has greater than 33% accuracy. While developing a strategy trader should always think to always have nominal imbalance while still being above 33% accurate.

It can also be determined that in a stock market, there is probable that some companies might not be associated at all, and mostly can be associated to each other, and can help justice movements of stock accordingly, we can scale affairs and see how much in percentages they are correlated. Including gigantic data sets, to increase more effectiveness, and in data set if had nan values in tables, because of two simple reasons either a specific company was not opened during that time of year, or the data is not readily obtainable, in both the cases replace the null values with 0, which is that trader might want to change while developing a trading tactic.

Furthermore, there can be back testing of the trading strategy, using zip line and Quantarian a python platform for testing trading strategies and can see how well can a model fit into some random data of stock, and can the model from this random data of stock develop relations and correlations, and predict on terms of change.

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E-COMMERCE APPLICATION USING MERN STACK (GADGETKART.COM)

Shaikh Mohd Noman¹, Laxmi Thakur², Ruchi Mishara³, Rishana Sherin⁴ and Ruchi Rahi⁵^{1,2,3,4}Student and ⁵Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India**ABSTRACT**

In today's generation, most people are using technology for leading their lives and fulfilling their daily needs. In this generation, most of us using E-commerce websites for shopping for clothes, groceries, and electronics. We have developed one E-commerce website by using MERN stack technology as it contains MongoDB, Express.js framework, React.js library, Node.js platform. This site is fully functional with different views for user and admin and it also has integrated with payment gateway for checkout. By using this website, we can buy different types of electronic products and we can choose different styles of electronic products based upon customer interests. In this project, we can add different products and can delete them also. We have developed administrative functions for the website such as create a product, create categories, Admin dashboard, manage products, Manage categories. For customers, they can quickly add their items to the cart. Based on the items in the cart then the bill gets generate and the customer can pay by using stripe. MERN stack is a collection of technologies that enables faster application development. It is used by developers worldwide. The main purpose of using MERN stack is to develop apps using JavaScript only. This is because the four technologies that make up the technology stack are all JS-based.

1. INTRODUCTION

The goal of this work is to build a simple E-Commerce website using MERN stack (MongoDB, Express, React and Node) where users can add items, pay and order. Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. Whereas e-business refers to all aspects of operating an online business, ecommerce refers specifically to the transaction of goods and services. In online shopping customers can select a wide range of products based upon their interests and their price also, one can compare prices also from one store to another by using online shopping. By encountering the all problems and weaknesses of the offline shopping system, creating an E-commerce web application is necessary for searching and shopping in each shop. These days we have seen so many e-commerce websites are created like Flipkart, Amazon, Myntra one can easily buy their necessary products by using these websites. By using these types of websites one can buy their products by staying in their home. Eventually, we can see the difference between the prices of products also effective and powerful web applications. We aim to make a working e-commerce website where everything functions correctly. So, the features we would be having in the application that we would be building are: -Authentication using JSON Web Tokens (JWT). Option to add, edit, view and delete all the items in our store. Option to add items or remove items from the cart. Display the total bill of the cart and update it as soon as the cart is updated by the user. Using Local Storage to store the JWT so that we only allow logged-in users to buy items. Option to pay and checkout thus creating order and emptying the cart. So, these are the basic features we would have in our application.

2. MOTIVATION

Study on ecommerce shopping and shoppers, mostly in the American continent, the European continent, Australia, and some parts of Russia have indicated various motivations behind the rising trends of ecommerce among the masses. However, the following are the most common and widely acceptable reasons behind the motivations for online shopping.

Low Price: Investment in online business is low compared to a brick-and-mortar store. Therefore, ecommerce can offer cheaper rates with other additional advantages that ultimately lures the shoppers to go online for various shopping needs.

Wide Selection Options: Ecommerce customers can surf the various stores for a wide range of products to make a better choice.

Convenience: Online shopping eliminates traveling or walking from one shop to another and save time, fuel, and money on visiting a number of brick stores.

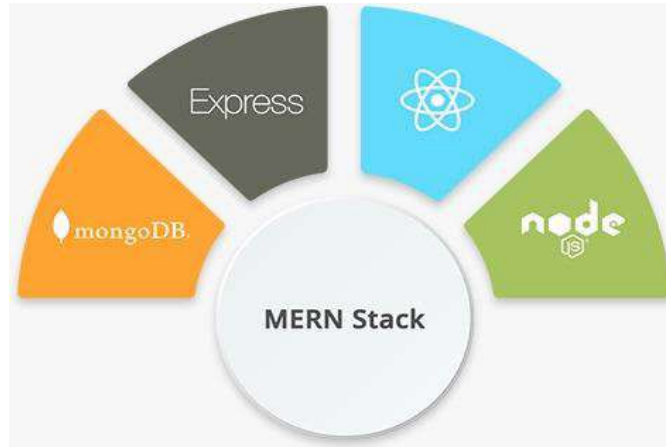
Price Comparison and Bargaining: Due to comparatively low investment in ecommerce and stiff competition in online businesses, customers can get the best deal and more opportunities for bargaining.

Free shipping and other incentives: The shipping price is the biggest obstacle after the delay due to shipping in the way to ecommerce. Therefore, to lure more online customers, ecommerce stores are offering free shipping on bulk/big volume purchases or big amount of order.

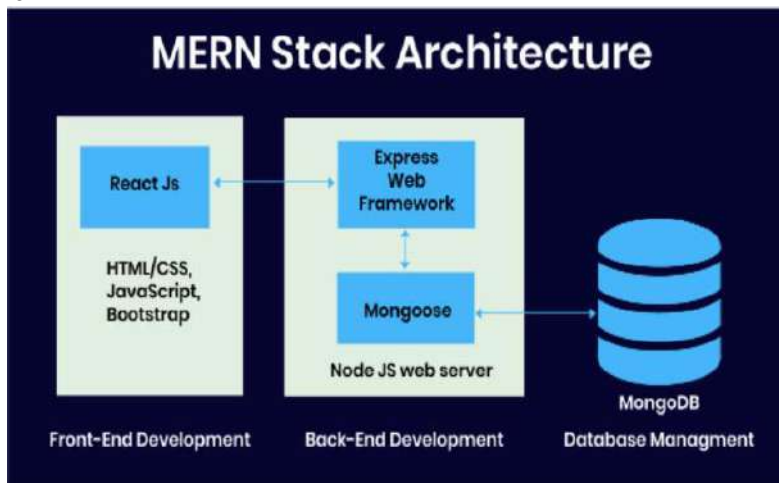
We will be able to introduce new products and services. Also to take advantage of brand name. It will allow us to enter the global market, also to react to pressure from competitors. To meet customer’s demand. To meet customer’s demand. It also allows us to increase sales. To reduce transaction costs. To reduce customer support costs. E-commerce customer motivation boils down to a few key factors: a streamlined shopping experience, an appropriate number of choices along the way, social proof to boost confidence and the power of a compelling discount.

3. LITERATURE SURVEY

The problem we are trying to solve is the lack of a platform for developers Alternatives that exist, but the difference is Jiphy provides all the features such as social media platform, code editor and compiler, social forum, blog post, and Q&A section on a single platform. When a user registers to Jiphy, they experience a clean UI, FAQ sections on how the website works, and a few blog posts to where they can get all the services like asking about code error, sharing code snippets, working on a code editor online with different developers in real-time, creating new connections, and sharing their experience on a social platform everything at one place. There are a few alternatives that exist, but the difference is Jiphy provides all the features such as social media platform, code editor and compiler, social forum, blog post, and Q&A section on a single platform. When a user registers to Jiphy, they experience a clean UI, FAQ sections on how the website works, and a few blog posts to get started on our website. People can use it as a platform to increase connections or can also use it to work on the same code base in real-time with multiple developers. We have used MERN stack in web development and firebase for authentication. We have also integrated a machine learning model in our code compiler which helps in auto compilation. Everything is hosted as a separate microservice. The web part is containerized and hosted on Heroku and the machine learning model is hosted on AWS Sage Maker. The future scope of our project would be making it open source and asking other developers for their contribution and new ideas a few of them will be a section for tech news updates and a section for learning chatbots to answer your tech questions.



4. System Architecture



Modules Imported

• **Mongo DB:** This is a free open-source, cross-platform document-oriented database program. It is classified as a No SQL database program, which means that data is stored in flexible documents with JSON-based query language. MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL).

• **Express JS:** This is also a free, open-source software, it can be classified as a web application framework for Node.js. To be more precise, Express JS is made for developing webapps and APIs. Express is a fast, assertive, essential and moderate web framework of Node.js. You can assume express as a layer built on the top of the Node.js that helps manage a server and routes. It provides a robust set of features to develop web and mobile applications. Let's see some of the core features of Express framework:

It can be used to design single-page, multi-page and hybrid web applications. It allows to setup middleware to respond to HTTP Requests. It defines a routing table which is used to perform different actions based on HTTP method and URL. It allows to dynamically render HTML Pages based on passing arguments to templates.

• **React JS/Redux:** Redux is an open-source JavaScript library for managing and centralizing application state. React is a JavaScript library for building user interfaces. React is used to build single-page applications. React allows us to create reusable UI components. The main objective of ReactJS is to develop User Interfaces (UI) that improves the speed of the apps. It uses virtual DOM (JavaScript object), which improves the performance of the app. The JavaScript virtual DOM is faster than the regular DOM. We can use ReactJS on the client and server-side as well as with other frameworks. It uses component and data patterns that improve readability and helps to maintain larger apps.

• **Node JS:** Originally built for Google Chrome and later on open-sourced, Node JS is a cross-platform runtime JavaScript environment used for executing JavaScript code outside of a browser. Node.js is an open-source and cross-platform JavaScript runtime environment. It is a popular tool for almost any kind of project! Node.js runs the V8 JavaScript engine, the core of Google Chrome, outside of the browser. This allows Node.js to be very performant.

• **React Native:** React Native is an open-source JavaScript framework, designed for building apps on multiple platforms like iOS, Android, and also web applications, utilizing the very same codebase. It is based on React, and it brings all its glory to mobile app development. React Native is a JavaScript framework used for developing a real, native mobile application for iOS and Android. It uses only JavaScript to build a mobile application. It is like React, which uses native component rather than using web components as building blocks.

• **Expo Go:** Expo is an open-source platform for making universal native apps for Android, iOS, and the web with JavaScript and React. Expo is an open-source platform for making universal native apps that run on Android, iOS, and the web. It includes a universal runtime and libraries that let you build native apps by writing React and JavaScript. This repository is where the Expo client software is developed, and includes the client apps, modules, apps, and more. The Expo CLI repository contains the Expo development tools.

5. PROPOSED SYSTEM ARCHITECTURE

The E-commerce Management System has many advantages, compare to traditional store as one can compare the cost of a product with other e-commerce websites, and if a user dislikes any product he/she can return it. While we can make use of the current technology to overcome the problem with the existing system. The E-commerce Management System companies can use a flying robot, so when a user places an order, the company will send the product through the robot. The robot will find the user by using the GPS, and in this way, we can reduce the time to deliver a product. While before sending a product the e-commerce company will check the product that it is same or not with the requested order.

6. METHODOLOGY

This system works using various modules listed below. Refer fig. 1.0 given below shows various modules in the system and the relationship that exists between them.

1. **User** - This module of the system describes the different views the system will provide. As shown in there will be two views. They are:

a) **Registered User** - This view will be provided by the system to the authenticated user who has successfully registered into the system. Only the registered user will be allowed to experience further functionality (i.e to access the products buy them place order and other stuffs.) of the system. Moreover registered user can also use different services provided by our Web App and Mobile Application.

b) Guest User - This view will be provided by the system to the guest user. Guest user can view add to cart functionality, but cannot use other important functionality of the system.

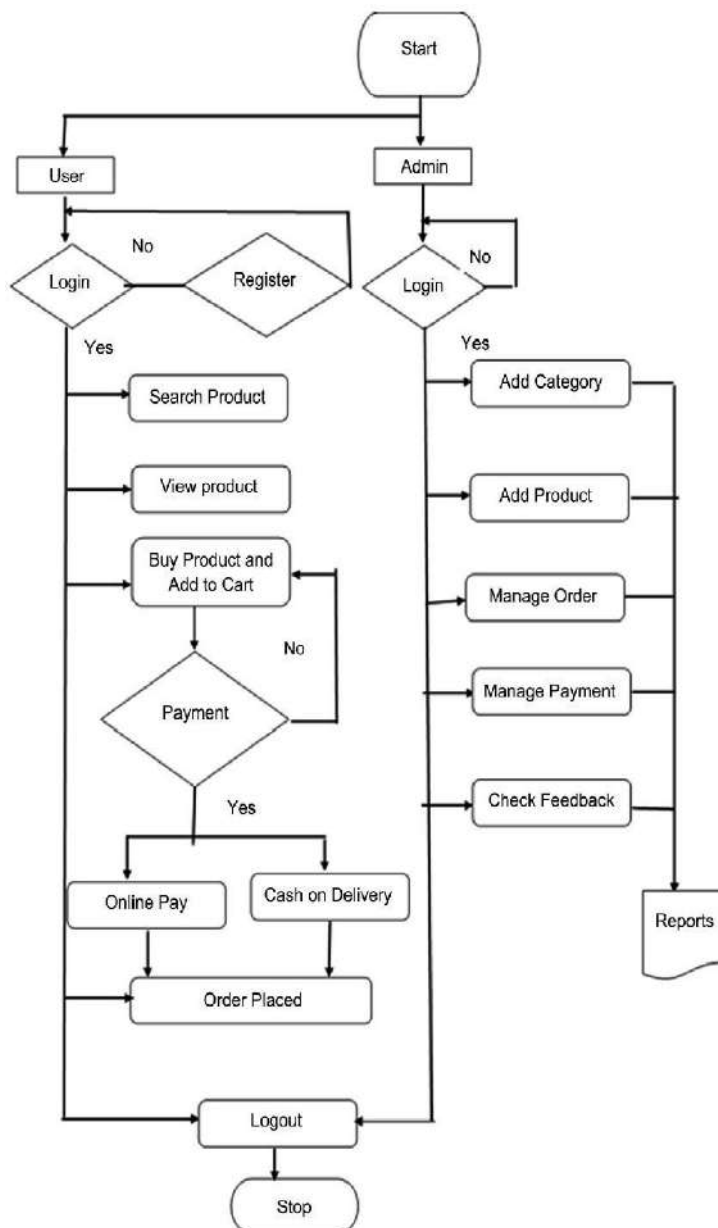
2. Authentication – This module deals with authenticating and verifying whether the user is registered user or not. The user gets to user other privileges once successfully authenticated.

3. Logged in User– This module of the system deals with taking inputs from the user. The users have to enter their credentials type they want along with some basic user information like delivery address PayPal credentials etc.

4. Payment Types: Can select the payment types COD or PayPal account or Card Payment.

5. Placed Order: Order has been placed and the user will get updated when the admin will update from its side after confirmation from the PayPal account of the company.

6. Admin Privileges: Admin will add, update and delete products. Admin has the access to view user profile and update order to deliver if amount is successfully paid.



7. FUTURE SCOPE

Working in the MERN stack delivers powerful results simply and efficiently. Knowing your way around the stack is an important skill set since building and deploying solid MERN apps is likely to gain importance in the future. These days, MERN Stack is used extensively since everything is done in JavaScript. As you know, JavaScript is everywhere. It is used both on the front-end and back-end side. Because of this, there's no need for context

switching. Tech stack that utilize multiple coding languages, force developers to figure out how to mix them together. Since MRN is JavaScript-based, developers only need to master a single coding language, which makes things a million times easier. Node.js was built on Chrome's JavaScript runtime to make it more conducive to building fast-operating network applications with easy scalability. The platform operates using a non-blocking, event-driven I/O model that is incredibly efficient. Node.js's efficiency and simplicity make it an ideal platform for real-time sites running across distributed devices, especially those with intense data requirements. But Node.js has far more potential in conjunction with the MERN stack.

8. CONCLUSION

The main theme is to build an e-commerce electronic gadget selling websites with all three i.e., Front end, Back end, and Database. This website is a fully fledged working website right from the login authentication, admin authorization, add items to cart, using payment gateway. It can be used by any textile industry on either a small scale or a larger scale. The website is easy for them to access and without any effort categories can be created and products can be added by them. It will be very attractive for the customer to see the products by sitting at home or office. It will be very helpful for the small-scale industries without selling to wholesales, large retail mediators they can directly sell to the customer by saving money for both.

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ONLINE NOTES PORTAL AND OCR**Prashant Shukla¹, Swapnil Lade², Vivek Chintankindhi³ and Sharique Shaikh⁴**^{1,2,3}Student and ⁴Assistant Professor, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India**ABSTRACT**

One of the foremost involved issues of these days is to precisely translate the text gift in a picture to somebody's clear text. This has been gaining attention of late due to the huge work done by the pc Vision Community.

The most vital idea behind this technology are a few things known as OCR – Optical Character Recognition. With the assistance of the OCR, we are able to search and acknowledge the text in electronic documents and might simply convert them into human clear text. It converts electronic documents' text into connected grapheme.

Document segmentation and Translation square measure one among the key areas in pattern recognition and tongue process. This paper presents details concerning translation in terms of an online application that accepts image associated pdf document as an input, wherever input document could be a user outline image file containing text in any language offered within the Python-tesseract library and will its actual translation in any supported languages victimisation Google Translator. Python script and numerous libraries square measure accustomed approach numerous challenges in segmentation and translation of a document.

And on-line Notes Portal permits student to share their Notes and Documents while not sharing their non-public info.

It will conjointly permit student to invite the notes that they're needed of on-line Notes Portal has its own info for storing the information files and knowledge recording the notes and student.

Keywords: Online Notes Upload, Download, OCR, Admin panel.

1. INTRODUCTION

Online Notes Portal and OCR may be a web-based application that permits student and school to share notes and documents concerning the topics and lectures.

In several schools their square measure therefore me students square measure introvert they merely can't raise anyone for notes and facilitate so we tend to making a poral which will have all reasonably notes for as long as college desires. It conjointly takes Queries from students if any student desires any reasonably special notes for the study, they merely simply enkindle it mistreatment question page on internet application.

It conjointly has OCR feature if any student desires to grab data the knowledge the data from pictures and pdf and edit that information as doc, they will do this by mistreatment OCR.

OCR signify Optical Character Recognition. it's a mechanism which will convert text in AN electrical document or a scanned writing into human decipherable text. It scans the text of the image character-by-character, analysis the image then converts into the respectable ASCII character Code. Most of the OCR devices have a optical scanner for scanning the text then Analysis it through the OCR and generating an editable document of the scanned image.

1.1 BACKGROUND

In today's world this is problem for many students that they cannot find all notes related to them Study. And also, many school and college doesn't have any website and any app related to library and for the notes. In the Pandemic many colleges and Schools were unable to provide the right kind of books for study for the student. Because they don't have any kind of online portal or app for notes and books study were mainly dependent on google for books and notes.

1.2 PROBLEM DEFINITION

In Current situation several schools don't have any reasonably IT support or any reasonably online management for them. they're in the main reliable on google and online services for give books and notes to their student. For that sort of faculties and college we have a tendency to try to produce an answer for them we have a tendency to create an internet notes portal for them wherever they'll share notes with one another while not revealing any one's identity. There's a quickly increasing demand for versatile and non-traditional learning and teaching. This demand is pushing universities and different instructional establishments to supply new ways in which of achieving best course delivery and scope, like by the increasing giving of on-line and amalgamated courses of study.

2. OBJECTIVE

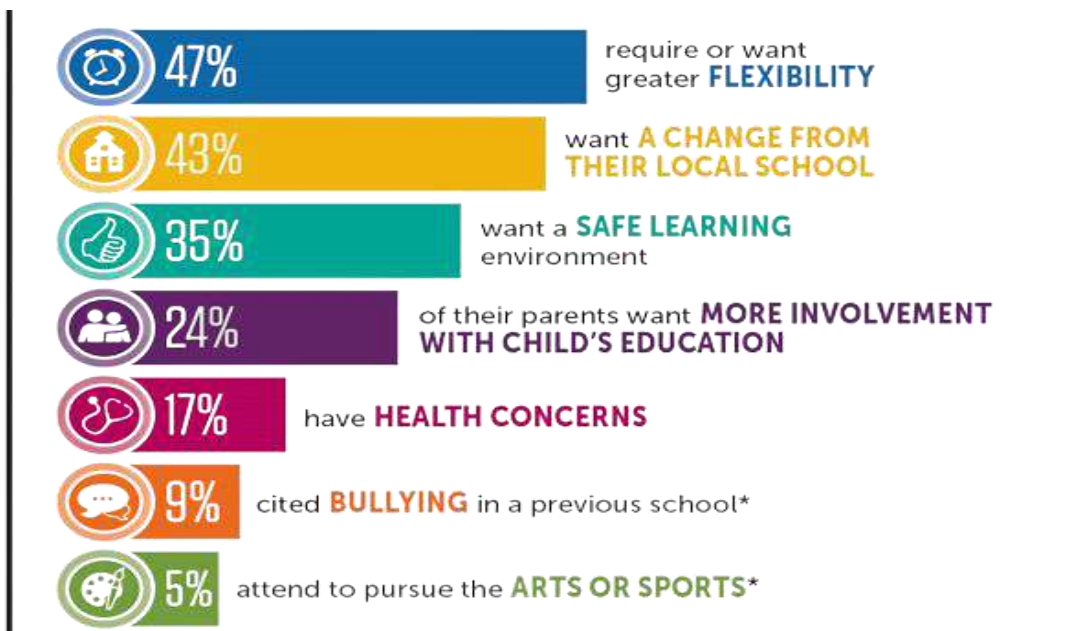
An impediment to the growth and improvement of online university education is that the lack of suitability of some courses and course options for online implementation. whereas the content of most ancient courses will be delivered on-line and learning outcomes will be achieved by adopting equivalents to face-to-face education approaches, bound courses gift important constraints for delivery on-line. we've got used technology as Django, Py-Tesseract, OpenCV and SQLite for building this project. Django is one in every of best framework for handling great amount of knowledge.

3. LITERATURE SURVEY

We have undergone certain research papers based on the Experimental Analysis of Colleges and Schools data Using Data Mining and found out certain methodology and key findings. During the process, we have also identified certain research gaps which we can overcome while implementing our project.

Table -1: Literature Review table

S.No	Statements	Responses	N	Marginal Percentage
1.	The usability and expertise in computer ensures the effectiveness in computer mediated learning.	SDA	6	7.2%
		DA	5	6.0%
		N	7	8.4%
		A	38	45.8%
		SA	27	32.5%
2.	Online learning ensures the effectiveness in terms of coping up with missed lectures.	SDA	0	0%
		DA	10	12.0%
		N	14	16.9%
		A	43	51.8%
		SA	16	19.3%
3.	Productivity of students can be enhanced through online learning to strengthen educational concepts.	SDA	1	1.2%
		DA	3	3.6%
		N	15	18.1%
		A	44	53.0%
		SA	20	24.1%
4.	Online learning is economic in terms of time for students and teachers.	SDA	2	2.4%
		DA	10	12.0%
		N	19	22.9%
		A	33	39.8%
		SA	19	22.9%
5.	Students and teachers interaction is weak through online learning.	SDA	4	4.8%
		DA	21	25.3%
		N	17	20.5%
		A	24	28.9%
		SA	17	20.5%
6.	Online learning ensures the effectiveness for presenting the work in class.	SDA	3	3.6%
		DA	13	15.7%
		N	28	33.7%
		A	24	28.9%
		SA	15	18.1%
7.	Quality of teaching and learning can be increased through Online learning because it integrates various types of media.	SDA	3	3.6%
		DA	14	16.9%
		N	14	16.9%
		A	34	41.0%
		SA	18	21.7%
8.	Online learning offer maximum engagement of students.	SDA	4	4.8%
		DA	14	16.9%
		N	18	21.7%
		A	36	43.4%
		SA	11	13.3%



Method	Description
Optical mark recognition (OMR)	OMR looks for marks in a predefined location. The earliest use of OMR was for paper tape (in 1857) and punchcards (created in 1890). Nowadays OMR uses an optical scanner or mark reader to look for the marks in a predefined location on the questionnaire. OMR can detect the mark but cannot identify what the mark is, as there is no recognition engine. OMR is best used for discrete data, with predefined response categories. Accuracy rates are typically high (~99.8%), and more accurate than manual keying (Smith et al. 2007). OMR employs special paper, special ink, and/or a special input reader.
Optical character recognition (OCR)	Through the recognition engine, OCR translates scanned printed character images into machine-readable characters (ASCII). It looks at individual characters rather than whole words or numerical amounts. Accuracy rates are ~80% (Smith et al. 2007). It therefore reduces the cost of data capture processing by reducing the amount of manual keying. OCR uses a pattern recognition engine, requiring clear contrasts between completed responses and the paper background.
Intelligent character recognition (ICR)	More recently the term ICR has been used to describe the process of interpreting image data, in particular alphanumeric text. ICR recognizes and converts handwritten characters to machine-readable characters. ICR is generally contained as a module of OCR and can provide real-time recognition accuracy reports.

4. Technology Used

OCR (Optical Character Recognition)

Optical character recognition or optical character reader OCR the electronic or mechanical conversion of images of typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billboards in a landscape photo) or from subtitle text superimposed on an image.

DJANGO

Django is a high-level Python internet framework that allows speedy development of secure and reparable websites. designed by toughened developers, Django takes care of a lot of of the effort of internet development, therefore you'll concentrate on writing your app while not having to reinvent the wheel. it's free and open supply, features a thriving and active community, nice documentation, and plenty of choices for gratis and paid-for support.

Django are often (and has been) want to build virtually any style of web site - from content management systems and wikis, through to social networks and news sites. It will work with any client-side framework, and might deliver content in virtually any format (including HTML, RSS feeds, JSON, XML, etc).

5. METHODOLOGY

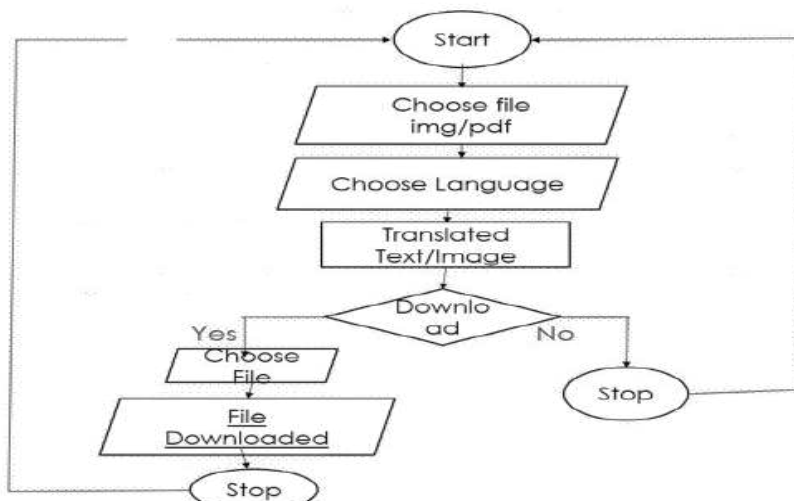


Fig -1: Methodology Diagram for Extracting Text from Images Using OCR

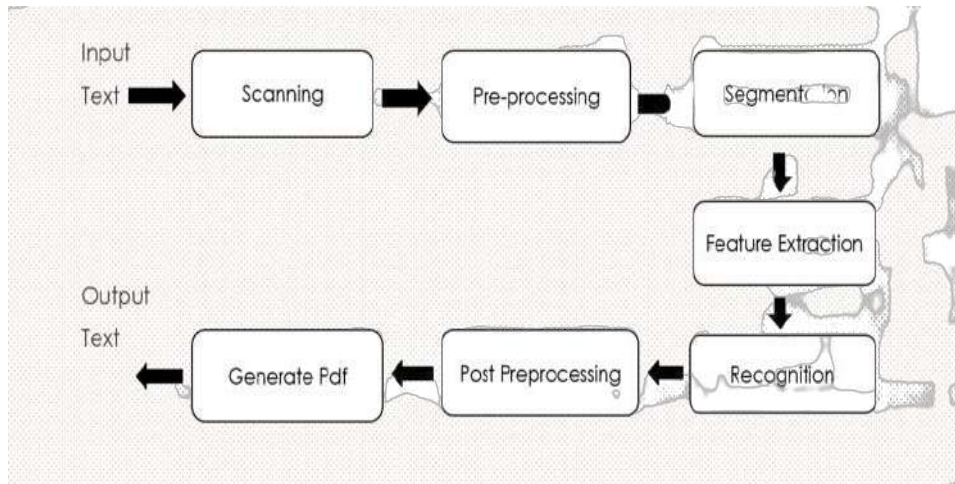


Fig-2: Block Diagram for extracting text from images

6. RESULT AND DISCUSSION

This project is fundamentally related to use of information technology in Education can change the scenario of decision making and learning method can yield in a better way. By using the Online Notes student will able to get study material related to their syllabus and they can also share notes with colleagues. Online Notes Portal also has OCR (Optical Character Recognition) features by using this feature student will be able to extract text from images and use it make documents and pdf files. we can browse any image and ask the application to convert the image text into the required language text.

7. FUTURE SCOPE

The Online Notes Portal will be used as Uploading sharing Notes with student belonging to their colleges and School. It also can be used as library where different kind of books and notes can be uploaded and student can download Share and Upload notes

All the Notes will be managed by some Admin in online notes portal admin could be anyone from teacher faculty all the uploaded Notes will be first verified by the admins than only it will be available for the student.

Student can also use built in OCR feature in Portal for scanning documents and extracting text from them and use that text makes Notes.

8. CONCLUSIONS

Here we have presented a method to use segmentation and translation together in order to separate a document in such a way that it will reduce the complexity to understand a document and make that document easily available in the most understandable form anyone could need. The technology used for Optical Character Recognition will help to get that document readily converted into the characters which can then be translated to any language known to Google Translate API. We have shown that any document whose image is available with us can be read and translated by means of some python scripting and which will ultimately help anyone to understand it in his/her known language. output from the working web-application.

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N-MARKET**Mr. Shamshad khan¹, Ms. Mayuri Umbarasada², Ms. Sushama Bhoi³ and K. N Attarde⁴**^{1,2,3}U.G Student, ⁴HOD, Department of Computer Engineering, Theem College of Engineering, Boisar, India**ABSTRACT**

As the world is so busy, no one like the complexity with any work dealing with numbers. It might be hectic works. Specially when we have to types numbers for calling, messaging and WhatsApp. The situation creates panic and confusion on the person who do the task of calling, messaging and WhatsApp. Having Records of the called numbers is important the feedback after calling too.

Keyword: Calling, Messaging, Tally, Feedback and WhatsApp

I. INTRODUCTION

So, our aim is to develop an android application for marketing purpose. Marketing application provides you facility to call all the numbers in an excel sheet. Automatically call and hang up after certain duration. It's automatically sends SMS to each number and let them know the scheme. This application gives universal acceptance for offline as well as online commutators.

This application is developed with the objectives of making the system reliable, easier, fast and more informative. This application will help to managing various types of records such as client's details, product/schemes list & easily sell.

One of the main advantages of this Multi-Marketing Caller application is to connect peoples or clients which are far away from the internet world & provides useful content to them through SMS.

Short Message Services (SMS) is one of the most engaging and cost-efficient ways to engage prospects and customers. SMS and Call is a very effective marketing tool.

II. LITERATURE SURVEY

Virtual mentoring to enhance persistence essential for secondary and post-secondary students with disability enrolled in STEM learning (Gregg et al., 2016). Their evidence showed positive results using intentional frameworks and constructs to help enhance persistence and engagement. Their Research uncovered findings from the National Science Foundation that indicated that 1 out of 4 students with a disability enrol in a STEM major (Gregg et al., 2016). In addition, 56% of students with a disability do not report that they have a learning disability (Newman, et al., 2010). As a result, Gregg et al., (2016) their study reveals that with additional Assistance via virtual mentoring, students with a disability can increase their confidence as well as their competencies in areas such as math and science. This virtual program also hoped to reduce some of the barriers often experienced by the students such as traveling, time constraints and costs.

III. TECHNOLOGY USED**1) Android SDK**

I) Android Studio as a Developer Environment for our app

II) Its open source

2) Java Language

I) The language that is been used to code N-Market App.

II) It is used in almost devices.

3) Android Device

I) To Install and test the App

II) Android 23+ API

4) XML Language

I) To design the Layout of the N-market app.

II) It is Extensible mark-up language.

5) WhatsApp API

I) TO connect the App with WhatsApp.

II) It check the validity of number

IV. RESULT

The result is shown below. It shows the main view of our N-Market app. It includes Call, Message, WhatsApp and exit button.

1. Size of our App is 79kb.
2. No extra module used.
3. It is freeware.

**V. CONCLUSION**

The Multi-Marketing Caller Application concludes that with combination of knowledge and technology one can surely find a new innovative way to produce such algorithm or idea from which our society can be converted to digitally orient. With the point of this application, if this idea can be implemented with full use of technology used by existing supports one can get benefits of this application which is connected to Peoples which are far away from internet world to providing useful information through calling and messaging as well as performing quick way to do selling products.

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FAKE NEWS DETECTION USING MACHINE LEARNING**Kinal Patel¹, Vrushti Patel², Aakansha Rathod³ and Sneha Sankhe⁴**^{1,2,3}Student and ⁴Professor Department of IT, Theem College of Engineering, Boisar, Maharashtra, India**ABSTRACT**

In these current instances, we heavily rely on social media applications inclusive of facebook, instagram, twitter, whatsapp, and many others. With these apps getting used every day, people are sharing extra statistics than ever before. Now-a-days, the news get unfold just in a couple of seconds, with the usage of social media programs. While absolutely everyone can use it best few can inform the distinction between what they're reading is some thing true or something completely fake. In this fast or rapidly developing world we simply examine the news or watch the information and trust it. The news we study is on some social media utility it does now not mean that the news must be correct, it can be fake or perhaps half proper. As we understand social networks are open for everybody and they do no longer verify their consumer or their posts so spreading faux information and misleading humans is an event which is regularly faced. Fake news may be truly harmful as they could target an character, organization or political parties. One such example may be the recent activities where some social media influencers might be bribed to give statements which includes the covid-19 vaccines are useless and can be dangerous for human beings. So, we're creating a gadget to come across whether or not the news that is provided is real or false, with the help of some Machine Learning Algorithms and some python libraries Our purpose is to offer the consumer actual or authentic information and allow the user come to recognise what they may be reading is absolutely actual or not, and additionally take a look at the authenticity of the web sites.

Keywords: Fake News, Machine Learning, News Detection, Algorithm

1. INTRODUCTION

Fake information is false or deceptive facts provided as information. It often has the purpose of adverse the reputation of a person or entity, or earning money through advertising and marketing revenue. They frequently have grammatical mistakes. They are often emotionally colored. They regularly try to affect readers' opinion on some topics. Their content isn't constantly true. They regularly use attention in search of phrases and news format and click baits. They are too properly to be real. Their assets aren't real maximum of the times. Our life now has turn out to be digital, as we can do most of the things on-line just by means of one click. In this virtual growing world, using net is increasing. It's like maximum of our lives depend on such social media programs. So, the use of those packages we additionally gain maximum quantity of news. The cause defined for this is, traditional information is more time ingesting. Consuming information from social media structures feels easy due to the fact we are able to proportion, speak the news via just one click While the use of social media we trust in what we study, and we even don't know that the news we read is whether or not correct or fake. We accept as true with what we see or what we read, and our maximum amount of decisions and reactions rely what we see and study. So, with the aid of analyzing fake news we may also judge the person or organization.

2. LITERATURE SURVEY

Mykhailo Granik ET. Al. In their paper indicates a simple technique for fake news detection using naive Bayes classifier. This technique changed into carried out as a software system and examined in opposition to a information set of Facebook news posts. They have been accumulated from three large Facebook pages every from the right and from the left, in addition to 3 massive mainstream political news pages (Politico, CNN, ABC News). They completed classification accuracy of about seventy four%. Classification accuracy for fake news is barely worse. This can be resulting from the skewness of the dataset: only 4.9% of it is fake information.

Himank Gupta gave a framework primarily based on different gadget studying approach that deals with numerous issues along with accuracy scarcity, time lag (BotMaker) and excessive processing time to handle heaps of tweets in 1 sec. Firstly, they have got accrued 400,000 tweets from HSpam14 dataset. Then they further symbolize the 150,000 spam tweets and 250,000 non- unsolicited mail tweets. They additionally derived a few light-weight capabilities along side the Top-30 words which can be supplying maximum facts advantage from Bag-ofWords model. They have been able to obtain an accuracy of 91.65% and exceeded the present solution through approximately 18%. Marco.

3. SYSTEM DESIGN

We have created this project for detecting fake news. We chose python programming language as it provides beneficial tools and capabilities that makes developing web applications less difficult. It offers developer

flexibility and is extra handy. It will assist taking the input from the user. Once the enter is given to the gadget the given input records can be passed on for records extraction manner and for this procedure we've TF-IDF vectorizer. It will rework the textual content to characteristic vectors that may be used as enter to the estimator. It is used for massive amounts of facts e.g: Tweets, posts, and many others. It will differentiate commonplace words and new words. After that the facts will go through pre-processing and data extraction using TF-IDF processor. Then the usage of Logistic Regression, Decision Tree classifier, and Random Forest Classifier the data can be categorized as actual or fake, and if actual then upto how tons percentage or faux then upto how lots percent and ultimately the output may be generated and displayed along with its probability percentage.

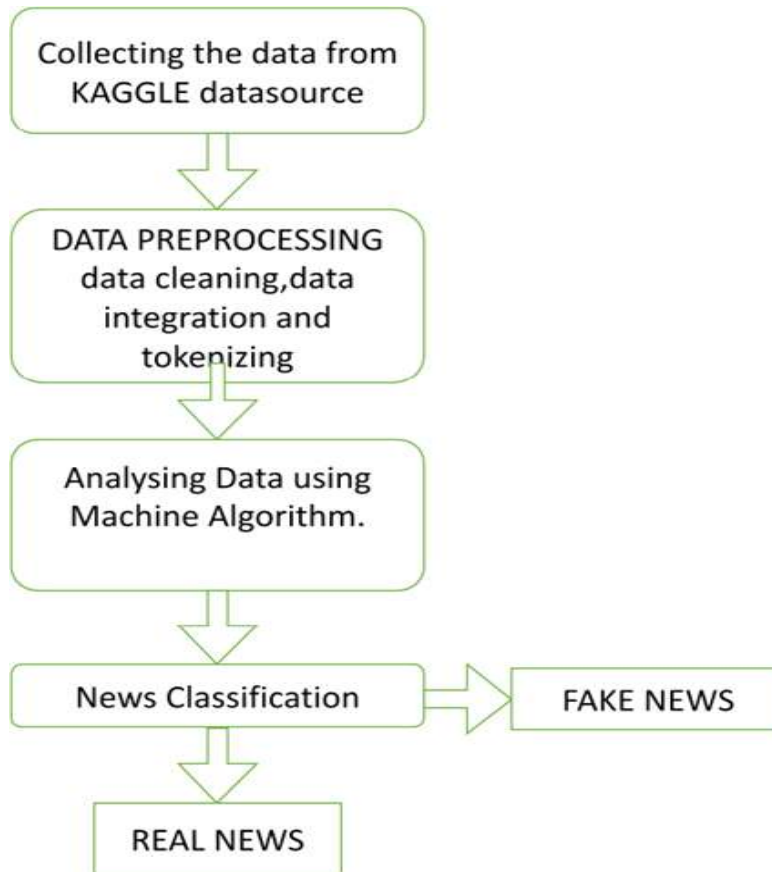


Fig – 1: System Flow diagram

4. IMPLEMENTATION

4.1 Data Collection and Analysis

There are two documents, one for actual news and one for fake news (each in English) with a total of 23481 "fake" tweets and 21417 "actual" articles.

4.2 Management of Data

In this section, a collection of understanding (dataset) is accumulated that could be a set of report articles, memories, information, posts. Once the dataset is gathered, nltk is overseas and corpus is used to perceive a collection of written or spoken material hold on a PC and acquainted with determine however language is used: the statistics is explored to set off a much higher facts of its shape and which means so the stopwords are eliminated.

4.3 Model Training

After the facts is properly explored and managed, the machine learning model is then geared up to be educated. A appropriate algorithm is chosen to teach the version. In our case, we've used three algorithms: Logistic Regression, Decision Tree Classifier and Random Forest Classifier.

4.4 Model Assessment

In assessing the model, the output of the model created is measured severally. Accuracy grading of the version is performed the usage of performance metrics like F1 rating, precision, keep in mind and accuracy charge that is based on confusion matrix record. Some adjustments are often created some of the model until delight is carried out in creating the version yield in clever accuracy of output.

5. RESULTS AND DISCUSSION

On the basis of 3 system mastering algorithms that we used on this project, each set of rules has its own accuracy percentage while carried out on the dataset. The accuracy in line with the each set of rules implemented are:

Classifier	Accuracy
Logistic Regression	98.8%
Decision Tree Classifier	99.6%
Random Forest Classifier	98.9%



Fig -2: Word Cloud

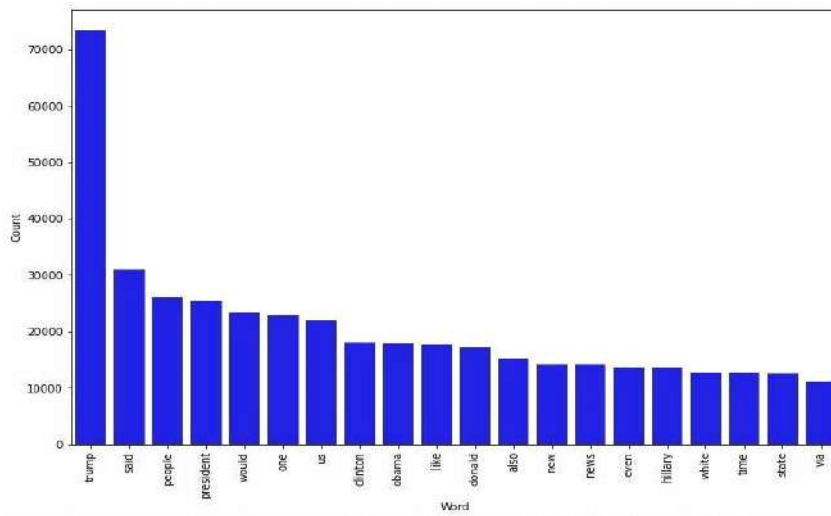


Fig-3: Graph of word count

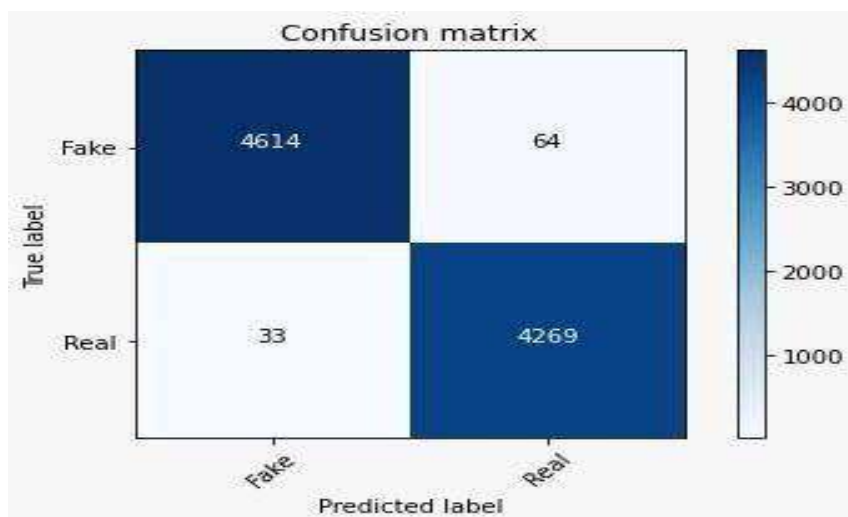


Fig-4: Confusion Matrix for Logistic Regression

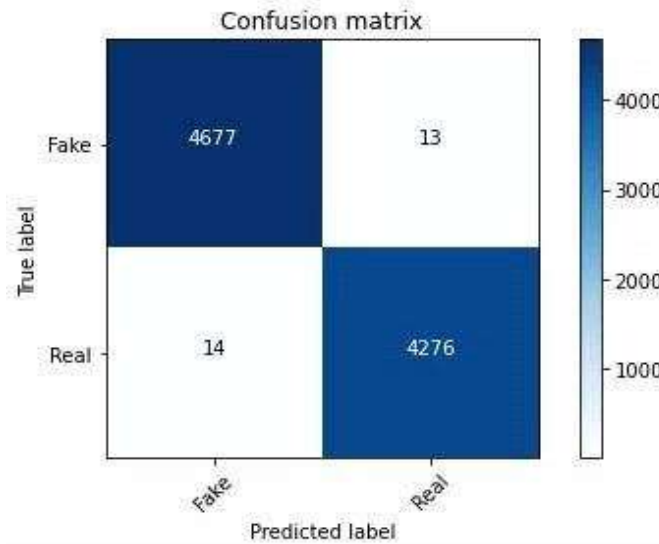


Fig-5: Confusion Matrix for Decision Tree Classifier

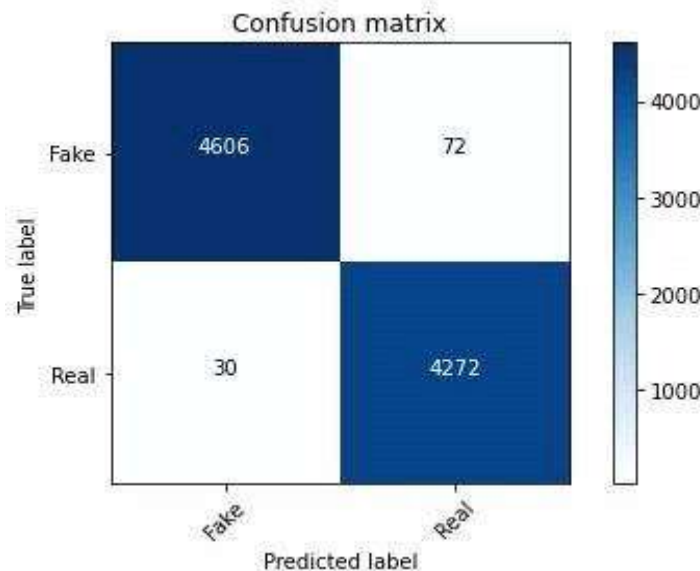


Fig-6: Confusion Matrix for Random Forest

6. CONCLUSION AND FUTURE WORK

“Fake news” is a time period that has come to mean different things to one-of-a-kind humans. At its core, we are defining “fake information” as those information stories which are fake; the tale itself is fabricated, with out a verifiable statistics, sources or fees. Sometimes these memories can be propaganda this is deliberately designed to deceive the reader. In latest years, fake news memories have proliferated through social media, in element due to the fact they may be so effortlessly and fast shared on-line. The assignment of classifying news manually requires in-depth expertise of the domain and understanding to perceive anomalies inside the text. In this mission, we discussed the trouble of classifying fake information articles using machine mastering models and ensemble method. The number one purpose of the undertaking is to identify styles in textual content that differentiate fake articles from authentic information. Fake news detection has many open problems that require attention of researchers, so that you can lessen the unfold of fake information, identifying key elements concerned inside the spread of news is an vital step. Graph idea and system studying techniques may be employed to discover the key resources involved in spread of fake information. Likewise, actual time fake information identity in videos may be any other possible destiny course. In the destiny, I wish to test out the proposed method of Naïve Bayes classifier, SVM, and semantic analysis, but due to constrained knowledge and time, this can be a task for thefuture. It is important that we've a few mechanism for detecting fake information, or a minimum of, an consciousness that no longer everything we examine on social media may be authentic, so we constantly need to be questioning severely. This manner we will help human beings make more knowledgeable selections and they may now not be fooled into questioning what others need to manipulate them into believing.

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MENTOR APPLICATION SYSTEM**Ankit Tiwari¹, Manish Vaity², Ajay Yadav³ and Sheetal Solanki⁴**^{1,2,3}UG Students and ⁴Professor, Department of Information Technology, TCOE, MU, Maharashtra, India**ABSTRACT**

Mentor is an individual with expertise who can develop the career of a mentee. This career-related function establishes the mentor as a coach who provides advice to enhance the mentee's professional performance and development. Mentors have the right to advise students on academic guidance, career advice, and professional development. Different mentors play various roles which are able to address different developmental needs of mentees in order to facilitate career progress. Mentoring is one of the most dynamic and traditional pedagogical tools, holding a great promise in the way of learning in educational technology. The emphasis should be on motivation and improvement of the students. As a replacement for face-to-face interactions, Electronic-Mentoring System (E-Mentoring System) uses an asynchronous, electronic medium to establish and sustain the liaison among the mentors and the proteges in an organization. Mentoring system is a client-server based model which acts as an interface between mentors and mentees. Mentoring uses a computerized medium to transfer knowledge and skills from teacher to student. It basically focuses on student and faculty relationships. E-Mentoring is fundamentally developed to improve the performance of students by assisting mentors to understand the problems of students more effectively and easily.

Keywords: Web Development, Admin Module, Student Module, Teacher Module, Database, Login.

I. INTRODUCTION

We have created a Mentoring software application which is accessible by both the Mentor (faculty) and the Mentee (student). The program is effectively designed to be used in the educational sector. The purpose of this program is mentoring students. This system is built under a runtime environment. While making this program complete object-oriented programming techniques are used to handle the real-world challenges in the system. This system contains three users who are admin, mentors and students. This system can be used as an application for Mentor Information Database to manage the college information and student's information. The system is an online application that can be accessed throughout the organization and outside customers as well with proper login provided. A mentor is an individual with expertise who can help develop the career of a mentee. A mentor often has two primary functions for the mentee.

The career-related function establishes the mentor as a coach who provides advice to enhance the mentee's professional performance and development. The psychosocial function establishes the mentor as a role model and support system for the mentee. Both functions provide explicit and implicit lessons related to professional development as well as general work-life balance. The mentoring relationship is inherently flexible and can vary tremendously in its form and function. The mentoring relationship exists between one individual in need of developmental guidance and another individual who is both capable and willing to provide that guidance.

The program allows for current students to impart their knowledge and experiences attending the college, and enhance their communication and goal setting skills. Mentors have the opportunity to advise students on academic guidance, career advice, and professional development. Mentors and students will be paired based on a variety of factors. There will be an expectation for both individuals to engage each other on a regular basis to ensure the relationship grows and benefits both the student and the professional. Pairs are asked to meet at least once a month for a formal commitment of 4 months, and we hope to allow each mentoring relationship to develop in a way that best suits the individuals involved. Mentees often have more than one mentor throughout their careers. With multiple mentors, a mentee can benefit from different mentors who have a variety of experiences and skill strengths to share. A developmental network perspective is used to expand our understanding of mentoring. Different mentors may be able to address different developmental needs of mentees in order to facilitate career progress.

II. LITERATURE SURVEY

We have undergone certain research papers based on the Experimental Analysis of Colleges and Schools data Using Data Mining and found out certain methodology and key findings. During the process, we have also identified certain research gaps which we can overcome while implementing our project.

1. E-Mentoring System Application (DOI: 10.1109/I-SMAC.2018.8653663):

Teaching is most dynamic and traditional pedagogical tool, which holds the great promise in the way of learning in educational technology thus the aim should be on motivation and improvement of the students. Replacing the

face- to-face interactions, Electronic-Mentoring System (E-Mentoring System) uses asynchronous, electronic medium to establish and sustain the liaison among the mentors and proteges in an organization. E- mentoring system is a client-server-based model which acts as an interface between mentors and mentees. The focus in mentoring program is on fostering and developing a positive relationship between mentors and student.

2. A Research and Mentoring Program for UG Women in Computer Science (DOI: 10.1109/FIE.2004.1408747): It includes multi-faceted mentoring, community building activities, and a research program with significant educational components. The research component gives women an opportunity to work in research teams under the direction of a female faculty member who serves as role model. While there are other programs that allow students to work with female faculty on their research, this research program was designed to develop female students. The research team presents its research at an appropriate conference each year. The team members also reach out to other students by participating in recruiting activities and presenting their research to high school students at local career days.
3. Implementation of Mentoring System in College for Smooth Transition to work (DOI:10.1109/ICL.2015.7318202): Developing and securing excellent human resources under both of the internal and external environmental changes today are a key deciding factor of the national competitiveness. However, due to the poor vocational training or career guidance services in college, the colleges have not been playing the role in the transition to the professional world for their students, who consequently cannot meet the industrial demand. In this study, the active support to help college students transferring to the professional world through mentoring was considered, and the needs analysis and system implementation were performed to find an effective way to support such service by implementing this as an online system.
4. Implementation of Mentoring System Using J2EE Architecture: E-Mentoring (DOI: 978-1-5090-5240-0/16): Mentoring is a traditional method of transferring knowledge and skills from an established professional in an organization to an inexperienced member in the field. Education sector has found mentoring as quite effective tool since long back and with the advent of new technologies, comes an idea of online mentoring, which is also referred to as e-mentoring. Instead of face-to-face meetings, Online Mentoring System (OMS) uses asynchronous, electronic communications to establish and support the relationship between mentor and the student using virtual mode. E-Mentoring uses electronic medium to transfer knowledge and skills from mentor to student. It primarily focuses on student and faculty relationship. Online Mentoring System is a Client-Server model, which acts as an Interface between Mentor and student. OMS strives to reduce the work load of students in entering their details and at the same time enable the Mentors to assess their students more efficiently.
5. MENTORing Affectively the Student to Enhance his Learning (DOI: 10.1109/ICALT.2009.205): In this paper a Web-based adaptive educational system to support personalized distance learning, which is named MENTOR is presented. The main purpose of MENTOR is to support learner Silas actions during the learning process in an effective way. To achieve this MENTOR incorporates an affective module which enhances the traditional learning practices with an affective dimension. The affective module makes use of an ontological approach in combination with the Bayesian network model in order to provide learner with the properly affective guidance. In this way the foremost goal of MENTOR, which is to supply the learner with a personalized and emotional awareness learning environment, is achieved.
6. Implementation of Mentoring System in College for Smooth Transition to Work (DOI:10.1109/ICL.2015.7318202): Developing and securing excellent human resources under both of the internal and external environmental changes today are a key deciding factor of the national competitiveness. However, due to the poor vocational training or career guidance services in college, the colleges have not been playing the role in the transition to the professional world for their students, who consequently cannot meet the industrial demand. In this study, the active support to help college students transferring to the professional world through mentoring was considered, and the needs analysis and system implementation were performed to find an effective way to support such service by implementing this as an online system

III. DESIGN AND IMPLEMENTATION

The users would be highly authenticated as well as can be verified through their google account. Any kind of Data should not be leaked from within the application. Any user without sufficient privileges should not be able to access important data. Firebase Security Rules stand between your data and malicious users. We can write Simple or complex rules that'll protect our app's data to the level of granularity that the application requires.

In this section, we will discuss how the Mentor Application System is developed. This system is built under a runtime environment using complete object-oriented programming techniques to handle the real-world challenges in the system. This system contains three users who are admin, mentors and students

Figure 01:- Architecture Overview

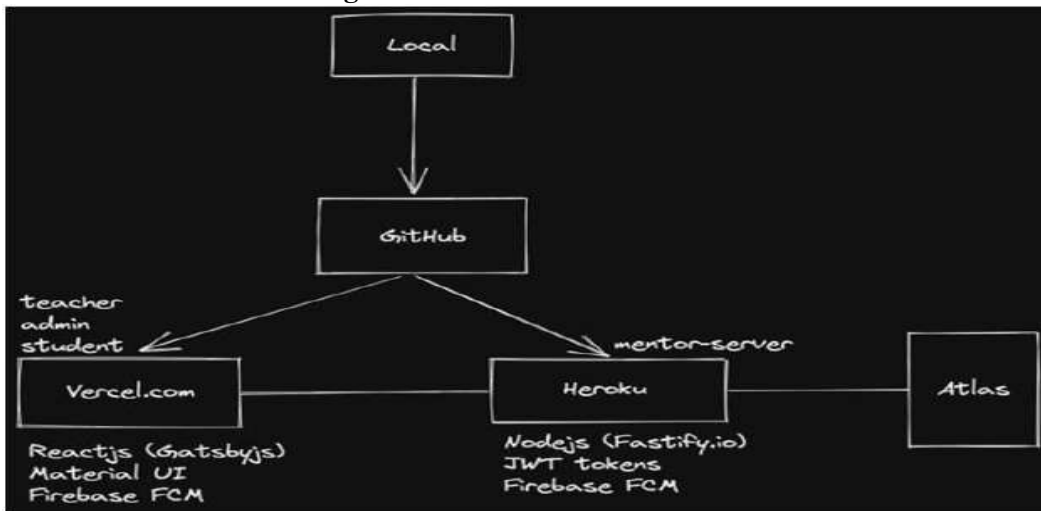
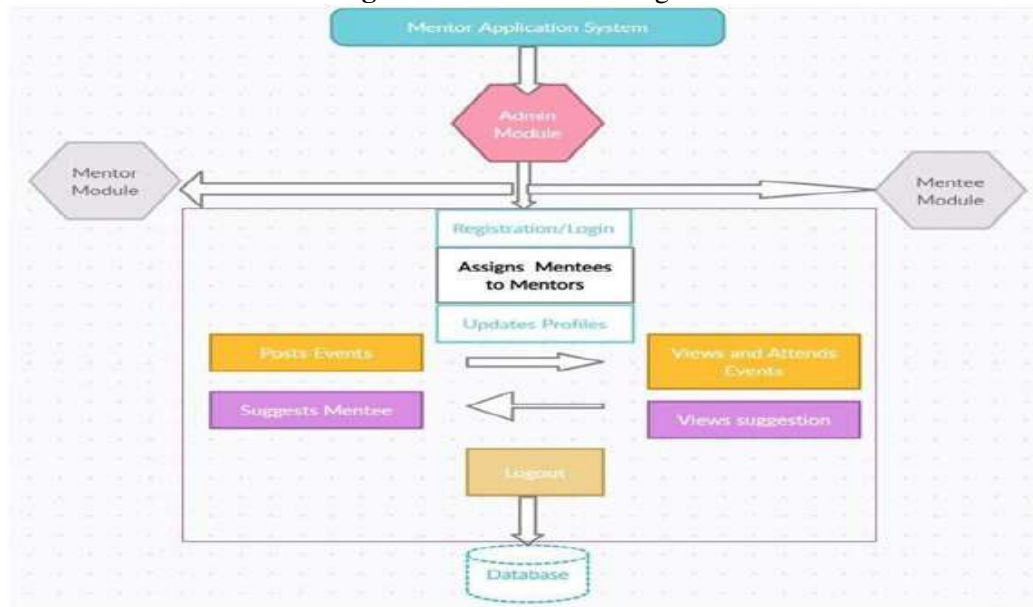


Figure 02:- Data Flow Diagram



ALGORITHM:-

1. The application starts with a home page
2. Home page contain Login button.
3. The application starts with Admin/Student/Mentee Login.
4. If the user is new, then admin will register the Student or Mentor using registration page.
5. Once Admin has entered the valid credential and details, he will share the credentials with the mentor or mentee.
6. After review page, the mentor or mentee login using that credentials and will be directed to Dashboard
7. Dash board is where user can choose to update information if gets wrong or review the Data review page.
8. If the user is existing user, then they will be directed to the dash board.
9. Step 6 again for all the users i.e., Mentor and Students.
10. This loop can only be close if user decide to click on log out button in the dashboard.

IV. RESULTS

- Admin module: The administrator has the only power to add a student or a student’s group, the addition of the faculty can only be done by the admin. The messaging system for the admin can support only the faculties, no students can message to the admin, and the message is secure.

The screenshot shows the 'Admin Dashboard' header with 'Admin Dashboard' on the left and 'Logout' on the right. Below the header is a form titled 'Personal Info'. The form contains the following fields: Name (text input), Birth Date (text input), Gender (dropdown menu), Address (text input), Email (text input), and Phone (text input). At the bottom of the form is a blue button labeled 'NEXT'.

Figure .03:- Admin dashboard

• **Mentor Module**

The mentor module has the capabilities that they can track the student’s attendance, marks, progress reports, UT marks, IA marks, etc. Apart from the admin, the mentors can also post the circulars for all the students and the notifications for their allotted mentees.

The screenshot shows the 'Admin Dashboard' header with 'Admin Dashboard' on the left and 'Logout' on the right. Below the header is a form titled 'Teachers Info'. The form contains the following fields: Name (text input), Gender (dropdown menu), Email (text input), Phone (text input), and Department (dropdown menu). At the bottom of the form is a blue button labeled 'SUBMIT'.

Figure 4:- Teacher Registration

- **Student Module:** The message/chatting facility for the students that is only with their mentors. The student module has the capabilities only for viewing the details about their marks, attendance, notices / circulars and their progress reports. Another feature that is enabled for the students to add or update their profile. There is also a one-time edit feature of the personal details of the students.

The screenshot shows the 'Student Dashboard' header with 'Student Dashboard' on the left and a power icon on the right. Below the header is a profile card with a grey circle containing a person icon. Underneath the profile card are three sections: 'Achievements', 'Internships', and 'Extra Curriculars'. Each section displays 'No data available' and has a plus sign icon to its right.

Figure 5:- Student Dashboard

V. CONCLUSION

In our application mentees are given more priority and freedom to select the mentor based on their area or interest and knowledge. This application can help the mentee and mentors to automate their normal workflows.

This system will be feasible for institutional/College use through the web interface and is secure to use. A mentor can conduct meetings by informing the students through this application and post their results. This module could also be used for collecting data of the mentee, mentor and interaction between them. This Application encourages real time knowledge sharing. We have designed and implemented the Mentor Application System. This system will be available for institutional/College use through the web interface. A database about mentee and mentor is stored. A mentor can conduct meetings by informing the students through this application. Each and every detail about the progress, weakness, strength of the mentee is observed by the mentor. We have successfully delivered the Mentor Application system with the features mentioned and deployed it to the cloud. We ran several tests around it to make sure it works well after being deployed to the cloud. This application thus helps the mentee and mentors to automate their normal workflows. This system will be feasible for institutional/College use through the web interface and is secure to use. A mentor can conduct meetings by informing the students through this application and post their results. This module could also be used for collecting data of the mentee, mentor and interaction between them. Mentors can also look at student's profiles and guide them based on their results.

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ONLINE SECOND HAND VEHICLE BUYING & SELLING**¹Sajid Kasari, ²Akash Singh, ³Iftikhar Shaikh, ⁴Aryan Bramhankar, ⁵Juned Sayyad and ⁶Adil Shaikh**^{1,2,3,4,5}Computer Engineering and ⁶Senior Lecturer, Computer Engineering, Diploma, Theem College of Engineering, Boisar East, Chillhar Road, Thane, Maharashtra**ABSTRACT**

This Project is a web based application developed for users who can Buy and Sell Second Hand Vehicle from the comfort of home through the Internet. It is a virtual store on the Internet where customers can browse the catalog and select Vehicles they are interested in, and Further read full details about the Vehicle. This system overcomes the problem of searching for a second hand vehicle. People usually go to garages and showrooms in search for their desired second-hand vehicle that they wish to buy that becomes tedious at a point and even consumes lot of time. Hence the project helps users to get their desired vehicle details online at a single place. User also get an Options where they can see the Health Condition of the Vehicle (Good, Average, Bad) and also the Live Status of the Vehicle whether it is For Sale/Sold. The Main Aim of the Project is to provide best used vehicles at low rates for the people without any Commissions. The Vehicles will be listed in the Ads Format, A user can view the details, status and condition. If the user wants to buy the vehicle he can contact the seller using Contact Details.

Keywords: Second Hand Vehicle buy & sell online system, Vehicle resell system

I. INTRODUCTION

SHVBS (Second Hand Vehicle Buy and Sell) is a Project meant to give people a better and trustworthy platform where they can List their vehicle to sell, and buy Vehicles of their own choice and obviously on their own terms and condition. With the help of internet and computer systems anyone can buy/sell his vehicle from anywhere the anytime.

People usually go to garages in search for their desired second-hand vehicle that they wish to buy, it becomes tedious at a point and even consumes lot of time. Hence the project helps users to get their desired vehicle details online at a single place.

User also get an Options where they can see the Health Condition of the Vehicle (Good, Average, Bad) and also the Live Status of the Vehicle whether it is For Sale/Sold.

The Main Aim of the Project is to provide best used vehicles at low rates for the people without any Commissions.

II. SCOPE OF THE PROJECT

This is Project is based on buying and Selling of Wide Variety of categorized used Vehicles, easily and more comfortably.

The Burden of visiting, seeing, condition and human mood gets cleared by this simple website.

This system overcomes the problem of searching for a second hand vehicle. People usually go to garages and showrooms in search for their desired second hand vehicle that they wish to buy that becomes tedious at a point and even consumes lot of time.

Hence the project helps users to get their desired vehicle details online at a single place.

III. EXISTING SYSTEM

- The existing system is paid and in some system commission is taken for buying/selling used cars.
- Whereas our system is Free to use for both Buyers and Sellers, no commission are taken, there is no middle-men.
- Buyers contact the Sellers using details provided in the Ad/Listing, and proceeds further.

IV. PROPOSED SYSTEM

- Second Hand Vehicle buy and sell website is not only for cars, but bikes, scooters, EVs as well.
- The scope of the system allows developer to know about the limitations of the proposed system.
- The system is designed for the people who is having much more interest in sell and purchase vehicles.
- The proposed system is a website developed for people who wants to sell their vehicles and purchase vehicles.

-
- This system provides all library portal functionalities in one where user can upload their vehicles, can search,
 - Can customize web pages according to their choice.

They have to have their laptops/desktop to enjoy the services provided by the system. The version of the system is Limited to only Maharashtra Territory. Therefore no foreign people can register in the System and avail facilities which is otherwise not present in the past system. The system is developed in English. Therefore the user can not convert the system in his Native language. The website content is limited in terms of user.

Some of the information about the user is provided when then user is registered.

V. ADVANTAGES

- It saves user time that is wasted in search of required second hand vehicles.
- User can find the various vehicles information along with images at a single place.
- This system is effective and saves time, efforts and cost of users.
- Sellers can also easily find a buyer for their vehicle easily by posting ads.
- Easy registration.

VI. DISADVANTAGES

- The user cannot view the vehicle in person.
- The system is developed in English. Therefore
- the user can not convert the system in his Native language
- If there are poor quality photographs then it's of no use.

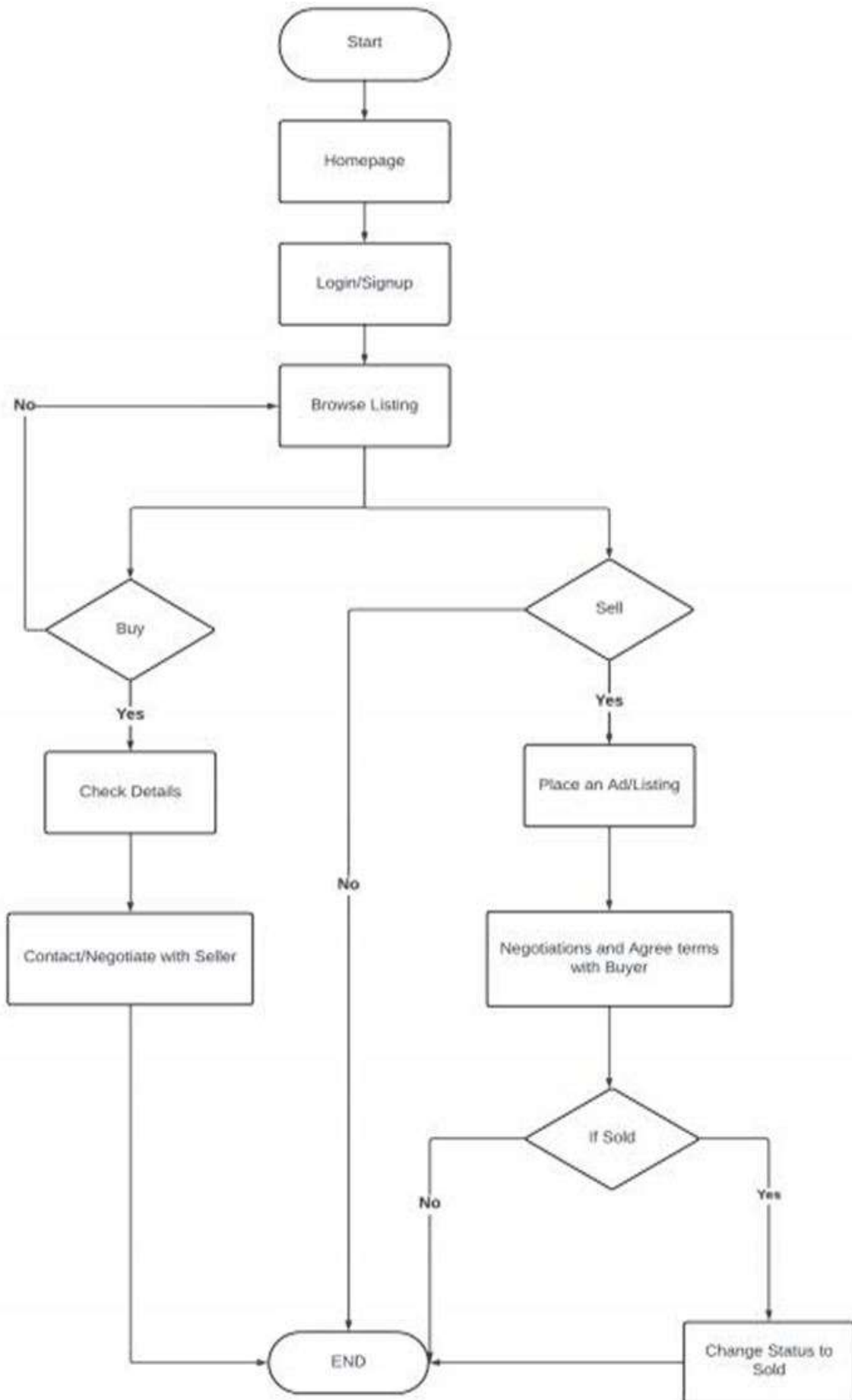
VII. APPLICATIONS

- The system can be applied to warehouses where the vehicles are put up for resale.
- Any person can use it to put up their vehicle for resale.
- Any person who wants to resell his/her old vehicle.

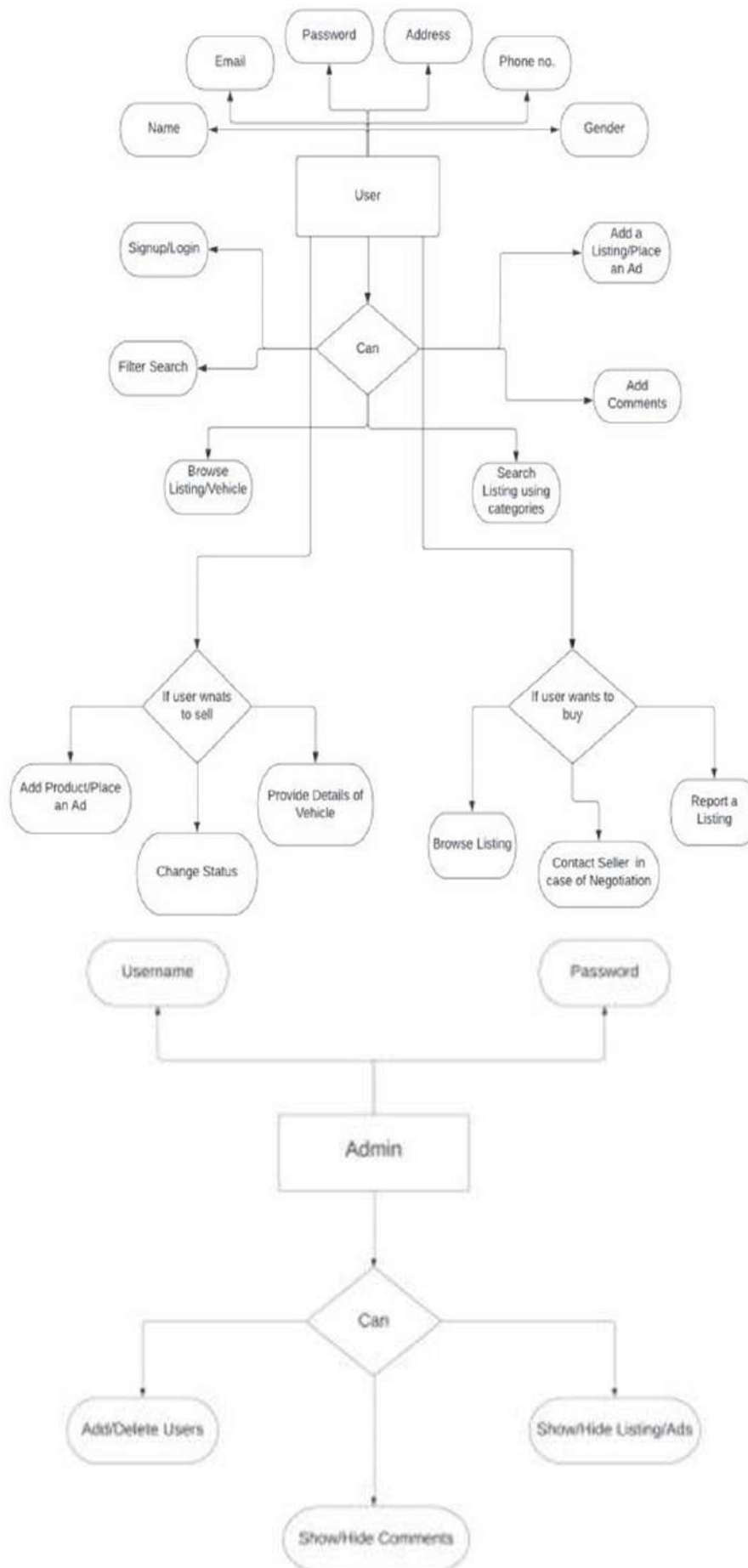
VIII. FEATURES OF THE PROJECT

- Search for your Desired Vehicles.
- Free of cost registration in the website.
- Free of cost listing of the Vehicle.
- Search through a variety of category.
- Commission is not required in buying/selling used vehicles.
- Price can be negotiated by Contacting with the buyer.
- Report an unwanted or misleading Listing.

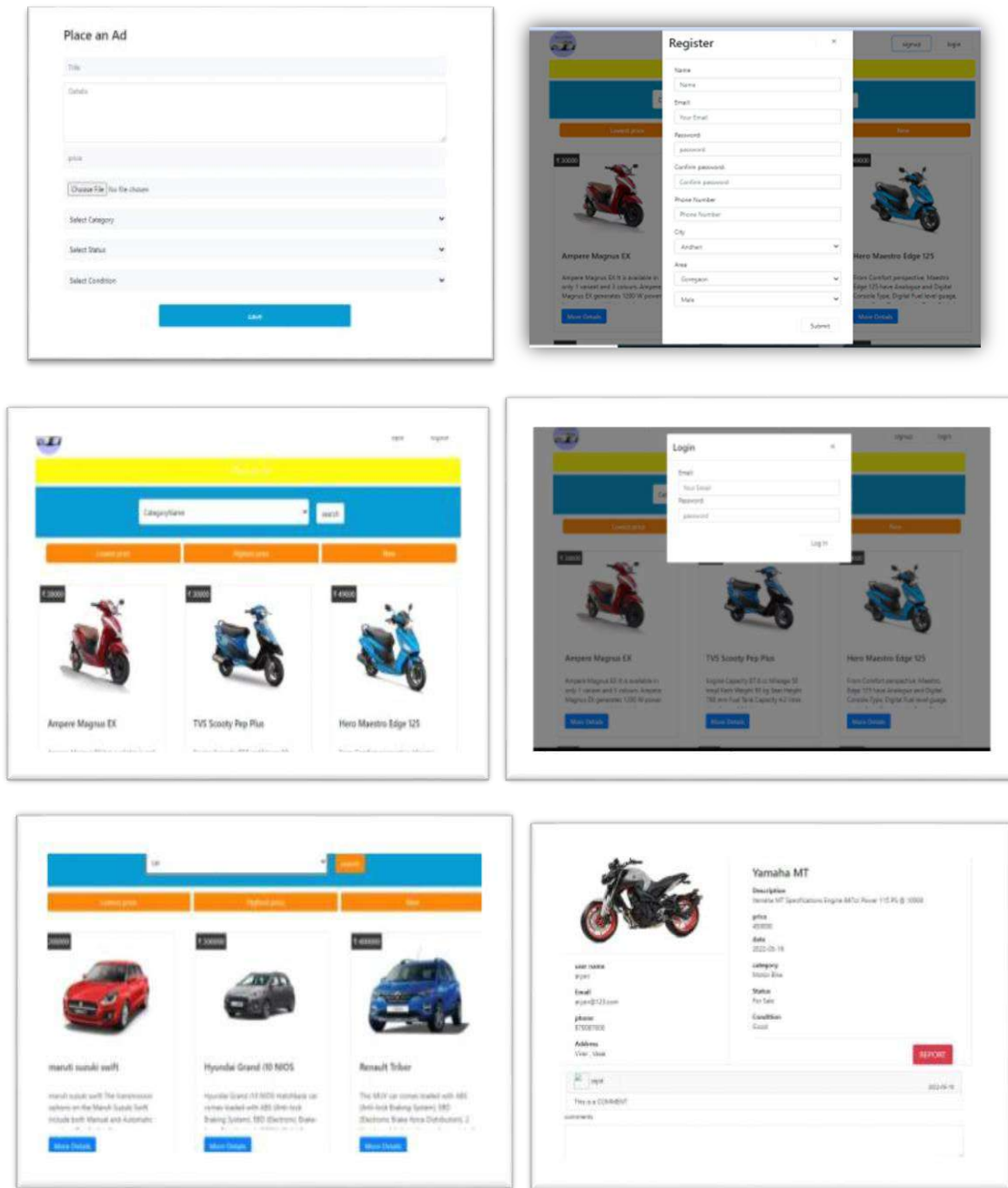
IX. FLOWCHART



X. E-R DIAGRAM



XI. SCREENSHOTS



XII. FUTURE SCOPE

- More customization, Customer Support, and Privacy Changes, etc.
- Providing Messaging functionality in user profile, so that buyer and seller can have a conversation inside the web application.
- An option in which a seller has to pay in order to get his listing maximum distribution/get suggested to more users than normal.

XIII. CONCLUSION

Second Hand Vehicle Buy and Sell (SHVBS) provides a better way for faster searching and uploading, it is a portal system which is meant for seller and buyer. There are several things which are important in a Vehicle portal like searching vehicles according to their profiles and Cheaper way. After a complete indent of hard work I conclude that the project was absolutely challenging for implementing features such as searching according to their Categories and Filters. The project comes out to be successful in some way. Quickly summarizing all the efforts put into this assignment, I would like to conclude that this assignment has definitely helped me enhancing my Web Designing skills and improve my existing knowledge in Php, HTML MYSQLITE, etc. in a unique way.

Like any other web-application, my website had errors; I had also performed proper testing so as to ensure that my website remains robust, usable and manageable. Working as a Php Web application designer and Programmer proved quite of a unique experience. I am sure this project would be beneficial for me in the near future.

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UP FLOW - ANAEROBIC SLUDGE BLANKET REACTOR (UASB)

Zulfiqar Ahmad

Theem College of Engineering Boisar

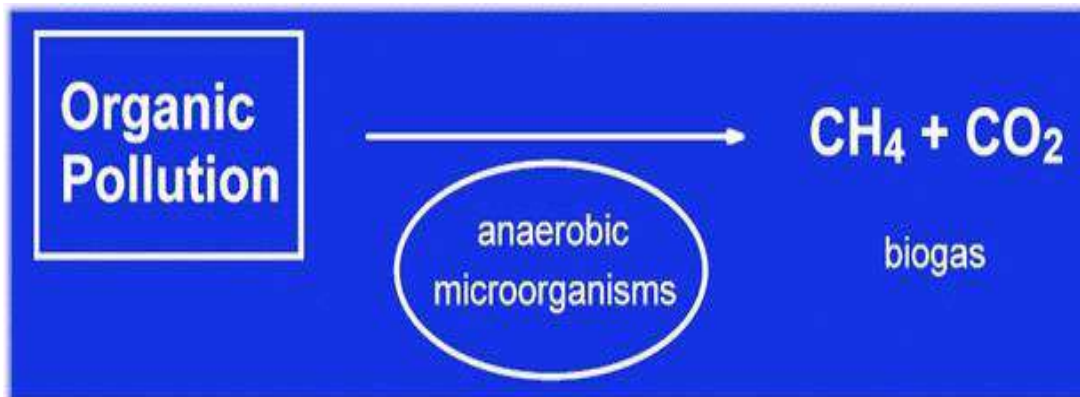
ABSTRACT

Anaerobic Wastewater Treatment is a wastewater treatment system in which waste is decomposed anaerobically in closed tank, anaerobic treatment is used around the world treating biologically for both domestic and industrial wastewater. The two principal advantages of anaerobic over aerobic treatment are the production of biogas, which can be used as fuel, and the lower rate of biomass production, which results in lower maintenance costs for the plant. The up flow anaerobic sludge blanket (UASB) reactor is an attractive alternative for regions in hot climates since it works better under mesophilic conditions and it does not need any other structure for the development of microorganisms, which grow in the form of granules. In this thesis, a model describing the UASB reactor behaviour with respect to substrate degradation, microorganism growth and granule formation is discussed

Keywords: UASB, aerobic, anaerobic

INTRODUCTION

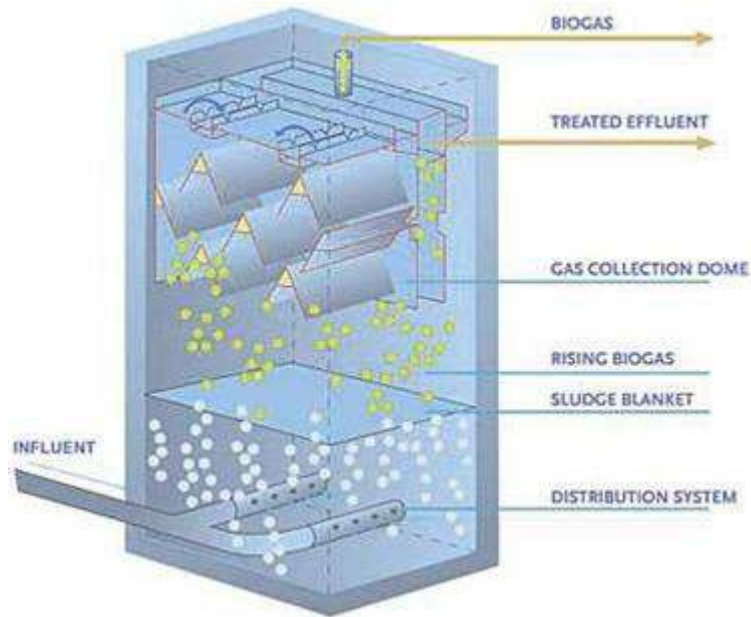
Anaerobic Wastewater Treatment is a wastewater treatment system treated biologically without using of air or oxygen. It aimed to remove organic pollution in wastewater, slurries and sludge. Anaerobic microorganisms convert organic pollutants into a “biogas” which contains methane and carbon dioxide.¹

**Conversion of Organic Pollutants to Biogas by Anaerobic Microorganisms**

Up flow anaerobic sludge blanket technology also known as UASB reactor is a form of anaerobic digester which used in wastewater treatment. UASB reactor is a methane-producing digester, which uses an anaerobic process and forming a blanket of granular sludge and is processed by the anaerobic microorganisms.

**Concept and Design**

UASB reactor is three-phase separator, which enables the reactor to separate gas, water and sludge mixtures under high turbulence conditions. This allows for compact, cheaper designs.¹



The reactor has multiple gas hoods for the separation of biogas. As a result the extremely large gas/water interfaces greatly reduce turbulence, making relatively high loading rates of 10 – 15 kg/m³.d possible. Separation in the UASB reactor requires only 1.0 meter of height, which prevents flotation effects and, consequently, floating layers.

Generally, during the treatment of UASB reactor, the substrate passes through an expanded sludge bed which containing a high concentration of biomass first. After that, the remaining part of substrate passes through a less dense biomass which named the sludge blanket.

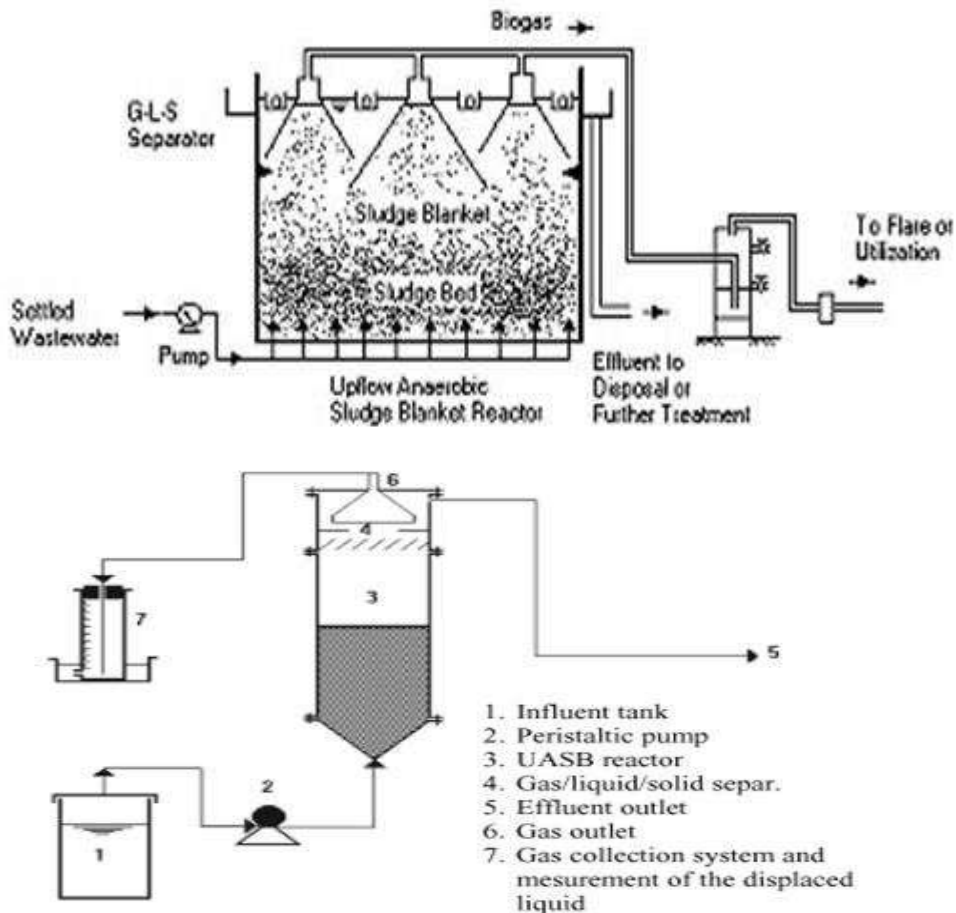


Figure 1: Schematic diagram of the laboratory UASB reaction system.

The influent is pumped to the UASB reactor from bottom of it by Peristaltic pump. The influent move upwards and get contact with the biomass in sludge bed, then continue to move upwards and the rest substrates act with the biomass again in the sludge blanket which has a less concentration of biomass compared with the sludge bed below.

The volume of sludge blanket must be sufficient to conduct the further treatment to wastewater by-passed from the lower layer of sludge bed by channelling. At the same time, it will help to ensure a stable effluent quality. A 3 phases (Gas-Liquid-Solid or GLS) separator located above the sludge blanket to separate the solid particles from the mixture (gas, liquid, and solid) after treatment and hence allowing liquid and gas to leave the UASB reactor.

After the treated wastewater will be collected by the effluent collection system via number of launders distributed over entire area discharging, to main launder provided at periphery of the reactor. And the bio gases generated will be collected as the valuable fuel or for deposal.

The average full-scale design loading of the UASB of 682 full-scale plants surveyed was 10 kg COD/m³.d.

UASB Reactor Dimension

To reduce size and to reduce the cost of land, GLS separator and influent distribution arrangement etc. the reactor should be as high as possible. And the height of the sludge bed should be sufficient to minimize the channelling and to make sure the liquid up flow velocity within the maximum permissible limits (1.2 – 1.5 m/h). Therefore, the height of the sludge bed should be at least about 1.5 to 2.5 meters and hence the height of the reactor should be restricted to 4 meters to provide convenient accommodation for sludge bed, sludge blanket and 3 phases separator. As the standard mentioned, the maximum height of the reactor is around 8 meters but the applicable height in common usage is between 4.5 and 6 meters.

In addition, the sludge bed occupies 30 to 60% of the total reactor volume, 20 to 30% of the total volume is provided for sludge blanket and GLS separator occupies remaining 15 to 30% of the total volume.

Gas Liquid Solid (GLS) Separator

The main objective of this design is to facilitate the sludge return without help of any external energy and control device. The function of the GLS separator is to provide enough gas-water interfaces inside the gas dome, sufficient settling area out side the dome to control surface overflow rate; and sufficient aperture opening at bottom to avoid turbulence due to high inlet velocity of liquid in the settler, to allow proper return of solid back to the reactor. Due attention has to be paid to the geometry of the unit and its hydraulics, to ensure proper working of the GLS separator.

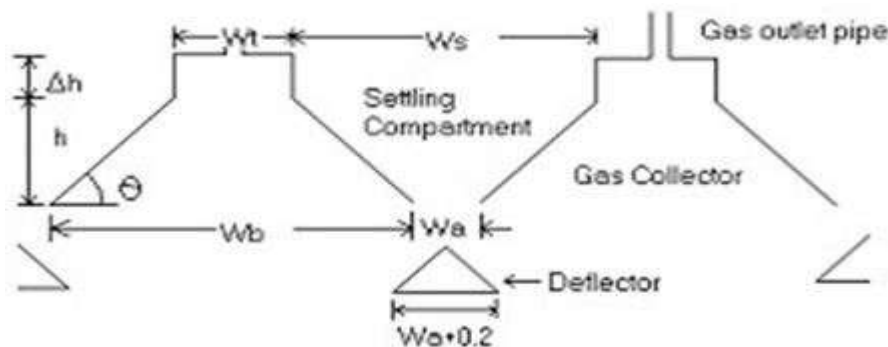


Figure 2: Details of the Gas-Liquid-Solid (GLS) Separator

Aerobic and Anaerobic Treatment

Aerobic wastewater treatment process is governed by aerobic organisms which need oxygen for the breaking process. Aerobic wastewater treatment tanks are constantly supplied with oxygen. It is been done by circulating air through the tanks. For effective functioning of aerobic organisms, sufficient amounts of oxygen should be present in the aerobic tanks at all times. Therefore, aeration is properly maintained throughout aerobic treatment. There are two main types of aerobic wastewater treatments: attached culture systems or fixed film reactors and suspended culture systems. In attached culture system, biomass is grown on solid surfaces or media and wastewater is passed over the microbial surfaces. Trickling filter and rotating biological contactor are two attached culture systems. In suspended culture systems, biomass is mixed with wastewater. Activated sludge system and oxidation ditch are two popular suspended culture system Anaerobic wastewater treatment is a biological treatment process where organisms, especially bacteria, break down organic material in the wastewater in an oxygen absent environment. Anaerobic digestion is a well-known anaerobic wastewater

treatment process³. The degradation of organic material is done anaerobically. For the effective anaerobic digestion of organic materials, the entry of air into anaerobic tanks is prevented. During anaerobic digestion, methane and carbon dioxide are produced. Methane is a biogas. Hence, anaerobic digestion process can be used to produce biogas which can be utilized as electricity. Anaerobic wastewater treatment process occurs via four major steps named hydrolysis, acidogenesis, acetogenesis, and methanogenesis. All these steps are governed by anaerobic microorganisms, especially bacteria and archaea. Anaerobic treatment is preferred to treat municipal wastewater because of its merits over conventional treatment methods⁴. These advantages are (i) its ability to treat high COD loads and withstand fluctuation in the influent, (ii) biogas formation, and (iii) effective treatment of wastewater in a short period of time⁵. Anaerobic reactors reduce pollution load and provide good stabilization of solids. Furthermore, depending on the design of a UASB reactor, a high sludge hold-up time can be obtained so that the excess sludge needs to be discharged only once every three to four years⁶

Table 1: Anaerobic vs Aerobic Treatment for 1000 kg CODB/d

Parameter	Anaerobic	Aerobic
Power consumption (kW)	1.5	65
Net biosolids prod. (kg TS/d)	15-100	200-600
Energy produced (kW)	140	Nil

(For a given biodegradable chemical oxygen demand (CODB) waste load)

FUNCTION AND APPLICATION

- Breweries and beverage industry
- Distilleries and fermentation industry
- Food Industry
- Pulp and paper.

ADVANTAGES

- During the treatment process a amount of valuable biogas energy will be produced which can be collected for other usage;
- Much less bio-solids waste generated compared with aerobic process because much of the energy in the wastewater is converted to a gaseous form and resulting in very little energy left for new cell growth;
- A low energy requirement for the treatment process;
- Less nutrients required;
- System can be shut down for extended periods without serious deterioration; and
- Can handle organic shock loads effectively.

DISADVANTAGES

- Anaerobic treatment cannot achieve surface water discharge quality without post-treatment;
- Reduced sulphur compounds are produced, which need to be properly addressed in terms of corrosion, odour and safety; and
- Longer start-up period.
- A proper temperature range is required for the anaerobic process (15oC to 35oC), therefore it is not applicable during cold season in certain countries. (i.e. Canada)
- Some equipment (i.e. pH meter, thermometer etc.) and professional staff is necessary for monitoring the internal condition of the reactor. It is costly.

CASE STUDY

Kanpur UASB

The present paper describes a performance of 1200 m³ UASB reactor at Kanpur India. The reactor was constructed in three parallel compartment 600,300 and 300 m³ respectively, data collected over a period of twelve month and showed that there was reduction in BOD, COD and TSS concentration of respectively 74%,75% and 75% at hydraulic retention time of 6 hours .the Excess sludge was 0.2kg TSS / m³ waste water ,the gas was 0.05-0.10 m3/kg COD removed.

CONCLUSION

In conclusion, up flow Anaerobic Sludge Blanket (UASB) reactor is a form of anaerobic digester that is used in the treatment of wastewater. It's typically suited to dilute waste water streams (3% TSS with particle size >0.75mm).

As we had mentioned earlier, these are the 4 top applications of the reactors:

- Breweries and beverage industry
- Distilleries and fermentation industry
- Food Industry
- Pulp and paper

Further more in warm climates, the UASB concept is also suitable for treatment of domestic wastewater.

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ACOUSTIC OF SOUND TREATMENT

¹Ansari Sameer Faruq and ²Sayed Farhan Ali, ³Ansari Arshad Shahid, ⁴Ansari Mohd Sameer and ⁵Chawhan Abdul Samad

^{1,3,4,5}Students and ²Assistant Professor, Department of Civil Engineering, TCOE, Maharashtra, India

ABSTRACT

Noise pollution 'is usually defined as Unwanted sound or noise that is not required. This disturbance noise is also known as noise pollution, which often haunts local communities especially for residents around cities, as well as industrial and commercialization areas. According to the world health organization (WHO), noise pollution is ranked third as the most dangerous environmental pollution after air and water pollution. So new field science is developed with planning building and auditorium and schools and colleges with to provide best audible to audience and students is called acoustic of sound treatment. Use of sound absorbing material to give desire degree of from echo and to absorb or diffuse sound in the room to avoid ringing and flutter echoes and improve stereo imaging. It helps to keep sound from leaking into or out of the room. Study how acoustic treatment is done by using such type of project improves the quality in auditorium or classrooms or conference hall or theatre, stadium etc. Audience in there can hear better sound. We have a idea about how we used waste material to different things after treatment of wastage of raw materials used are polyester cloth, polythene rope, nails. The polyester cloth or polyester acoustic panel is a high performance and durable sound absorptivity product installation of polysorb acoustic. Polythene rope is to resist polyester cloth on wall surface. Concrete nails we use for fixing the rope in the wall. It is found how acoustic treatment is done by using above type of waste material. It is expected results to improve the sound quality in auditorium or classrooms etc. Audience can hear better sound. Full construction of acoustic treatment of sound is durable. Economical and very strong for long suitable. Thus this paper is an attempt to define sound treatment, its classification and types, procedure adopted, advantages and its application in the field of construction by literature view are discussed.

Keywords: Noise, Sound Absorber, Echo Time, Frequency.

1-INTERODUCTION

Noise pollution 'is usually defined as unwanted sound or noise that is not required. This disturbance noise is also known as noise pollution, which often haunts local communities especially for residents around cities, as well as industrial and commercialization areas. According to the world health organization (WHO), noise pollution is ranked third as the most dangerous environmental pollution after air and water pollution. So new field science is developed with planning building and auditorium and schools and colleges with to provide best audible to audience and students is called acoustic of sound treatment.Noise pollution does not only impact human psychology but also flora and fauna following noise pollution that often affects people and the environment sound absorbing panels have been introduced for use in all types of space. Different types of sound absorption materials have been produced from a variety of sound absorption materials in the market. Every sound absorbs produce different sound absorption rates. Nowadays, a lot of sound absorber panels are made using less environmentally friendly materials which are synthetic.Among synthetic materials used are glass fabrics and minerals studies have shown that glass fiber can absorb sound better than their synthetic materials, however other studies on health issues mentioned that glass fiber is not suitable to be used as a materials for sound absorbing purposes. It is stated that if humans breathe in the air filled with glass fiber for too long they will experience skin inflammation redness, sore throat, cough, bronchitis, breathlessness, and lungs related illness.

2- STATEMENT OF THE PROBLEMS

Acoustic Problems and Solutions, we address some of the most common acoustic problems music education face in their rehearsal and practice areas. We help define the problems and explain the steps you can take to fix or at least minimize them. A few solutions are simple, most will require some investment, and in some cases, very little can be done short of renovating your space. But in every instance, we believe this guide will help you better understand and evaluate your own areas—help you avoid spending time or money on remedies that don't actually work and equip you with a starting point and some facts to advocate effective improvements to your spaces. In this guide, Acoustic Problems and Solutions, we address some of the most common acoustic problems music educators face in their rehearsal and practice areas. We help define the problems and explain the steps you can take to fix or at least minimize them. A few solutions are simple, most will Require some investment, and in some cases, very little can be done short of renovating your space. But in every instance, we believe this guide will help you betterunderstand and evaluate your own areas help you avoid spending time or

money on remedies that don't actually work---and equip you with a starting point and some facts to advocate effective improvements to your spaces.

3-OBJECTIVES OF THE PROJECT

- This is done in theatre to improve sound quality and audience can hear clear sound.
- It also in music studio to hear good quality of sound through the instrument which they have used.
- It also used in conference hall to clear sound of speaker.
- It also done in auditorium.
- The main goal of acoustic of sound treatment auditorium is to maintain sound quality and hearing better or objectives of the project are as follows.
- Cheap and economical.
- Acoustic treatment helps in keeping the noise inside the room.
- It also helps in keeping the noise from the exterior environment out.
- Sound treatment also results in improving the sound quality in the auditorium of them collage of engineering.
- Save time.
- It also used in seminar hall or conference hall to clear sound of speakers.
- It also done in buildings, flats, bungalows.

4-PURPOSE OF THE PROJECT

- Use of sound absorbing material to give desired degree of from echo and reverberation.
- To prevent standing waves and affecting the frequency response in auditorium.
- To reduce model ringing in small room and lower the reverb time in auditorium.
- To absorb or diffuse sound in the room to avoid ringing and flutter achose and improve stereo imaging.
- To keep sound from leaking into or out room.

5-METHODOLOGY

Stage 1: Taking dimensions of the wall between column to column distances 3.10m center to center distance. By using tape.

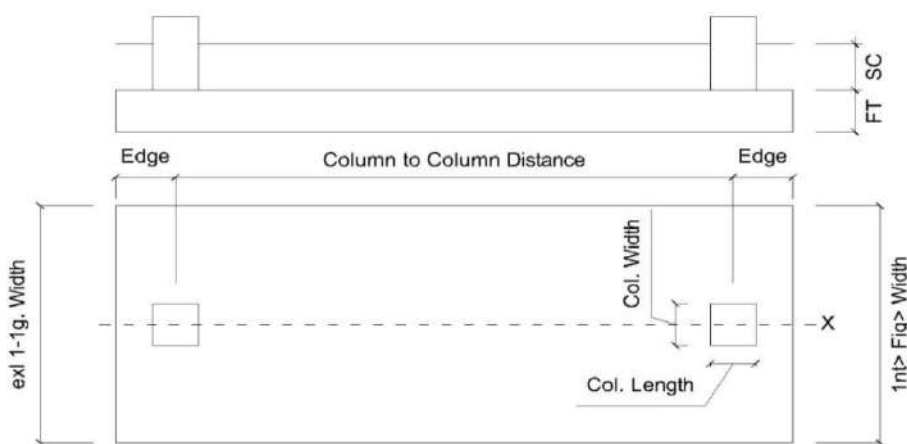
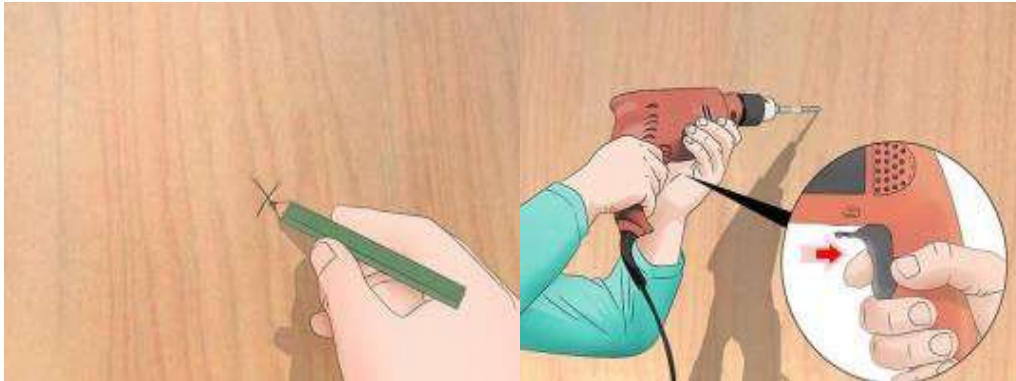


Fig.5.1

Stage 2: Drilling is done as per dimensions which we have taking in previous stage in such a way that the nails are fixed in the holes.

- Determine exactly where you want your picture frame or mirror to hang. If your picture frame or mirror has a wire-hanger in the back, be sure to take into account the amount of slack when figuring-out where you want the picture or mirror to hang.

- **Make a small pencil mark where the center of the screw will go:** If the picture frame or mirror has multiple hooks on the back, be sure to measure the distance between them. Use a level to measure the spot for your second anchor. Make another small pencil mark where the second anchor will be installed. You can also apply a bit of grease or lipstick on the hooks of the item you will hang. Place the item where you want it on the wall and gently press it against the wall. The grease or lipstick will leave a mark to show you where to install your anchors.



- **Drill a Hole in the Spot(S) You Marked:** Be sure that you hold the drill perpendicular to the wall so that the anchor will sit parallel to the ground: an anchor that is not installed straight will not be able to support as much weight. You should drill a hole that is approximately the same size as the anchor itself (the screw will force it to expand outward). Make sure the hole you drill is deeper than the anchor is long.
- **Slide the Expansion Anchor into the Hole:** If the hole is too small, the anchor will collapse onto itself and may not install properly. Push it in until the anchor sits flush against the wall. Do not bang on the screw because it could bend or break. If needed, tap the anchor with a rubber mallet lightly to get it to sit flush against the surface of the wall.



Screw the support screw into the anchor: Line up the screw and the anchor and, using either a Philips or flat head screwdriver, turn the screw clockwise just until the base of the screw comes to rest against the base of the anchor.

- If the object you are hanging has a mounting bracket, you may need to slide the screw through the bracket before screwing it into the anchor.
- Back the screw out slightly by turning it counter-clockwise: Be sure to leave just-enough of the screw exposed to "catch" the hanger on the back of picture frame or mirror. A good rule of thumb is to leave about a 1/4" of screw exposed for hanging.

Stage 3: Fasten the polythene rope on the concrete nails in such away that it bears the weight of the cloth.

Stage 4: Fasten the cloth on the polythene rope with using string. Tighten the cloth in this way that it does not form any unavoidable waves.

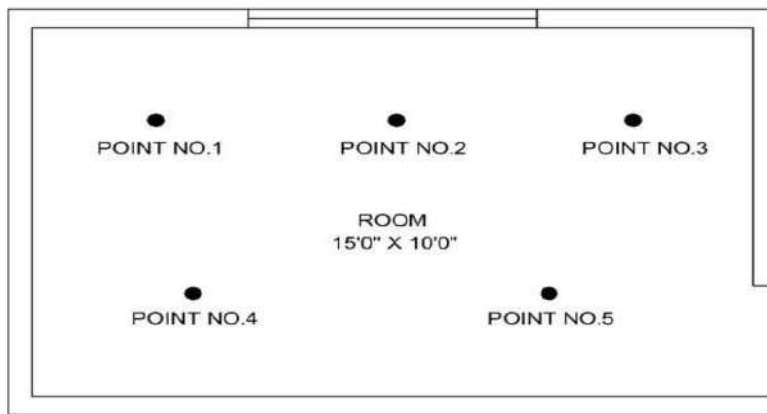


6-RESULTS & DISCUSSION

Take a reading at five station points before installation project with the help of decibel meter.

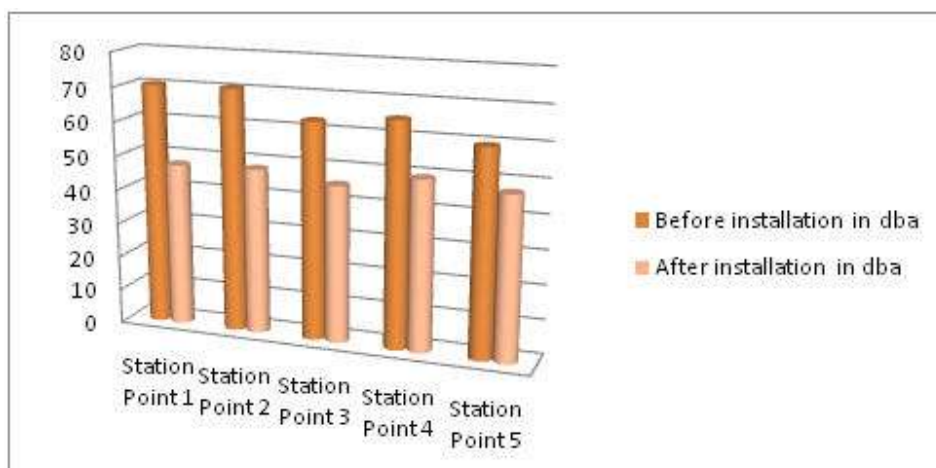
Take a reading at five station points after installation of project with the help of decibel meter.

- The sound level or noise inside the room by using decibel meter.
- The decibel (dB) is a logarithmic unit used to measure sound level.



Calculation of Noise Reduction Coefficient

Sr.No.	Before installation in dBA	After installation in dBA
Point 1	70.5	47.6
Point 2	70.7	48.2
Point 3	63.1	45.6
Point 4	65.2	49.5
Point 5	59.7	47.5



- Total NRC in particular area of room before installation of project.

$$NRC = 70.5 \text{ dBA} + 70.7 \text{ dBA} + 63.1 \text{ dBA} + 65.2 \text{ dBA} + 59.7 \text{ dBA}$$

5

$$\sum \text{NRC} = 65.84 \text{ dBA}$$

- Total NRC in particular area of room after installation of project.

$$\text{NRC} = 47.6 \text{ dBA} + 48.2 \text{ dBA} + 45.6 \text{ dBA} + 49.5 \text{ dBA} + 47.5 \text{ dBA}$$

5

$$\sum \text{NRC} = 47.68 \text{ dBA}$$

7-CONCLUSIONS

The project course provided us the chance to apply our theoretical knowledge in practical application. In this project we study how acoustic treatment is done. By using such type of project improve the sound quality in auditorium and audience in auditorium can hear better sound. This project has given us chance to test our group working ability, managerial abilities and technical knowledge and has imparted a great confidence for successfully carry out the work with responsibility. This is done in theatre to improve sound quality and audience can hear clear sound. It also in music studio to hear good quality of sound through the instrument which they have used. It also used in conference hall to clear sound of speaker. It also done in auditorium. The main goal of acoustic of sound treatment auditorium is to maintain sound quality and hearing better or objectives of the project are as follows. Cheap and economical. Acoustic treatment helps in keeping the noise inside the room. It also helps in keeping the noise from the exterior environment out. Sound treatment also results in improving the sound quality in the auditorium of them collage of engineering. Save time. It also used in seminar hall or conference hall to clear sound of speakers. It also done in buildings, flats, bungalows.



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MINI HYDROELECTRIC POWER PLANT

¹Shubham P. Govalkar, ²Dipesh D. Ghodake, ³Pranay N. Prabhu, ⁴Susmit A. Akre and ⁵Navajyothi K
^{1,2,3,4}Students and ⁵Assistant Professor, Department of Electrical Engineering, TCOE, Maharashtra, India

ABSTRACT

Hydroelectric power plant are one of the best renewable energy sources in the world. This paper presents the development of a hydroelectric generating system that generates electricity from the potential energy of water strike on the Pelton bucket and converting the kinetic energy of water into electrical energy that can be stored in batteries to be used as power supply for Home appliances, and any other applications. The developed system is hydroelectric generator designed for small sized pipes (1 to 2 inch). Hydroelectric power plant contains a turbine that rotates by the running water in these penstock to generate the electricity and a charging circuit to store the generated electricity into battery cell. It also contains a Pressure detector and DC Voltmeter, ammeter for the whole operation of the system, measure and display the amount of water flow, the amount of electricity generated. By increasing the flowing of water, the rotation of the Pelton turbine will be increased and the amount of generated electricity will be increased. Therefore, the proposed system can also be applied on a wider scale so that this system with big Pelton turbine can be connected with municipal water pipelines, which ensures greater flow of water and generating more energy that can be used for street lighting and etc. The results show that the proposed hydroelectric generator can harness the untapped kinetic energy of water flowing inside the Penstock and produce power around 70 W when the velocity of water flow is 31.8 l/min.

Keywords: Hydroelectric generator; renewable energy; Pelton turbine; Penstock; kinetic hydropower.

I. INTRODUCTION

Renewable Energy is an energy which can be replenished naturally and thus is not going to run out such as solar energy, wind energy, geothermal energy, bio energy, hydropower energy. Hydropower is considered one of the most developed renewable energy technologies and it is used for generation electric power in many countries worldwide. Since generation electricity from the hydropower does not consume or pollute the water used for this generation, it leaves this energetic resource available for the other uses.

The electric power shortage and the continuously electrical power cut-off is big problem that Gaza faces. Using Hydro power plant for electric power generation is one of the Best methods to generate electricity. A power generating system using the hydropower which is the most pure type of energy in the world. The proposed hydroelectric generating system generates electricity from the potential energy of water flowing inside Penstock through converting the kinetic energy of water into electrical energy that can be stored in batteries, which is used as power supply for uninterruptible operation of home appliances and any other uses.

Hydroelectric power technology is generating the electricity from the flowing of water of streams, rivers, and tides. Water is moved through a Penstock to turbine which let its shaft to rotate when the water is striking to the blades of this turbine. The shaft of turbine is connected to a generator which converts the mechanical motion of turbine shaft into the electrical energy. The water flowing is a pollution-free, renewable, safe, and reliable energy source. The water flows in Penstock and turbine contains kinetic energy due to the water pressure fluctuation which can be converted to electrical energy by energy harvesters.

Therefore, this paper proposes a power generating system using the hydropower which is the most pure type of energy in the world. The proposed hydroelectric power plant that generates electricity from the potential energy of water strike on the Pelton bucket and converting the kinetic energy of water into electrical energy that can be stored in batteries to be used as power supply for Home appliances, and any other applications. The developed system is hydroelectric generator designed for small sized pipes (1 to 2 inch). Hydroelectric power plant contains a turbine that rotates by the running water in these penstock to generate the electricity and a charging circuit to store the generated electricity into battery cell. It also contains a Pressure detector and DC Voltmeter, ammeter for the whole operation of the system, measure and display the amount of water flow, the amount of electricity generated.

This paper is organized as follows. Section II discusses previous related works. Section III describes the proposed design of the hydroelectric power plant and its implementation. Section IV presents the results. Finally, Section VI the conclusions of this work.

II. LITERATURE SURVEY

The new method of micro hydro power plant is [1] by water level control of small - scale Hydroelectric Power plant by Deadbeat control method. In Deadbeat control method. In Deadbeat control method variation of water level is forecasting using two - tanked model for the penstock and the head tank and the water level control algorithm is processed by deadbeat control. It gives stable generation by maintaining the water level in the head tank located in the mid-way in the stream Channel at a constant level. The parameters of the system is that the length of penstock 1800m width of penstock 2.1m maximum - flow from river intake 1.1 m² sec. and Horizontal surface area of head tank 66m². By making preliminary estimation of a system performance and control scheme of deadbeat control high accuracy water level control in the head tank is confirmed.

Speed Optimisation Module of a Hydraulic Francis turbine based on Artificial Neural Networks is proposed [2]. In this paper an Artificial Neural Network is used to generate the reference speed that optimises the turbine efficiency. In order to improve the practicability of the complete system, a modified of the proposed OSM-ANN technique has been implemented, this process gives rise to dynamic changes in operation variables. Where commercial frequency converters and tubular micro turbine (Francis turbine) have been used in this paper. This OSM-ANN technique has been developed to adjust automatically turbine speed to the existing operating conditions. The experimental results confirm the improvements obtained in the turbine efficiency when the turbine speed is continuously adjusted, depending on the hydraulic conditions. So, the variable-speed option would be more advantageous for high specific speed turbines

In [3], a design of an axial flux PM generator (AFPMPG) for Pico hydro power plants in remote areas has been discussed. However in the literature, typically have some inherent technique difficulties used in hydro applications. It is hard to balance the Performances stability efficiency and cost. Further to improve the operating performances optimal design -variable speed.

The small Hydro power plant with Integrated Turbine - Generator working at Variable Speed [4] In This paper shows the small hydropower plant based the propeller turbine integrated with the PM generator and the power electronics converter can effectively acquire and transfer available energy from water to electric grid with sufficient efficiency. In this plant new solution of a Variable speed SHP equipped with two hydro set is discussed.

In [5], Hydro power generation using “Archimedes screw generator ” is highlighted. They are beginning to be widely adopted at low head hydro sites, due to high efficiency (greater than 80% in some installations), competitive costs and low environmental impact. The main idea was to providing a range of controlled head and flow conditions during operation, Water is supplied by an electric pump that Operates continuously, and reservoir depth is controlled by an adjustable overflow weir. It was designed to operate with a volume flow rate of 70 lit/s. Typical head was 0.85m. The cause of changes in power output caused by varying the water level at the outlet of the screw were attributed primarily to the corresponding variation in head, and dynamic limiting of screw rotation speed causing corresponding limits in volume flow through the screw.

A New structure of turbine base on low head turbine is proposed [6], for getting high efficiency in cross-flow turbine the maximum efficiency was found 88% for different values head and water flow rate. And also that maximum 18 stunner blades are used for smooth running of the turbine. The design was done considering head as 10 m and discharge as 316 lit/sec.

A newly developed hydro power plant Design of Pico-scale Turgo Turbine is proposed [7] they used of Pico Bucket using coconut shell spoon scale Turgo Turbine which is an independent power plant is recommended now a days. Coconut Shell is proposed to the material, thus to ensure the performance of the Turgo turbine under maximum condition. The Curvature angle of coconut shell spoon is -90* taken. Based on the measurement, there is a minimum flow required for the turbine to produce electrical power: For a D/d ratio of 11.6, the minimum flow is 48 ± 0.05 lpm, for a D/d ratio of 13.7, it is 33.52 ± 0.16 lpm, for a D/d ratio of 14.67, it is 31.7 ± 0.14 lpm, for a D/d ratio of 22, it is 19.17 ±0.18 lpm, and for a D/d ratio of 27.5, it is 15.06 ± 0.01 lpm because the used DC generator will generate current. If the minimum rotational speed is 190 rpm.

Table.1 Turbine Classification

Head Classification	Turbine Type		
	Impulse	Reaction	Gravity
High (>50m)	1. Pelton 2. Turgo		
Medium (10-50m)	1. Crossflow 2. Turgo	1. Francis (Spiral Case)	

	3.Multi-jet Pelton		
Low (<10m)	1.Crossflow 2.Undershot waterwheel	1.Propeller 2.Kaplan 3.Francis (open flume)	1.Overshot water wheel 2.Archimedes Screw

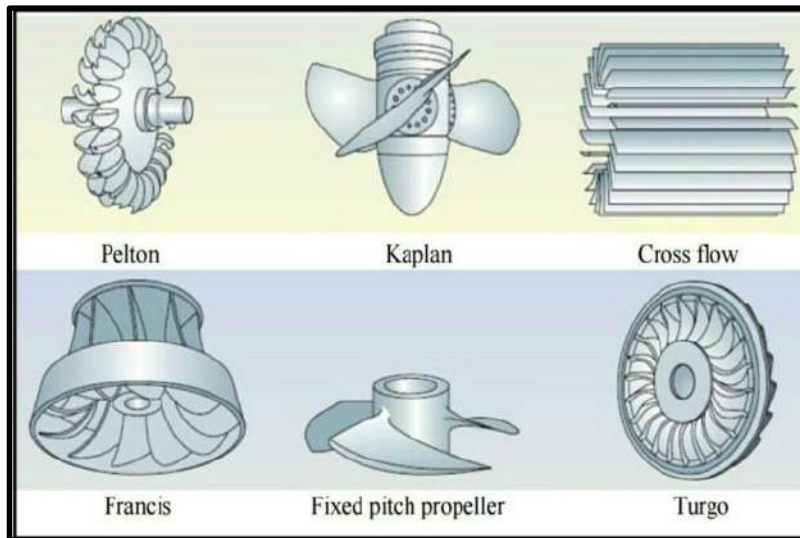


Fig.1: Types of turbine

Thus, a multi jet Pelton wheel turbine based mini hydroelectric power plant has been selected for this project taking its merits in to consideration over other turbine. Using this turbine, the maximum power and constant efficiency was found for different value of head. The suggested turbine reduces the losses compare to other turbines. This turbine can strictly extract energy as of any fast moving fluid, Simple in construction and easy to maintenance.

iii. Design of the Hydroelectric Power Plant and Its Implementation.

This section describes the design of hydroelectric power plant and implementation of the proposed hydropower generating system that generates the electricity from the water running inside Penstock.

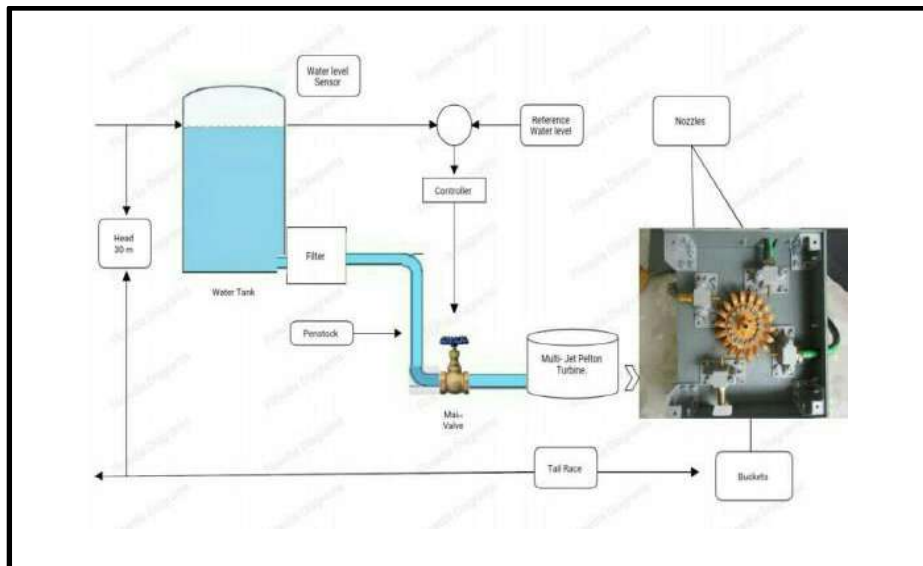


Fig.2: Diagrammatical representation of mini hydroelectric power plant.

As shown in Fig.2, the proposed system consists mainly of a designed Pelton turbine and external electrical generator connect with load, voltmeter and ammeter to display the amount of voltage and current. The hydro turbine is encased and its runner is put it into flowing water and faces the residual pressure of the flowing water. When water runs into the Pelton turbine through the Penstock, its runner will be rotated as the water flows in one side of the runner and comes out it on the bottom side of the casing. Rotation of the runner will run a shaft of permanent magnetic DC motor to produce electricity. In short, the hydraulic power of flowing water pressure is converted by the turbine into mechanical energy which is consequently converted by a DC motor into electrical energy.



Fig.3: Pelton Turbine

Fig.3 shows the Pelton turbine design and the main components of the proposed hydropower plant which is developed based on the principle of generating power from rotation of an inline Pelton turbine.

Table.2 Table of Parameters

Particular	Details
Head (H)	15 m
Velocity of jet (Vj)	16.81 m/s
Diameter of runner (D)	0.12 m
Diameter of jet (d)	0.00635 m
Flow rate (Q)	$5.3 \times 10^{-4} \text{ m}^3/\text{s}$
Number of Bucket (z)	12
Width of Bucket	38 mm
Depth of Bucket	7.6mm
Speed (N)	1200 rpm

Table shows the parameters that we got from the theoretical calculation done, for manufacturing these custom made bucket and runner and for purchasing the other main components.

Fig.2 shows the Pelton turbine, we have used Pelton type bucket in our project. The length, width and depth of the bucket are 40, 50 and 15mm respectively. The material we used for the bucket is Gun metal and to hold the bucket with runner we used 2 units of nut & bolt with the dimensions of 8 mm. On the basis of the calculation we have used diameter of runner is 120 mm. whereas thickness of runner is 20 mm and bore of diameter is 20 mm to fix the shaft

in it. The weight of the runner is 1.32 kg. Here is an image of runner and bucket fixed with nut & bolt at 30° angle. And there is key slot of 6 mm done on the runner to make it fixed on the shaft. There are 12 buckets used to fixed on runner so if we divided 360° with 12, we get a 30° angle which gives us equal distance of each buckets.

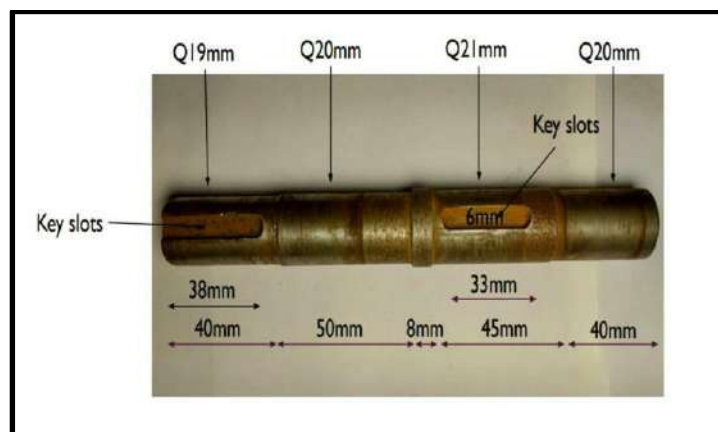


Fig.4: Shaft

Beside from runner and buckets the shaft play an important role. The centre of the shaft has diameter of 21 mm, this is a thickest part of the shaft which is used to connect with runner aligning it with key slot of 6 mm. On the both side of this part thickness decrease to 20 mm to lock shaft with Bearing. The left end part of shaft has thickness of 19 mm with a key slots of 6 mm is used to lock the sprocket and pulley.



Fig.5: Bearing

Fig.5 shows the square flange type pillow block bearing we have used to rotate the shaft very easily and smoothly. Which is made up of normal metal with coating of paint. Two number of bearing we have used in our project for no vibration occurs on the body.

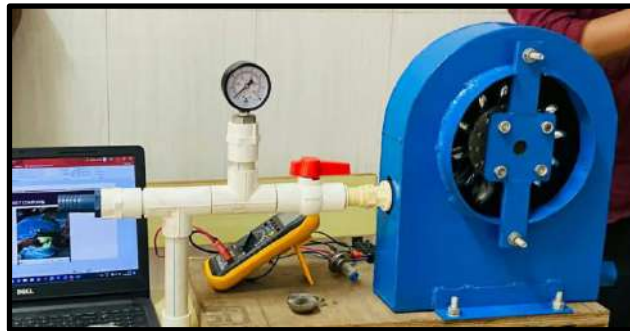


Fig.6: Body Frame

Fig.6 shows the outer design of the proposed hydroelectric power plant. The hydroelectric power plant is designed for the purpose of generating electricity in building's water pipelines ranging from 1 to 2 inch. Body is made up of metal with thickness of 3 mm and height, length, Width of body are 420, 340, and 95 mm respectively.



Fig.7: Nozzle

Fig.7 Shows the image of nozzle, which is made up of brass material. Diameter of nozzle is 6 mm and diameter of inlet is 20 mm and nozzle is fixed on body at 160 mm from the base. Nozzle strike on the bucket at an angle of 90°. On the basis of theoretical calculation we have used DC motor as generator. The specification of the motor is 2750 rpm, 350 W output power, 24V DC, 29.9 A DC current.

We want more output power that's why we experiment on two mechanisms. 1st is spocket chain, on turbine side we attach big spocket of diameter of 5 inch with slots of 60 and pitch is 1/4th and on motor side we connect small size spocket of diameter of 1 inch with slots of 10 and pitch is 1/4th because we want more rpm on motor side that's why we select small size spocket on motor side and big size on turbine side. But while we testing the spocket chain mechanism we get chain slipping problems. That's why we shifted to pulley mechanism. Same

calculation we did for pulley mechanism we connect 5 inch pulley on motor side and 2 inch pulley on motor, V belt type we have used. Using these pulley mechanisms if we pull the motor we get high resistance problem on motor side because of brushes in DC motor that's we get very low rpm on motor side and got 30 W output power which less than from our requirement. We have used various type of belt but we got the same result.

Finally we shifted on direct coupling method, we connect motor shaft and turbine shaft using coupling of 30 mm diameter, one side bore the coupling of 20 mm to connect the turbine shaft on it and another side we bore the coupling of 10 mm to connect the motor shaft on it. To test the direct coupling we have used water pressure up to 5 psi and we got output power around 70 W.

IV. RESULT



Fig.8: Direct Coupling

Fig.8 shows the proposed hydroelectric Power plant which is expected to harness the untapped kinetic energy of water flowing inside the penstock and produce power around 70 W when the water flow velocity is more than 31.8 l/min required. Which is enough to operate continuously and safely the electrical devices home appliances. If this Pelton turbine was available in Gaza that will assist in a low cost power generation and generate greater amount of electricity thereby solving the continuous power shortage that Gazan people faces.

By increasing the flowing of water, the rotation of the Pelton turbine will be increased and the amount of generated electricity will be increased. Therefore, the idea of this proposed hydroelectric power plant can also be applied on a wider scale so that this hydroelectric power plant with big turbine can be connected with municipal water pipelines, which ensures greater flow of water and generating more energy that can be used for street lighting and other uses.

V. CONCLUSION

In this paper, the concept of development a hydroelectric power plant, in order to generate electricity from the potential energy of water running inside penstock and converting the kinetic energy of water into electrical energy was briefly introduced and described. hydroelectric generating system that generates electricity from the potential energy of water strike on the Pelton bucket and converting the kinetic energy of water into electrical energy that can be stored in batteries to be used as power supply for Home appliances, and any other applications. The developed system is hydroelectric generator designed for small sized pipes (1 to 2 inch).

The proposed system was fully modelled, fabricated and tested. The developed system consists mainly of a Pelton turbine that rotates by the running water inside the penstock to generate the electricity and to store the generated electricity into a battery. It also has a voltmeter and pressure detector to measure and display the amount of water flow, the amount of electricity generated.

The idea of this proposed hydroelectric power plant can also be applied on a wider scale so that this system with big Pelton turbine can be connected with municipal water pipelines, which ensures greater flow of water and generating more energy that can be used for street lighting and other uses. The proposed system is not only support stopping our dependency on the fossil fuel for generation of electricity, but it also can supported our dependence on the green energy and provided an easy generation of electricity in places with a continuous power shortage.

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FOUR QUADRANT SPEED CONTROL OF DC MOTOR WITH THE HELP OF AT89S52 MICROCONTROLLER

¹Priyesh Singh, ²Dhiraj Talge, ³Krishna Singh, ⁴Arvind Machhi and ⁵Navajyothi Katela

^{1,2,3,4}Students and ⁵Assistant Professor, Department of Electrical Engineering, TCOE, Maharashtra, India

ABSTRACT

The main goal of this study is to use a microcontroller to create a four quadrant speed control for a DC motor. Control is the most critical aspect of any industrial organisation. The rate at which a machine operates. The key benefit of employing a DC motor is that the Speed-Torque relationship is more accurate. can be transformed into nearly any useful shape Pulse Width Modulation, an electronic technology, is used to adjust the speed. which produces both high and low pulses. These pulses change the motor's speed. A microcontroller is employed to generate these pulses. Because a microcontroller is utilised, modifying the duty cycles time period in the software to set the speed ranges as needed is simple. Different buttons control different speed grades and directions.

The microcontroller in this project is from the 8051 family, and the programming was written in assembly language before being converted to hex using the micro vision Kiel software. The programme was burned into the microcontroller using the positron boot loader software. Microcontroller AT89S52, DC Motor, L293D Motor Driver IC, Push Buttons, PWM, Voltage Regulator (LM7805)

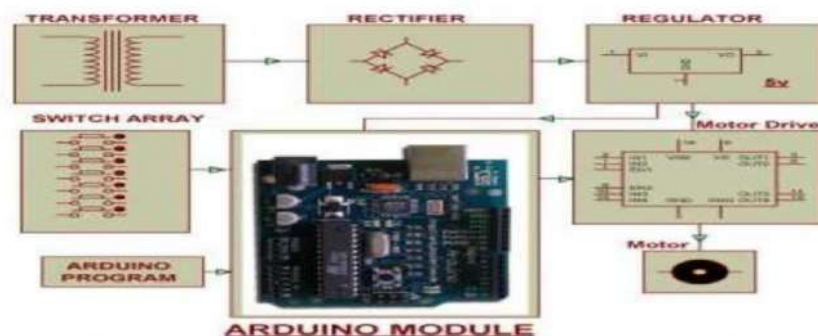
I. INTRODUCTION

DC machines are extremely significant in both industry and everyday life. DC machines have the distinct benefit of having easily adjustable properties. The goal of this paper is to use a microcontroller to create a four quadrant speed control system for a DC motor. The motor has four quadrants of operation: clockwise, counterclockwise, forward brake, and reverse brake. It also features a speed control option. Because electronic technology has advanced rapidly in recent years as a result of scientific and technological progress and social development, a DC motor is now widely used to achieve portability, low cost, energy efficiency, and noise limit, so the study of DC motor speed adjustable has more practical significance. The motor rotates in four directions.

The DC motor's four quadrant action is most suited for industries where motors are utilised and as required, as they may revolve clockwise, counter-clockwise, and apply brakes in both directions. In industrial applications, the motor is used for a specific operation. It must be stopped right away. In this case, the proposed system is an excellent front brake and its integrated features include reverse brake. As a result of the instantaneous brake in both directions, placing a temporary reverse voltage across a running motor and controlling the motor's speed PWM pulses generated by the microcontroller can be used to do this.

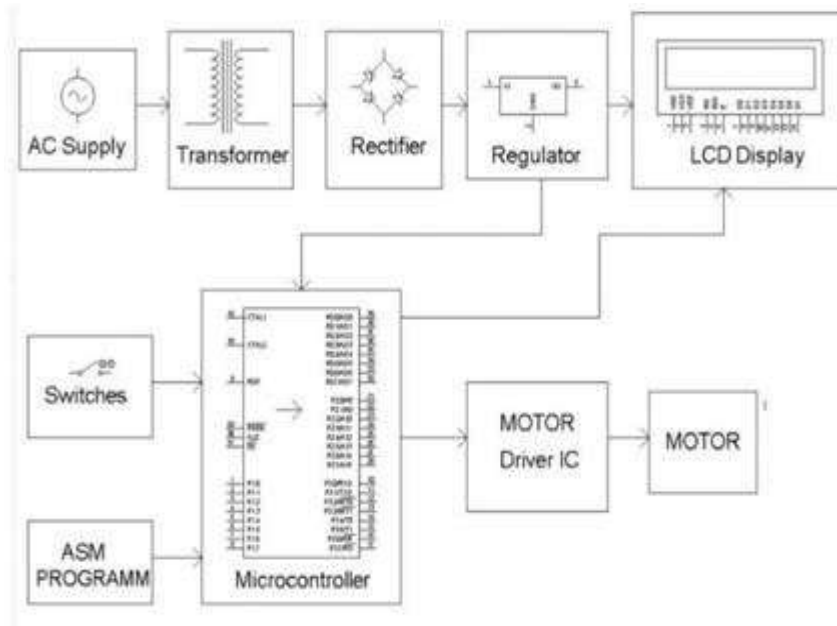
II. LITERATURE SURVEY

The goal of the project is to create a four-quadrant speed control system for a DC motor. It is same as the our project but difference only in we are used in our project microcontroller 8051 and those are used in Arduino. but both project work as same The motor has four quadrants of operation: clockwise, counterclockwise, forward brake, and reverse brake. It also features a speed control option. The DC motor's four-quadrant functioning is best suited for industries where motors are used according to need. They can revolve in both clockwise and counterclockwise orientations, and brakes can be applied instantly in both directions. When performing a certain activity in an industrial setting, the motor must be stopped promptly. In this situation, the proposed system is ideal because it includes both forward and reverse brakes. When you apply a reverse, you get an instantaneous brake in both directions.



III. METHODOLOGY

A. Block Diagram



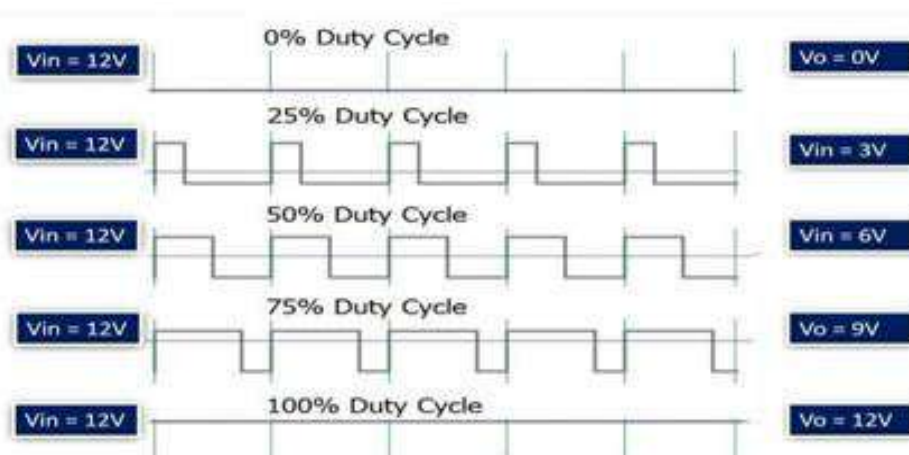
Block Diagram of System

B. Four Quadrant Operation of Dc Motor

depicts the four possible quadrants of operation or modes when using a DC Motor. The supply voltage is greater than the back emf when a DC motor is working in the first and third quadrants, indicating forward and reverse driving modes, respectively. The current flow varies. The value of the back emf created when the motor operates in the second and fourth quadrants Forward braking and reverse braking should be larger than the supplied voltage by the motor. braking types of operation, the direction of current flow is reversed once more.

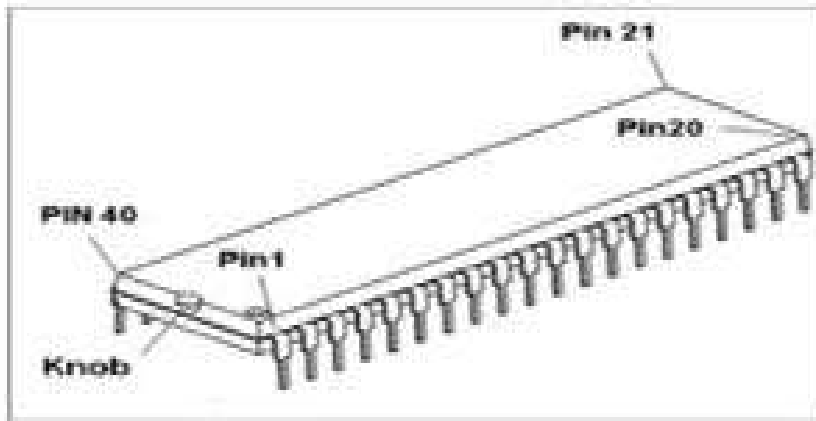
C. Pulse Width Modulation

Varying the width of these delivered pulses, and thus the average DC voltage applied to the motor terminals, can change the power applied to the motor. The speed of the motor can be regulated by adjusting or modulating the timing of these pulses, i.e., the longer the pulse is "ON," the quicker the motor will rotate, and the shorter the pulse is "ON," the slower the motor will rotate. To put it another way, the wider the pulse width, the higher the average voltage delivered to the motor terminals, the stronger the magnetic flux inside the armature windings, and the faster the motor will spin. The advantage of using pulse width modulation to operate a small motor is that the switching transistor's power loss is minimal because the transistor is either fully "ON" or totally "OFF." As a result, the switching transistor has a substantially lower power dissipation, allowing for more linear control and improved speed stability. Also, because the magnitude of the motor voltage is constant, the motor is always at full power. As a result, the motor can rotate at a considerably slower speed without stalling. So, how can a pulse width modulation signal be generated to operate the motor?

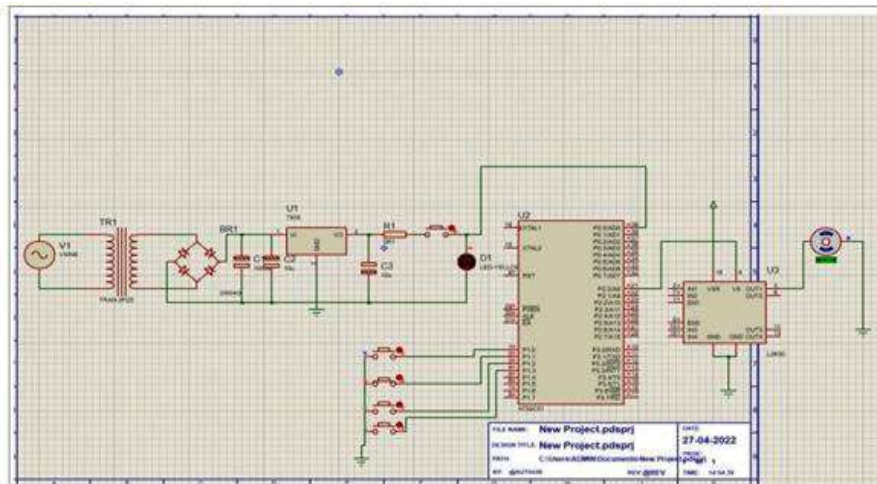


D. Microcontroller

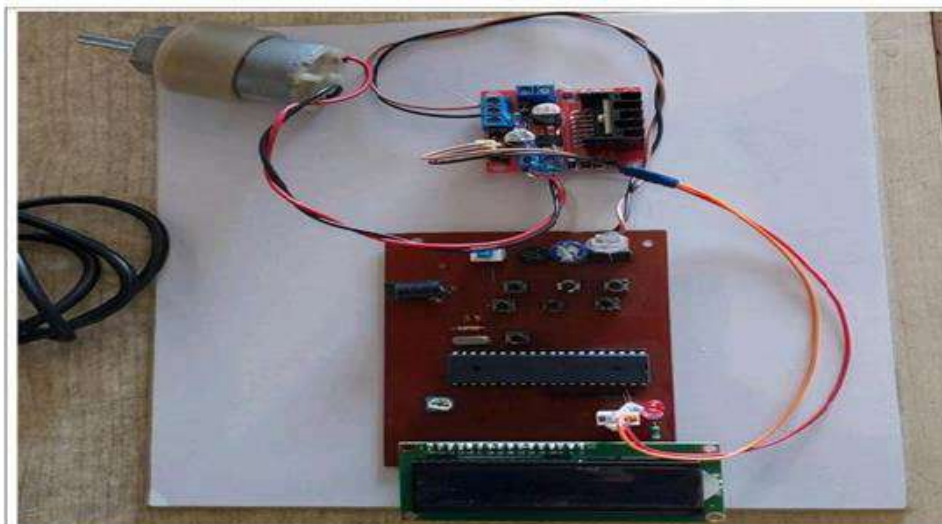
The 8051 architecture, initially launched in 1980 and possibly the most widespread microcontroller architecture available, is the culmination of the microcontroller development effort. The 8051 is a powerful microcontroller with plenty of built-in control memory (ROM and EPROM), increased I/O ports, and the ability to access external memory. An 8051 microcontroller can execute instructions at a maximum clock frequency of 20MHz. A microcontroller is a little computer. The design includes all of the components of a microprocessor, including the CPU, ALU, PC, SP, and registers. It also has the following additional features: ROM, RAM, parallel and serial I/O, counters, and a clock circuit. A non-volatile FLASH programme is included in the 89C51/89C52/89C54/89C58.



IV. Simulation Model



V. Hardware Model



VI. CONCLUSION

The hardware for controlling the speed of four quadrant DC motors with a microcontroller has been built. The four quadrant DC motor speed control prototype hardware model is created utilising a microcontroller. Proteus software created a virtual model, which was then checked for accuracy. Using a hardware prototype model the PWM approach has been employed to control the proposed model. The DC motor's rotational speed The speed of DC is affected by the duty cycle, which changes the applied voltage. Controlling the motor is possible. The waveform of the DC motor's input pulse has been captured for various applications. It has been discovered that the speed of a DC motor is directly related to duty cycle values. As the one-time duty cycle grows, the cycle lengthens

VII. ADVANTAGES AND FUTURE WORK**ADVANTAGES**

- Due to PWM, the switching time is reduced.
- It is easy to operate
- It requires less maintenance
- Using it is safer.

FUTURE WORK

- It can enable wireless control by using a transmitter and a receiver after the microcontroller.
- A comprehensive automation can be provided by using appropriate sensors.

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FEATURE EXTRACTION OF THERMAL IMAGES FOR FRUIT (BANANA) CONTAMINATION**Prof. Sheeba Naaz, Shahegul Afroz and Mr. Rahatullah Khan**

Assistant Professors, Theem College of Engineering, Boisar

ABSTRACT

Entire world is accentuated on inaction health certainty and food safety. Mostly, for fruit ripening the fruit seller uses calcium carbide and for human body the calcium carbide is exceptionally dangerous as it accommodates the phosphorous and arsenic traces. In many countries it is prohibited but in Pakistan, India, Nepal, and Bangladesh and in another country it is directly used. Quality assessment of banana fruit can be concluded by either human inspectors or instrumental tools. This paper presents a method of Thermal Imaging Technology for detection of banana fruit whether it is ripened by calcium carbide or naturally ripened. Thermal imaging is a technology that creates analyzes images by detecting heat radiating from an object. Temperature can be sensed using theaCAM E45 with thermal emissivity and temperature reflectance of 0.5 °C with temperature range -20°C to -100°C. This paper also presents image preprocessing, image segmentation and feature extraction steps for processing of an image. For classifying these images the Neural Network is used.

Keywords: Thermal Image; Banana Fruit; Neural Network; Feature Extraction; Segmentation.

INTRODUCTION

In the world bananas are the forth almost essential crops, India is the superior country for banana manufacturer. For food artifacts of high grade with increased assumptions and welfare standards, the requirement for correct, fast and equitable grade resolution of these attributes in food artifacts ongoing to grow [1]. Presently the fruits bananas are intentionally by chemicals being contaminated effecting health hazards. Randomly Toxic chemicals are used to ripen, grow and make banana fruits which act smooth fresher or last longer, especially during off season. Among the pretreatments, those are mainly resulted for banana fruits deliberated acceptance for best purchaser and ease better marketing, is synthetic banana fruit ripening [2].

The fruit seller of banana uses Calcium carbide for fruits ripening process. For human body the calcium carbide is really dangerous as it includes the arsenic and phosphorus traces. In numerous country of the world the calcium carbide is prohibited, but in India, Pakistan, Nepal, and Bangladesh it is directly used. Thus there is the short-term and long-term possibility of health effects eating banana fruits directly which are persuade to ripen. Calcium carbide has innumerable uses in steel industries, agriculture and chemical. It is colorless when unadulterated, but grayish-white in color otherwise, small like-garlic fragrance. Undiscriminating pesticides on dissimilar variety of fruits conduct to effects of poisonous. Calcium carbide is commonly known as masala, and ripening agent use it, where as the use of calcium carbide is banned in so much countries. When calcium carbide is pure then it is color-less otherwise it is black grayish-white in color. When it reacts with water, $CaCl_2$ provides acetylene gas those are analogues of ethylene and ripening process is done in quickness.

In different places the fruits are sent which requires many days either in refrigerated transportation or in ordinary. Before retailing at the destination the fruits are ripened. Use of calcium carbide for ripening process takes less time for fast ripening. The fruit seller uses Calcium carbide for ripening the banana fruit by wrapping the tiny quantity of $CaCl_2$ in packet of paper, and put that packet near the fruit or in fruits box. Whenever the chemical reaction takes place the banana fruit changes its upper surface as well as the test of the banana. The banana fruit which is ripened artificially presents the outer skin as yellow but inside tissue will not be ripe and remains raw and green. As the calcium carbide uses on raw fruit, the chemical amount required for fruit ripening has increased.

Identification of Calcium Carbide Ripened Fruits

The fruits whose outside looks are attractive may not be good for health and also the fruits which has the same color, for example when there is a bunch of bananas and all bananas having same color in those bunch then they are more likely an artificially ripened fruits.

As we discussed in above, the chemical is used for artificially ripening the fruit. The banana fruits which are ripened by naturally has not similar color means not the totally the yellow color either they have some yellow and green bananas. Likewise when papaya and mango are totally orange/ yellow, and also tomatoes are red then $CaCl_2$ have been used. Similarly, for banana if stem of banana is dark green and all remaining body of banana are yellow then bananas can be identified whether it is ripened by natural or by an artificial.

Calcium carbide is indiscriminately used in partially to another advance practice of influencing fruit ripening like the banana fruits dipped in a solution of subjection of fruits to ethylene gas or the solution of

ethrel/ethephon. The human health infects by using calcium carbide. The effect influences insensibility in the hands and legs, cold and damp skin, weakness and low blood pressure. The chemical remains inside the fruit could conduct miscarriage. Fruits which look delightful from upper coating may not be healthy for health. Fruits which have uniformly color, example, a dozen of bananas having a uniformly color, are further have been ripened artificially [2].

THERMAL IMAGING

The thermal imaging technology detects the heat given off by an object or a person. The use of thermal imaging is to detecting infrared radiation means the heat source and generates the electrical signals from these laser signals, and provides the images in the form of heat. In medical imaging this technology has been widely used, this technique also used in, fault diagnosis, non-destructive testing and structure defect detection. This type of technology can instantly diagnostic target envision, rapid hot spots points, and also thermal profile verification, to regulate the problem condition [4]. Now this technique will be used to detect whether the banana fruit is contaminated or de-contaminated by toxic chemicals (Calcium carbide) or not. Because for ripening a fruit calcium carbide have been extensively used.

It is an exacting problem to detect contamination in fruit that are generally take place underneath the skin of fruit. Detection defects furthermore considerably affected by numerous factors like time, contamination type, contamination extremity, fruit difference, and fruit pre- and postharvest states [3]. The fruits which are ripened naturally are not yellow uniformly; preferably, they are of green and yellow. Whenever mango and papaya are constantly orange/ yellow or tomatoes are red, then fruit sellers may have been used Calcium carbide; banana fruits can be identified if the stem is dark green where the remaining portion of banana fruits are yellow [2]. To determine such kind of problem in fruits Thermal imaging Technique is used. ThermaCAM E45 is used for taking the color images of the contaminated and not contaminated fruit (banana). Thermal camera detects the defected portion in banana fruits as it is affected by the calcium carbide or not. ThermaCAM E45 provides the information in terms of temperature, thermal camera sensed the temperature and displays the color images, and different color shows different temperature.

The colored images of banana fruits can be compared to classify whether the banana fruit is contaminated or not contaminated. Section II gives proposed work. Section III provides the Thermographic Camera system. Section IV provides image preprocessing includes image filtering, and image segmentation. Section V provides different feature extraction. Section VI provides the classification process. Section VII and VIII provides the result and conclusion.

PROPOSED WORK

This paper presents an overview on Thermal Imaging Technique for detection of fruit whether it is contaminated or de-contaminated by toxic chemicals (Calcium carbide) or not. The image is captured by Thermal Imaging Camera FLIR (ThermaCam E45). Thermal camera detects the defects in fruits. If fruit is ripened by calcium carbide means it is contaminated by calcium carbide and when image of that banana fruit is taken by thermal camera then it represents the information of an image in terms of temperature. The different temperature profile for each sample will be generated by thermal camera and classification of an image is done by using artificial neural network.

BLOCK DIAGRAM OF SYSTEM

Fig.1. shows the block diagram of the system. First we take the colored images of the contaminated and non contaminated banana fruits by using ThermaCAM E45 then filtering these images by using different types of filters like, Median filter, Weiner filter, Gaussian filter, Adaptive weiner filter, and Unsharp filter etc. Color based segmentation with PSO is done. After that the feature extraction and classification of those images.

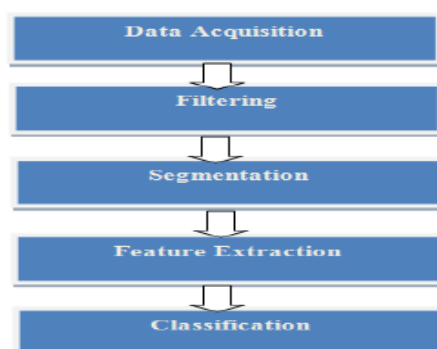


Fig.1: Block Diagram of System

Thermographic Camera System

Infrared energy coming from an object is focused by the optics onto an infrared detector. The detector sends the information to sensor electronic for image processing. The electronics translate the data coming from the detector into an image that can be viewed in the viewfinder or on a standard video monitor or LCD screen.

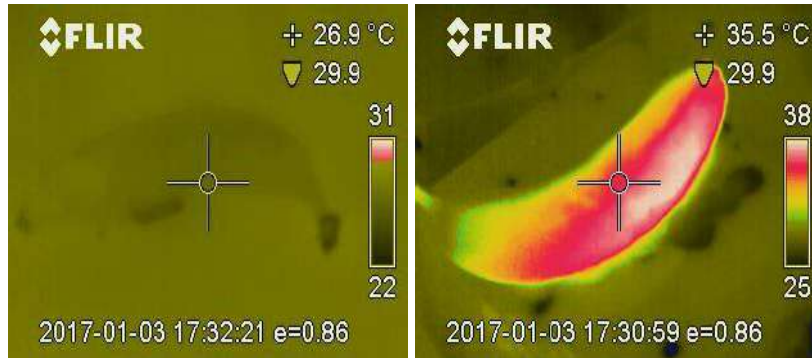


Fig.1: Thermal image of normal Banana and Banana having carbide effect

The ThermaCAM E45 is easy to use. Before capturing an image we have set the thermal camera first then use it so we first go on menu system then navigating the menu system to change the value in dialog box. Point to Meas. mode on the vertical menu bar and press MENU/YES to display the Meas. mode dialog box. In that dialog box we select Meas. mode as spot, Color alarm is set to be below and color alarm temperature is set to be 27.2. For Emissivity the reflectance temperature is set to be 0.5 degree Celsius. For palette the rainbow is selected and alarm is set to be yellow. The range for the images is of -20 to -100. In Fig.3 right figure shows the thermal image of banana for without calcium carbide (which is not contaminated) and left image shows the thermal image of banana with calcium carbide (which is contaminated) obtained from thermaCAM E45.

Image Preprocessing

Pre-processing is the first step for the conversion of thermal image into gray scale image which is followed by filtering process and resizing of image to eliminate unwanted part of the banana fruit.

Image Filtering

In this paper for filtering of images the wiener and median filter is used. Median filter produces good result as compared to wiener filter. So median filter is use for filtering process.

Median Filter

Nonlinear median filtering is used to eliminate noise from an image. It is very productive so it is used to eliminating noise to conserving edges. It is extremely productive to eliminating noise like pepper and salt. The working of median filter is done by affecting across the pixel image through pixel, exchanging each value with neighboring median pixels value.

The design of neighbors is known as “window”, which glides, pixel by pixel overall the whole image. Image median is estimated by firstly categorize all pixel values into numerical sequence from window and after that pixel value which is actually accounted with the median pixel value. The input pixel which is exchanged by middle of the pixel is incorporate around the pixel in the window.

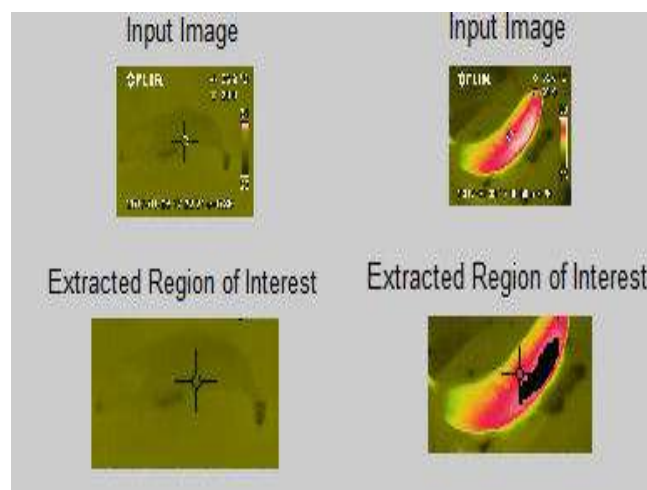


Fig.2: Region of Interest

The median filtering algorithm instructs in window arrange the pixel values in increasing or decreasing sequence and selecting the median value of the image. Median is calculated by in the middle by two average values. Typical windows are 5x5, 7x7, 3x3, or the 5 point window is reviewed for special type of averaging.

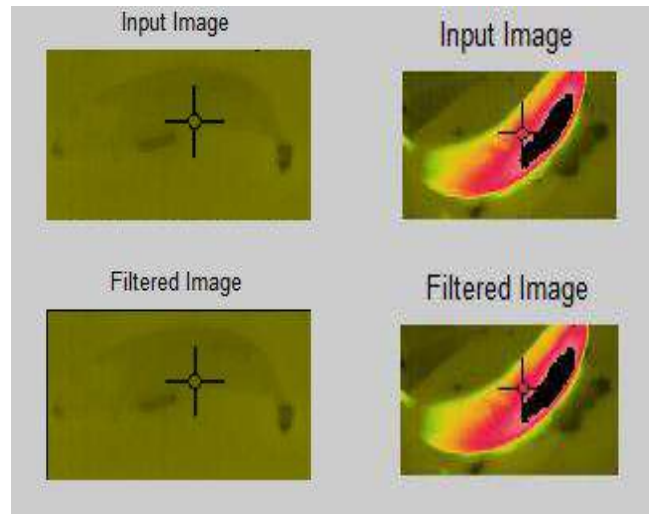


Fig.3: Output of the Median filter

Image Segmentation

In image processing the important step is the image segmentation and it is exacting step position to separate the image constituent regions of interest or area. Segmentation methods are of four types namely classification-based segmentation, edge-based segmentation, threshold-based segmentation and region-based segmentation and clustering based segmentation.

1. Region Based Segmentation

In region based segmentation the image is partitioning into set of connecting regions. The similar regions are found out according to specific criterion like texture and value of intensity. After that the thresholding is independently performed in each region. The main aim of region based segmentation is used to characterize the detected object by certain parameters analysis (size, shape, position). In this type of segmentation the region growing is one of the methodologies.

2. Pixel Based Segmentation

It is the simplest method for segmenting an image and it is known as Thresholding method. In this method the image is classified into an array of sub images overlapping and after that optimum thresholding is applied on that sub images. The thresholding for each and every single pixel is find out by interpolating the results of sub images. The disadvantage of pixel based segmentation is that it is computationally expensive so that this method is not applicable for the application in real time.

3. Clustering Based Segmentation

The clustering based segmentation is mostly used for segmenting the grey level images. This type of segmentation is easily extendable and they are also directly applicable for the data which have large dimensional. The popular clustering methods are fuzzy k-means and the k-means.

4. Edge Based Segmentation

The edge based segmentation works on the discontinuities of data image in sequence to locate boundaries. The edge based segmentation has different profile such as texture and shading can changes due to this the edge based segmentation is not reliable. The object for edge based detection methods are Sobel, canny and the laplacian of Gaussian.

The analysis and processing of an image depends on segmentation of an image. In this paper the color based segmentation is used to segment the contaminated portion in banana fruit. It is attainable to segment image on the basis of color. This can be done by situating of object based on color in an image is attainable. Analysis of image can be accomplished either straightly on the true image or either across individual color of plane. On the basis of intensity value of color to segment the image the threshold is set because intensity values are sustained in homogeneous color region. Specific color range with an object can be detected easily from whole image. The mean value of necessitate color is calculated and it is compared with each RGB pixels values of an image using either Mahalanobis distance measure or the Euclidian distance measure. The particle swam optimization (PSO) algorithm is used for color based segmentation.

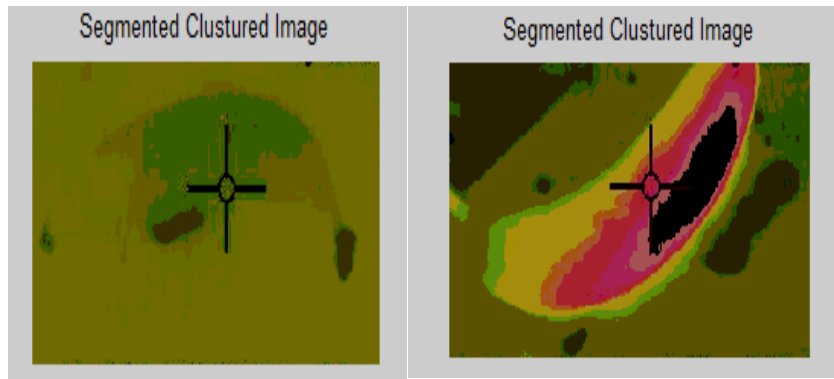


Fig.4: Segmented Clustured image

Particle Swarm Optimization

Particle Swarm Optimization is a kind of Evolutionary computational technique which is developed by Kennedy and Elberhart. Particle swarm optimization is simple and powerful search technique which can be applied in a successful manner to a large variety of optimization problems, which includes the problems of image processing like image segmentation.

Table 1: Particle Swarm Optimization

Parameters	Description
Particle	candidate solution to the problem
Velocity	rate value ob of position change
Fitness	the best solution achieved
Pbest	best value obtained in previous particle
Gbest	best value obtained so far by any particle in the population

In particle swarm optimization, a solution is representing by a particle, and a solution of populations is known as swarm of particles. Each and every particle has mainly two properties: velocity and position. Each particle moved to the new position by use of velocity. Whenever the each particle reached to the new position that time the best position of swarm and the best position of each particle are updated as it is needed. Each particle velocities are adjusted depending on the particle experiences. This process is repeated till the stopping criterion is met.

Particle Swarm Optimization Steps

1. Initialize each particle.
2. For each particle estimate the personal best (pbest) and the fitness value.
3. Estimate global best = best among all particles.
4. Update new positions and velocity.
5. Repeat step from 2 to 4 till the termination criteria is reached.

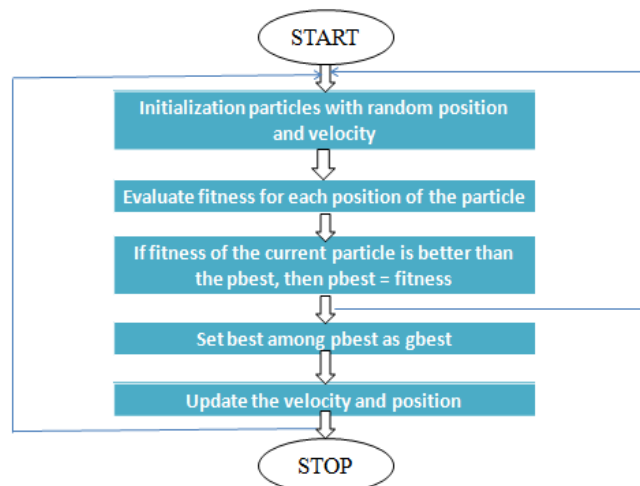


Fig.5: Flowchart for particle swarm optimization algorithm.

Initialization is the first process of particle swarm optimization where the initial particle of swarm is generated. The concept for solution representation is applied also here as it is applied in genetic algorithm in similar manner. Initializes each particle with a random velocity and position. For fitness value each particle is calculated. Fitness value is calculated each and every time, it is just compared with against previous best fitness value of the particle and global best positions and the personal best positions are updated where it is applicable. Whenever the stopping criterion is not met, then create a new swarm by updating the velocity and position. For updating the velocity the personal best and global best positions and old velocity are also required.

As mentioned above, there are two keys requires for operations of particle swarm optimization to update the positions and velocity. Velocity is updated on the basis of three components such as experience of an individual particle (momentum term or inertia), the old velocity (self learning term or cognitive), and the whole swarm experience (social learning term or group). Each term has the constant weight associated with it. The number of required constants is three for basic particle swarm optimization.

It should be seen that the particle swarm optimization does not require fitness values of solutions for sorting in any process. This is significantly computational advantage over genetic algorithm, especially in that case where the size of population is large. The simple arithmetic operations of real numbers are require in particle swarm optimization for updating the position and velocity of the particle.

First step is to initialize some particles that is known as initial population and the particles those are chosen as the number of particles are considered as size of swarm. Each and every particles are initializes by assuming the initial solutions and after that gradual all particles varies their velocity and position according to their personal best so far and group or global best position in the current time.

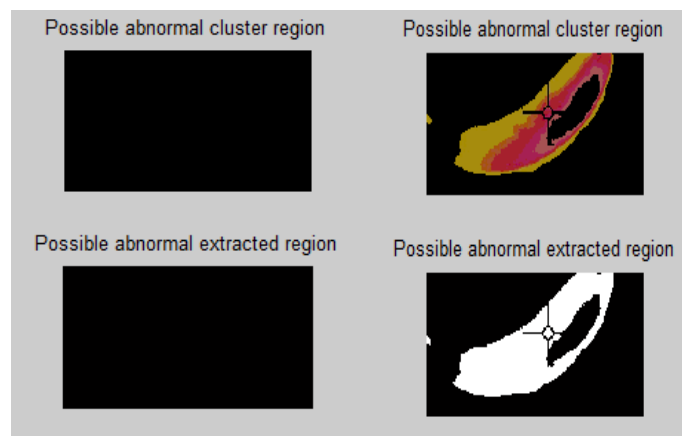


Fig.6: Possible abnormal cluster and extracted region

Feature Extraction

It is the important step in image processing. The most important aim is to extricate the feature from an image. For feature extraction we evaluate the area of an object (i.e. area of banana fruit) in binary image. An input images either a numeric or logical. If an input is numeric then nonzero pixels are appraised like Area, Mean, and Standard Deviation, minimum and maximum of RGB. They are as follows

1. Area: Area is the information of pixel which is present in binary image. Area is defined as:

$$Area = A = \sum_i \sum_j (A_{i,j} X_{roi}[A], Y_{roi}[A])$$

Where, $X_{roi} [A] = i$ and $Y_{roi} [A] = j$ vector contains ROI X AND Y position respectively.

1. Mean: The mean, μ of the pixel values in the defined window, calculates the value in the image in which central clustering occurs. The mean can be estimated using below formula:

$$\mu = \frac{1}{MN} \sum_{i=1}^M \sum_{j=1}^N p(i,j)$$

Where, $P (i, j)$ is the pixel value at point (i, j) of an image size $M \times N$.

2. Standard Deviation: The standard deviation, σ is the calculate of the mean square deviation of grey pixel value $p (i,j)$ from its mean value. Standard deviation explains the dispersion within a local region. The std. deviation value of RGB is calculated. It is determined using below formula.

$$\sigma = \sqrt{\frac{1}{MN} \sum_{i=1}^M \sum_{j=1}^N (p(i,j) - \mu)^2}$$

Where, P(i,j) is the pixel value at point (i,j), μ and σ are the mean and standard deviation respectively.

3. Minimum and Maximum values of RGB are also calculated.

Classification

After feature extraction the images will be classified by using Artificial Neural Network and the Support Vector machine. Support vector machine basically deals with pattern classification which means that this algorithm is mainly used for classifying the different types of patterns. The main aim of SVM is to maximize the margin hence the SVM can correctly classify the given patterns.

Basically neural networks are those parallel computing devices, which attempt to make computer brain model. The main aim is to design a system. Which perform different computational works or tasks which is faster than the traditional systems. Artificial Neural Network are those types of computer architecture which is supreme by biological neural networks and use to imprecise functions which depends on maximum number of inputs and are usually unknown. During training period, it can be easily estimated whether the outputs of ANN is correct by observing pattern or not.

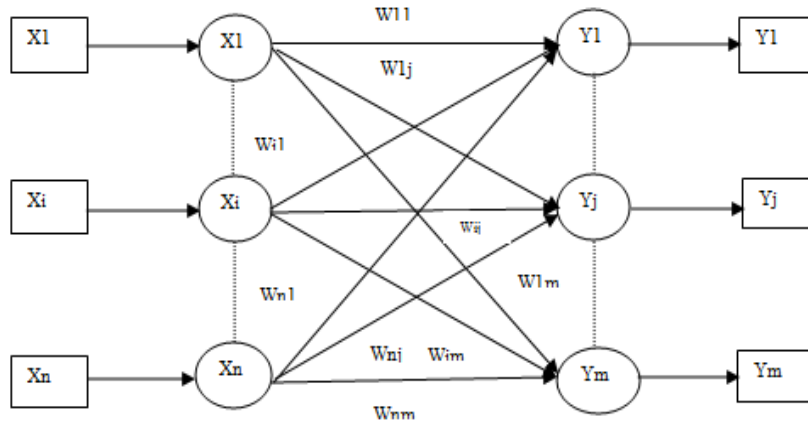


Fig. 7: Architecture for linear vector quantization

In this paper for classification of the banana image we have used the Learning Vector Quantization Neural Network. The learning vector quantization is differ from the Kohonen Self-Organizing Maps (KSOM) and Vector Quantization (VQ), generally uses the supervised learning which is competitive network. Learning vector quantization defines in such a way that it is a process of patterns classification where each output unit representing the class. Supervised learning is uses, so the network will give set of training patterns with known classification along with the class of output with an initial distribution. When the training process is completed the linear vector quantization will classify the vector input by assigned to the same class likely the output unit.

Below figure shows the linear vector quantization architecture which is little but similar to the kahonen-Self-organizing map architecture. In below figure “n” is the number of input units and “m” is the number of output units. These layers are totally interconnected by the weights which they have on them. Parameters used in Linear vector quantization for training process and also for flowchart are as follows:

1. x = training vector ($x_1, \dots, x_i, \dots, x_n$)
2. T = class for training vector x
3. W_j = weight vector for j th output unit
4. C_j = class associated with the j th output unit

Training Algorithm

Step 1 – Initialize the reference vector, it can be done like:

- From the given set of training vectors, take first “m” (number of clustering) training vector and use as weight vector. The remaining vector can be used for training.

- Randomly assign the initial weight and classification.
- Apply the method of K-means clustering.

Step 2 – Initialize reference vector α

Step 3 – If the condition for stopping this algorithm is not met, then continue with steps from 4-9

Step 4 – For every training input vector x , follows the steps from 5-6.

Step 5 – For $j = 1$ to m and $I = 1$ to n then estimate the square of Euclidian Distance.

Step 6 – Obtain the winning unit J where $D(j)$ is minimum.

Step 7 – estimate the new weight of the winning unit by the following relation:

- If $T = C_j$ then $W_j(\text{new}) = W_j(\text{old}) + \alpha [x - W_j(\text{old})]$
- If $T \neq C_j$ then $W_j(\text{new}) = W_j(\text{old}) - \alpha [x - W_j(\text{old})]$

Step 8 – Reduce the learning rate α

Step 9 – Test the stopping condition.

1. Maximum number of epochs reached.
2. Learning rate value reduced to a negligible value.

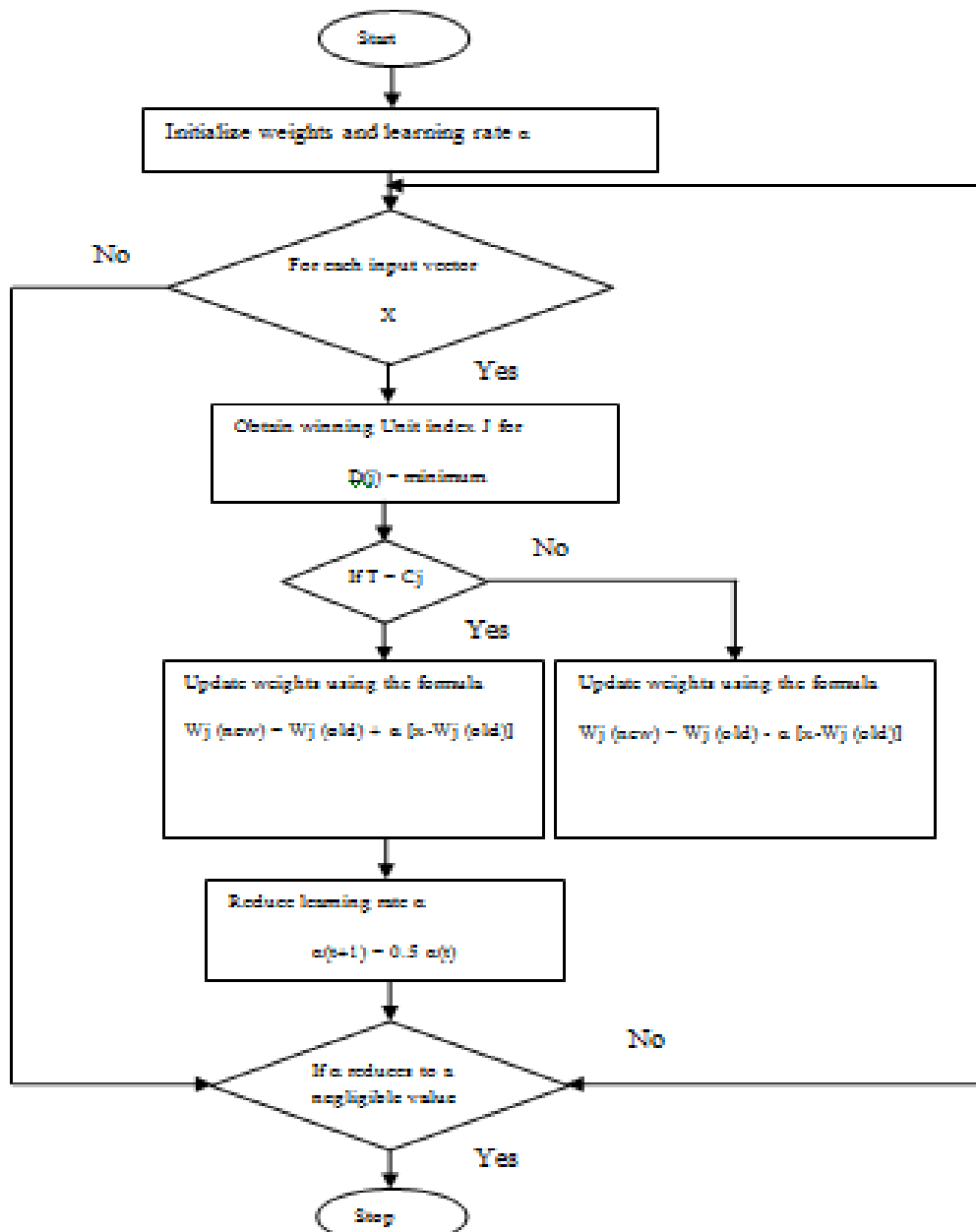


Fig.8: Flow chart for learning vector quantization neural network

RESULTS

Different parameters for contamination like, area, Mean, Std. deviation of RGB and minimum and maximum values of RGB of normal fruit (not contaminated fruit) and for the contaminated fruit on the basis of different quantity level of calcium carbide has been calculated and also their results based on the thermal camera and system output as shown in below table. For our analysis we take area greater than 100 is normal and value above that is considered that it is contaminated fruit. So we have concluded that these four parameters considered for feature extraction are sufficient for classification of banana to detect either banana is contaminated or not contaminated.

Table 2: Comparative Analysis

Contaminati on level of CaCl2(gm)	Area	St dr	Stdg	Stdb	Mnr	Mng	Mnb	Mxr	Mxg	Mxb	Mir	Mig	Mi b	System analysis on contamination		Desired O/P Analysis
														SVM	ANN	
2	522	0	12.9608	30.5305	165	108.3 8	43.67	165	115	83	165	40	0	Yes	Yes	Yes
5	1175	0	41.2997	27.8624	168	29.45	49.72	168	117	85	168	0	0	Yes	Yes	Yes
10	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	Yes
15	2218	0	25.9648	26.7150	177	45.47	48.06	177	115	84	177	0	0	Yes	Yes	Yes
20	617	0	45.4062	15.2944	175	63.69	38.16	175	111	65	175	0	9	Yes	Yes	Yes
24	6128	0	28.315	28.315	208	52.98	42.99	208	85	41	208	0	0	Yes	Yes	Yes
25	11344	0	48.3207	48.3207	166	90.07	36.65	166	140	81	166	0	0	Yes	Yes	Yes
Without CaCl2	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	No

CONCLUSION

The accurately identification and classification of banana fruit whether it is ripened by calcium carbide or naturally ripened is very important for human body as calcium carbide accommodates traces of arsenic and phosphorous. This paper presents a thermal imaging technique that creates and analyzes images by detecting the heat radiating from an object. Thermal imaging can be used to detect the contamination in fruits as it is non-contact, non-traumatic, non-invasive and simple method for fruit skin temperature.

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ELECTROMAGNETIC SPACE SHUTTLE LAUNCHER

Prashant Harilal Gupta, Harsh Bholaprasad Tiwari, Nikhil Anil Sankhe and Swapnil Dilip Patil

Department of Electrical Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

An electromagnetic launcher is a device which use magnetic field to accelerate a projectile. Research of electromagnetic launcher has become wider and discussion on its future has become popular among the scientists and engineers all over the world. Many experiments have performed to understand the characteristics of producing high efficiency of electromagnetic launcher. The efficiency of electromagnetic launcher, in terms of velocity, is directly related to design, material selection and construction techniques. This paper is proposed to design and develop an electromagnetic launch system using a coil gun. A coil gun is a type of projectile accelerator comprising of one or more coils used as Electromagnets in the configuration of a linear motor which accelerate a conducting projectile to high velocity. In almost all coil gun configurations, the coils and the gun barrel are placed on a common axis. Coil guns generally comprises of one or more coils arranged along a barrel, so the path of the accelerating projectile lies along the central axis of the coils. The coils are switched off and on in a precisely timed concatenation, resulting the projectile to be accelerated quickly along the barrel via magnetic forces. Coil guns are definite from railguns, as the direction of acceleration in a railgun is at right angle to the central axis of the current loop formed by the conducting rails. Also, railguns usually require the use of sliding contacts to pass a large current through the projectile but coil guns do not necessarily require sliding contacts. Whilst some simple coil gun concepts can use ferromagnetic projectiles or even permanent magnet projectiles, most designs for high velocities actually incorporate a coupled coil as part of the projectile.

Keywords: Coil-Gun, Projectile, Linear Motor, Rail-Gun, Ferromagnetic projectile

INTRODUCTION

Electromagnetic Launch systems have advantages juxtaposed with the existing chemical launch systems. Generally, the electromagnetic launchers are categorized into two kinds of systems; railguns and Coil-Guns. Here we have tried to make a launch system using Coil-Guns. A reluctance Coil-Gun is basically a solenoid which can launch iron or steel projectiles by careful timing of the coil current. The cutaway diagram in figure1 shows the very simplest of Coil-Gun designs.

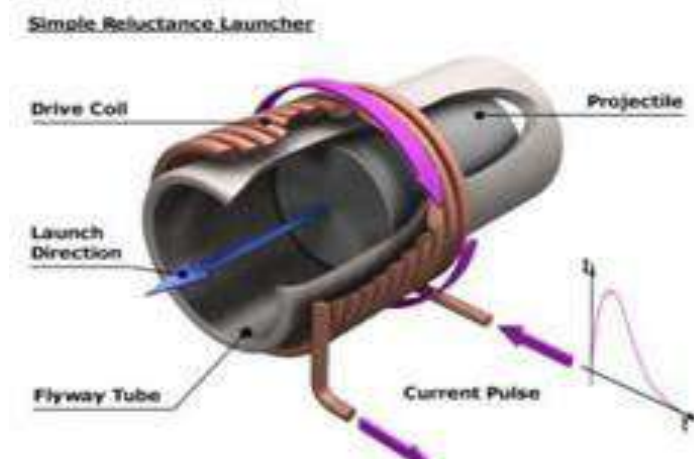


Figure 1: Cut section of Coil-Gun

A coil is wound over a non-conducting 'flyway' tube and the projectile is positioned at the breech end of the tube. If a small pulse of current is passed through the coil the projectile will accelerate into the coil, and if this pulse is terminated just as the projectile gets to the middle of the coil it will leave with a gain in velocity. This is, in a nutshell, how a reluctance Coil-Gun works. The correct timing and shaping of the current pulse is one of the most important facets of Coil-Gun design. There are various refinements that can be implemented to improve the performance. While Coil-Guns don't have any industrial application at present, but these systems could be used to launch payloads into orbit. A more rational application may be launch boosting where a vehicle is given an initial speed from a long Coil-Gun accelerator [1]. Vehicle would fire its rockets to achieve orbit after leaving the Coil-Gun. Launch boosting could result in noteworthy savings in fuel costs. From a military point of view Coil-Gun technology may have a place in future combat vehicles. Electromagnetic space shuttle launcher can be termed as smokeless launch.

LITERATURE REVIEW

1. The first Coil-Gun was patented in 1900 by Norwegian researcher Kristian Birkeland. However, his attempts to produce a practical weapon proved disappointing, and the concept was abandoned and languished for many decades. Interest in the concept revived in the wake of the Reagan Administration's SDI program, and NASA began looking into the possibility of using Coil-Guns to launch orbital payloads.
2. Sandia National Laboratories investigated electromagnetic launchers to orbit, in addition to researching other EML applications, both railguns and Coil-Guns. In 1990, a kilometer-long Coil-Gun was proposed for launch of small satellites. [2][3] Later investigations at Sandia included a 2005 study of the StarTram concept for an extremely long Coil-Gun, one version conceived as launching passengers to orbit with survivable acceleration. After NASA Ames estimated how to meet aerothermal requirements for heat shields with terrestrial surface launch, Sandia National Laboratories investigated electromagnetic launchers to orbit, in addition to researching other EML applications, both railguns and Coil-Guns. In 1990, a kilometer-long Coil-Gun was proposed for launch of small satellites.
3. The Center for Electromechanics at The University of Texas at Austin (CEM-UT) performed a feasibility study of an EML system for a hypersonic model test Facility for NASA-Langley Research Center. The work resulted in a high-energy EML design to accelerate large, complex 18 in. winged aircraft models up to 11 km/s (25,000 mph) at less than 33,000 gees. Two different designs evolved which are based on railgun and Coil-Gun concepts. Both designs make use of low current density, very long, low acceleration electromagnetic motors.
4. Electromagnetic aircraft catapults are planned, including on board future U.S. Gerald R. Ford class aircraft carriers. An experimental induction Coil-Gun version of an Electromagnetic Missile Launcher (EMML) has been tested for launching Tomahawk missiles.
5. A Coil-Gun-based active defense system for tanks is under development at HIT in China.
6. Speculations about Coil-Guns for use as military artillery predate the First World War, and in 1917 a Frenchman named Fauchon-Villeplee actually built a working model of a railgun, with the shells fitted with "wings" that served as an armature. In 1937, an employee of the German Siemens company named Otto Muck started looking at railguns again, and in 1943 proposed the construction of a long-range railgun that could fire twelve 200-kilogram shells every minute, driven by a 100-megawatt power station. The German military was already committed to the development of long-range missiles and other V-weapons, and the project was not funded.
7. An electromagnetic launcher (EML) was designed for NASA-Langley to boost large models to hypervelocity for flight evaluation. Two different concepts were developed using railgun and coil gun principles. The aim is to present experimental research information on Coil-Guns and related topics. In this capacity we hope to foster interest in the fields of physics and engineering. Our long-term objective is to design and construct single and multi-stage Coil-Guns capable of firing projectiles at supersonic speeds. [5]
8. "Magnetic Journey of Space Shuttle" published in *Advances in Aerospace Science and Applications*, By Ravi Kumar Shakya, Priya Garg, Rishabh Bana and Praveen Raj from Aerospace University, SRM University, Chennai, India. In this paper it describes under the principle of magnetic levitation, space shuttle is launched and is directed towards North Pole or South Pole. The contributing factors for magnetic launch discussed are magnetic field strength, the location of the launch and the structural design of the space shuttle. The location for the launch of the space shuttle is the area with least gravitational force, helping in achieving extra velocity, with the minimum usage of propellant. [6]

PROPOSED SYSTEM

This paper represents a space shuttle launching by using electromagnetic principle. Generally, space shuttle launching is done by giving the command to relayed to initiate the space shuttle's three main engines, solid rocket boosters are ignited as the bolts securing the shuttle to the ground are discharged, allowing the rocket launch to propel the spacecraft into the atmosphere. In this process there are required a maximum amount of fuel, space, human efforts and releases gaseous form of pollution. Whereas in electromagnetic principle the power through wounded coils or rail tracks produces magnetic field around it and projectile launches in space by Lorentz force. It has higher reliability and reduced maintenance. This project introduces to an electromagnetic shuttle launcher. Here we are connecting rectifier circuit to an AC supply (240V-440V) with in series resistor and zener diode connected in parallel /across it. The capacitor bank is for stores the energy in it and supplies when the rail needs a desired voltage level for producing magnetic field. As we can also use Microcontroller AT80s51 for control

circuit to reset or control the clock and I/O of the circuit. A digital oscilloscope is connected across the circuit which shows the ripple free dc waveform. This paper presents developing the shuttle launcher by rail gun method. Where the two-rail track (aluminum strips) which are made up of aluminum are laid on a thin acrylic sheet, by connecting a thick wire to tracks/strips. We made capacitor bank by using connecting 8 capacitors to each other. A 5v charger and for projectile we used tube bearing. And a rectifier circuit uses to charge the capacitor bank. When the AC supply converts to pulsating DC by rectifier the pulsating dc voltage is passes through zener diode for pure dc voltage, then capacitors are charge and when closes the switch for launching the projectile the supply passes through the aluminum strips or tracks the magnetic field starts generating through it and at the specific amount of kinetic energy through the strips the projectile starts moving towards the end of tracks with an higher velocity and speed by principle of Lorentz force. At the end of tracks there a projectile at its maximum speed and with higher accelerations projectile launches in atmosphere, starts to locates at the orbit. The gravitational factor also affects at the speed of projectile hence the launching place it should be located at less gravitational force (<9.81 m/s). The same process we can use in coil gun also for launching the space shuttle but due it's having a less reliability and less speed than rail gun. The flowchart for developed rail gun system is shown in Fig. 2 the workflow of developed rail gun system.

Block Diagram

The block diagram for proposed system has been shown in figure 3. The various stages of the system are as follows:

A. Microcontroller

An embedded AT80s51 microcontroller is a chip that features a processor with all its support functions (clock & reset), memory (both program and data), and I/O (including bus interface) integral into the device.

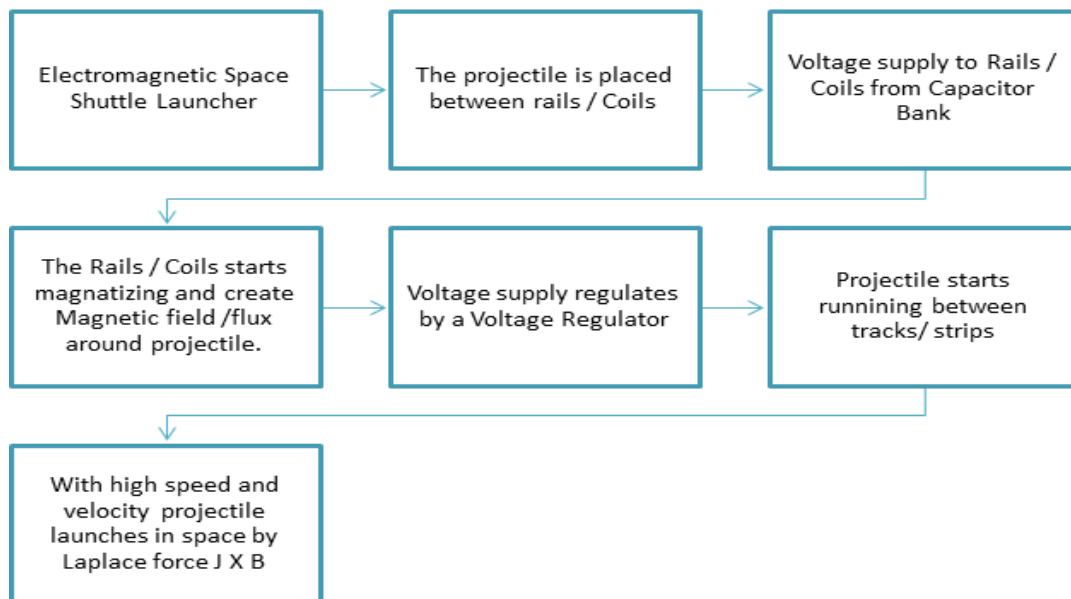


Figure 2: Flow diagram of Rail Gun System

B. RELAY DRIVER CIRCUIT ULN2803 The eight NPN Darlington connected transistors during this family of arrays are ideally suited to interfacing between low logic level digital electronic equipment (such as TTL, CMOS, or PMOS/NMOS) and also the higher current/voltage needs of lamps, relays, printer hammers, or different similar masses for a broad vary of computer, industrial, and client applications. All devices feature open collector outputs and freewheeling clamp diodes for transient suppression.

C. COIL-GUN/RAILGUN The ohmic resistance of the coils and also the equivalent series resistance (ESR) of this supply are among different limits to the efficiency of a coil gun. The magnetic circuit ideally, 100% of the magnetic flux generated by the coil would be delivered to and act on the projectile, but this is often off from the case due to the common air-core coil construction of most coil guns, which are usually comparatively easy and inefficient designs created by hobbyists. To reduce component size, weight, robustness necessities, and most significantly, cost, the magnetic circuit deliver a lot of energy to the projectile for a given energy input.

D. TRANSMITTER and RECEIVER For transmitter section, the different commands signals are transmitted via RF transmitter module of 500 MHz it has 4 pins of antenna, Vcc, ground, & serial data input. Antenna, +5v & ground are connected to respective places and serial data input is generated from encoder IC HT12E.

This encoder IC's function is to convert parallel data into serial data address lines of encoder are grounded because they are not used.

- E. CAPACITOR BANK A capacitor bank consists a numerous capacitor to stores the energy and supplies to a coil gun or rail gun. In this project each capacitor carries 12V-80V and it's connected to a two end to end terminal of the rail gun circuit.
- F. RECTIFIRE AC supply is connected through rectifier circuit to stores the charge in DC form in capacitor bank with a Zener Diode across it to form pure dc supply. The Transformer is step up the voltage up to 440V and rectifies it through a rectifier circuit.

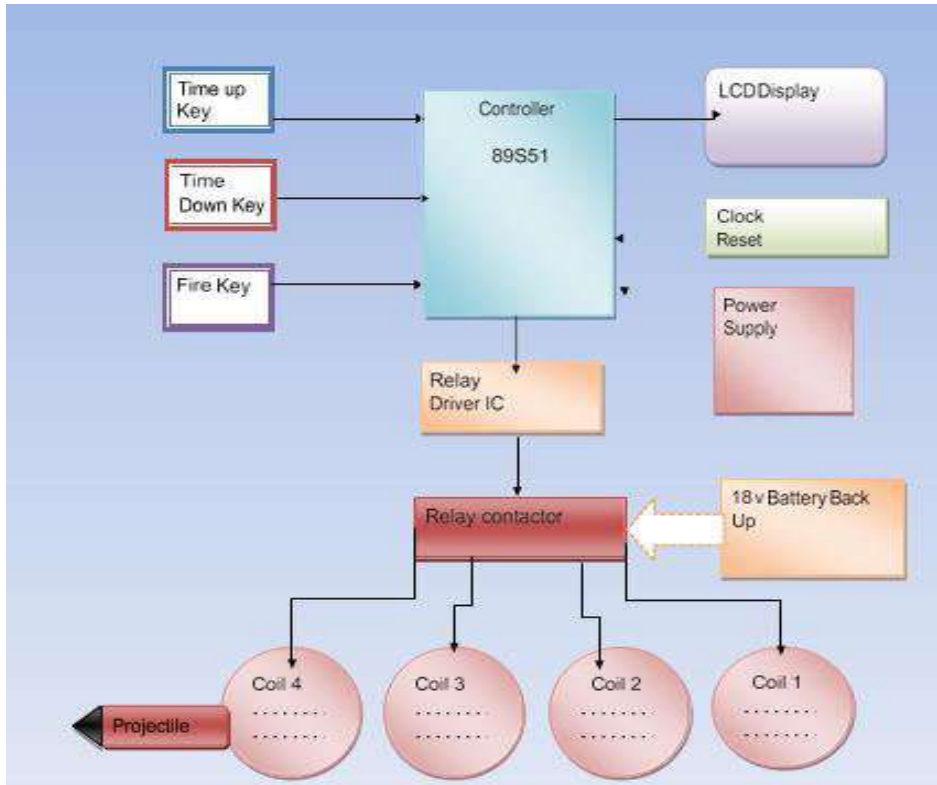


Figure 3: Block Diagram of proposed system

Simulation Results for Railgun Circuit

Controller circuit and capacitor bank switch regulates voltage in the circuit. The simulation results of circuit are as shown in below Fig. 4 when the switch 1 open while Fig 5 shows when the switch 1 is closed. The Digital Oscilloscope is connected across the magnetized tracks and rectifier circuit.

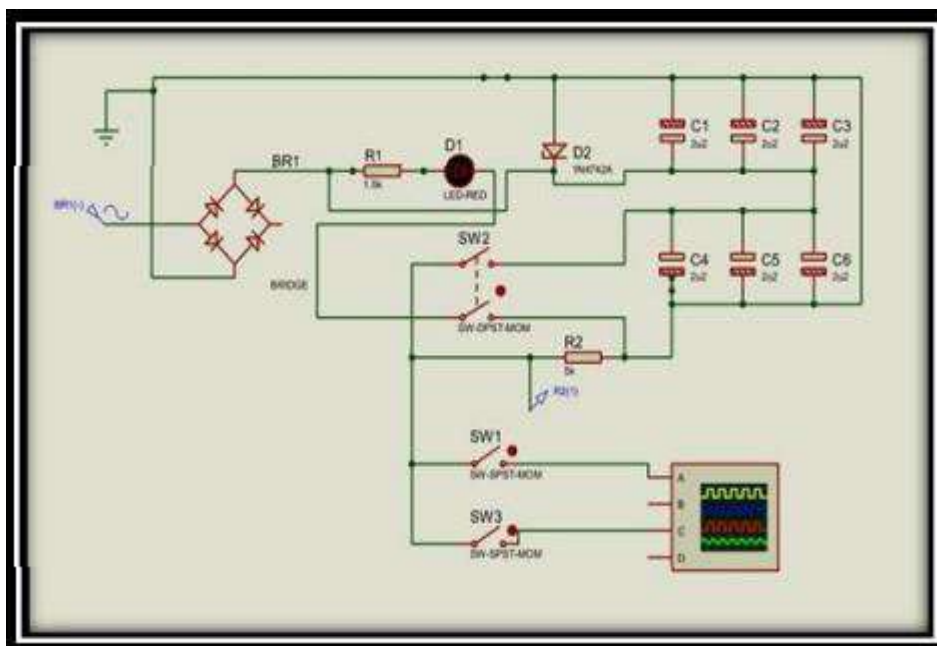


Figure 4: AT switches 1 and 2 open in condition

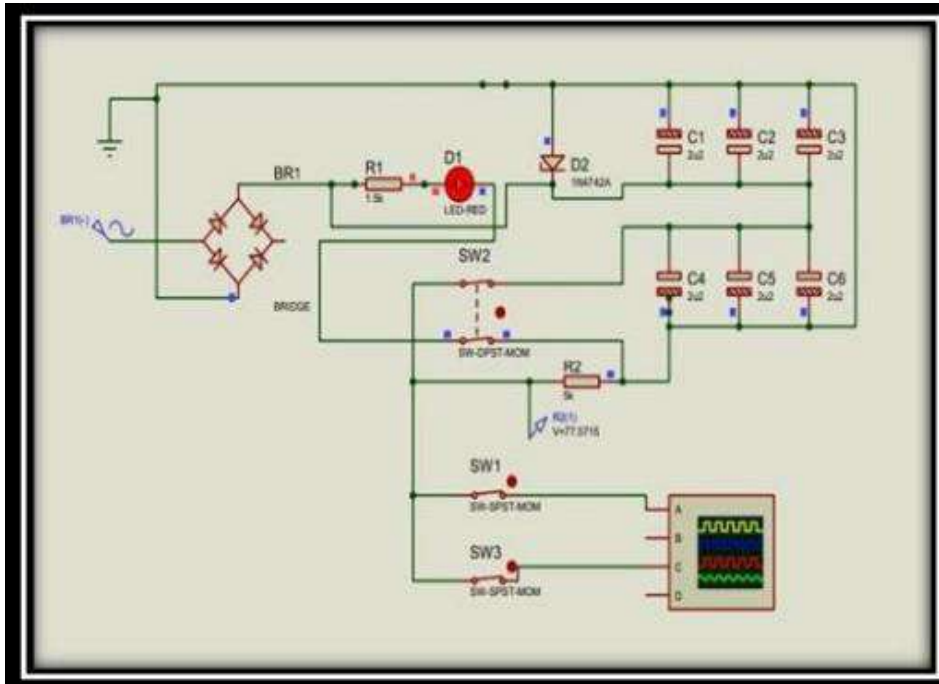


Figure 5: 5. At switches 1 and 2 in close position and projectile starts to run on rail gun and launch in space.

CONCLUSION

The proposed system shall help to make launching system more cost-efficient, reliable and less consumption of propellant. The use of Coil-Gun method can increase speed of projectile and for more reliability aspect the rail gun method implanted for space launcher. The use of magnetic field of the earth for the space transportation would revolutionize the launching mechanism of the space shuttle, which would in turn improve the reliability and the efficiency of the launching process. As the principle of the magnetic levitation is under major application for the railway transportation as well as space transportation, for astronauts to travel in space is in a completely efficient way. The speed of a projectile or rockets are increased effectively by rail gun method.

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PARALINGUISTICS – A KEY FOR THE AUDIENCE FULLY UNDERSTAND THE ESSENCE OF SPEECH AND CONVERSATION**M. S. Balasubramani**

Assistant Professor, Department of Applied Science and Humanities, Theem College of Engineering, Boisar

ABSTRACT

This article examines Paralinguistics (the voice pitch, voice tone and the rhythm of the speech) which is the most often responsible for “not what you say, but the way you say.” It also studies the role of Paralanguage for revealing emotions and the role of language and body language for sharing ideas, conveying information and the people’s perceptions and persuasion. The study involves fieldwork of inspecting the speech and conversation of 40 pairs of engineering students. The findings are that people generally use non-verbal communication and apply a combination of paralanguage with language when they need to express their emotions and share pleasure but when they want to express the factual messages in accurate form, only use the words. The research concludes that language, body language and paralinguistics work together in sharing ideas, thoughts and information but paralinguistics is the best one to express a high degree of emotions and to bring people’s sentiments out.

Keywords: Paralinguistics, speech, conversations, emotions, perception, persuasion

I. INTRODUCTION

In the process of speech, our voice is our trade mark that assigns extra life while delivering a speech and adds a human touch to the words. It is said that the words are just words, they do not state any meanings but the speaker’s voice goes with language and uses Paralinguistics (the non-verbal cues: the voice pitch, voice tone and the rhythm of the speech) to reveal emotion, attitudes, status, personality, etc. Non-verbal communication involves direct communication not exclusively relying on written or spoken words (Berry, 2010; Rimondini, 2012). Paralinguistics reveals feelings of meaning and improves English fluency and accuracy and communication skills more effectively which are the most important requirements in the present era from the learning arena to excel in all professions. Keep on excelling as there is no perfection in the world.

II. AIMS

The objective of the research is as follows:

- Analyse the aspects of communication and how they work together to interpret language
- Study how the paralinguistics helps express the speaker’s attitude and reveal emotion, attitudes, status, personality
- Examine how the paralinguistics opens up paths to make the audience fully understand the essence of speech and conversation
- Identify how paralinguistics help to attain good and proper results in communication
- Ignite the learners’ interest in enhancing paralinguistics to give a better presentation

III. LITERATURE REVIEW

To complete and achieve the goals of this work, it referred to many research works, books and websites and explored to worldwide things of the following:

- ✓ Language is the use of words to convey information and present meaningful data to different people (Phifer, 2007) but Non-Verbal Communication (NVC) is used to show the way people feel at a given point in time (Littlejohn & Foss, 2010; Wood, 2009).
- ✓ Language, Paralanguage and Body language complement each other in order to provide meaningful communication (Zimmerman & Uecke, 2012).
- ✓ To present or convey various understandable messages and the modification of voices, the components of paralanguage such as non-verbal voice qualities, voice modifiers and independent utterances are used and they are produced by various parts of the body (Poyatos, 2012; Wilson, 2011).
- ✓ Through conventional dialogue and speech of a language, information is carried out from one person to another in mutually intelligible dialect (Perkins, 2010).

IV. HYPOTHESIS

The study presents here its hypothesis:

- The only aspect of communication is what we say
- The non-verbal communication plays a crucial role in ‘how we say the message’ and
- Convey as many or more meanings in human interaction with high culture-specific
- It reflects the thought “Action speaks louder than words”

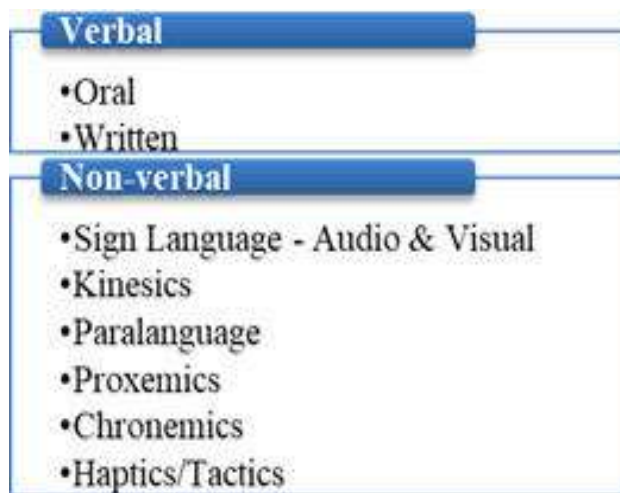


Fig.1: Verbal & Non-verbal Communication

A) **Communication Theory:** In everyday interaction, Communication is a vital aspect that comprises both verbal and non-verbal elements. Communication theory, seen as a way to map the world and navigable, helps you to study people’s behaviours, understand people and their communities, media and associations with families, friends and companies. Communication theory plays a vital role to understand human beings, (Richard West & Lynn H. Turner, 2014).

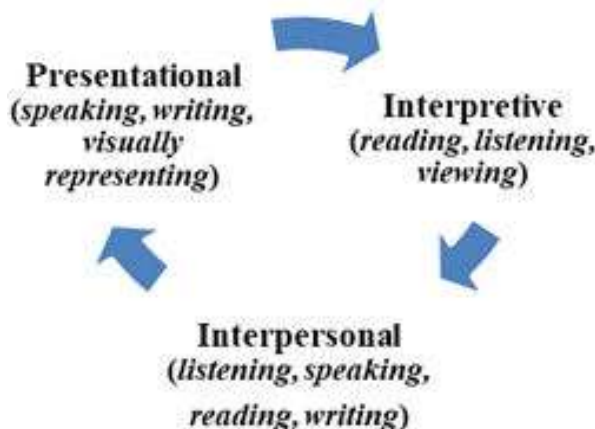


Fig.2: Mode of Communication

B) **Modes of Communication:** Modes of communication includes Presentational, Interpretive and Interpersonal communications where the communicators follow Listening, Speaking, Reading and Writing (LSRW) processes. The New London Group defines five modes of communication:

Table 1: Five Modes of Communication

5 Modes	Definition
1. Linguistic	Written and spoken words
2. Visual	Images (still or moving)
3. Aural	Sound, music
4. Gestural	Body movements, expression
5. Spatial	Physical arrangement, position, proximity

C) English Language Skills: The broad and primary plane of communicative competence has discoursed with respect to language development and acquisition of body language and paralanguage. To attain these, you should keep a good habit of reading books that enjoys you. Reading can be an ideal gift by yourself so carry a book where ever you go. As the basic skills are required in all areas, you learn English systematically with fundamentals of study skills, practical grammar for English writing styles such as punctuation, sentence structure, correct word usage, methods to the analysis of English words and sentences for effective writing and speaking. Hence, there is a need for these different approaches to gain the best forms of meaning.

D) Interpretation of Language: Language uses the definition of words, para-language and kinesics which help to understand the meaning within the current and past context.

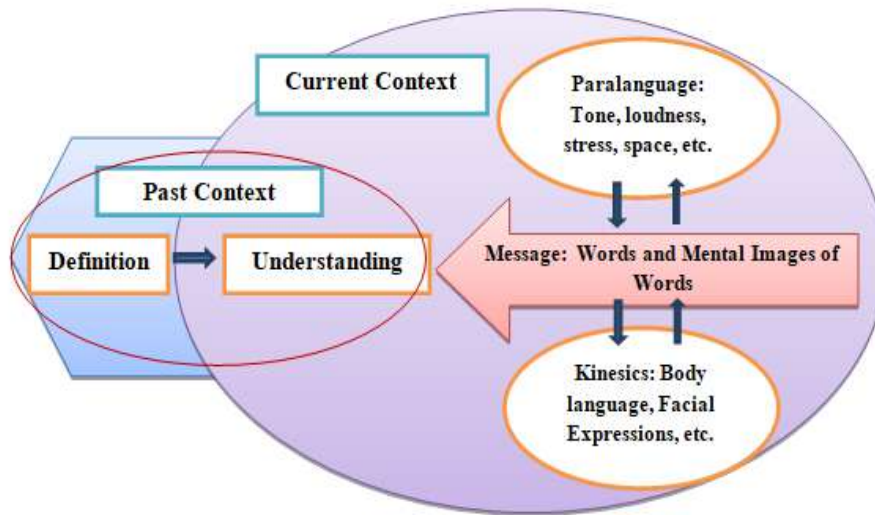


Fig.3: Interpretation of Language in Past and Current Context

Effective communication is not what you say but how you say

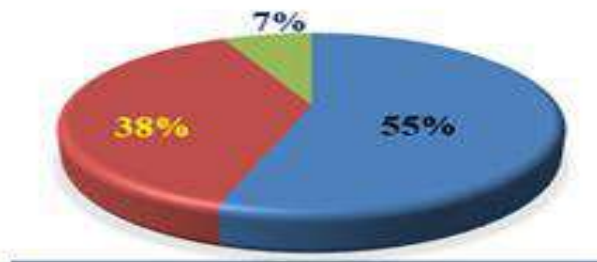


Fig.4: Ratio of Communication

E) The Ratio of Communication: People use words to convey messages but they use paralanguage to express a high degree emotions as they can change the meaning of the message completely. Figure 4 shows the research result of Albert H Mehrabian in the 1960s and 1970s: A message being conveyed by body language accounts for 55 per cent, 38 per cent paralanguage and 7 per cent verbal. The study defines that the meaning of what we express is limited or part of the words we say but how we say contains the power to make success in people’s perception (awareness) and persuasion (influence).

The details of ratio of communication and its usage are as follows:

Ratio	Categories	Usage
55%	Body language - It is conveyed through the whole body which could be understood by vision and sight.	Use of appropriate body language can make face to face communication more meaningful. Kinesics (body language), Haptics (touch), Proxemics (space distancing), Signs and Signals (audio/visual), Chronemics (use of time),

38%	Paralanguage - It is conveyed by the mouth which could be understood by listening.	1. Components: Consciousness or unconsciousness, Intonation, Accent, Pitch, Pace/Rate, Pause, Silence, Emphasis, Word Stress and syllable, sound of voice <ul style="list-style-type: none"> It reveals more effectively emotion, attitudes, status, personality, etc. in oral communication.
		2. Paralanguage can alter the meaning: In English, a sentence becomes a question when the speaker’s voice tone rises at the end of it.
		3. Paralanguage can give emotional context for the content of speech: A loud, high pitched voice tone can express excitement, anger or fear.
		4. Paralanguage can show geographical linguistic subgroup: Accents are partially caused by paralanguage so the rhythm of native speakers easily helps us to know the their geographical region. For example, a southern accent in the U.S. is slow and lazy sounding.
7%	Verbal (Words)	Provides similar or opposite meanings

Table 2: The details of ratio of communication and functions

F) Types of Non-verbal Communication: An interesting fact about non-verbal communication is that it is spontaneous and continuous whereas verbal communication can be planned. The verbal communication can be started and stopped abruptly but the non-verbal can’t and it can be considered to be more reliable whenever both types contradict each other. The Non-verbal Communication tools are presented over here:

Sr. No.	Types of Non-verbal Communication	Definitions
1	Kinesics	It is the study of body’s physical movements which is considered as an intelligent way of communication.
2	Haptics	It is a Greek word which means able to come into contact with or touch . The touch is the most proficient at the core of personal experience or sense for capable of simultaneous input and output.
3	Proxemics	It is the study of how we communicate with the Space/Distance around us that involves how we arrange personal space and what we arrange in it.
4	Paralanguage	It is the vocal but non-verbal dimension of speech deals with the manner in which you say something rather than what you say. It defines the Rate (speed at which you speak); Volume (loudness or quietness of vocal tone); People Perception ; and Persuasion .
5	Sign Language	It is the Audio/Visual normally used by dumb and deaf and it is very important part in their life.
6	Chronemics	It guides us to understand the use of time, punctuality and how people perceive and structure the time and trying to use it more effectively. Rehearsal of formal presentation educates us to be within the time limit and a mark of courtesy and professionalism.

Table 3: Types & Definition of Non-verbal Communication

G) Characteristics of Paralanguage

1) Definition of Paralanguage: Para + language itself means something beyond the language. It has a great impact on people’s perception (awareness) and persuasion (influence). This is the non-lexical component of communication that uses the technical term for the voice varieties accompanying spoken words. Paralanguage modifies thoughts and expresses emotions by the way we say something rather than what we say. People normally use it multiple times per day and are sometimes unaware of doing so. As the non-verbal vocal cues are concerned with the sound of the voice, they are known as audio parts of speech. These are very important to identify the way you emphasize certain words in a sentence which can change the meaning. For example, If you ask lovingly, “Did you eat the chocolate?” The answer will be ‘Yes’ in a polite manner but if you use a harsh or angry voice, you will receive a fearful answer.

2) Components of Paralanguage: Listeners can interpret various meanings from any sentence depending on the tone, volume, pitch and other non-verbal hints which are classified into two main categories: 1) Vocal Characteristics, and 2) Vocal Interferences. The table presents you with a brief report of these two:

Table 4: Vocal Characteristics

1) Vocal Characteristics
Voice plays a part in the impression others have of you. For example, a) A loud voice is usually associated with aggressiveness. b) People who speak quickly are said to be nervous.
1. Pitch (high or low of your voice)
2. Volume (how loudly or softly you speak)
3. Pace/Rate (the speed at which you speak)
4. Voice Quality (how pleasant or unpleasant your voice sound/voice tone)
5. Rhythm (smooth and regular shows your confident attitude but uneven shows lack of clarity)
6. Articulation (the way you pronounce individual sounds)
7. Pronunciation (the way in which you pronounce or say a word)
8. Enunciation (clearly pronounce or speak the sound of a word)
9. Vocal Segregates (a short non-lexical utterances like ‘mm-hmm’, ‘ok’, ‘aa’, etc. help to regulate and maintain dialogue and sometimes disturb audience)
10. Kinesics (body language like facial expressions, gesture, posture shows different messages) <ul style="list-style-type: none"> • Gesture: (Movements of hands or other body parts to convey a message, for example, moving hands to say ‘hallo or bye’) • Posture (the way a person stands or sits like relaxed or tensed posture which reflect attitude of the person)

Table 5: Vocal Interference

2) Vocal Interferences
1. Vocal interferences are the sounds and words we use when we hesitate or are not sure of the right word.
2. We all use the occasional “uh”, “er”, “well”, “you know”, etc. to indicate that we are searching for the right word.
3. Such interferences may become a problem when they pop up too frequently as they can interrupt your listeners’ concentration and comprehension.

3) How we can Use Paralanguage to Give a Better Presentation: Paralanguage is considered as a non-verbal in nature that we generally use in communication. It represents a wide range of vocal characteristics like altering the tone and speed of words, changing the facial expressions to underline the remarks and whispering or speaking loudly to emphasize the message which helps us to articulate and imitate the speaker’s attitude.

Paralanguage is used to reflect gasp, sigh, clear our throats, change our tone, whisper or shout, emphasize certain words, wave our hands, frown or smile, laugh or cry, string vocal identifiers like uh-huh and ah-hah between our words or speak faster or slower. If you use them intentionally and appropriately in public speech and conversation, you can heighten your speech quality effectively which makes your audience fully understand the essence of your presentation.

H) Tips for Improving Public Speaking Skills

Require Skills	Definition
1. Self-confidence	It is an important aspect of personal development that comes from being well prepared. The following methods will help you to build your confident: <ul style="list-style-type: none"> ✓ First, do practice in front of mirror ✓ Then, present to family or friends and receive feedback ✓ Use the feedback for further improvement ✓ Never memorize a speech; if you forget, it will cause great confusion
2. Body-language	Body language generally includes Speaker’s Appearance and Voice such as grooming, dressing, posture and gestures which are important to impact on the audience because the audience notices the speaker’s body language at first before delivering the speech.

3. Personality	It is greatly influenced by posture, manner of standing, sitting and walking and positions of arms, legs, etc. and how to comfortably handle the thing which you carry in your hands.
4. Comfortable Posture	Deliver your speech by balancing your body weight on both feet and avoid the following: constantly shifting the weight from one foot to another that looks uncomfortable, putting your hands into your pockets and leaning on the table or podium. Practice a free and relax standing posture.
5. Eye Contact	Eye contact builds rapport with the audience. Move your eyes to as many people as possible for making brief eye contact but less than 2 seconds.
6. Movements	Avoid too much movement or walking around on the stage because it distracts audience attention.
7. Facial Expressions and Gestures	Naturally, while speaking, we make expressions and gestures; be friendly, pleasantly with cheerful face always to keep up the audience attention.
8. Volume and Pitch of Voice	Your voice tone, volume and pitch should suit the room and reach the audience to make them attentive to you.
9. Pace and Pause	Speak at a comfortable speed right pause or silence for making listeners to perceive important points.
10. Health	Maintain your good health that gives you energy to your body-language, voice and practice to build your confidence.
11. Practicing Delivery of a Speech	Your preparation gives you success in presentation so rehearse your speech naturally and comfortably and maintain the time as per the requirement.

Table 6: Tips for Improving Public Speaking Skills

V. METHODOLOGY

In order to execute the research, practical fieldwork is employed to analyse and review the way students understand the concept of paralinguistics and how they use it with words to share their ideas, thoughts, information and emotions and how they work in relation to:

1. **Sharing ideas, thoughts and information**
2. **Expressing emotions**
3. **Analyzation and Suggesting a better view**

Process Results: In the conduction of fieldwork on 40 pairs of first-year engineering students over a week-day period, they were asked for presenting information by the following activities: dialogue, monologue, story-telling and role-play. The facilitator tested the use of three approaches of language, body language and paralinguistics by monitoring each of the respondents while communicating with another person. After that, they were asked to identify and analyse the benefit of paralinguistics in expressing emotions and grade it as important, quite important or very important in each case. The study analysed the collected data and identified the importance and significance of paralinguistics. The findings draw the conclusion and the tailored data as presented in table 7. It shows how the different respondents presented their views on how emotions can be expressed and make the audience to fully understand the conversation or speech. The grade is presented on the scale of important (A), quite important (B) or very important (C).

Types of Work	Language			Body Language			Paralinguistics		
	A	B	C	A	B	C	A	B	C
1. Sharing ideas, thoughts and information	5	5	30	7	5	28	5	2	37
2. Expressing Emotions	12	13	15	10	10	20	5	2	37
3. Analyzation and Suggesting a better view	10	13	17	5	4	31	3	6	31

Table 7: Grade of Type of Work

Treatment of Results: Results reflect the relative strength and the relative importance of the different approaches to language sharing, information sharing and different methods of sharing ideas which are presented by the various respondents’s chosen options. The findings are classified according to the number of respondents chose an option conferring its sum the critical reviews are analysed. These analysation and reviews draw conclusions on whether the hypothesis is valid or not.

1. **Sharing Ideas:** While sharing ideas, most of the participants acknowledged that the imparting information was almost done with language. Thus, over 75% state that the language is very important to provide knowledge but in conversation and speech for fully understanding and enjoying that knowledge paralinguistics plays a vital role.
2. **Expression of Emotions:** Most of the participants specified that our action and voice tone reveals our emotions although they stated that language is an important tool to concede it. It proves that language, body language and paralinguistics are people's natural components and natural attitudes. They work together to convey knowledge, reveal emotions and express joy and happiness. Over 80% recognize that the paralinguistics to be very important and vital in making the audience fully understand and enjoy the speech and conversation. It was accepted unanimously.
3. **Analysation and Suggesting a Better View:** This session was quite complicated as the respondents were split in discussing whether the paralinguistics was important or not. Response of 50% said paralinguistics is important to express feelings and body language supports that. However, over 70% state that paralinguistics is very important in suggesting a better or improved view.

DISCUSSION

The facilitator introduced students to the real style of reading the English language which is as follows:

- ✓ Proper stress (individual word, phrase and clause in sentences)
- ✓ Accurate modulation (intonation: voice pitch, voice tone and the rhythm of speech)

Below one is a sample of the reading passage. Students were guided on how to make syllables to read it in original style with proper stress and accurate modulation i.e. understanding the stress of individual words, phrases and clauses in sentences. In addition, the following instructions were given to them to follow: half-second pause for single slash (/); and one-second pause for double slash (/ /).

To be a good teacher, / you need some of the skills of a good actor / such as / the ability to hold the attention and interest of the audience; / having a clear and strong pleasant voice to control over them well. // Listen carefully, / and you will hear the quality of voice, / pitch, / tone / and the rhythm of the speech changing according to / what the teacher is talking about. // Watch a good teacher / and you will see / that she or he does not sit motionless / before the class. // Teachers stand most of the time, / they walk about, / they use their arms, / hands and fingers to help in explanations, / and face to express feelings. //

Students exclaimed why we have to change our Indian style of reading and follow the American accent. The facilitator advised them, "You are not asked to follow others' accents but the real style/accents of reading English."

Suggestion and Conclusion: The study suggests that a high degree of emotions can be revealed through bodily actions and intonation that makes listeners feel more emotions and sentiments. Finally, the study concludes that the hypothesis is honoured and justified by proving a better view of "A matter is a matter that is persuasive in nature" here language, paralinguistics and body language all work together for making the speaker and the listener attain a reasonable communication. It highlights that in the form of exchange of information language is the main measure in almost all the scenarios and situations but non-verbal communication is used to express everything in concise terms.

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DESIGN AND FABRICATION OF ELECTRIC FORKLIFT

Jayesh Yadav¹, Manish Vishwakarma², Siddiqui Mohd Shakir³, Sanoj Yadav⁴ and Iqbal Mansuri⁵
^{1, 2, 3, 4}Student, ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar- 401501

ABSTRACT

In today life there is wide of forklifts variety of forklifts from the large heavy loadings trucks to the one that works among narrow aisles forklifts have becomes one of basics transportation tools we use in our lives with all the forklifts in existence we find that there are some improvement that can be to bring forklifts to the better performance. We describe forklift powered by an electric motor instead of the IC engine using rechargeable batteries the main objective of this project is to design electrically powered forklift for material handling in industrial warehouses and workshops. Nowadays in industries, the forklift operates on an IC engine for transportation and hydraulic system for lifting and lowering of materials. Due to this mode of operation, there are many adverse environmental impacts such as emission of carbon dioxide and leakage of hydraulic fluid. Thus, this project aim to making the electric system into a forklift to make it electrically powered which lift to 1 ton kg and elevate up to 8 feet.

Keyword: Forklift, Heavy Loads, Transportation, I.C engine, Industrial Warehouse, Environment, Electrically Powered.

I. INTRODUCTION

In general the forklift can be defined as a tool capable of lifting hundreds of kilograms. A forklift is a vehicle similar to a small truck that has two metal forks on the front used to lift cargo. The forklift operator drives the forklift forward until the forks push under the cargo, and can then lift the cargo several feet in the air by operating the forks. The forks, also known as blades or tines, are usually made out of steel and can lift up to a few tons. Forklifts are either powered by gasoline, propane, or electricity. Electric forklifts rely on batteries to operate. Gasoline or propane forklifts are sometimes stronger or faster than electric forklifts, but they are more difficult to maintain, and fuel can be costly. Electric forklifts are great for warehouse use because they do not give off noxious fumes like gas powered machines do. Forklifts are most often used in warehouses, but some are meant to be used outdoors. The vast majority of rough terrain forklifts operate on gasoline, but some use diesel or natural gas. Rough terrain forklifts have the highest lifting capacity of all forklifts and heavy duty tires (like those found on trucks), making it possible to drive them on uneven surfaces outdoors. Forklifts have revolutionized warehouse work. They made it possible for one person to move thousands of pounds at once. Well-maintained and safely operated forklifts make lifting and transporting cargo infinitely easier. This is the general description of a normal forklift truck. To enhances the technology further, this prototype module is constructed with remote technology, there by the operator can walk along with the forklift for better visibility & the container can be placed accurately (precision position). This increases the safety of the operator.

II. LITERATURE REVIEW**A. Battery Operated Forklift Vehicle.**

Dr.V.R.Gandhewar¹, Kalyani R. Bhokare², Chirag D. Pande³, Vaibhav G. Mali⁴, Ganesh V. Badaki⁵ Assistant Professor¹, BE Student ^{2, 3, 4, 5} Department of Mechanical Jawaharlal Darda Institute of Engineering and Technology, Yavatmal, Maharashtra, India.

A forklift truck is a powered industrial truck used to lift and transport. This vehicle is self-drive by the used of battery power and the lifting mechanism is also runs on battery power with the help of lead screw mechanism. There are already many types of forklift conveyer available since ancient time. But our aim is to design forklift conveyer pollution free by using battery and more efficient lifting by using lead screw The project work "Battery operated forklift" is aimed to control through lead screw. The main advantage of using this technology is to increase the safety of operator by operating the forklift from certain distance. This increases the efficiency of the productivity, because human errors due to the poor visibility can be minimized.

B. Design and Analysis of Mechanical Forklift

Khebude Karan N*, (B.E, Dept. of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala, MH, India

The Design Calculations of Fork are compared with Structural Analysis Report. The Lifting of Fork makes the Deformation and bending of fork. Due to selection of forklift material as mild steel it has increased the

advantages of design due to its high specific stiffness and strength By Using the Mild Steel Material for the Fork the Deformation is minimum. The Results shows Mild steel is Strong wear resistance & Impact strength. The theoretical calculations are safe as it has compared with ANSYS Results.

C. The Travelling of Forklift in Warehouse

Dr.R.N.Mall (2013), Automated Guided Vehicle, ISBN 2091 Journal, MMMEC, Gorakhpur.

In the warehouses forklifts are the most expensive machines. The study pays special attention to the travelling of these machines. Factories, industries and storage go downs need forklifts and cranes for storage and moving large goods. Also there are a number of goods weighing around 40 – 60 kg that are comparatively lighter but cannot be moved around in market there are several types of forklifts are used in warehouses. These forklifts are either powered by gasoline, propane or electricity but they are more difficult to maintain and fuel can be costly which takes more space. To overcome this entire problem we designed and fabricate the three wheel forklift which drives on electric power and loading & unloading is done by hydraulic jack through forks. In general, there are a lot of activities in traditional warehouses.

D. Construction of Battery Operated Forklift

Krunal R. Dhivar Lecturer Department of Mechanical Engineering L.I.T. Sarigam, Valsad, India

Today all heavy engineering company uses Forklifts. Widespread use of the forklift truck had revolutionized warehousing practices before the middle of the 20th century. A mixture of material handling systems is in the use, exact from that entirely physical to the ones that are semi-automatic but manually controlled. Forklifts have revolutionized warehouse work. They made it possible for one person to move thousands of pounds at once. The project work “Battery operated forklift” is aimed to control through wired communication. The main advantage of using this technology is to increase the safety of operator by operating the forklift from certain distance. This increases the efficiency of the productivity, because human errors due to the poor visibility can be minimized. The system is designed and developed successfully, for the demonstration purpose prototype model (mini model) is constructed. Most of all human safety is a major concern’s by using a remote controlled forklift.

E. Design of Electric Forklift used in Small industrial Warehouses and Workshops

Prof. Suryavanshi Amol V Faculty of Department of Mechanical Engineering, PCCOE Savitribai Phule Pune University Nowadays in industries, the forklift operates on an IC engine for transportation and hydraulic system for lifting and lowering of materials. Due to this mode of operation, there are many adverse environmental impacts such as emission of carbon dioxide and leakage of hydraulic fluid. integrate the electric system into a forklift truck to make it electrically powered The main boon of using the technology is to reduce the impact of fuel-based forklift also it lessons human efforts and their misconceptions. It’s not only user friendly but also environment friendly. It is highly affordable at a lower cost.

III. PROBLEM STATEMENT

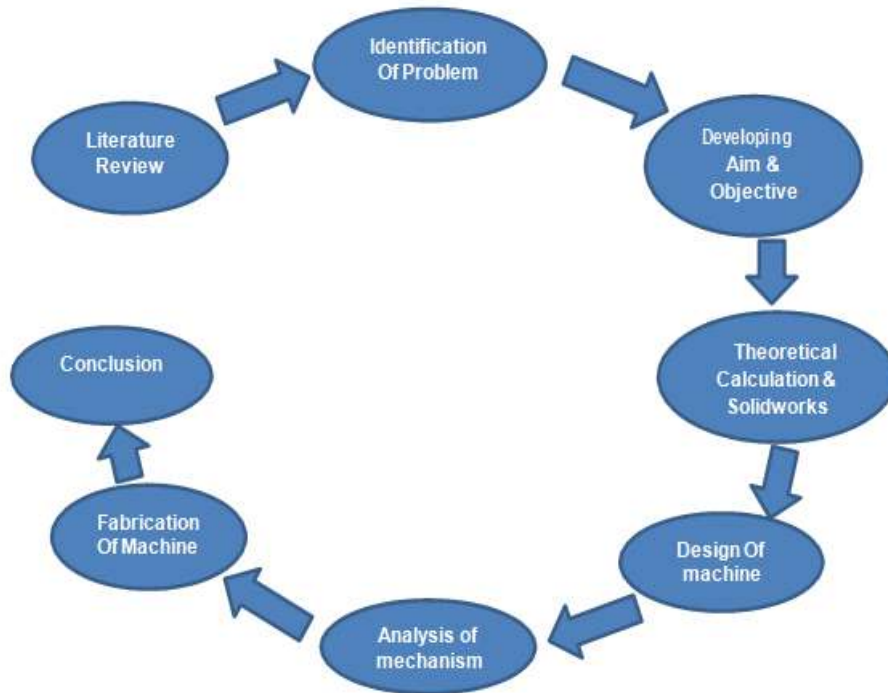
- Small scale industries having major problem related to cost of material handling system.
- In markets forklift’s lifting mechanism is function on hydraulics, chain and screw based which is suitable for small loads.
- Forklifts are either powered by gasoline, propane or electricity but they are more difficult to maintain and fuel can be costly which takes more space.
- Failure of any technology part.
- Electric forklift are not as affordable as LPG, gas, or diesel equipment.
- Charging electric forklift batteries can be tricky for multi-shift operation.
- Forgetting to charge the battery overnight can result in significant productivity losses the next day.
- Battery chargers have certain voltage requirements and the existing electrical service must meet those.

VI. OBJECTIVE

In this project we investigate a forklift design that is new and different from existing design. The new design offers two features, the forklift’s Lifting Mechanism. i.e. Pulley Mechanism which Working of Compound Pulley and 4 ropes Distributes the load and Divide Total Load by Four. So the effective Load on motor will be four time less than actual load of object. The other feature is that the Better Integrated Body design. Which Provide more balance and smooth sliding mechanism and wide Wheels provide more stability.

V. RESEARCH AND METHODOLOGY

Although designs vary, the method followed for Project is:



VI. Design of Equipment And Drawing Components

Fabrication of Forklift is consists of the Following components to full fill the requirements of Complete operation of themachine.

1. Ac Motor
2. Lifting Fork
3. Guide Column
4. Inner Column
5. Compound Pulley
6. Wire Rope
7. Bearings
8. Caster wheels
9. Limiter

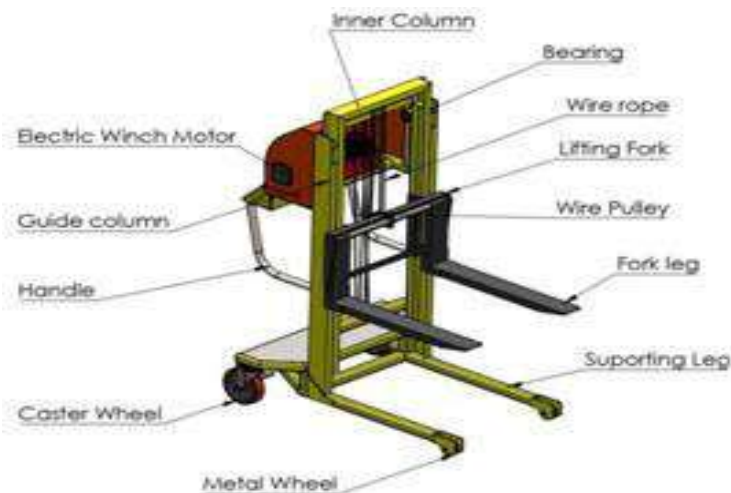


Fig: Electric Forklift

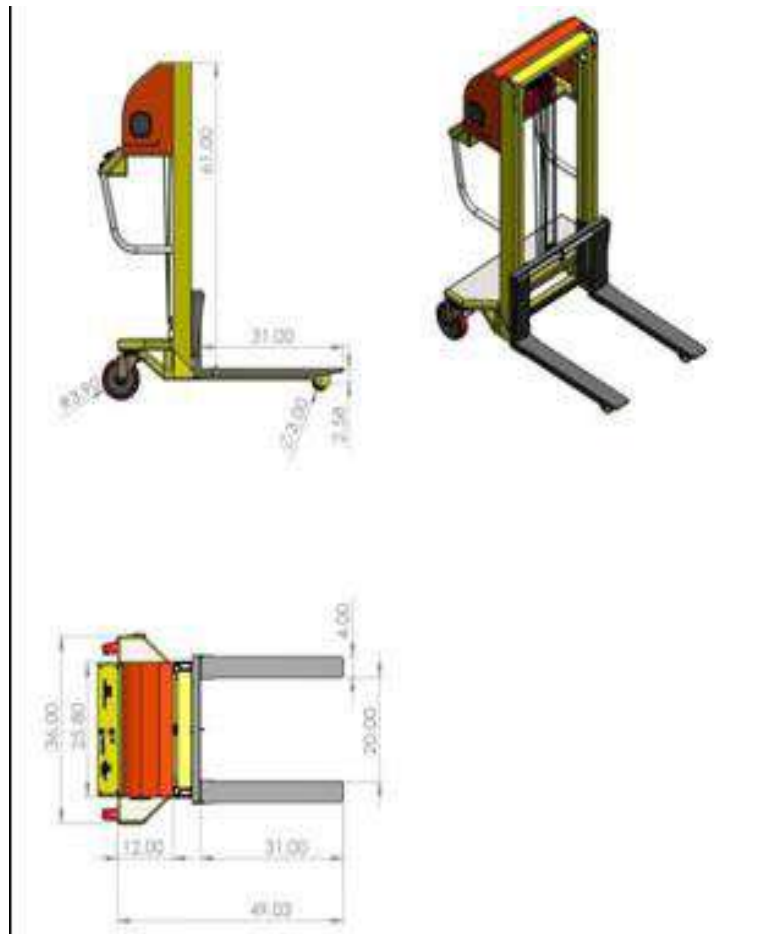


Fig: Solidworks Design

VII. WORKING PRINCIPLE

Forklift works on electrically powered hoist. The lifting mechanism consist of a compound pulley system combines a fixed pulley with a movable pulley (attached to the load). The mechanical advantage can be greater than with only fixed pulleys. With four wheels, the mass is supported by four strands of rope. This configuration gives a mechanical advantage of four, and it is possible to lift the load with one-quarter of the force of the load.

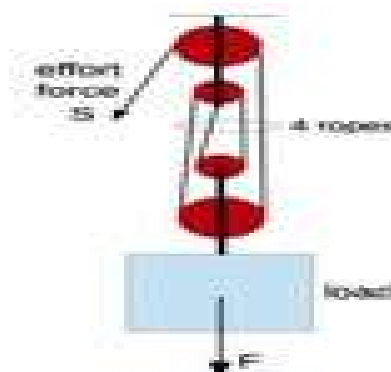


Fig: Compound pulley

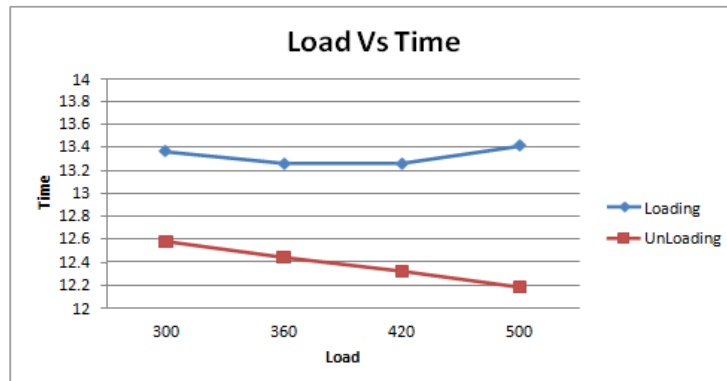
Forklift can raise pallets over five ft and can raise them over 8 ft for placement on shelves. Unlike a pallet truck, simply use the control stick to effortlessly raise and lower heavy loads. Capacity of up to 1ton. Forks adjust from 9 to 28 inches, allowing them to accommodate different pallet sizes And a 180° steering arc and 58" turning radius makes them ideal for use in smaller warehouses and loading docks. The back wheels are 6 inch extra wide and provide extra stability to the load and keeps the operator safe and the emergency shut off switch provides additional safety by powering off the machine controls.

VIII. RESULT

Load test upto 600kg for 2.5 feet was done successfully. The tests main objective was to observe time delay for loading and unloading after the Appling of various loads. Below are the test readings for various loads.

Table 1: Results

Load	Height	Loading Time (Sec)	Unloading Time(sec)
300	2.5	13.36	12.58
360	2.5	13.26	12.43
420	2.5	13.26	12.32
500	2.5	13.41	12.18



Graph 1: Load Vs Time

IX. CONCLUSION

The main boon of using the technology is to reduce the impact of fuel-based forklift also it lessens human efforts and their misconceptions. It’s not only user friendly but also environment friendly. It is highly affordable at a lower cost. The project carried out by us made an impressive task in the field of production and manufacturing industries. this project will reduce the cost involved in the concern. Project has been designed to perform the entire requirement task at the shortest time available.

X. FUTURE SCOPE

This project can be further also modified as rechargeable Battery Operated Hoist instead of Ac Supply and automated driver system can be installed instead of manual handling. For the safety precaution we can add lock in mechanism in case electric hoist won’t stop or rope breaks then lock in mechanism suddenly stop the forklift.

XI. REFERENCES

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REMOTE CONTROLLED ROVER USING ROCKER BOGIE MECHANISM**Nilesh Badgujar¹, Mohit Mahale², Shreya Dani³, Tribhuvan Bharati⁴ and Iqbal Mansuri⁵**^{1,2,3,4}Student, ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar 401501**ABSTRACT**

The rocker-bogie suspension system has robust capabilities to deal with uneven terrain because of its distributing the payload over its six wheels uniformly. Most of the cover designs have been developed for Mars and Moon surface in order to understand the geological history of the soil and rocks. Exploration operations need high speed and long distance traversal in a short mission period due to environmental effects, climate and communication restrictions. In this research, a new suspension mechanism has been designed and its kinematic analysis results were discussed. One of the major shortcomings of current Rocker-Bogie rovers is that they are slow. In our project, we have focused on six-wheeled rocker bogie suspension system design which has advantage of linear bogie motion in protecting the whole system from getting rollovers during high-speed operations. This has greatly increased the reliability of structure on rough terrains and also enables its higher speed exploration with same obstacle height capacity as twice the diameter of wheel. The project aims to improve some basic working so that it can perform in a better way.

I. INTRODUCTION

The rocker-bogie suspension system was initially used for the Mars Rover and is currently NASA's preferred design for rover wheel suspension. The perfectly designed wheel suspension allows the vehicle to travel over very uneven or rough terrain and even proceed over obstacles. This rocker suspension is a type of mechanism that allows a six-wheel vehicle to constantly keep all six wheels in contact with a surface when driving on uneven terrain surfaces. The rocker bogie mechanism describes a method of driving a rover so that it can progressively step over most obstacles rather than impacting and climbing over them. Most of the benefits of this method can be achieved without mechanical modification to the same designs – only a change in control structure. Some machine changes are suggested to gather the maximum profit and to greatly increase the effective speed of future rovers. The rocker bogie mechanism is one of the most popular suspension mechanisms, which was initially designed for space travel vehicles having its own deep history embedded in its development.

II. PROBLEM DEFINITION

The Rocker-Bogie Mobility System was designed to be used at slow speeds. It is capable of overcoming obstacles that are on the order of size of a wheel and also use for surveillance. However, when surmounting a sizeable obstacle, the vehicle's motion effectively stops while the front wheel climbs the obstacle. The rocker-bogie suspension system has robust capabilities to deal with uneven terrain because of its distributing of the payload over its six wheels uniformly, while there is one major shortcoming to high-speed traversal over the planar terrain. Here we aim to overcome the above mentioned issues.

III. LITERATURE SURVEY

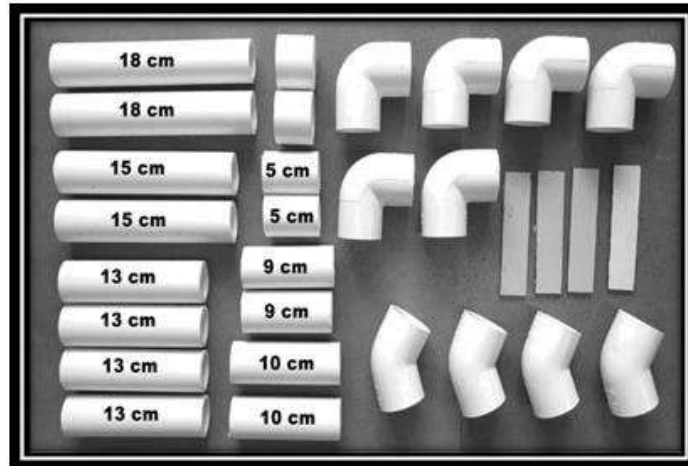
- 1) Para Bimal Saraiya "Design of Rocker Bogie Mechanism" The proposed modification increases in the stability margin and proved with valuable and profitable contrasting the SSF metric with the 3D model simulations done on AUTOCAD. Study of the existing models of rocker bogie suspension enabled rovers and tried to manufacture a similar kind with the material available.
- 2) Roshan Sharma, Rajesh Jaiswal, Ankit Yadav, Subash Roy "Design and Fabrication of Rocker Bogie Mechanism Automated Combat Rover" The proposed paper presents a special design in seeking after of developing the rocker-bogie portability framework in customary overwhelming stacking vehicle conduct while high-pace traversal is required and to expand the battery effectiveness and working time of the Rover, which become made achievable these of the autonomous directional control machine which utilizes least power modules organized upon the working condition and circumstance.
- 3) Rajat Murambikar, Vinay Omase, Vivek Nayak, Karan Patil, Prof. Yogesh Mahulkar "Design and Fabrication of Rocker Bogie Mechanism using Solar Energy" Infused solar energy generation, sun tracking and design characteristics to create a modern, more updated and less sophisticated version of Rocker Bogie Rover. Tested its abilities and finally reviewed and updated calculations.
- 4) Abhisek Verma, Chandrajeet, Yadav, Bandana, Singh, Arpit, Gupta, Jaya, Mishra, Abhishek Saxena "Design of Rocker-Bogie Mechanism". The proposed paper produces a novel design in pursue of increasing the rocker-

bogie mobility system in conventional heavy loading vehicle behaviour when high-speed traversal is required. The proposed modification increases in the stability margin and proved with valuable and profitable contrasting with the 3D model simulations done in SOLIDWORKS.

IV. COMPONENTS OF ROVER

A. PVC Pipe

PVC Pipe is shown in fig.1 This Pipe have adequate strength, durability, easy installation, and low cost forming the body of rover.



B. Wheels

Wheels is shown in fig.2 This Wheel having Diameter 7 mm.



C. Motor

Motor is shown in fig.3. This is Geared DC Motor Having 100 RPM working on 12V Supply.

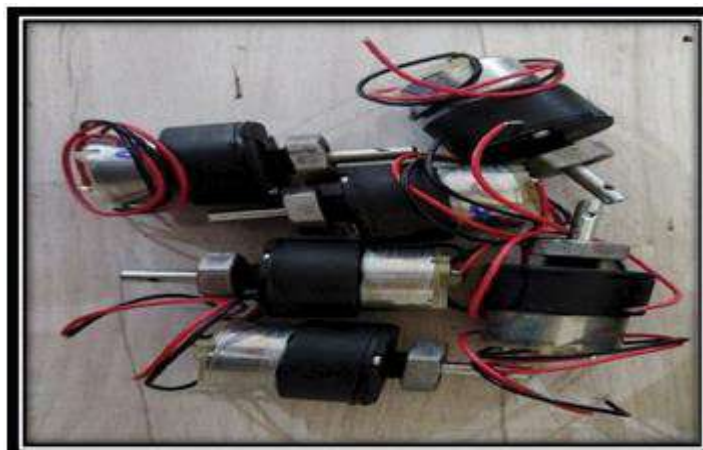


Fig.3

D. ESP 32 Cam Board WithCamera module-

ESP32 Cam Board Shown in Fig.4, Thisboard contain the ESP32 Cam module with it.

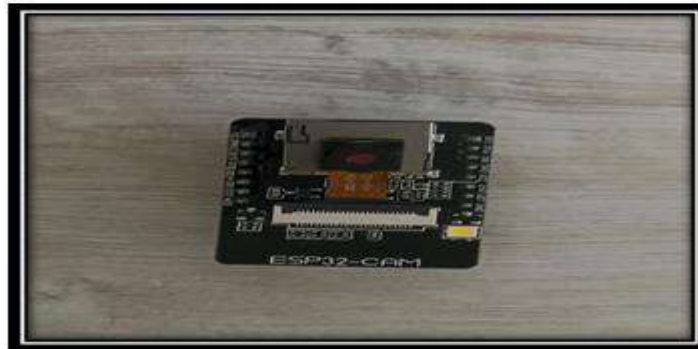


Fig. 2

E. AMS 1117

AMS 1117 shown in fig.5. this module use to convert the 12V voltage into 5V voltage for camera.

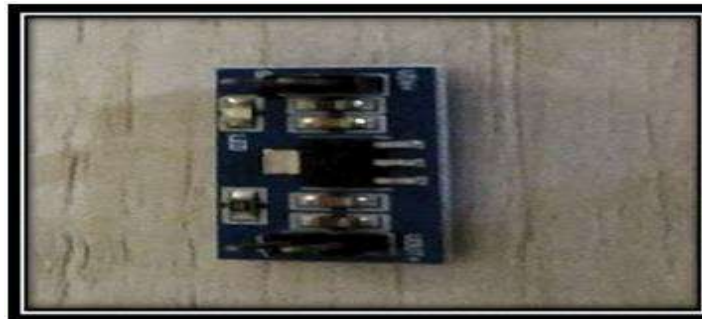


Fig. 3

F. Motor Driver

Motor Driver shown in fig.6, This is L293D Motor driver use to drive the six wheel motors of the rover.

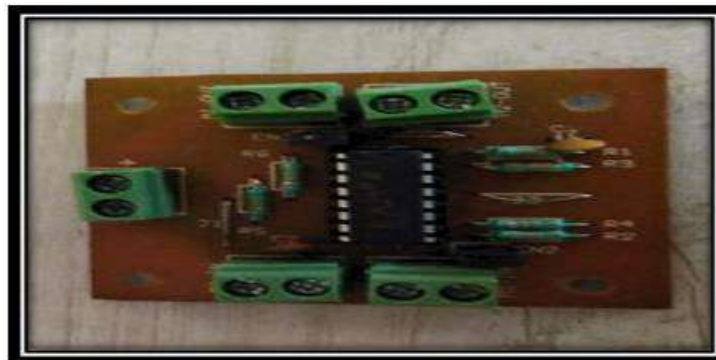


Fig. 4

G. Battery Pack

Battery is shown in Fig.7; This is 12V volt Rechargeable Battery Pack use for rover.

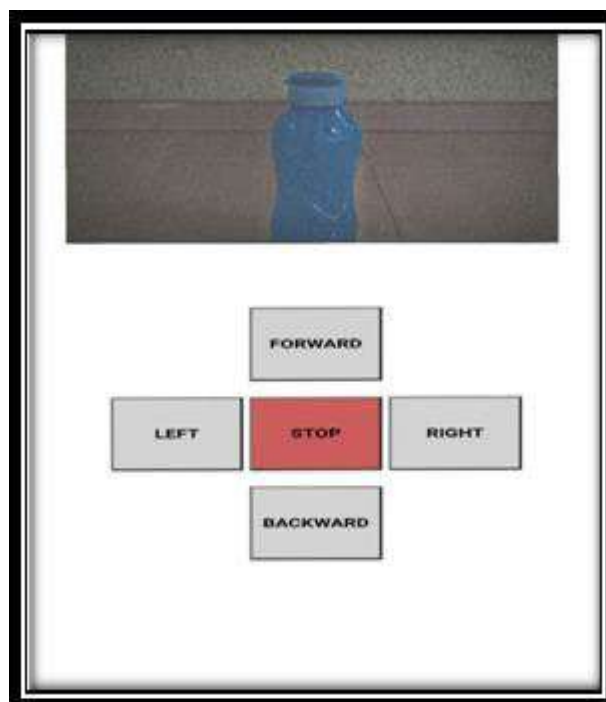
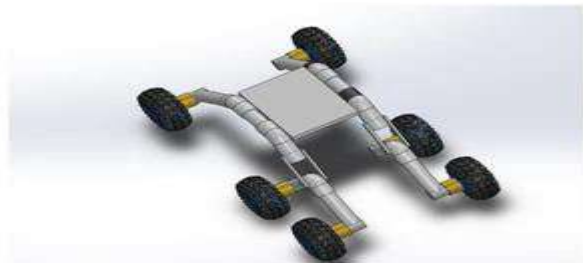
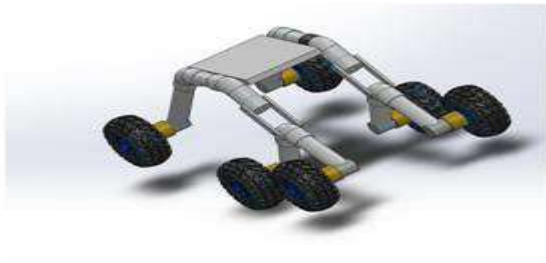


Fig. 5

V. METHODOLOGY

- 1) The system uses ESP32 Cam Board as the microcontroller.
- 2) The main reason behind selecting this microcontroller is it has inbuilt Wi-Fi which makes it suitable for IoT remote control and monitoring applications.
- 3) It also has a camera slot and an ESP32 camera can be used on the rover.
- 4) The rover uses L293D Motor Driver for driving all the motors connected to the rover
- 5) Rocker Bogie type of suspension is used in the system so that the rover can be operated on off roads or more specifically it can be operated on any type of land.
- 6) Blynk app is used for remote controlling of the robot as well as the camera video streaming from the robot can also be seen in the same app
- 7) Since the Rover are connected to an app hence the rover can be controlled from app easily in less time and high efficiency.

VI. Design of Rover



VII. RESULT

Testing the distance of controlling the rover through ESPCAM32 Cam Board is done 6 times by controlling the rover at a certain distance, whether ESPCAM32 Cam Board can accept the command or not. The test results can be seen in Table 1

Testing Rover Connection

No.	Testing	Distance	Status	Visuals
1.	Testing 1	1m – 3m	Connected	Clear
2.	Testing 2	4m – 6m	Connected	Clear
3.	Testing 3	7m – 9m	Connected	Clear
4.	Testing 4	10m – 12m	Connected	Clear
5.	Testing 5	13m – 15m	Connected	Clear
6.	Testing 6	Above 15m	Disconnected	Distort (Disconnect)

The test results in Table 1 can be concluded that the control distance from the surveillance rover can only be controlled with a maximum distance of 15 meters, if the control is carried out at a distance of more than 15 meters, the monitoring robot cannot run because the connection between the android smartphone and ESP32Cam Board has been lost. ESP32CamBoard testing is the basis for controlling rover. If the ESP32Cam Board has been successfully used, the next step is testing the IP camera on Rover.

Testing ESP32 Cam Connection

No.	Command	Successful	Failed	Percentage of Success
1.	Rover Connection	9	1	90%
2.	Cam Connection	10	0	100%
3.	Move Forward	10	0	100%
4.	Move Backward	10	0	100%
5.	Turn Left	10	0	100%
6.	Turn Right	10	0	100%
7.	Stop	10	0	100%

Overall testing of the system is carried out 10 times per instruction on Rover to ensure that rover can function as it should. The rover is used to perform all of its functions in accordance with the commands on the web browser that is packed on android app. Table 2 shows the results of overall system testing conducted by rover.

VIII. Technical Detail of Rover

- 1) Total Length of Rover = 540 mm
- 2) Total Width of Rover = 330 mm
- 3) Total height of Rover = 210 mm Weight of Rover = 2.09 kg

IX. FUTURE SCOPE

- 1) This system can be configured to work on protocol other than Wi-fi.
- 2) Other Mechanism for application Can be added in the system
 - a) SPY Operation
 - b) Rescue Operation
 - c) Surveillance Operation
- 3) Sensors can be incorporated in order to monitor an area under observation.

X. CONCLUSION

The proposed paper produces a novel design in pursue of increasing the rocker-bogie mobility system in conventional heavy loading vehicle behavior when high-speed traversal is required. The proposed modification increases in the stability margin and proved with valuable and profitable contrasting with the 3D model simulations done in SOLIDWORKS. In future, if the system installed in heavy vehicles and conventional off road vehicles, it will definitely decrease the complexity as well as power requirements to retain bumping within it. Future scopes of Rocker Bogie Mechanism are in military operations as a weapon carrier & for locating coal deposits in coal mines.

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DESIGN AND FABRICATION OF DYNAMIC WHEELCHAIR

Rhulik K. Patil¹, Shreetej R. Mhatre², Krutik M. Naik³, Tanvesh R. Naik⁴ and Md Saqib Ansari⁵^{1,2,3,4}Students and ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar- 401501**ABSTRACT**

The research proposes a solution to implement the purpose of this project was to manufacture the multipurpose wheelchair in low cost which promote mobility and enhance the quality of life for the people who have difficulties in walking. This product make the users to lift the patient directly from the bed which help to reduce the pressure injuries. Along with the reducing the cost of product, we also aim to minimizing the pressure injuries and fall. Other specialty of the multipurpose wheelchair is, we can use it on indoor as well outdoor. Then after the completion of project we have successfully achieved what we set out to bring in wheelchair. We made a better multipurpose wheel chair with all safety measures, low cost and high quality. It provide a safe transferring of patients from one place to another place. The procedure that is used for transferring patients is very simple and unique

Keywords: Patient, Wheelchair, Multipurpose wheelchair, Smart Wheel chair

I. INTRODUCTION

A wheelchair is a chair with wheels, used when walking is difficult or impossible due to illness, injury, problems related to old age, or disability. These can include spinal cord injuries (paraplegia, hemiplegia, and quadriplegia), cerebral palsy, brain injury, osteogenesis imperfecta, motor neurone disease, multiple sclerosis, muscular dystrophy, spina bifida, and more.

Wheelchairs come in a wide variety of formats to meet the specific needs of their users. They may include specialized seating adaptations, individualized controls, and may be specific to particular activities, as seen with sports wheelchairs and beach wheelchairs. The most widely recognized distinction is between motorized wheelchairs, where propulsion is provided by batteries and electric motors, and manual wheelchairs, where the propulsive force is provided either by the wheelchair user/occupant pushing the wheelchair by hand ("self-propelled"), by an attendant pushing from the rear using the handle(s), or by an attendant pushing from the side use a handle attachment. A wheelchair assists people to become more mobile and independent. There are many different types of wheelchairs that are used for various reasons. It is important to understand the limitations and safe operation of whatever wheelchair you choose.

A wheelchair is the catalyst to increased independence and social integration, but it is not an end in itself. Studies have shown that assistive technologies including wheelchairs, when appropriate to the user and the user's environment, have a significant impact on the level of participation which people with disabilities are able to achieve and when provided through a supportive service have been reported to reduce the time and physical burden for caregivers. The use of mobility devices, in particular, creates opportunities for education and work, and contributes to improved health and quality of life but may also have an impact on the prevention of falls, injuries, further impairments and premature death. Investment in provision of mobility devices can reduce health-care costs and economic vulnerability, and increase productivity and quality of life.

II. LITERATURE SURVEY

Akhil C, Muhammed Irfan Et.Al. (2021). Even if there is highly advanced equipments, it is highly expensive beyond common patients can't afford. So we have come up electrical and manual wheelchair available in the international market. The wheelchair will make shifting of patients to a far better way. [1]

R.Hari Krishnan Et.Al. (2019) .The study was Based on the conceptual design, a manual and a powered self-transfer device have been developed that can be used as an attachment to a manual and powered wheelchair respectively. [2]

Kedar Sukerkar, Darshitkumar Suratwala, Et.Al. (2018).There are several issues faced by the manufacturers and researchers which needs to be addressed so that, smart wheelchair becomes a commercial success and be widely used. Smart wheelchairs have great scope in future and technological advancement in the field of robotics and sensors will lead to commercial success as well. [3]

Ninad M. Borkar, Saurabh A. Apte, et.al. (2016). The study was intended to develop a concept of wheelchair convertible stretcher with the motivation of saving space and prevent exertion of patient as well as by making sure that the patient does not get hurt. Our study shows that it is possible to save 50% space by using wheelchair convertible stretcher rather than using wheelchair and stretcher separately. [4]

III.METHODOLOGY

Wheelchair is a device which can empower and enable a person with a disability to live a normal and independent life.Over the years wheelchairs have evolved rapidly from the manual wheelchairs to the powered wheelchairs.But still these wheelchairs have not been able to satisfy the needs of the disabled people.It is therefore critical that the problems of disabled be understood and accordingly wheelchairs are developed fulfilling their needs. Designing of Dynamic wheelchair This design phase included brainstorming, concept sketches and computer models. By categorizing and investigating different mechanisms used for height adjustment and patient transfer, a design matrix was created.Design concepts were selected based on the design matrix.

Height Adjustment Mechanism

The lifting system is comprised of three primary components. The most important part is the “lifting force”, which provides the main strength in height adjustment. Two kinds of lifting mechanisms were investigated in this research, the scissor jack and Screw jack. But use of scissor jack couldn't fulfil the requirement so Screw jack was selected.The second primary component is the operation interface. Different control methods were considered for the different lifting methods and the third component is a stability for safety.

Transfer Mechanism

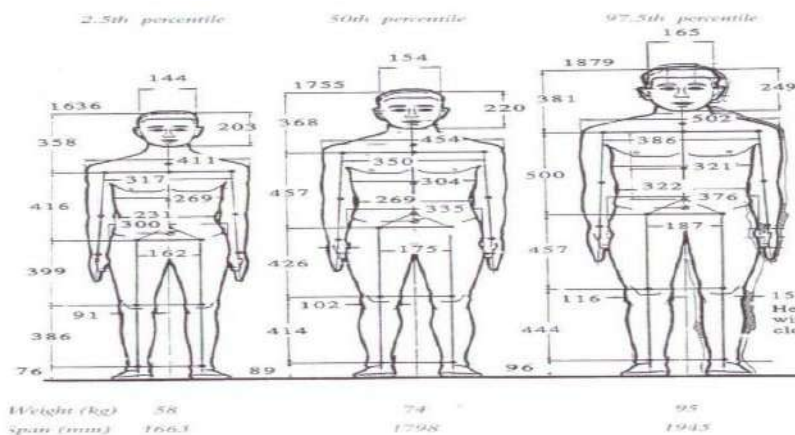
A simple mechanism is used it seems to be a normal wheelchair, but seat and the backrest are divided in two parts from centre as shown in fig. The forearm rest is pivoted at vertical member consisting of height adjustable mechanism, providing 90° of movement by each part.ts unique design helps patient to do their daily routine work like bathing, washroom etc.

Patient Transferring

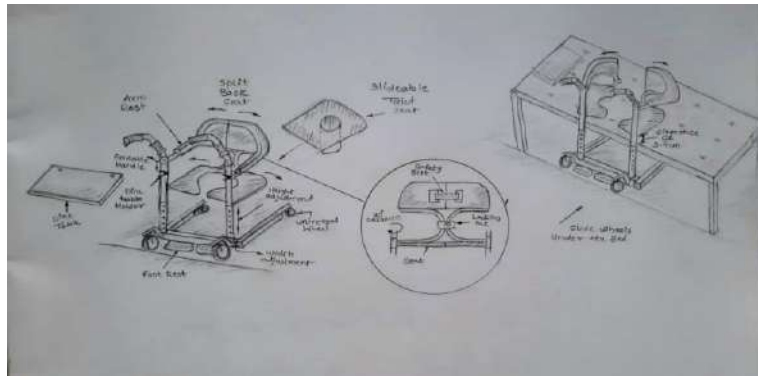
Patient resting on bed need to mobilise with care without pressure injuries and also with less effort application by care taker. Here comes Dynamic Wheelchair, patient is made to be seated on bed then wheelchair is placed next to bed as its secondary wheels rolls beneath the and seat on the bed with opened in opposite direction creating angle of 180° Then patient is slightly lifted and both seat are pushed under the patient and are locked provided on the back of wheelchair with a safety belt. The patient is successfully transferred from bed to wheelchair without any trouble also with less effort applied by care taker. And patient is ready to mobilise.

Study of Ergonomics

Ergonomics is about ensuring a good fit between people, the things they do, the objects they use and the environments in which they work, travel and play. Human factors (or human factors engineering) are an alternative term for ergonomics. Ergonomics needs to be considered in the design of any product, system or environment. Failure to do so may lead to designs which do not fit the physical, psychological or sociological needs of the users, leading to ineffective, inefficient or unsafe designs, which are unlikely to be commercially successful.The human sciences of psychology, anatomy and physiology provide information about the abilities and limitations of people, and the wide differences that exist between individuals. People vary in many ways: body size and shape, strength, mobility, sensory acuity, cognition, experience, training, culture, emotions, etc. Ergonomics are trained in analytical techniques, which will consider user characteristics and individual differences to the full extent in the design process. Good designers shall consider the people who will use the products, systems and environments they design, but they also have many other factors to consider. Often, it was due to commercial or percentile of population meant that ergonomics principles are compromised or not given adequate priority. Figures (a) to (d) are the body dimensions to different percentile for men and women. (Dreyfuss, 1967).

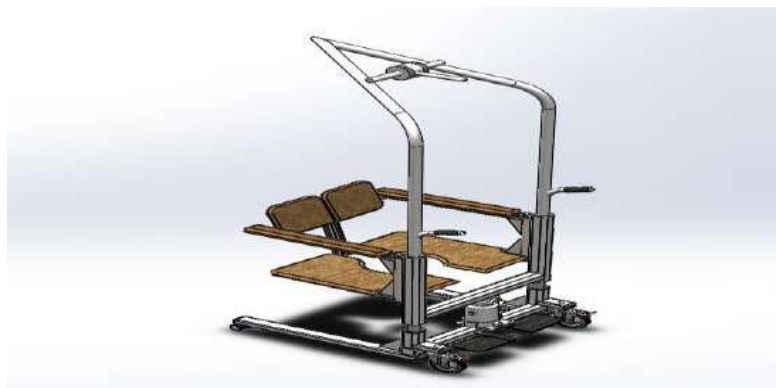


Ergonomic Evaluation Male (A)



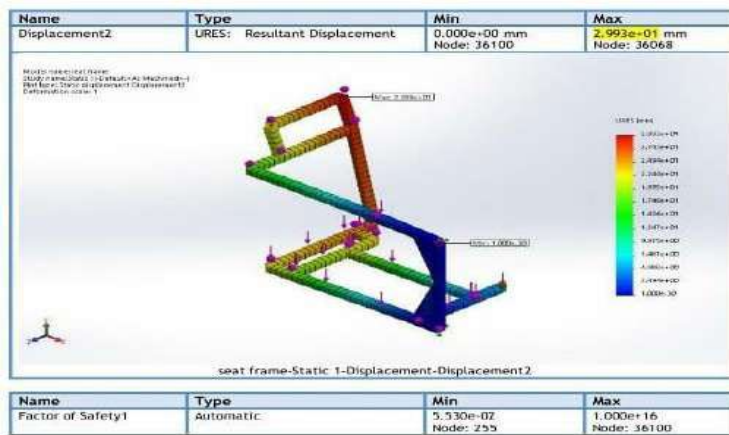
Conceptual Drawing

Design Software -Solid Works

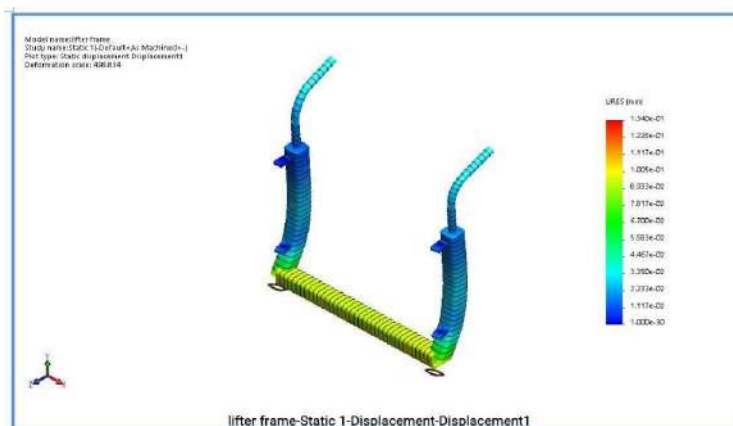


Wheelchair with Overhanging Mechanism

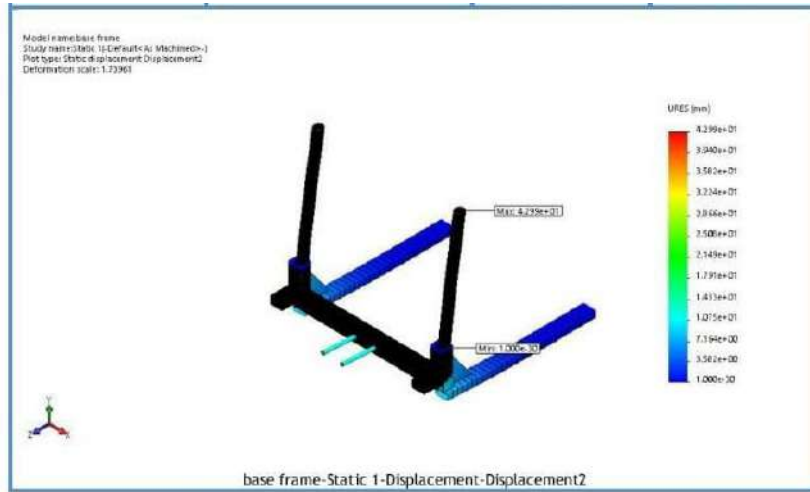
Stress Strain Analysis software -Solid Works Simulation



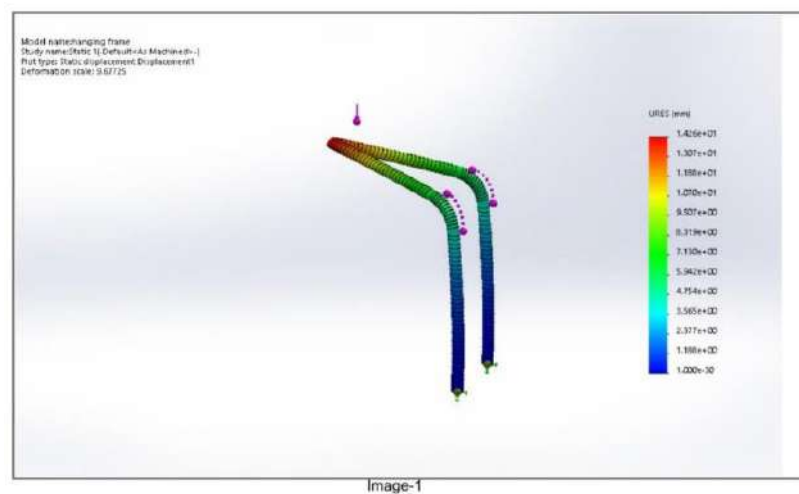
Seat Frame Analysis



Lifter Frame Analysis



Base frame Analysis



Overhanging Frame Analysis

IV. RESULT & OBSERVATION

From this project, we designed and fabricated a dynamic wheelchair for the shifting of patients from bed with an affordable amount that will be more suitable in the Indian scenario. Analysis were done on wheelchair through both theoretically and practically. The theoretical analysis as done on Solidworks simulation .Maximum principal stress and maximum shear stress were obtained from Analysis report .The maximum stress was found to be 5.022e+08 N/m² and minimum of 0.000 N/m² . The factor of safety was obtained as 1 .According to maximum strain analysis it was found that a maximum strain of 6.425e-03 and minimum of 0.000. When the deformation was analyzed a distance of 4.299 mm displacement were found. During practical analysis 110 kg weight were loaded and lifted by Dynamic wheelchair. The cost of multipurpose wheelchair is 9000, it is very low comparing to the electrical and manual wheelchair available in the international market

Sr. No.	Parameters	Standard Manual wheelchair	Our Dynamic Wheelchair
1	Weight Capacity (kg)	Up to 100	Up to 130
2	Total Weight of Wheelchair	18	20.5
2	Length (cm)	76	60
3	Width (cm)	80	74
4	Seat Width (cm)	45	48
5	Height (cm)	76	75
6	Height With Overhanging Mechanism (cm)	No	171
7	Transferring Mechanism	No	Yes
8	Lifting Mechanism	No	Yes
9	Height Adjustment mechanism	No	Yes

10	Commode activity	Yes	Yes
11	Flexibility	Foldable	Detachable & Semi Rigid
12	Costing (Rs)	9990	9000

V. CONCLUSION

Caregiver shall be ensuring that the safety precaution is implement before or during transferring the disabled person from wheelchair to bed or vice versa. It is very dangerous to transfer disabled person without implement the safety precaution, as the accident may be occur. In the worse scenario, disabled people may fall down from the bed or wheelchair. Applied safety lock and canvas, it will be reduce the hazard to minimize level. From time to time, the caregiver shall perform self-inspection.

Our designed wheelchair can reduce handling process if compared to conventional wheelchair. Directly, it can be minimize the pain generate on the under arm due to improper handling by caregiver. At same time, it makes the job much easier for caregiver. He or she might not complaint about their back problem. This will be made the caregiver job more attractive and easy. As the population of elderly increase fast, this will be definitely increasing the caregiver demand. Though our project is less expensive, it does not compromise with the service provided by the conventional equipment. This equipment can be easily portable and can be used in the hospitals, old age homes as well as in houses. With the aid of my designed wheelchair, these shall be no problem of hardly to find people to serve this professional job. In short, the objectives for this research project are meet.

VI. FUTURE SCOPE

The Dynamic wheelchair must be available and affordable and be maintainable and sustainable in the country of use. This is not always easy, because wheelchair users are a diverse group with different requirements and environmental and socioeconomic. Stainless steel or Aluminium Material for making wheelchair can used for overall reduction in weight of chair. Screw nut mechanism or worm and worm wheel mechanism with screw nut mechanism can be used to raised the height of the wheelchair. But maintenance will be required on the regular basis as there will be more moving parts will be included. Portable

Commode bowls can be provided for rural areas where commode are not preferred. Electric operating overhanging system can be used for lifting the patient, but periodically charging would be required for batteries.

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DESIGN AND FABRICATION OF COMPOSTMACHINE

Mohan Bangar¹, Sushil Yadav², Pranav Ghone³, Noman Ansari⁴ and Md. Saqib Ansari⁵^{1,2,3,4}Student and ⁵Assistant Professor, Department of Mechanical Engineering, Theem College Of Engineering, Boisar- 401501**ABSTRACT**

Organic waste and Food waste is a worldwide problem, is cost to be disposed and nothing is gained from it on the contrary, it causes the fission of harmful gas such as methane. Vegetable waste with high moisture content and readily biodegradable nature is causing major environmental problems due to improper waste management practices The Design and Fabrication of Compost Machine in India. So, composting could be considered the best alternative for the treatment of these organic fractions. Composting has proven to be a valid solution to this problem. The objectives of this project are to design a composting machine with certain parameters for the design, Process time, and easy, odourless and power saving. The designed food waste decomposition system is designed for rapid composting performance. It can be used for households, restaurants, hotels, schools, apartment buildings, communities, offices and cafeterias depending on the capacity of the machine. The system employs high temperature, microorganisms to decompose food waste and organic matter. The prototype was able to decompose organic waste in a time frame of 38 to 50 hours with minimum harmful gases emissions and odours.

Keywords: Vegetable waste, decomposition, recycling process, solid waste management.

I. INTRODUCTION

The designed machine is a fully automatic and highly compact composting machine, which uses special microorganisms to breakdown and decompose all kinds of organic waste into compost within 24 hours with a volume reduction of 85- 90% There also lies an issue in transporting the wastes to the recycling plants, wherein a huge amount of effort, time and money needs to be put in for transporting the wastes which are clustered and are not in uniform shape or size. The waste materials need to be made into a uniform shape for easy and effective transportation. This paper aims in producing a mechanical crusher which would be a helping hand for waste management. The machine has U-shaped composting tank, with a crusher, heater, mixing blades. These materials if carried just like that would occupy more space and would require huge containers and transportation cost becomes an issue. These materials need to be arranged properly to increase the carrying capacity of the vehicle and as the organic waste being an indefinite shape needs to be made into uniform shape and size for easy decomposed. This is where the mechanical crusher comes into play. The crusher would crush the organic waste thus reducing the gap between them and make them to uniform size and shape so that the materials can be baled up according to the size of the crushing bin. The uniform size and shape of the materials can be obtained by providing a bin onto which the material is to be crushed. The crusher is designed to operate by both mechanical and electrical means. This crusher is designed in such a way that it is simple to construct and would require minimum effort for operating in both mechanical and electrical types of operation.

II. LITERATURE REVIEW**[1] Vivien Arief Wardhany et.al (2019)**

Has studied in their paper named "Smart Chopper and Monitoring System for Composting Garbage" concluded the results of research and testing that have been carried out, it can be concluded, by combining the technology, we can reduce the garbage pollution by utilize the chopper machine and monitored them. The garbage also can provide the benefit by recycling it into the compost, so it will help the environment by giving the supplement to the soil.

[2] Mansi Pare et.al (2019)

Has studied in their paper named "Design of Organic Compost Machine" concluded the designed machine is a fully automatic and highly compact composting machine, which uses special microorganisms to break down and decompose all kinds of organic waste into compost within 24 hrs with a volume reduction of 85-90%. The entire process is natural and biological. The outcome of this report is the basic knowledge of working of heavy-duty machines and the criteria behind their working in a brief manner.

[3] Mustafa Elalami et.al (2019)

Has studied in their paper named "Design and Test of the Smart Composter Controlled By SENSORS" concluded the design and the realization of a new composter destined to convert the residues food and all type of organic wastes in situ (to eliminate transport charges) to obtain a mature compost with high quality in 4 weeks.

This system is based on the interndesign and automated and optimized control of all operating parameters. This solution will reduce up to 80% of waste produced per day.

III. PROBLEM STATEMENT

Now a day's most of the farmers are using chemical fertilizers for their crops. Due to this the productivity of crops as well as the fertility of soil is decreasing day by day. Also, the prices of these chemical fertilizers are more to farmers. Thus, it brings to our knowledge that the traditional methods are not sufficient and satisfactory for agriculture. Due to these, some major problems are identified & to over-come these problems some idea or concepts are developed and adopted.

Following are the Problems

- There is no more scope for organic farming which is required.
- The machines available for preparing organic fertilizers are costly which farmers cannot afford to buy.
- Available machines are operating at high power consumption which indirectly increases the cost.
- **Available Machines are Very Bulky.**

The aim is to design & develop a low-cost fertilizer preparing machine which will help farmers to fertilize their land by their self- prepared organic fertilizer i.e., compost instead of buying costly and harmful chemical fertilizers which decrease the nutritive value of soil. We are going to design and fabricate such a machine that will eliminate most of the problems of farmers such as high cost of machine, more floor space requirement, high power consumption, requirement of electricity which is not possible in rural areas. So, the machine will be designed & developed to reduce the human effort by introducing proper gearing mechanism, to make use without electricity manually thereby helping to earn more profit to farmers.

IV. DESIGN METHODOLOGY

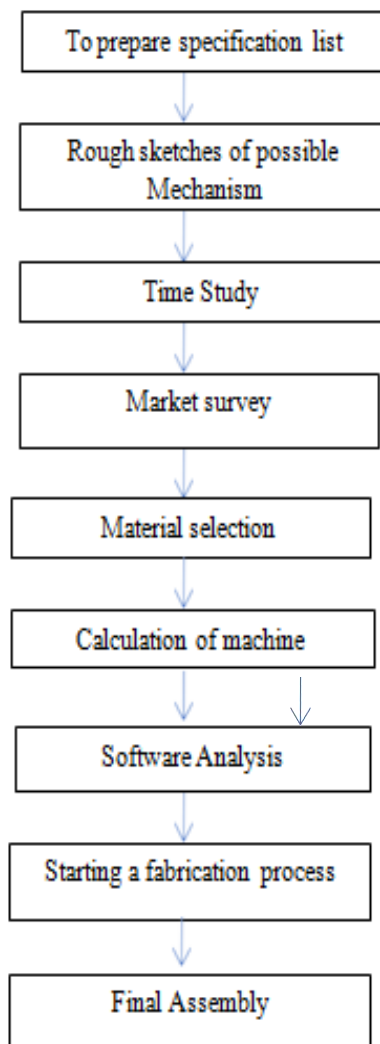


Fig 1: Methodology of Composting Machine.

COMPONENTS FOR COMPOSTING MACHINE

1) Single Phase Induction Motor



Fig 2: Single Phase Induction Motor

Single Phase Induction Motor is shown in Fig 2. The speed of this motor is 1440rpm with 0.5 Horse Power (HP) work on 230 ACvoltage supply.

2) Feed Grinder



Fig 3: Feed Grinder

3) Mixing Blade

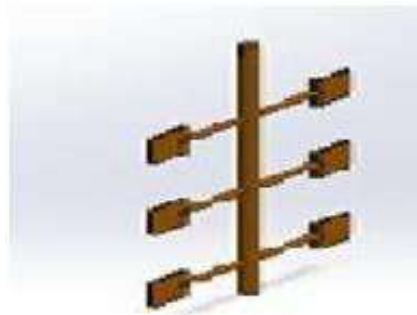


Fig 4: Mixing Blade

It is used to mix the waste properly in the tank. There is 4 mixing blade whose size is 5x2.5 (Inch)

4) Heater



Fig 5: Mica Flat Heater

Flat strip heaters of mica, also called flat mica heaters used for heating waste product after it gets mixed properly to form a final product i.e. Fertilizer. This Heater is of 500watt.

V. Design and Calculation

SYSTEM DESIGN: a. Motor Design

Voltage = 230 AC/V, Current = 1.6 Amp, Speed = N = 1440 RPM, 0.5HP= 373WATT Allowable Shear Stress of Shaft Is 100Mpa

$\tau=100\text{Mpa}$

b. Belt and Pulley

A Section Type of Belt is Used (A-48)B Type Pulley

10inch Pulley for Crasher 3inch Pulley for Motor

c. Hopper

Upper Diameter = 139.7mm Mid Diameter = 101.6mm Lower Diameter = 30mm

d. Tank

Tank Size = 13inch (diameter) Height (depth) = 12.5inch Volume of Tank (V) = $\pi r^2 h$ V=1534inch

Capacity= 25litre

e. Frame

Frame Size = 27x28inch Height = 35inch

f. Heater

500W Mica Flat Heater Maximum Temperature = 300°C

Following figures shows the designed machine in SOLIDWORKS.

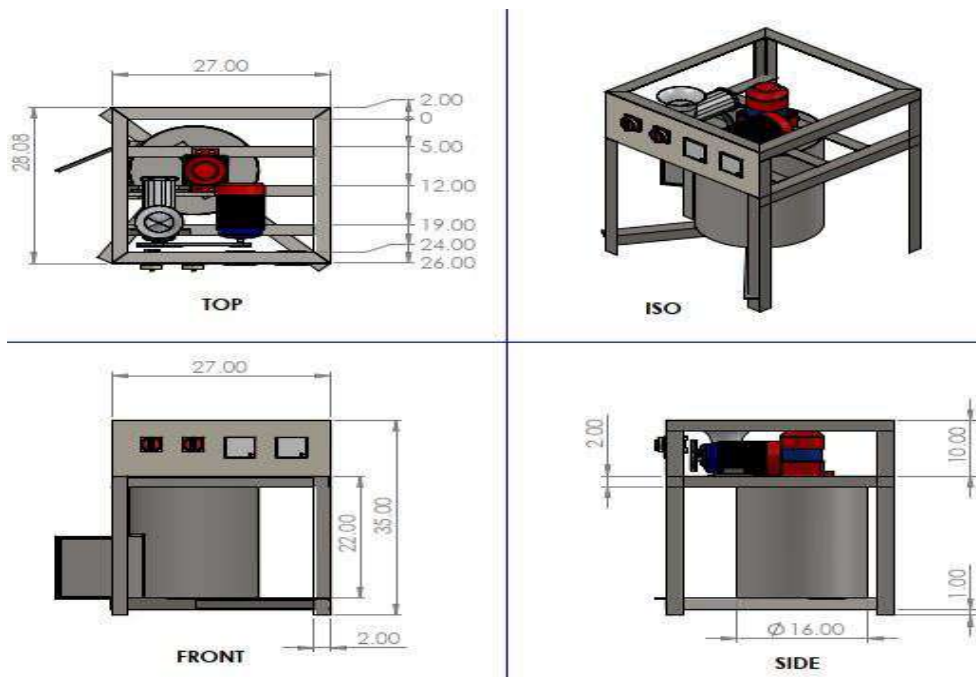


Fig 6: Assembly of Composting Machine



Fig.7: 3D view of compost machine designed in SOLIDWORKS

VI. RESULT

- Organic wastes will compost fast best if the pieces were small.
- Soft tissue wastes such as orange don't need to be very small because it will decompose fast.
- The turning blades are playing the big role in the composting process because it prevents the waste from overheating at some point inside the tank.
- After the process is completed, all weeds and weed seeds are killed, even insects, that is done by rising the temperature.
- The use of wood chips has increased the reduction in odors.
- To have the composting process as effective as possible, the input waste should have an approximate carbon to nitrogen ratio of 30 to 1.
- The process will work best if the moisture level of the input waste is about 50 percent. It is not also easy to measure.

Input	Time	Output
500 gm	1 Day	257 gm
1 kg	1 Day 2 Hours	500 gm
3 kg	1 Day 6 Hours	2.5 kg

VII. CONCLUSION

Proper evaluation of the design is performed and created something even better. Finally, we conclude that fertilizer preparing machine is better option to use by the farmer as its cost is low as compared to other machines. The machine is designed taking into consideration the various demands of farmers & other customers. Since this machine is made for small businessman or for farmers, therefore the work carried out by this machine is less. The capital required for purchasing the bigger size fertilizer preparing machine is very high & also the substitute way of using chemical fertilizers is also very costly. And also, we study the different factors within the composting process & the effect of bacteria on the composting process.

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DESIGN OF SAND BLASTING MACHINE

Bhavesh Waghmare¹, Hanish Bari², Aadil Khan³, Dhirendra Patil⁴ and Iqbal Mansuri⁵^{1,2,3,4}Student and ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar- 401501**ABSTRACT**

When a metal is exposed to atmosphere, it gets corroded by atmospheric air. To overcome this sand blasting process are used. When machining leaves the sharp burrs or edges on an object, sandblasting can smooth it until it is safe to handle. Sand blasting is a method used to clean, polish or strengthen metal with the help of abrasive material. Sand blasting is used in almost every industry that uses metal, including aerospace, automotive, construction, shipbuilding, rail, and many others. Sand blasting machines use abrasive material like steel grit, glass bead, sand etc. The blast media is pneumatically accelerated by compressed air and projected by nozzles onto the component to roughen a smooth surface, shape a surface or remove surface contaminants. For the application of sand blasting process on a big component, which may require secondary surface treatment, which is carried out in a confined space, so many times we have to shift jobs to confined room. Due to this material handling cost increases. To avoid this, there is need of design of portable type of sand blasting machine.

Keywords: Sand Blasting, Abrasive Material, Surface Treatment Process, Material Handling Cost, Portable.

I. INTRODUCTION

Sand Blasting is a surface treatment process using high velocity steel abrasive. Sand blasting is used to obtain excellent cleaning and surface preparation for secondary finishing operations.

- The cleaning of iron, steel, non-cast parts, forgings, etc.
- Mechanical cleaning of sheets, rods, coils, wire, etc.
- Shot peening to alter mechanical properties (increasing resistance to fatigue for springs, gears, etc.)

Sandblasting is also known as abrasive blasting. Basically, it is the process of bombarding a stream of abrasive material to the surface which we want to clean. The sandblasting operation is done with high pressure to smooth a rough surface. There are several types of sandblasting process like Soda blasting, Shot blasting and Bead blasting. Sandblasting is an extremely useful procedure in a welding applications and industries for removing excess weldments as well as for cleaning the surface. Whether a material needs to be cleaned, deburred, prepped for powder-coating, de-rusted, shot-peened or otherwise just have its paint removed, sandblasting is the process for the job. These machines are mainly useful in the auto industry, in ship and rail yards and in a range of industrial applications. Certain degrees of skill and safety training are required to use the sandblaster as abrasive material may cause some injuries. The sand blasting machine which was used in the industry are big in size and cannot be mobile so our main objective of our project is to make the machine mobile and less space occupying machine with reduction in weight, also reducing the cost of machine to make it budget friendly for small scale industries too.

II. LITERATURE REVIEW

Rupesh Narkhede Et.Al. (2019) [1], The study shows that the portable sand blasting machine is very economical & useful for heavy fabrication company. Big size products require sand blasting process before painting. The sand blasting machine are generally immovable and used in confined space, so every time we need to shift such big products in confined space of blasting after welding small components, this increases the material handling cost. After using portable sand blasting machine, we can do blasting on small components which we welded after first blasting process; this can be done on same location where we can manufacture, therefore we do not need to shift same again to confined space of blasting room. In this way we can save handling time as well as handling cost also. It helps to reduce human fatigue by considering handling process.

D Dudek Et.Al. (2018) [2], The study shows that the surface roughness after the abrasive blasting process is undetermined that is random. As a result of the treatment with low granulation grains, an even distribution of roughness on the work surface is obtained. The using larger sizes of abrasive grains may affect smoothness of surface. The surface after blasting is more susceptible to corrosion, hence the abrasive slurry should contain corrosion inhibitors.

Chuanli Yu Et.Al. (2022) [3], The study shows that under ultrasonic fatigue test, the effect of sand blasting and hot isostatic pressing (HIP) on VHCF performance on IN718 fabricated by selective laser melting (SLM), X Ray Computed tomography (CT) and 3D optical profiler are used to characterize the defects, including size and location

Meike Stiesch1 Et.Al (2020) [4], The study shows that the within the limitations of this study, it was shown that the residual stress correlates with the mean surface roughness Rz after sandblasting. The highest residual stress and surface roughness was found after sandblasting perpendicular to the surface. Among the parameters blasting angle, the blasting pressure showed the greatest effect on surface roughness and residual stress with the parameter range tested in this work. Further research is needed to evaluate the effect of these different surface treatment regimens on the adhesive bond strength after veneering with feldspar ceramic.

Kubilay Barutçigil DDS Et.Al (2015) [5], The study shows that Surface treatments of hybrid ceramic resin blocks could enhance the bond strength to resin cement; however, using Single Bond Universal without surface treatment showed a higher bond strength value.

III. PROBLEM STATEMENT

- Eliminate the oil and scale present on a superficial level, the projection of the abrasives eliminates consumption from the surface also, giving a particularly surface condition which has simple bond to the paint.
- We realize that around 80% of the surface disappointments happen when the pre-treatment of the surfaces isn't finished appropriately.
- Consequently, this progression of sandblasting the surface, earlier to painting, galvanization or such a covering should not be neglected as it is considered as the most basic stage for a great pre-treatment of surface.
- It is one of the most straight forward and the quickest approach to eliminate old paint and rust from the metal surface.

IV. OBJECTIVE

- To reduce the cost of the sand blasting machine which are available in market so that these machines can also be used in the small industry and it does not occupy more space.
- These machines are used to reduce the weight and reduce the time by manually removing the rust from the object.
- The main aim of our project is to make it compactable by reducing the size of the tank and make it movable.

V. RESEARCH AND METHODOLOGY

Fabrication of Sand blasting machine is consisting of the Following components to full fill the requirements of complete operation of the machine.

1. LPG Tank
2. Ball Valve
3. Hose Pipe
4. Blast Pot
5. Pressure Gauge
6. Nozzle
7. T Joint
8. Coupling
9. Wheels
10. Stand



Fig: Solid works Design

Sandblasting can be defined as a surface treatment process using high velocity of abrasive material to remove the rust paints and other surface impurities. Stationary sandblasting is done in cabinets and portable sand blasting can be done anywhere, thus; it is also known as a portable sand blasting machine. It can be related to garnet sandpaper for their similar effects. After sand blasting, the material receives a completely new look and a better finish. This method involves blasting of air on very small surface of work piece at very high pressure in order to etch or clean or to smooth surface.

Air + selected abrasive material + portable sandblasting machine + appropriate sandblasting nozzle + on/off control + blast surface = high-speed erosion (removal of rust particles from the blast surface). Sandblasting is also called as Abrasive blasting. It is the operation of forcibly propelling a stream of abrasive material against a surface under high pressure to smooth a rough surface, to remove the surface contaminants. There are several variants of its process, such as bead blasting, sandblasting, shot blasting and soda blasting etc.

- The height of the tank is 630 mm and the diameter of the tank will be 317 mm.
- The materials used for the air receiver will be cast iron. The tank can hold the pressure of 2000 psi.
- There will be two Ports of ½ Inch in LPG tank one for inlet of compressed air which is connected with T-Joint and ball valve and at the other end the Pneumatic male connector of ½×8 mm is fitted. The other end is used for the outlet of compressed air which is connected to hose pipe by means of ½ Inch nut joint and ½ Inch ball valve.
- There will be two T-Joint, one at the inlet side to fitting the Pressure Gauge and another one for fitting of pneumatic male connector to the blast pot.
- The blast pot is basically the reservoir for media and maintains the pressure necessary for blasting. The blast pot contains fabrication of barrel nipple of ½ inch diameter and 6-inch length to sand storage tank is of 2-inch diameter and 6 inch in length welded at right angle triangle. At the top of sand storage tank, a coupling is welded for joining of ¼ inch ball valve.
- While the diameter of the hose will be for 20x1500mm.
- The size of pneumatic tube will be 8mm.
- The pressure for the compressed air will be nearly 7 to 8 bars.
- Nozzles permit media to be sprayed at variable speeds depending on type of nozzle is used.
- Inlet and Outlet valves monitor the inflow and outflow of air and confirm whether or not the blast pot is pressurized.
- The pop-up or inlet valve responds to pressure place into the system and pops up to pressurize the system.
- The Sandblasting Media valve regulates the flow of abrasive from the blast pot.
- The abrasive lure prevents abrasive from traveling through the outlet valve.
- After media is loaded into the machine, variety of events should occur to start blasting.
- The jet flow valve is used to force the mixture of abrasive material and air towards to nozzle which increases the velocity of jet.
- A mixture of air and abrasive can spray through the nozzle.

VI. CONCLUSION

The portable sand blasting machine is very economical & useful for heavy fabrication company. There are such big products in size and it requires sand blasting process before painting, so every time we need to re-shift such big products in confined space of blasting after welding small components or some rework on small attachments, this increase material handling cost. After manufacturing portable sand blasting machine, we can do local blasting on small components which we welded after first blasting process; this can be done on same location where we can manufacture, in this way we need not to shift same again to confined space of blasting room. On same place we can do blasting with the help portable sand blasting machine & same time we can release to painting. In this way we can save handling time as well as handling cost also. It helps to reduce human fatigue by considering handling process.

VII. FUTURE SCOPE

For some more Improvement in Portable Sand Blasting Machine using LPG cylinder, we can use some following points.

- We can use nozzle of tungsten carbide which will have higher life than stainless steel nozzle.
- As in sand blasting machine we store the air pressure in air receiver, so for safety and security purpose we can use the Pressure Relief Valve and set it at 10 bar pressure.
- As compressed air contains moisture in it, we can use the moisture separator at the inlet of compressed air to remove the moisture contaminants

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GENERATION OF POWER BY WASTE HEAT OF AUTOMOBILE

¹Shaikh Mohammed Yusuf, ²Abdussalm Dawane, ³Nirmiti Jagdish Mer, ⁴Mohit Naresh and ⁵Iqbal Mansuri

^{1,2,3,4}Student and ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar- 401501

ABSTRACT

More than 30% of an automobile's engine energy is wasted through exhaust gases and in form of heat. So there is a scope to develop a system to utilize this waste heat and generate power. This power can be further used to charge mobiles, power banks or the automobile's battery which in turn will reduce the consumption of fuel.

I. INTRODUCTION

Automobile industry is one of the world's most important economic sectors. Automobiles use IC engines, which have huge amount of energy. The loss up to 30% in the form of heat. In the recent times, scientists have tried and refined the automobile technology appreciably, but could not control the loss in IC engine in the form of waste heat. This project focuses its attention not to control the waste heat in IC engine, rather it focuses on trapping the waste heat to generate electricity by using a suitable device called thermoelectric generator (TEC). The temperature of the 'exhaust bend pipe surface' through which exhaust gases are flowing, ranges between 200 °C to 300°C, by attaching a copper plate to this bend pipe hot junction of the thermoelectric module is made, other cold junction is created by aluminum heat sink. As this potential difference is created, voltage is produced using seebeck effect. The produced voltage is further amplified by using booster circuit and is tested across the load. Tzer-Ming Jenget. al. (2016) have carried out a study on Design, Manufacture and Performance as between TEC output voltage and generated power/efficiency.

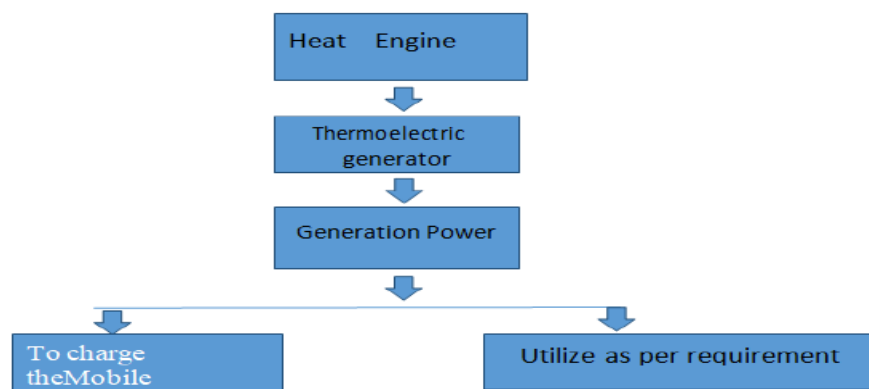
II. LITERATURE REVIEW

A.Rmit University, Bundoora, Victoria, Australia Fujikura Ltd, Kiba, Tokyo, Japan. The modelled system is predicted to produce approximately 1 kW. The Honda system used a simple design of a thin flat rectangular box with TECs placed on the top and bottom surfaces. Liquid cooling was used in this design. The system consisted of 32 30 mm × 30 mm TECs and produced a maximum of approximately 500 W. The claimed fuel consumption reduction is 3%.

B.Tzer-Ming Jeng and Sheng-Chung Tzeng Department of Mechanical Engineering, Chienkuo Technology University, Changhua County, 500, Taiwan. This study constructed an efficiency testing platform for the thermoelectric conversion system for recovering waste heat of real vehicles. Using a Toyota 2200

c.c. vehicle with four-cylinder four-cycle engine as the test vehicle, it successfully measured the relation of engine speed of real vehicle and external cooling air flow to the engine exhaust temperature and flow rate, and discussed the influence of the vehicle's engine speed and external cooling air flow on the energy output of the waste heat recovering thermoelectric conversion system. This study found that the energy output increases with the engine speed.

C. T. Kashid, S. H. Barhatte and D. S. Ghodake. Results show that voltage, current, power developed and efficiency of the system increase with the increase in engine speed & mass flow rate of exhaust gas. At the engine speed of 3736 rpm, the power generated is 13.106W and efficiency of the system is 5.28%.

III. METHODOLOGY

IV. WORKING PRINCIPLE

A single thermoelectric couple is constructed from two ‘pellets’ of semiconductor material usually made from Bismuth Telluride (Bi₂Te₃). One of these pellets is doped with acceptor impurity to create a P-type pellet; the other is doped with donor impurity to produce an N-type pellet. The two pellets are physically linked together on one side, usually with a small strip of copper, and mounted between two ceramic outer plates that provide electrical isolation and structural integrity. For thermoelectric power generation semiconductor material A and B joint together, if a temperature difference is maintained between two sides of the thermoelectric couple (T₁ and T₂), thermal energy will move through the device with this heat and an electrical voltage, called the Seebeck voltage, will be created.

Components



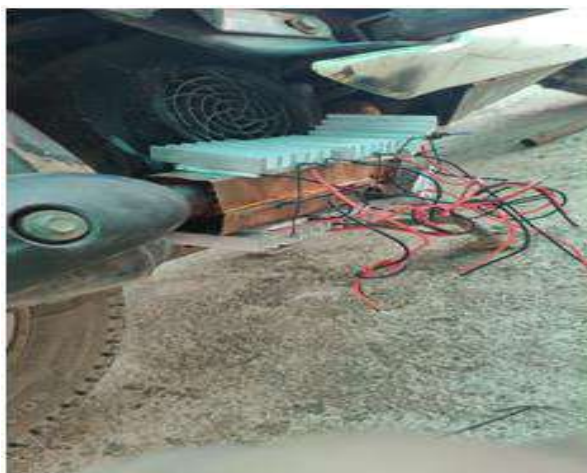
Copper Plate



Heat Sink



Booster Circuit



Final Assembly

V. CONCLUSION

1. This project aims to find a possible way to recover the waste heat from the exhaust of I.C. engine as well as to design and fabricate one such system to serve the aim.

2. Experimentally it is found that when six thermoelectric generator are connected in series. This generated power either directly used to run some auxiliary devices of an automobile or may be stored in the battery and used later.
3. The engine performance is unaffected by the designed system because heat extracted from the surface of the bend-pipe of the exhaust manifold which doesnot affected the working of engine.
4. If higher temperature range is required then TEC module must be changed to higher temperature range (200°C). Thus, the above stated system may be successfully implemented in different automobile engines, with slight changes.
5. The power developed can be further used to charge mobiles, power banks orthe automobile's battery which in turn will reduce the consumption of fuel.
6. It can be used as a power source for the electronics accessories and chargingbattery of a vehicle.

VI. REFRENCES

A.RMIT University, Bundoora, Victoria, AustraliaFujikura Ltd, Kiba, Tokyo, Japan

B.Tzer-Ming Jeng and Sheng-Chung Tzeng Department of Mechanical Engineering, Chienkuo Technology University, Changhua County, 500, Taiwan

C. T. Kashid, S. H. Barhatte and D. S. Ghodake

SPRING LOADED KNEE BRACES USING 3D MANUFACTURING

Abdul Gujarati Rehman, Jha Keshav, Shaikh Mafizul Hassan and Siddique Faiz Mohammed
Students, Department of Mechanical Engineering, Theem College of Engineering, Boisar, Palghar,
Maharashtra, India

ABSTRACT

Recent research on exoskeletons and braces has examined the ways of improving flexibility, wear ability or overall weight-reduction. Part of the challenge arises from the significant loading requirements, while the other part comes from the inflexibilities associated with traditional (rigid link-moving joint) system architectures. Compliant mechanisms offer a class of articulated multibody systems that allow creation of lightweight yet adjustable-stiffness solutions for exoskeletons and braces, which we study further. In particular, we will introduce the parallel coupled compliant plate (PCCP) mechanism and pennate elastic band (PEB) spring architecture as potential candidates for brace development. PCCP/PEB system provides adjustable passive flexibility and selective stiffness to the user with respect to posture of knee joint, without need for mediation by active Devices and even active sensors. In addition to the passive mode of operation of the PCCP/PEB system, a semi-active design variant is also explored. In this semi-active design, structural stiffness re-configurability is exploited to allow for changes of preload of the PEB spring to provide force and torque customization capability. The systematic study of both aspects (passive and semi-active) upon the performance of PCCP/PEB system is verified by a lightweight 3D printed physical brace prototype within a ground truth (optical motion tracking and six degrees-of-freedom (6DOF) force transducer) measurement framework.

Keywords: Knee osteoarthritis, braces, walking, knee arthroplasty, 3D printing, CAD.

I. INTRODUCTION

A knee brace is one tool in managing the discomfort of knee osteoarthritis. A brace might help reduce pain by shifting your weight off the most damaged portion of your knee. Wearing a brace can improve your ability to get around and help you walk farther comfortably. Osteoarthritis is a complex condition involving the entire joint. It's mainly known as a wear-and-tear type of arthritis that commonly affects the knees of older people. The disease frequently affects one side of your knee more than the other. This unequal damage can cause your knee to align imperfectly (malalignment), which can make you look knock-kneed or bowlegged. As the damage progresses, this malalignment worsens. A knee brace can take pressure off the part of your joint most affected by osteoarthritis and help relieve pain. If your knee feels like it might buckle when you put weight on it, a knee brace can also help you stand and move around with more confidence.

Additive manufacturing (AM) is the industrial production name for 3D printing, a computer-controlled process that creates three dimensional objects by depositing materials, usually in layers. This revolutionary method for creating 3D models with the use of inkjet technology saves time and cost by eliminating the need to design print and glue together separate model parts. Creating a complete model in a single process is possible using 3D printing. The basic principles include material cartridges, the flexibility of output, and translation of code into the visible pattern. 3D Printers are machines that produce physical 3D models from digital data by printing layer by layer. It can make physical models of objects designed with a CAD program or scanned with a 3D Scanner. It is used in a variety of industries. In most of the industries such as manufacturing aerospace, automobile, jewellery, footwear industrial design, architecture, engineering and construction, dental and medical industries, education and consumer products, additive manufacturing is used for prototyping of various models for research as well as demonstrations of end products.

OBJECTIVES**II. RESEARCH & METHODOLOGY**

- To create a Knee Brace that can be affordable for underprivileged people, especially the senior citizens that live in Old Age Homes.
- To provide the option of customization on the basis of shape, size & load.
- To use additive manufacturing (3D Printing) technology so that it can be manufactured in small quantities. Use additive manufacturing so that customization of knee braces can be done in much cheaper price than available in market.
- To create the awareness of Knee Arthritis among the people.

Our aim was to design, construct & validate a knee brace that can be affordable to underprivileged, customized according to the need of patient & can be produced in small quantities for cost reduction. After running a trial & testing our model we conclude that we have successfully provided a solution for you knee related problem which is affordable for every class of people, can be customized according to the need, requirement & size & can be manufactured in small quantities even single unit in cheap affordable price.

Problem Statement

Knee braces available in markets are too costly for some underprivileged to afford since most of the knee braces are made using the traditional method of bulk manufacturing, customization is not easily available. The cost of customized knee braces is again too much costlier even for a well settled person to afford.

Only universal size of knee braces is available in the market, which sometime create the issue of fitting to the patients. Many people especially senior citizens are not aware about the problem of Knee Arthritis, they just tend to live with the pain While doing the survey with the people of old age home we came to the point that, most of them don't know about the Knee Arthritis & only few people knew about Knee Braces. They don't use knee braces if because either it is too expensive for them to afford or they can find one of their sizes.

The Steps & Method for the Production of 3D Printed Knee Braces Are:

Cad Modelling & 3d Modelling of the Part.

Creating A 3d Printed Prototype In Pla Material To Check The Function & Actual Product Look Of Model. Selection of Material. (Classified on The Basis of Strengths, Elasticity,

Production Price, Etc)

Selection of A 3d Printer. (Technology, Print Size, Etc) 3d Printing of the Individual Parts

Post Processing of the Individual Parts. Assembly Of The Parts As Designed.

Final Finishing Touch on the Product.

Running Physical Tests to Check the Strength & Compatibility of Knee Braces

III. Design of Equipment and Drawing Components

Stages of 3D Printing

3D printing also known as additive manufacturing, it is the process through which solid objects can be built from digital files. This can be achieved with using various 3D printing techniques. Most of these techniques involve the creation of an object by laying down thin layers successively.

➤ The main stages involved in 3D printing are:

1. Designing
2. Export as STL
3. Slicing
4. Preparing printer
5. Printing

1. Designing

The first stage of 3D printing is designing. In this stage digital blueprint of the object which has to be printed is prepared. The most common way of creating the digital blueprint is by Computer Aided Design (CAD).

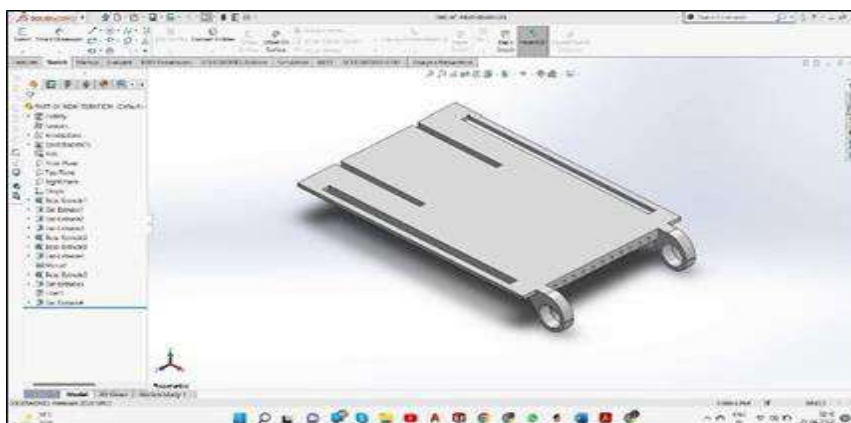


Fig 4.1: Solid Works Designing Page.

2. EXPORT AS STL

Once you have a finished the CAD design, it is time to send it to the printer. First, we need to convert it into an appropriate file format. The appropriate 3D Printing file format is called STL (Stereo-Lithography), named after the first ever 3D printing process. STL has several other meanings such as “Standard Triangle Language” and “Standard Tessellation Language”.

Extension OBJ can be used as an alternative for STL.

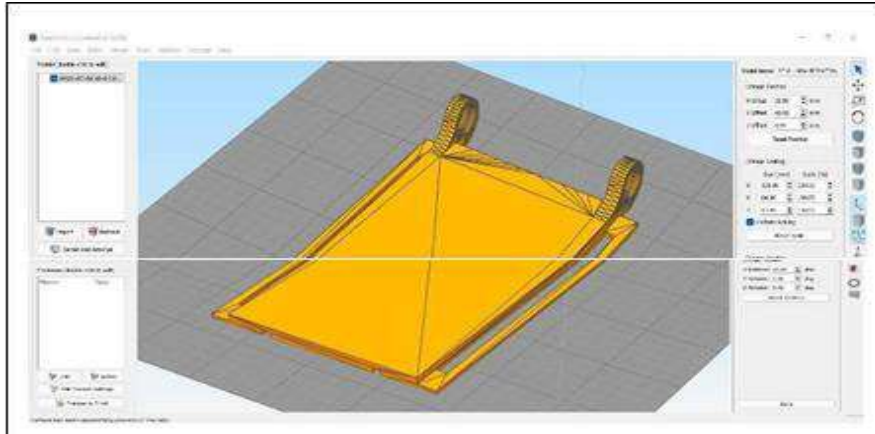


Fig 4.2: Conversion from CAD to STL.

3. SLICING

This is the process of translating the STL file into instructions for the 3D printer to follow. Basically, slicing is dividing or chopping the 3D model into hundreds or thousands of horizontal layers, telling the machine exactly what to do, step by step. After the files are sliced, a new file format is generated called G-code, with the file extension g-code. These G-codes are the codes which could be understood only by the 3D printer.

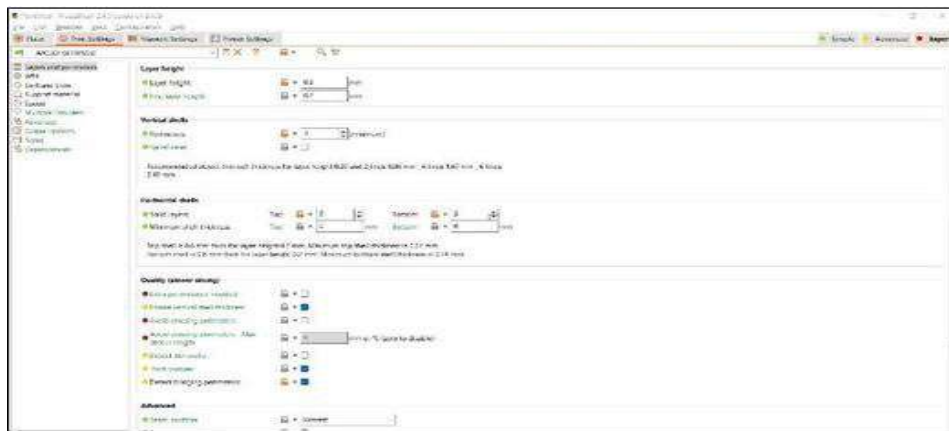


Fig 4.3: Slicing Parameters



Fig 4.9 Sample G-Code.

4. Preparing Printer

The g-codes are then sent to printer. Before starting printer, we should set up the printer by setting some of the printer parameters according to the requirement and refiling the required filament.

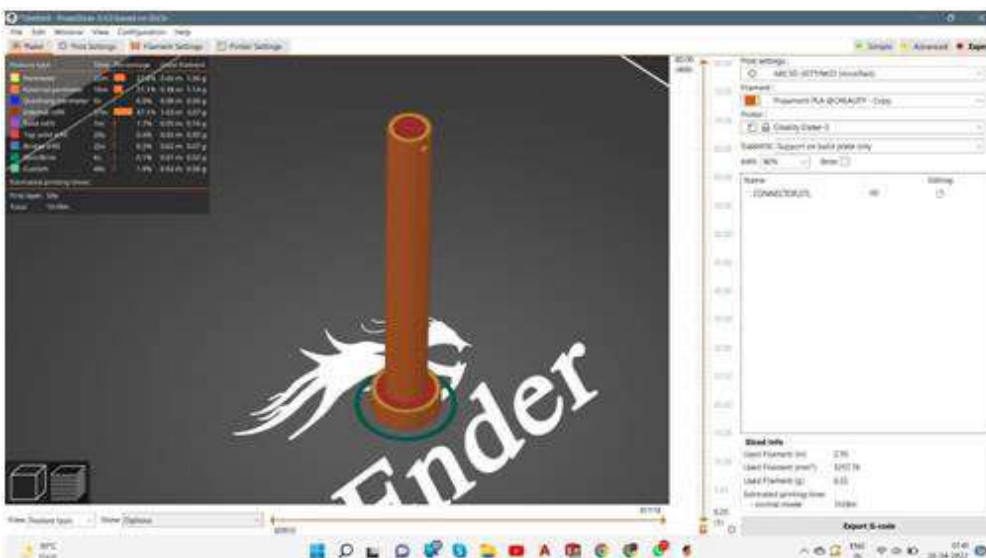
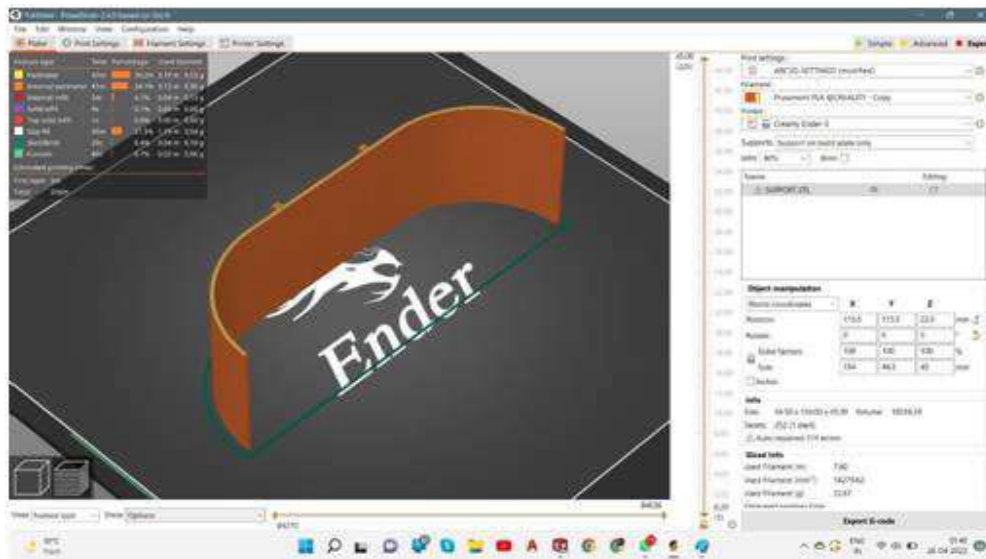
5. Printing

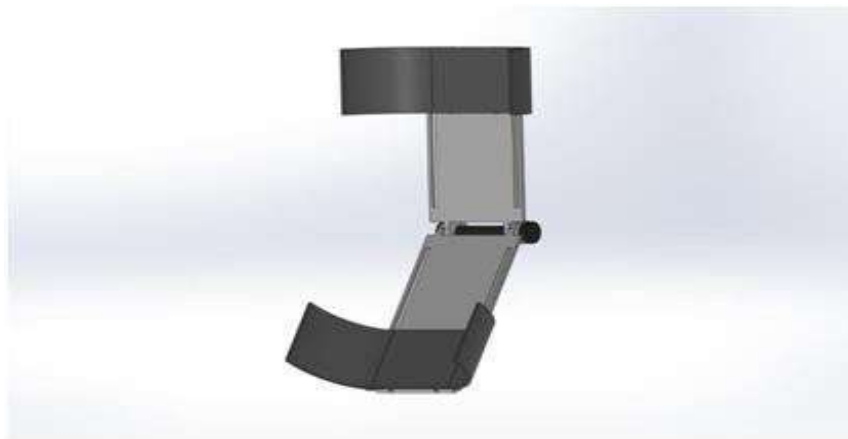
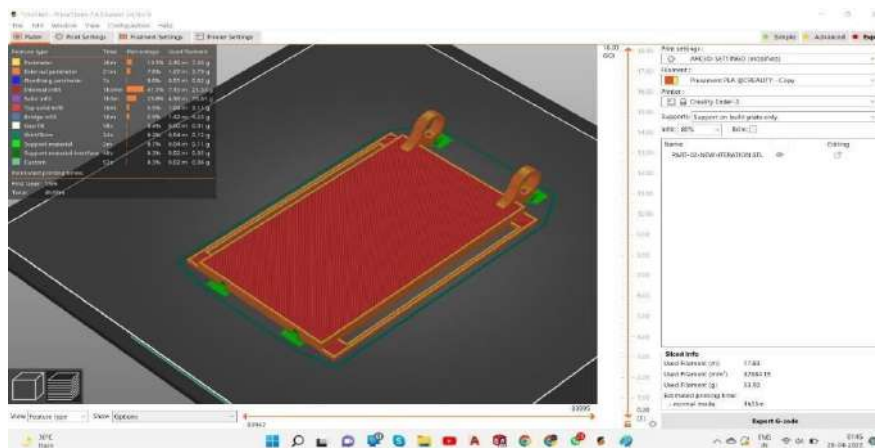
After setting up the printer, the printing begins. There are many methods for 3D printing. Here we use FDM (Fused Deposition Modelling) method for printing, as it is less expensive. FDM is additive manufacturing process that belongs to the material extrusion family.

In FDM firstly, the material, usually ABS or PLA plastic, is melted down by the printer head and extruded onto the printer bed, similar to how ink is deposited onto a page on a paper printer. The extruder head of the printer is attached to the 3-axis which allows it to move in x, y and z direction. The printer lays down material layer by layer according to the instructions of G-code uploaded to the printer to build up a 3D model, and each layer fuses to the previous one as it cools. Sometimes the cooling can be accelerated by using cooling fans which can be attached to the extrusion head. This process can be repeated until we get the complete model.

IV. RESULTS AND OUTPUTS

During the trial run of our project model, it was observed the models is successfully working for both the age group. Feedback was taken from both the old man & cyclist & the outcome from both the parties was that our product is working successfully. The old man uses the knee brace on daily basis for at least 10-12 hrs while walking & doing other average work & it was observed that the knee brace has made the moment of his joint much easier than before, now he has to apply less force which results in easy moment & the reduction in pain. The cyclist uses the knee brace every time he goes for cycling & again it was noted that the knee brace has help him to improve his moment of keens & to provide more force while working out.





V. CONCLUSION AND FUTURE SCOPE

SPRING LOADED KNEE BRACES USING 3D PRINTING after trials & testing has been came out to be successful on all the conditions.

Our aim was to design, construct & validate a knee brace that can be affordable to underprivileged, customized according to the need of patient & can be produced in small quantities for cost reduction. After running a trial & testing our model we conclude that we have successfully provided a solution for you knee related problem which is affordable for every class of people, can be customized according to the need, requirement & size & can be manufactured in small quantities even single unit in cheap affordable price .

Knee braces available in markets are too costly for some underprivileged to afford Since most of the knee braces are made using the traditional method of bulk manufacturing, customization is not easily available. The cost of customized knee braces is again too much costlier even for a well settled person to afford.

Only universal size of knee braces is available in the market, which sometime create the issue of fitting to the patients. Many people especially senior citizens are not aware about the problem of Knee Arthritis, they just tend to live with the pain

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DESIGN, ANALYSIS AND FABRICATION OF HUBLESS CYCLE

Lukde Mohammed Qasim A. Gafoor, Shaikh Alam Afroz Zakir Hussain, Shaikh Saif Ali Shaukat Ali and Bakhed Naim Mohammed Rasid

Department of Mechanical Engineering, Theem College of Engineering Boisar

ABSTRACT

The cycle is the common mode of transport. Bicycle can be driven by all kind of individuals like children and senior citizen. But the old school sort of wheel which is being utilized for centuries has been given a unused plan which progresses the aesthetics of the cycle. In old bicycle the effort required to ride the bicycle is more. In the hubless cycle the gear transmission is provided which reduces the riders effort to pedal and ride the bicycle. In normal cycle, the directing (i.e) the handle bar is joined to the center of wheel. But in hubless wheel, the handle bar is attached to the wheel edge which increments steering efficiency. The cycle with ordinary look (i.e) cycle with spoked wheel (center wheels) is continuously being used everywhere and an substitute for the look isn't considered in plan. As it were the outlines and chassis of the cycle has been altered all through the ages. The wheel has remained the same. So considering it as the most objective of our venture, the hubless cycle is designed.

I. INTRODUCTION

In popular we recognize that the cycle run on chain power mechanism and it is ideal and famous manner of transportation in rural as well as city area also. Due to the fact preliminary price may be very low, no gasoline is needed to run the bicycle. There is no threat to pollute the environment because of no use of fuel. But the bicycle used for many years now change only in looks of the frame of bicycle. In the traditional bicycle the rider needs to put more effort to ride because of the spokes attached to the rim of the cycle. When the rider pedals the sprocket rotates because of the chain and the spokes attached to the rim were forcefully rotated which causes the rider to put more effort to ride the bicycle.

So considering it as the most objective of our venture, the hubless cycle is designed. In the hubless bicycle the rear rim have a internal gear mounted on it and the hub will behave like the spur gear mounted on it. Because of the use of gears for transmission the rider will be needing less effort to ride the bicycle and as the spokes are removed it also give a new and stunning look to the bicycle.

II. LITERATURE REVIEW

Algot V.V., Bhalerao R.S., Autade K.N., Shimpi G.B., Prof. Ghodake A.P., explained in journal "Hubless Wheel Bicycle With Gear Train Drive Mechanism" states that "The construction of Hubless wheel bicycle with gear train drive mechanism is designed to convert the human muscle power through pedalling work in to the mechanical work. The system is assembled with the combination of pedals, shafts, one small size alloy wheel and one large size Hubless wheel which is function as driving wheel. The pedal and shaft are receiving the human effort and convert in to rotational mechanical motion. This rotational motion is transmitted up to the driving wheel via the spur gear drive train. The gear drive train is the combination of four stages of gear pair. These gear pairs not only transmit the power but also improve the gear ratio step by step. The gears and pinions of drive train are fixing with the bicycle body by using deep groove ball bearings. The last spur gear in the gear train is coupled with the driving wheel through the Hubless mechanism which also performs the holding function of driving wheel. The front wheel is small in size as compared to drive wheel and it only perform the system balancing function without actually participate in driving and driven mechanism. This system has ability to reduce the fatigue on bicycle rider by improving the power transmission efficiency and by extending the maximum limit of bicycle speed."

Bannetross said that the inventive device includes a frame having a seat structure and handle bar, rear bracket having rear bearings within that rotatably engages a rear wheel, a front bracket having front bearings within that rotatably engages a front wheel, and a drive train that engages the rear wheel for driving the rear wheel. The rear rim of the rear wheel includes a rear groove that

III. Fabrication of Hubless Wheel**1. Rear Wheel**

The internal gear is mounted internally on the rim of cycle through welding. The spur gear is mounted on the hub through welding and the sprocket is also mounted on the hub for transmission when the pedalling starts the chain rotates the fly wheel mounted on the hub and the spur gear also rotates as it is also mounted on the hub. When spur gear rotates it meshes with the internal gear mounted on the rim and forces the rim to rotate and then the bicycle will be in motion.



Fig.1: Internal Gear mounted on inner diameter of rim.

Spur gear is mounted on the hub by welding and the sprocket is mounted on one side of the hub where thread is present on the hub the sprocket is rotated when the rider starts pedalling the sprocket rotates and chain rotates the sprocket. Sprocket and spur gear are mounted on the same hub so the spur also rotates.



Fig.2: Spur Gear mounted on the hub.

Spur gear will be in continuous mesh with the internal gear mounted on the rim through welding when the hub rotates the spur gear rotates and it will rotate the internal gear so ultimately the wheel of the bicycle will rotate.



Fig.3: Position of spur gear in mesh with internal gear.

Smaller three spur gear are mounter on the roller bearing which will be in continuous mesh with the internal gear. These 3 spurgear will act as a supporting gear so that while riding the wheel will not be able to roll out and cause harm to the rider.



Fig.4: supporting spur gear.

Side bearing is welded on the Mild Steel ring it will act as a barrier so that the M.S ring does not collide with the tyre and the internal ring gear. A total of 4 bearings are used on each side of the tyre so that the ring does not collide with the tyre.



Fig.5: Side bearing.

2. Front Wheel.

In front wheel the roller bearing is mounted on the Mild Steel ring through nut and bolt and the bearing will be in continuous contact with the inner surface of the rim. These bearing will act as a supporting so that the front wheel will not roll out while riding and cause any incident. 3 small diameter bearing are also used as a barrier so that the M.S ring does not collide with the front wheel tyre. The small bearing will be in continuous contact with the side surface of the rim.



Fig.6: Support bearing mounted on M.S ring through nut and bolt and side bearing mounted on ring though nut and bolt.



Fig.7: Front wheel mounted on the bicycle frame.

IV. METHODOLOGY

Improved aesthetics of the cycle was kept as the vision of the project. First of all the selection of cycle was done and the Roto bike 360 freestyle cycle was selected. Then according to the inner diameter of rim the internal gear was made having 116 teeth and then spur gear was made with 36 teeth and 3 small spur gear having 14 teeth each. Then in next step Mild Steel ring was made which is used to mount the gears on it and also the weight of the bicycle and also the riders weight will be handle by the Mild Steel ring.

Then a rectangular steel plate was welded on the M.S ring facing towards the rim. Drilled was done on the rectangular steel plate and then small bearing was fitted on the plate through nut and bolt on all the four rings total of four plates were welded on each ring so on each side of the wheel 4 bearings were mounted on rings so total 8 side bearings are mounted on the rear wheel. Then a rectangular steel plate of 3mm thickness and 50.8mm in height was welded on the surface of all the four rings total of 3 plates was welded on each ring. Drill was done on the rectangular plate welded on the surface of the ring and then a bolt of 127mm long was pass through out the plate to the ring which was on other side of the tyre. Small spur gear was mounted on the bolt and adjusted so that they are in mesh with the internal gear. Total of 3 small spur gear were mounted on ring of the rear wheel. These 3 spur gears having 14 teeth each acts as supporting gear so that the tyre does not roll out while riding.

Front wheel structure is same as the rear wheel a rectangular steel plate was welded on the M.S ring facing towards the rim. Drilled was done on the rectangular steel plate and then small bearing was fitted on the plate through nut and bolt on all the four rings total of four plates were welded on each ring so on each side of the wheel 4 bearings were mounted on rings so in total 8 side bearings are mounted on front wheel. Then a rectangular steel plate of 3mm thickness and 38.1 mm in height was welded on the surface of all the four rings total of 3 plates was welded on each ring. Drill was done on the rectangular plate welded on the surface of the ring and then a bolt of 127mm long was pass through out the plate to the ring which was on other side of the tyre. Bearings are mounted on the bolt and adjusted so that they are in contact of the inner surface of the rim.

Then a semi-circular arc was cut through laser cutting. Total of 8 semi-circular arcs was cut 4 for the front wheel and 4 for the rear wheel. 2 arc were welded on the surface of the M.S ring and 2 arc were welded to the cycle fork then all the 4 arc was drilled 2 whole on each arc then a bolt of 152.4mm was pass through out the drilled hole to the other side of the arc which is welded on the fork of the cycle. Then through nuts it is fitted to the cycle.

Then 2 Rectangular plate of 5mm thickness was on welded on the ring of rear wheel each plate is drilled. Spur gear having 36 teeth is welded on the hub. The hub is mounted on the rectangular plate of 5mm thickness which is mounted on the ring of the rear wheel and on hub a sprocket having 18 teeth is mounted. When Rider starts pedalling then it forces the sprocket to rotate. The sprocket is mounted on the hub and the spur gear having 36 teeth is also mounted on the hub so when rider starts pedalling the spur gear also rotates. The spur gear is in continuous mesh with the internal gear mounted on the rim of the cycle. So when spur gear rotates it rotates the internal gear mounted on the rim and when rim starts rotating the cycle is in motion.



Fig.8: Hubless Bicycle.

V. CALCULATION

Internal Gear

M (Module) = 3

P (Pitch) = $\pi \times M = \pi \times 3 = 9.494\text{mm}$. T (Number of Teeth) = 116.

ID (Internal Diameter) = 342mm. OD (Outer Diameter) = 354mm

Spur Gear

M (Module) = 3

P (Pitch) = $\pi \times M = \pi \times 3 = 9.494\text{mm}$. T (Number Of Teeth) = 36.

ID (Internal Diameter) = 25mm. OD (Outer Diameter) = 114mm

Pedal Sprocket

M (Module) = 1.5

P (Pitch) = $\pi \times M = \pi \times 1.5 = 4.71\text{mm}$. T (Number of Teeth) = 54.

ID (Internal Diameter) = 25mm.

Hub Sprocket

M (Module) = 1.5

P (Pitch) = $\pi \times M = \pi \times 1.5 = 4.71\text{mm}$. T (Number Of Teeth) = 18.

ID (Internal Diameter) = 36mm.

Gear Ratio

Internal gear no of Teeth: 116 spur gear no of Teeth: 36 pedal sprocket no of Teeth: 54 Hub sprocket no of Teeth: 18

Pedal sprocket to Hub sprocket gear ratio: $54/18 = 3$.

As Spur gear is mounted on the same hub so Spur gear also rotates 3 times on one rotation of Pedal sprocket. Spur gear have 36 teeth and Internal gear is having 116 teeth.

As spur gear rotates 3 times so $36 \text{ teeth} \times 3 = 108 \text{ Teeth}$.

Internal gear is having 116 teeth so when spur gear rotates 3 times then spur gear travels 108 teeth from 116 teeth. So the Gear ratio is $108 / 116 = 0.93$.

So When Pedal sprocket completes One rotation then the rear wheel completes One rotation as well i.e The ratio of the cycle is 1:1.

VI. CONCLUSION

Thus the project enhances the aesthetics of the conventional cycle by giving it a good look. The use of gears also reduced the effort of the rider to pedal. The steering efficiency is also increases because the cycle fork is mounted on the ring directly. The load carrying capacity also increases because of the strength of Mild Steel ring which is welded to the bicycle frame. The weight of the cycle can be reduces by using nylon gears or composite nylon gears.

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ANALYSIS OF COMBUSTION AND EMISSION PARAMETER OF CI ENGINE USING WASTE TRANSFORMER OIL AS ALTERNATIVE FUEL**Dhruv M. Somani¹, Navin R Shukla², Arpit S. Sharma³, Daivik H. Sheth⁴ and Iqbal Mansuri⁵**^{1,2,3,4}Students and ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar- 401501**ABSTRACT**

This project gives idea for the effective use of Waste Transformer Oil as an alternate option for petroleum based fuels. Rapid depletion of fossil fuels, increasing pollution and increasing prices of petroleum based fuels have given a base for the research of various fossil fuels. As we all know that, petroleum based fuels are limited in reserves, concentrated in certain regions of the world are shortening day by day. Huge amount of dollars are being invested in research of alternative fuels. Meanwhile, the disposal of waste products like waste transformer oil from different electric power stations from many electric transformers throughout the country is becoming increasingly complex. while biodiesel from certain vegetable oils like Jatropa, Karanja, Soyabean and Rapeseed is acquiring much needed attention. The Waste Transformer Oil is a waste product which comes out from a electrical transformer is used for insulation and cooling purpose. This waste product can be used as a source of fuel for diesel engine applications. The WTO can be used after refining it by transesterification process or catalytic cracking process and then mixed with diesel fuel as an base fuel for evaluating different engine and emission parameters and to use it as an alternate source of fuel. The engine and fuel researchers are devoted to explore alternative fuels as the present world largely depends on petroleum fuel for generating power, vehicle movement and agriculture sectors. Price hike, limited reserve of petroleum oils and stringent emission regulation also forced researchers to find alternative fuels. In Bangladesh, there is limited petroleum reserve to meet the demand of the petroleum product and for this reason it is necessary to spend a lot of foreign currency for importing fuel every year. Recent price hike of petroleum oil incurs lots of money. Bangladesh imports most of the petroleum oils from Middle East. In this point of view, waste transformer oil (WTO) can be an alternative source for petroleum oils. WTO has significant physiochemical properties. WTO can meet a portion of our demand without any hesitation. There is a huge unused amount of transformer oil in Bangladesh which is rejected every year. This oil is not used for any other purpose. So, WTO is an important source for meeting the demand of diesel in Bangladesh. Bangladesh imports approximately 2.4 million ton diesel each year. It is well known that the transformer oil is used mainly in the electrical transformer for insulation purpose. Moreover, cooling is another purpose of using transformer oil in the electrical transformer while the transformer is running. Among various properties, one of the main properties of transformer oil is to sustain high temperature during operation. When an electrical transformer is in operation, the transformer oil is subject to mechanical and electrical resistance. For a certain period of time, it is recommended to check the electrical and chemical properties of the transformer oil. By using WTO, Bangladesh can reduce importing a huge amount of petroleum products from foreign countries. Our attention goes to the WTO. WTO results from the power generation and transmission station. At present 100 per cent transformer oil is not used in place of diesel fuel (DF) to run the engine rather blends of WTO and DF.

Keywords: Waste transformer oil, WTO characteristics, Diesel fuel

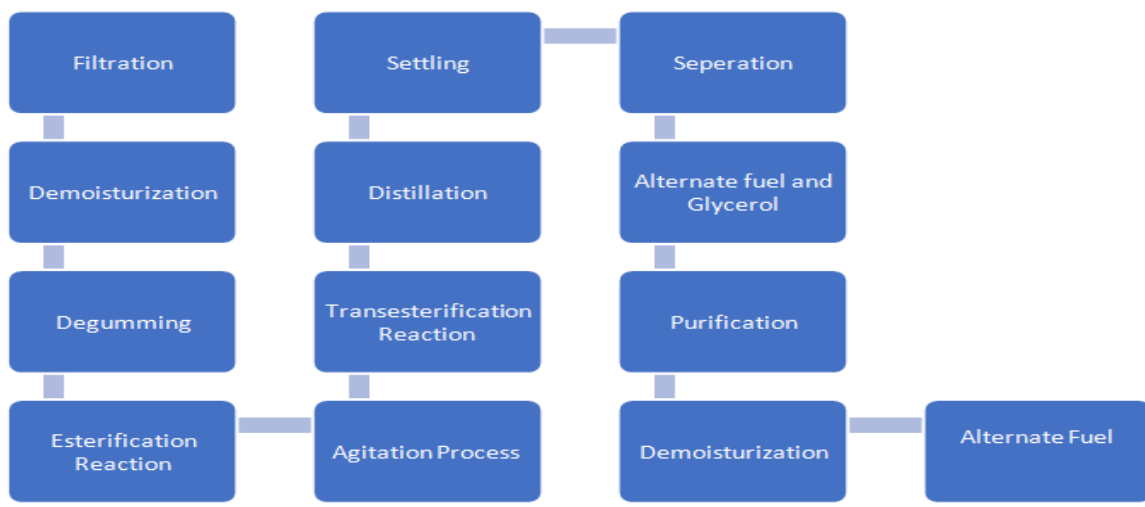
I. INTRODUCTION

The engine and fuel researchers are devoted to explore alternative fuels as the present world largely depends on petroleum fuel for generating power, vehicle movement and agriculture sectors. Price hike, limited reserve of petroleum oils and stringent emission regulation also forced researchers to find alternative fuels. In Bangladesh, there is limited petroleum reserve to meet the demand of the petroleum product and for this reason it is necessary to spend a lot of foreign currency for importing fuel every year. Recent price hike of petroleum oil incurs lots of money. Bangladesh imports most of the petroleum oils from Middle East. In this point of view, waste transformer oil (WTO) can be an alternative source for petroleum oils. WTO has significant physiochemical properties. WTO can meet a portion of our demand without any hesitation. There is a huge unused amount of transformer oil in Bangladesh which is rejected every year. This oil is not used for any other purpose. So, WTO is an important source for meeting the Demand of diesel in Bangladesh. Bangladesh imports approximately 2.4 million ton diesel each year [1]. It is well known that the transformer oil is used mainly in the electrical transformer for insulation purpose. Moreover, cooling is another purpose of using transformer oil in the electrical transformer while the transformer is running. Among various properties, one of the main properties of transformer oil is to sustain high temperature during operation. When an electrical transformer is in operation, the transformer oil is subject to mechanical and electrical resistance. For a certain

period of time, it is recommended to check the electrical and chemical properties of the transformer oil. By using WTO, Bangladesh can reduce importing a huge amount of petroleum products from foreign countries. Our attention goes to the WTO. WTO results from the power generation and transmission station, At present 100 per cent transformer oil is not used in place of diesel fuel (DF) to run the engine rather blends of WTO and DF

II. PROCESSES INVOLVED

The making of the Alternative fuel for the use of various diesel Engines consists of various steps from extracting the fuel from the Transformer to mixing it with diesel in a chemically balanced way without affecting the properties of diesel and waste transformer oil in a huge manner. These processes are carried out in a certain manner to get the efficient chemically balanced formula for the alternative fuel. The basic step before using any fuel is Filtration where we just filter the obtained Waste Oil from the Transformer so that the impurities bigger in size can be extricated from the oil and it can be further taken to carry out the other processes with a bit more efficiency.



Filtration: This method removes impurities that have poor solubility at these reduced temperatures. Another potential method of purification is an energy-intense process that involves distillation of the final biodiesel product.

Demoisturization: The moisture from the waste transformer oil is removed by heating it at 110oC for 10 minutes.

Degumming: Degumming is the process of hydrating phosphatides present in an oil by adding water followed by centrifugation. There are only three reasons to degum oil: to produce lecithin (phosphatides), to provide degummed oil for long-term storage or transport, and to prepare for physical refining.

Esterification: Esterification is the chemical process that combines alcohol (ROH) and an organic acid (RCOOH) to form an ester (RCOOR) and water. This chemical reaction results in forming at least one product of ester through an esterification reaction between a carboxylic acid and an alcohol.

Agitation: Agitation refers to forcing a fluid by mechanical means to flow in a circulatory or other pattern inside a vessel

Transesterification: transesterification is the process of exchanging the organic group R'' of an ester with the organic group R' of an alcohol. These reactions are often catalyzed by the addition of an acid or base catalyst.

Distillation: It is the process of separating the components or substances (Alcohol) from a liquid mixture by using selective boiling and condensation.

Settling: Settling is the process by which particulates settle to the bottom of a liquid and form a sediment.

Separation: A separation process is a method that converts a mixture or solution of chemical substances into two or more distinct product mixtures. Here, after settling the biodiesel is separated into two components i.e. Crude Biodiesel and Glycerol.

Purification: The obtained crude biodiesel is purified by water washing the fuel.

Demoisturization: Excessive moisture is removed from the fuel.

IV. METHODOLOGY

Engine Details

ICEngine set up under test is Research Diesel having power 3.50 kW @ 1500 rpm which is 1 Cylinder, Four stroke , Constant Speed, Water Cooled, Diesel Engine, with Cylinder Bore 87.50(mm), Stroke Length 110.00(mm), Connecting Rod length 234.00(mm), Compression Ratio 16.00, Swept volume 661.45 (cc)

Combustion Parameters

Specific Gas Const (kJ/kgK): 1.00, Air Density (kg/m³): 1.17, Adiabatic Index: 1.41, Polytropic Index: 1.28, Number of Cycles: 10, Cylinder Pressure Referance: 4, Smoothing 2, TDC Reference: 0

Performance Parameters

Orifice Diameter (mm): 20.00, Orifice Coeff. of Discharge: 0.60, Dynamometer Arm Legnth (mm) : 185, Fuel Pipe dia (mm) : 12.40, Ambient Temp. (Deg C): 27, Pulses Per revolution: 360, Fuel Type: Diesel, Fuel Density (Kg/m³): 830, Calorific Value of Fuel (kj/kg): 42000

$$BP = W \times N \times 0.45 \times 0.746 / 5000 \quad (\text{kW}) \text{----- (1)}$$

Where, W is load in IB and N is engine speed in rpm.

$$\text{Input Power} = \dot{m}_f \text{ CV} / 3600 \quad (\text{kW}) \text{----- (2)}$$

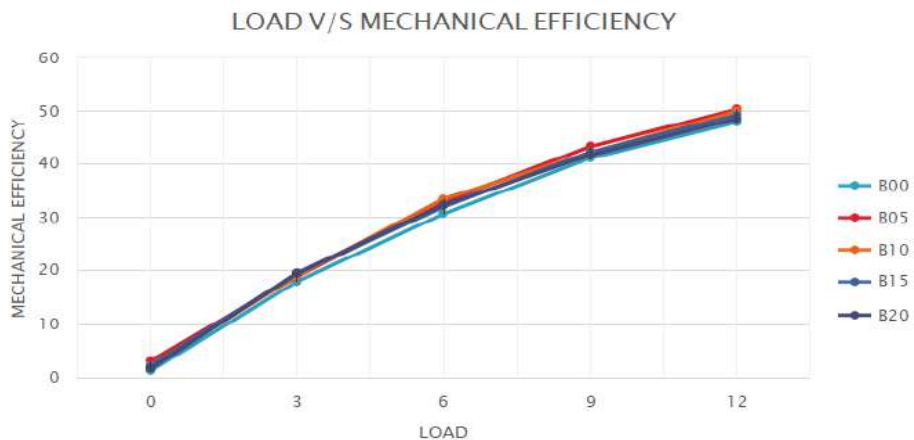
Where, \dot{m}_f is the mass flow rate of fuel in kg/hr and CV is the calorific value of fuel in kJ/kg.

$$\text{BSFC} = \dot{m}_f / \text{BP} \quad (\text{kg/kWh}) \text{----- (3)}$$

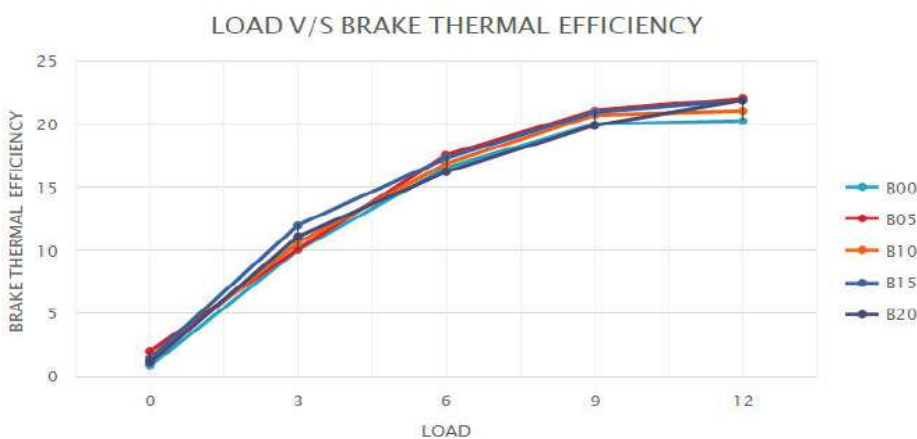
$$\text{Brake thermal efficiency} = 100 / (\dot{m}_f / \text{BP}) (\text{CV} / 3600) \quad (\%) \text{----- (4)}$$

V. RESULTS & DISCUSSIONS

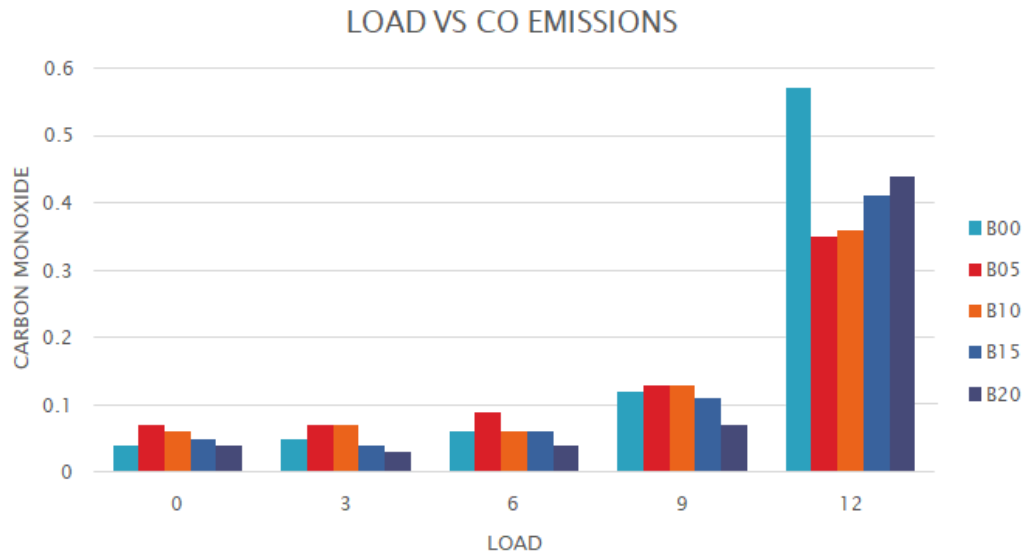
(V.I) Effects of WTO on different engine parameters For CR16: LOAD VS MECHANICAL EFFICIENCY:-



For Cr16: Load Vs Brake Thermal Efficiency:-



(V.Ii) Effects of WTO on Different Emission Parameters for Cr16: Load Vs Co Emissions:-



VI: CONCLUSIONS

The objective of this experiment was to use transformer oil as an alternative fuel. The pure diesel was used as base fuel for comparing the properties and performance parameters. The performance test was conducted on a diesel engine at a constant speed of 800. The results of the current investigation may be summarized as follows:

1. The viscosity of B05 blend is 2.4 and that of pure diesel i.e. B00 was 2.3 and the calorific value of WTO B05 blend was 41.7 compared to 42.1 of diesel. The flash and fire point of WTO was 72 and 82 respectively while for diesel flash and fire point were 66 and 72 respectively. This shows transformer oil is safer for storage
2. The brake thermal efficiency for each blend was found to be high because of proper combustion. The brake thermal efficiency of B05 was 22.05% whereas baseline diesel was 20.31% for the same power output.
3. The fuel consumption for B05 was higher as compared to DF due to the lower heating value.
4. The mechanical efficiency of B05 was 50.29 as compared to 47.88 of diesel fuel.
5. The exhaust gas temperature of blends were higher as compared to diesel fuel due to more residence time and higher viscosity.

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FOOT OPERATED WASHING MACHINE**Omkar A. Mandavkar¹, Tejas P. Komawar², Dipesh R. Gawad³, Shubham V. Gupta⁴ and Shaikh Abdul Bari⁵**^{1,2,3,4}Student and ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar 401501**ABSTRACT**

The foot operated washing machine is a huge innovation all by itself. Foot operated washing machine is especially designed for its use for washing laundry by means of foot application. Today, because of non-renewable energy cries out its basic need to use energy in another way or to save energy. This project involves the construction and use of the foot operated washing machine. The next pages in the paper include the constructions of foot operated washing machine, its raw material, its operation, benefits of the foot washing machine in terms of the actual electronic washing machine save time, water, electricity and not very expensive. His main expectation is exercises with the application of the foot to wash the cloths.

Keywords: foot operated, pedal, chain, cloths, washing, rinsing

I. INTRODUCTION

The project covers one of the daily activities of the washing clothes but solves many other problems with her as well. We wash our garments either by hand or using electric washing machines. Over the years, this has been a process that requires a lot of efforts and time. The project aims to solve the problem so many people have encountered in their daily lives. In rural areas and undeveloped countries, where electrical power is unavailable and expensive, electric washing machines become almost impractical. It uses a simple mechanism that utilizes a chain drive and converts human power into mechanical energy to wash cloth. The foot operated washing machine permits human beings to wash clothes in a more efficient manner with less effort and strain than using hand/manual washing.

The Project has the Following Objectives

1. Low-cost and low maintenance.
2. It should operate with less water.
3. It will be easy to repair when things go wrong.
4. Easy to operate and maintain as readily available parts.
6. Women do not have to be in contact with soapy water which may damage their hands.
5. Another way to reuse energy that we don't utilize during exercise.

LITERATURE REVIEW**A. Pedal Powered Washing Machine (PPWM)**

By: Adarsh Ranjan, Kushagra Sharan and Sudeep Mazumdar

This project not only covers one of the daily household activities (laundry), but also solves many other problems related to it. We all wash by hand or use an electric washing machine. This project aims to solve the problems that many people face in their daily lives. In rural areas where electricity is not available and expensive, electric washing machines are almost impractical. The main goal is to provide the product with another way to wash clothes when there is no electricity. But this project has more Product and manufacturing cost. This also has intricate shape. It also requires more maintenance due to more mechanical arrangements.

B. Design and Fabrication of Pedal Powered Washing Machine

By: Gaurang Bhatwadekar, Budye Salman, Nilesh Chiplunkar, Swapnil Devrukhakar, Singh Akashdeep Rajendra Mane

The pedal power washing machine is different from any other method of the cleaning device. The community may be reluctant to try a new machine. They have carry out a trial period in groups such as women's associations that are familiar with pedal drivers. They have achieved our goal of building a low-cost, manually operated pedal-operated washing machine that uses locally available materials to easily perform the required cleaning and rinsing functions.

C. Design and Analysis of a Pedal Operated Washing and Drying Machine

By: Hakizimana E*, Masengesho P, Cyusa O, Niyigena M

This washing machine is made from easily available parts at rural area thus, does not required to import any part or component. It uses the parts of bicycle for precision parts. therefore it is inexpensive and easy to build. this machine can also runs without electricity. we can easily perform washing and rinsing cycle on it. peoples in the city can be use this for exercise as well as washing clothes thus utilizing energy.

D. Pedal Operated Washing Machine Using 4-Bar Crank Mechanism

By: Blair Fargose, Mihir Raorane, Manas Dhumal, Chinmay Khanvilkar, Prathamesh Bidaye

In this pedal operated washing machine they have designs using 4 bar crank mechanism and bevel gear arrangement to transfer power. they have done calculation, modelling and analysis of their machine. From that they concluded that there machine will work smoothly and effectively. their machine allows cloths to wash faster.

E. Design & Fabrication of Pedal Operated Multi Purpose Machine

By: Yash Hiragar, Ketul Dantani, Gautam Prajapati, Rixit Kakani

This project aims to develop pedal operated multipurpose machine. this machine can be operated when electricity is not available. There main objective is to make machining operation cost effective and eco friendly.it can run with zero operating cost. unskilled worker can also operate this machine. This machine can perform drilling & grinding operation on materials like wood, aluminium & steel which having less hardness & thickness.

F. Pedal Power Generation: An Implementation of Stationary Bike Generator

By Ron Edward Guia, Aodrel Dave Ilagan, Lorenz Gerald Sauz, Engr. Favis Joseph Balinado

This study shows the design and development of an alternative source of electricity in supplying one household that is in rural areas. With the use stationary bike, the user can be productive in different ways beside of being active in cardio workout but also productive in such away the calorie burned upon using the pedal can produce a certain amount of voltage that is a part of power.

G. Design and Fabrication of a Foot Operated Washing Machine

By: Chetan rajoria, Deepali Gautam, harsh Rajput, Abhinav vats, amit singh

The current research project aims to solve the problem of electric supply to people because of which many in rural area are unable to wash clothes. Nowadays there is electric supply which is provided in most parts of the world but we cannot neglect those who don't have access to electricity. In India most of village and hilly areas are suffering from lack of electricity supply. So, to overcome above problem we select the washing machine, which is operated manually. It requires no power supply. It is a machine which use the power generated by human pedalling and with the use of bevel gears and shaft converts the pedalling motion into required rotary motion of the inner drum of washing machine. This is a low cost project and can be transported veryeasily.

H. Design and Fabrication of a Pedal Operated Power Generator

By: Anyanwu s. Ikechukwu, ashinze e. Anthony

In conclusion, this project was designed to serve as a model/prototype to meet specific need in our locality. The device can also serve as an alternative power source in extreme case scenario even in urban centres. Since the device is manually operated, it can be used in areas where there is no power supply and would always be readily available. The device is environmentally friendly as it produces no waste in the process of its operation, and the device work with little or no noise. The system proved efficient since even with a minimum peddling speed, the system produced enough voltage required to charge the battery in order for the system to be usable by almost anybody at anytime.

I. Development of A Human Powered Pedal Washing Machine

By: M A Fajobi, E Y Salawu, J Azeta, J O Dirisu, O O Ajayi, P Onwordi

Human powered pedal washing machine has been designed using materials suitable for its application. An existing bicycle was used as the pedal and other parts of the machine such as the drum, the frame was fabricated using galvanized steel. The material selection was put into consideration, such as corrosion because of the machine's involvement with water. The human powered pedal washing machine was tested with a used dirty Laboratory coat. The peddling washing was first done for the first 15 minutes, using water and sunlight detergent soap. The washing testing was done on cloth and it was excellent because the cloth was clean. The human powered pedal washing machine performed well with all the designed parts functioning well. This is an eco-friendly machine, maintenance cost free, energy conservation machine and highly sustainable for underdeveloped nationsof the world.

II. PROBLEM STATEMENT

The problems that we are currently facing in current trends:

- A. High cost of electricity powered washing machines.
- B. It require electricity to run electric washing machines, it can't be run if there is power cut-off.
- C. Water requirement is more for washing.
- D. Manually washing of clothes can cause detergent to come in contact with human hands which may cause allergic reactions to there hands.

III. FABRICATION METHODOLOGY

- First, as the inner drum was open from one side we have to close that side of the drum so we cut a plate of same diameter as the inner drum and welded it to the drum. Then on the outer and inner drum we cut the door. Then on the outer drum we created a hole on both sides on its centre which will be greater than the shaft diameter. And then on the inner drum shaft was welded by argon welding on both the sides and also hinges and latches were welded for opening and closing the door. As the washing chamber was as tank it was open from one side so argon welding was done to close that opening.



- Then for the frame MS pipes were cut using the hack saw as per the required sizes for the main frame of the machine. First the side frame were welded together and then the bottom parts were welded to the side frame and was made sure that is stands still without any wobble then two more square pipes were welded to give support to the drum so is cannot be moved while operating the machine. And after the welding we made sure that there were any wobbling even after the load of the drum is placed. Then on the side frame at top side holes were drilled so that the plummer block can be fitted on that spot.



- A cycles centre frame was cut which will works as the driving parts main frame, then from the cycles rare hub was cut and it was fitted on to the left side of the shaft. Then cut section of the cycle frame was welded to the stand and then the handle was welded to it. The on the main frame bolt arrangement was made so that the cycles frame can be removed or attached easily. And after all the fittings were completed we painted the both the frame of the machine.



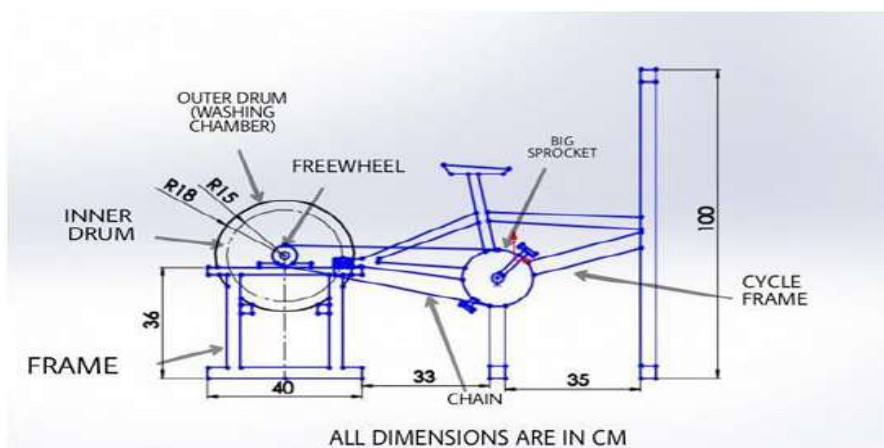
IV. WORKING

First of all open the outer and inner drum doors. put the clothes in inner drum and close the door of inner drum. Then fill 8 to 9 litre water for 1.5 kg clothes and add some detergent as per requirement. Then close the outer drum and then sit on seat provided on cycle frame. Then start cycling slowly at the begin, then rear freewheel also starts rotating due to chain sprocket arrangement. then inner drum also starts rotating which creates turbulence between clothes. when pedalling at a rate of 30rpm the inner drum rotate with speed of 90rpm. after about 6 to 7 mins of continuous pedalling the washing cycle gets completed. Then remove the soapy water by opening the drain valve located at the bottom of outer drum. Then add about 2 to 3 litre water for rinsing cycle, it requires faster pedalling rate i.e. when pedalling at 60rpm, at that time inner drum rotates at about 180rpm. Then approx. after 5min rinsing of cycle get completed. then remove the clothes from the washing machine.

V. Fabricated Model



VI. Calculation Dimensions,



For inner drum,

Diameter of inner drum= 30cm Length of inner drum= 42cm

Volume of inner drum = $29688\text{cm}^3 = 30\text{litre}$

For outer drum,

Diameter outer drum= 36cm

Length of outer drum= 50cm

Volume of outer drum = $50893\text{cm}^3 = 50\text{litre}$

For big sprocket and rear gear freewheel, Big sprocket diameter =

Rear sprocket diameter =

No. of teeth on big sprocket = 42 No. of teeth on rear sprocket = 14

Gear ratio= $\frac{\text{No. of teeth on big sprocket}}{\text{No. of teeth on rear gear}} = \frac{42}{14} = 3$

Water required for 1kg laundry = 5-6 litre Maximum weight of cloth that can be wash= 3kg Average weight of human= 60

Average rpm can human produce at big sprocket = 60rpm Average rpm at inner drum = 180rpm

Average power transferred by human during pedalling = 125kw (assumed)

VII. RESULT

Observations made while testing of washing machine:-

Trial no.	Load (in kg)	Washing time (in min) at average 90 rpm	Rinsing time (in min) at average 180 rpm	Total time(in min)
1	1.5	7	5	12
2	2.5	8	5	13
3	3	9	6	16

VIII.

CONCLUSION

We have made foot operated washing machine with the use of chain and sprocket mechanism. this project can be feasible in our day to day life. Middle class family can also afford this. operation time for this product is also less without applying much great efforts.it also consumes less water. Also strain of washing clothes on women’s get reduce. from this we are concluding that this concept can be use at rural as well as urban areas.

IX. FUTURE SCOPE

- A. Increasing capacity, so that more clothes can be washed, thus utilizing the wasted energy.
- B. The energy wasted during washing can be utilized in most fruitful way by using it in another household machine which would work simultaneously as the washing goes on. Load on the new machine would be such that entire energy is consumed and not wasted. The excess energy can be used to generate electricity to charge battery. It can be used to operate pedal powered pumps. Many machines operated on pedal power have been developed such as, Cassava graters, Coffee/grain hullers, cracking of oil palm nuts, Potter's wheels, Flexible shaft drive for portable grinders, saws, etc., Tire pumps, Sewing machines.
- C. Designing and Implementing the Drain Valve mechanically A normal washing machine uses an electronic control valve in the drainage system to control the flow of waste water out. This valve can be designed mechanically using bicycle brakes. The brakes would block the rubber outlet pipe when the clothes are being washed, rinsed or dried. The blockage would open to make the waste water flow out after a washing cycle or during drying.
- D. We can use gear shifter as used in gear cycle to vary speed.

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COMMON EFFLUENT TREATMENT (BY PHYTORID TECHNOLOGY)**¹Khan Abdu, ²Patel Nouman, ³Vergese Rinson, ⁴Tejas Pandey, and ⁵Sayed Farhan Ali**^{1, 2, 3, 4}Student, ⁵Assistant Professor, Department of Civil Engineering, Theem College of Engineering, Boisar**ABSTRACT**

Constructed wetlands are artificial wastewater treatment system of shallow experimental tanks, ponds or channels that are planted with locally available wetland plants. They work on natural capacity of plants to treat wastewater from different sources. In view of rising concern about pollution of water bodies due to discharge of waste in them, it is necessary to initiate alternative thinking as conventional methods through STPs (Sewage treatment Plants) have had limited success. In recent years the application of specifically designed wetland based technology (popularly known as Phytoid technology) for treatment of wastewater- municipal, urban and agricultural, is becoming widely acceptable. It treats the wastewater in natural manner without the use of chemicals. In short, Phytoid technology is an improved wetland system for treatment of wastewater. The main objective of present research work is to provide and popularize a simple, feasible, practically sound, ecofriendly and cost effective technology for wastewater treatment. Phytoid technology is such a type of system, which reduces the impact of sewage and converts into useful water for gardening and irrigation purpose.

Keywords: Constructed wetland, wastewater treatment, locally available Phytoid plants species and Phytoid technology.

1-INTERODUCTION

The Earth is called the blue planet, since freshwater is a scarce resource available in earth. Only 2.5% of all water resources are fresh water, of the 2.5% which are freshwater, nearly 70% is not accessible, because it is bound in snow and ice, thus only 0.5% of the total water on earth is accessible for drinking and other fresh water uses. Primary water source is polluted to a great extent through the discharge of harmful substances. It is estimated that every 1m³ of contaminated water once discharged into water bodies will contaminate further 8to10m³ of pure water. In addition to this, the effects of the globe warming has increase the water source in one side and scarcity in the other part in major uses such as agriculture. Population in India is growing by geometric proportion whereas food production is growing by arithmetic proportion. Rapid industrial development and increasing population is increasingly exerting pressure on limited natural resources. The population growth has not only increased the fresh water demand but also increased the volume of wastewater generated. Total waste water generated in India is 38255 MLD and 30% of it is treated by different means. Similarly in Maharashtra 26469 MLD wastewater is generated and 16% is treated, (CPCB, 2010).

When toxic substances enter a body of water, they will be dissolved, become suspended in water or get deposited on the bed of the water body. The resulting water pollution causes the quality of the water to deteriorate and affects aquatic ecosystem. Pollutants can also seep down and affect the ground water deposits. If waste water is left untreated in water source then there after it increases load on water treatment plant and thus increases cost of water treatment. Following are the impacts of emitting the untreated water in the water source: 1. Odour problems 2. Mosquito nuisance and breeding of insects 3. E-coli and other pathogenic micro-organisms can contaminate drinking water sources. 4. Spreading of communicable diseases like cholera, dengue, malaria, etc 5. Impact on bathing quality of rivers, beaches etc.

2- STATEMENT OF THE PROBLEMS

Problem concerning water sanitation stem from the rise in urban migration and the practice of discharging untreated wastewater. The uncontrolled growth in urban areas has made planning and expansion of water and sewage systems very difficult and expensive carry out. In addition, many of those moving to the city have low incomes, making it difficult to pay for any ware system upgrades. It is common practice to discharge untreated sewage directly into water bodies of water or put onto agricultural land, causing significant health and economic risks. Water-related diseases include dengue, filariasis, malaria, and yellow fever etc.

3-OBJECTIVES OF THE PROJECT

- To Survey the selected site
- To collect the waste water sample from these respective resources
- To perform physical test on waste water samples
- To collect the various plants species

4-PURPOSE OF THE PROJECT

It achieves standards for tertiary treatment with low cost, no electricity, no chemicals for pH adjustment. It enhances landscape and gives site a green look. Use of plants species along with their root zone system along with the natural attenuation processes can be combined together to get the Phytorid technology. Use of untreated waste water in agriculture is of public concern due to possible phyto-toxicity and incorporation of metal cat ions into the food gradient.

5-APPLICATION

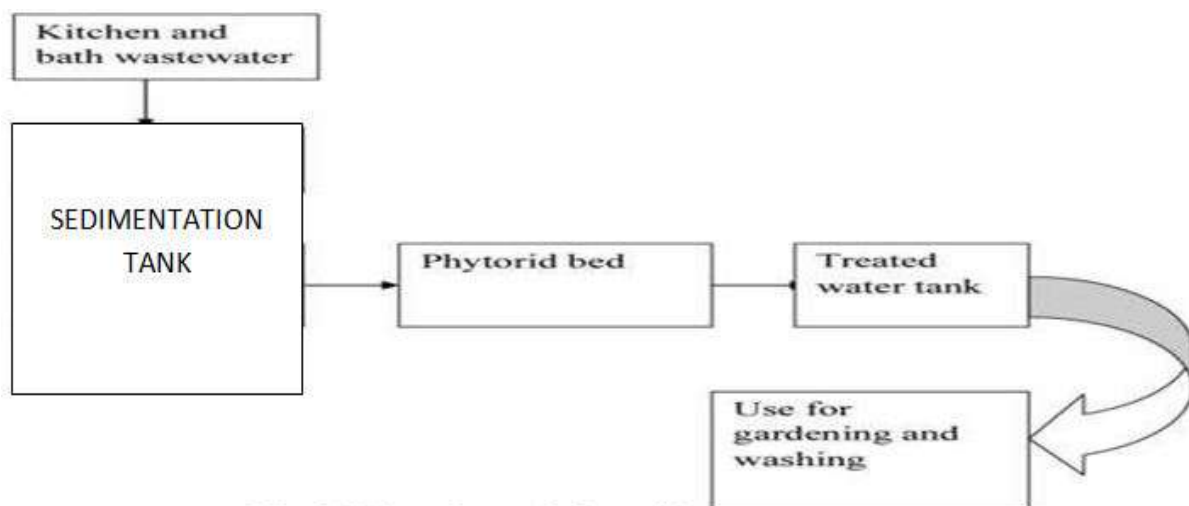
Phytorid system is useful for treatment of waste water in following applications: -

- Domestic wastewater (including decentralized Municipal waste water treatment)
- Colonies
- Airports, Commercial complexes, Hotels Open drainage cleaning of nallah water
- Agricultural wastewater
- Dairy waste
- Slaughter House Waste
- Fish pond discharges.
- Pretreated industrial wastewater
- Municipal and fill leachates
- Several other applications

6-GREEN POINTS

Best Adoptable technology of in-situ treatment and Reuse of wastewater. Phytorid Technology carryout on-situ treatment and reuse of Grey water up to 95%, which would attract total of 5 credits on Indian Green Building Certification (IGBC).

7-METHODOLOGY



Volume of Sewage: 35 liters.

Source: Abhadnya bungalow, at post Chikhle, vadakati pada, Dahanu.

Volume of Phytorid Tank: 90 litres. It depends upon quantity of sewage. (Note: Volume of tank should be more than two times the volume of sewage with 24 hrs detention time.)

Use of Baffle Walls: Baffle walls are provided to increase the travel time in order to maintain the detention period i.e. 24 hrs, they are spaced at 12 cm, 18 cm, 18 cm, 12cm from inlet to outlet respectively.

Size of Phytorid Tank: Depth of phytorid tank depends on depth of root zone in case of common arrow head the depth of root zone is around 0.5m in fully matured plants. Depth of roots of small Plants is around 0.2m and

hence we have adopted tank depth of 0.5m. After knowing depth of tank, from volume of tank the length and breadth of tank are obtained as following:

Length of tank =0.6m

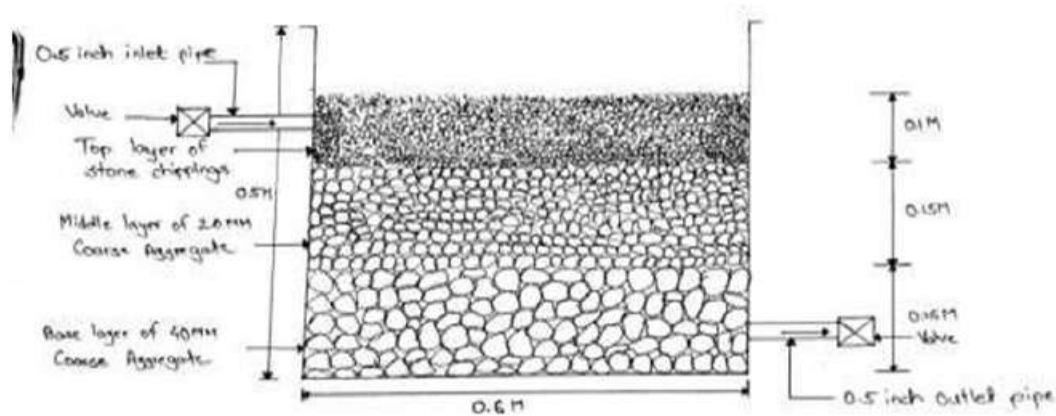
Breadth of tank =0.3m

Inlet and outlet holes of size 0.75 inch are provided to the phytorid tank based on the size of the pipe used. Pipe used to convey waste water is of diameter 0.5 inch. For regulating the flow two valves are provided at inlet and outlet pipe.

Sedimentation/ Storage Drum: Volume of the drum is equals to volume of sewage (i.e.30 lit.) An Inlet pipe of phytorid tank is connected to the storage drum.

Aggregate: Aggregates of two different sizes are provided in three different layers. Number of layers are decided from depth of tank. Three layers of aggregates are provided of depth 12mm, 13mm, 15 mm from bottom to top of size 40 mm, 20 mm respectively and third layer of stone chippings. Max size is kept at bottom as it act as a supporting media to the layers above.

Storage Tank at Outlet: For collection of treated water storage tank is provided at outlet of phytorid tank and is used of same volume as of sewage.



7-WORKING PROCESS

1. Firstly the waste water is collected form source and stored in the storage/sedimentation tank where sedimentation of suspended solids takes place under the process of anaerobic decomposition.
2. After this waste water is allow to enter in the phytorid tank by regulating valve with designed velocity. Once the water is passed through the root zone of cannaindica actual treatment process is started.
3. When roots of plants come in contact with waste water they uptake the nutrients present in waste water which are in form of nitrates, potash etc. and used as food.
4. Simultaneously oxygen is added in waste water from roots due to process of photosynthesis an hence B.O.D. removal takes place after the 24 hrs. detention period treated water is collected into storage tank.

Treated water can be either send for tertiary treatment or directly used for gardening.



8-RESULTS & DISCUSSION

For performing experimental analysis of phytoid technology a working model (prototype) was built in Abhadnya bungalow.

Dimensions of the tank (0.6m*0.3m* 0.5m) are already discussed in chapter 3. Keeping the top freeboard of 0.1m. Therefore, revised volume of tank = $0.6*0.3*(0.5-0.1) = 0.072$ cubic meters = 72litres

Now, since the aggregates and roots of phytoid plants have their certain volume, sample water was poured into the model (up to the top most point of the stone chipping layer) for checking its maximum capacity. About 35 litres of sample was drained to achieve its capacity. Hence maximum capacity of the model come out to be 35 litres perday.

Test on Wastewater Sample

Various test was conducted on waste-water are pH, Turbidity, Hardness, etc. These tests were conducted to know properties of waste-water before using it in Phytoid treatment plant.

Determination of Ph Procedure

Take the liquid sample which the pH is to be determined in class beaker. Note the sample temperature. Rinse the electrode thoroughly with distilled water and carefully wipe with a tissue paper. Dip the electrode into the sample solutions and find out the reading on the pH meter. The final value will give the pH of the sample.

Result: Ph value of sample = 8.6

Determination of Turbidity Procedure

Switch the instrument on. Open the lid of the sample compartment. Insert a test tube filled with distilled water into the sample compartment. Close the lid. Adjust 'SET 0' control to get '0' displayed on the read out. Open the lid. Replace the test tube filled with distilled water with a test tube filled with formazine standard. Close the lid. Adjust the 'SET 100' control to get '100' displayed on the read out. Repeat the above operation to get consistent values of 0 to 100 within 1% to 2%. Thoroughly shake the sample. Wait until air bubbles disappear and pour the sample into the nephelometer tube. Read the turbidity directly from the instrument.

Result: Turbidity of sample = 39.24 NTU

Determination of Hardness Procedure

Dilute 25 mL with distilled in an Erlenmeyer flask. Add 1 ml of buffer solution . Add two drops of indicator solution. The solution turns wine red in color. Add the standard EDTA titrate slowly with continuous stirring until the last reddish tinge disappears from the solution. The colour of the solution at the end point is blue under normal conditions. Note down the volume of EDTA added.

Result: Hardness of sample = 745.25 PPM

Determination of chloride Procedure

Take 20ml of the sample in a conical flask and add 1-5ml of K_2CrO_4 solution. Titrate the contents against 0.01N $AgNO_3$ until a red tinge colour appears.

Result: Chloride of sample = 365 CaCo₃/litr.

9-CONCLUSIONS

Based on the above analysis, It can be concluded that the test performed on waste un treated water should be between permissible value after treating the water. It can be concluded that phytoid technology is a kind of constructive wetland and a successful approach towards decentralization and reuse of wastewater, which gives fair quality results. Moreover, the treated water has its application in: Irrigation, River dilution, Flush tanks, Gardening etc. Water of high quality can be obtained if the retention period is increased (48 or 72 hours according to NEERI). The materials and methodology used to treat the wastewater with Phytoid technology.

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SELF-ILLUMINATING ROAD

Jeevan Chandrakant Kadav¹, Chinar Rajesh Naik², Kaushik Dilip Naik³ and Chaitanya Jayant Tambvekar⁴ and Faiz Mohammad Khan⁵

^{1,2,3,4}Student and ⁵Professor & HOD, Department of Civil Engineering, Theem College of Engineering, Boisar

ABSTRACT

“The objective of this research was to develop a soy-based luminescent sealant for use on concrete surfaces. The luminescent sealant is a mixture of soy methyl ester polystyrene (SME 50 PS) and strontium aluminate; a phosphorescent powder that slowly luminesces after being excited by light. A test procedure was developed to quantify the magnitude and duration of the luminance of the coated concrete surface, which is key to evaluating the performance of the luminescent sealant. The luminescent sealant was excited in a consistent manner with a xenon lighting system that simulates sunlight, a photometer (light measuring instrument) that measures the luminance of the excited concrete surface, and a housing unit to prevent extraneous light from the surroundings to influence the test results. The results of the tests performed indicate that the luminescent surface emits light i.e Glows) for approximately 24 hours in a dark space after it was excited. It was found that larger particles of strontium aluminate luminesce for a longer time than smaller particles. The excited sealant's luminance was independent of time exposed to Light coming from the xenon lighting system.

The researchers introduced different quantities of strontium aluminate to traffic paint to achieve phosphorescence. Factors to consider for his study are charging time, lux received, luminance emitted, and amount of SrAl₂O₄: Eu added and its effects through abrasion. It was found out that the luminance emitted vs. time follows a power $(x) = ax^n$ where x is in minutes. There are positive trends when relating lux emitted with charging time with per cent strontium aluminate added with millimeters of paint removed.

INTRODUCTION

New developments in road construction use different technologies in a myriad of ways. Technologies like water-absorbing and silent asphalt, or intelligent traffic light systems, improve a road's ability to fulfil its current function, namely: enabling transportation in the most secure and comfortable way.

But next to these improvements, another branch of innovative technology has been created technologies that not only enhance the current functionality of a road, but add a new aspect or even a whole new function to it. These 'smart-road technologies' make use of principles and materials that are not a necessity to construct a road (like asphalt is), but are used in many settings, (like solar panels). The road becomes smart by integrating technologies, previously used in other contexts, in order to add a new function or enhance the driving experience. Three examples of these smart road technologies are solar roads, paint-related technologies and charging lanes. They will be the object of investigation in this magazine, because they are currently in the furthest state of development and can have an enormous impact on society in several different ways. In order to have solid base for further analysis, the smart-road technologies will be now introduced in regard to their function and then explained in detail in subsequent chapters.

1. LITERATURE**RESEARCH PAPER 1**

Topic: - Luminescent Technologies

Author Name: - Wiedemann, E. and H. Ebert. (1888), 1889.

Highway lighting and roadway safety goes hand in hand. The usage of roadway lighting is still one of the most effective methods to prevent roadway accidents. Integration of other safety features of a road is also part of the highway design. The integration of the mixed strontium aluminate and paint to the highway system together with the lightings seems ineffective as observed by the researchers since both emit light that produced silhouette, and it is obvious which one is more beneficial. This mixture works best when there are absolutely no lighting present at night since this only produces small amount of luminance. Nonetheless, this might have the potential to still save lives when worked properly.

RESEARCH PAPER 2

Topic: - Character of the light emitted by incandescent zinc oxide

Author Name: - Nichols, E. L., and B. W. Snow. (1892).

Sunlight is measured from the lux meter throughout the month of September to October during the monsoon season. Light source emitted an hour before dark is assumed crucial since it charges the strontium aluminate

mixed paint. In this test, the researchers obtained the average illuminance from 5pm-6pm from previous testing and replicate the conditions in a controlled environment and compare the illuminance emitted. Depending on the amount of lighting present during the day, the amount absorbed by the glow in the dark traffic paint depended on the illuminance present throughout the entire day.

RESEARCH PAPER 3

Topic: - History of Luminescence

Author Name: - E. Newton Harvey. (1957).

There are two types of paint use in road one is glowing paint and other is dynamic paint glowing paint is glow at night and dynamic paint glows in special circumstances like low temperature. Many accidents occur or can be correlated precisely with weaker visibility of road markings. When drivers due to weaker conditions visibility cannot see road markings, often lose their orientation to their current position, as in the highly mortised countries of the world, a significant proportion of accidents occur at night.

RESEARCH PAPER 4

Topic: - Advance in immunomodulation & research

Author Name: - R. John Koshel (2013)

A phosphorescent material is simple material that absorbs light but does not emit instantly but fluorescent material emit instantly. The intensity of phosphorus paint is more than fluorescent paint on the road causing the cross section of the road that is designed for the vehicles from the opposite direction or landing from the road because they are not able to detect in time where the edge of the pave mentor landing from the road because they are not able to detect in time where the edge.

RESEARCH PAPER 5

Topic: - Illumination of Road

Author Name: - Jack L. Lindsey (1997)

The paint is highly durable with a life of 12 years. the strength of glow is hardly impacted by aging Many accidents occur or can be correlated precisely with weaker visibility of road markings. When drivers due to weaker conditions visibility cannot see road markings, often lose their orientation to their current position on the road. If the lifespan of this mixture could last for more than or equal to a year, then this would be a big contribution to the roadway safety. The Bureau of Research Standards continues to innovate new or better materials in the field of civil engineering. With this advancement in research, this study has the prospect to be further improved, later might be adopted by the government.

RESEARCH PAPER 6

Topic: - Illustration design with non-imaging optics

Author Name: - Richard C. Ropp (2013)

Fluorescent paint has two variants one is visible and invisible (transparent). Where visible use for glowing at night. And invisible use for dynamic lighting Information to the driver is usually related to objects that transmit a message Typically, there is very little technology that goes into roads. They tend to be made out of asphalt or concrete, which is compacted into a smooth, Solid surface and painted upon to indicate certain restrictions, routes and information. And that's pretty much it.

RESEARCH PAPER 7

Topic: - Properties of green phosphor in LDPE and polymer

Author Name: - D.B. Bem, H.C. Swart, A.S. Luyt, E. Coetzee, F.B. Dejene (2009)

GID green colour is pale green colour glows luminescent green in dark this paint produces brightest glow. GID aqua blue colour is pale green colour luminescent blue in dark GID yellow is a bright neon colour which glow yellow in uv light. This yellow paint is not preferred because of fade colour.

In the near future, the road (road markings) will "glow" in the dark without being illuminated by headlights of the vehicle, thanks to a new type of material for road markings, modern technologies and new materials for the road.

RESEARCH PAPER 8

Topic: - The luminescent properties of persistent

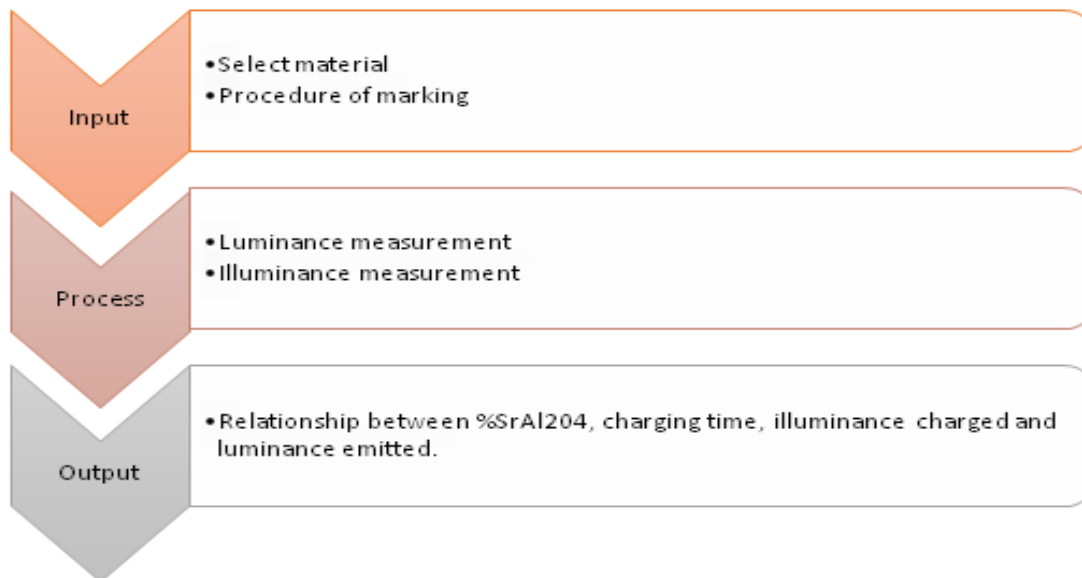
Author Name: - D. Haranath, Virendra Shankar, Harish Chander (2003)

Multi-colour emissions of Eu²⁺ doped SRA samples have been prepared using high temperature treatment. Addition of a stoichiometric excess of alumina or introduction of a rare-earth halide impurity shifted the

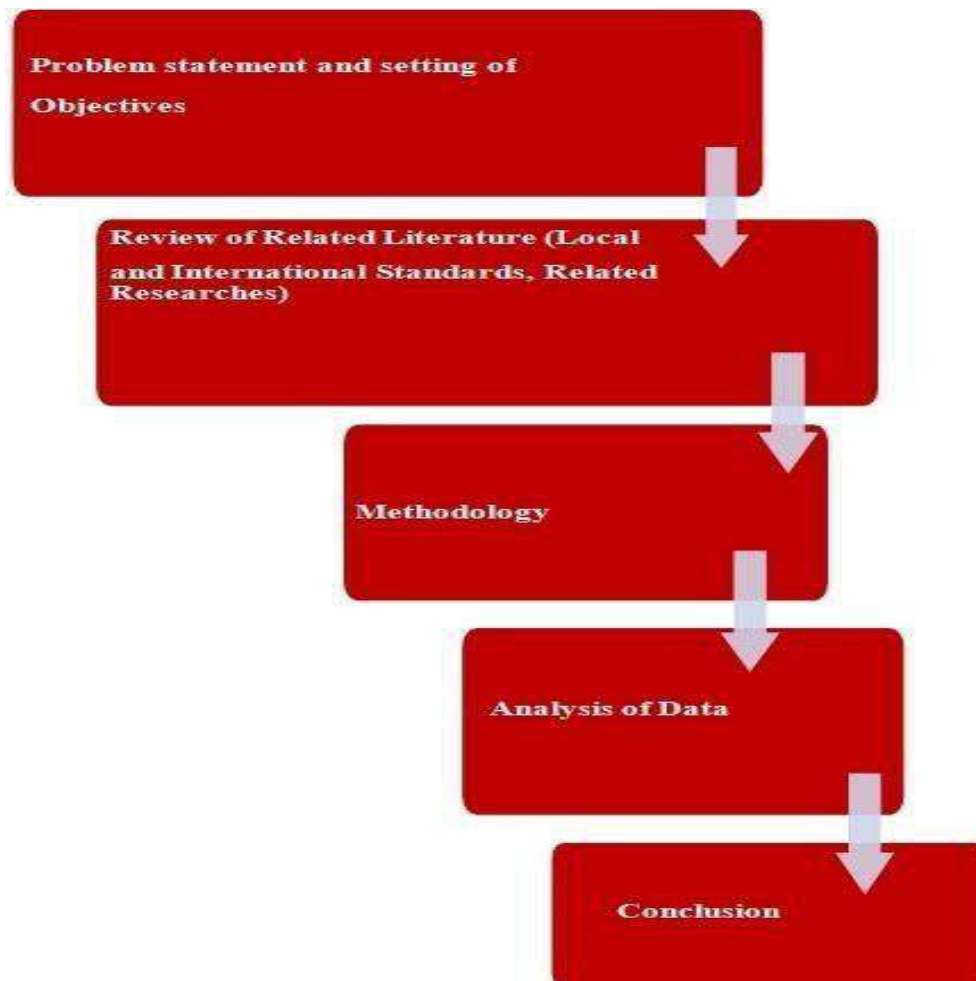
emission colour of the phosphor towards the blue part of the visible spectrum, whereas a change in the type of reducing atmosphere from CO to urea vapour shifted it towards yellow-green. The colour coordinates mentioned in the emission spectra clearly indicate the exact location of emission wavelengths in the colour space. The phases and the melting behavior of various SrAl₂O₄ phosphors noted in this study were checked by XRD and SEM observations.

2. DESIGN METHODOLOGY

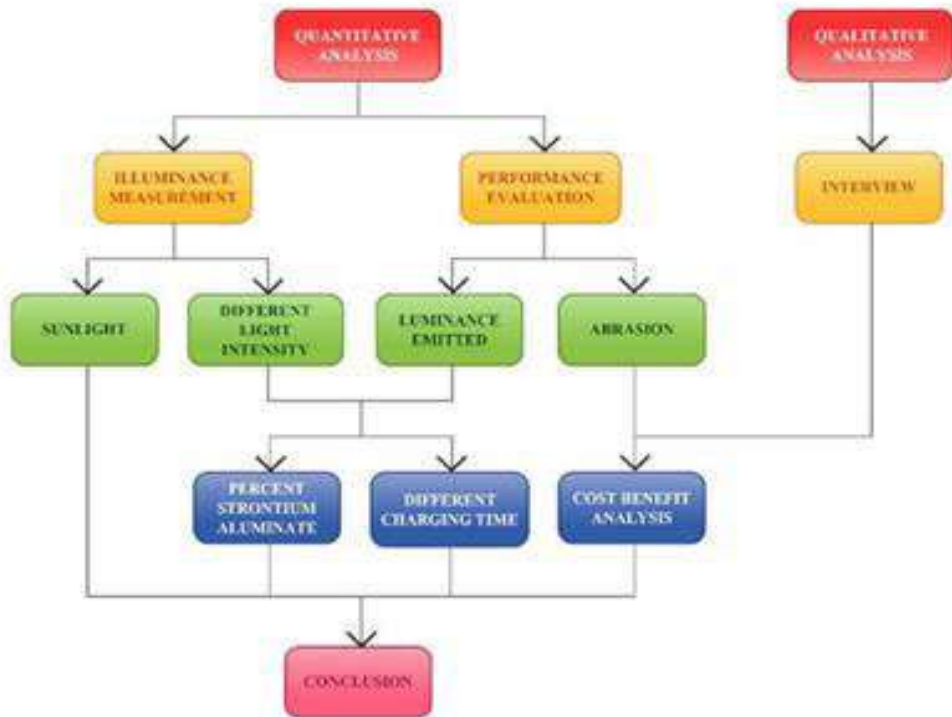
1) Conceptual Framework



2) Analytical Framework



Overview of Methodology



I. CONCLUSION

Traffic signalization is a visual guideline of traffic situation and affects the behavior of all the participants, and also provides unambiguous and clear information to all road users, especially drivers in pursuit of the chosen path and adjusting the speed technical elements of the road. Drivers in driving should detect, recognize and understand traffic signalization, and for that greatest impact has her visibility cannot see road markings, often lose their orientation to their current position on the road causing the cross section of the road that is designed for the vehicles from the opposite direction or landing from the road because they are not able to detect in time where the edge of the pavements is. Information to the driver is usually related to objects that transmit a message. (E.g., Traffic sign or road makings).

II. REFERENCE

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2. <https://www.slideshare.net/abdultayyebshabbir/smart-road-in-future>
3. <https://newatlas.com/smart-highways/24836/>
4. <https://www.fastcodesign.com/3037527/glow-in-the-dark-highways-open-in-the-netherlan>

MOVABLE ROAD DIVIDER

Harshad Suresh Kondaskar¹, Pinak Sunil Lonushte², Chaitanya Krushna Mahale³, Bhushan Pandurang Patil⁴ and Faiz Mohammad Khan⁵

^{1, 2, 3, 4}Student and ⁵Professor & HOD, Department of Civil Engineering, Theem College of Engineering, Boisar

ABSTRACT

This paper presents Smart Movable Road Divider for controlling the traffic congestion in metropolitan cities and to provide a free path for the ambulance. The work presented in this paper focuses on reducing the latency in traffic and free path for ambulance. The existing Road Dividers consists of equal number of lanes. Usually, in morning and evening peak hours the opposite side of the Road Divider is generally underutilized. To overcome this, Smart Movable Road Divider is implemented where the divider is moved based on the density of the traffic using IR Sensors. If the density of the traffic is high on one side, the divider is moved to the other side. Then the density of traffic is stored in cloud which is possible through IoT. A free path for Ambulance is provided using RF Module by controlling the traffic signal. A Prototype is developed and tested for the Congestion control which also works on safety measures by intimating the drivers about the movement of the Divider.

INTRODUCTION

In recent years, with an ever increasing rate of development in metro cities around the world, there has been proportional increase in numbers of automobiles on the roads. Although the number of vehicles using the roads has increased, the static road infrastructure is almost the same and is unable to cope with changes like congestion, unpredictable travel- time delays and road- accidents that are taking a serious shape. Traffic congestion has been one of the major concerns faced by the metropolitan cities today in spite of measures being taken to mitigate and reduce it. It has emerged as one of the main challenge for developers in urban areas for planning of sustainable cities. In developing countries, like India, traffic is inherently chaotic and noisy. Identification of magnitude of traffic congestion is an essential requirement for defining the congestion and finding appropriate measures. The main focus of this paper is aimed at understanding the recurring urban congestion, its measurement, precautionary measure and suggests a remedial measure for the same. The implication of widening existing roads or building new ones will only results in additional traffic that continues to rise until peak congestion returns to the previous level. The total available space within the city for the construction of roads, railways and other transportation is restricted. The paper discusses implementation of movable traffic dividers as congestion release strategy for metropolitan areas instead of traditional solution of widening the roads. The moveable traffic divider helps in there configuration of road capacity, so as to attain optimum benefit from roadway usage on the existing road. The problem with Static Road Dividers is that the number of lanes on either side of the road is fixed. Since the resources are limited and population as well as number of cars per family is increasing, there is significant increase in number of cars on roads. This calls for better utilization of existing resources like number of lanes available.

I. LITERATURE REVIEW**II. Implementation of Movable Road Divider Using Internet of Things (IOT) [1]**

In this project the road is connected to cloud where continuous monitoring of the traffic is done and intensity of traffic is Uploaded to cloud. Traffic intensity which is available in cloud can be used for various purposes like traffic updates on various apps such as HERE maps. After uploading traffic updates on cloud by considering traffic intensity in three variables like LOW, MEDIUM and HIGH road divider is moved accordingly. If intensity is LOW then divider stays in its position.

If intensity is MEDIUM then divider moves by a small distance. If intensity is HIGH then divider moves by a large distance. The project also provides solution to traffic clearance for the ambulance. Using RFID a cloud is made to detect the arrival of ambulance and then to make a way specially for ambulance by moving divider of the road accordingly. Hence it is concluded that it is possible to avoid congestion in a given route by moving the divider to widen or narrow the road and clear the traffic. Also it is possible to provide a free way for the ambulance irrespective of the traffic on the road.

Controlling of Traffic Using Movable Road Dividers [2]

In this paper, we have successfully designed and developed a demo model of 'Controlling of traffic using Ultrasonic sensors', in which the results are satisfactory. Since it is a demo model, we have only shown it through one way of traffic using ultrasonic sensors . The traffic congestion data from the sensors is given to the nearest traffic control room using a wi-fi module .The data from the sensors is updated automatically. But in real time traffic congestion can be in more than one direction and then also this module can be used by using image processing rather than the basic sensors.

Design and Implementation of Movable Road Divider [3]

In this paper, we had designed and implemented a demo model of „Movable road divider“. The data from the sensors is updated automatically and driven to the nearest traffic control room using a Bluetooth module. In real time traffic congestion can be in more than one direction, then this module can be implemented using image processing instead of the basic sensors.

Automatic Movable Smart Road Divider Using IOT [4]

The proposed structure helps to reduce the chances of traffic jams and to provide clearance of road for the emergency vehicles to an extent. In these proposed work we are aimed to clear the traffic in accordance to priority. It will help in to reduce the traffic highway. Also it is helpful for the government to apply traffic rules. And people will follow the rules of traffic. It's applicable in almost all areas in the Pune city. It will be applicable in the cross road and traffic zone.

IoT Deployed Automatic Movable Smart Road Divider to Avoid Traffic Problems [5]

The proposed structure helps to reduce the chances of traffic jams and to provide clearance of road for the emergency vehicles to an extent. In these proposed work we are aimed to clear the traffic in accordance to priority. The Blob analysis and the traffic density victimization morphological filtering has discovered in these system. The road with best priority (with very high traffic level) is cleared first. The proposed system mainly focuses on the motor cars. Using the victimization image processing emergency vehicles is detected.

Smart Road Divider... Solution for Traffic Congestion [6]

The movable divider is capable of providing extra lanes with certain specified width to traffic congested side of road, by acquiring one lane of another side which carries light traffic at that time. Provision of lanes to a congested side totally depends on 'either another directing side of the road is also congested or not?' Thus by providing the suggested mechanism, we can use the width of the road to its full efficiency.

The divider is said 'Smart' because it can detect the congestion through sensors and thus microcontrollers sends signals to divider to slide. So, basically movable divider is used to solve problems of traffic congestion on one side of the road with other side is free from heavy traffic. By doing this we can use road width at its full efficiency without widening of road which ultimately helps to preserve acquired land for other purposes besides of road from the unnecessary widening of road, which also leads to reduce cost of the widening of road, land acquisition and compensation. By using renewable energy sources, we can reduce the operating charge of the movable divider.

A. AIM & OBJECTIVES

Aim: The main aim of this project is to the proposed structure helps to reduce the traffic jams and also reduce the time required for travelling and to provide clearance of road for the emergency vehicles to an extent.

OBJECTIVES

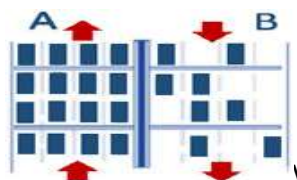
The issue with Static Road Dividers is that the number of paths on either side of the street is constant. Since the resources are constrained and population just as number of vehicles per family is expanding, there is huge increment in number of autos or cars on streets. This calls for better use of existing resources like number of paths accessible. The primary point of this undertaking is to take the traffic controlling to another time.

The goals of this paper as follows,

- To control high Traffic Intensity.
- To avoid the Traffic Congestion.
- To reduce time of journey during rush hours.

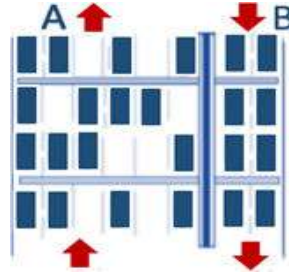
III. DESIGN METHODOLOGY

The main aim of this module is to detect the count of vehicles according to which the movement of divider depends. IR Sensors are placed at the start of the divider. It is used to get the count of the vehicles indicating the traffic density. If the traffic density is high, then the divider moves towards less density side. If the traffic density is normal then no type of action is taken and the divider is in the middle.

A. Functionality of Proposed System

High Traffic Density in One Direction

This creates traffic congestion and delay. This traffic density, calculated by the IR sensors and the Arduino uno microcontroller determines the movement of the movable traffic divider. The ratio of lane A and lane B is 3:1. Hence a divider needs to move 25% towards lane B. this reduces the traffic congestion in lane A. After the movement of the movable divider, lane A occupies 75% of the entire stretch (lane size expanded) and lane B occupies 25% of a road.



Adjusted Lanes to Balance Traffic Density on Both Directions

The proposed methodologies are implemented in this project around the data that is received from sensors fitted alongside of the road, and then the data is gathered regarding the standing of every vehicle by utilizing a IR transceivers and conveys this to microcontroller. This data is then computed to determine the density of the traffic at that given time. When the density reaches beyond the present threshold, the microcontrollers perform a forward and reverse movements of a actuators using an H bridge, this operates the divider.

In addition to this, an RFID reader will also be equipped at a reasonable distance which can read the RFID tag of the emergency vehicle prior to its arrival at the traffic signal. This allows time for the divider to move and create a lane. The RFID reader also forwards input to the microcontroller in order to operate the divider.

The proposed methodology contains the following modules:

- a) **Data Input Module:** Used to estimate a traffic density and determines a priority of a vehicle.
- b) **Processing Module:** Analyzes a data and perform operations.
- c) **Motor Driver Module:** Used to control and drive a motors based on a input.

B. Hardware Used:

- IR Sensors
- RFID Reader/Tag
- Actuators
- Arduino

C. Components

- 1) Arduino
- 2) IR Sensors
- 3) Liquid Crystal Display
- 4) AC Motor
- 5) RFID
- 6) SP8266 Wi-Fi Module

IV. RESULT

- A module has been developed based on microcontroller that consists of an ultrasonic sensor which is used for measuring the traffic density and to move the dividers automatically.
- When the signal turns red, the traffic density is measured and the action should take place before the signals turns green.
- If the traffic density is high then the divider moves to low traffic side and road gets widened for high density side.
- If the traffic density is normal then no type of action is taken and alerts a message stating traffic normal.

V. CONCLUSION

The movable divider is capable of providing extra lanes with certain specified width to traffic congested side of road, by acquiring one lane of another side which carries light traffic at that time. Provision of lanes to a congested side totally depends on 'either another directing side of the road is also congested or not?' Thus by providing the suggested mechanism, we can use the width of the road to its full efficiency.

The divider is said 'Smart' because it can detect the congestion through sensors and thus microcontrollers sends signals to divider to slide. So, basically movable divider is used to solve problems of traffic congestion on one side of the road with other side is free from heavy traffic. By doing this we can use road width at its full efficiency without widening of road which ultimately helps to preserve acquired land for other purposes besides of road from the unnecessary widening of road, which also leads to reduce cost of the widening of road, land acquisition and compensation.

VI. REFERENCE

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- 2) https://www.google.com/search?q=dahisar+check+naka+images&rlz=1C1RXQR_enIN974IN974&oq=dahisar+check+naka+images&aqs=chrome..69i57j0i22i30l2.13729j0j7&sourceid=chrome&ie=UTF-8
- 3) <https://www.passco.de/en/home/faq/steel-safety-barrier-installation/>
- 4) <https://akstudysource.com/traffic-studies/>
- 5) www.ijcstjournal.org

PAVEMENT DESIGN ON LIQUIFIED SOIL

Shubham Padmakr Dubey¹, Vrushabh Sunil Khatate², Abhijeet Suresh Lande³, Ramling Shivaji Sukane⁴
and Ehtesham Ahmad⁵

^{1,2,3,4}Student and ⁵Professor, Department of Civil Engineering, Theem College of Engineering, Boisar

ABSTRACT

The research presented in this paper introduces a new liquefaction mitigation measure, "Induced Partial Saturation (IPS)", which will be a cost-effective and practical solution for new as well as existing structures. The liquefaction mitigation measure that is being explored improves earthquake resistance of loose sands by introducing some amount of air/gas in the voids of the sand. This research explores two different methods to introduce air/gas in the fully saturated sands. These methods include; generation of hydrogen and oxygen gases in the sand through electrolysis and air entrapment in the voids by draining and reintroducing water in the fully saturated sand. Uniform cyclic simple shear tests performed, using a shaking table, on air/gas entrapped specimens demonstrated that air/gas entrapment reduces the pore pressure build-up significantly, thus preventing initial liquefaction. Also, the tests performed on air entrapped specimens under vertical upward/downward and lateral flow regimes showed that air/gas bubbles remain entrapped in the sand. The research reported in this paper demonstrated that induced-partial saturation (IPS) in sands can prevent liquefaction and the technique holds promise for use as a liquefaction mitigation measure. Based on the observations and the results from the study being presented here, further research focuses on the development of a methodology for predicting liquefaction strength of the partially saturated sand specimens, to be applicable in practice, and on exploring the field application techniques

INTRODUCTION

Liquefaction occurs when the structure of loose, saturated sand breaks down due to a rapidly applied load. As the structure breaks down, the loosely packed individual soil particles attempt to move into a denser configuration. In an earthquake, however, there is not enough time for the water in the pores of the soil to leak. Instead the water is trapped and prevents the soil particles from coming into contact with each another. This is accompanied by an increase in soil water pressure, which reduces the contact forces between the individual soil particles, thereby softening and weakening the soil deposit, (University of Washington 2000). Many research attempts have been done to analyze the liquefaction phenomenon qualitatively and quantitatively. Several researchers attempted to investigate possible remedies to the different aspects of the liquefaction problem. This paper attempts to present some of these efforts and propose other types of investigations and ideas.

Liquefaction occurs when saturated and cohesion-less soils lose strength as a result of increased pore water pressures and thus decreased effective stresses caused by earthquake packing. Due to earthquake ground motion and some other dynamic vibration, liquefaction reduces the stiffness and hardness of soils. Liquefaction occurs in saturated fields, where water entirely fills the gap between individual particles. This water exerts a force on the soil particles, affecting how tightly the particles are packed together.

The phenomenon of liquefaction of saturated sand deposits is one of the most drastic causes of structural damage during earthquakes. If the soil is moist and largely unable to drain during shaking, loose sand continues to contract under the cyclic loading exerted by earthquake shaking, which may shift normal stress from the sand matrix to the pore water. As a result, the successful stress confining stress within the soil decreases, resulting in a lack of strength and stiffness that leads to soil deposit deformations.

I. LITERATURE REVIEW**1.) Dr. R.P.Rethaliya and Kanan Thakkar (P.G.Scholar, SPIT, Mehsana, Gujarat.) Volume - 5 | Issue - 1 | Jan Special Issue - 2015 |**

According to them liquefaction is a phenomenon in which saturated cohesion less soil under oscillatory motion during earthquake loses all its shear strength due to pore water pressure and flows like a liquid.

Liquefaction occurs when the structure of a loose sand breaks down due to some rapidly applied to the structure breaks down, the loosely-packed indie particles attempt to move into a denser configurate earthquake, however, there is not enough time for in the pores of the soil to be squeezed out. Instead, is "trapped" and prevents the soil particles from closer together. [Increased water pressure is caused soil particle s trying to rearrange and pushing on the increased water pressure reduces the contact between the individual soil particles, thereby softening weakening the soil deposit.

2.) Hadi Haeria, Vahab Sarfarazib , Alireza Bagher Shemiranic , Hoshang Poyan Gohard , and Hamid Reza Nejatie (Young Researchers and Elite Club, Bafgh Branch, Islamic Azad University, Bafgh, Iran) Received February 28, 2017:

This group of researchers have taken the sample of fine grained sandy soils and had further studied about their properties and by performing certain test they finally reach to the conclusion that, Prior to carrying out any measures for improving soil vulnerable to liquefaction, the type of soil and earth conditions in that region should be completely studied and the potential liquefaction rate of the soil should be completely specified. In order to better understand the condition after liquefaction, if feasible, rupture mechanisms in the previous earthquakes are studied and safety conditions necessary for the structure with regard to structure type and site conditions for the structure are provided. Also, in order to use an efficient rehabilitation method, the most efficient method for soil reinforcement is chosen with regard to soil type, grading curves, and economical considerations.

3.) Rupam saikia (Indian Institute of Technology Kharagpur) discussions, stats, and author profiles for this page was uploaded on Jan 2013

In this paper a review of the liquefaction potential studies of Guwahati city is endeavored. It has been more than 50 years from now Assam has not experienced an earthquake of intensity close to 8. But the study of the tectonic movements and faults has predicted a probable earthquake of magnitude close to 8 in near future. In such a scenario earthquake induced liquefaction has to be considered as a serious hazard to the people of Guwahati. So, a proper evaluation of the liquefaction potential of Guwahati city is necessary. As per two evaluations almost the entire Guwahati city is found susceptible to liquefaction on the contrary according to one analysis only 25 % results were susceptible to liquefaction. In this paper the common areas that were found to be vulnerable to liquefaction were figured out and the congruencies and differences in the previous evaluations were shown along with the probable reason behind these differences. It is also seen that in order to give a more precise evaluation of liquefaction potential further research is necessary as most of the analysis were based on simplified empirical methods.

4.) J. Chu (School of Civil and Structural Engineering, Nanyang Technological University, 2263 Singapore):

Researcher J. Chu have taken the sample of Dilating granular soils and had further studied about their properties and by performing certain test they finally reach to the conclusion that, Conventionally, liquefaction is studied under undrained conditions. An experimental study was carried out to investigate the liquefaction occurred under non-undrained condition. It was observed that a special type of liquefaction can occur before the failure is reached and can even occur for dense sand. Although pre-failure liquefaction is also mainly a result of generation of pore water pressure, it is essentially different from the liquefaction observed in undrained tests. Thus, the steady state approaches cannot be applied to this kind of liquefaction.

5.) E. E. Bayat1, M. K. Yegian, A. Alshawabkeh, S. Gokyer (WCCE – ECCE – TCCE Joint Conference: EARTHQUAKE & TSUNAMI):

Induced partial saturation (IPS) was introduced as a new cost-effective liquefaction mitigation measure which can be applicable for new as well as existing structures. Gas generation through electrolysis and air entrapment by drainage-recharge (D-R) were developed as the induced partial saturation techniques to prepare large partially saturated specimens in the laboratory. A liquefaction box that permitted the application of cyclic simple shear strains in large loose sand specimens using a shaking table was designed and manufactured. Fully and partially saturated sand specimens were tested under constant cyclic simple shear strains. The experimental results demonstrate that small reduction in the degree of a fully saturated specimen can lead to significant reduction in excess pore pressures generated in loose liquefaction susceptible sand, hence increases the liquefaction strength. Furthermore, large scale constant head flow tests were performed on large soil columns in vertical and lateral directions to investigate the endurance of air/gas bubbles in the voids. The test results led to the observation that air bubbles remained entrapped in the sand without any significant indication of diffusion.

A. AIM & OBJECTIVES

Aim: The main aim of this project is to design a pavement on liquified soil such as coastal sand by adding waste plastic and waste rubber in sub base of pavement layer.

Objectives: The use of waste plastic and rubber in road construction also solves the problem of their effective disposal. Besides that, the soil having necessary characteristics required to construct a pavement is fast depleting, thus increasing the cost of pavement resulting from the transportation of soil to the site. some recycled materials are allowed to be used for certain purposes in Britain, no standard includes definitions of these materials or the levels of acceptable contamination. The main aim of the research project was to examine

the properties of recycled materials; it was expected that the conclusions would be a basis from which to develop the production of a standard for recycled rubber and plastic. We are adding this waste material in Natural subgrade

II. METHODOLOGY

The main aim of the research project was to examine the properties of recycled materials; it was expected that the conclusions would be a basis from which to develop the production of a standard for recycled rubber and plastic. We are adding this waste material in Natural subgrade

Mix Proportion

For this we have to take sample of coastal sand in the quantity as 25kg and we have to calculate CBR value of that sand.

Then we have to take waste such as waste plastic and waste rubbers. Then In first case we have to take 5kg soil sample and add 10% of both rubber and plastic waste and perform CBR test on it.

In second case we have to take 5kg soil sample and add 12% of both plastic and rubber waste each and perform CBR test on it.

In third case we have to take 5kg soil sample and add 5% of both rubber and plastic waste each and perform CBR test on it. In fourth case we have to take 5kg of soil sample and add 5% of rubber waste and perform CBR test on it.

CBR: The California Bearing Ratio test is penetration test meant for the evaluation of subgrade strength of roads and pavements. The results obtained by these tests are used with the empirical curves to determine the thickness of pavement and its component layers. This is the most widely used method for the design of flexible pavement.

In this method, the CBR values are used to determine the total thickness of the flexible pavement and the thickness of various layers. Fig. 29.5 give the design curves for different wheel loads and traffic condition the design curves are based on the data collected on a large number of pavements which performed satisfactorily. The curves give the required thickness of construction above a material of a certain CBR value. As it is evident, the required thickness of construction above a material decreases as the CBR value increases.

The Indian Road Congress (IRC) has recommended the design chart given in Fig. 29.6. The chart is similar to one used in U.K. The soaked CBR value of the subgrade is evaluated and the volume of the traffic is estimated. The total thickness of the pavement is determined using the appropriate curve. Likewise, the CBR value of the sub-base material is used to determine the thickness of construction over that material. Obviously, the thickness of the sub-base is equal to the total thickness above the subgrade minus the thickness of construction above the sub-base Likewise, the thickness of the base is determined.

Formula:

$$N = \frac{365 \times [(1+r)^n - 1] \times A \times F \times D}{r}$$

Where:

N = The cumulative no. of standard axles (8160 kg) to be carried by the pavement during the design life in term of msa.

A = Initial traffic in the year of completion of construction.

$$A = P(1 + r)$$

P = No commercial vehicle as per last count.

D = Lane distribution factor. F = vehicle damage factor.

n = Design life in year.

r = annual growth rate of commercial vehicle.

x = no. of years of construction.

III. RESULT

FOR 110msa, 15 YEARS LIFE SPAN

Sr. no.	TEST SAMPLE LIQUIFIED SOIL	C.B.R. (%)	THICKNESS OF PAVEMENT
1	SOIL	6.3	680
2	SOIL + 10% RUBBER + 10% PLASTIC	6.4	680
3	SOIL + 12% RUBBER + 12% PLASTIC	5.6	760
4	SOIL + 5% RUBBER + 5% PLASTIC	10	550
5	SOIL + 5% RUBBER	10.8	550

IV. CONCLUSION

After performing CBR Test on sand sample the

CBR value was 6.3% and pavement thickness for that is 680 mm, we keep this value of sand as our bench mark to compare our results with other mix proportions.

- 1.) In sample 1 we had added 10% waste rubber and waste plastic and got CBR value as 6.42% and thickness of pavement as 680 mm. There is no changes as compare to sand.
- 2.) In sample 2 we had added 12% of waste rubber and plastic and we got CBR value as 5.2%, and thickness of pavement as 760mm. which are higher than our bench mark and we need to increase pavement thickness by 11% as compare to bench mark. This result are less effective for our project point of view.
- 3.) In sample 3 we had added less amount of waste rubber and plastic such as 5% of waste rubber and plastic each, we can get CBR value as 10% and pavement thickness as 550mm. which are lesser than our bench mark and we can successfully reduce pavement thickness by 20% as compare to bench mark.
- 4.) In sample 4 we had added only 5% waste rubber and, we can get 10.8% CBR value and pavement thickness as 550 mm. Which is lesser than our bench mark an we can successfully reduce pavement thickness by 20%.

After comparing all Mix proportions, we can finally conclude that if we are adding 5% waste rubber with soil sample we can reduce pavement thickness by 20%, which means it is cost effective and we can use less construction material.

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GENERATION OF OIL AND METHANE GAS BY USING WASTE PLASTIC**Kanojia Rupeshkumar¹, Gond Vinod K. R² and Ehtesham Ahmad³**^{1,2}Student and ³Professor, Department of Civil Engineering Theem College of Engineering, Boisar**ABSTRACT**

Due to increasing population & rise in the standard of living of people, plastics have woven their way into our daily lives and now pose a tremendous threat to the environment. Over 368 million tonnes of plastics are produced annually worldwide, and the used products have become a common feature at overflowing bins and landfill. The process of converting waste plastic into value added fuels is explained as a viable solution for recycling of plastics. Pyrolysis runs without oxygen and in high temperature of about 300°C which is why a reactor was fabricated to provide the required temperature for the reaction. Converting waste plastics into fuel hold great promise for both the environmental and economic scenarios. Thus, the process of converting plastics to fuel has now turned the problems into an opportunity to make wealth from waste. The conversion of oil from plastic has dual benefits. First of all the oil and methane produced can be used as a fuel for domestic purposes and also in vehicles and industries when further refined. Secondly the various types of pollution caused due to waste plastics can be minimized.

Keyword: Polyfuel, Pyrolysis, Plastic, Methane.

1. INTRODUCTION

Waste disposal is one of the major problem being faced over the world and India is no exception. Plastics have become an integrated part of human life due to its adaptive and resourceful properties like cost effective, light weight, flexibility, durability and faster production rate. It is used in almost every field. Plastics are non-biodegradable polymers mostly containing carbon, hydrogen, and few other elements like nitrogen. Due to non-biodegradable nature, the plastic waste contributes significantly to the problem of waste management. As per the record provided by Central Pollution Control Board (CPCB) for the year 2018-2019 in Mumbai about 409 tonnes of plastic waste is generated per day of which only 90-110 tonnes of plastics are sent for recycling whereas in Maharashtra its around 409,630 metric tonnes per annum. In India the number rises to 34 lakh tons of plastic waste per annum the efficiency of plastic waste collection is 67% of which only 60% was recycled and more than 9,400 tonnes ends up in the seas, oceans or gets piled up on lands devoid of source segregation. Pyrolysis is a commonly utilized method for destruction of waste products. It is often considered as an alternative to incineration, wet oxidation and other treatment processes. The products of pyrolysis are typically gases, liquids and a solid char, although the process can be designed to avoid the formation of hydrocarbon liquids by having a secondary pyrolysis (cracking) stage. From the perspective of management of waste streams in a space environment, pyrolysis offers certain advantages as a means of solid waste Disposal. One significant advantage is the partial Decoupling of issues of CO₂ management from the waste stream disposal problem, since some of the carbon will end up in the char residue and some will end up as CH₄ and other hydrocarbons (as well as CO and CO₂).

2. EXPERIMENTAL SET-UP**2.1 The Equipment's used for set-up**

- A Iron Container
- 2 Plastic container for storage
- A bucket half filled with water
- PVC pipe of 15mm diameter
- 1ft Iron pipe of 20mm diameter
- 5-6 PVC pipe fitting
- Crushed HDPE waste plastic



Fig. 1 Experimental set-up for pyrolysis process

3. METHODOLOGY

A plastic waste was collected from site. Firstly this plastic waste is needed to be identified according to there types and need to be segregated carefully as different plastic contains different properties with it. For this experiment we selected HDPE type plastic. Selection and segregation of types of plastic is very much essential and most important step. The segregated plastic waste is need to be crushed or shredded into the smaller particles of size around 1.2cm to 5cm. This shredded plastic waste is then filled into a furnace. This small particle must be filled properly and not much compacted and loosely filled.

A proper attachment and connection of the pipe should be made and it should be taken care properly that there should be no leakage from the joints. Special care of furnace should be taken as there are high chances of leakage from joints and any case of leakage may lead to setup failure. This furnace filled with granular plastic waste is then subjected to heat around 150°C - 300°C temperature. The continue heating for around 1hr 30 min to 2 hrs. is required for degradation of plastic waste and converting this solid waste into a steam (gaseous form). When this gas will pass through the pipe and settle in the 1st container which is already immersed in half filled bucket of water it will turn this gaseous steam into in the form of impure oil or polyfuel (liquid form) and will settle at the bottom of container. This polyfuel contain carbon contents along with it which makes it impure and requires to be refined. The remaining steam will again pass through PVC pipe and will be collected in 2nd container in the gaseous form as a methane. This process will be continued for around 2hr. The left out residue in the furnace will be char and some non-sticky, slippery material will be formed in 1st container in the form of grease.



Fig. 2: Polyfuel



Fig. 3: burning of extracted methane gas



Fig. 4: Grease formation in 1st container



Fig. 5: Char

Bi-Products Obtained from Pyrolysis Process

Bi-Products	Polyfuel	Grease	Methane	Char
Extraction Quantity	620gm	153gm	---	568gm
Physical properties	<ul style="list-style-type: none"> • Cool in feel • Smell • Blackish colour • Flammable • Flash point (15°C - 18°C) 	<ul style="list-style-type: none"> • Oily • Non-sticky/ slippery • Semi-solid • Whitish-yellow in colour 	<ul style="list-style-type: none"> • Highly-flammable • Cool in feel • Smell 	<ul style="list-style-type: none"> • Dark brown or black in colour • Smell • Semi-solid and Semi-liquid • High carbon content
Removal %	20.67%	5.1%	---	18.93%

Table: 1: Physical properties of Bi-products

4. RESULTS

In this experiment, where we took 3kg of shredded HDPE type plastic waste. Which was set for burning and the plastic waste was 100% burned with minimal pollution emission from it. As compared to open field burning of plastic this amount can be even negligible. Bi-product such as polyfuel, methane, grease and char was obtained which can be useful not only reducing the price of this fossil fuel but also can reduce the dependency for it on gulf countries. The Bi-product obtained are not in the pure form so it further requires refinery so that it can be used as per its requirements.

5. CONCLUSION

From the experiments on the HDPE pyrolysis, three types of products can be produced which include non-condensable gases, condensed liquid hydrocarbons and char. The distribution of the product varies greatly under different reaction conditions. Conversion of waste plastics into polyfuel can solve the problem of plastic waste recycling and the shortage of liquid fuel in developing countries like India, Brazil, Argentina, and Guyana etc. pyrolysis by using HDPE waste plastics can be done easily with economic means. The yield of the product can be increased by varying the process parameters like temperature, pressure, good investment etc. The fuel produced in this study was found to be comparable to the regular diesel fuel used in automobiles. So it can be concluded that the “Polyfuel” may be an alternative fuel of the future which can solve many issues thereafter. This process can be called as zero discharge process as no wastage is found in this technique.

The implementation of this project can develop so many opportunities in the city. It can be a solution to control waste plastic, develop a new technique or idea, and detect the source of diesel for the country. Bangladesh is such a country where this kind of project could be very promising and effective in the future the use of plastic pyrolysis oil in diesel engine in the aspect of technical and economical is compared and found that oil is able to replace the diesel oil. Though the plastic pyrolysis oil offers lower engine performance, the plastic waste amount is enormous and it needed to be process to reduce the environmental problems. Moreover, the engine can be modify follow the combustion condition of plastic pyrolysis oil. The waste plastic used in the process must be PE or PP or LDPE in order to protect the contamination of chlorine in the oil

6. FUTURE SCOPE

It has been found by many surveys and studies that the nature and volume of solid waste has been changing over time and with development of society. Popular cities of developed countries have more consumption of

plastic waste and their quality. ex. Calorific value is much higher. In this situation energy from waste production process may help significantly to get rid of problem of waste management.

- The obtained fuel could be utilized in diesel generators, vehicles such as tractors.
- The fuel has to be refined at the industrial establishments, based on the results of which small scale industry can be established.
- As there is a high demand of crude oil and due to its sky reaching prices, we could take up this project to setup large or small scale industries and produce the fuel locally at much cheaper rates directly benefiting the National economy and also a step towards SWAACH BHARAT by recycling the waste plastics
- The application of this project could help in reducing the dependency on the gulf countries and promote a step towards innovation.

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REMOVAL OF OIL AND GREASE USING NATURAL ADSORBENTS**Kazi Aasiya¹, Rithik Mishra², Mansi Raut³, Siddique Saniya⁴ and Faiz Mohammad Khan⁵**^{1,2,3,4}Student and ⁵Professor & HOD, Department of Civil Engineering Theem College of Engineering, Boisar**ABSTRACT**

There are several pollutants that can harm our environment. Oil and grease are one of the examples of a pollutant that can cause a severe environmental problem. The highest concentration of oil and grease inside the sewer system can cause the sewer to clog that can lead to overflow. It can affect not only to the environment but can also affecting our health. There are various methods of oil and grease removal that one of the examples is by using adsorption method. This study objective is to determine the ability of adsorbents, which are sugarcane bagasse and banana pith, Honeycomb, Neem curry leaves, pineapple peels, organoclay

INTRODUCTION

Organic toxic waste (oil and grease (O&G)) causes ecology damages for aquatic organisms, plant, animal, and equally, mutagenic and carcinogenic for human being. They discharge from different sources to form a layer on water surface that decreases dissolved oxygen. O&G layer reduces biological activity of treatment process where oil film formation around microbes in suspended matter and water. This lead to decrease dissolved oxygen levels in the water. Then oxygen molecules are difficulty to be oxidative for microbial on hydrocarbon molecules and cause ecology damages to water bodies. The conventional techniques remove oil and grease using skimming tanks and oil and grease traps in treatment plants but the main disadvantage of these methods is their low efficiency of removal. The most important pollutants in the oil processing wastewaters are conventional pollutants such as oil and grease, suspended solids and pH, and non- conventional pollutants such as phenolic compounds, COD, sulphide and ammonia. Among these pollutants, oil and grease is one of the most complicated pollutants to remove. This paper summarizes available technologies to remove oil and grease, and should assist oil and grease discharges in complying with their effluent limits. A major challenge wastewater treatment comes from a category that includes emulsions or solids composed of esters of glycerol, fatty acids, or triglycerides derived from animal or vegetable sources. Stubbornly insoluble in water.

LITERATURE REVIEW

The conventional techniques remove oil and grease using skimming tanks and oil and grease traps in treatment plants but the main disadvantage of these methods is their low efficiency of removal. In view of water pollutants, they are becoming more complex and multi pollutants simultaneous removal is paid more and more attention to be removed. Recent composite materials such as aluminum oxide, nano particles, amorphous zeolite and laterite adsorbents are used to treat complex wastewater that have high adsorption capacities. With these points in view, the present research studies new approach to degrade toxic waste (oil and grease) form industrial wastewater. The work presented lipase hydrolysis stage using Pseudomonas strains as a producer of lipase and assess their degradation capabilities. This approach included enzyme unit coupling with adsorbent materials as efficient method to complete removal. Adsorption technique uses zeolite (laterite and amorphous materials) as easily and cheaply available adsorbent. Over the years, oil spill contaminations has become a major hazard to the environment especially the marine areas thus drawing vast consciousness to the researchers as it is an appalling problem that set both the marine life and

ecosystem at atrocious danger. The term 'oil spill' is usually applied to marine oil spills, where oil is released into the ocean or coastal waters when oil is manufactured, stored, and shipped but spills may also occur on land. If oil is explored, transported, stored and used too widely, the space to spill it will cause a severe problem and impose serious damage on the environment. Oil spills may be caused by the release of crude oil from offshore platforms, tankers, drilling rigs and wells, fuels used by large ships such as bunker fuel, or the spill of any oily byproduct or waste oil by household. This affects the cleanliness and allure of the ocean or coastal waters, and the survival of the marine life. Regardless of the optimum efforts to control oil spill, it is not impossible for the oil to pollute shorelines of the ocean and reservoirs, and the edges of watercourses and brooks. To assist in preserving these water resources from destruction for our future generation and for the sustainability of various marine species, the cleanup of the water resources especially the ocean is crucial. Thus, a well-organized system is extremely vital for the retrieval of the spilled oil.

METHODOLOGY

Fresh pineapple that bought from market was peel off. The peels were washed and chopped into small pieces. The peels were dried under direct sunlight for 5 hours and 30 minutes in air oven at 60 °C. Dried pineapple peels were weighed using an analytical balance and was placed in 500 mL beaker. The samples were then rinsed

with distilled water and soaked with acetic acid for 30 minutes at room temperature to neutralize the sample . The treated samples were ground using mechanical grinder and were sieved to get the finest powder for the next step of the experiment. Along with the pineapple peels there were 2 more adsorbents which were experimented i.e neem and organoclay. The setup of 20litres of water was used in which 20ml of oil was immersed which was let out through the kitchen waste along with it we have used lubricants used from the garage. This was then allowed to pass through 100 ml beaker with the natural adsorbents used neem, pineapple peel, organoclay. This were kept for some time for the observations. At 4hours of interval four readings were taken on which based calculations were done.

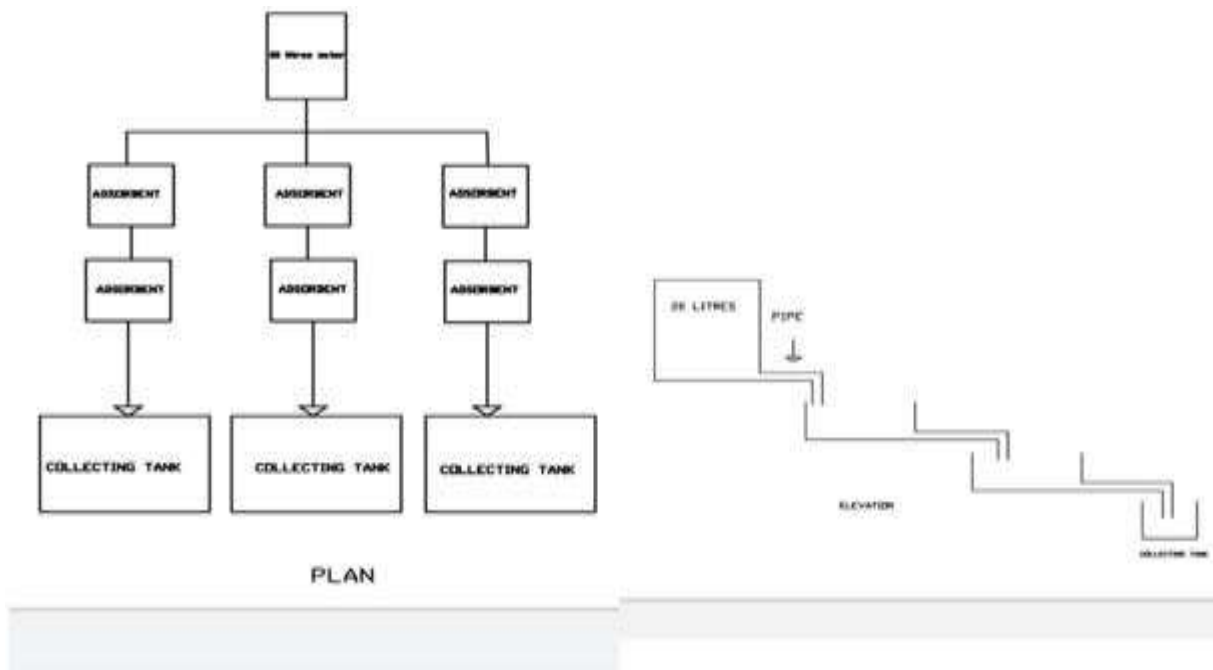


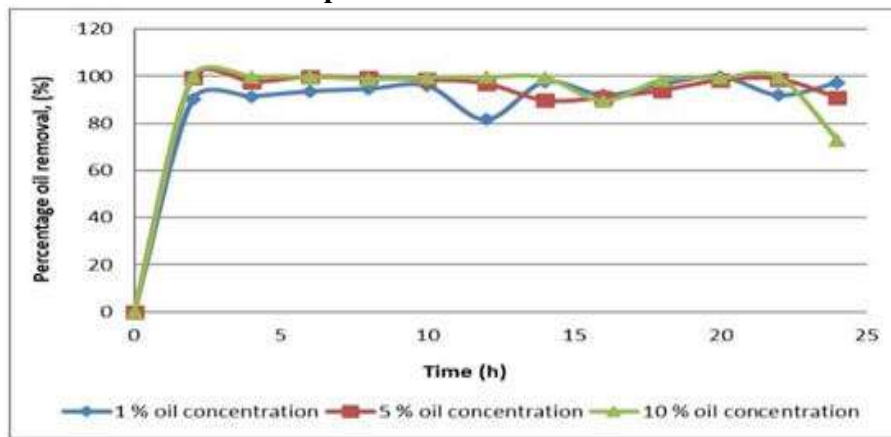
Fig 1.1 Experimental Layout

ADSORBENTS	TIME (INMINS)	VOLUME	DOSAGE of adsorbent gm/100ML	% REMOVAL
NEEM	20	20LTS	0.5	49.9
	40	20LTS	1.0	63.35
	60	20LTS	1.5	78.81
	80	20LTS	2.0	87.90
PINEAPPLE PEEL	20	20LTS	0.5	24.40
	40	20LTS	1.0	41.80
	60	20LTS	1.5	55.69
	80	20LTS	2.0	87.20
BENTONITE	20	20LTS	0.5	33.49
	40	20LTS	1.0	43.6
	60	20LTS	1.5	68.75
	80	20LTS	2.0	69.03

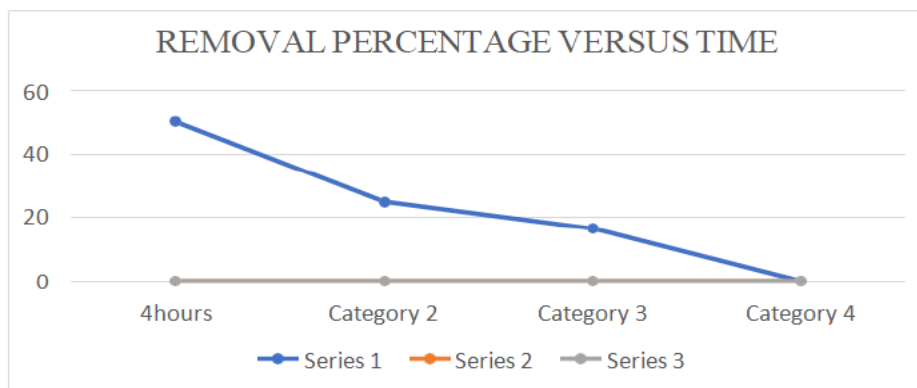
RESULTS AND CONCLUSIONS

In this study, pineapple peel waste was productively prepared by soda treatment method for oil adsorption for the cleanup and recovery of spilled oils. The oils can be speedily removed from water surface by affixing the pineapple peel waste in oil and water mixture, and the oil sorption capacity of the pineapple waste is in the range of 19.5% - 752%. Furthermore, it can be explained that the viscosity of oil affects the percentage of oil removal by adsorbent capacity. The viscosity of lubricant oil is 0. 213Pa.s while cooking oil is 0. 073Pa.s according to Li et al., (2012). The used lubricant oil has a higher viscosity hence, can remove higher amount of oil. The pineapple peel waste is collected easily from water surface, and the absorbed oil can be kept in the pineapple peel waste assembly well in the form of semisolid after removing oil-loaded pineapple peel waste from water surface. This pineapple peel waste, which has the advantages of low cost, abundant, high sorption capacity, and fast sorption rate, may be a promising substitute for synthetic oil absorbing fiber used for oil adsorption and for the removal of spilled oil.

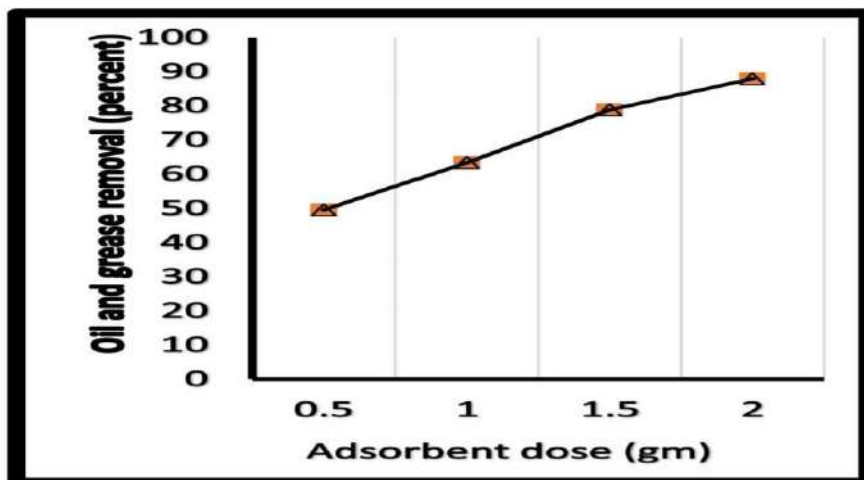
Graph: Shows the Removal %



Bentonite



Pineapple



NEEM

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ENERGY UTILIZATION OF KINETIC PAVING TECHNOLOGY

Mohd Umar Ajmal Khan, Khan Tahir Ubedurrehman, Saurabh Vikas Gharat, Bhavna Devendra Singh and Ansar Sheikh

Department of Civil Engineering, Theem College of Engineering Boisar (E), Tal & District Palghar – 401501

ABSTRACT

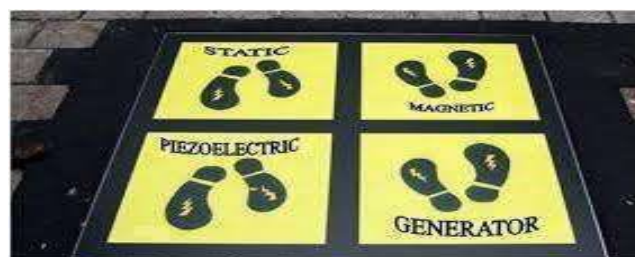
Nowadays, India is the developing country and now a days the demand for energy has been increasing at an alarming rate and there has been a decrease in the availability of energy resources electricity has become a priority in daily life and can even be considered as a primary human need. On the other hand, the excessive use of electricity or energy and the increase in population is one of the factors that can increase energy requirements. In Indonesia, the use of electricity comes from very limited natural resources. Therefore, energy savings should be implemented, either by using as necessary or even making an update that can sustain existing electrical energy. Apart from saving energy, it would be better to create new energy with minimal effort. Like producing energy from daily human activities, one of it is walking. The result is the creation of Kinetic Paving material technology that when people step on it will produce electricity. The benefits of this technology can create electricity that can be used for the environment of this kinetic paving. As for lighting in paving as lighting art or as a source of energy for surrounding buildings. Kinetic Paving is applied in pedestrian traffic spaces. This energy is expected to help the community and the surrounding environment. This is an update that should have been implemented. When natural resources are getting low and energy prices are getting higher, we need all these reforms.

I. INTRODUCTION

The population in India is increasing each day. Therefore, the needs are also increasing. One of them is the need for electricity. Electricity is now a primary need in daily life because many things are done every day using electricity. The use of electricity in the house or other building functions is not effective where the excessive use of electrical energy. So that the energy spent is very much and not proportional to the energy produced. So that resources are increasingly depleting. Therefore, we need technology that can create its energy. To produce electrical energy, the easiest method is the result of the transformation of kinetic energy. The kinetic energy that is easily obtained in the middle of the city is the movement of the human itself. It can be concluded that human energy in walking can be used as kinetic energy which will be a source of electrical energy. India is one of the countries with quite a large number of young people. Youth tend to have more outside activities than other groups. So that at some point the place is quite active with the activities of this young man. This can be an advantage in terms of creating electrical energy from kinetic energy.

Previous research has shown that excessive use of energy will lead to the extinction of natural resources and the possibility of fossil fuels and oil will be depleted around the 21st century. What is needed in this research is kinetic paving which is connected to a USB port and street lights. The top surface of the paving uses materials from recycled mattresses, athletic tracks or tires where the material is flexible. Installation of kinetic paving is quite easy because there is no need for excavation and it must be in an area with a high pedestrian level.

One alternative source of energy generation could be human energy harvesting, where the source of energy generation is energy expended by the human body such as work in everyday activities such as walking, opening doors or even typing etc. Much research has been carried out in the field of personal energy generators, where a device is attached to an individual and the generated energy used for portable loads. Recently however, there appears to be a trend towards developing devices embedded in the urban environment, and provides the focus of this thesis.

**II. PROBLEM STATEMENT**

- 1) Clean, renewable and environmentally friendly energy generation has always been an issue that needs to be solved. Technologists have created various methods such as solar panels, wind turbine, hydro electricity etc.

However, Pavegen has come up with another innovative idea, which is to generate electricity from kinetic energy.

- 2) Pavegen tiles is a device that generates electricity by converting kinetic energy that is obtained when mechanical stress is applied on the device. When someone steps on the tile or moving vehicle's, a certain amount of energy will be generated and stored in the built-in battery, which will use for power low energy consumption appliances such as street light, mobile battery charger, small electric vehicle's, street indicators, etc.
- 3) Pavegen Company state that the durability of its product is 20 million steps. Each footstep on a tile can generate about 3-4 watts per hour on average. And by vehicle it can be generated upto 8 watts.

III. METHODOLOGY

Piezoelectricity, discovered by Curie brothers in 1880, originated from the Greek word “piezenin”, meaning to press.

A force is applied along a neutral axis (y) of a crystal and the charges are generated along the (x) direction, perpendicular to the line of force. The amount of charge depends on the Geometrical dimensions of the respective piezoelectric element. The pressure applied.

Present day we are using asphalt roads (Tar road) on which thousands of vehicles run on it. When a vehicle passes over a road, the road deflects (vibrates) vertically. These vibrations are released as thermal energy which is being wasted.

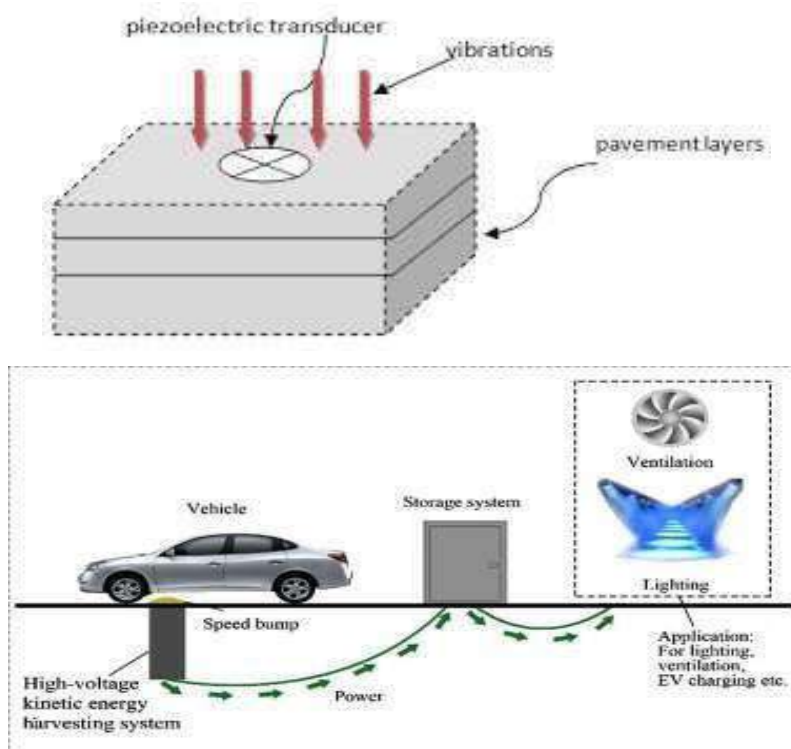
The first layer is laid with fine gravel and sand content. Then a thin layer of asphalt is laid which acts like a strong base for the generators. Piezoelectric generators are placed in quick drying concrete and left for 30min.

Then all the generators are wired in series to get collective output. A bitumen sheet is used to cover all the generators to provide better adhesion of concrete to asphalt. Finally a thick layer of asphalt is laid which finishes the construction.

Generators harvest the mechanical energy of the vehicles and converts to electrical energy. Then it is charged into the battery on one side of the road. From there it is distributed. Yield:

For one km of piezoelectric road of one lane we can generate 44000 KWh/yr.

This is a green solution for power generation. It is relatively inexpensive and easy to install. Even the most untouched and remote areas can be electrified. Dependence on thermal electricity is minimized which in turn saves the nature. This Technology is also applicable to airport runways and rail systems. This is an excellent alternative to reach the increasing demands for electricity. It should be implemented in India also to accelerate the development.



IV. CONCLUSOIN

Paving kinetic when viewed on environmental aspects, there are many positive aspects. Starting from the energy source, namely the power from the footrest that previously did not mean anything, but after the existence of this paving kinetic technology, the power from the footing is very meaningful because of the source of kinetic energy for this technology. The Pavegen technology used in the installation of flooring that transfers the kinetic energy of pedestrians into electrical energy and data. As people step on the top surface, their weight causes generators underneath the tiles to rotate, generating off-grid power via electro-magnetic induction. The walkways are equipped with wireless technology to transmit data on how people are interacting with them. We also connect to people's smartphones, showing how much energy is being harvested and converting this into rewards and permission-based relationship data. Launching a new technology that operates in urban environments was always going to be challenging. Unlike an app, we're designing and building a complex physical product that must operate reliably in all conditions. City streets are constantly undergoing challenges, from extreme temperature variations to a wide range of forces and impacts. Engineering this versatility into our system has been a big challenge, and it has been a highly iterative process to get to where our design is today. Our latest model comes as a modular system to simplify the installation process. It is retrofitted and easy in maintenance. When stepped on, the tile surface flexes between 5-10mm. This downward pressure creates a rotation in the electro-magnetic generators beneath, producing around 3 joules per footstep or around 5 watts of continuous power while the person is walking. We can either store that energy in batteries or use it to power local applications such as lighting, sensors and data collection and transmission.

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FORMATION AND COMPARISON BIOMEDICAL WASTE BRICKS

Tamore Manas Bharat¹, Nalawade Sai Sunil², Pimple Vipul Nitin³, Gavade Swapnil Gangaram⁴, Faiz and Mohammad Khan⁵

^{1,2,3,4}Student and ⁵Professor & HOD, Department of Civil Engineering, Theem College of Engineering, Boisar

ABSTRACT

Bricks are most important construction material, but there are so many different type of brick but we trying to make a brick by using biomedical waste like surgical mask, ppe kit, due to the covid pandemic them biomedical waste numbers are increase in large amount, we are going through another big crises in called biomedical waste crises, so we decide to make brick to reduce biomedical waste and also give a another option to people to save the environment. this brick in standard size and also give better strength than mud bricks, the price of this brick will be less because it made by paper waste, surgical mask, ppe kits, and binding agent.

I. INTRODUCTION

Since ancient days from stone age to modern days age humans need food, cloths and shelter out of three needs of humans shelter that means house building is placed a prominent need. to build a house building humans choose mainly types of materials for the construction but during time course since olden days according to the house building after developed some civilization man build dams canal along with house building. all these built to modern construction main item and materials is the brick in time to time making of brick man developed some sophisticated technologies. Basically in making of brick clay and soil is the main material and ever standard materials but in modern days we making cement brick by using and mixing some chemical admixtures and formulas, and in recent age we are using light weight cement bricks for the structures of the building. these light brick are most used for the building of multi storied building. an effort for an alternative investigation the manufacturing of the brick was accomplished. By using industrial byproducts like fly-ash, silica fume, lime, gypsum, stone dust as key ingredients. In india thermal power plants are generating fly-ash in large quantities. industrial waste are hazardous in nature, their disposal is of major concern. recycling such a waste by utilizing them in to building materials is a modern solution for the pollution issues. So we are making an economical and eco-friendly brick which will provide good strength with standard size.

II. LITERATURE REVIEW

the mask wastes are increased across the world as the people are not following the appropriate disposal methods for the used mask. Thus, it creates a new environmental challenge. Further, there are no appropriate mask or plastic waste collecting method specified in whole countries or part of the region in sri lanka, india, pakistan and china (sangkam 2020). This is adding a vast amount of plastic and plastic particle waste in the environment, which may end up in the streets and landfills. Besides, it gets into the waterways and reaches the fresh water and marine water. This adds the presence of the plastics into the aquatic medium. The health and environmental effects of plastic and plastic particles due to the inappropriate disposal of facemasks were also highlighted by number of literatures. Furthermore, the production of the face masks also contributes the emission of CO₂, which will potentially contribute to the global warming. the processes of propylene, small aluminum strips and polypropylene in the production of n95 and surgical mask contributes the significant amount of CO₂ emission to the environments. Furthermore, production of fabric, sewing and weaving process of cloth mask fabrication also contributes the CO₂ emission to the environments. the n95 mask production release 50 g CO₂-eq per single mask, excluding the transportation. Surgical mask is embodied with 59 g CO₂-eq per single and the highest share is from the transportation process. Whilst, the cloth mask production contributes about 60 g CO₂-eq greenhouse gas emission per single mask. However, this would create a massive impact to the atmosphere because; millions of face masks are produced all over the world to control the pandemic situation. The face masks used by medical examiners in hospitals are carefully collected as its hazardous waste. A study was conducted in the uk and analyzed that if each individual uses one disposable surgical mask every day for a year, this would create over 124,000 tons of unrecyclable plastic waste 66,000 tons of contaminated waste and 57,000 tons of plastic packaging. However, there is currently no specific waste stream for these products if it used by the public. Mostly, it is thrown recklessly in the streets or collected as a mixed waste. In the handling of urban solid waste and hazardous medical waste, the pandemic has led to a significant challenge. The collected hospital face masks and other mixed waste are sent to the incineration and landfill. However, due to the existence of the plastics in the mask, such methodologies often have the potential to cause adverse environmental effects. Most plastics are chemically stable, resistant to corrosion and, difficult to degrade by microorganisms yet they prefer to remain in the soil and pose environmental

threats. The solution that allows the chemical energy content of plastics to be recovered for useful purposes is the incineration of medical waste coupled with waste heat recovery. for medical waste incineration, the who has suggested 900 °c and 1200 °c to guarantee safe destruction, but most of them are unaware of the temperature range however, with heat recovery, there are limitations to the widespread use of incineration. Public worries about dioxin and furan trace emissions can become trouble some. the transportation of those waste to relevant disposal site also consume energy and release greenhouse gases to the environment. recent study by stated that 10 ton of ppe waste including face masks travelled 10 km for the relevant disposal site resulted in total global warming potential (gwp) impact of 2.76 kg co₂-eq. the mask littered in the soil can impact the fauna in which it causes entanglement and can cause death for instance, it is reported in columbia that a bird was tangled in a discarded corona virus facemask in a tree. then died after the mask is wrapped around its **body and beak . further,when the mask is mistaken for food.**

A. AIM & OBJECTIVES

Aim: Making bricks by using biomedical waste

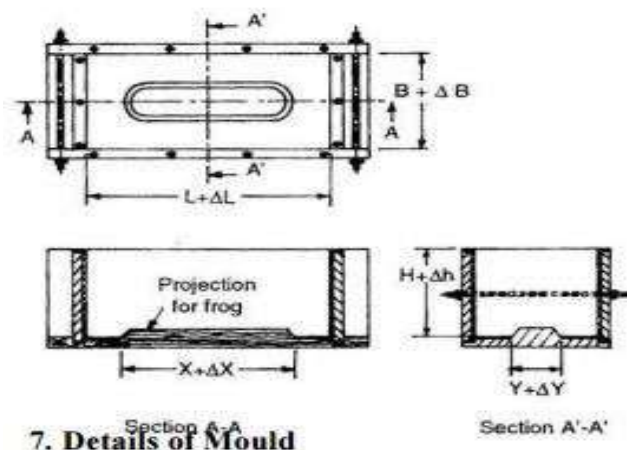
OBJECTIVES

1. To make eco-friendly brick.
2. To increase strength of brick.
3. To reduce the biomedical waste (mask, ppe kit).

Reduce cost of construction.

III. DESIGN METHODOLOGY

In this project our main aim is to reduce covid waste and use it of the construction ,so firstly we started to collect some information about covid waste and we get know that covid waste using for construction is very dangerous .so we firstly collect covid mask with full precautions and we disinfect covid mask by disinfection process and after that we collect paper waste and cut mask and paper waste in small pieces after that the pieces of mask soaked in water for 48 hours and paper waste soaked in water for 24 hours after all this process are raw materials are ready to use and we used cement as binding agent.we make different samples of brick and perform some test on them to cheak their compression strength ,water absorption and compare the with mud brick and fly ash brick by this way we make brick by using some covid related waste try to reduse some covid waste which is very harmful of nature and humans



Matarial Containt Table:

Contains	Sample 1	Sample 2	Sample 3
Cement (in kg)	3.036	2.42	3.64
Mask waste (in kg)	1.214	1.21	1.21
Paper waste (in kg)	1.81	2.43	1.21
Water (in liters)	1.51	1.21	1.82

IV. Procedure

- 1) Make mould should of 230x110x85mm by using wood , steel.
- 2) Clean the mould properly.

- 3) Mixed shredded mask, paper , cement in each other.
- 4) Apply oil in side of mould.
- 5) Fill the mould with mixture.
- 6) Lets the mould in sunlight for 48 hours.
- 7) After that carefully took out the brick from mould let it dry for 10 hours.



(Filled Mould)

V. OBSERVATION

1) **Compression Strength Test Table:**

No	Area (MM ²)	Load (N)	Compression strength = Load /area (N/MM ²)
Sample 1	25300	32000x9.81= 313920	12.40
Sample2	25300	30000x9.81= 294300	11.63
Sample3	25300	28000x9.81= 274680	10.85
Mudbrick	25300	15000x9.81= 147150	8.60
Fly ash brick	25300	29000x9.81= 284490	11.24

2) **Water Absorption Test Table:**

No.	Wet weight (kg) W1	Dry weight (kg) W2	Percentage = (w1-w2)/w2 X100
Sample1	2.17	1.92	13
Sample2	2.8	2	9
Sample3	1.99	1.8	10.55
Mud brivk	3.5	3	16.66
Fly ash brick	2.8	2.5	12

3) **Various Test Comparrison on Bricks:**

Test	Sample 1	Sample 2	Sample 3
Size and shape	230x110x85	230x110x85	230x110x85
Compression test	12.40	11.63	10.85
Water absorption test	13	9	10.3

4) **Comparison With Mud Brick and Fly Ash Brick:**

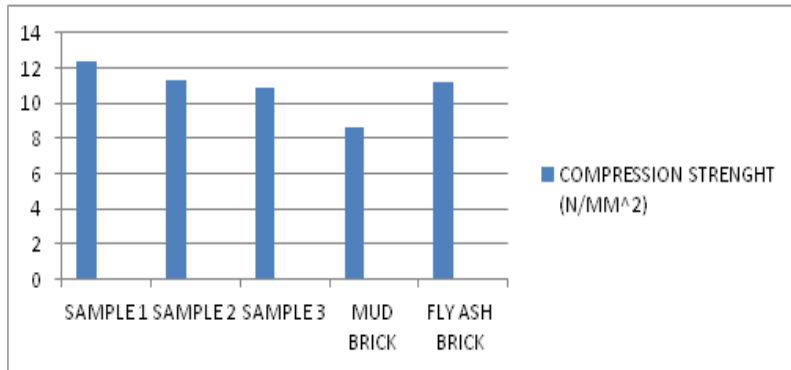
Test	Sample1	Sample2	Sample 3	Mud brick	Fly ash brick
Size and shape (MM)	230x110x85	230x110x85	230x110x85	190x90x90	230x110x75
Compression Test (N/MM ²)	12.40	11.63	10.85	8.60	11.24
Water Absorption Test (%)	13	9	10.5	16.66	12

5) Bricks Price Comparison

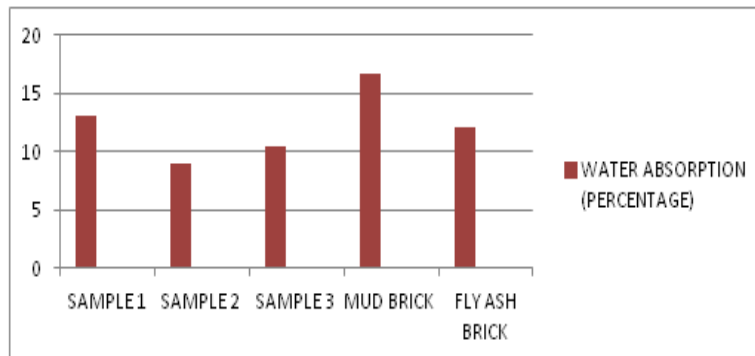
Types of Brick	Size and Shape (MM)	Price of Brick (Rs)
Fly Ash Brick	230x110x75	7
Mud Brick	190x90x90x	10
Sample 1	230x110x85	8
Sample 2	230x110x85	7
Sample 3	230x110x85	8.5

VI. RESULTS & DISCUSSION

1. Compression Strength Graph



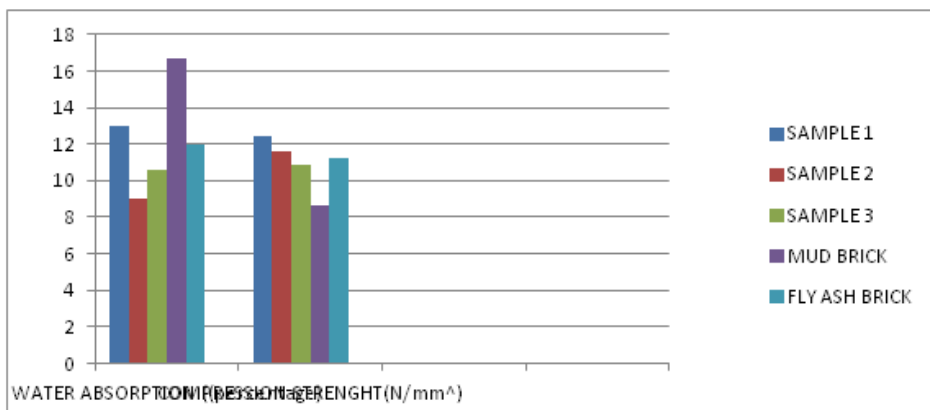
2. Water Absorption Graph



❖ DISCUSSION

- 1) Water absorption of all brick samples is less as compared to mud brick.
- 2) Sample 2 and sample 3 water absorption is less than fly ash brick.
- 3) The compression strength of all samples is high as compared to the mud brick.
- 4) Sample 1 and sample 2 compression strength is high compared to fly ash brick.

3. Water Absorption and Compression Strength Comparison of Each Sample With Mud Brick and Fly Ash Brick:



VII. CONCLUSION**1) To Reduce Biomedical Waste**

The main aim of the project is to reduce the biomedical waste like (mask, ppe kits), by using mask as material we reduce some infections mask waste the waste which is very harmful for environment.

2) High Compression Strength

The compression strength of brick is high as compared to mud brick, and its almost equal to the strength of fly ash brick. Its shows that the brick strength is also high.

3) Economical and Eco Friendly Brick

By using paper waste and mask as materials it reduce the cost of brick. The brick will used not only reduce the cost but it also helps to reduce the cost.

4) Reduce The Cost of Construction

By using mask and paper waste the cost of brick is less as compared to mud brick and fly ash brick. this brick gives high strength low cost, so by using this brick in construction, it will reduce the cost of construction.

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SIMULATION AND HARDWARE DESIGN OF SINGLE PHASE FIVE LEVEL ACTIVE NEUTRAL POINT CLAMPED CONVERTER

Jaykumar Lakhani, Amit Name and Akash Saroj

Department of Electrical Engineering, Theem College of engineering, Boisar, India

ABSTRACT

This Project presents a Simulation and Hardware style of Single section Five-Level Active Neutral Purpose Clamped Converter. so as to get construction output voltage wave-forms, a switch strategy supported through switch angles is explained. Simulation and Output results of construction voltage wave-forms are given for 5 levels. Five-Level Active Neutral Purpose Clamped Converter is shown during this project and therefore the steps to synthesize the 5 level voltages are given. The Simulation diagram and triggering diagram of the circuit is explained. We have a tendency to are victimization MATLAB/Simulink for simulation of Single section Five-Level Active. Neutral purpose Clamped converter. This topology we have a tendency to use power Switches (MOSFET) as a covering device and check performance of resistive load and output wave form.

I. INTRODUCTION

A medium voltage drives in industrial applications. In order to obtain the best performance in medium voltage and high-power electrical transmission, dv/dt and harmonics should be minimized. By introducing more output voltage levels. This puts forward the theory of multi-level inverters for industrial drives to overcome the above short comings. The voltage generated at high frequency and low switching frequency has almost no distortion. Multi-level inverters play an important role in high performance and medium voltage conditions, such as rolling mills, SVCS, HVDC pumps, blowers, compressors, etc. It plays a role in the electronics field and is widely used in industry and renewable energy to convert direct current to alternating current. It can not only provide high performance, but also use renewable energy. Various configuration can be used for shaping multi-level inverter multi-level inverter with diode clamp multi-level inverter with floating capacitor clamp multi-level inverter with cascaded H-bridge flying capacitor multi-level inverter use attached to the circuit breaker Capacitor Voltage level. This design allows the inverter to provide high power, especially in the case of a power outage due to the reduced switching state provided by the holding capacitor.

The demand for high-voltage and high-power converters that can generate high-quality signals through low-voltage devices and lower switching frequencies has led to the development of multi-level inverters that take into account the voltage limitations of semiconductor power switches. The capacitor voltage source generates a stepped voltage at its output. By switching the switch, the capacitor voltage can be added, and a high output voltage can be achieved, while the power semiconductor only needs to withstand a low voltage.

II. LITERATURE SURVEY

Single phase Five-Level Active Neutral-Point-Clamped Converter where we want to generate for medium-voltage and high-power applications, including renewable energy conversion. Considering the voltage rating of commercially available semiconductors, the five-level active neutral point clamped converter (5LANPC) is one in all the foremost advantageous topologies among five-level multilevel converters. The multilevel inverter is in a position to produces five level pulses for medium voltage application.

In [1], A three-level neutral point clamped voltage source converter (NPC VSC) is widely employed in high-power, medium voltage applications. To beat its major drawback – the unequal loss distribution among the semiconductors – the employment of active NPC switches (ANPC) was proposed previously. During this paper, an easy feed forward loss-control scheme for the ANPC converter is presented.

Active-Neutral-Point-Clamped (ANPC) Multilevel Converter Technology [2] An idea for multilevel power conversion has been presented during this paper. The structures discussed throughout the paper are a mixture of neutral-point-clamped (NPC) and floating capacitor converters. A careful selection of the redundant switching states enables the control of the floating capacitor voltages without the connection of passive networks.

III. SYSTEM STRUCTURE

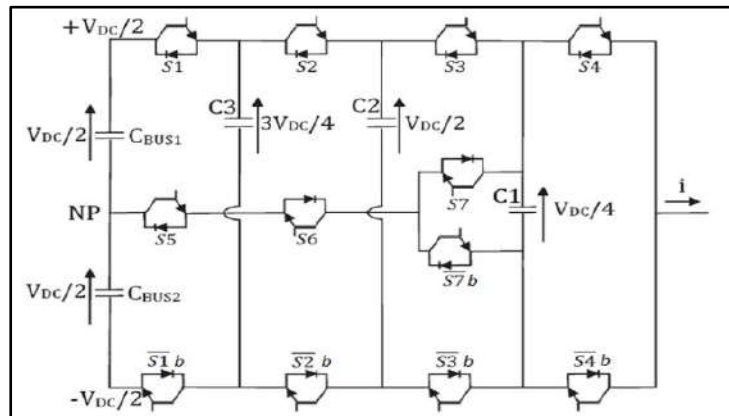


Figure 1:- Single Phase Five Level Active Neutral Point Clamped Converter

• OPERATION

In the present work, attempts have been made to the five-level active neutral point clamped converter. Combines the capabilities of neutral point clamped and flying capacitor topologies. only one neutral point is used just like three level ANPC. In addition, the required volume is determined by Flying capacitors are reduced compared to FC A topology that allows you to build converters. That is, the five-level active neutral point clamped converter Requires the same number of voltage sensors to control Previously used five level active neutral point clamped converter. previously in flying capacitor there were a greater number of capacitors in which the voltage used to imbalance therefore in this proposed topology we have reduced the capacitor and by using active neutral point clamped converter we have balanced the voltage level which leads to lower switching losses.

• WORKING

The converter has 5 voltage levels ($+V_{DC}/2$, $+V_{DC}/4$, $-V_{DC}/4$, $-V_{DC}/2$ and 0). Converter operation It can be divided into two different half cycles: positive and Negative half cycle of output voltage. Between Positive half cycle of output voltage, C_{BUS1} and C1 are used Voltages of 0, $+V_{DC}/4$, and $+V_{DC}/2$ are obtained, Negative half cycle of output voltage, C_{BUS2} and C1 are used Voltages of 0, $-V_{DC}/4$ and $-V_{DC}/2$ were obtained.

Table 1: - Switching Table

State of the Switch												Output V_o
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	
1	1	1	1	0	0	0	0	0	1	0	1	$+V_{DC}/2$
1	1	1	0	1	0	0	0	0	1	0	1	$+V_{DC}/4$
0	1	1	1	0	0	0	1	1	1	0	1	$+V_{DC}/4$
0	1	1	0	1	0	0	1	1	1	0	1	0(+)
0	1	0	1	0	1	0	1	1	1	1	0	0(-)
0	1	0	0	1	1	0	1	1	1	1	0	$-V_{DC}/4$
0	0	0	1	0	1	1	1	1	0	1	0	$-V_{DC}/4$
0	0	0	0	1	1	1	1	1	0	1	0	$-V_{DC}/2$

$+V_{DC}/4$ during half a cycle of positive output voltage It is obtained by adding the C1 voltage (V_{C1}) to NP. + Subtract V_{C1} from $V_{DC}/2$. These two different shifts the condition has the opposite effect on V_{C1} . Similarly, half cycle of negative output voltage can be $V_{DC}/4$ It is obtained by adding V_{C1} to $V_{DC}/2$ or subtracting V_{C1} from NP. These two different switching states also have the opposite effect. Impact on V_{C1} . Therefore, V_{C1} can be put under control Choosing the right switching state.

The frequency of PMW determines how fast a PMW completes a period. The frequency of a pulse is shown in the figure.

Frequency of the proposed system: -

$$F_m = 50 \text{ Hz}$$

Total time period of one cycle: -

$$T = \frac{1}{F_m} = 0.02s$$

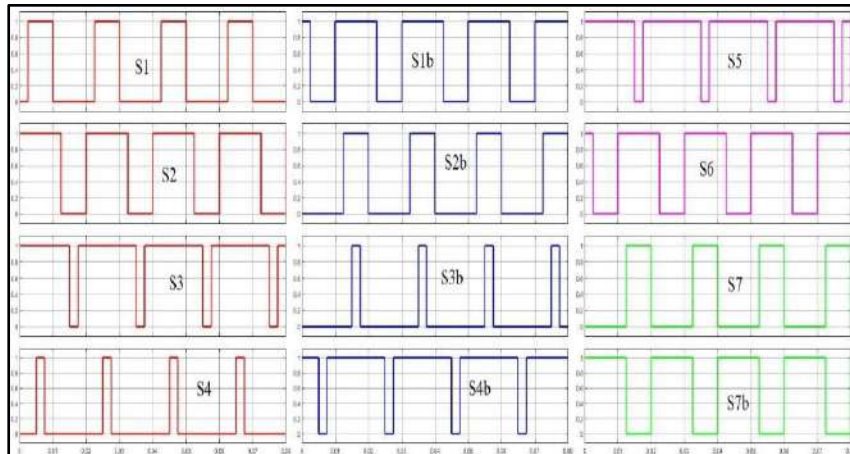


Figure 2: - Duty Cycle for MOSFET

IV. Simulation of Multilevel Inverter: -

A twelve-switch model using MOSFET as a switching device is used in positive and negative region using MATLAB model. To evaluate the performance of the Active neutral point clamped converter inverter, MATLAB/Simu-link models were built and simulated. A structure shown in fig 3.

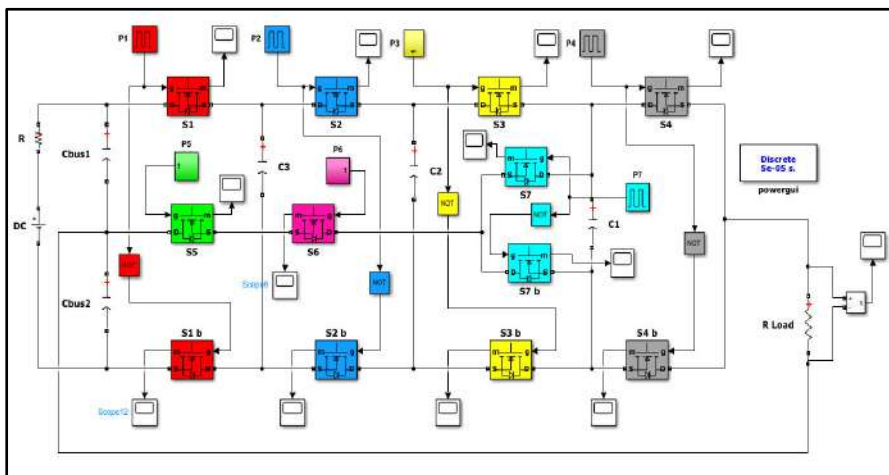


Figure 3: - Structure of the active neutral point clamped inverter

- Output voltage, $V_o = 1200V$
- Input voltage, $V_{in} = 600V$
- Output Frequency, $F = 50Hz$

Input is a 1200V, DC source with a load resistance. The expected output of 600V frequency of 50 Hz is obtained as shown in Fig.4 output of the multilevel inverter is also achieved in steps like $(+V_{DC}/2, +V_{DC}/4, -V_{DC}/4, -V_{DC}/2$ and 0).

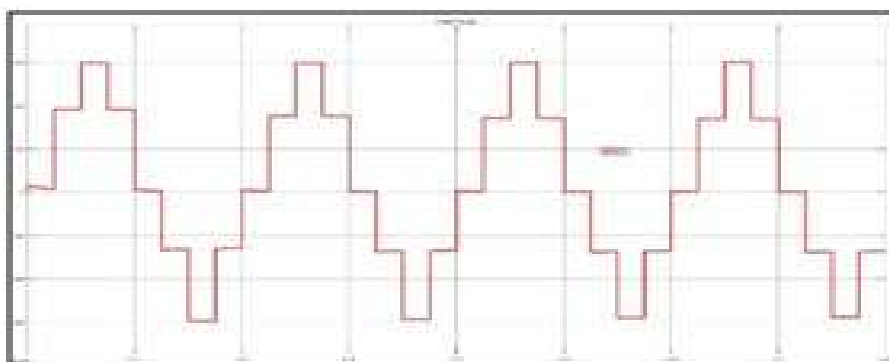


Figure 4: - Output voltage of simulation model

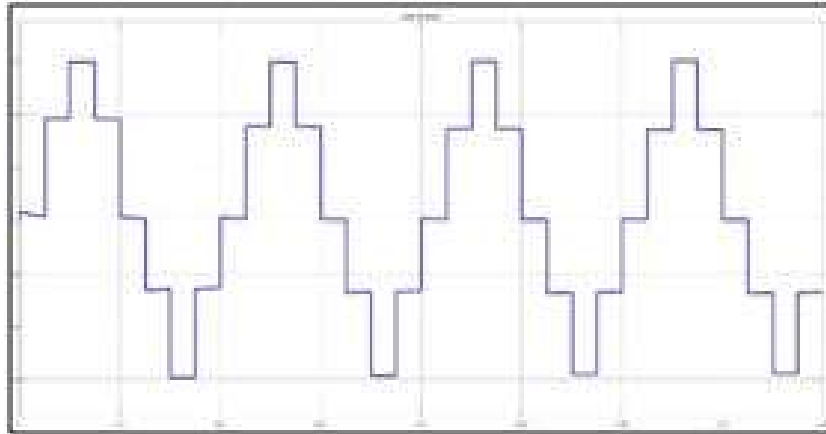


Figure 5: -Output current of simulation model

V. Hardware Design

A laboratory level prototype of the circuit which has been developed and tested. Circuit consists of five capacitors, twelve switches and one resistor as load. Selection of switches and capacitor has been done based on simulation.

The system is designed for 12 V input supply. Thus, for considering a safety factor, the ratings have been selected 5 to 10 times more than the input supply. Thus, high voltage rating i.e., 500 V MOSFETs has been selected. The hardware model shown in Fig.9 comprises with the main power circuit as well as the driver circuit for the switches. Input of 12V will be given to the Driver circuit to obtain an output of 15V with a pulse-width. Designing and implementing of Single phase Active Neutral Point Clamped Converter Multilevel topology in hardware is done by scaling down the simulation circuit parameters.

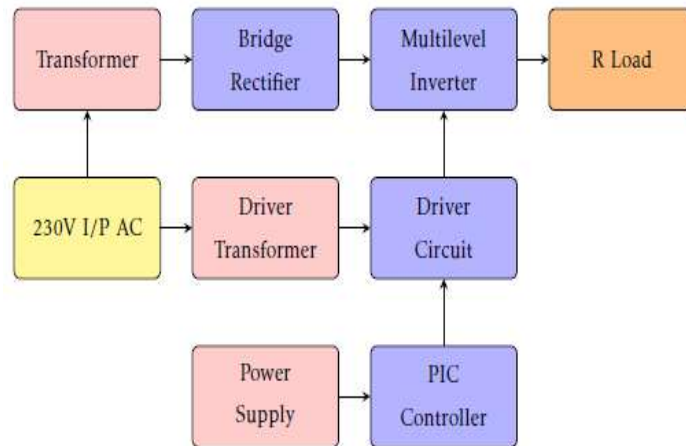


Figure 6: - Block Diagram

VI. Hardware Results

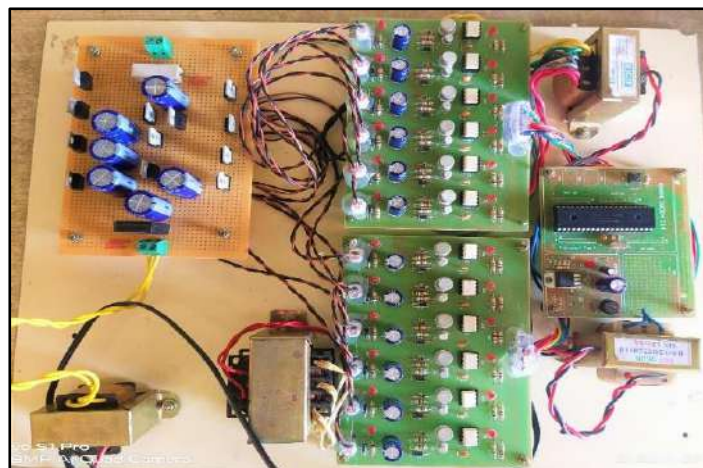


Figure 7: - Hardware Setup

The laboratory hardware a multilevel converter shown in fig 7. circuit consisting of 12 power switches is designed. There are three capacitor, 2 Dc link capacitor and one resistive load. The system is designed for 12 V input supply.

An input of 240V AC is given to the transformer which converts it into a 12V AC An input of 12V AC is given to the multilevel circuit which converts it into a 12V DC using a bridge rectifier. This 12V DC is passed through filter capacitors to get a smoother, ripple-free output and is fed to the terminals of driver IC. Signals of magnitude 5V produced by the PIC16F877A are fed to the driver IC. Later, the driver circuit steps-up the voltage of these signals and a 15V gate pulse obtained is fed to the switches (MOSFET) of multilevel inverter. Also, there is a 12V DC supply to the Driver circuit through the transformer.

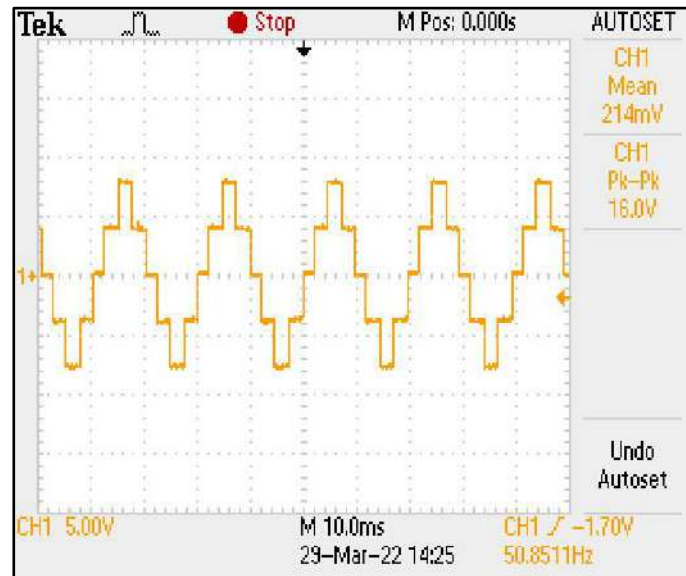


Figure 8: - Output of hardware

An important observation here is that the simulation outputs are nearly perfect the output of multilevel inverter if 6 volts steps smooth output as shown in fig 8 it also gives a 50 Hz cycle with stepped output.

A laboratory level prototype of the circuit which has been developed and tested. Circuit consists of five capacitors, twelve switches and one resistor as load. Selection of switches and capacitor has been done based on simulation.

As they have high power application, they are widely used for form medium and high-power ranges. The simulation of 5 level multi-level inverter is carried out with a simple control strategy. They have switches which are triggered to a suitable delay with an appropriate firing angle. The output of waveform obtained from the power switches and hence design five level multilevel inverter was successfully done with respect to its resistive load. In this project it reduces the uneven degradation of power switches, switching losses when compared to the conventional PWM technique and harmonics are reduced and the output waveform level is increased. And also increase the efficiency.

VII. CONCLUSION

In five-level active neutral point clamped converter topology, it is famous for its own benefits the devices used for its circuitry are quite sufficient and are also economically stable or controlled. The multilevel is famous its goal power quality and also for its performance according to the waveform we have studied that in multi-level inverter the output consist of 5 output voltage level. In this voltage level the output goes in positive as well as in negative sign periods in which the capacitor of multi-level inverter can charge as well as also can discharge this are the analysis that have been carried out in the 5 level multi-level inverter.

As they have high power application, they are widely used for form medium and high-power ranges. The simulation of 5 level multi-level inverter is carried out with a simple control strategy. They have switches which are triggered to a suitable delay with an appropriate firing angle. The output of waveform obtained from the power switches and hence design five level multilevel inverter was successfully done with respect to its resistive load. In this project it reduces the uneven degradation of power switches, switching losses when compared to the conventional PWM technique and harmonics are reduced and the output waveform level is increased. And also increase the efficiency.

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ULTRASONIC RADAR SYSTEM USING ARDUINO MEASURING DISTANCE AND ANGLE

Aditi Dive, Vinit Sankhe and Abdul Mustafa Motiwala

BE Electronics and Telecommunication, Theem College of Engineering Mumbai University, India

ABSTRACT

RADAR can see things at long distances before humans can see with naked eyes. Radar acts as both an early warning device and tracking device. Radar based systems are used as object detection systems which utilizes electromagnetic waves. This Radar System is controlled via Arduino. Ultrasonic sound sensors are used instead of Electromagnetic waves. A servomotor is used to continuously monitor an area of limited range. The project aims at making RADAR that is cost-efficient and accurate. Due to its insensitivity it can withstand harsh working conditions such as dirt, dust, rain. The system constantly monitors a limited range and alerts the presence of obstacles if any. If the object is very close to the sensor then it is alerted using a buzzer and a red LED while if an object is at short distance buzzer and green LED turn on but if the object is out of limited range alert system is off.

Keywords: Object Detection System, Arduino, Ultrasonic Sensor.

INTRODUCTION

Target detection is easier when an object is near or easily visible. But, the same doesn't stand true when the object is far away or is not visible due to weather conditions. The history of radar actually dates back to the 1880s, when Heinrich Hertz showed that radio waves exist and could be both generated and detected. American physicists Gregory Breit and Merle Tuve developed usable radar in 1925, but its use remained limited until shortly before World War II. During the Second World War, technological advances by Germany, England, and the United States resulted in significant improvements to radar in terms of technology, reliability, and power.

The project works on the principle of radar echo effect of the transmitting signal. In this Project we are using the Ultrasonic Sensor to operate by emitting a burst of sound waves in very rapid Succession. These sound waves hit the intended target, bounce back to the sensor, and travel at known speed. An ultrasonic Sensor, radar is much less affected by temperature improving consistency and accuracy. Servos are small but powerful motors that can be used in a multitude of products ranging from toy helicopters to robots. Arduino controls the servo motor for the direction of the ultrasonic sensor and it moves from 0 degree to 180 degree. Ultrasonic sensor transmits the signal in all directions and if any obstacle that is the target is detected then echo pulse sense. With the help of this echo pulse arduino program, find out the distance and direction angle of the target. The angle of rotation is displayed on a 16x2 LCD screen. Whenever an obstacle is detected, the buzzer turns on and it is also displayed in the LCD display.

LITERATURE REVIEW

Subsequent to experiencing a portion of the papers with respect to usage utilizing ultrasonic sensors and ARDUINO, it was found that this idea is searched a lot and is a mainstream idea which is still in advance. The advances utilized were not just productive and solid yet in addition financially achievable. Not only this, here other very useful applications of ultrasonic sensors were observed too.

This paper discusses about a monitoring system which is designed measure to speed of waves and height of river through ultra-sonic sensor using micro-controller (Arduino). On the off chance that the waterway can't oblige the volume of water, then all the water will submerge with land and this phenomenon is called as flood or surge. We can overcome this flood problem by earlier identification in height of water and observing speed. If we identify problem earlier we can overcome this problem before it become crisis. By testing the system i.e. simple water level, it was observed that ultra-sonic have accuracy of 96.6%. But when it is implemented in the rivers there are many errors because of different type of water levels due to heavy waves and speed of water and also due to floating of heavy objects. Unlike Previous testing results, author directed this analysis on tracking of speed of water improvement or modification and level of water in flooding. The test was completed when the Arduino used as controller of application. For more research, information of depth level and speed of water of this system will be sent to database server website to be checked regularly.

This research is about a blind walking stick made for blind people through which they can avoid obstacles while they walk and recognize currency. With the thought of visually impaired individuals, it is to some degree troublesome job to distinguish the cash or any unexpected obstacle. Despite the fact that currency dependent on size could possibly be recognized however it is relatively hard to distinguish that whether the note is unique or phony. So to overcome this issue the authors have designed the Currency Recognition Blind Walking Stick. A

lot of work is done on currency recognition and obstacle detection using advanced technologies like optical character recognition, SURF and pattern extraction through colors. But none of these systems had the feature for obstacle detection for blind people. Therefore this framework is efficient as the other ones having an extra feature for helping the visually impaired.

COMPONENTS:-**1) Arduino Uno**

Arduino is a free open source microcontroller. Having input and output digital and analog pins which enables it to get interfaced with different components. We have interfaced Ultrasonic sensor which is like the heart of the radar. Then to display output LCD (16*2 module). It can be operated in read/write mode. For our purpose we have operated it at write mode. It has enable pin which indicates as acknowledgement.

**(Fig a)**

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Arduino controls the servo motor in angle between 0 to 180 degree therefore covering the radar range. On this servo motor we are mounting the Ultrasonic sensor. The LED's and a buzzer is used for the indication of the obstacle.

2) Ultrasonic Sensor Hc-S304

The ultrasonic sensor works on the same principles as a radar system. An ultrasonic sensor can convert electrical energy into acoustic waves and vice versa. The acoustic wave signal is an ultrasonic wave traveling at a frequency above 18 kHz and HC SR04 ultrasonic sensor generates Ultrasonic waves at 40 kHz frequency.

**(Fig b)**

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound. The sensor measures the time it takes between the emissions of the sound by the transmitter to its contact with the receiver

3) Servo Motor

A servo motor is a rotary actuator or a motor that allows for a precise control in terms of the angular position, acceleration, and velocity. Basically it has certain capabilities that a regular motor does not have.

**(Fig c)**

Consequently it makes use of a regular motor and pairs it with a sensor for position feedback. Positional rotation servo motor is the most important servo motor. Hence it is also the most common type of servo motor. The shaft output rotates in about 180 degree. Additionally it includes physical stops located in gear mechanism to stop turning outside these limits to guard the rotation sensor.

4) Liquid Crystal Display:-

It is a kind of electronic display module. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments.

**(Fig d)**

The main benefits of using this module are inexpensive; simply and programmable, animations, and there are no limitations for displaying custom characters, special an even animations, etc.

5) Buzzer:-

A buzzer is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers include alarm devices, timers, and confirmation of user input such as a mouse click or Keystroke

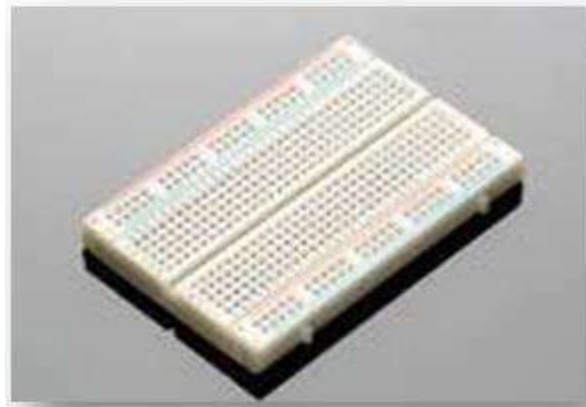
**(Fig e)**

6) Light Emitting Diode (Led)

A LED is a semiconductor light source that emits light when current flows through it. It is a special type of PN junction diode. Light is produced when the particles that carry the current combine together within the semiconductor material.

**(Fig f)****7) Breadboard**

It is a solderless breadboard, which does not require soldering, it is reusable. It is easy to use for creating temporary prototypes and experimenting with circuit design.

**(Fig g)****8) Connecting Wires**

Connecting wires allows an electrical current to travel from one point on a circuit to another, because electricity needs a medium through which to move.

**(Fig h)****METHODOLOGY**

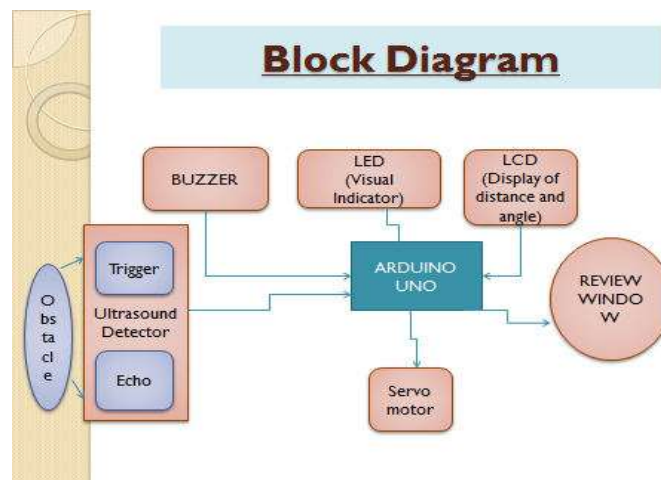
The system is an Arduino base radar system for measuring distance and angle which uses radio waves to decide or get the range, height, heading, or speed of items or objects. Radar frameworks or system arrive in an assortment of sizes and have distinctive performance particulars. Some radars are utilized for aviation authority at air terminals and others are utilized for long range observation and early cautioning frameworks. There are some ways to show radar working data. There are also some modified radar systems which have advance technology of handling the systems. These modified system are used at higher levels to get or extract the helpful or important data. working principle components which are is ultra-sonic sensor connected to the

microcontroller (we have chosen Arduino) digital input and output pins. Then we have servo motor which is also connected to digital output and input pins. Our both main components ultra-sonic sensor and servo motor are connected simultaneously, so that when our servo motor rotates from 0 degree to 180 degree from extreme right to extreme left the motor will rotate nearby its axis. We utilize Computer screen to demonstrate the data (distance and angle) through.

In order to testify the working of this system, after its designing, construction and programming we placed few objects in front of the ultrasonic sensor. As the motor started to rotate, our monitor started to display the output through processing IDE. Hence, when the sensor crossed over the object it showed a red segment with the distance and angle where the object is placed.

Block Diagram:-

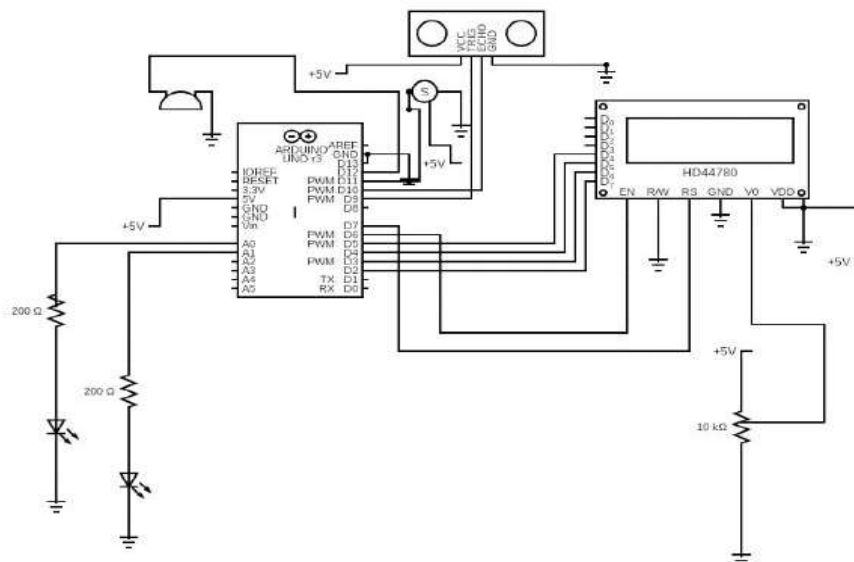
The above figure represents a brief overview of this radar system. Here, as it is shown the controller we are using is Arduino, with the input Ultrasonic sensor and the output is the servo motor which rotates 180 degrees. The microcontroller controls all the operations of this system, from rotation of the motors to the obstacle detection of the ultrasonic and representation of the result on the screen.



(Fig1).Block Diagram of the Ultrasonic Radar System using Arduino measuring Angle and Distance

The sensor is going to sense the obstacle and determine the angle of incident and its distance from the radar. The servo motor is constantly rotating to and fro, hence making the sensor move. The data obtained is encoded and fed to the processing IDE which represents it on the screen. The results are displayed further in this paper. All these operation are done by Arduino microcontroller from the rotation of the servo, data collection from the sensor, feeding the data to encoder to transferring it to the display.

Circuit Diagram



(Fig2).Circuit Diagram of the Ultrasonic Radar System using Arduino measuring Angle and Distance

This is the circuit diagram of Ultrasonic Radar system Measuring Angle and Distance ,there are three major components they are 31 Arduino Uno, Ultrasonic Sensor, Servo motor. Firstly we connect Vcc of servomotor and Vcc of ultrasonic sensor to 5v of Arduino. Connect the gnd of ultrasonic sensor and servo(black wire) to ground of the Arduino .Connect trig and echo pin of ultrasonic sensor to 9 and 10 of Arduino.. Connect signal pin of servo to pin D12 of Arduino Uno. Servo Motor rotates (0 degree to 180 degree) continuously. The Ultrasonic Sensor sense till 400 cm and our Output Range is set to 20cm. Digital PWM is connected to pin 2 to 7 of LCD D4 to D6. Analog Pin (A0 and A1) are connected to LED. First LED gives the green colour notification when the object is in 20 cm range then object is Detected and the Distance and Angle of the object is measured. Second LED gives warning in Red colour that the Object is in 10 cm range. We are using IDE Processing Software.

Application

This Radar System have various applications for security purposes and it is mainly used for mapping.

Application in Air Force

It is used in airplanes or aircraft machines which have implemented radar system in it to detect the objects that comes in a way. It is also used to calculate height readings.

Application in Marine

This radar system also used in ships or marine. It is implemented on big ships to calculate the distance of other boats or ships, with the help of this sea accidents can also be reduced by not colliding. It can also be implemented on ports to see the distance of other ships and to monitor or control the ship movements.

APPLICATION IN METEOROLOGY: - Meteorologists also uses radar systems to track or monitor the wind. It has been become an 47 important equipment for climate testing. For example to detect tornados, storms.

ADVANTAGES

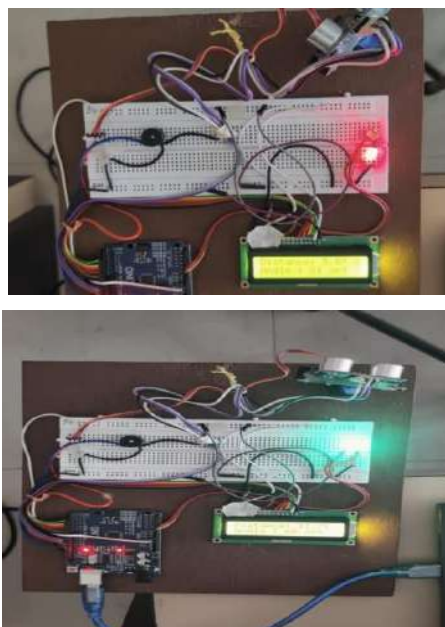
- It is not affected by the colour or transparency .The ultrasonic sensor transmit the sound off the object and so the colour and transparency has no effect on radar.
- Easy to design at low cost.
- Sensor is not affected by dust and dirt.

DISADVANTAGES

- Detection range depends on which ultrasonic sensor is used.
- Object with soft fabrics tends to absorb more sound waves so it becomes difficult to detect them.

RESULTS

Begin with uploading the code to Arduino after interfacing all the components and completing all the connections. It is observed that the servo is sweeping from 0o to 180o. Reading are displayed on the LCD.



(Fig3). Picture of Ultrasonic Radar System using Arduino measuring Angle and Distance

FUTURE SCOPE

- a) This project as modification with Wifi connection between Arduino and Android can be introduced in order to monitoring through internet
- b) GPS can be introduced for Security purposes. The project can be developed and modified according to rising need and demand.

CONCLUSION

The importance of the project is calculating accurate distance from any obstacles that we want to measure. The device can be used in many different fields and categories like distance calculating in construction fields, robots to avoid obstacles and many other applications.

ACKNOWLEDGMENT

We would like to acknowledge and extend our heartfelt gratitude to all those people who have been associated with This Project and have helped us with it thus making it a worthwhile experience.

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IOT BASED HOME AUTOMATION**Diksha Satve and Chinmayi Satave**

Department of Electronics and Telecommunication Engineering, Theem College of Engineering, India

ABSTRACT

The home automation system is implemented for decades but due to the costing and budgeting of the project, it remains a niche product for high-end consumers. The Intelligent Home Automation System, security is one of the major factors that does not implement the home automation system. The hectic daily life routine sometimes makes them forgetful to switch off the devices at home. The clumsiness attitude plus with our packed daily routine life that sometimes makes ourselves such in hurry situation that sometimes makes us forgot to switch off the lamps. It will cause the electricity bill rose sharply. Besides, it is one of the electricity wastage that will lead the earth became an unhealthy one. The strength of this project is to control the devices such as lamp and door at home using a smartphone. The system is related to home appliances using PIC MCU. Home appliances that can help the user to control the devices at home and develop a good condition of house area that will prevent any loss and damage to the property of any organization. The hardware that is being used in this project is a relay, WIFI module, PIC MCU, Relay Driver IC, Relay, Sensor's Etc.

INTRODUCTION

A smart home incorporates sensors, Relay, and a WIFI network and has two major interacting components which is a Adityakumar Dubey, Department of electronics and telecommunication engineering. Mumbai University, India.

Smart network and a smart load. The Smart home known as House automation, with the use of new technology, to make the domestic activities more convenient, comfortable, secure and economical. The Internet of things can be defined as connecting the various types of objects like smart phones, personal computer and Tablets to internet, which brings in very new-fangled type of communication between things and people and also between things. With the introduction of IoTs, the research and development of home automation are becoming popular in the recent days. Many of the devices are controlled and monitored for helps the human being. Additionally various wireless technologies help in connecting from remote places to improve the intelligence of home environment. An advanced network of IOT is being formed when a human being is in need of connecting with other things. IoTs technology is used to come in with innovative idea and great growth for smart homes to improve the living standards of life. Internet helps us to bring in with immediate solution for many problems and also able to connect from any of the remote places which contributes to overall cost reduction and energy consumption.

Background Research: - The process of improving and upgrading the living standard of the house has been raised due to the advanced technology applied in this era society. Home Automation System is implemented for decades but due to the costing and budgeting of the project, it still remains as a niche product for high end consumers. Although the concept of smart home automation has been around for quite a long time, but an actual smart home has only established a short time. The invention of home appliances such as a television with a remote control which is a simple home automation system was patented in 1893 . Other than that, more home appliances have been invented since that. In early 2000, the popularity of smart home automation began to increase due to different of technology started to arise. Smart home automation turns into a more affordable choice and therefore a viable or available technology for consumers. With the uprising of the prestige of smart home, home networking, domestic technologies and other gadgets began to emerge on store shelves Today's smart home automation are more emphasize about smart living, living greener and security. Our smart home is sustainable and it ensures that our home is not utilizing unnecessary energy. In addition, the smart home also can prevent any intruders by alerting us with alarm or send any signal to us through smartphone related application. The current trend in smart home automation includes automated lights, remotely mobile control, remote video surveillance and receiving notifications of mobile, email and text.

The System Suitable for Below Applications:

1. Security Alarm System applications;
2. Building, home and industrial Automation system
3. Supervision and monitoring alarm systems;
4. Automatic monitoring system;

5. Pumping Stations, Tanks, Oil or Water levels;
6. Buildings and Real Estate;
7. Weather Stations;
8. River Monitoring and Flood Control;
9. Oil and gas pipelines;
10. Temperatures, water leakage applications
11. Energy saving, street lights control system;
12. Valve controls;
13. Transformer stations;
14. Unmanned machine rooms;
15. Control room application;
16. Automation System.

CIRCUIT EXPLANATION

Micro Controller Interface

The project is based on a pre-programmed PIC16Fxx micro controller. The circuit used in this kit uses only one IC – the PIC16Fxxx. It is one of the RISC architecture Based high-performance flash micro controllers from MICROCHIP. The IC is preprogramed. Using a micro controller greatly reduces the component count while providing more features than could be found using dedicated logic ICs. Cost is also lower. It is pre-programmed with software to provide all the timing functions. PIC16Fxxx is an 8-bit, low-cost, high-performance flash micro controller. Its key features are 8K words of flash program memory, 1536 bytes of data RAM eleven interrupts, three ports, 10-bit ADC and only 35 powerful single- cycle instructions (each 14-bit wide). The full circuit of the IOT controlled switch is shown in circuit diagram. The brain of the switcher is the Microchip PIC16Fxxx Fxxx micro controller (U1). User Send Command to operate device on and off by IOT webpage & is transferred to the MCU Using WIFI and Hotspot Network. As per the AT commands given by the microcontroller to the wifi module, the control signal from the IOT is extracted and is used to control the devices connected to it. MCU process is necessary to decode the message from IOT. A program (for extracting the control signal part from received IOT) is loaded into M MCU, and then the circuit is connected to the modem.

Mcu Cock

Clock signal for the micro controller provided by crystal Y1 (4 MHZ) and two 33PF (C1, C2) capacitors hanging off it ensure correct loading for the crystal, so that it starts reliably. The frequency of the oscillator is internally divided and to get the operating frequency. This high frequency clock source is used to control the sequencing of CPU instruction.

Sensor Interface

A maximum of three sensors can be connected to the system via CN5, and CN6 ; these can be found in the circuit diagram. These sensors need to have their contacts open when in the inactive state (i.e. normally open) or active low signal @ 5V DC. A power supply voltage of +5 VDC is available for each sensor at the corresponding wiring terminals (CN7). There are many type of sensor available you can connect with the projects. External detection Sensor's interface to micro controller via Port, RA0 to RA3, (pin no 2 to 5). Port RA Used as a digital Input Port and is pulled up via 10K resistors s network (R-pack – RN1)

- PIR (Passive Infrared Detector) Sensor
- Smoke detector
- Flame Sensor
- Alcohol sensor
- Glass Break Sensor
- Sound Sensor
- Vibration sensor

- LPG GAS detector
- Magnetic door sensor
- FIRE sensor (Temperature sensor with active Low output)
- Ultrasonic motion sensor
- Water Overflow Level Sensor
- Oil Overflow Level Sensor,
- Water Leak Sensor,
- Temperature Sensor
- Shock Sensor
- Power failure sensor, etc. WIFI communication

Circuit Explanation Micro Controller Interface The project is based on a pre-programmed PIC16Fxx micro controller. The circuit used in this kit uses only one IC – the PIC16Fxxx. It is one of the RISC architecture Based high-performance flash micro controllers from MICROCHIP. The IC is preprogramed. Using a micro controller greatly reduces the component count while providing more features than could be found using dedicated logic ICs. Cost is also lower. It is pre-programmed with software to provide all the timing functions. PIC16Fxxx is an 8-bit, low-cost, high-performance flash micro controller. Its key features are 8K words of flash program memory, 1536 bytes of data RAM eleven interrupts, three ports, 10-bit ADC and only 35 powerful single- cycle instructions (each 14-bit wide). The full circuit of the IOT controlled switch is shown in circuit diagram. The brain of the switcher is the Microchip PIC16Fxxx m

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MCU Cock Clock signal for the micro controller provided by crystal Y1 (4 MHZ) and two 33PF (C1,C2) capacitors hanging off it ensure correct loading for the crystal, so that it starts reliably. The frequency of the oscillator is internally divided and to get the operating frequency. This high frequency clock source is used to control the sequencing of CPU instruction. **SENSOR INTERFACE** A maximum of three sensors can be connected to the system via CN5, and CN6 ; these can be found in the circuit diagram. These sensors need to have their contacts open when in the inactive state (i.e. normally open) or active low signal @ 5V DC. A power supply voltage of +5 VDC is available for each sensor at the corresponding wiring terminals (CN7). There are many type of sensor available you can connect with the projects. External detection Sensor's interface to micro controller via Port, RA0 to RA3, (pin no 2 to RA Used as a digital Input Port and is pulled up via 10K resistors network (R-pack – RN1).5). Port RA Used

WIFI communication WIFI is a wireless technology standard for exchanging data over short distances (using short-wavelength radio transmissions in the ISM band from 2400–2480 MHz) from fixed and mobile devices, creating personal area networks (PANs) with high levels of security. it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.

WIFI technology is a short-range communications technology that is simple, secure, and everywhere. You can find it in billions of devices ranging from mobile phones and computers to medical devices and home entertainment products. It is intended to replace the cables connecting devices, while maintaining high levels of security. The key features of WIFI technology are robustness, low power, and low cost. The WIFI Specification defines a uniform structure for a wide range of devices to connect and communicate with each other. When two WIFI enabled devices connect to each other, this is called pairing. The structure and the global acceptance of WIFI technology means any WIFI enabled device, almost everywhere in the world, can connect to other WIFI enabled devices located in proximity to one another. Connections between WIFI enabled electronic devices allow these devices to communicate wirelessly through short-range, ad hoc networks known as piconet. Piconets are established dynamically and automatically as WIFI enabled devices enter and leave radio proximity meaning that you can easily connect whenever and wherever it's convenient for you. Each device in a piconet can also simultaneously communicate with up to seven other devices within that single piconet and each

device can also belong to several piconets simultaneously. This means the ways in which you can connect your WIFI devices is almost limitless. A fundamental strength of WIFI wireless technology is the ability to simultaneously handle data and voice transmissions. which provides users with a variety of innovative solutions such as hands-free headsets for voice, calls printing and fax capabilities, and synchronization for PCs and mobile phones, just to name a few. The range of WIFI technology is application specific. The Core Specification mandates a minimum range of 10 meters or 30 feet, but there is no set limit and manufacturers can tune their implementations to provide the range needed to support the uses cases for their solution.

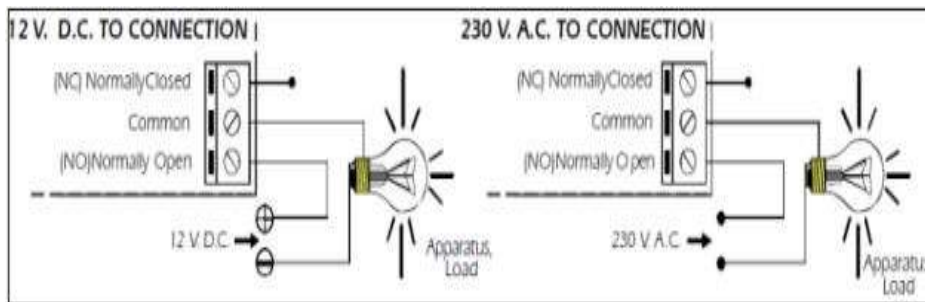
WIFI Module Connect to MCU Rx & Tx Pin. Its Communicate With MCU and Cloud Server. MCU Send Sensor Data To Cloud using WIFI Module, & Received Command To Operate Relay by User from Cloud

LED INTERFACE Four LEDs (L6 to L9) indicate the status of the sensor inputs. When the external sensor has been detected / activated, the LED (L6 to L9) of the sensor that caused on for 5 to 10 seconds. LED's Connected to, MCU Port pin RC0 to RC3 (PIN no 11 to 14) via, 220E current limiting resistor

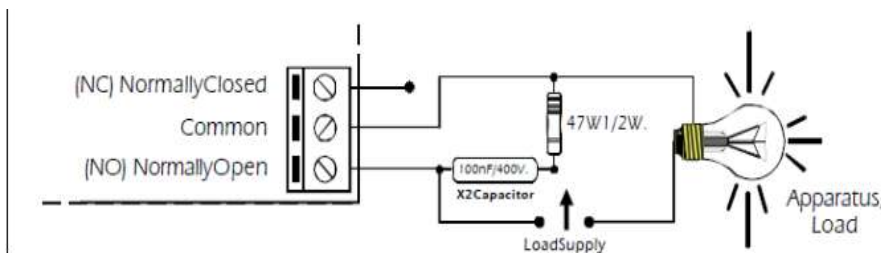
Relay Driver

The micro controller controls the outputs over port RB. The relay requires 12 volts at a current of around 100 ma, which cannot provide by the micro controller. So the driver IC is added. The most commonly available driver chip which ULN2003, we are used. A single pole dabble throw (SPDT) relay is connected to port RB0 to RB3 of the micro controller through a Relay driver IC (ULN2003 – U2). The relay is used to operate the external high Voltage Load or appliance or any other electrical device. Normally the relay remains off. As soon as pin of the micro controller goes high, the relay operates. LED L1 to L4 indicates relay status. The relay contacts are rated at 10 amps. However the PCB tracks can only take around 5 amps. You may need to add wire links on the bottom of the PCB to increase the current carrying capacity if you want to draw over 5A. The relay outputs are rated to switch up to 240VAC mains voltages.

HOW to Connect Load with Relay?



The output of the projects is controlled by a relay, allowing any load until 230V AC / 3 Amp. as maximum consumption. The relay has 3 output terminals the normally open at quiescent (NO), the normally closed at quiescent (NC) and the common. The operating of this mechanism is the same as a switch with two (2) terminals NO and common, if you wish that the output will be activated during the timer, or between the NC and the common to obtain the reverse operating. In the drawing, you could appreciate the typical connection for a devices operating at 12 VDC and to operate at 230 VAC. When the project is working and according to its load, it could happen an incorrect operating of the output. If it is the case, you have to install a circuit between 2 relay's contacts used for the connection. See the drawing map.



External Outputs

Output (CN1 to CN8), Its controlled by a 12V SPDT relay and can switch up to 230V AC/DC This is more than enough for all common signal sources such as Electronic lock, door strike, motor light or any other appliances.

NOTE - Extreme Care Should Be Taken When Switching Mains Voltage. Don't Do This Unless You Are Experienced And Know Exactly What You Are Doing. Mains Voltages Can Be Lethal!

POWER SUPPLY

The power supply circuit. It's based on 3 terminal voltage regulators, which provide the required regulated +5V and unregulated +12V. Power is delivered initially from standard 12V AC/DC adapter or 12V_1000ma Transformer. This is fed to bridge rectifier (Diode D1 ~ 4) the output of which is then filtered using 1000uf electrolytic capacitor and fed to U4 (voltage regulator). U4 +5V output powers the micro controller and other logic circuitry. LED L9 and its associate 1K (R9) current limiting resistors provide power indication. The unregulated voltage of approximately 12V is required for relay, and Relay Driver Circuit.

PART EXPLANATION

Micro Controller PIC16F886 / 16F72

Special Micro controller Features:

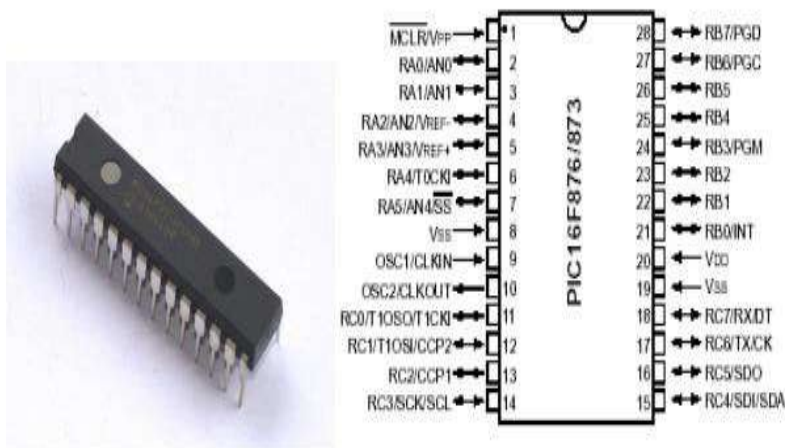
- High performance RISC CPU
- Operating speed: DC - 20 MHz clock input
- DC - 200 ns instruction cycle
- 2 ~ 4K FLASH Program Memory,
- 128 bytes of Data Memory (RAM)
- 10-bit multi-channel Analog-to-Digital

Converter

- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code protection
- Power saving SLEEP mode
- Selectable oscillator options
- Low power, high speed CMOS FLASH / EEPROM technology
- Fully static design
- Single 5V In-Circuit Serial Programming

Capability

- Wide operating voltage range: 2.0V to 5.5V
- High Sink/Source Current: 25 mA
- Commercial, Industrial and Extended Temperature ranges
- Low-power consumption:



PIC (Peripheral interface controller) is the IC while was enveloped to control the peripheral device, dispersing the function of the main CPU. PIC has the calculation function and the memory like the CPU and is controlled by the software. However the throughput, the memory capacity isn't big. It depends on kind of PIC but the maximum operation clock frequency is about 20MHZ and the memory capacity to write the program is about 1K to 4K words. The clock frequency is related with the speed to read the program and to execute the instruction. Only at the clock frequency, the throughput cannot be judged. It changes with the architecture in the processing parts for same architecture; the one with the higher clock frequency is higher about the throughput. The point, which the PIC convenient for is that the calculation part, the memory, the input/output part and so on, are incorporated into one piece of the IC. The efficiency, the function is limited but can compose the control unit only by the PIC even if it doesn't combine the various IC's so, the circuit can be compactly made. More information please refer Data sheet Of PIC 16Fxx

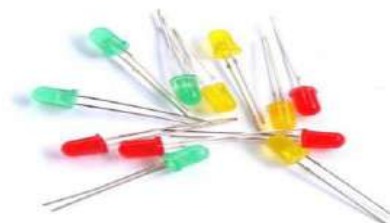
ESP8266 WIFI Module

The ESP8266 WI Fi Module is integrated TCP/IP protocol stack that can give any microcontroller access to your Wi Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much Wi Fi-ability as a Wi Fi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community. This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interfaces, it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.



Light Emitting Diode (LED)

A light-emitting diode (LED), is an electronic light source. Luminescence from an electrically stimulated crystal had been observed as early as 1907. The LED was introduced as a practical electronic component in 1962. All early devices emitted low-intensity red light, but modern LEDs are available across the visible, ultraviolet and infra red wavelengths, with very high brightness. LEDs are based on the semiconductor diode. When the diode is forward biased (switched on), electrons are able to recombine with holes and energy is released in the form of light. This effect is called electroluminescence and the colour of the light is determined by the energy gap of the semiconductor. The LED is usually small in area (less than 1 mm²) with integrated optical components to shape its radiation pattern and assist in reflection.[2] LEDs present many advantages over traditional light sources including lower energy consumption, longer lifetime, improved robustness, smaller size and faster switching. However, they are relatively expensive and require more precise current and heat management than traditional light sources. Applications of LEDs are diverse. They are used as low-energy indicators but also for replacements for traditional light sources in general lighting, automotive lighting and traffic signals. The compact size of LEDs has allowed new text and video displays and sensors to be developed, while their high switching rates are useful in communications technology.

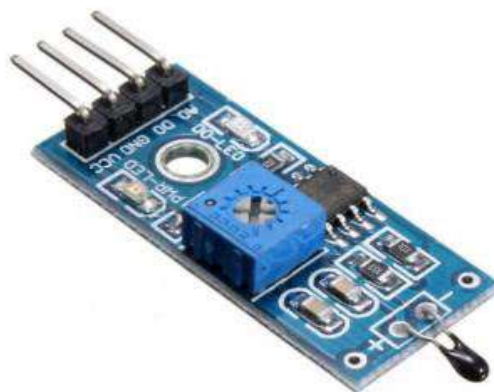


Door Sensor

The door sensor is an essential component used in-home security system. The designing of these sensors can be done with two parts which are arranged in parallel to each other. So that the circuit can be formed. When someone tries to open the door then these parts will get separated and breaks the circuit. So the control panel will activate to generate an alarm. These sensors are very easy to install and portable



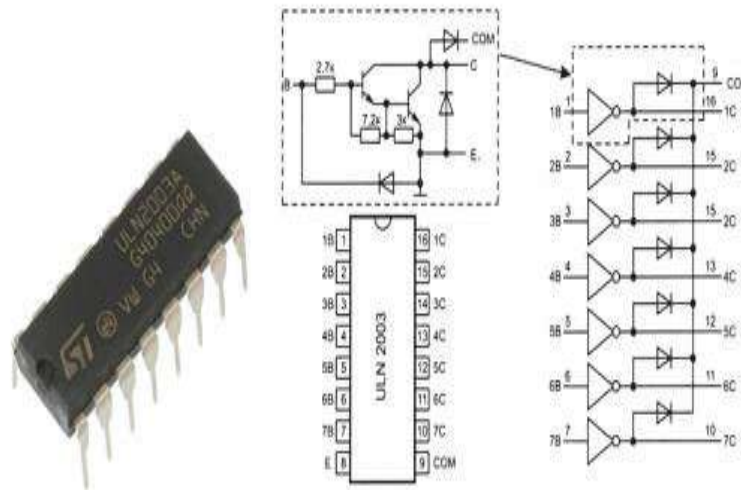
Temperature Sensor Module Thermistor Thermal Temperature Sensor is consists of an NTC thermistor that measures temperature changes. This module is able to provide both digital and analog outputs. NTC thermistor is a variable resistor that's resistance value changes according to change of temperature. The word of NTC means Negative Temperature Coefficient. The sensitivity of the module will be change by the on board potentiometer. At first, we need to connect the temperature sensor module to the 5v power supply. Then set the threshold voltage according to the normal temperature of the environment by rotating the pre set knob for setting the sensor sensitivity.



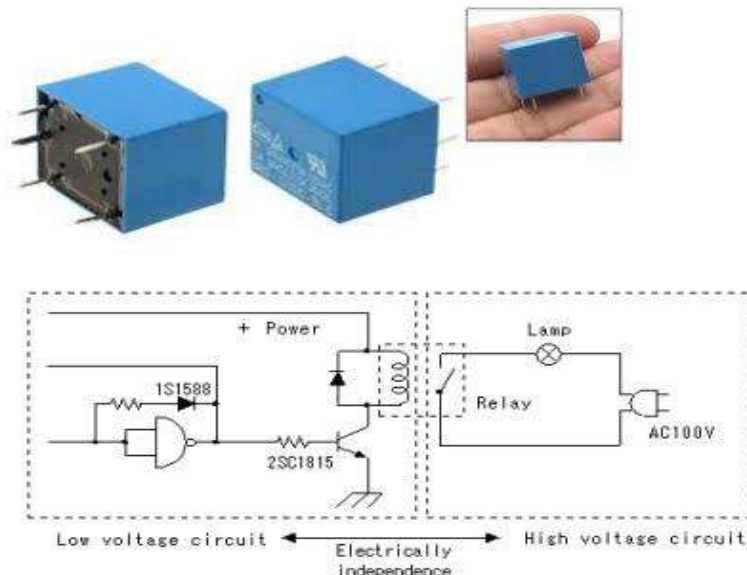
Water Level Sensor The working of the level sensor is pretty straight forward. The wire probe with two exposed conductors, acts as a variable resistor (just like a potentiometer) whose resistance varies according to the water content. This resistance is inversely proportional to the water: The sensor produces an output voltage according to the resistance, which by measuring we can determine the water level. The sensor also contains an electronic module that connects the probe to the Micro controller. The module produces an output voltage according to the resistance of the probe and is made available at an Analog Output (AO) pin. The same signal is fed to a LM393 High Precision Comparator to digitize it and is made available at an Digital Output (DO) pin. The module has a built-in potentiometer for sensitivity adjustment of the digital output (DO). You can set a threshold by using a potentiometer; So that when the moisture level exceeds the threshold value, the module will output LOW otherwise HIGH. This setup is very useful when you want to trigger an action when certain threshold is reached. For example, when the moisture level in the soil crosses a threshold, you can activate a relay to start pumping water. You got the idea! Apart from this, the module has two LEDs. The Power LED will light up when the module is powered. The Status LED will light up when the digital output goes LOW. Fire Sensor A Flame Sensor module or Fire Sensor module is a small size electronics device that can detect a fire source or any other bright light sources. This sensor basically detects IR (Infrared) light wavelength between 760 nm – 1100 nm that is emitted from the fire flame or light source. The flame sensor comes with a YG1006 Phototransistor sensor which is a high speed and high sensitivity. Two types of IR Infrared Flame Sensor Module available in the market one having three pins (D0, Gnd, Vcc) and another one having four pins (A0, D0, Gnd, Vcc) both are can be easily used with Arduino and other microcontroller boards.

ULN2003A (Relay Driver IC)

The ULN2003 is high voltage, high current Darlington arrays each containing seven open collector Darlington pairs with common emitters. Each channel rated at 500 mA and can withstand peak currents of 600 mA. Suppression diodes are included for inductive load driving and the inputs are pinned opposite the outputs to simplify board layout. These versatile devices are useful for driving a wide range of loads including solenoids, relays DC motors; LED displays filament lamps, thermal printer heads and high power buffers.



SPDT RELAY – 12V It closes the voltage less point of contact while the remote control works to control the equipment outside. The relay takes advantage of the fact that when electricity flows through a coil, it becomes an electromagnet. The electromagnetic coil attracts a steel plate, which is attached to a switch. So the switch's motion (ON and OFF) is controlled by the current flowing to the coil, or not, respectively. A very useful feature of a relay is that it can be used to electrically isolate different parts of a circuit. It will allow a low voltage circuit (e.g. 5VDC) to switch the power in a high voltage circuit (e.g. 230 VAC or more). The relay operates mechanically, so it cannot operate at high speed.



Part (Components) List Iot Based Sensor Networking & Automation Sys R1 ~ 6 - 1k [Brown, Black, Red] (6 Nos) R7 ~ 10 - 220e [Red, Red, Brown] (4 Nos) Rn1 - 10k – 5 Pin R-Pack C1, 2 - 33pf Disc (2 Nos) C3 - 1000uf / 16v Electrolytic C4, 5 - 0.1uf Disc (104 / 100nf) (2 Nos) Y1 - 4mhz Crystal D1 - 1n4148 Diode D2 ~ 5 - 1n4007 Diode (4 Nos) L1 ~ 4 / L6 ~ L9 - 3mm Or 5mm Red Led (8 Nos) L5 - 3mm Or 5mm Green Led U1 - Pic16f72 Or Pic16fxxx Micro Controller (Pre Programmed Mcu) U2 - Uln2003 Relay Driver Ic U3 - Lm7805 – +5v 3 Terminal Voltage Regulator 2nos - 14 Pin Ic Socket For U1 (14 + 14 = 28 Pin) Inos - 16 Pin Ic Socket For U2 Cn5, 6, 7 - 2 Pin Terminals Block (3 Nos) R11 ~ 4 - 12v Spdt Relay (Pcb Mount) (4 Nos) Bz1 - 12v Dc Buzzer.

CONCLUSION

The internet of things involves associate increasing range of sensible interconnected devices and sensors (e.g. cameras, biometric and medical sensors) that area unit typically non-instructive, clear and invisible. An IOT has been transportation new set of technological changes in our daily lives, that successively serving to America to form of our life less complicated and lighter. IOT applications believe a communication infrastructure for exchanging info thus it's vital from a public policy purpose of read to confirm that IOT applications, that embody aid, energy management, transportation, or the other innovative applications, can enjoy a good access to the present infrastructure.

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MODIFIED FRACTIONAL FREQUENCY REUSE TECHNIQUE TO REDUCE INTERFERENCE IN LTE NETWORKS

Shahegul Afroz, Sheeba Naaz and Rahatullah Khan
Assistant Professors, Theem College of Engineering, Boisar

ABSTRACT

The LTE (Long Term Evolution) is a wireless standard communication which result in high spectral efficiency, high data rates and flexible frequency bandwidth. By using frequency reuse mechanism high spectral efficiency is achieved. Because of frequency reuse mechanism it may cause interference in this networks. Here we proposed Modified Fractional Frequency Reuse technique with hybrid DAS (Distributed Antenna Aided) algorithm in the Long Term Evolution (LTE) networks that is based on OFDMA technique. MFFR generally divides the cell into center and boundary area and based on these deviation the proposed scheme may follow various different steps to select the optimal FFR technique. The first step is totally depend on creating proposed technique with hybrid DAS algorithm and increasing throughout with increase in user satisfaction and the second step defined on the maintenance of power optimization. The MFFR technique calculate the SNR, optimized power based user support and throughput and again uses these technique to evaluate throughput and user satisfaction. Simulation result will show that the SNR value is higher than previous technique hence throughput will also high with user satisfaction. The proposed technique results better than previous technique as per result showed further.

Keywords: LTE Networks, interference reduction, OFDMA, Modified FFR, co tier and cross tier interference.

INTRODUCTION

Mobile communication and several wireless standard based system utilize orthogonal frequency division multiple access (OFDMA) as a very desirable and current technique [1][2]. The reason behind this is because from the subcarriers band each end point engage one subset and at one time one user can occupies one traffic channel.

OFDMA system considered several techniques for mitigating complexities of cell boundary and interference issues. OFDMA provides dynamic allocation of sub bands to various users with their time requirements, to take report of channels between variations in between many users for many channels [11][12][13]. The weak user utilized the bandwidth with active fraction part of power decided by sub channelization. When cell sectors are allocating sub bands to the boundary area that time important issues are also considered the interference among users.

Cellular network have concept of frequency reuse which improves the network capacity and coverage [14][15]. In Long Term Evolution (LTE) network MFFR is used to reduce the co tier problem. The MFFR technique divide one cell into two different regions center area of cell and boundary area of cell [4][11]. Divide the one frequency band into different parts, sub parts and assign them to center and boundary region respectively. MFFR shows results as, eliminate the cross-tier interference and also mitigate co-tier interference [16][18] with this the throughput of system is increased. Bandwidth allocated to each region with utilizing transmitted power and various interference reduction parameters.

This paper have basic aim as evaluating and presenting an interference management Modified FFR technique with hybrid distributed antenna system aided algorithm for LTE networks. The technique will evaluates the MFFR technique based on parameters: power optimization, signal-to-noise ratio, and throughput and user satisfaction. The Modified FFR technique examines the radius and frequency of inside cell and will evaluates each user based SNR, throughput and capacity. For calculation of throughput with user satisfaction these calculated SINR values are useful. Now, the particular mechanism will select optimal modified FFR technique and algorithm which will either increase the user satisfaction or the user throughput. This paper also gives simulations to examine the MFFR technique.

Further, the paper is organized as below, some short summary about previous work and problem definition in section II, then will introduce the proposed mechanism and calculation of SNR, throughput, user satisfaction and power optimization with interference is explained in section III. Evaluation of technique and simulation results is explained in section IV, while section V will conclude the paper and explain some future work.

Related Work and Problem Definition

The related work about FFR with OFDMA system has mainly noted with cellular network and LTE standards. F-ALOHA technique were proposed based on OFDMA and was not able to work with full bands [5]. DFP was also proposal for interference reduction but inappropriate in terms of femtocell organization [6]. LIP algorithm was also a good technique for interference reduction under general wireless networks but interference between femtocell and macrocell was not estimated [7]. OFDMA system based Private and Coupled method [8] was beneficial for location disputation but doesn't apply FFR properly which cause interference. The FFR technique was proposed as femto and macro suited but there would be an interference at the border linking cell center and edges known as cross tier interference [9][10].

Spectrum swapping [11][12] was another technique suggested for assuring macrocell based near and far problems. For interference reduction all the femtocell were allotted different sub bands. Further, the femtocell were united through join detection of the received signal which is also useful to upgrade the global error performance but it seems more complex. Optimal Frequency Partitioning [13] [14] used to maximize the frequency capacity but because of resource allocation reduce the system capacity and spectral efficiency.

All the above techniques are good as per their own requirements they are giving good results also but some techniques are not proper with system capacity some have high rate of interference. To reduce this problem we are proposing Modified Fractional Frequency Reuse technique with Hybrid DAS algorithms, the result will be shown letter with comparison and analysis. The proposed algorithm will be explain in next part.

Femtocell Approach and Working

Femtocells are the cellular base station having specification like it is tiny, low fetch, low ability, short span that can be positioned in houses and bridged to the backhaul. While measuring connection of network such as a fixed connection some devices like optical fiber and asymmetric digital subscriber line. If user's are trying to insert network connection then these are some very good tools that user can utilize without previous knowledge also. Though, these devices have to be acquired from the mobile network employed by anyone desired to have in their accommodations. The femtocell has various benefits of it's like the inside cell coverage capacity can be improved, if any coverage holes occur than it also able to overcome those issues and at the boundary area of cell the operator can have better signal services.

The basic point of view of the 4G (LTE-A) network has to it have some different steps with new features and profit for both the users and the operative operator also. The benefits can be measure in terms of the maximizing the throughput, improving the coverage and capacity by locating femtocells. Femtocells are of three types; Private, Organization and Metro-Femtocell.

Private: Four channel unit required for this femtocell. It has capability to support number of callas at a single time and other some cells are available for support. It is nothing but a building or an office or any house specific femtocells.

Organization: It works under very slow speed environment; it is a type which is able to handle the more number of channels as compare to private femtocells. It handles channels between 8 and 32. It is suitable at company and any organization based areas.

Femtocell-Metro property: To cover big areas and high traffic data this femtocell is utilized. It is new concept of femtocell in which the operator themselves create huge number of femtocells as per their needs. This is new technology which is beneficial for latest network technology like LTE and 4G networks.

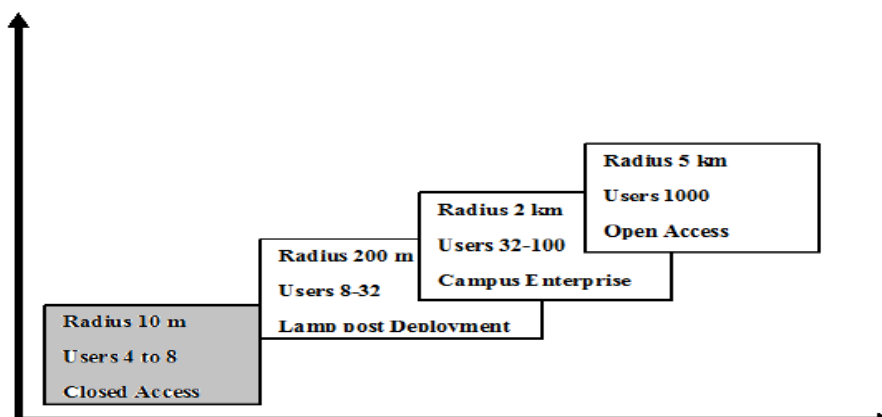


Figure 1: Types of Cells

Working of Femtocell

If a cell phone is receiving any call and the particular person suddenly responded to that call and he knows that the particular phone is connected to the near femtocell, instead of connecting to the particular base station it will directly get connected to the nearby femtocell. Femtocell essentially covers a small area or any communication. The femtocell use various modems like and wired cable to the house or DSL modem to convey the particular voice data till the particular receiver. This way the femtocell is very beneficial for people to save money on calls by posting calls on any IP address. Femtocells primarily work for the mobile phones because they are only mobile phone base station.

If the signal is weak or changed then it will inform to that particular connection by using respected gateway of femtocell. This way femtocell are able to connect themselves with each other and will have same design as per the network requirement and also this will affect the outdoor area of the cell.

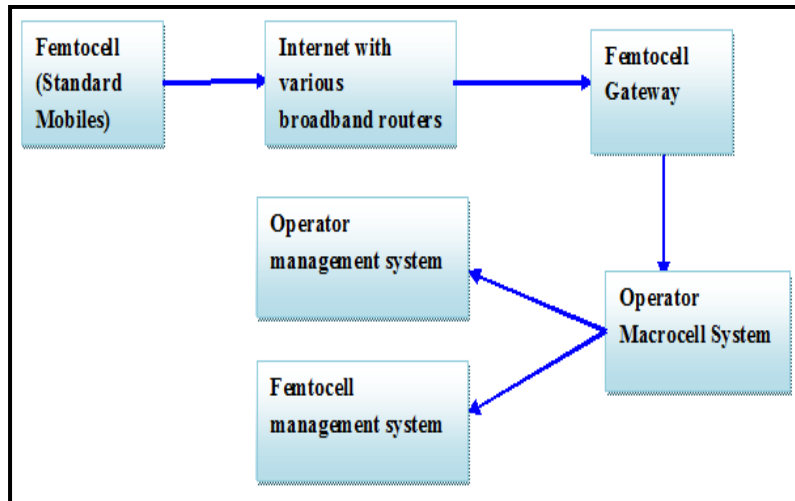


Figure: Working of Femtocell

SYSTEM MODEL

A. Distributed Antenna System

DAS is basically a system which is utilized by the cellular network to create the small cells whenever they need. DAS is a managed hub based system and antennas with remote access which able to provide wireless signal to the indoor and outdoor sub bands and multi bands. To provide cellular signal with proper coverage at the head end they locate base stations. The hub receive that signal digitize the signal, and distribute it to the other hubs via optic fibre network with high bandwidth. The digitized signal via fibre are able to transport to the other station with full signal, doesn't matter how far this is from hub and base station. By focusing on the base stations signal on a particular area by different antennas it provides higher capacity and consistent coverage over particular area.

DAS can support multiple frequency bands and service providers with single set of antennas. DAS is not only useful for small cell delivery but also efficient for small cell backhaul.

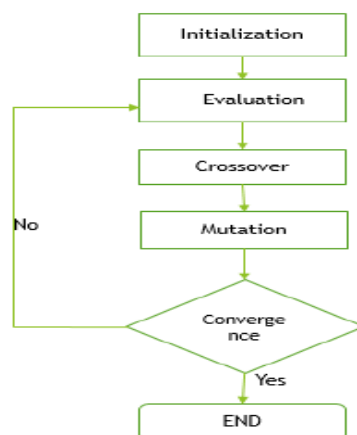


Fig: Standard DAS Flow Chart

B. Proposed Hybrid Das Algorithm

The hybrid DAS is a combination of RSSI and DAS algorithm. The RSSI algorithm basically work with MFFR technique to split the macro cell into two parts that is centre and edge region. One frequency band is split into four different parts which will further allotted to the macro and femtocell. One part of sub band will be allocated specifically to the centre are and other three will be divided to the boundary area. When femtocell get on at that time it will first check neighbour macro cell’s signal. The RSSI values will be generated for each and every sub bands. Whenever it will detected that at the centre area the signal strength is very good then femtocell will detected. Again this will calculated for other femtocell location. The femtocell will choose the sub bands which are utilized by the macrocell because they are having high signal strength.

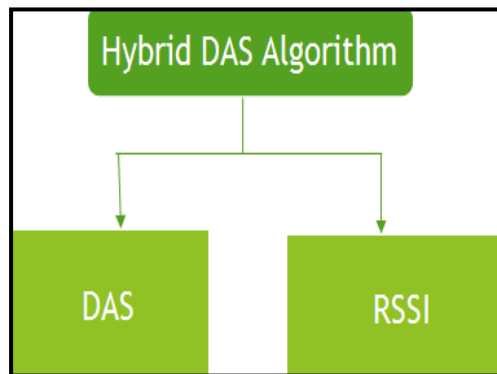


Figure: Classification of Algorithm

If the signal strength of centre area is poor at that time femtocell will be located at the boundary region. In this RSSI work with MFFR and then the DAS algorithm will work. DAS have antennas at each and every base station so that system capacity can be maintained properly. As per shown in figure 1, flowchart the DAS will calculate the power optimization with interference maintenance by using carrier to noise ratio.

The DAS algorithm will evaluate the number of supportable users with optimized power. In crossover level it will calculate throughput and user satisfaction method which generally known as fitness calculation. After cross over it will go for mutation evaluation where it will compare the throughput with other technique if the possible result will found then will show the results, otherwise again will go to first step for doing RSSI based signal strength calculation and allocation of cell and the whole procedure will continue.

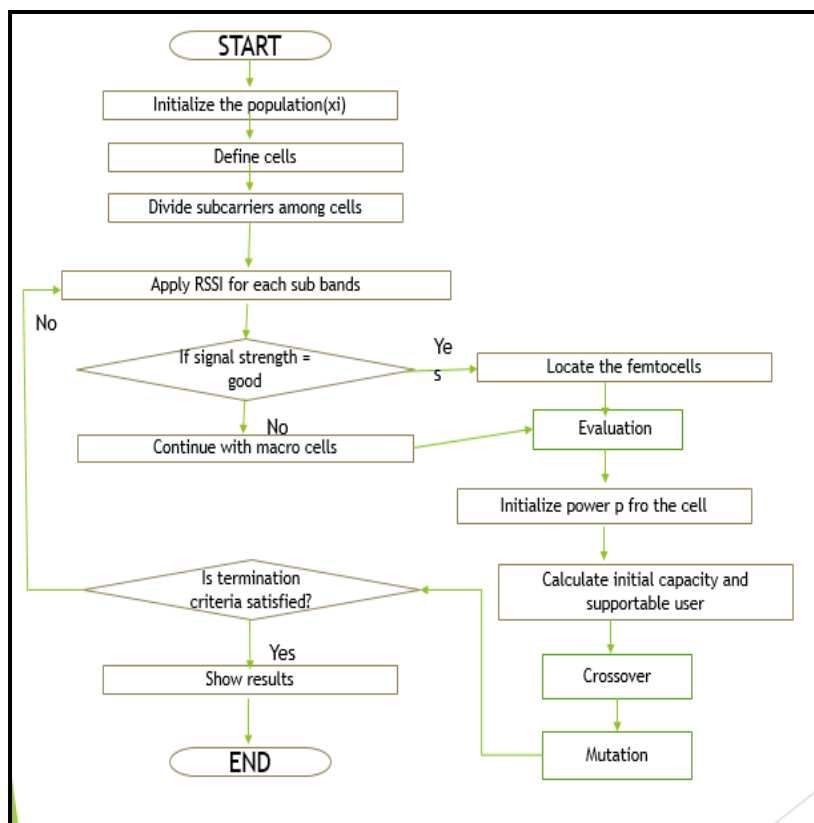


Figure 1: Flow chart of Hybrid DAS algorithm

C. Hybrid DAS With MFFR

In MFFR technique, the one frequency band get divided among four equal parts known as orthogonal frequency based sub bands written as, $F = F1 + F2 + F3 + F4$, where one of them is reserved for the center area and the remaining three are utilized by the cell boundary area. Hence, the macro cell at the center area will not get affected by the interference because of DAS is available within the same macrocell base station. In MFFR technique the cell center area and cell boundary area have their own mobile base station as per requirement with antenna system. As per the comparison result the center area mat less affected in this as compare to previous technique.

And the received SNR of the mobile users at the particular radius and with antenna angle may expressed as,

$$\gamma_u = \frac{\frac{P_b d_0^{-\alpha} h}{A}}{\sum_{i \neq 0} \frac{P_b d_0^{-\alpha} h}{A} + \sum_{i \neq 0} \frac{P_b d_0^{-\alpha} h_{i,j}}{\sum_j}} \quad (1)$$

When the mobile user is roaming around the cell boundary area at that time no interference will occur which is imposed by the main base station. Whereas, this output will depends on the interference reduction from both the mobile base station and the interfering femto base stations by utilizing the different and same frequency band as per the bands changes.

$$\gamma_u = \frac{\frac{P_b d_0^{-\alpha} h}{A}}{\sum_{i \neq 0} \frac{P_b d_0^{-\alpha} h}{A} + \sum_n \frac{P_f d_f^{-\alpha} g_n}{AW}} \quad ..(2)$$

D. Throughput Calculation with User Satisfaction

This part defines the mathematical calculation of the signal to noise ratio, network throughput with user satisfaction. These are the factors of the networks. Let assume that whole network has composed of N number of neighboring cells. A group is defined to allocate subcarriers to the users of each cell. Two cases are here where users is found inner region and outer region of cell because we are applying FFR. The typical wireless cellular networks calculate SNR as follows for the user y which served by base station b having sub carriers s,

$$SNR_{u,s} = \frac{G_{b,u} P_{b,s} h_{b,u,s}}{\sigma_n^2 \sum_j^k G_{b,u} P_{b,s} h_{b,u,s}} \quad (1)$$

In this equation (1), $G_{b,u}$ is referred as the particular related path loss with the utilized channel of base stations and users. $P_{b,s}$ the base station relevant power for performing transmission on the sub bands s, $h_{b,u,s}$ is the distributed power affected by exponentially fast fading and σ_n^2 is the Additive White Gaussian Noise channel based noise power. The symbols j and k are referred as set of base stations facing interference. Their physical definition is that co-channel cells are defined by k and index of cells are shown by j. In this paper, we are considering transmit power in equal amount, $P_{b,s} = P$ which is applied for all the base stations. The distributed power channel coefficient $h_{b,u,s}$ will replaced by its minimum value which is approximate =1 that is $h_{b,u,s} = 1$ in equation (1).

Interference in inner and outer region comes from the disjoint set of downlinks in network. In a cell the center area assigned one specific frequency band which may cause interference for the other center area of cell which is working on same band. Specifically, base station necessarily divided into two categories. The first category consist of interfering base station which may transmit to the center area of cell on similar band as user u and the second may consist of all the base stations interfering transmitting to the boundary area of cell on the same band as user u.

After estimating SNR, will proceed with calculation of throughput. The capacity of user u on the sub carrier of s can be calculated by the following equation:

$$C_{u,s} = \Delta f \cdot \log_2(1 + SNR_{u,s}) \quad (2)$$

Where, Δf refer as bandwidth which is available for every subcarrier divided by the number of users that share the specific subcarriers. Furthermore, the throughput of particular user u can be represent as follows:

$$T_u = \sum_s \beta_{u,s} C_{u,s} \quad (3)$$

Where, $\beta_{u,s}$ represents the macro user based subcarriers. When, $\beta_{u,s} = 1$, then basically subcarrier is registered for macro users. Otherwise, $\beta_{u,s} = 0$. The performance of the experiments evaluated successfully, now to define User Satisfaction (US) is as the addition of all the users' throughput divided by the product of the

maximum user's throughput and the number of users (u). This method easily presents the relationship between user's throughput and the maximum throughput of particular area. Hence,

$$US = \frac{\sum_{u=1}^U T_u}{max_throughput * U} \quad (4)$$

US have range from 0 and 1. All the users in the correspondence cell will have similar throughput and it will show by user satisfaction = 1. The user satisfaction 0 shows huge throughput differences between users in the cell.

E. Carrier to Noise Ratio

Carrier to noise ratio C/N₀ is defined as the received power level of carrier to the ratio of noise power level measured in Hz. The calculation of C/N₀ is referred as it predicts the receiver performance under the impact of interference signal and its value determines the precision of the pseudo range and carrier evaluation.

When there is no loss of tracking loops because of interference signal, the interference signal may affects the tracking loop performance which shows result in a pseudo range based error. The pseudo range and C/N₀ relationship can be degrade by the receiver based specific feature. It is receiver manufacturer responsibility to supply the data. This data are utilized by the C/N₀ also known as pseudo range error factor.

The usual value for the C/N₀ in normal applications is around 40 dB [4], but this range is totally depend on the receiver quality. The standard range that can handled by the receiver is of C/N₀ is from 25 to 40dB. The noise of signal can be captured by the antenna or can be generated by the inside amplifiers of receiver. The noise has a PSD flat which can be written as,

$$N_0 = K (T_{ant} + T_{amp}) \quad (5)$$

Where, K is Boltzmann constant, $K = 1.38 \times 10^{-23} (J/K)$, T_{ant} the antenna noise temperature (K), $T_{amp} = 290(N_f - 1)$ the amplifier temperature and N_f is nothing but amplifier based noise ratio (dB) at 290K.

The power density of interference at the output shown in [W/Hz] unit and written as,

$$N_I = P_I \cdot T_d \quad (6)$$

Where, P_I is the output power of interference signals? The noise power at the output described with [w] unit,

$$P_N = N_0 / T_d \quad (7)$$

The post correlation C/N₀ can be expressed as

$$C/N_0 = \frac{P_G}{(N_0)_{post}} \quad (8)$$

Where, P_G is the signal power at the correlator output, and $(N_0)_{post}$ is the post correlation noise density with interference signal and also additive white Gaussian noise (AWGN). Can be defined as,

$$(N_0)_{post} = N_0 + N_I \quad (9)$$

Substituting the (9) into (8) will give correlation C/N₀ with presence of interference and AWGN:

$$C/N_0 = \frac{P_G}{N_0 + N_I} = \frac{P_G}{N_0 + T_d P_I} \quad (10)$$

The above equation shows that interference increases the noise level in the correlator output causing simple drop loss in the value C/N₀.

Performance Study

A. Scenarios and Environments

The necessary simulation parameters for the experiments are presented in the Table 1. Here we have consider a 11MHz of bandwidth based system known as Long Term Evaluation (LTE), which is spitted among 27 subcarriers and each subcarriers are working on bandwidth of 380KHz. OFDMA technology is used by all the base stations. Number of femtocell vary according to the signal strength and coverage of macrocell. Femto and Macro cell users are randomly divided in the whole network.

The users of macro and femtocells are randomly divided by the sub carriers. One band is divided like half is assigned to center area and the other half remains for boundary area. One omnidirectional antenna with three small sectors antenna are installed for macro base station, and for center area the transmit power is of 16 W and for boundary area transmit power is of 21 W, respectively.

Table 1; Simulation Parameters

Parameters	Values
Cellular Network Model	Hexagonal grid, 3 cell
MBS coverage radius	2 Km
FBS coverage radius	0.9 m
Carrier frequency	2000 MHz
Inter-cell Distance	500 m
Radius of Femtocell	10 m
MBS transmit power	43dBm
FBS transmit power	15dBm
Path loss Model (O to O)	$28+35*\log_{10}(d)$, d in meters
Path loss Model (O to I)	$40*\log_{10}(d) + 30*\log_{10}(f) + 49$; f in MHz, d in km
Path loss Model (I to I)	$38.5 + 20*\log_{10}(d) + L_{walls}$ $L_{walls} = 7 \text{ dB}, 0 < d < 10$ $L_{walls} = 10 \text{ dB}, 10 < d < 20$ d in meters
White Noise Power Density	-174dB
Path loss exponent (a)	4 (Outdoor)
Path loss exponent	2 (Indoor)

At other side, macro base station will utilize 19 W transmit power if the particular MFFR technique is not utilized properly. The femtocell utilize the 19 mW transmit power. When, path loss is a dominant factor, then for indoor and outdoor network different sub carrier channels are utilized.

Then for each and every sub carrier the SNR values will be calculated. By using this SNR value the throughput and user satisfaction will calculate by user located in the center area of macrocell.

B. RESULT AND COMPARISON

In figure 1, it shows the supportable users as per allotted power. When signal strength = 0.25, this value shows that at the 10^{-4} whole users are get activated. With signal strength 0.5, this will start activating users from 10^{-4} and activate all the users at 10^{-3} . For signal strength 1 and 1.25 all the users are activated permanently at 10^{-3} and after this. So here we get that at the 1.25 value all users get activated permanently.

In figure 2, throughput for femtocell user area shown in femtocell coverage as the number of users varies. In this proposed scheme, at each location, the femto users can be able to get the sub bands which are not utilized by the macro users. This may result in avoidance of interference between femto and macro users. The throughput is calculated for three level maximum, minimum and average respectively.

But the proposed scheme shows that it effectively utilize the power and reduce the interference as per allocated power. It is a technique with optimized power and improved throughput and SNR values. The SNR value is calculated by using mathematical formulae. As shown in all the figures, the proposed scheme improve the overall throughput and reduce the interference with optimized power for both center and boundary users.

In figure 3, the throughput comparison between 0 to 50 densities of femtocell is shown. The three level of throughput is there like minimum level, maximum level and the average level, that figure is clearly showing us that our throughput is better than previous one with reduced interference.

At other side sub bands are allocated to the femtocells which are used by the macro cells in previous schemes. If femto and macro cells are very near to each other it may happen they will utilize the same sub bands for both cells. Hence, this may cause higher interference between femto and macro users which is higher than proposed technique.

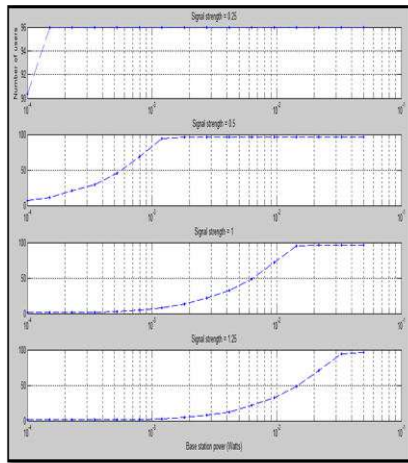


Figure 1. Supportable Users With Optimized Power

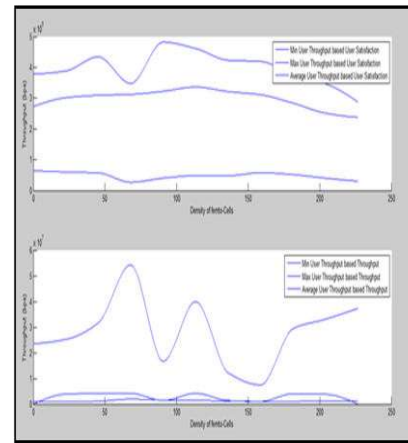


Figure 2. Throughput Comparison Between Previous and Proposed Scheme Based on Density of Femtocell of Femtocell

The proposed scheme and previous scheme have big gap as per femtocell increases. Proposed scheme avoids this interference, and also show less degradation. Figure 3, shows the sub carrier allocation for the inner area users. In cellular system performance is weak in the inner area because of inter cell interference. The proposed scheme shows an effective way of allocating sub bands to inner area at the boundary level which is good for throughput and user satisfaction improvements.

The bandwidth allocation done here is based on different considerations. The bandwidth allocation is based on throughput and user satisfaction with or without adaptation.

The figure 4, shows three technique comparison based on optimized power and improved throughput with user satisfaction. The FFR-1 scheme shows that it activates all numbers of users before the allocated power so the remaining power is not useful for any further work and get waste. The FFR-2 technique required more power to activate all the users as per allocated in the figure 1.

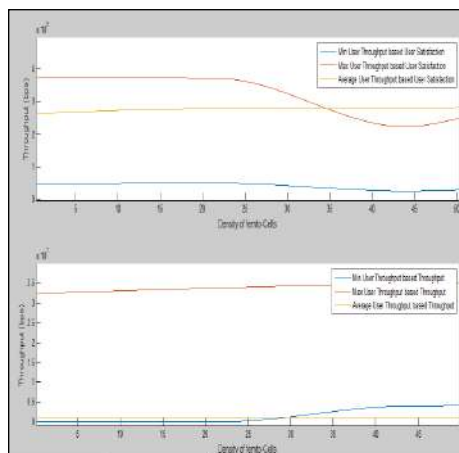


Figure 3: Throughput Comparison With Deep Analysis Between 0 To 50 Femtocell Density

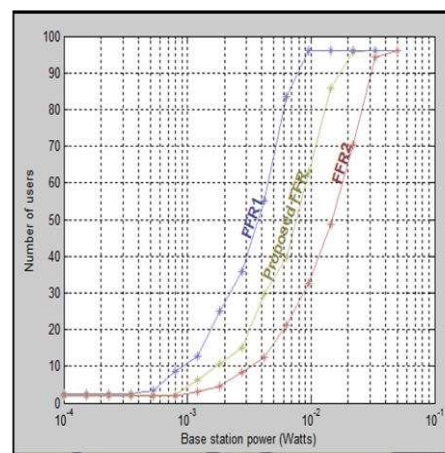


Figure 4. Technique Comparison With Optimized Power And Improved Throughput

CONCLUSION

In this paper we proposed an interference reduction MFFR technique that calculate the SNR mathematically, optimized power based user support and throughput and again uses these technique to evaluate throughput and user satisfaction. Based on these calculated values the scheme may follow different approaches for selecting optimal technique of FFR. The first approach is based on the maximization of throughput with user satisfaction and the second approach is based on the maintenance of power optimization.

Furthermore, we have taken some parameters to perform simulation experiments and then we have compared three techniques. As per general consideration we can say that the technique that is based on Modified FFR with hybrid DAS algorithm is represent better result than other techniques. It gives positive result with improved SNR and throughput with user satisfaction.

Hence, hybrid DAS algorithm with MFFR technique in the LTE networks is beneficial for next generation communication with interference reduced technique. The working flow that is followed by the mechanism could be extend in order to support proper coverage issues according to mobility.

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CENTRIFUGE LIQUID SEPARATION MACHINE**Rushab Vishwakarma¹, Shaikh Ruman², Atul Rai³, Sayyed Samir⁴ and Iqbal Mansuri⁵**^{1,2,3,4}Students and ⁵Assistant Professor, B.E. Mechanical Engineering, Theem College of Engineering, Mumbai, Maharashtra**ABSTRACT**

This paper introduce, Centrifugation is a method of separating molecules having different densities by spinning them in solution around an axis (in a centrifuge rotor) at high speed. The major components of the centrifuge include; an electric motor, a rigid frame, rotating wheel, three sedimentation vessels and a centrally mounted shaft. The centrifuge was designed to withstand vibration caused by the rotating masses and fabricated using locally sourced standard material. Performance test analysis gave a specific energy consumption and optimal separation time of 30 minutes respectively. Thus the centrifuge constitute a variable option for production of pure and quality industrial products in small and medium scaled industries. The main purpose of making machine is to check our product before going for batch production, for avoiding losses time and material.

INTRODUCTION

A centrifuge is a device that uses centrifugal force to separate various components of a fluid. This is achieved by spinning the fluid at high speed within a container, thereby separating fluids of different densities (e.g. cream from milk) or liquids from solids. It works by causing denser substances and particles to move outward in the radial direction. At the same time, objects that are less dense are displaced and move to the centre. In a laboratory centrifuge that uses sample tubes, the radial acceleration causes denser particles to settle to the bottom of the tube, while low-density substances rise to the top. A centrifuge can be a very effective filter that separates contaminants from the main body of fluid.

There are three of centrifuge designed for different application, Industrial scale centrifuges are commonly used in manufacturing and waste processing to sediment suspended solids, or to separate immiscible liquids. An example is the cream separator found in dairies. Very high speed centrifuges and ultracentrifuges able to provide very high accelerations can separate fine particles down to the Nano-scale, and molecules of different masses.

Large centrifuges are used to simulate high gravity or acceleration environments (for example, high-G training for test pilots). Medium-sized centrifuges are used in washing machines and at some swimming pools to draw water out of fabrics.

Gas centrifuges are used for isotope separation, such as to enrich nuclear fuel for fissile isotopes.

REVIEW OF THE LITERATURE

In this Literature Survey, an overview of important of laboratory centrifuge rotor design and other parameter selection is presented. It is mainly focused on studying the different parameters of laboratory centrifuge rotor to improve the strength of the rotor and safety of the product.

- [1] Anon Wang boon, Pattarapong Phasukkit, Computational Analysis of Blood Parameters Separate by Centrifuge Technique: This article is purpose of the computational fluid dynamic (CFD) simulation for blood parameters separated by centrifuge machine which has different spinning velocities. The structure of the machine, as a fixed tube at 30 degrees from the base is used to prove that the precipitate of the blood's 2 parameters, such as blood cell and plasma, by using the simulation from computer In three dimensional (3D) symmetry modelling to study the change of the precipitate in centrifuge at different velocity of spinning. At 2000 rpm, 3000 rpm, 4000 rpm and 5000 rpm (round per minute) the result of this simulation showed the density of blood as low density in the top of the blood it's mean plasma and high density at the bottom of the tube it's mean blood cell. From the model in centrifuge can prove that in each different level of the density from velocity of spinning that useful for study to improvement of blood parameters separated by used computer simulation
- [2] Neethu S.1 and B.G. Fernandez Design, Analysis and Optimization of High Speed Axial Flux Permanent Magnet Synchronous Motor for Centrifuge Application: This paper presents novel design and analysis of a high speed axial flux permanent magnet motor for centrifuge application. The centrifuge motor is designed to rotate at a speed of 45000 rpm inside an evacuated casing for a long time. The proposed axial flux motor has light, yet strong, well-balanced rotor that can run for about 25 years continuously. The designed motor is optimized for obtaining superior performance. Magnet 3-D and OptiNet are used for the Finite Element Analysis (FEA) and optimization of the motor respectively and the results are presented. Finally, the fabricated motor is tested using sensor less Field Oriented Control (FOC) for experimental verification

[3] Mr Himanshu J Gajjar¹, Mr Nikunj Modh², Mr Killol Kothari³, A Review On Optimization Of Laboratory Centrifuge Rotor Using Simulation Tools, Vol.2, and March 2016: In the present review paper an effort is made to study the previous investigations which have been made in the different structural analysis and optimization techniques of Rotor of Laboratory High Speed Micro Centrifuge. That analysis may be static or dynamic analysis. A number of analysis techniques like analytical and experimental are available for the structural analysis of High Speed Micro Centrifuge Rotor. Same as no of optimization techniques are available for optimization of it like Taguchi method. In this scenario, a structural optimization tool like topology optimization is becoming more relevant and attractive in product design processes. Determination of the different structural or topology analysis and optimization through the various methods like FEA, in high speed laboratory centrifuge rotor has been reported in literature.

Inertia Plate Fabrication

1. SS 316 Plate 12 mm thickness marking And cutting With plasma cutting Machine
2. Material cutting , 350 long 240 width, 12mm thickness,
3. Grinding In order to get surface right angle.
4. SS Rod diameter Cutting of SS 316 (Bearing Housing)
5. Rod diameter cutting of 100mm and 70mm length
6. SS plate of 12 mm should be cut 100 mm dia at center for welding of Rod
7. Rod of diameter 100mm Should be done rough machining before welding on Inertia plate, Rod is held on True jaw lathe machine for Boring purpose that will reduce Time for final machining with inertia plate
8. Welding with inertia plate of rod diameter 100mm with maintaining height of 28mm with respect to top side of inertia plate.
9. Welding Height Will be 5 mm With Argon Gas Welding.
10. With DP i.e. Developer And penetrant Flaw check of welding Joint. 11. Cutting of pipe diameter 180mm *30mm length *3mm thickness ss 316 for Bottom Shell.
12. Machining of pipe by holding true on jaw chuck of lathe machine, light cut of 1mm on both side.
13. Ring cutting of diameter 225mm, 8mm thickness , SS 316
14. machining of ring by light cut on face ,OD and ID of 180mm tolerance(+0.2)
15. Welding of pipe with ring fillet of 5mm outside and 3mm inside (bottom shell).
16. Welding of bottom shell with inertia plate fillet of 5mm inside and outside
17. Machining of bottom shell with inertia plate and rod of diameter 100mm (Bearing housing) with maintaining diameter of 62mm inside on one side and width of 18mm, now machining of bottom shell maintaining height of 30mm and diameter of 215 mm.
18. Machining of other side of bearing housing with inner diameter of 62mm and 18mm width.

Body Fabrication of Centrifuge Machine

1. SS 316 pipe of diameter 180mm.
2. Pipe cutting of diameter 180mm and 120mm length , 3mm thickness
3. Machining of pipe holding on true Jaw chuck for Face Cutting operation to make diameter 180mm length 115mm.
4. Cutting of ring ID 170 mm & OD 220 SS 316 Grade
5. Rough machining of ring by light Cut of 1 mm.
6. Welding of ring on both side with diameter of 220mm welding size will be 5mm on bottom side and 4mm on top side one round argon gas welding
7. Machining of body shell by maintaining size of diameter 215 mm on the side one side machining groove of 6*6mm for Teflon type gasket fitting.
8. Top side machining of ring maintaining light cut on face by maintaining diameter 215mm.

Lid Fabrication of Centrifuge Machine

1. Diameter 215mm, 3mm thickness circle cutting and used pressing machine for maintaining depth of 15mm

inside.

2. Cutting of ring diameter of 185 ID and 220 OD.
3. Machining of ring with light cut (0.5mm)
4. Welding of ring with circle of fillet size of 5mm inside and 3mm outside.
5. Machining of lid circle by light cut on ring face(0.5mm) and OD will be 215mm. & groove size of 4.8mm for O ring fitting (rubber type) of 5mm diameter.

Basket Fabrication of Centrifuge Machine

1. Cutting of pipe diameter 150mm length 80mm.
2. Machining of pipe with light cut on face, cutting of circle 25mm thickness diameter 15mm OD.
3. Machining of circle with maintaining OD 140mm and step of 50mm*16mm depth IS 24mm for locating.
4. Welding of plate with basket pipe (shell) inside and outside of fillet 5mm one round.
5. Drilling of basket pipe 115mm pitch and light cut on base by maintaining ID of 25mm(-0.02).
6. Shaft machining of 30mm diameter with bearing size diameter 32mm(+0.02).
7. Nylon gear coupling alignment with motor & shaft with using diameter 16mm OD 180mm long.

WORKING

First ensure of tightening of basket nut with silicon gasket fix the filter bag inside surface of basket properly so that it stick to basket and after rotating of basket it should not get stuck to pipe line nozzle Close the Lid & body Shell with provided I bolt screw Rotate basket for 30sec freely So that the filter bag get fixed properly And feed by water inside for cleaning and filtering of bag You can Pour Slurry Liquid from feed pipe Constantly and equally while rotating of basket, so a constant ML liquid can be separated from Slurry Liquid i.e. (drug, Chemical, High Density liquid, Etc..)

Rotating times depends on density of material which is used to separate. Sight Glass is provided to ensure Working and material can be seen through it. After obtaining Cake or Powdered material in filter bag Shut the Supply of motor Open the lid and the whole Filter bag can be removed out manually.



RESULT

We used ammonium nitride scullery liquid for trial we get the result in the form of cake powder.

High Flow Material

Curd was inputted in the machine and the result is in the form of strained yogurt. Low Vibration has observed.

CONCLUSION

The main boon of using the ideology is to reduce the cost for testing of Chemicals in lab before taking any heavy batch of material in use so that the drug cost will be saved, also to obtain a very simple drive with any other misconceptions. Time and vibration has been reduced to obtain results with more effective by increasing RPM and Power.

A Better design for maintenance and cleaning purpose

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DESIGN & FABRICATION OF MULTI-PURPOSE MECHANICAL MACHINE

Aditya Pramod Patil¹, Aamir Ali Rizvi², Sayed Husain Mustak³, Mohd Anees Farooq Nagori⁴ and Iqbal Mansoori⁵

^{1,2,3,4}Students and ⁵Assistant Professor, B.E. Mechanical Engineering, Theem College of Engineering, Mumbai, Maharashtra

ABSTRACT

This is paper presents the concept of ‘Multi-Purpose Mechanical Machine’ mainly carried out for production based industries. Industries are basically meant for Production of useful goods and services at low production cost, machinery cost and low inventory cost.. So in this project we have a proposed a machine which can perform operations like drilling, cutting, grinding some lathe operations at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously. In this machine we are actually giving drive to the main shaft to which a bevel gear is attached, all four shafts have a bevel gear attached to each other to form a differential mechanism, and three of the four operations are both engageable and disengageable.

Keyword: Multipurpose, Power transmission, Concurrent Engineering, FMS (Flexible Manufacturing System), Cutting.

1. INTRODUCTION

Every industry desire to make high productivity rate maintaining the quality and standard of the product at low average cost .in an industry a considerable portion of investment is being made for machinery installation .so in this project work is propose where a machine is designed which can perform operations like cutting, buffing, milling, and drilling.

Our Research describes the design of a “Multi-Purpose Mechanical Machine” which is based on the concept of concurrent engineering to perform multi-operations such as cutting, drilling, grinding. I have worked on the same project at my college presenting a synopsis showing its basic construction and working. The project work subject is one, in which actually we are learning the theoretical concepts in practical way. Also the practical experience is one of the aim of this subject. For a developing industry these operating performed and the parts or components produced should have its minimum possible production cost, then only the industry runs profitably

2. LITERATURE REVIEW**2.1 Rakesh S. Ambade, Komal D. Kotrange Et.Al. “Paddle Operated Multipurpose Machine”**

The survey of the literature regarding pedal driven machine are listed: Dharma Chaitanya Kirtikumar was design and develop of multipurpose machine which does not required electricity for several operation like cutting and drilling etc. This is a human power machine runs on chain drive mainly with human effort. But if we wanted to operate this machine by electric power this machine can also does that. This design is ideal for use in the developing world because it does not required electricity and can be build using metal base, pulley, rubber belt, chain, grinding wheel, saw, bearing, foot pedal for operated by human effort.

2.2 Krishnappa R1, Venkatesh G2, ET. Al. “Motorized Multipurpose Machine”

Industries are basically meant for Production of useful goods and services at low production cost, machinery cost and low inventory cost . Today in this world every task have been made quicker and fast due to technology advancement but this advancement also demands huge investments and expenditure, every industry desires to make high productivity rate maintaining the quality and standard of the product at low average cost.

2.3 Dr. Toshimichi Moriwaki (2006) “Multi-Function Operating Machine”

Recent trends in the machine tool technologies are surveyed from the viewpoints of high speed and high performance machine tools, combined multifunctional machine tools, ultra precision machine tools and advanced and intelligent control technologies. Frankfurt-am Main, 10 January 2011. The crisis is over, but selling machinery remains a tough business.

2.4 Mr.Gawari Tushar1, Mr. Gawade Rahul2, Et.Al. ‘Multi Purpose Machine’

This model of the multi operational machine is may be used in industries and domestic orientation which can perform mechanical operation like drilling , cutting and shaping of a thin metallic as well as wooden model or body. Economics of manufacturing: According to some economists, manufacturing is a wealth-producing sector of an economy, whereas a service sector tends to be wealth-consuming.

3. ELEMENTS OF PROJECT

3.1 Drilling: - A drill is a tool fitted with a cutting tool attachment, usually a drill bit used for drilling holes in various materials. The attachment is gripped by a chuck at one end of the drill and rotated while pressed against the target material. The tip of the cutting tool does the work of cutting into the target material.. Specially designed drills are also used in medicine, space missions and other applications. Drills are available with a wide variety of performance characteristics.



Fig 1: Drill bits

3.2 Cutter: - Cutting is used to machine flat metal surfaces especially where a large amount of metal has to be removed. Other machines such as milling machines are much more expensive and are more suited to removing smaller amounts of metal, very accurately.. The cutting tool removes the metal from work which is carefully bolted down. The shaping machine is a simple and yet extremely effective machine. It is used to remove material, usually metals such as steel or aluminium, to produce a flat surface.



Fig 2: cutting

3.3 Frame: - The frame of setup for the Multi-Operational Machine consist of four ends inclined at certain position to transmit power from AC motor connected to shaft at one end having Scotch Yoke Mechanism such that the power to another parallel shaft is transmitted via chain sprocket system having drill chuck fitted with drill bit at one end and grinding wheel at other end for the other two operations to be performed under single workstation. The frame is made up of mild steel which holds the mainframe of the project such that to minimize the vibrations and oscillations during it working operation ,all the four ends of the frame is clamped at fixed position by means of mechanical clamps.



Fig 3: Frame

3.4 Bearings: - A bearing is a device to permit constrained relative motion between two parts, typically rotation or linear movement. Bearings may be classified broadly according to the motions they allow and according to their principle of operation. Low friction bearings are often important for efficiency, to reduce wear and to facilitate high speeds. Essentially, a bearing can reduce friction by virtue of its shape, by its material, or by introducing and containing a fluid between surfaces. Rolling-element bearings such as ball bearings and roller bearings are used for this purpose. In this project roller ball bearing such as bearing no: - (SKF-6294) is used for this purpose.

3.5 A.C. Motor: - An AC motor is an electric motor driven by an alternating current (AC). The AC motor commonly consists of two basic parts, an outside stator having coils supplied with alternating current to produce a rotating magnetic field, and an inside rotor attached to the output shaft producing a second rotating magnetic field. The rotor magnetic field may be produced by permanent magnets, reluctance saliency, or DC or AC electrical windings.

3.6 Shaft: - A shaft is a rotating machine element, usually circular in cross section, which is used to transmit power from one part to another, or from a machine which produces power to a machine which absorbs power. The various members such as pulley & belt and bearings are mounted on it. The material used for ordinary shafts is mild steel. When high strength is required, an alloy steel such as nickel, nickel-chromium or chromium-vanadium steel is used. Shafts are generally formed by hot rolling and finished to size by cold drawing or turning and grinding.



Fig. 4: Shaft

3.7 Belt and Pulley: - A belt is a loop of flexible material used to link two or more rotating shafts mechanically, most often parallel. Belts may be used as a source of motion, to transmit power efficiently or to track relative movement. Belts are looped over pulleys and may have a twist between the pulleys, and the shafts need not be parallel.. They run smoothly and with little noise, and cushion motor and bearings against load changes, albeit with less strength than gears or chains.



Fig. 5: Belt and pulley

3.8 Gears: - Bevel gears are used as the main mechanism for a hand drill. As the handle of the drill is turned in a vertical direction, the bevel gears change the rotation of the chuck to a horizontal ratio. Bevel gears are gears where the axes of the two shafts intersect and the tooth-bearing faces of the gears themselves are conically shaped. Bevel gears are most often mounted on shafts that are 90 degrees apart, but can be designed to work at other angles as well. The pitch surface of bevel gears is a cone.



Fig. 6: Gears.

3.9 Buffing: - Buffing is defined as a finishing process that involves the use of a loose abrasive on a wheel. To polish a work piece, a manufacturing company may use a wheel that's covered with an abrasive disc. Generally, the wheels used in the buffing process are made up of cloth or the fiber which is charged with loose abrasive grains. The buffing belts are made in the same way as wheels. A very fine abrasive is used for being charged to these wheels or belts and charging is generally done by using sticks made up of abrasive or/and wax.



Fig. 7: Buffing wheel.

3.10 Milling: - Milling is the process of machining using rotary cutters to remove material by advancing a cutter into a work piece. This may be done varying direction on one or several axes, cutter head speed, and pressure. Milling covers a wide variety of different operations and machines, on scales from small individual parts to large, heavy-duty gang milling operations. It is one of the most commonly used processes for machining custom parts to precise tolerances.

4. METHODOLOGY

Power is transmitted through the motor to the shafts with the help of belt and pulley mechanism, this helps in transferring the power of the motor to the shafts. The shafts are held on to the frame with the help of pedestal bearings which are bolted to the frame. Bevel gears are used in this condition and they are strong and rigid and can work in dry condition as well. Splines are ridges or teeth on a drive shaft that matches with grooves in a mating piece and transfer torque to it, maintaining the angular correspondence between them. For instance, a gear mounted on a shaft might use a male spline on the shaft that matches the female spline on the gear. The splines on the pictured drive shaft match with the female splines in the center of the clutch plate, while the smooth tip of the axle is supported in the pilot bearing in the flywheel. An alternative to splines is a keyway and key, though splines provide a longer fatigue life, and can carry significantly greater torques for the size.

5. OPERATIONS PERFORMED

- 1) Drilling
- 2) Cutting
- 3) Milling
- 4) Buffing

6. PROPOSED PROJECT FIGURE

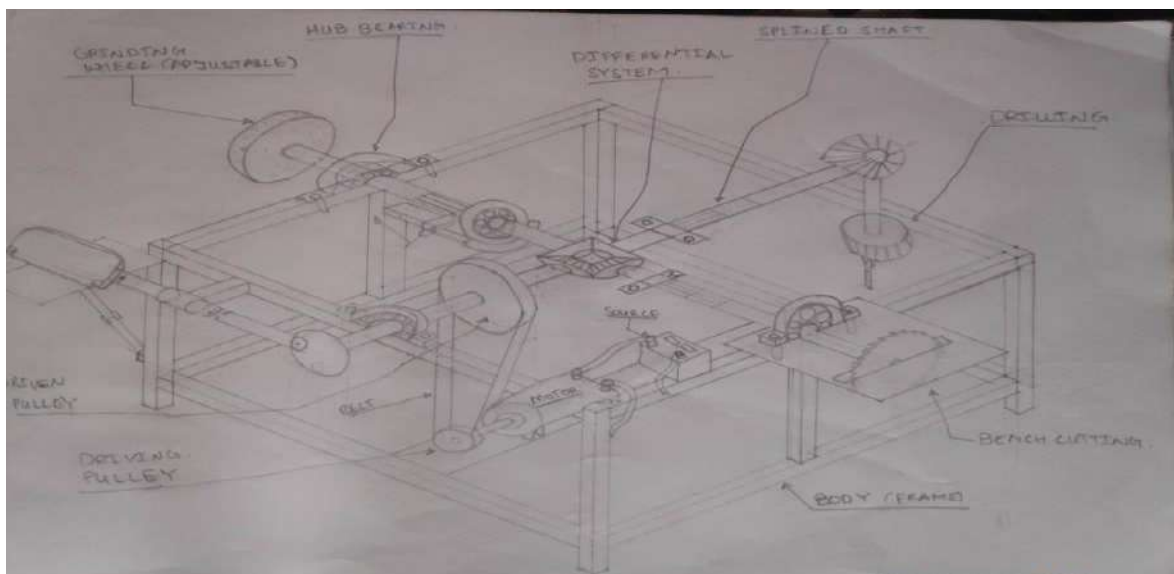


Fig. 8: Design of Multipurpose Mechanical Machine

7. FINAL DESIGN OF PROJECT

Fig. 9: Final Design of Multipurpose Mechanical Machine.

7. SPECIFICATIONS OF COMPONENTS

- Frame of the model: length=2.5 ft., width=2.5 ft., height=3.5 ft.
- Shaft dia. =20 mm (main.), shaft length=360 mm
- Splined Shafts (3)
 - o Bush Dia.= 25mm (outer), 16mm inner dia., 2mm splined, for 85mm length.
 - o Shaft Dia. = 20mm for 260mm length; 18mm outer dia., 2 mm deep cut, for 100mm length.
- Roller bearings of inside dia. =20 mm and 25 mm
- Roller bearing no:- SKF 6294
- Shaft is also of mild steel.
- Frame is also made of mild steel
- Belt length= 4.5 ft., Pulley dia.=3''
- Drill bit length=6mm
- Cutting wheel dia.=110mm.
- Centre to centre dist. Of pulley and shaft=48cm.
- Speed of motor = 1440 rpm, 0.5 H.P.
- Torque transmitted = 2455.5 N.mm

8. RESULT

- Performing operation on more than one Job at a time.
- Performing multiple operation in one cycle and easy operation and attachments.
- Easy to install and use anywhere.
- Low maintenance cost.
- Simple in construction.

9. ADVANTAGES AND APPLICATION

- Machine cost is minimum.

- Five operation work at a time in machine.
- Maintenance cost is low.
- Easy to assemble. Simple in operation.
- Simple in operation.
- No need of skill operator.
- All operation is performing by only one motor.
- This machine can be used in Steel industry.
- It can be used for multiple operations in workshop.
- It can be used in part manufacturing work.

11. CONCLUSION

We can see that all the production based industries wanted low production cost and high work rate which is possible through the utilization of multi-function operating machine which will less power as well as less time, since this machine provides working at different centre it really reduced the time consumption up to appreciable limit. In an industry a considerable portion of investment is being made for machinery installation. So in this paper we have proposed a machine which can perform operations like drilling, cutting, grinding at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously.

12. FUTURE SCOPE

- Other operations can also be incorporated in to the machine
- The machine can be made more portable
- Cost can also be reduced to some extent by manufacturing it on a mass scale.
- Regulator can also be incorporated onto the AC motor to regulate the speed of moving motor (varying speed of motor).

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DESIGN AND FABRICATION OF GYROBIKE

¹Jadhav Ashish Narayan, ²Patel Rushang Naresh, ³Shaikh Saif Ali Farooq, ⁴Tejam Mohit Mangesh and ⁵Shafiq Shaikh

^{1, 2, 3, 4}Student, ⁵Assistant Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar- 401501

ABSTRACT

This paper contains detailed description of designing and analysis of Gyro wheel used for the stabilization of the mono bike. The Gyro wheel is a special kind of wheel which is designed as an alternative to the training wheels used in bicycle for new learners. The Gyro wheel works on the principle of gyroscopic effect cause by the rotating flywheel. The Gyro wheel consists of a solid disk flywheel inside it which is spinning independently. The flywheel rotates at a high speed and creates a gyroscopic effect known as gyroscopic precession. It is design as a special type of wheel working on mechanical aspects that would be able to balance it-self i.e. it would maintain vertical position because the rotating flywheel nullified all the forces acting upon the wheel. For designing of the Gyro wheel, 3d modeling software used is Solid Works. As the title of the project gives a rough idea of this research which is about aconcept which can be implemented on bike with which the bike can be balanced itself without any support. This self-supporting bike will be powered with the help of DC hub motor which will be connected to a lithiumion battery .The purpose of this project is to design and build a mono wheel bike which can be used for ease of transportation and balance itself with the help of gyroscopic effect. The gyroscope balances the bike by countering external disturbance by the use of precision effect. This technology is generally used in heavy ships for balancing purpose to neutralize the effect of waves force. The same principle we can use with bikeas well. The gyro wheel will be mounted to same shaft as the mono bike's main wheel and it will be powered with dc motor which will also be connected to the same battery output. When in rotation, it resists any change inorientation of its spin axis.

Keywords: Flywheel, Gyro wheel, Monowheel, Precision Effect.

I. INTRODUCTION

Developing a one- wheeled electric vehicle which has features that can cover the problems such as ease of transportation, decrease atmospheric pollution ,using less parking space, mentioned above since it has small longitudinal length and low carbon footprint. Moreover, they are suitable for all age groups; and do not require any registration, taxes. Most humans can learn to ride a bike without any problem because humans are skilled to balancing laterally left to right and the gyroscopic effect of the wheels makes it easy to stay up onceon the move. Remove one of the wheels to make it a unicycle and the tendency to topple backwards or forwards around the single axle is almost impossible to avoid. Seasoned unicyclists manage it by using the directly connected pedals to constantly adjusting the wheel backwards and forwards underneath them.

II. OBJECTIVE OF THE PROJECT**A. To Maintain the Wheel in Vertical Position.**

The Gyro wheel consists of a flywheel which is co-axially aligned with the wheel. The flywheel needs to be rotated at a desired speed to obtain the required gyroscopic effect. When the flywheel rotates at the respective all the forces acting on it are nullified due to the rotation. The flywheel is coupled to a DC motor with friction drive method and these motor drives the flywheel which creates a gyroscopic effect helps in processing of the wheel in vertical direction.

B. To Rotate the Flywheel to the Desired Speed.

To create the gyroscopic effect in the Gyro wheel the flywheel needs to be rotated at the respective speed (rpm). This is done by using a D.C motor. D.C motor has a high starting torque and starting time is also less so it is used for the purpose. The D.C motor is coupled to the flywheel by a friction wheel.

III. DESIGN AND COMPONENTS

Following general components of Gyro wheel are to be designed and selected:

1. Flywheel
2. Bearing
3. Axel
4. Motor
5. Motor controller
6. Battery
7. Tire

IV. CALCULATION

1. Calculation for Motor to Rotate the Flywheel

DC Motor Speed (N) = 2650 rpm

Voltage (V) = 24 V

Watts = 250 W

Torque of the motor

$$\text{Torque (T)} = \frac{\text{power} \times 60}{2\pi \times N}$$

$$T = \frac{24 \times 60}{2 \times 3.14 \times 2605}$$

T = 0.0865

Torque = 86.5N/m

2. Calculation for Battery Range

Battery used Lithium ion = 48 V

Ampere = 24 Amp

Watts Hour (WH) = Voltage × Ampere

Watts Hour (WH) = 48 × 24

WH = 1152 Watt Hour

Charging time depends upon the charger

If the charger is of 6 Amps it will take 4 hours to charge the battery to its full capacity.

To run a 750 watt motor for 1 hour it will consume 750 WH.

If the motor running at speed of 25 kmph for 1 hour 32 min it will be fully drained giving us the range of 33km.

V. DESIGN OF GYRO WHEEL

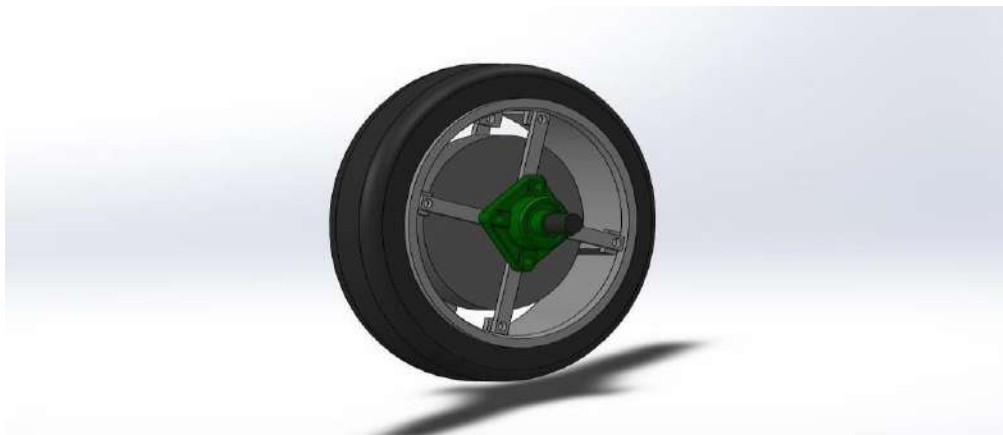


Figure 1: Gyro wheel design solidworks

This is the first step making Gyro bike. Gyro wheel is the main component on this project it's powered with a 250 Watt motor which produces 2650 rpm. The Flywheel is an important part of the gyro wheel. The gyro wheel is made using a normal tire which is a section of (90/90-12) dimension. A flywheel is a mechanical device with a significant moment of inertia used as a storage device for rotational energy. Here diameter of the flywheel is 241.1 mm and weight of the flywheel is 10kg. Minimum occurs at the center of the flywheel. It is made of mild steel material and has hole in the middle of it to pass the axel through it. The flywheel inside the tire is held with the help of 8 total mild steel strips which are welded through the rim of the tire as shown in the figure above and the shaft which is also made with mild steel is connected with 2 box housing bearing so that shaft rotates freely as well as the gyro wheel. When powered the gyro wheel with battery and motor as mentioned above the result are that flywheel inside the wheel starts to rotate at a high speed making the wheel stabilize.

VI. DESIGN OF FRAME

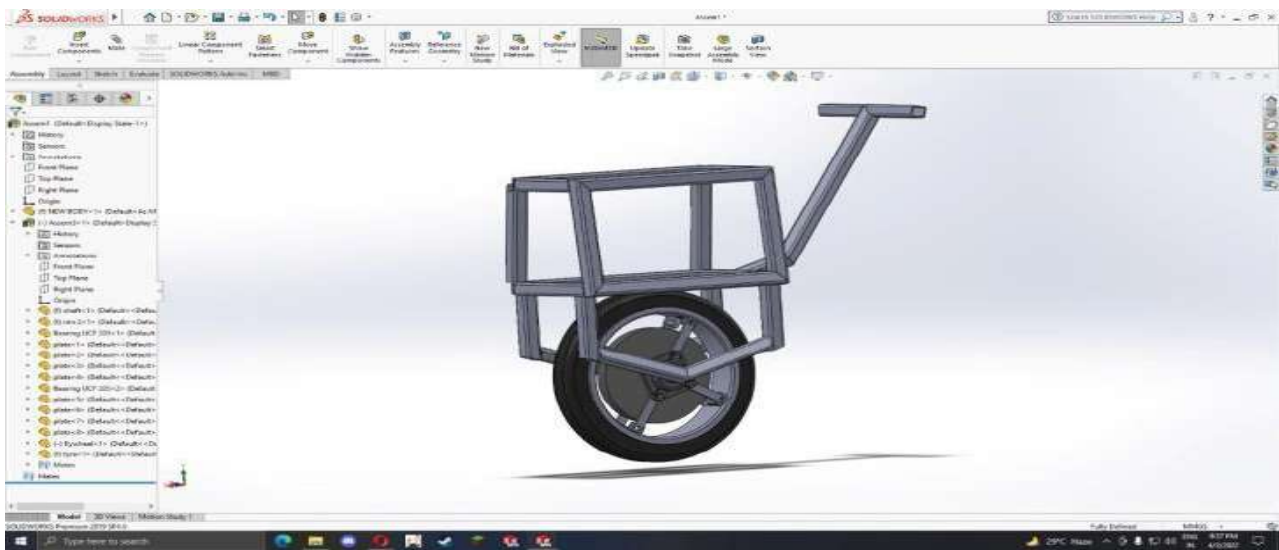


Figure 2: Gyrobike frame solidworks design

Frame is designed with help of computer software Solidworks Design. This design is to make compact so that it can take less space, light weight and can be comfortable will sitting and riding it. The body is made as a one whole structure and it is welded. The hollow squared metal tubes are used and it is stronger enough and it will not bend while riding after facing a bump.

VII. CONCLUSION

In the course of this project, the design and analysis of Gyro wheel was done. The attempt to replace or find an alternative use of transportation. The main objective is to achieve space utilization, making it cost efficient, less complicated and simpler in use. Thus, the mono- wheel is much helpful in the large campuses like airports, universities, space centers and in large industries etc. This system reduces the work of humans as well as no pollution it provides eco- friendly environment. The use of Gyro wheel has a wide range of applications that can be harnessed in the near future.

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MULTIPURPOSE WHEEL HOE FOR COST AND WORK EFFICIENT FARMING**¹Jay Madav, ²Roshan Killedar, ³Pooja Gaikwad, ⁴Jayesh Arekar and ⁵Iqbal Mansuri**^{1, 2, 3, 4}Student, ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar- 401501**ABSTRACT**

It is said that Farmers are the backbone of the country, But nowadays they are leaving or either selling their farms and moving towards different profession for their living. And, by this our country is affected in all aspects. Due to lack of financial support, taxes on goods in market and low market value of the grown crops. Because of these reasons farming has becomed one of the expensive occupation or profession. So, we have decided as being an engineer and the citizen of this country we should contribute our knowledge and skills towards country and the people living in this country. By making our KISAN strong to face any situations.

We have created an 'All Purpose Farming Machine' which can does almost everything in the field which creates farming cost and work efficient named as 'Multipurpose Wheel Hoe'.

Our Main Motive is to

- 1) To make agriculture easy and affordable.
- 2) To support agriculture and the farmers willing to do farming.
- 3) To bring back the farmers who left their profession as a farmer.
- 4) To gather new generation towards farming for country's growth.

I. INTRODUCTION

Development and Fabrication of "Wheel Hoe" is aimed to produce the multifunction tools according to the agriculture field conditions. Wheel Hoe has three implements which is used to trim weeds (WEEDER), to cultivate a soil (CULTIVATOR), to make the drainage (FURROWER) on the dried soils. But, we have enhanced traditional wheel hoe by developing two more attachments which is to plain soil (PLAINER) and to separate grains from waste material (HARVESTER) and we have named it as "Multipurpose Wheel Hoe".

Today's world requires speed in each and every field. Hence rapidness and quick working is most important. Now a day for achieving rapidness, various machines and the equipment are being manufactured. In such a modern era of liberalization, small scale industries are contributing in a big way to the growth of our country. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality. Taking into account the above contribution we have tried to manufacture a machine which can reduce human workload and can do various agricultural activities. The organic food system or often mentioned the organic agriculture is one of the activities Indian Government Program to decrease usage of chemical fertilizers and pesticides which is causing reduced soil fertility and an environmental damage. An organic agriculture is defined as the holistic and integrated system of agricultural productions, through optimizing the health and productivity of agro economy so, it will be producing the good quality of food. There are principles of organic agriculture that is the fertility and soil biological activity must be maintained, the soil must behave right humus and loose, trimming weed is using mechanical or semi- mechanical way of farming. Indian farmers problems are lack of agricultural mechanization to support the productivity of agricultural product. The Indian farmers are still using the traditional tools in their agricultural activities. Therefore, the outcome is less than the efforts they are putting in their fields.

II. LITERATURE SURVEY**A. Development and Evaluation of Wheeled Long-Handle Weeder**

Silas O. Nkakini a,^Ψ and Abu Husseni b Department of Agricultural and Environmental Engineering, Faculty of Engineering, Rivers State University of Science and Technology, Nigeria (E-mail: nkakini@yahoo.com, E-mail: abusky4u@yahoo.com) ^Ψ - Corresponding Author. A push-type operated wheel weeder with an adjustable long handle, was designed, constructed and tested. The hoe performance from the tests on a field of Okra plant having an inter-row spacing of 800mm, showed that it could weed satisfactorily, and eliminate the drudgeries associated with the use of the short handle hoe such as backache, pains at the spine and lower waist region.

Field capacity and efficiency of 0.050ha/hr and 87.5% were obtained respectively. Furthermore, the average weeding index and performance index obtained were 86.5% and 1108.48, respectively. At a speed of 0.04m/s, a high efficiency of 91.7% at 0.4m depth of cut was obtained. The developed wheeled long-handle weeder was found efficient.

B. An Ergonomic Study on Evaluation of Single Wheel Hoe in Reducing Drudgery

Shilpi Verma, Shobhana Gupta and C.P. Pachauri

Women constitute a major task force in agricultural operations in India. Therefore, it becomes necessary to study the ergonomics of women operators involved in weeding and to suggest modifications for further reduction of human drudgery. Heart rate is one of the accurate means to evaluate the functional demands of work on the worker. Hence, the study was done to know the performance of improved weeder that is single wheel hoe in reducing drudgery among women engaged in weeding activity. The results showed that the total cardiac cost of work was 285.0 beats, the physiological cost of work was 6.33 beats/min, the average working heart rate during weeding was 112.5 beats/min and the average energy expenditure was 9.16 KJ/min during the weeding activity performed by improved tool, the single wheel hoe. Weeding activity was performed for maximum number of days in a year from morning till evening in squatting position majority of women perceived it as moderately heavy activity.

III. COMPONENTS

A. Main Frame

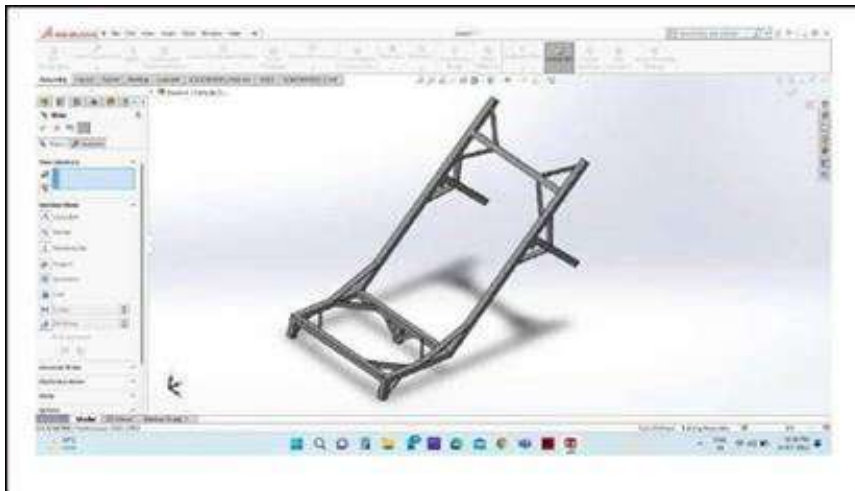


Figure 1: Main Frame

The main frame is the most important part of the project as it holds all the attachments and all the work is totally dependent on it.

B. Handle and Stand



Figure 2: Handle



Figure 3: Stand

- 1) Main Frame with Handle (for Cultivator, Weeder, Furrower and Plainer attachment). Main frame consists of handle which is removable, the main job of the handle is to steer the project and to do push and pull operation efficiently.

2) Main Frame with Stand (for Harvester attachment). The handle itself is the stand of the project. It's main job is to keep project stable while using Harvester attachment and to make project stand while not in use.

C. Attachment Holders



Figure 4: For Cultivator, Weeder and Furrower and Plainer



Figure 5: For Harvester

- 1) For Cultivator, Weeder, Furrower and Plainer attachment. It's job is to hold the following attachments mentioned above.
- 2) For Harvester attachment. It's job is to hold Harvester attachment, which is use to spin the Harvester.

D. Attachments

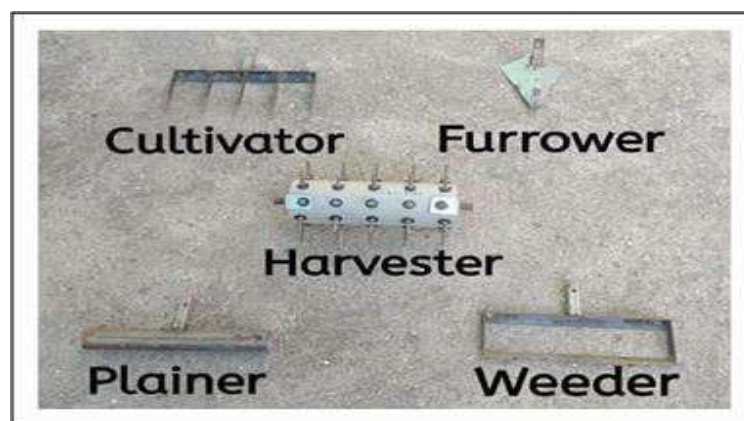


Figure 6: Attachments Attachments are designed specially as per the job's desired requirement.

The Attachments are as Follows,

- 1) **Cultivator:** It is used to loose the soil for making field ready to get seeds sow in the soil.
- 2) **Plainer:** It is used to plain the soil.
- 3) **Weeder:** It is used to remove weeds from the field.
- 4) **Furrower:** It is used to make sections on the land or to make small gaps for planting.
- 5) **Harvester:** It is used to harvest crops by separating unwanted straws and waste materials.

E. Wheels



Figure 7: Wheels

The job of the wheels is to move the body of the project from one place to the another with ease. It plays the main role in reducing efforts required during various operations done on the field.

F. Assembly



Figure 8: For Cultivator, Weeder, Plainer and Furrower.



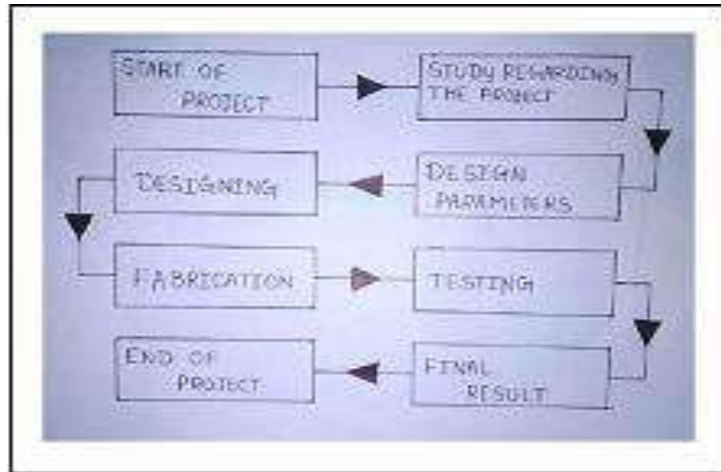
Figure 9: For Harvester.

IV. METHODOLOGY

A. Working Methodology

- 1) Start of Project
- 2) Study regarding the project (Multipurpose Wheel Hoe)
- 3) Design parameters
- 4) Designing

- 5) Fabrication
- 6) Testing
- 7) Final results
- 8) End of Project



- a) Design of the Equipment: The first stage of our project is to make proper plan and preparing the design of the equipment as per approximate suitable dimensions.
- b) Fabrication of the Working Model: Once Designing is over we are planning to fabricate the working model using suitable materials.
- c) Testing of the Model: Once the fabrication is over testing the equipment in the agricultural field by using different material.
- d) Result and Conclusion: Once testing is over compare the results with manual wheel hoe and this is helps to give conclusion of our project work.

V. DATA AND ANALYSIS

A. Time v/s Working Methods Graph.

The tests were done on (2m × 2m) ground for (Cultivator, Furrower, Weeder and Plainer) and for Harvester (10kg) of crops were tested.

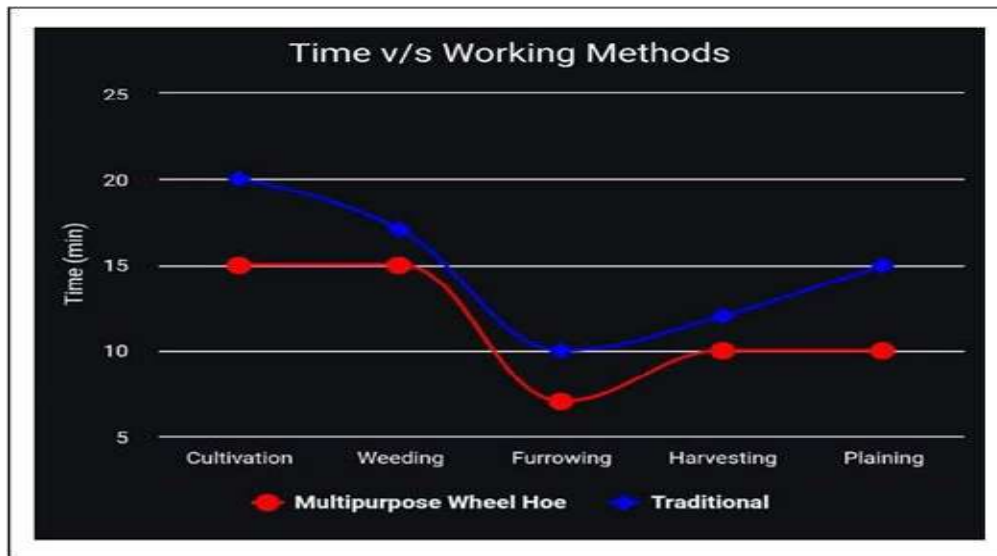


Figure 10: Field Work

Table 1: Time and Working Methods.

Sr No.	Methods	Cultivation	Weeding	Furrowing	Harvesting	Plaining
1.	Traditional	20 min	17 min	10 min	12 min	15 min
2.	Multipurpose Wheel Hoe	15 min	15 min	7 min	10 min	10 min

Note: Time is taken in minutes.



Graph 1: Time v/s Working Methods Graph

The above given graph shows us the time comparison between traditional methods and the Multipurpose Wheel Hoe. Conclusion: Multipurpose Wheel Hoe is more time efficient than traditional methods.

B. Ergonomical and Field Performance Evaluation of the Multipurpose Wheel Hoe.

Five male subjects of age group (25 to 35) were selected for ergonomical investigation from the agricultural labour community; medical fitness test was carried out prior to the experiment and details are furnished in Table.2 The maximum aerobic capacity of the selected subjects was varied from 1.40 to1.84 l/min (lpm).

The varied individual differences in maximum aerobic capacity (VO2max) was observed due to the differences in the ability to supply oxygen to the muscles and also due to genetic factors (Bridger 1995), whereas, Noakes (1988) suggested that failure of muscle power might be the reason for variation of the VO2 max among the subjects.

Table 2: Details of the subjects participated in the study.

Sr No.	Subject	Age (years)	Average of MaximumHR, (bpm) For all 5 working procedures.	Average of Maximum aerobic capacity VO2 max (lpm)	Height (mm)	Weight (kg)
1.	S1	34	186	1.61	165	63
2.	S2	30	190	1.74	163	74
3.	S3	36	184	1.55	173	68
4.	S4	36	184	1.41	168	67
5.	S5	27	193	1.84	156	56
6.	Mean	32.6	187.4	1.63	165.4	65.6
7.	SD	3.97	3.97	0.17	6.95	6.65

Here, (bpm = beats per minute; lpm = litres per minute)

C. Assessment of Physiological Cost of Work

The energy expenditure (KJ/min) was estimated using the following formula proposed by Varghese et al. (1994) for Indian housewives.

$$\text{Energy expenditure} = 0.159 \times \text{HR (bpm)} - 8.72$$

Following formulae were used for calculation of physiological cost of work (PCW) and total cardiac cost of work (TCCW).

Cardiac cost of work = Average heart rate (AHR) x Duration of activity where,

AHR = Average working heart rate – Average resting heart rate

CCR = (Average recovery HR - Average resting HR) x duration TCCW = Cardiac cost of work (CCW) Cardiac cost of rest, (CCR is taken 0).

Therefore, PCW = TCCW / Total Time of Work. Calculations,

Table 3: For Traditional Methods.

Sr No.	Methods	Energy Expenditure (EE)	Total Cardiac Cost of Work (TCCW)	Physiological Cost of Work (PCW)
1.	Cultivation	21.0766	3748	187.4
2.	Weeding	21.0766	3185.5	187.4
3.	Furrowing	21.0766	1874	187.4
4.	Harvesting	21.0766	2248.8	187.4
5.	Plaining	21.0766	2811	187.4

Table 4: For Multipurpose Wheel Hoe.

Sr No.	Methods	Energy Expenditure (EE)	Total Cardiac Cost of Work (TCCW)	Physiological Cost of Work (PCW)
1.	Cultivation	21.0766	2811	187.4
2.	Weeding	21.0766	2811	187.4
3.	Furrowing	21.0766	1311.8	187.4
4.	Harvesting	21.0766	1874	187.4
5.	Plaining	21.0766	1874	187.4

CONCLUSION: Total Cardiac Cost of Work:

(Traditional Farming Methods > Multipurpose Wheel Hoe).

Hence, less efforts and same outcome with Multipurpose wheel Hoe.

D. Health issues due to Traditional Methods on Human Body.

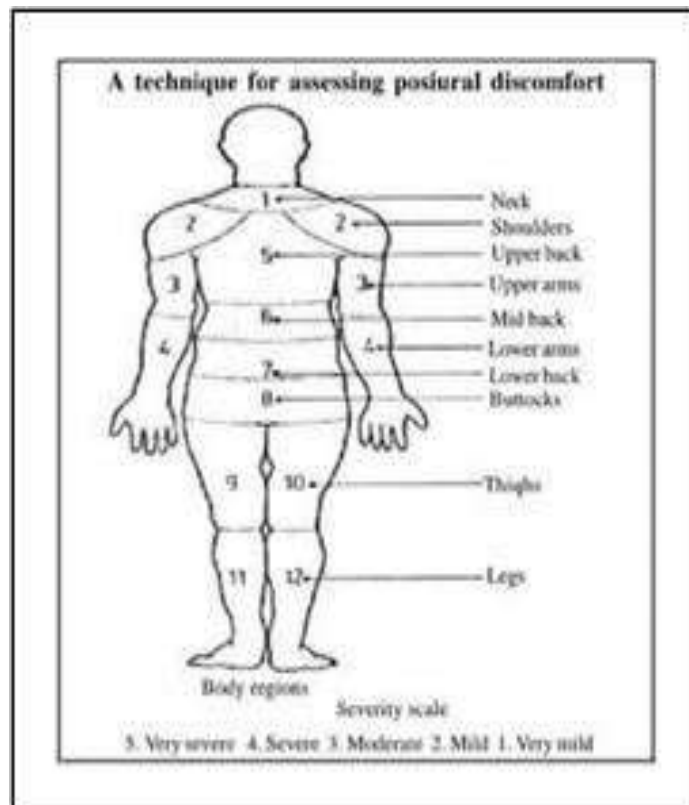


Figure 11: Technique for Assessing Postural Discomfort after Using “Multipurpose Wheel Hoe”.

Table 5: Responses on Musculo-skeletal problems and perceived exertion experienced by respondents

Sr No.	Methods Used	Musculo-skeletal problems	Rating of perceived Exertion (RPE)
1.	Traditional	Severe pain in shoulders, upper and lower back and upper arms	Very heavy
2.	Multipurpose Wheel Hoe	Moderate to light pain in shoulders, hands and arms	Moderately heavy

CONCLUSION: Traditional method was leading to posiueral discomfort and drudgery

VI. SOLIDWORKS MODEL



Figure 12. Main Frame

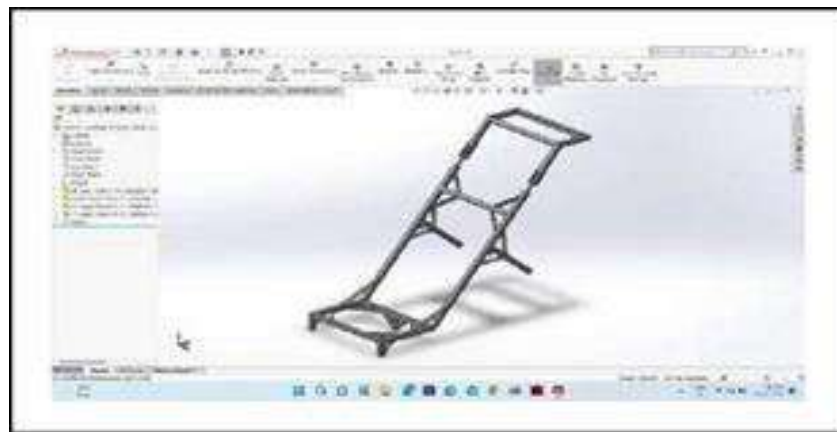


Figure 13: Assembly for Cultivator, Weeder, Furrower and Plainer

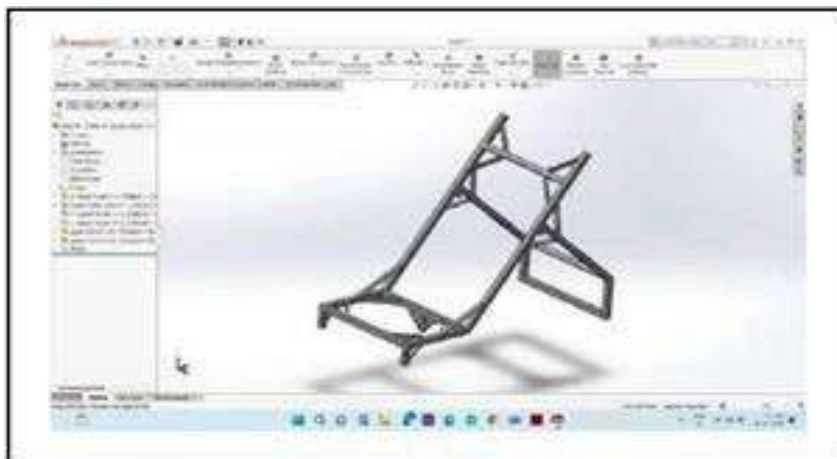


Figure 14: Assembly for Harvester

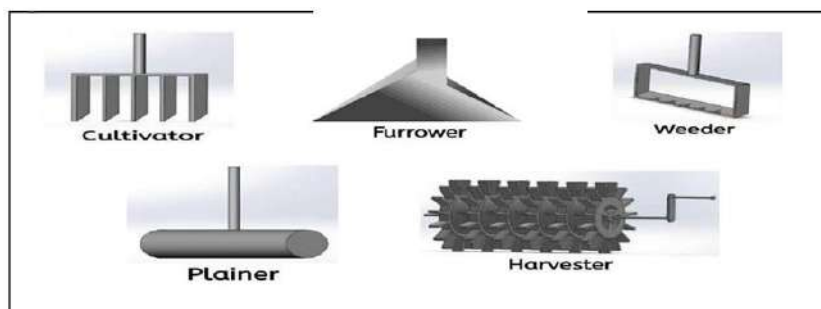


Figure 15: Attachments

VII. CONCLUSION

Multipurpose Wheel Hoe was found useful in terms of saving time, human effort, increasing work capacity and productivity. It was found to be compatible, easy to handle and applicable in field situation as well as most efficient in vegetable fields. It was observed that use of Multipurpose Wheel Hoe improved posture and efficiency of worker. The body discomfort reduced with use of Multipurpose Wheel Hoe because it employed standing posture eliminating muscular fatigue and excessive loading of inter- vertebral discs of backbone. This proved that Multipurpose Wheel Hoe is ergonomically sound, women friendly, drudgery reducing and improves efficiency of farmers.

VIII. FUTURE SCOPE

- A. Since, the machine is totally man-powered working efficiency is less. So, to increase it motor or engine is required for the enhancement.
- B. Various mechanisms should be used to improve maneuverability.
- C. More attachments should be designed to attach on this machine to benefit consumers.
- D. Design of the product should be made more simple to reduce product cost, maintenance cost and durability.

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DUAL- AXIS SOLAR PANEL

¹Aman Jitendra Chaudhary, ²Dhruv Krishnaraj Dhule, ³Ritik Milan Penjay, ⁴Srirag Sreekumar and ⁵Shafiq Shaikh

^{1, 2, 3, 4}Student, ⁵Assistant Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar- 401501

ABSTRACT

This paper contains a detailed description of the solar tracking and efficiency this provides. Energy needs are continuously increasing in this rapidly growing world. Most of our energy needs are met by burning fossil fuels which is harmful for the environment. Due to climate change and pollution, there is an increasing need of renewable sources of energy that are not harmful to the environment. The sun is a source of renewable energy. This energy is abundant and can be harnessed by using photovoltaic cells to produce electrical energy. The only drawback of this energy is that its conversion efficiency is low. The main reason for low conversion efficiency is because the absorption of solar energy is the most when the solar panel is perpendicular to the sun and it decreases in any other condition. Due to constant rotation of the earth the productivity is lowered. There are other drawbacks like weather conditions and harnessing is only possible during the day. Hence to overcome this problem solar trackers are used. Solar trackers help in increasing the productivity i.e., it increases the efficiency of the solar panel. Micro controller is connected to the solar trackers and with the help of starter motors the solar panel is moved to that particular direction. The micro controller is coded in such a way that it receives the input from the solar trackers and it gives the output to the starter motors which rotates the solar panel to the desired position. In this project we are going to increase the tracking efficiency which in turn will increase the efficiency of the solar tracker allowing it to produce more energy.

Keywords: Solar tracker, efficiency, energy.

I. INTRODUCTION

In photovoltaic systems, trackers help minimize the angle of incidence (the angle that a ray of light makes with a line perpendicular to the surface) between the incoming light and the panel, which increases the amount of energy the installation produces. Concentrated solar photovoltaics and concentrated solar thermal have optics that directly accepts sunlight, so solar trackers must be angled correctly to collect energy. All concentrated solar systems have trackers because the systems do not produce energy unless directed correctly toward the sun. Single-axis solar trackers rotate on one axis moving back and forth in a single direction. Different types of single-axis trackers include horizontal, vertical, tilted, and polar aligned, which rotate as the names imply. Dual-axis trackers continually face the sun because they can move in two different directions. Types include tip-tilt and azimuth-altitude. Dual-axis tracking is typically used to orient a mirror and redirect sunlight along a fixed axis towards a stationary receiver. Because these trackers follow the sun vertically and horizontally they help obtain maximum solar energy generation.

II. OBJECTIVE OF THE PROJECT

To create a solar tracker that is efficient than the one currently available in the market. Dual axis solar tracker consists of 4 sensors, 2 for each axis. When the difference between the sensors are there it will move to the direction of solar sensor that has the highest lux.

III. DESIGN AND COMPONENTS

The components of Dual Axis Solar Panel are as follows:

1. Solar panel
2. BH1750 sensors
3. Gear motor 10 rpm
4. ESP 32 microcontroller
5. L298N motor driver
6. Voltage sensor
7. Current sensor
8. LM2596 converter
9. TP4056 charging module

IV. CALCULATIONS DC Motor Speed (N) = 10 rpm Voltage (V) = 3.3V

For Voltage from solar panel:

(Voltage reading/ 4095.00)*16.469

For current generated from solar panel:

ACS.ma/1000.00

For power

Power (WH) = voltage * current

Watts hour = 3.3 * 1

WH =3.3 Watt Hour

Charging time depends upon the solar radiation available throughout the day. If enough sunlight is available then this solar panel should charge the battery within 3 to 4 hours.

V. METHODOLOGY

Although design may vary, Dual Axis Solar Panel depends mainly on solar tracking and the motors to keep the panels perpendicular to the solar rays. Solar tracking will greatly affect on the sensors we use. Normally LDR's are the sensor that's used for this purpose, but these sensors are less reliable because of the limitations it has.

Consideration and Planning for the Complete Setup:

1. Selection of material for the frame.
2. Selection of microcontrollers, sensors, etc.
3. Calculation and programming for the microcontrollers and the motors used for the setup or frame to rotate the frame.
4. Preparation of the setup.

The whole solar panel frame will move with the help of the motors used and the sensors used for the detection of the light sensor. A UV based sensor is beneficial in this case because this is better at improving the limitations faced by the LDR's. UV tracking has a set amount of wavelength that it can detect and can cover the whole visible rays. There are 2 motors that are going to be used for the rotation of the frame to get the desired position. We will use 4 sensors which will be placed on all 4 sides to cover the panels. In these 2 sensors will mainly detect the solar motion on the daily basis and 2 sensors for the angular motion, though all 4 will also be used for the detection of solar positioning. There are possibilities of some noise or errors made by electrical components or due to the clouds or environmental conditions, these can be reduced by some Methods like EMA, etc.

SELECTION OF MATERIAL

The main purpose is to obtain the materials that can be used for the different materials and are suitable, cost effective and are available.

- **Frame:** The frame must be made up of such material that can hold the whole setup as well as the solar panels and can provide movability to the frame. This will depend on the cost.
- **Motor:** The motor will be selected as such to hold the frame and rotate the frame to the desired position with minimum time required.
- **Microcontroller:** The microcontroller will be selected in a manner such that it can be easily available and is easy to program and can compute the required calculations with less time.
- **Sensors:** The sensor used should be able to track the sun rays on all possible conditions and keep the solar panels perpendicular to the sun rays.

Solar Panel: The panel should generate as much electricity as possible and also should be able to maintain temperature and cost effective as well.

WORKING

When the first ray of sunlight touches the UV sensor the whole mechanism will start. The 4 sensors on the frame of the will track the sunlight and will give the reading, this reading is then sent to the microcontroller. The microcontroller will take the input and then calculate the difference between the data and will send the

command to the motors to move in accordance to the values, and will adjust itself till the difference in the reading of all 4 sensors is equal.

There are 2 motors used in this system, one will move the frame in the direction of sun's day to day path i.e., WEST – EAST, and the other motor which will rotate the frame in the direction of sun's angular path i.e., NORTH – SOUTH. This means the solar panel is perpendicular to the solar rays. When this is achieved the solar panel will generate the electricity and the generated electricity is sent to a battery to store the energy when needed. According to our theory this system will adjust itself according to the position of the sun to keep the solar panel perpendicular at all times. This will ensure the maximum generation of electricity and less wastage of solar energy.

Since the sensor used in this system is UV based this means that the limitations of LDR can be removed and thus can actively track the solar rays. The sensor will continuously track the sunlight and when there is not enough sunlight to generate the electricity, the microcontroller will shut down the device so that the energy spent to run the system will be lowered. Once there is low sunlight to generate the electricity the microcontroller will then send the signal to the motors and will set it back to the position it was on the start. This done because the solar path is EAST- WEST, this means there exists a possibility where any one or multiple sensors cannot track the solar rays for quite a long time and will result into less generation of electricity. So, this readjustment in the evening will ensure this doesn't happen. After this adjustment the system will shut down. And will reactivate itself after the sensors pick up the solar rays, this will ensure less consumption of energy. And this will run in the loop.

VI. CONCLUSION

After doing all the literature survey, we have found out that dual axis solar panel is better than single or fixed solar panel. Also it has been found out UV based sensor can improve the solar tracking than any other LDR's. From many researches it has been found that UV based solar tracking has higher efficiency followed by the LDR and then the fixed solar panel. The proposed method is cost effective and it can be further extended and utilized for various applications of solar energy. This research focus more on the tracking system and further upgrade should be made by technological optimization as well as minimal amount of operation energy should be utilized.

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PIPE INSPECTION ROBOT

Mohammad Asad Shaikh¹, Ayaz Ranasariya², Firoz Patel³, Aftab Pathan⁴ and Harshal Ahire⁵
^{1,2,3,4}B.E. Student and ⁵Professor, Mechanical Department, Theem College of Engineering, Boisar

ABSTRACT

The engineer is constantly conformed with the challenges of bringing ideas and design into reality. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality. The pipe inspection robot with active pipe-diameter adaptability and automatic tractive force adjusting is developed for long-distance inspection of main gas pipelines with different diameter series. Its physical design employs the scheme that three sets of parallelogram wheeled leg mechanism are circumferentially spaced out 120° apart symmetrically. This structural design makes it possible to realize the adaptation to pipe diameter and tractive force adjusting together. On the basis of analyzing the mechanical actions of the adaptation to pipe diameter and tractive force adjusting, the related mechanical models are established, and their control system structure and control strategy are discussed. To verify the pipe-diameter adaptability and tractive force adjusting of the robot, related field experiments are implemented in actual underground gas pipeline. The experimental results show that the theoretical analysis in this paper is valid and the prototype of this robot can work well in actual underground gas pipelines. Compared with other similar robots, this robot, which employs active mode for its adaptability to pipe diameter, can be adaptable to the wide range of gas pipeline diameters from Ø300 mm to Ø500 mm and automatically provide a stable and reliable tractive force with strong capacity of tractive force adjusting. As a mobile carrier for visual inspection wireless camera is mounted to see corrosion, crack, defect, and holes of main gas pipelines, spring is also mounted in middle for making it flexible to take turn.

Keywords: In pipe robot, Active pipe diameter adaptability; Tractive force adjusting; Gas pipelines inspection

INTRODUCTION

There are a wide variety of pipelines such as urban gas, sewage, chemical plant, nuclear power plant etc., which are indispensable in our life. Also, pipelines are the major tools for transportation of oils and gases and a number of countries employ pipelines as the main facilities for transportation. In our country, the urban gas pipelines currently go up to 13,000 Km long but since most of them have been constructed in 1980's, there happen a lot of troubles caused by aging, corrosion, cracks, and mechanical damages from third parties. Continuous activities for inspection, maintenance and repair should be performed from now on. However, those activities need enormous budgets that may not be easily handled by gas companies as they are mostly small and medium in size. Efficient equipment's for inspection and integrated maintenance program are required in gas industries an in-pipe inspection robot for the inspection of pipe with pipe diameter adaptability is introduced here. There were various models developed for the pipe inspection; however, this robot excludes various disadvantages associated with them.

1.1 Aim of Project

In-pipe inspection robot with automatic adaptability to various pipe diameters and to monitor the defect, cracks, corrosion, block etc.

Why this Topic is Chosen?

Often, robots are used to do jobs that could be done by humans. However, there are many reasons why robots may be better than humans in performing certain tasks.

1. Speed

Robots may be used because they are FASTER than people at carrying out tasks. This is because a robot is really a mechanism which is controlled by a computer - and we know that computers can do calculations and process data very quickly. Some robots actually MOVE more quickly than we can, so they can carry out a task, such as picking up and inserting items, more quickly than a human can.

2. Accuracy

Accuracy is all about carrying out tasks very precisely. In a factory manufacturing items, each item has to be made identically. When items are being assembled, a robot can position parts within fractions of a millimeter.

3. Hazardous (Dangerous) Environments: Robots may be used because they can work in places where a human would be in danger. For example, robots can be designed to withstand greater amounts of Heat, Radiation, Chemical fumes than humans could.

4. Repetitive Tasks: Sometimes robots are not really much faster than humans, but they are good at simply doing the same job over and over again. This is easy for a robot, because once the robot has been programmed to do a job once; the same program can be run many times to carry out the job many times. And the robot will not get bored as a human would.

5. Efficiency: Efficiency is all about carrying out tasks without waste. This could mean not wasting time not wasting materials.

1.1.1 Problem Definition

The inspection of pipes may be relevant for improving security and efficiency in industrial plants. These specific operations as inspection, maintenance, cleaning etc. are expensive, thus the application of the robots appears to be one of the most attractive solutions. The pipelines are the major tools for the transportation of drinkable water, effluent water, fuel oils and gas. A lot of troubles caused by piping networks aging, corrosion, cracks, and mechanical damages are possible. So, continuous activities for inspection, maintenance and repair are strongly demanded. The robots with a flexible (adaptable) structure may boast adaptability to the environment, especially to the pipe diameter, with enhanced dexterity, maneuverability, capability to operate under hostile conditions.

Pipe inspection robots have been studied for a long time, and many original locomotion concepts have been proposed to solve the numerous technical difficulties associated with the change in pipe diameter, curves and energy supply. Although an exhaustive review of the literature is impossible due to the limited space available, a few broad categories can be identified:

(i) For small size, many projects follow the earthworm principle consisting of a central part moving axially while the two end parts are provided with blocking devices connected temporarily to the pipe. Pneumatic versions of this concept have been proposed but they require an umbilical for power. For smaller diameter (10 mm or less), a piezoelectric actuation has been considered, according to the inchworm principle, or according to an inertial locomotion driven by a saw-tooth wave voltage, or using vibrating fins with differential friction coefficients.

(ii) For medium size piping, classical electromechanical systems have been proposed with various architectures involving wheels and tracks, with more or less complicated kinematical structures, depending on the diameter adaptability and turning capability

(iii) For large pipes, walking tube crawlers have also been proposed.

1.1.2 Scope of the Project

The main scope of our FINAL YEAR MECHANICAL project is to locate defects due to corrosion and obstacle at the inner side of the pipe line. Nevertheless, damage still occurs, which reduces the strength of the pipe. If it goes undetected and becomes severe, the pipe can leak and, in rare cases, fail catastrophically. So, extensive efforts are made to mitigate defects. So we proposed a new design in inspecting pipelines.

METHODOLOGY

2.1 Main Component and it working in Project

Dc Motor: The project is powered by using three permanent magnets direct current motor, The DC motor which we are using in our project consumes 12v and 10-watt power and in output it gives us 10 RPM. The gear box is attached with DC motor. On the shaft of DC motor nut is provided for mounting it on link. Wheel is directly nut bolt on the shaft of motor.

Wheels: The wheels used in pipe inspection robot is of 75 mm diameter and 25 mm width. This wheels made of nylon material. here we have used 6 number of wheels. The circumference of wheel is provided with rubber grip so that it should not slip inside pipe. Three wheels are idle and other three wheels are powered by using DC gear motor. These wheels are used to grip pull and push the robot inside pipe.

Spring Arrangement: Springs are flexible machine elements used for controlled application of force (or torque) or for storing and release of mechanical energy. Flexibility (elastic deformation) is enabled due to cleverly designed geometry or by using of flexible material. The springs used in pipe inspection robot is for providing grip of robot inside pipe. By using spring compression, we can compress the robot and will put it inside variable size of pipe diameter. in our project we are using three number of spring, two spring are used for gripping the wheels at front and back of robot and middle spring is used for making the robot flexible while turning.

Toggle Switch: The toggle switch is used to move the project in forward and reverse direction. These switches are fitted inside switch box and are connected by using wire with DC motors and battery. This is spring loaded toggle switches; it will automatic comes in its center position when you release the forward or backward button. Electric toggle switches control the current to power equipment.

Ms Flat: MS flat are used in our project for fabricating the arms of robot. the MS flat are used because they are light in weight compared to angle or square pipe and consumes less area for making mechanism. The ms flat used in our project is of 18 x 3 mm cross section. Flats is done by the Width (W) & the Thickness (T) of the Flat. The weight of flat bar is easily calculated. Simply multiply the appropriate alloy density by the length, width, and thickness of the required part

Wireless Camera: Wireless cameras are wireless transmitters carrying a camera signal. The components are shown in Fig.15. The camera is wired to a wireless transmitter and the signal travels between the camera and the receiver. This works much like radio. Wireless cameras also have a channel. The receiver has channels to tune in and then the picture is obtained. The wireless camera picture is sent by the transmitter the receiver collects this signal and outputs it to a Computer or TV Monitor depending on the receiver type.

Fasteners (Nut and Bolt): The nut bolt used for making pipe inspection robot is M6 size. The M6 size is selected because they are light in weight and it can easily take the load of our mechanism. Majorly they are used in our project for pivoting the mechanism and for tightening of Bush on shaft.

Battery: The battery is an electrochemical converting chemical energy into electrical energy. The main purpose of the battery is to provide a supply of current for operating the cranking motor and other electrical units. Its specifications are 12v and 3 amps.

Pop Rivet: The 5 mm rivets are used in our project for making the robot. Therivet is used for joining powder coated sheet with MS flat for making external pipe. A rivet is a permanent mechanical fastener. Before being installed, a rivet consists of a smooth cylindrical shaft with a head on one end. The end opposite to the head is called the tail. On installation, the rivet is placed in a punched or drilled hole, and the tail is upset, or bucked (i.e., deformed), so that it expands to about 1.5 times the original shaft diameter, holding the rivet in place. In other words, pounding creates a new "head" on the other end by smashing the "tail" material flatter, resulting in a rivet that is roughly a dumbbell shape.

Shaft: A shaft is rotating machine element which is used to transmit power from one place to another. But in pipe inspection robot shaft is used for assembling of whole mechanism here shaft is not transmitting any tangential power but it is acting as a chases for the whole project the material used for shaft is mild steel c45.

Sheet Metal: Sheet metal is metal formed by an industrial process into thin, flat pieces. Sheet metal is one of the fundamental forms used in metalworking, and it can be cut and bent into a variety of shapes. The sheet metal is used in our project for making pipe. The Powder coated sheet metal we are using here use of 26-gauge size i.e. 0.5 mm thickness, the weight of sheet is 3.9 kg per square meter.

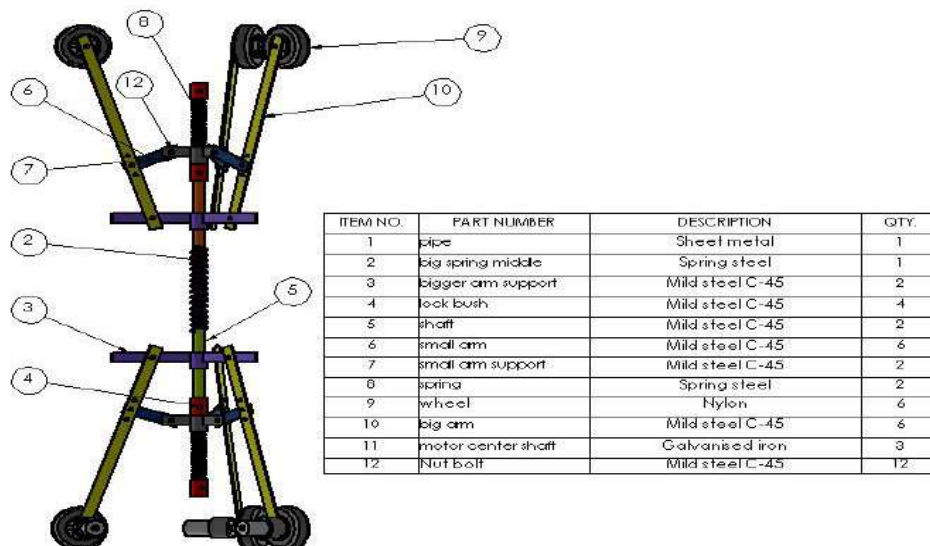


Figure 0-1 Drawing with BOM of pipe inspection robot

RESULTS AND DISCUSSION

Pipe used for the demonstration is made of a powdered coated sheet plastic with 300 mm in diameter. The footpads are made of rubber grip just for the demonstration, but it may be need touse high friction footpads for real application. Both spring loaded arms are partially expanded at the initial position. The robot is subjected to the speed test. It is done by measuring time while the robot moves along the predetermined distance. It is shown that the average speed ranges 0.6~ 0.79 m/min and fifty percent decrease in speed while taking turn. By using lights and camera clear view of cracks and holes is shown on mobile and holes are visible on pipe from outside.

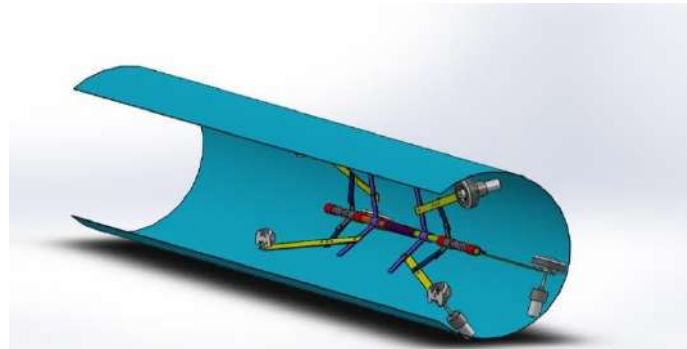


Figure 4-1 Cut sectional view

CONCLUSION

The design and assembly of a pipe inspection robot has been shown successfully. The camera for inspection purposes is functional; it provides a clear picture of cracks, obstacles, defects, rust, and holes. For non-insulated pipes, a pipe inspection robot is equipped with an LED light; if the pipe is cracked or holed in any way, a ray of light emerges from that crack, allowing us to quickly detect the damaged areas.. The robot is equipped with three springs, which perform admirably. All of the robot's six limbs are properly gripped by the two springs installed on the front and back of the robot. This robot can go through pipes ranging in diameter from 300 to 500 mm. Because of the spring, the robot has a good grip and does not slip within the pipe, while the middle spring gives the robot flexibility so that it may turn inside the pipe. The robot is controlled by a wired remote, and Robert is equipped with a wireless camera and a battery bank, allowing for a clear picture within the pipe to be displayed on the mobile device.

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MOTORIZED STAIRLIFT

Sayyad Layak B, Tejas Sanjay Patil, Harsh Govind Prajapati and Aditya Ajay Dubey
Mechanical Engineering Diploma, Theem College of Engineering, Boisar, India

ABSTRACT

A stairlift is a mechanical device for lifting people and objects upwards and downwards on the stairs, who may find difficulty in doing so themselves. A stairlift can be used as a Material Handling System. For sufficiently wide stairs, a conveyor is mounted to the treads of the stairs. A chair or lifting platform is attached to the conveyor. Stairlifts can be mounted on the stairs without altering the civil structure. This lift runs on electric power and consists of a motor, reduction gear box, chain drive, a ladder with conveyor system.

A DC motor is used in this system to reverse the polarity of the power supply, causing the motor to run in reverse. The conveyor runs in upward or downward direction with the help of 6 pin reverse forward switches and push buttons. As guide pulleys are attached to conveyor belts, the movement of the conveyor is like a linear tracking system. Compared to conventional hydraulic lifts, there are some advantages like no civil work or alteration needed, low cost, less bulkiness, less power, less maintenance requirements, easy design, easy installation.

Keywords: Stairlifts, Conveyor, Pulley, DC motor.

INTRODUCTION

The number of patients with disabilities is on the rise according to the first official report "the global disabled persons report", there are 650 million people which are about 10% of the global population are disabled in the 1970s, and now the number has increased to 15%. Aging population who has chronic diseases is rising which makes the proportion of disabled persons expand.

The following picture (Figure 1.1) is about the proportion change of elderly people and younger people from 1950 to 2050, the percent of the young children is decreasing from 13% to 6%, in contrast to the percent of elderly population which keep increasing sharply.

BTH had a collaboration agreement with the government and the projects. of recent years had been focused on making life easier for the disabled and elderly people. The previous students in BTH had already designed some wheelchairs like "Electric wheelchair for easy access to toilet", This device can also prevent the wheelchair from overturning backward, and improve the security and comfort of the wheelchair. Locking system is added which is used to lock the wheelchair while climbing up and down stairs, making sure it can only move in one direction, and protect the wheelchair from slipping down. And combining the principle of ergonomics: a desk, shopping basket is added, and a curved seat is designed which makes the seat more comfortable and convenient. Then all parts of the wheelchair are modelled in Autodesk Inventor, and the strength of the important components of the wheelchair will be simulation analyzed.

OBJECTIVES

- To develop a lifting system which can be helpful for disabled people.
- To introduce a cost friendly solution for material handling to the upstairs.
- To design a safe lifting system which can easily be installed.
- To give a solution for the old buildings where typical lift cannot be installed.
- To determine the working efficiency and beneficial working of the stairlift.
- To determine the load carrying capacity of the stairlift.

Design and Construction

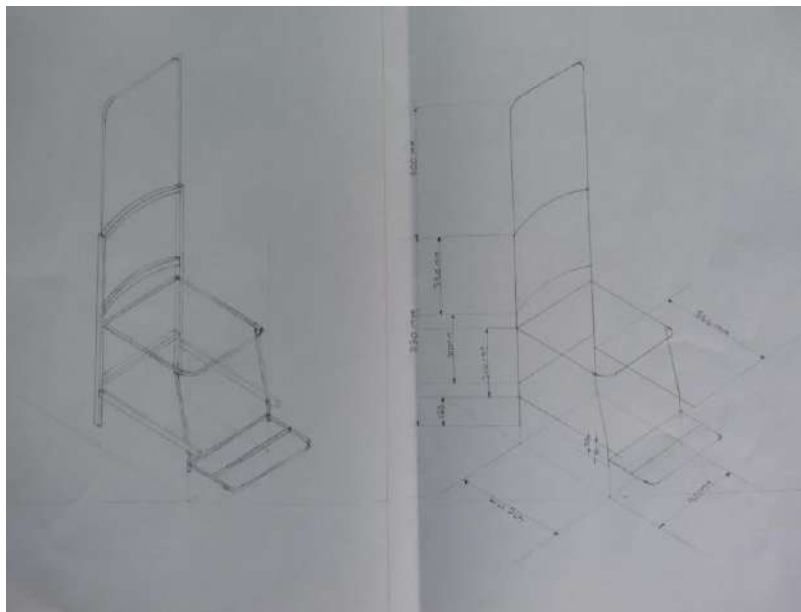


Fig: Design of Wheelchair

Wheelchair

A wheelchair is a chair with wheels, used when walking is difficult or impossible due to illness, injury, problems related to old age, or disability. These can include spinal cord injuries (paraplegia, hemiplegia, and quadriplegia), cerebral palsy, brain injury, osteogenesis imperfecta, motor neuron disease, multiple sclerosis, muscular dystrophy, spina bifida, and more.

Wheelchairs come in a wide variety of formats to meet the specific needs of their users. They may include specialized seating adaptations, individualized controls, and may be specific to particular activities, as seen with sports wheelchairs and beach wheelchairs.

Conveyor Belt

A conveyor belt is the carrying medium of a belt conveyor system, one of the many types of conveyor systems available today. Each conveyor system requires different modules in order to function properly and do the tasks required by the belts. A conveyor belt system consists of two or more pulleys (referred to as drums), with an endless loop of carrying medium – the conveyor belt – that rotates around them creating a pull effect for the goods it's carrying. One or more of the pulleys will be powered moving the belt and the material on the belt forward and along the system.

Dimension:

Length- 1750 mm belt

Width - 50 mm

Teeth – 140

Pitch – 12.7 mm

Material- PU rubber coated conveyor belt

Pulley

A pulley is a wheel on an axle or shaft that is designed to support movement and change of direction of a taut cable or belt, or transfer of power between the shaft and cable or belt. In the case of a pulley supported by a frame or shell that does not transfer power to a shaft, but is used to guide the cable or exert a force, the supporting shell is called a block, and the pulley may be called a sheave. A belt and pulley system are characterized by two or more pulleys in common to a belt. This allows for mechanical power, torque, and speed to be transmitted across axles. If the pulleys are of differing diameters, a mechanical advantage is realized.

Dimension:

Diameter: - 60 mm

Teeth -15

Motor

A DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic; to periodically change the direction of current in part of the motor.

Specification	BLDC Motor
Rated Output Power	60 W
Voltage	24 V
Rated Speed	2800 RPM
Actual Speed	60 RPM
Load	200KG

Sprocket

A sprocket is a toothed wheel upon which a chain ride. Contrary to popular opinion, a sprocket is not a gear. Three sprockets were used- one in motor shaft and other two were in output and input shaft of the gearbox.

Teeth	18, 9
Pitch	12.7 mm
Outer Diameter	80, 40
Thickness	8, 6

Battery

When in a battery, positive terminal of one cell is connected with the negative terminal of succeeding cell, then the cells are said to be series connected or simply series battery. Here, overall emf of the battery is algebraic sum of all individual cells connected in series. But overall discharged current of the battery does not exceed the discharged current of individual cells. We use two 12V battery for power supply in series. These batteries can be recharged

Chain

A chain is a series of connected links which are typically made of metal. A chain may consist of two or more links.

The Main Functions of Chain Are:

- Transmit power.
- Convey objects or materials.
- Convert rotary motion to linear motion, or linear motion to rotary motion.

Reverse Forward 6 Pin Switch

The working of this motor can be done in two ways like forward rotation and reverse rotation. Once the switch is pressed in forward direction then terminal-A is connected to terminal C whereas terminal B is connected to terminal D. Therefore, the DC motor rotates in forward direction because the battery is allied in forward connection toward the motor. Once the switch is pressed in the reverse direction, terminal-C is connected to terminal-E & also terminal-D is connected toward terminal-F. Therefore, the DC motor rotates in the reverse direction because the battery is allied in reverse connection toward the motor.

Conveyor System



Fig.2: Conveyor System

Motorized Stairlift**Fig.3:** Motorized Stairlift**WORKING PRINCIPLE**

There is a motor within the base of the chair that is usually powered by a battery also within the base of the chair. The stair lift motor turns a gear that is meshed into a geared strip on the track or rail. When the gear turns the chair is moved along the geared strip. When the motor turns the gear, the chair moves one direction is reversed the chair moves to opposite way.

Call/send switches are used to move the stairlift chair without anyone being on it. This is particularly helpful if two people use the lift is opposite end of the track when a user wants to use it. The user simply calls the lift to come to them using a call/send switch. Another use of call.

CONCLUSION

Though making a cost friendly Stairlift had some limitations, it was a good and challenging project for us. Making a stairlift with conveyor is not a complicated process and all the components are widely available in market. DC motors this can be directly used in the stairlift. During the test run of this project, it was realized that it would capable of carrying heavy load without suffering any deformation or local fractures if it would go into real world production at an ideal scale. Though the initial cost of the project seemed to be a little bit higher but more accurate manufacturing would shorten this.

FUTURE SCOPE

Stairlift has distinguished advantages and benefits. In this case no one has alter the civil structure for installation thereafter shortest cost for installation procedure as compared to that of lift. So, future of such lifting system seems to be very bright. There is lot of scope for further modification in the project as follows.

- Using monorail instead of two.
- Incorporation and automation / timer unit which will ease the use of device.
- Push button ON/OFF using timer circuit can also be used.
- A swivel seating arrangement and Seatbelt for future safety can be included.
- Rack and carrier arrangement, Pulley drive, hoisting rope system can also be used for stairlift system.
- Use of work & roller reduction gear assembly.
- Folding seat arrangement

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CRABY STEERING SYSTEM

Bhavin Sanjay Darji¹, Shubham Viju Dhodi², Shashank Suni Jadhav³, Ibrahim Akram Khan⁴ and M. A Gulbarga⁵

^{1,2,3,4} Student and ⁵HOD, Department of Mechanical Engineering, Theem College of Engineering

ABSTRACT

In present the car steering system is 2 wheel steering system and in conventional steering system there are only two wheels are moving while taking the turn, either forward two or the rear two wheels. While in 4 wheel steering system the rear and front both wheels are act +ive and can guide in steering. Here we using MARUTI-800 car as a reference model. We have developed a optimized 4 wheel steering system for implementation of mechanism that can give the work in changing in-phase and counter-phase steering of rear wheels depending upon the condition of turning and lane changing with respect to front wheels, thus enhancing the manoeuvrability of as edan in accordance with its speed.

Keywords: 4 Wheel steering system, octa steering, craby steering mechanism, steering system

I. INTRODUCTION

In current scenario most of the vehicles have only front wheels steering mechanism or use only front wheels for changing the direction of vehicles. But there are some limitations for this system, like less turning radius or front tyre wear due to more action of wheels, problem while get free from congested place etc. To overcome these issues we introduce CRABY MECHANISM. This mechanism will help us to reduced this kind of problems by giving our vehicle front as wheel as horizontal movement. In this mechanism vehicle will free to move at very tight corners as well as at any directions. In order to reduce the turning radius of the vehicle we need the opposite phase configuration of four wheel steering system. The main intension of this project is to reduce the turning radius of a vehicle as much as practically possible without crossing the practical limits of design and assembly of the components of the steering system. Based on these requirements, a four wheel symmetric steering system is analyzed using kinematic approach and a conclusion is drawn regarding the geometry of the optimum steering system and the effect of this on the turning radius of the vehicle. This system is seen not to cross any practical limitations of the vehicle in terms of assembly and spacing. Also the wheels are turned to the optimum extent possible and not exceeding this limit.

II. LITRATURE REVIEW

Er. Amitesh Kumar, Dr Dinesh N Kamble¹ has discussed that, Conventional Steering mechanism involves either the use of Ackerman or Davis steering systems. The disadvantage associated with these systems is the minimum turning radius that is possible for the steering action. This difficulty that is associated with the conventional methods of steering is eliminated by employing a four wheel steering system.

Saket Bhishikar, Vatsal Gudhka, Neel Dalal, Paarth Mehta, Sunil Bhil, A.C. Mehta² A has discussed that t, A model for 4WS system is created to test all the possible cases available in four wheel steering system. Four wheel steering system is critical and it is also popular in large farm vehicles and trucks. Some of the modern steering found it most widespread use in monster trucks, intercity buses also utilizes four wheels steering to improve road stability. The four-wheel steering mechanism is developed so that both front and rear wheel actively participate during turning, lane changing.

Ravi Shankar, Kumar Saumya, Sujeet Kumar, Saurabh Kumar, Praveen Kumar, Jitendra Kumar, Ashis Saxena and Hitendra Bankoti³: The rack and pinion mechanism is commonly used to convert the rotary motion into linear motion. This mechanism contains a circular gear and teeth on a linear shaft. The circular gear is called pinion and the teeth on a linear shaft is called a rack. The rack and pinion steering mechanism are simple in construction and friendly to drive. The mechanism consists of a pinion at the end of the steering column that meshes with the rack. The pinion is fixed to the steering column at its end. As the pinion is in contact with the rack, the rotary motion given to pinion is converted to linear motion by the rack. To meet all the steering requirements the rack and pinion steering must be precise and direct under normal driving conditions. A manual rack and pinion gear suitable for a solar car. It is found that the simulation results are higher than the theoretical calculations.

X. PROBLEMDEFINITION**1. Parking Problem:-**

The increase in the population and reduction in the free land for easy and wide parking is not possible now days.

1. Reduce Turning Radius:-

Because of high turning radius we cannot make turns easily like U-turn, zero turn.

3 Reduce Skidding at Curves:-

While taking sharp turn there is high chances of skidding at conventional steering system.

4 Reduce Tire Wear:-

By enabling the front and rear wheel to Take turn it reduce the tire wear while taking u turns or zero turns.

III. THE CONCEPT

This project consist of one rack and pinion mechanism at centre, by using its motion we were able to create new steering mechanism which allows all wheel to rotate at 90° . To create this mechanism we have used bevel gears shafts. First of all when we rotate steering wheel in clockwise direction that time pinion at the end of the steering wheel also start rotates by the help of two universal joints. This rotary motion is converted in to linear motion with the help of rack which is placed at the mid section of the frame. Over this rack we have placed one shaft which also contains one another pinion at the mid portion of the shaft. So the linear motion of the rack is transmit to the main shaft by the means of 2nd pinion. Now we attached a bevel gear at both the ends of main shaft to transmit this rotary motion toward wheels we have take another small shafts and that small shafts also contains bevel gears to transmit the motion towards the wheels. By using this mechanism we were able to rotate all the wheels at 90° .

IV. METHADODOLOGY

- The literature reviews are studied completely and identified the problem statement.
- The design parameters are taken from references and design calculations are done.
- With the design calculations 3D model is designed using SOLIDWORK software.
- The model is imported to SOLIDWORK2021 SIMULATION and static analysis is carried out with a mesh size of 1mm.

[With reference to static analysis, fatigue analysis is conducted]

Solidwork Steps:

1. First of all Frame is made of size 3ft×2ft in rectangular shape as shown in figure.
2. Then Bearing supporting plates are design of size 1. Plate A=125mm×125mm, 2. Plate B=100mm×90mm, 3. Plate C=125mm×90mm.
3. Then bevel gear is design according to calculated dimensions. Bevel Gear ID=12mm, OD=36mm, L=25mm
Then pinion gears also designs according to calculations. Pinion A ID=15mm, OD=40mm Pinion B ID=12mm, OD=34mm
4. The shafts are designs which are 3 in total having different lengths 1. Shaft A-D=15mm, L=670mm, 2. Shaft B- D=20mm, L=75mm, Shaft C- D=15mm, L=200mm.
5. After that Universal joint is designed by taking standard references from research paper ID=12mm, OD=30mm, L= 60mm.
6. Wheel frame is design to attach the wheels and provide rotary motion of steering to wheels.
7. Then Bearings are design 1. Pedestal Bearing ID=20mm, OD=44mm T= 40mm and 2. DGBB ID=15mm, OD=34mm T=9mm
8. Bush is design to support the pinion gear and steering shaft with universal joint. It contains 2 DGBB in it. BUSH ID1=16mm, ID2=34mm, L=40mm
9. Then finally all parts are assembled and crabby steering is ready.

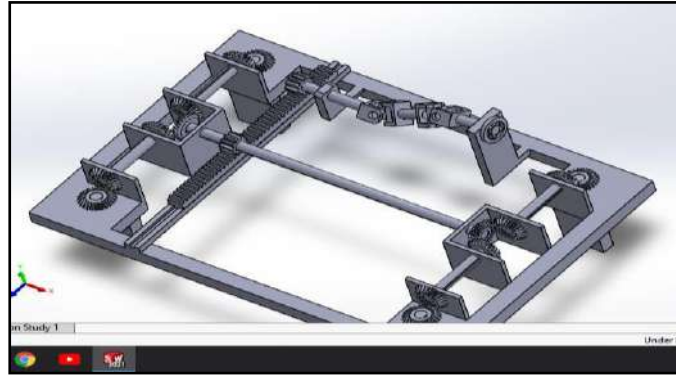


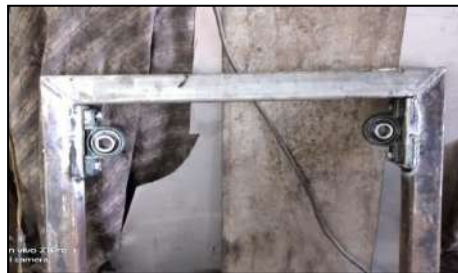
Fig: Crab steering mechanism

V. Procedure to Make this Mechanism

1. First of all M.S. square pipe of 3ft in length ,2ft in width and 50mm thickness frame has been cut by using grinding cutter machine.
2. Then they are welded together to form a frame by using **Metal arc welding** (95to 100 amp rating).



3. After frame gets welded then 4 pedestal bearing are placed to each corner and marking has been done for their fitting purpose.
4. But square pipe alone is not capable to take load of pedestal in place of that 4 plates are cut of length 125 cm, 50mm width and 10mm thickness. On this plate marking of pedestal bolts marked and drilling operation performed for bolt size M10 then tapping operation performed with tap of $D=10\text{mm}$ & $P=1.5$.
5. After tapping those plates are welded on frame and pedestals bearings are bolted like shown in figure.



6. Then supporting plates are mounted on lathe machine to make bearing size hole for DGBB bearing .Total 10 Plates are drill with bearing size holes.



7. Then the DGBB bearings are fitted in those plates by slightly hammering.

8. Then 4 shafts of 20mm diameter and 75 mm length are cut and on its one side. Gear's inner diameter of 12mm is turned on lathe machine till the length of 30mm.



9. This shaft is mounted with one bevel gear and it is fitted in pedestal bearing.
10. Then 4-M.S. shaft diameter of 16mm and length 190mm are cut on its both end bevel gear are mounted by turning it to $D=12\text{mm}$ and $L=30\text{mm}$.
11. Another $D=16\text{mm}$, $L=660\text{mm}$ M.S shaft is cut and it's both ends are turned for bevel gear fitting.
12. After that supporting plates with bearing in it are welded with MAW. For supporting of this plates L-shape M.S. columns are used to give rigidity to plates.
13. Then shafts are placed through this metal plates and DGBB and gears are fitted.
14. To avoid slipping of gears on shaft gap screw are fitted by drilling and tapping the gears. 6mm drilled and tap of $P=1$ is used to create threaded hole for gap screw.
15. Hand drill machine is used to drill a small counters hole in each shaft to fit the bevel gears and shaft rigidity and gap screw of $D=6\text{mm}$, $L=8\text{mm}$ of L.N key head is used (L.N KEY SIZE 3mm)
16. Then checks the rotation of all bevel gears, bearings and shaft then after checking middle shaft is removed for rack and pinion installation.,
17. Then pinion is mounted on middle shaft and measures the gap between pinion and frame. According to it sliding bars are selected of size 20mm*20mm square M.S. bright bar 2 pieces. Length 2ft.
18. For rack's sliding moment 2 holes are drilled from 65mm from it's Centre on each side. A plate of size width=25mm and length_185mm and thickness is 4mm is fitted.
19. Then those 20mm*20mm square bar are welded on frame and rack is mounted in it width contact with pinion fears.
20. Now steering, for steering 2 universal shafts is used. $D=16\text{mm}$ shaft is used From rack side another pinion gear is mounted with shaft $D=16\text{mm}$ and $L=130\text{mm}$ On this shaft one end is attached with pinion gears and another end with universal joint. To support this shaft one bush is made of M.S. material on $D=40\text{mm}$ and length -38mm with both side DGBB bearings are fitted. On shaft grooves are made for circlip of size $D=14\text{mm}$, thickness-1mm.
21. To support this bush square pipe 30mm frame is made whose dimensions are height is 65mm and width is 165mm. This frame welded on main frame.
22. Then wheel frame is made and wheel is attached on it with M10 bolt of length 75mm with 2 washers on each side. This wheel frame is attached on diameter of 20mm shaft below the pedestal bearings with the help of screw.
23. For steering on another bush of $D=30\text{mm}$ and $L=35\text{mm}$ is used from another end of universal joint one shaft of 16mm diameter and length 400mm is attached with gap screw and on its other end steering wheel of size $od=250\text{MM}$ & $ID=220\text{mm}$ on its center bush for steering is attached.
24. Then for finishing slightly grinding is done with hand grinder and glass white spray paint work is done.

25. Then by checking the rotation of wheels the rack is cut to suitable length and stoppers are mounted.



Final Crabby Steering Mechanism

VI. CALCULATION

1. Calculation of Pitch Diameter,

$$D_p = N_p * M_n$$

2. Calculation of Torque

$$M_t = F_t * D_p$$

3. The Pitch Line Velocity can be Calculated As

$$V = \frac{2\pi n t}{60}$$

$$N_f = \frac{N_p}{\cos^3 \psi}$$

4. Allowable Stress can be Calculated As

$$S_{all} = S_o * \left(\frac{3}{3+V}\right)$$

5. CALCULATIONS of Endurance Stress

$$S_o = \frac{S_u}{3}$$

6. The Calculations of Actual Induced Stress can be Done by Lewis Equation As

$$S_{ind} = \frac{2 M_t}{M^3 K \Pi^2 Y_p n p \cos \psi}$$

7. With the Above Strength the Strength is Checked by Using Sall and Sind

For A Good Design $S_{all} > S_{ind}$

If Not The Module Needs To Increased Untill The Conditon Satisfies.

8. The Face Width Ccan be Calculated As

$$B_{min} = K_{red} * \Pi * M_n$$

$$B_{max} = K * \Pi * M_n$$

$$K_{red} = K_{max} * \frac{S_{ind}}{S_{all}}$$

Thus The Design Is Checked By Strenth Point Of View. Before Going To Analysis It Is Necessary To Check In Dynamics Point Of View. To Undergo Dynamic Calculation The Following Equations Are Used:

1. The Load Transmitted is Given By

$$F_t = \frac{2 M_t}{D_p}$$

2. Calculation of Dynamic Load is Done by Usnig Following Equation

$$F_d = F_t + \frac{2v(Bc \cos^2 \Psi + Ft) \cos \Psi}{2v + \sqrt{(Bc \cos^2 \Psi + Ft)}}$$

3. Calculations of Limiting Endurance Load is Given By

$$F_0 = S_0 b y p c \cos \psi$$

4. Limiting Wear Load can be Calculated As

$$F_w = \frac{D_p \times B \times K \times Q}{\cos^2 \Psi}$$

$$K = \frac{S_e s^2 \times \sin \phi_n}{1.4} \times \left[\frac{2}{E} \right]$$

The Dynamic Check Should Satisfy Condition As $F_0, F_w > F_d$

If Not Keep On Increasing The Module And Calculate Until The Condition To Be Satisfied. After The Gear Tooth Dimensions Are Calculated:

• In Order to Determine Dimensions Following Equations are Used:

1. Addendum – $H_a = 0.8 m_n$
2. Pitch Diameter- $D_p = N_p \times M_n$
3. Diametral Pitch- $P_d = \frac{N_p}{D_p}$
4. Tooth Thickness- $T = \frac{1.5708}{P_d}$
5. Whole Depth - $H_t = 1.8 m_n$
6. Clearance - $C = 0.2 m_n$
7. Outer Diameter – $D_o = D_p + 2 H_a$
8. Dedendum - $H_d = 1 m_n$
9. Root Diameter - $D_r = D_p - 2 H_d$

• In General the Intermediate Shaft are with Circular Cross Section. So,

1. Maximum Power Used is Given By

$$P = \frac{2 \pi n T_{max}}{60}$$

2. Maximum Torque Acts on Intermediate Shaft

$$T_{max} = \frac{60 P}{2 \pi n_{max}}$$

3. Minimum Torque Acts on Intermediate Shaft

$$T_{min} = \frac{60 P}{2 \pi n_{min}}$$

4. Mean Torque can Calculate As

$$T_a = \frac{T_{max} - T_{min}}{2}$$

5. Maximum Shear Stress is Given By

$$T_{Max} = \frac{S U}{F S}$$

The FS = Factor Of Safety = 15 (Consider)

6. The Inner Diameter can be Calculate As

$$T_{Max} = \frac{16 T_{max}}{\pi (D_o^3 - D_i^3)}$$

7. The Mean Shear Stress Developed is Given By

$$T_m = \frac{16T_m}{\pi(D_0^3 - D_i^3)}$$

8.The Alternating Stress can Calculated As

$$T_a = \frac{16T_a}{\pi(D_0^3 - D_i^3)}$$

Bevel Gear Design Results:

[Referenc From VB BHANDARI Design Of Machine Element -Fourth Edition]

VII. RESULT

Steering wheel rotation (in ⁰)	No. of Teeth Rotate			Linear Moment of Rack	Deg of Rotaton of Wheels	Turning Radius
	P.A	P.B	B.G			
10	2	2	1	5.5	23	1590.2
20	4	4	2	12	42	749.663
30	6	6	4	25	72	219.32
40	8	8	6	35	90	0

WHERE

P.A	PENION A
P.B	PENION B
B.G	BEWEL GEAR

VIII. CONCLUSIONS

As per the focus of the project we have created an innovative 4 wheel active steering mechanism which is feasible to manufacture, easy to install and highly efficient in achieving in-phase and counter-phase rear steering with respect to the front wheels using bevel gears arrangement. This system assists in high speed lane changing and better cornering. It combats the problems faced in sharp turning. It reduces the turning circle radius of the car and gives better manoeuvrability and control while driving at high speeds, thus attaining neutral steering. Moreover components used in this system are easy to manufacture, material used is feasible, reliable and easily available in market. The system assembly is easy to install and light in weight and can be implemented in all sections of cars efficiently. The purpose of developing this mechanism is to solve the problem of car parking. 90 degree steering mechanism helps in minimizing the space and effort required for a person to park his vehicle. The 90 degree steering mechanism made using rack and pinion and with the help of differential gears is feasible to manufacture and is easy to switch between normal mode and parallel parking mode. However, a major disadvantage here is the limitation of top speed in such mechanism due to use of differential gears. Moreover, cars can be parked very close to each other. This may save costly parking space, In congested apartment complexes where parking is limited this mechanism can be very helpful and if our vehicle got stuck to some uneven road or surface then four wheels can be engaged to power mechanism and with this we can easily come out from that surface.

IX. FUTURE SCOPE

Having studied how 4WS has an effect on the vehicle’s stability and driver maneuverability, we now look at what the future will present us with. The successful implementation of 4 Wheel Steering using mechanical linkages & Electro-magnetic Clutch will result in the development of a vehicle with maximum driver maneuverability, uncompressed static stability, front and rear tracking, vehicular stability at high speed lane changing, smaller turning radius and improved parking assistance. Furthermore, the following system does not limit itself to the benchmark used in this project, but can be implemented over a wide range of automobiles, typically from hatchbacks to trucks. With concepts such as “ZERO TURN” drive as used in, Tata Pixel and “360° Turning” used in, Jeep Hurricane, when added to this system, it will further improve maneuverability and driver’s ease of access.

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MULTIPURPOSE SIEVING MACHINE**Aniket A. Chavan¹, Prathamesh D. Kadam², Sahil S. Lad³, Manas M. Mankar⁴ and Sajid A. Shaikh⁵**^{1,2,3,4}Student and ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar- 401501, Maharashtra**ABSTRACT**

A sieve is a device for separating wanted elements from unwanted material or for characterizing the particle size distribution of a sample, typically using a woven screen such as a mesh or net. This project focuses in design, fabrication of the mechanical part of machine and the system of the sieve machine. To achieve this project objective, this sieve machine body structure and mechanical system needs to concern some other criteria such as strength, safety and ergonomic design. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface. There are different machines that are being used for sand sieving processes. In our project the process will takes place automatically. Thus, the time consumed during the whole process is reduced.

Keywords: Sieving Machine, Sand Sieving Machine, Sieving Machine Fabrication, Automatic Sieving

I. INTRODUCTION

Today's world requires speed in each and every field. Hence rapidness and quick working is most important. Now a day for achieving rapidness, various machines and the equipment are being manufactured. In such a modern era of liberalization, small scale industries are contributing in a big way to the growth of our country. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality. This project focuses in design, fabrication of the mechanical part of machine and the system of the sieving machine. Sieving Machine mainly depends on converting rotary motion provided by AC motor. With the help of pulley attached to motor the Rotary Motion is converted into Reciprocating Motion with help of Connecting Rod and Wheels. The horizontal sieving machine is worked on the basis of crank and slider mechanism. The sieving box is placed inside the rail track and the machine is started. When the sieving box moves in the reciprocating motion the sieving process is performed. Sieving is an uncomplicated practice for sorting out the particles of different sizes. Generally, while preparing the concrete for construction purpose, the process of sieving is carried out manually. Sieving of sand is carried out using rectangular mesh which is inclined at certain angle. In the present sand sieving method, the sample is subjected to horizontal movement in accordance with the chosen method. This causes a relative motion between the particles and the sieve. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface. There are different machines that are being used for sand Sieving, but we demonstrate the design & fabrication of automatically driven sand sieving machine which have low cost and simple in operation. For small scale farming in rural areas the main aim of the cultivator is over domestic use. The harvest is usually a small bulk. Therefore, they are not taken in for refining in major refining factories. Here we generate an idea to solve the problem of filtering or refining the harvested crops mainly grains, cardamom etc. This project is a domestic sieving machine which can be used to separate or sieve or filter out dirt and unwanted particles from the harvested crops. The machine is compatible and requires only a limited amount of space. The machine can also sort out stones and other unwanted particles from purchased goods or stored crops.

II. LITERATURE REVIEW**A. Design and Fabrication of Domestic Sieving Machine**

Alan Biju, Alwin Thomas, Akash J Kalarickal, Jeswin Jose, Rittin Abraham Kurien, Conventional practices like winnowing require highly expertise hand movements considering gravity, aerodynamics and centrifugal force. This is the major difficulty observed in the winnowing process. Nowadays people always prefer the most suitable way to save time and energy. This project proposes a domestic sieving machine which can easily remove unwanted particles from the grains, nuts and other pulses automatically.

B. Automatically Driven Sand Sieving Machine**P.R. Gajbhiye, Rupesh Khode Pratik Sukhadeve ,VickyChaple**

Construction of buildings requires sand as an important ingredient Sand is used at different stages in construction right from the foundation to the finishing work i.e. plaster. This sand is needs to be screened properly for various stages in construction, i.e. size of sand for construction work is slightly coarse whereas that used for plaster work is fine These processes are carried out manually. Sieving of sand is carried out using rectangular mesh which is inclined at certain angle. This causes a relative motion between the particles and the sieve. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface

C. Development of NCAM Reciprocating Cassava Mash Shifter

Abiodun L.O., Oladipo N.O and Bamidele B.L.

The NCAM cassava mash sifter was developed to tackle the problems of high labor, expense associated with manual sifting, time wastage, the tedious nature of the operation, injury to the hand or palm as one rubs against the raffia sieve continuously, back ache, caused by prolonged sitting in one position during manual sifting, low productivity, and the hygienically unsafe nature of manual sifting as products are exposed to germs.

D. Stacked Siever for Natural Sand Processing

W.D. Handoko, N. Widiastuti, G.S. Budi, K. Karelius, S. Pratapa

This stacked sand sieve was intended to replace conventional sieves that had several disadvantages, including unstable speed, inefficient time in processing large amounts of sand, and relatively higher costs incurred. This stacked sieve exhibited the following characters: 1) composed of two sieves, 2) can be assembled easily to change the size of the sieve, 3) had 3 variations of the sieve slope, and 4) used a gasoline motor to produce a sift speed of 25.2 cm/s and 36.4 cm/s. The sieve slopes were manually adjusted by positioning the sieves according to the available slots on the device.

E. Energy-based Indicators of Soil Structure by Automatic Dry Sieving

Dmitry Fomin, Maria Timofeeva, Olga Ovchinnikova, Ilya Valdes-Korovkin, Andrey Holub, Anna Yudina

Numerous methodological approaches and fractionation procedures contribute to the continuation of discussions about soil aggregate formation. This study aims to justify the dry sieving procedure and suggest an optimal sieving regime for automatic shakers for soil samples. For this approach to calculating total sieving energy, using oscillation frequency, vibration amplitude, and time was proposed. Retisol, Phaeozem, and Chernozem topsoil samples from agricultural and native ecosystems were analyzed using a sieving test, in which 50-kg soil samples were divided into 500–700 g subsamples and sieved with a constant oscillation frequency (50 Hz), but with varying vibrational amplitudes (0–2.5 mm), for sieving times that ranged from 1 to 5 min. We found that the optimal sieving regime is characterized by total sieving energy of 1850 J kg^{-1} , reached during 2 min of sieving with a 50 Hz frequency and a 2.5 mm amplitude. Based on results of the dry sieving test, we have proposed the indicators of mechanical stability of soil structure: index of soil structure stability (SS) which characterize the degree of change in the soil aggregates size during sieving with minimal and optimal sieving energy, and modified the soil friability index (F4), that characterizes the rate of change in the soil aggregates size under mechanical load by dry sieving. The proposed formula of total sieving energy calculation allows comparing results between soil studies. Our meta-analysis showed that most (26 of 34) studies used insufficient sieving energy, where the aggregate size distribution did not reach the equilibrium state. A detailed protocol for soil dry sieving analysis is provided.

F. Quality Attributes of Parboiled Rice Prepared with a Parboiling Process Using a Rotating Sieve System

Naruebodee Srisang, Thatchapol Chungcharoen

The aim of this study is to apply a rotating sieve system to the parboiling process for parboiled rice production. The parboiling time and rotation speed were the main production factors affecting the quality attributes of the parboiled rice, including the degree of starch gelatinization (DG), fissure percentage, head rice yield (HRY), white belly, and color. The results showed that the parboiling process with a rotating sieve can decrease the parboiling time required to provide an even quality of parboiled rice. The parboiling time for an even quality of parboiled rice was 5 min at rotation speeds of 10 and 15 rpm, while the parboiling time at a rotation speed of 5 rpm was 10 min. These times were shorter than that with a fixed sieve (15 min). Moreover, the parboiling process using a rotating sieve system provided better qualities of parboiled rice than that using the fixed sieve system, including higher DG and HRY and lower fissure and whiteness percentages. Additionally, the values of DG and HRY were increased with increasing parboiling time. In contrast, the fissure and whiteness percentages of the parboiled rice decreased. However, the quality of the parboiled rice was not dependent on the rotation speed.

III. PROBLEM STATEMENT

- Sieving of sand particles in construction, grain sorting in agriculture is done manually and human effort is required.
- After careful review of literature, it was found that no specific solution to separate different sizes of grains are not available.

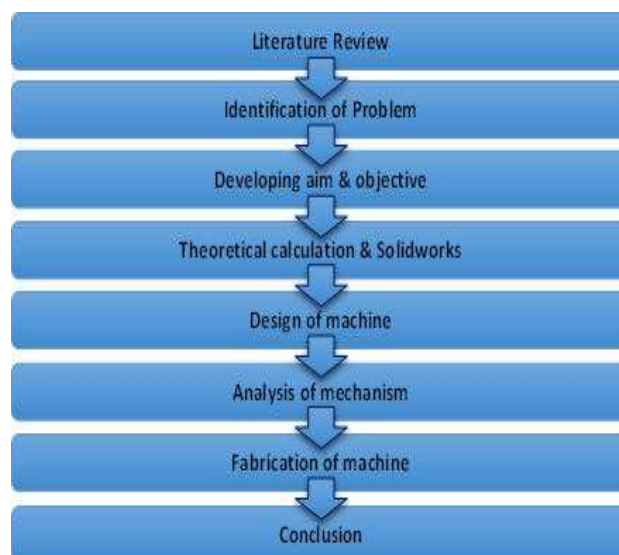
- The Speed of Motor cannot be controlled so that can be set according to preference.
- The waste which is not sorted in sieving remains in sieve after an operation it needs to manually cleaned and remove.
- Now days people always prefer the most suitable way to cut their cost and time. Example in a construction where they have to finish the work before the due date. His might be a problem. Since we have waiting long waiting for the good to arrive
- However, sometime in big company there are high tech machine that can do this work sieving any sub stand or mixture. But sometime in construction required a special sieve machine that are comfortable and easy to use.
- Traditional method gives low efficiency as it is operated manually but the automated sand sieving machine have higher efficiency
- Traditional method requires more labour.
- Traditional method is more time consumed during the process of preparing the concrete.
- The cost of highly sophisticated machine is very high which is not affordable for small scale foundries and low-level contractors.

IV. DESIGN CONSIDERATION

- This project focuses in design, fabrication of the mechanical part of machine and the system of the sieve machine. To achieve this project objective, this sieve machine body structure and mechanical system needs to concern some other criteria such as strength, safety and ergonomic design.
- Sieving is done automatically of sand particles in construction, grain sorting in agriculture and various operations were things need to be sieved
- As it is multipurpose so the sieve can be replaced as per the sieve size requirement in sieve bracket
- As the sieve operates on reciprocating motion the speed of the motor can be controlled by foot.
- Design and Fabricate a Sieving Machine which can filter 2-3 kg of grains at a time.
- Selection of gathering of component for the craving moment. Components like motor, pulleys, bearing etc.
- calculation of vitality machine parts. Calculation of motor rpm, load of motor, torque of motor, voltage required to run motor, pulleys dimensions, bearings dimensions etc.
- And at last manufacturing or collecting and assembling machine.

V. RESEARCH AND METHODOLOGY

Although designs vary, the method followed for Project is:



VI. WORKING PRINCIPLE

The Multipurpose Sieving Machine is very easy to construct and can be operated easily. It is very economic among this kind of machines. This project is fabricated with the help of parts like a motor, crank and slider link mechanism, bearing, C.I. wheels, sieving box. The horizontal sieving machine is worked on the basis of crank and slider mechanism. Here crank is attached to the sieve box the power is given by motor through pulley belt arrangement. The rail bracket is made in which the sieving box moves in it. The sieving box fixed with the connecting rod in order to move when the wheel is rotated by means of pulley attached to the motor. The sieving box is placed inside the rail bracket and the machine is started. When the sieving box moves in the reciprocating motion the sieving process is performed for various operations by changing the inner sieve for different applications.

VII. CAD MODEL

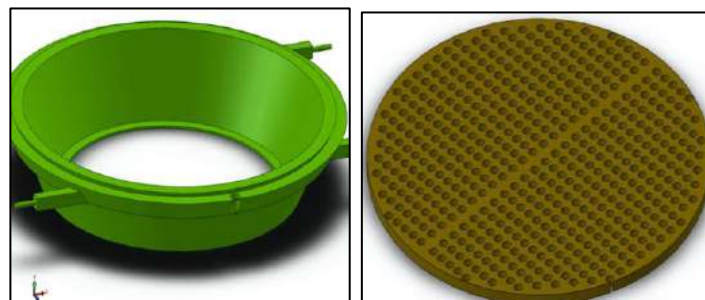


VIII. COMPONENTS

A. FRAME



B. SIEVE



C. BEARING



BEARING 608

BEARING 6204

D. PULLEY / WHEEL



E. BELT



F. MOTOR



3PHASE MOTOR

3HP-1410RPM

FOOT MOUNTED

CONTROLLED BY VFD

IX. WORKING PROCESS



The figure shows the sieve used as separator. In this the whole work is based on the mechanism of crank and slider mechanism. The rotation of the crank transfers the motion to the movement of sieve. It consists of the pulley-wheel and belt arrangement which rotates the crank and through its slider consists of reciprocating mechanism. The power is transmitted to the crank and slider mechanism. This mechanism is used to rotate the

crank, the wheel which is having an extended rod is connected to the sieve holder plate directly by means of a linkage. The sieve plate is passed through the guide ways by means of maintaining the reciprocating motion. The sieve moves horizontally on guided path. The crank is connected to the wheel which is transfer the motion from one to another. The pulley is connected to another wheel which is transferring motion through belt. The rotating motion of the electrical motor converts to the sliding motion using pulley and wheel by belt. The sliding crank mechanism is used in this project. The wheel which is placed at same level of pulley and is powered by motor and speed controlled through vfd. This sieving operation can be performed for multiple purposes like in sand sieving, construction sites and also in agriculture for harvested crops and sand sorting.

X. CONCLUSION

In this research study, the mild steel failure problems encountered by loads were successfully. Thus, a cost effective and simple design motor operated multipurpose sieving machine is fabricated. This machine reduces the human effort and hence we don't need multiple persons to filter/sieve at a time. Also, machine is portable as it can be de-assembled and assembled easily.

XI. SCOPE FOR FUTURE WORK

The project can be made for higher capacities by increasing the dimension and improving the design aspects. The machine can be operated using solar energy also which is economically useful.

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ACCIDENT PREVENTION SYSTEM USING EYE BLINK SENSOR**¹Usama Malbari, ²Moshir Ahmed, ³Hussain Shaikh, ⁴Nikhil Surve and ⁵Irshad Shaikh**^{1, 2, 3, 4}Student and ⁵Assistant. Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar**ABSTRACT**

The aim of this project is to design an Accident Prevention System which helps in preventing/avoiding accidents. Accident due to cause of drowsy is prevented and controlled when the vehicle is out of control. The accidents due to the drowsy state of the driver is prevented using automatic braking system by using eye blink sensor and accelerometer. In recent times drowsiness is one of the major problems of highway accidents. The accidents occurred caused by drowsy and when driver wakes up he can't be able to control the vehicle. The drowsiness is induced by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame or IRS. If the driver is drowsy, then the system will give buzzer and the speed of the vehicle is reduced in 3 to 5 sec. Also accelerometer sensor is mounted on spectacles frame for measuring head tilting angle of driver. The advantage of this project is to less the number of accident and also save the lives of human beings and also creating a new theory of accident detecting system in this competitive world, as new technology is going to lead the globe.

Keywords: Eye Blink Sensor, Accelerometer Sensor, Accident Prevention System, Relay Circuit, Braking System.

I. INTRODUCTION

The drowsiness [a feeling of being sleepy] is one of the reasons responsible for the vehicle accidents. Around 30 percent accidents are occurs due to drowsiness of the driver. The driver drowsiness can be detected by checking driver response. One of the methods for detecting eye blinking of the driver is by making use of IR sensor. The IR sensor is used to see the blinking of eyes of the driver. If the eyes are closed for certain period it will sense by IR sensor. The information of eye blink is send to microcontroller from IR sensor and makes the device work. Hence drowsiness of the driver is prevented and results in reduce percentage of accidents. Vehicle accidents are most common if the driving is inadequate. These happen on most factors if the driver is sleeping or if he is alcoholic. This Paper was focused mainly on road accidents occurring due to drowsy state of drivers in four wheelers. As the fatality rates due to growth of accidents IS increase in day by day, the below method are implemented to decrease the fatality rate. Driver drowsiness is recognized as a crucial aspect in the vehicle accidents. It was demonstrated that driving performance deteriorates with increased sleepiness with resulting vehicle accidents. But the life lost once cannot be re-winded. Advanced technology over's some hope avoid these up to some extent. This project involves measure and controls the eye blinking using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reacted infrared rays of eye. If the eye is closed means the output of IR receiver is high other side the IR receiver output is low. This to know the eye is closing or opening Position. This output is given to circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is in vehicle where if anybody loses consciousness and indicate through alarm. Then eye blinking sensor transfer signals to the dc motor and it starts dc gun which apply on the break and vehicle will be stops gradually. Previously the very first method of eye blink detection was made through image processing. But this sometimes contains slow processing of image and leads to more time. It needs additional set of computer or laptop which becomes complicated arrangement.

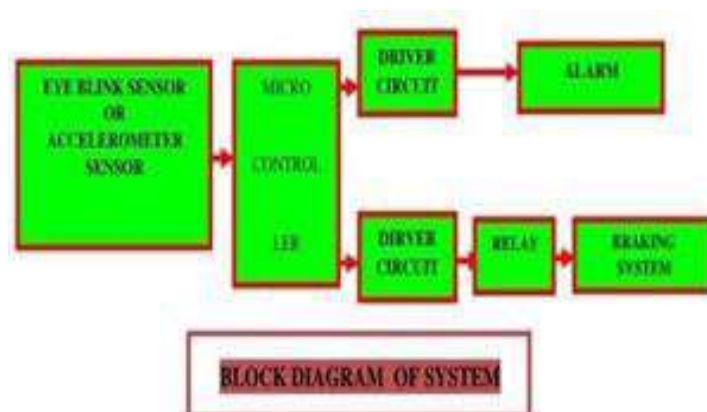
Sometimes the shocks in the vehicle due to bad conditions of the road may damage the program stored in laptop or computer. So the second technique installing sensors in front of eye or in long range is the possible way to detect the accurate blinking of eyes.



Fig 1.1: Image Processing of Drowsiness

II. METHODOLOGY

A single tire will be mounted on a frame and will be rotated by using DC gear motor. Braking system will be designed accordingly. The driver will wear goggle have sensors and will perform demo. The above results and the works shows the present design is best and the Accident alarm indicator and braking will work good according to the eye blink closing and opening of the driver and will be successful. Actually the fact that the driver is not able to control his vehicle when he is asleep and by the time he realizes it, there is an accident. The car is at a very high speed on highways due to which handling is tough and getting the vehicle to halt in such a condition is very difficult. Due to this many automobile companies are trying to research onto how an accident which cause due to driver fatigue can be prevented. In this project we will generate a model which can prevent/avoid such an incident. The Purpose of such a model is to advance a system to detect fatigue symptoms in drivers and control the speed of vehicle to prevent accidents. The main components of the system consists of an eye blink sensor for driver eye blink acquisition and an adaptive speed controller designed using stepper motor for providing accurate positioning of the throttle valve to control the speed of car or any vehicle. Advanced technology offers some hope avoid these up to some type of extent. This project involves in measure and controls through alcohol sensor and eye blink using IRsensor.If the driver is seen to be drowsy i.e. the eyes of drivers are closed for 3 seconds then the IR sensor and accelerometer sensor gives the information to the timer the sensor to the 5V and ground of the arduino and the Analog pin of sensor to the A0 circuit it activates the microcontroller and microcontroller gives information to three relays. Accordingly the buzzer will make noise and at the same time the driving motor will be disconnected by disconnecting the relay and motor used for braking will be on through relay. This is how the project works.



III. WORKING

It is used by us is to see the blinking of eyes of a person driving the car. This will not recognize the normal flashing of eyes but will provide the time period for it, so that it will detect after the given time period. If the eyes are closed for 3sec it will sense by IR sensor and this signal is further send to microcontroller .The intensity of IR light and time for closed position of eyes can made adjustable according to the distance of sensor from the eyes. The accelerometer sensor is used to detect the head inclination angle if the head is inclined for more than 45 degree for 3 seconds it is programmed for actuate braking system and buzzer. There are three

relays one for the disconnecting the driving motor and another for the braking circuit running purpose. If the driver is seen to be drowsy i.e. the eyes of drivers are closed for 3 seconds then the IR sensor and accelerometer sensor gives the information to the timer the sensor to the 5V and ground of the arduino and the Analog pin of sensor to the A0 circuit it activates the microcontroller and microcontroller gives information to three relays.

COMPONENTS

The Main Constitutes and Components Are:

- Microcontroller Circuit
- Relay Circuit
- Driver Circuit
- Timer Circuit
- Alarm Circuit
- Braking Mechanism
- Eye blink sensor.
- Accelerometer sensor.
- Vibrator Motor

Eye Blink Sensor

The eye blink sensor consists of an Infrared Transmitter and a Receiver. The infrared transmitter transmits the rays and the receiver receives the rays. The sensors sense our reaction of the eye [closed or opened] for 3 sec and gives information to the system that is the timer circuit. The timer circuit then precedes the information to the microcontroller.



Figure 3.1: Eye Blink Sensor

Accelerometer Sensor

The accelerometer sensor is used to detect the head inclination angle if the head is inclined for more than 45 degree for 3 seconds it is programmed for actuate braking system and buzzer.

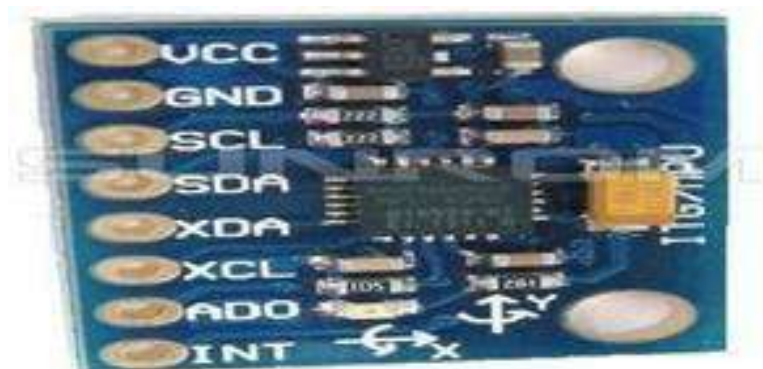


Figure 3.2: Micro Controller

Buzzer

A buzzer or beeper is a signaling device usually electronic. These devices are used in automobiles, household appliances such as microwave oven. It consists of a number of switches or sensors connected to a control unit that determines if and which button pushed or a present time has lapsed, sounds a warning in the form of an intermittent buzzing or beeping sound. The infrared transmitter transmits the rays and the receiver receives the rays. The sensors sense our reaction of the eye [closed or opened] for 3 sec and gives information to the system that is the timer circuit. The timer circuit then precedes the information to the microcontroller.



Figure 3.3: Buzzer

Vibrator

This is the vibrator kept in the circuit of the system. In real time the vibrator is set under the seat of the driver or at the back of the seat or on the steering of the vehicle. The vibrator has a separate driver circuit and a relay for its control. The vibration is controlled by the microcontroller. A vibrator is fixed in the circuit in which it will vibrate and make the driver alert about the drowsiness condition.

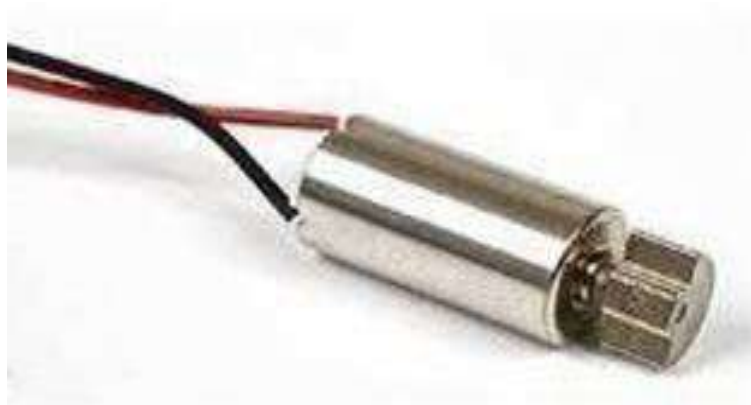


Figure 3.4: Vibrator

IV. DESIGN



Figure 4.1: Glasses with IR Sensor

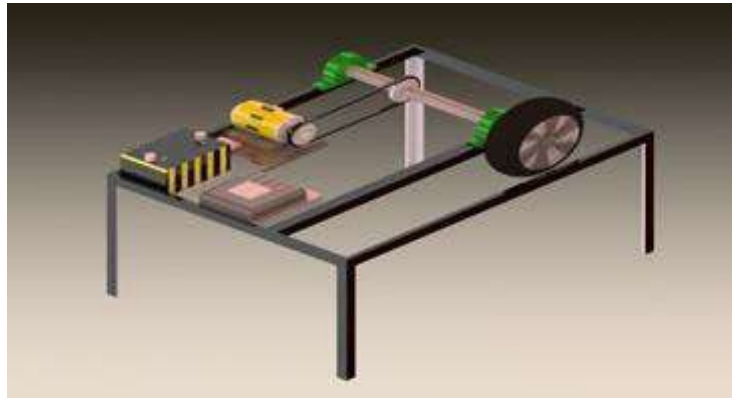


Figure 4.2: Project with Assembly in CAD



Figure 4.3: Assembled project

V. CONCLUSION

Actually the fact that the driver is not able to control his vehicle when he is asleep and by the time he realizes it, there is an accident. The car is at a very high speed on highways due to which handling is tough and getting the vehicle to halt in such a condition is very difficult. Due to this many automobile companies are trying to research onto how an accident which cause due to driver fatigue can be prevented. In this project we will generate a model which can prevent/avoid such an incident.

The Purpose of such a model is to advance a system to detect fatigue symptoms in drivers and control the speed of vehicle to prevent accidents. The main components of the system consists of an eye blink sensor for driver eye blink acquisition and an adaptive speed controller designed using stepper motor for providing accurate positioning of the throttle valve to control the speed of car or any vehicle. Advanced technology offers some hope to avoid these up to some type of extent. This project involves in measure and controls through alcohol sensor and eye blink using IR sensor.

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DESIGN AND FABRICATION OF GROUNDNUT SHELLER

Manthan Patil¹, Chirag Raut², Rahul Raut³, Anish Vartak⁴ and Iqbal Mansuri⁵^{1,2,3,4}Mechanical Department, Mumbai University⁵Assistant Professor, Mechanical Engineering, Theem College of Engineering, Boisar**ABSTRACT**

In a developing countries like India groundnuts is grown on small scale, so there is a lack of lack of groundnut sheller machine which are affordable. The average price of peanut is approximately twice the price of pod. There are some groundnut sheller machines are available in market but the cost is not affordable and also they are large in size so they are not suitable for domestic applications they are suitable for mass production like industrial applications. Hence it is essential to design and fabricate a portable groundnut sheller machine for domestic applications. The performance of the machine was evaluated in terms of overall capacity, shelling and material efficiency and mechanical damage. This paper describes about the working, result and conclusion of the groundnut shelling machine.

Overall, this project involves processes like design, analysis, fabrication and assembling of different components.

I. INTRODUCTION

The process of removal of the skin and bark of the beans is a very time-consuming process and requires labor. Hence machine could fasten this process and reduce labour to one man that would be very advantageous in mass production. The need of this machine is in food processing industry and in agriculture sector for de-shelling of the beans. The bean Sheller will be very efficient for mass production. The objective of this machine is to speed up the process of de-shelling and to reduce the labour work. When the beans are de-shelled manually the bean are pressed at the edge and their shell opens. Same thing happens when we thrash the bean at a hard place it opens up its shell. The same principal is used here in our bean Sheller. The beans are hit by the wooden arms and they cause the bean's skin to rupture and the beans fall in our collect.

II. OBJECTIVES

- The main and basic objective is to make low-cost groundnut shelling machine.
- Another thing is that to shell maximum possible groundnut in shortest possible time

III. LITERATURE SURVEY

Sr no	Name Of Paper/journal	Authors Name	Year of	Findings of the Paper published
1	A Review on Design and Fabrication of Groundnut Shelling and Separating	Adwal Ravindra1, Ghadge Rohit, Awad Saurav, Prof. Khare G.N	2017	The agriculture is the basic profession of vast of population world-wide. Some modifications can be done in this machine and it will be used over long scale. The scope in agricultural field is tremendous. It will definitely be a vast sector to work on to minimise man power and improve efficiency of operation, decrease cost of operation, decrease efforts.
2	Design and Fabrication of Groundnut Pods and Shell Stripper Machine.	G. Karthik , D. Balashankar	2018	This work presents the design of an electrically powered groundnut pods stripper and shelling machine. It can be used for both domestic and industrial purposes. The advantage to be derived from the use of this machine far outweighs its shortcomings. It was also observed that groundnut with one seed per pod and those with two small seeds in their pods were the ones that came out unshelled or partially shelled
3	Groundnut Peeling Shelling Machine	A.Mani1 P.Manishkumar, M.Krishna U.Karthick	2021	The main importance of this project is as this machine is battery operated it can be directly transported to the groundnut farms and can be operated without an external electric supply which is not available at most of the farms. Proper evaluation of the design will be performed and

				created something even better instead of simply manually operated operations. Finally, we conclude that atomizing machines is a better option to use farmer instead of manually operated.
4	Design & Fabrication of Groundnut Sheller Machine	Tushar Walke1, Praful Gadge, Ganesh Gohate, Ritesh Banpurkar	2017	The cost of the machine is less and if the farmer buys this machine, farmer can recover the invested money back. By using this machine problem of the labour crises can be reduced. Comparing with manual harvesting only one labour is required. It makes the process faster hence reduces most of the shelling time and labour cost.
5	Design and Fabrication of Pedal Operated Groundnut Decorticator Machine	Kulbhusan M.Shejole1, Nitin B. Borkar, Abhijit M. Bobade	2017	Based on it is concluded that, the pedal operated groundnut decorticator machine is better option to use farmer instead of hand operated. The machine is pedal operated so that there is no energy consumption which will help to reduce the cost of productions. This machine also saves time and manpower. If we go on continuous work we got a higher output in very short time. The operating procedure of this system is very simple, so there is no skill labour required to operate a machine.

IV. DESIGN METHODOLOGY



V. RESULTS AND CALCULATION

The sample of a readings are recorded. Five tests are conducted each of them consists of one Kg of groundnuts. Each of test conducted at a same speed. Approximately 78% groundnuts are shelled. The shelled groundnuts are collected in a drawer among with some small size pods. In shelled groundnuts damaged and undamaged peanuts are separated for calculating efficiencies.

Sr. No.	Total wt. of groundnut in Kg. (Qt)	Wt. of shelled groundnut in Kg (Qs)	Wt. of undamaged groundnut in Kg (Qu)	Wt. of amaged groundnut in Kg (Qd)	Time for shelling operation in seconds (Tm)
1	1	0.80	0.59	0.186	30
2	1	0.76	0.55	0.180	30
3	1	0.78	0.58	0.183	30
4	1	0.77	0.57	0.181	30
5	1	0.79	0.54	0.188	30
Total	5	3.90	2.83	0.918	150
Average	1	0.78	0.566	0.1836	30

$$\text{Shelling Efficiency (\%)} = \frac{Q_s}{Q_t} \times 100 = \frac{0.78}{1} \times 100 = 78\%$$

$$\text{Material Efficiency (\%)} = \frac{Q_u}{(Q_u + Q_d)} \times 100 = \frac{0.566}{(0.566 + 0.1836)} \times 100 = 75.5\%$$

$$\text{Mechanical Damage (\%)} = \frac{Q_d}{(Q_u + Q_d)} \times 100 = \frac{0.1836}{(0.566 + 0.1836)} \times 100 = 24.4\%$$

$$\text{Overall Capacity (Kg/h)} = \frac{Q_s}{T_m} = \frac{0.78}{0.0083} = 93 \text{Kg/h}$$

DESIGN MODEL



VI. CONCLUSION

Reduction in Size:

The overall size of the unit fabricated is smaller than the one which are commercially available in the market. The dimensions this of the machine are 1117.6x762 mm (44” x 30”). Upon calculating the area occupied by the machine it comes out as 851611.2mm². The dimensions of the machine available in the market is about 1150x762 mm. The machine can be made even more compact by reducing the free space in the body and drum. However, reduction in the free space will make the maintenance and cleaning of the machine harder. Also adding of the accessories like a gear box, shaker or blower and changing the mesh (drum net) will be harder.

Reduction in Weight:

The project is light in weight as it is built from wood. Using high quality steel would have increased the weight as well as the cost of the machine. Also the mechanism which includes the drum and the planks are made from wood which not only reduces the weight, but it also reduced the direct forced and centrifugal forced acting on the shaft which also helps in the reduction of vibrations.

Reduction in Cost:

The overall cost of the fabricated project is around Rs. 13000 whereas the average cost of the machines available in the market ranges from Rs. 15,000 to Rs. 50,000. The lower power motor, the wooden body and drum are some of the factors which help in major cost cutting of the overall cost of the project both in terms of material cost and machining cost.

Power Saving:

The motor used in the project is a 0.5 hp (0.37 KW) 1440 rpm motor where as most of the machines in the market uses around 1.1 to 2.2KW. It reduces the power consumption. The motor is able to drive the mechanism as it is light in weight. Also higher power motors are costly and bulky that is it adds in more weight to the machine. Using a higher RPM motor would lead to the mechanism rotating at much higher RPM producing unnecessary sound and vibration.

VII. FUTURE SCOPE

The groundnut sheller can be modified with various attachments and changes in the components to increase the efficiency and for maximum output conveniently. These changes would increase the cost of the machine but also increasing the efficiency and can avail new features to the machine a few of the attachments/modifications are as follows:

1. Blower:

A process for removing the skins from the bean comprises:

Loading the beans in the de-shelling chamber

Rotating the de-shelling chamber and the arms inside on the shaft that will hit the beans and the beans will fall down and if some of the skins fall down, it will get collected in the draw.

To avoid the skins of the beans to get collected in the drawer a blower should be installed so that the peeled skins of the beans are blown away and would be expelled from the rear side of the machine.

2. Automatic Pouch Packing:

This machine can be attached to the Bean Sheller and the beans could be packed and sealed directly which will increase the productivity and the time will be saved. This machine should be installed just before the unloading drawer where the beans would fall after passing the mesh. The beans would be packed and sealed in plastic bags and can be sent straight for sales in the market or it can even be frozen to increase its life.

3. Solar Driven Motor:

Motor installed on the machine could be driven by solar panels increasing the efficiency much and would eliminate the wastage of electricity but these installments could be expensive causing high initial costs. The solar panels would be installed and would set on the open field which would simply generate electricity giving power to the motor.

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EFFECT OF COMMUNICATION SKILLS ON STUDENTS LIFE

Shravankumar Champaram Kumavat, Suraj Omprakash Rana, Vinayak Jatashanker Pandey and Dhiraj Milind Patil

Students, First Year Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

The purpose of the paper is to study about the problems faced by young adults in communication skills and provide them guidance to success in personal and professional life by developing communication skills. It educates them the importance of good communication skills in teaching-learning process and in technical sector. It also emphasizes that the teacher should provide hands-on practice in soft skills and in technical sectors so that students can do communication effectively both in business and social life. The study also highlights Communication skills is an incorporating skills that can be taught by facilitating Training with Personality Development which could ensure a healthier and stronger working life after their graduation. It presents a brief of Definition of Communication, Process of Communication, Method of Communication, Barriers to Communication and Reason for Lack of Communication Skills and its Remedies. The conclusion of the study is presented with explanation of Advantage of Communication and Benefits and its results.

I) INTRODUCTION

The aim of this study is to overcome the communicational problems of young adults, especially engineering students and guide them to gain good communication skills to success in their personal and professional life. As communication is being a major part of teaching-learning process as well as a huge importance in the technical sectors, development of this skill starts when an individual has motivation and opportunity to express his/her thoughts and transfer of information through a medium to people.

In general, students develop their skills in terms of knowledge and communication in a socialize environment but not in the environment of continuously attending the class. So, in the terms of developing communication skills, the role of a teacher is very important. They have to organize number of hands-on practice activities to facilitate training in both soft skills and technical sciences. This allows students to effectively communicate with business team members and other members of social life.

II) LITERATURE REVIEW

To add weightage to the research, we referred some books, internet and research papers which had given us a lot of points to improve our views and thoughts to fulfil this activity. Recognizing these contexts, communication is regarded as one of the fundamental areas in which the function of human communication is clearly understood. However, in the literature survey, the cases of “adult education” and “communication in adult education” were ignored in Japan, and educational events planned for adults still had an educational character. For this reason, Andragogy-based communication skills training organized for young adults that was considered to serve as a guide for further research. We also examined whether the communication skills training for university students affects the level of ability to express emotions and empathy tendencies that play important roles in the communication skills of young adults.

III) IMPORTANCE OF COMMUNICATION SKILLS

The rapidly developing world, changing environment, technological advancement and the regular use of communication technology in the lives of people convince the young adults for the importance of communication skills. In the recent years, there has been frequent research on the importance of communication skills where people learnt that the communication is a multifaceted concept in many areas of interest mainly centred on people such as the healthcare field, services at the hospital, etc., which required a proper and effective communication and quality of care for all reasons.

For example, medical professionals spend most of their time in contact with patients and their families and due to their sensitive situation; communication with patients and relatives requires a gentler and friendlier approach. Therefore, it is expected that the communication skills of healthcare professionals will be effective.

Developing communication skills for health science students will enable them to communicate effectively with their patients. Communication skills are not just personal talents, they are very important in incorporating skills that can be taught. In addition, this study is believed that the Communication Skills Training and Personality Development can be prepared for college students to ensure a healthier and stronger working life after their graduation.

IV) DEFINITION OF COMMUNICATION

Communication is a two-way process in which messages in the form of ideas, thoughts, feelings, and opinions are passed between two or more people to create a common understanding. Simply put, the act of conveying intended information and understanding to the other party is called communication. Communication is a two-way process in which messages in the form of ideas, thoughts, feelings, and opinions are passed between two or more people to create a common understanding. Simply put, the act of conveying intended information and understanding to the other party is called communication. Effective communication is when the message conveyed by the sender is precisely understood by the recipient as intended. Effective communication is when the message conveyed by the sender is precisely understood by the recipient as intended.

V) PROCESS OF COMMUNICATION

Communication is a dynamic process in which the sender conceptualizes an idea, delivers a message to the receiver, and the receiver provides feedback in the form of a message or signal over a given period of time. Therefore, there are 7 main elements in the communication process. Sender: A caller or communicator is someone who starts a conversation and comes up with an idea that they want to share with others. Encoding: The sender begins with the encoding process using specific words or non-verbal methods such as signs, symbols, gestures, etc. to translate information into a message. Your knowledge, skills, awareness of the sender, your background, and your competencies will greatly influence the success of your message.

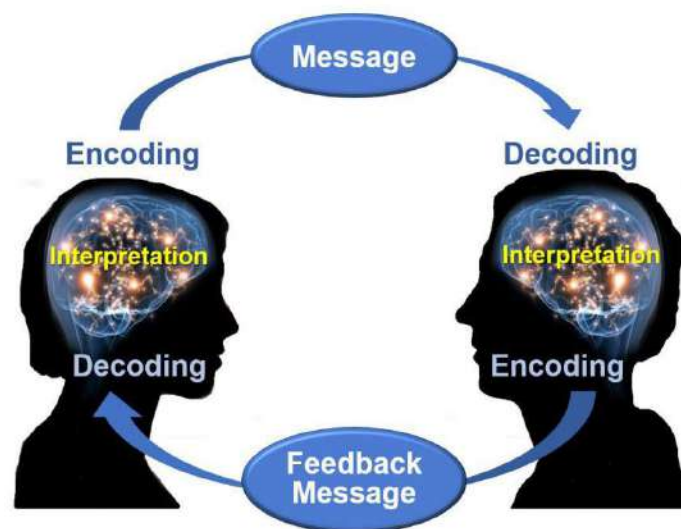


Fig.1: Process of Communication

Message: After encoding is complete, the sender receives the message it was about to send. Messages can be written, spoken, symbolic or non-verbal, such as gestures, silences, sighs, sounds, etc. or any other signal that elicits a response from the receiver.

Communication Channel: The sender chooses the medium through which he wants to send his message to the receiver. You must choose carefully so that the recipient of your message can interpret it effectively and accurately. The choice of means depends on the interpersonal relationship between the sender and the recipient and the urgency of the message being sent. Oral, virtual, written, audio, and sign language are the most commonly used means of communication.

Recipient: The recipient is the intended or intended person of the message. He tries to best understand him in order to achieve the goal of communication. The degree to which a receiver can decode a message depends on the subject's knowledge, experience, trust, and relationship with the sender. **Decoding:** Here, the receiver interprets the message from the sender and tries to understand it in the best possible way. Effective communication is only possible when the recipient understands the message exactly as the sender intended.

Feedback: Feedback is the final step in the process for a recipient to receive a message and interpret the message exactly as the sender intended. This makes communication more efficient because the sender is aware of the impact of the message. The recipient's response can be linguistic or non-verbal.

VI) METHODS OF COMMUNICATION

Basically, in communication skills, the most important thing is effective dialogue that involves both verbal and non-verbal elements. These two elements are considered as method of communication. Here, we present the details of Verbal Communication and Non-verbal Communication.

Verbal Communication: In this type of communication spoken or written words are used which can be divided into two parts as Oral and Written Communication.

1. **Oral Communication:** In this type of Communication, face to face interaction happens between a sender and a receiver.



Fig.2: Process of Communication

2. **Written Communication:** In this type of communication, written or typed words are used for communication. Written type of Communication is widely used to deal with distanced people for professional works.



Fig.3: Process of Communication

Non-Verbal Communication: In this type, communication is done without uttering words. This type of communication plays a very important role in professional communication because it requires non-verbal cues to transmit and receive information. These non-verbal cues are classified into: Body language, facial expression, eye contact, tone of voice, gesture, posture, etc.



Fig.4: Process of Communication

VII) Barriers to Communication: Many times communication fails especially interpersonal communication. It happens because the message which the sender wants to send is not exactly received by the receiver as sender intends for that reason the sender seeks for feedback from the receiver to verify the message given by him is clearly understood.

A) Major Barriers to Communication: It is sender’s responsibility to clear it by making a sound knowledge on language which he/she using to communicate.

1. **Wrong Channel:** There are different types of channels from which we present you a few examples for how wrong channel can affect the communication and make a person misunderstand the importance and nature of a sentence/message. The message “how are you” is most suitable in oral channel but it will be less effective or inappropriate in written on book or paper. On the other hand, if someone is saying different items name then you must be write it in paper or sender should write the items name in paper. If a sender say that “The Kashmir is so beautiful place”, it will not have much effect. If a video is used to show the beauty of the Kashmir, it will have a great effect and then the receiver will wish to go the Kashmir. Simple rules for choice of a channel cause a lot of issues than they solve. In selection of a channel, the sender must be sensitive to such things because the quality of the message (good morning versus a construction contract); the results of a misunderstanding (medication for a sick animal versus a guess concerning tomorrow’s weather); data, skills and talent of the action from the message (order for this morning’s work versus a thought of labour for 1994). To overcome it you should learn about different type of channel and which one to be used and where. If someone use some channel and you are not understand why it is use then ask about it, clear your doubts.
2. **Language:** Words are not absolute and not reality because it is the sender understands them, are combined with the perception of those words by the receiver. A language represents only a fraction of part, remaining part is filled by the receiver’s perception. When you try to understand a foreign language, it's easy to see that the language isn't real. Being a “foreigner”, it is not limited to the language of another country. It could be the language of another form, the house of Gerkens where Brown lives. Green goose can be coloured red long after it has been given the name green goose. A busy day has to do with temperature and a little bit of colour. Each apprentice must learn the language of the form. Until they learn the language of the form, this can be as problematic for communication as with other languages.
3. **No Feedback:** Feedback is very important. When the sender receives the feedback, it sends another message accordingly. Without or not enough feedback, the sender may hit a communication barrier or the communication is one-way. Feedback can be of any type, such as question-and-answer, repetition, embarrassment, etc. So, try to get good feedback and give correct feedback.
4. **Lack of Listening Skills:** Listening is not easy. The average speaker speaks about 125 words per minute, and the average listener can read 400-600 words per minute. So, about 25% of the time is listening time and the rest of the time is free time that allows listeners to draw attention to other things or to think about things other than the topic. Sketching or summarizing key point’s memorial can be very helpful. Do not disturb the speakers. “Shut up” is a useful recommendation for listeners. “Shut up a little bit more” is a useful addition to this rule. Let someone else finish your message, and then offer your judgment, rating or opinion. An impatient impression, a shake of the head and a bored look on the listener's face can easily convince the speaker that there is no attempt or boasting to convey his/her brilliant idea. To handle this situation and the provide feedback, ask the speaker a question, agree and nod. Be an active listener. Look into the speaker’s eyes and lean forward. Focus on what the other person is intends to say and repeat the point.
5. **Physical Distraction:** Physical distraction is a physical thing that causes communication problems. For example, noisy places and uncomfortable meeting places and the phone ringing. These physical distractions are common on forms. When the phone rings, that person cannot refuse to answer, even if it interrupts your very important conversation. Supervisors can give instructions from the driver’s seat of the pickup truck. A person sitting next to a table, especially a large chair, having a conversation across a table is a conversation caused by a physical barrier. The personal sense of communication become much open when there is conversation between people facing each other without a truck-door or a desk. A place on the farm that is too hot or too cold makes the meeting places uncomfortable. The meeting also can be uncomfortable chair that makes people to want to stand or leave even if it means cutting short the discussion. The common physical distraction is noise; it is hard to focus on conversation if hearing is difficult because it is physical. You can overcome it easily, for example, ask the person to came across the desk, ask the management to provide comfortable chairs, use washroom before important meeting, etc.
6. **Interruption:** The long period of calm and quiet rarely interrupt the usual frantic pace. In this conversation, meeting, environment, instructions and casual talk about last night dinner can be interrupted. This interruption causes due to something more pressing, lack of privacy for conversation, rudeness, drop-in visitor, even curiosity of someone who wants to know what is your discussion or emergency. For example, when you and your friend discussing about assignment and that time your classmate jump in interrupt your discussion and says share that assignment with me, then you cannot overcome it, just can take precautions.

B) Common Barriers to Communication: The common issues faced in communication are as follows:

1. Lack of attention, interaction, distraction, cause irrelevances to the receiver.
2. Difference in perception and viewpoints.
3. Physical disabilities.
4. Physical barriers.
5. Language difference, unfamiliar accent.
6. Psychological barriers.
7. Physiological barriers.
8. Attitudinal barriers.

C) Factors Affecting Students' Communication Skills: There are many researches have been done to find out whether the poor performances of students in communication skills is influenced by teaching methods or lack of interest, curiosity in students. If they are useful in their studies or not, during presentation, students thinks presenting means only giving information and such a skill would not be effective or useful in students life.

VIII) What is Lack of Communication?

The lack of communication is a discrepancy between sender and receiver on what message is given and what message is received. It could be possible by many reasons like barriers to communication and others.

A) Remedy for Lack of Communication

1. **Ensure you Want to Learn More:** Most of the students hesitate to ask questions because of their fear and lack of confidence. As communicating helps them to listen for better understanding in day-to-day life, the students can ask questions freely which will boost their confidence and eventually give them more information to improve their skills.
1. **Be Friendly:** Clear communication about skills, information, objective vocabulary in words while doing communication will give you confidence and you will be lack of nervousness. For example, many students face difficulties during the job interviews. They become nervous and give bad postures and gestures which will directly affect their performances.
2. **Engage With New People:** Being socially active is one of the most important things in communication skills. While communicating, we should respect each other because good communication will make you trustworthy and will impact students' life positively.
3. **Have Collaborative Attitude:** As earlier said that the good communication skills will make you trustworthy, it is important in teamwork and will be very effective while presenting your point of views. After doing graduation, you will enter the corporate world where this skill will be most important as it is sign of good leadership quality.
4. **Improving Presence of Mind and Memory:** Every student should have sharp brain and presence of mind for effective communication and being productive to become successful. These will help them improve vocabulary, communication skills in every difficult situation. As good communication indicates you well-educated person, you should start communicating with everyone with proper manner without disrespecting anyone.

IX) Advantages of Communication Skills

1. **Communication Build Relation Stronger:** Personal correspondence moreover depends on effective communication in many ways. Good communication improves relation, trust, love, and strengthens the bond and also reduces the dispute. Talking can reduce stress and make awareness of love, hope, and care. If you don't take communication seriously in your relation then it may take you to important points like disagreement, cheat, etc. If you don't do it right, you can lose it. So, the choice is yours.
2. **Understanding:** Other advantages of the communication skills are that effective communication removes estimate/guess from any message. When information is successfully transmitted to your audience, your audience does not question or ask you a reason. Even a physician make sure that he does his best to make the sufferer understands what he is facing. When you communicate properly, your piece of information becomes easy to understand by all. For example, if you are expressing your suggestion in a meeting, so it is compulsory to give your speech clearly so that everyone can understand your perspective and rely on you.

3. **Read Emotional Signs:** The human beings are stressed all the time so, paying attention to signs and conveying desires or needs may occur not unexpectedly. These skills can be exercise with improved self-awareness and understanding of emotional signs. It can be a big advantage if you have the expertness of reading others' emotions in agreement and finding solutions. It makes it easier to adjust your communication according to the situation to hit the target listeners. Pay attention to their body language and adjust your words corresponding. For example, if you are giving a speech on stage and your listeners seems to be bored, you can add little funniness or take a break to grab their attention back.
4. **Easy Presentation:** The whole conversation will be improved if we attach non-verbal communication. The whole meaning of conversation will be converting if there is no non-verbal communication. Non-verbal is body moments like nodding of the head, sign like waving of a hand, a facial expression like a smile. It is also one of the trump cards of communication skills. Without execute justly, these forms of communication can result in a change in message. For Example, if you are at a social gathering and everyone is enjoying, a man with an angry face ask you stop dance, WILL YOU? The whole sequence of events will be changed if it is not executed well.
5. **Substituting:** You can replace your words with non-verbal forms of communication for easy and better understanding to others, without using a single word.
6. **Expressive:** Communication helps human beings to be more expressive about their suggestions and to be further creative. It allows us to understand others' emotions, their way of thinking, their goals and line of thinking of others. As a result, we develop our thoughts for others and develop affection or bad feeling for them or making positive and negative relationships.

To Overcome the Lacks of Communication Skills Here are Some More Solutions and Tip:

- Always try to communicate with other, don't hold back because of any anxiety
- Make positive attitude toward communication
- Avoid defensiveness that interferes with communication
- Work on your weakness and make it your power. It takes knowledge and hard work
- Try to learn about barriers to communication because it will provide you the necessary knowledge and will help you to know your weakness
- Consider communication as a skill, evaluate along with other skills
- Try to help other people to improve in their weakness in communication skill; it will help you to understand the communication problem
- Try to make good understanding and relationship, it will free you from any fear and anxiety and make your communication much better.
- Try to know the point of interest of receiver and speak on it, it will help you to make long discussion.
- If you do any miscommunication, accept it. By doing this, it will minimize its negative impacts.



Fig.5: Process of Communication

CONCLUSION: The study concludes its research points as follows:

- Communication skills are incorporating skills that can be taught by facilitating Training with Personality Development.
- It defines that the teachers are responsible to provide this facility through student-centred education process that ensures a healthier and stronger working life after students' graduation.
- Students must know the importance of effective communication skills in teaching-learning process and in technical sector for building good and life-long relationships.
- If students strictly follows the guidance and remedies of lack of communication, they can understand others' emotions, their way of thinking, their goals and line of thinking of others which will lead them to have success in personal and professional life.

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HYDRAULIC BRAKING SYSTEM

Nitin Galwade, Saumey Mukesh Chaudhari, Vasant Shrinuvashuu Vakiti and Nikhil Kishor Satote
Mechanical Engineering Diploma, Theem College of Engineering, Boisar, India

ABSTRACT

Now days the no. of accident are so high and uncertainly. Accident occurs frequently and causes worse damage, serious injury and even death. Most accident takes place due to driver error in recognition, judgments or vehicle operation. This report is about a system known as 'Hydraulic Braking System' which has been use around on most car models since the early 1930s, with combination brake systems added to cars in the mid-1960s. Combination systems combine drum brakes with hydraulic brakes to offer backup braking support in case the vehicle's hydraulic system fails. Many modern vehicles feature solely hydraulic disc brakes because of their proven effectiveness in safety testing.

A hydraulic brake system has advantages over traditional brakes. Hydraulic brakes are more efficient than most brakes when coming to a complete stop. Hydraulics also offer better cost economically and space compared to other types of brakes.

Keywords: master cylinder, brake pedal, hydraulic lines, brake caliper, disc brake

INTRODUCTION

1.1 HYDRAULIC

Hydraulics is the use of a liquid under pressure to transfer force or motion, or to increase an applied force. The pressure on a liquid is called hydraulic pressure and the brakes which are operated by means of hydraulic pressure are called HYDRAULIC BRAKES. In 11118, Malcolm Lougheed developed a hydraulic brake system. The hydraulic brake is an arrangement of braking mechanism which uses brake fluid, typically containing ethylene glycol, to transfer pressure from the controlling mechanism to the braking mechanism. Hydraulic Brake is an arrangement which uses brake fluid under certain pressure to actuate the brakes. Thus, brakes are applied to stop the rotating wheel.

1.2 BRAKE

A brake is a mechanical device that inhibits motion by absorbing energy from a moving system. It is used for slowing or stopping a moving vehicle, wheel, axle, or to prevent its motion, most often accomplished by means of friction.

Most brakes commonly use friction between two surfaces pressed together to convert the kinetic energy of the moving object into heat, though other methods of energy conversion may be employed. For example, regenerative braking converts much of the energy to electrical energy, which may be stored for later use. Other methods convert kinetic energy into potential energy in such stored forms as pressurized air or pressurized oil. Eddy current brakes use magnetic fields to convert kinetic energy into electric current in the brake disc, fin, or rail, which is converted into heat. Still other braking methods even transform kinetic energy into different forms, for example by transferring the energy to a rotating flywheel.

Brakes are generally applied to rotating axles or wheels, but may also take other forms such as the surface of a moving fluid (flaps deployed into water or air). Some vehicles use a combination of braking mechanisms, such as drag racing cars with both wheel brakes and a parachute, or airplanes with both wheel brakes and drag flaps raised into the air during landing.

Since kinetic energy increases quadratically with velocity (
$$K = mv^2/2$$
), an object moving at 10 m/s has 100 times as much energy as one of the same mass moving at 1 m/s, and consequently the theoretical braking distance, when braking at the traction limit, is up to 100 times as long. In practice, fast vehicles usually have significant air drag, and energy lost to air drag rises quickly with speed.

Almost all wheeled vehicles have a brake of some sort. Even baggage carts and shopping carts may have them for use on a moving ramp. Most fixed-wing aircraft are fitted with wheel brakes on the undercarriage. Some aircraft also feature air brakes designed to reduce their speed in flight. Notable examples include gliders and some World War II-era aircraft, primarily some fighter aircraft and many dive bombers of the era. These allow the aircraft to maintain a safe speed in a steep descent.

Friction brakes on automobiles store braking heat in the drum brake or disc brake while braking then conduct it to the air gradually. When traveling downhill some vehicles can use their engines to brake.

When the brake pedal of a modern vehicle with hydraulic brakes is pushed against the master cylinder, ultimately a piston pushes the brake pad against the brake disc which slows the wheel down. On the brake drum it is similar as the cylinder pushes the brake shoes against the drum which also slows the wheel down.

LITERATURE SURVEY

In the 1800's, the first mechanisms to slow a vehicles momentum and prevent motion were tested. Today, over 100 years later, the braking system has evolved into a complex device designed to adapt to different road conditions. From the early drum brakes to modern day discs, brake system evolution has improved safety and reduced the risk of car crashes. In 1918, the concept of a four-wheel brake system using hydraulics was first proposed by Malcolm Loughead. Brake system evolution has seen interesting advances in technology since the introduction of the wooden block brake. Such innovations have led to an increase in safety on the road and fewer accidents. The system used fluids to transfer force to the brake shoe when a pedal was pressed. This braking system was adopted in nearly every vehicle by the late 1920's. The disc brake was invented long before becoming popular. William Lanchester patented the disc brake in 1902; the system was not popular until the auto industry began to boom in the mid-20th century. The rise of disc brakes as a popular option is attributed to the increasing weight and speed capabilities of vehicles, which caused hydraulic brakes to become less efficient in distributing heat. The first system to use disc brakes integrated both disc and hydraulic functions and was introduced in the Chrysler Imperial. In our project we are using Hydraulic Brake with Hydraulic Disc which Help to reduced speed of the vehicle.

HDRAULIC BRAKING WOKING

Construction

Hydraulic braking system is mainly confined with "brake fluid" this fluid consist of Alcohol, castor oil & glycerin, Hydraulic braking system has following components.

Master cylinder, brake pedal, wheel cylinder, brake drum, retracting spring, brake shoe etc.

The disc brake is a lot like the brakes on a bicycle. Bicycle brakes have a caliper, which squeezes the brake pads against the wheel. In a disc brake, the brake pads squeeze the rotor instead of the wheel, and the force is transmitted hydraulically instead of through a cable. Friction between the pads and the disc slows the disc down. A moving car has a certain amount of kinetic energy, and the brakes have to remove this energy from the car in order to stop it. How do the brakes do this? Each time you stop your car, your brakes convert the kinetic energy to heat generated by the friction between the pads and the disc.

Working

The brake pedal is connected to the master cylinder by means of piston for application of brake driver presses the brake pedal, which moves the master cylinder. In master cylinder pressure is instantly transferred to all four wheels. In a disc brake, the fluid from the master cylinder is forced into a caliper where it presses against a piston. The piston in turn squeezes two brake pads against the disc (rotor), which is attached to wheel, forcing it to slow down or stop. When driver releases the brake pedal, the master cylinder piston returns to its original position due to return springs, dropping fluid pressure.

Fluid Properties

Fluid is the medium in which energy is transmitted through in a hydraulic system and the type of fluid used will have an impact on a number of different system properties. The fluid itself might be synthetic or non-synthetic and important properties and issues that need to be considered when selecting a hydraulic fluid are lubricity, Viscosity, protection against corrosion, tendency to foam, fire resistance and environmental impact. The properties of a fluid medium are apart from the type of fluid used also dependent on temperature, pressure and entrained air. Understanding how these various parameters affect the behavior and control of a hydraulic system constitutes the fundamentals of hydraulic system theory and is therefore presented in the following.

Fluid Mass Density

The density of a homogeneous fluid is defined as its mass per unit volume, denoted with the symbol ρ

$$\rho = \lim_{\Delta V \rightarrow 0} \frac{\Delta m}{\Delta V} = \frac{m}{V},$$

Where m , V , P and T correspond to fluid mass, volume, pressure and temperature respectively. The definition above assumes an isothermal and isobaric condition, where the Latin prefix iso used in these terms translates into equal or similar, i.e. a condition where the fluid pressure and temperature are held constant such that $P = P_0$

and $\gamma = 70$. The mass density of a fluid is dependent on temperature and pressure, both causing volumetric change to a fluid under varying conditions.

The relation between fluid density, temperature and pressure may be formulated through the equation of state that describes the state of a matter under a given set of physical conditions. An example of an equation of state is the ideal gas law

$$PV = nRT$$

Where P is the absolute pressure, V is the gas volume n is the amount Substance (number of moles), R is the universal

Fabrication

Fabrication is the building of metal structures by cutting, bending, drilling, machining, and welding etc. or assembling process. It is a value added process that involves the creation of machines, part, and structure from various raw material.

Cutting:

We used angle grinder for Cutting the raw material with cutting disc of yuri green. We cut the square tubes for frames, breaking system for mounting.



Fig 5.1: Cutting

Drilling:

We also done drilling operation on the wheel for brake mounting and to mount the motor on frame using C clamp, also to angle for mounting

Turning:

To mount/insert the shaft in the place of axle that is preinstalled, we decrease the diameter of shaft at the one end.

Boring:

To mount the chain sprocket on the shaft be enlarges the inner dia of the chain sprocket to 30mm.

Welding:

To make the frame, mount the wheel, install the bearing support we did welding at current of 100 amperes. And to join the brake with frame used stainless steel welding rods.

MODEL CONSTRUCTION AND DESIGN

Engine

An engine or motor is a machine designed to convert one or more forms of energy into mechanical energy. Available energy sources include potential energy (e.g. energy of the Earth's gravitational field as exploited in hydroelectric power generation), heat energy (e.g. geothermal), chemical energy, electric potential and nuclear energy (from nuclear fission or nuclear fusion). Many of these processes generate heat as an intermediate energy form, so heat engines have special importance. Some natural processes, such as atmospheric convection cells convert environmental heat into motion (e.g. in the form of rising air currents). Mechanical energy is of particular importance in transportation, but also plays a role in many industrial processes such as cutting, grinding, crushing, and mixing. Mechanical heat engines convert heat into work via various thermodynamic processes. The internal combustion engine is perhaps the most common example of a chemical heat engine, in which heat from the combustion of a fuel causes rapid pressurisation of the gaseous combustion products in the combustion chamber, causing them to expand and drive a piston, which turns a crankshaft. Unlike internal combustion engines, a reaction engine (such as a jet engine) produces thrust by expelling reaction mass, in accordance with Newton's third law of motion.



Fig 6.1: Engine

• Specifications of the Engine Used

Specification	Honda CBZ
Engine Type	Air cooled, 4 stroke
Number Of Cylinders	1
Valves Per Cylinder	2
Engine Displacement	150 CC
Max Power	14.4 PS @8500 rpm
Max Torque	12.8 Nm @6500 rpm
Bore x Stroke	57.3 x 57.8 mm
Fuel Type	Petrol

Table 6.1: Engine Specification

2) Chassis

Chassis is the vehicle’s main support structure, also known as the ‘Frame.’ It bears all the stresses on the vehicle in both static and dynamic conditions. In a vehicle, it is analogous to the skeleton of a living organism. The origin of the word Chassis lies in the French language. Whether it is a two-wheeler or a car, or a truck, every vehicle has a chassis-frame. However, its form, obviously, varies with the vehicle type. It consists of all the parts which are required to function the automobile.



Fig 6.2: Chassis

3) Steering Mechanisms

Steering is a system of components, linkages, and many other parts that allows a vehicle to follow a desired course. An exception is the case of rail transport, by which rail tracks combined with railroad switches provide the steering function. The primary purpose of the steering system is to allow the driver to guide the vehicle.



Fig 6.3: Turning Mechanisms

4) Battery

An electric battery is a source of electric power consisting of one or more electrochemical cells with external connections for powering electrical devices. When a battery is supplying power, its positive terminal is the cathode and its negative terminal is the anode. In This Project we use battery for the starter switch to start.

• **Specifications of the Battery Used**

Specification	Honda Activa
Size	11.3 x 7 x 8.5 Centimeters
Voltage	12 Volts
Item Weight	1.5 Kilograms

Table 6.2: Specification of battery

5) Wheels:

Tires or Wheels are designed to support the weight of the vehicle, absorb road shocks, transmit traction, torque and braking forces to the road surface and maintain and change the direction of travel. To fulfill these four basic functions tires are made of resilient rubber and filled with compressed air.



Fig 6.4: Wheels

6) Chain

A chain is a series of connected links which are typically made of metal. A chain may consist of two or more links. The main functions of the chain to Transmit power to the engine to the rear wheel.



Fig 6.5: Chain

7) Brake

Brake systems have been widely used in automobiles, motorcycles, rail trains, and aircrafts. In brake systems, friction is both a principal performance factor and a potential cause of undesirable noise and vibration. The structures and principles of the brake systems of different kinds of vehicles are analogous and similar. Friction dynamics has been one of the most challenging problems in the brake.



Fig 6.6: Brake Disc

RESULT

After doing all the activities we make this model of hydraulic braking system.



Fig 7.1: Final result

CONCLUSION

With this project we achieved a safe, durable and viable design for a rotor component in a disc brake system taking in consideration the forces exerted for all the components in the brake system. In our fracture analysis for the static and the dynamic approach we found that our safety factor numbers are elevated. With this we demonstrate that disc brakes do not fracture. That is because the force exerted in the disc is a compressive force. That's why the materials used for the manufacturing of brake disc are brittle.

FUTURE SCOPE

Our future course of action is to assemble a system on vehicle & perform various experimentations by varying different parameters. Those parameters are as follows:

1. Vehicle Speed
2. Obstacle distance
3. Sensor Position
4. Varying deceleration rate

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PERFORMANCE ON SHELL AND TUBE HEATEXCHANGER

Jeel Chauhan¹, Krish Panchal², Parth Mewada³ and Sajid Ahmed⁴^{1,2,3}Student and ⁴Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar**ABSTRACT**

Heat transfer is one of the most important processes inside the industry so increasing heat exchanger efficiency has a great use and major beneficial effect to the heat transfer. The project objective is to design an experimental system of shell and tube heat exchanger. Shell And Tube heat exchanger are widely used in industries due to their versatility. Different types of shell and tube exchangers can be easily configured by changing the shell and tube arrangement. In this project design and fabrication of a simple shell and tube heat exchanger is done. In this project different calculations are done in order to find the optimum heat transfer using limited option of materials. This heat exchanger consists of a MS shell and tubes which pass inside the shell and are supported with the help of baffle plates and there are two inlet and outlet ports for the water to flow inside of shell and tube. In present day shell and tube heat exchanger is the most common type heat exchanger widely used in oil refinery and other large chemical process, because it suits high pressure application.

1. INTRODUCTION

A heat exchanger is a system used to transfer heat between two or more fluids. Heat exchangers are used in both cooling and heating processes. The fluids maybe separated by a solid wall to prevent mixing or they may be in direct contact. The classic example of a heat exchanger is found in an internal combustion engine in which a circulating fluid known as engine coolant flows through radiator coils and air flows past the coils, which cools the coolant and heats the incoming air. Heat exchangers are one of the mostly used equipment in the process industries. Heat exchangers are used to transfer heat between two process streams. One can realize their usage that any process which involve cooling, heating, condensation, boiling or evaporation will require a heat exchanger for these purpose. Process fluids, usually are heated or cooled before the process or undergo a phase change. There are different types of heat exchanger

- Double Tube Heat Exchangers
- Shell and Tube Heat Exchangers
- Tube in Tube Heat Exchangers
- Plate Heat Exchangers
- Finned heat exchanger
- Plate fin heat exchanger
- Compact heat exchanger
- Plate shell heat exchanger

Different heat exchangers are named according to their application. For example, heat exchangers being used to condense are known as condensers, similarly heat exchanger for boiling purposes are called boilers. Performance and efficiency of heat exchangers are measured through the amount of heat transfer using least area of heat transfer and pressure drop. A typical heat exchanger, usually for higher pressure applications up to 552 bars, is the shell and tube heat exchanger. Shell and tube type heat exchanger, indirect [6] contact type heat exchanger. It consists of a series of tubes, through which one of the fluids runs. The shell is the container for the shell fluid. Generally, it is cylindrical in shape with a circular cross section, although shells of different shape are used in specific applications. For this particular study shell is considered, which is generally a one pass shell. A shell is the most commonly used due to its low cost and simplicity, and has the highest log-mean temperature-difference (LMTD) correction factor. Although the tubes may have single or multiple passes, there is one pass on the shell side, while the other fluid flows within the shell over the tubes to be heated or cooled. The tube side and shell side fluids are separated by a tube sheet. Baffles are used to support the tubes for structural rigidity, preventing tube vibration and sagging and to divert the flow across the bundle to obtain a higher heat transfer coefficient.

2. PROBLEM DEFINATION

Shell and tube heat exchanger is the most common type of heat exchanger used in industries. In this project, the design of a shell and tube heat exchanger unit has been carried out. The task at hand was to design and fabricate

a heat exchanger with minimum cost and a good heat transfer rate. The tests for the heat exchanger are done by experimental method. The shell of the heat exchanger is made from Mild Steel material and the pipes used are made of copper

3. LITERATURE REVIEW

[1] **Pranita Bichkar:** - In the paper “Study of shell and tube Heat exchanger with effect of types of baffles” it is shown that how design of baffle plates can affect the thermal efficiency of the heat exchanger. . Increasing the number of baffles beyond certain number gives serious effects on pressure drop. So by changing the types of baffles without hampering the other dimensions suggested that single segmental baffles show the maximum pressure drop while it reduced when helical baffles are used. Single segmental baffles show the formation of dead zones where heat transfer cannot take place effectively. This problem is solved by usage of double segmental baffles. It also reduces the vibrational damage as compared to single segmental baffles.

[2] **Moses Petinrin:** - In the paper “Performance of shell and tube type heat exchanger with varying tube layouts” In this paper it is shown that how different tube layouts affect the pressure drop of fluid flowing through shell. In this study, numerical investigation has been carried out for predicting the performance of shell and tube heat exchangers with three different tube layout patterns. The results showed that much of the heat transfer and pressure drop occur during the crossflow of shell-fluid through the tube bundles. the $STHE_T$ is more desirable follow by the $STHE_C$ as they exhibit higher heat transfer coefficient than the $STHE_RT$ for the same pressure drop in the shell-side. [8] (a) triangular($STHE-T$) (b) rotated triangular($STHE-RT$) (c) combined ($STHE-C$)

[3] **Raj Rajat, Piyush Verma:-** In the paper “Performance Analysis of shell and tube type heat exchanger under the effect of varied operating conditions” In this paper it is shown that how different load conditions and different ambient temperature affect the working of the heat exchanger. a lot of factors affect the performance of the heat exchanger and the effectiveness obtained by the formulas depicts the cumulative effect of all the factors over the performance of the heat exchanger. It may be said that the insulation is a good tool to increase the rate of heat transfer if used properly well below the level of critical thickness. Amongst the used materials the cotton wool and the tape have given the best values of effectiveness. Moreover the effectiveness of the heat exchanger also depends upon the value of turbulence provided. However it is also seen that there does not exist direct relation between the turbulence and effectiveness and effectiveness attains its peak at some intermediate value. The ambient conditions for which the heat exchanger was tested do not show any significant effect over the heat exchanger’s performance.

[4] **Saurabh Sharma:- Ritesh Kumar Dewangan:-** In the paper “Shell and Tube heat exchanger using various angle of baffle” this paper provides a review about major work done on design of Baffle plates and its different orientations to improve overall performance of shell and tube heat exchanger. From CFD simulation results, for fixed tube wall and shell inlet temperatures, shell side heat transfer coefficient, pressure drop and heat transfer rate values are obtained. So, overall we can say that using heat exchanger with 25% baffle cut percentage with 45° inclination angle will give best result compared to all other design models [9] under study. This results in higher heat transfer rate, greater heat transfer coefficient value and lesser pressure drop of that shell side fluid.

[5] **Sandeep. K. Patel:** - In the paper “Shell and Tube design with optimization of mass flow rate and baffle spacing”. This paper shows that how to design with optimization of mass flow rate and spacing of baffle. From literature review it can be concluded that, there is increase in pressure drop with increase in fluid flow rate in shell and tube heat exchanger which increases pumping power. Tube pitch ratio, tube length, tube layout as well as baffle spacing ratio were found to be important design parameters which has a direct effect on pressure drop and causes a conflict between the effectiveness and total cost. It is necessary to evaluate optimal thermal design for shell and tube heat exchanger to run at minimal cost in industries.

[6] **Uday C. Kapale:** - Satish Chand:- In the paper “Modeling for shell-side pressure drop for liquid flow in shell-and-tube heat exchanger”. This paper shows the effect of pressure drop at the shell side of shell and tube heat exchanger. The present model is developed based on estimated actual flow pattern of the liquid in the shell. The model is simple and based on geometrical and operating parameters of the heat exchanger and covers the Reynolds numbers ranging from 103 to 105. The present model results can be used by designers confidently.

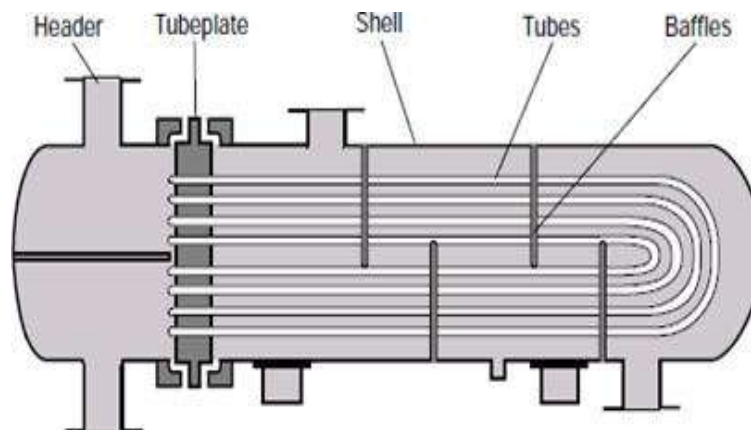
[7] **Majid Amidpour:** - In the paper “Economic optimization of shell and tube heat exchanger based on constructal theory” It is shown that how the total construction cost for the manufacturing can be reduced by using constructal theory. Shell and tube heat exchangers have been optimized using a new useful method called the constructal theory. The results of design using the constructal theory are heat exchangers with in-series

sections which we call constructal shell and tube heat exchangers. In sections of the heat exchanger, optimal values of diameter and length are found by trade-off between operational and capital costs. The series structure of sections of constructal heat exchangers facilitates repairation, maintenance and deposit removal throughout their operation. The case study used in this paper for validation which was taken from one of the renowned reference texts on heat exchanger design represented more than 50% reduction in [10] total cost compared to the usual method of design. Consequently, designing heat exchangers by the use of constructal theory is proposed as a useful method for designers, engineers and researchers.

[8]P.S.Gowthaman, S.Sathish:- In the paper “Analysis of Segmental and Helical Baffle in Shell and tube Heat Exchanger” the analyse of two different baffle in a Shell and Tube Heat Exchanger done by ANSYS FLUENT. Baffle is an shell side Component of shell and tube heat exchanger. The segmental baffle forces the liquid in a Zigzag flow and improving heat transfer and a high pressure drop and increase the fouling resistance and Helical Baffle have a Effective Performance of increasing heat transfer performance. From the Numerical Experimentation Results it is Confirmed that the Performance of a can be improved by Helical Baffles instead of Segmental Baffles. Use of Helical Baffles in Heat Exchanger Reduces Shell side Pressure drop, pumping cost, weight, fouling etc as compare to Segmental Baffle for a new installation. The Pressure Drop in Helical Baffle is Appreciably lesser as Compared to Segmental Baffle heatexchanger

4. DESIGN METHODOLOGY

Several designs constrain have been implicated in the project they are as follows.



This study is an attempt to address the performance and efficiency of shell and tube heat exchanger using the fluids i.e (hot water and cold water).

- Design of an experiment setup to perform study.
- Perform the experiment to investigate the heat transfer between the two fluids.
- Optimise the results by comparing the experimental outcome with the theoretical result.
- Provide recommendation to enhance the performance of shell and tube heat exchanger.

Shell and Tube Heat Exchanger

The shell and tube heat exchanger consists of two cycles which are cold water and hot water. The exchanger has two inlets and two outlets for the hot and cold flow. There are two ways to do the experiment in the heat exchanger, which are the parallel and the counter flow. However using the counter flow will give a better efficiency than the parallel one.

Safety

Safety is an important factor to be considered during work and experiment implementation.

Hot Water Tank and Cold Water Tank

The water temperature for the hot tank reaches around 50⁰ C so, to avoid touching the hot tank we put a stamp mark on the hot surface of the hot water tank. The cold water is kept in a separate tank at low temperature as it has to exchange the heat with the hot fluid through the partition of tube walls.

Thermometer

As we all know that a thermometer is used for the measuring of temperatures. We are going to measure the temperatures of both the fluids that is temperature of inlet and outlet of both hot and cold fluid.

Baffle Plates

Baffle plates are nothing but a thin steel plate with number of holes which is equal to the number of tubes. It is mainly used to create the turbulence flow into the shell, as the turbulence flow helps in very high heat transfer rate. They are also used to support the tubes and to hold them in position until they are dismantled.

Pumps

A pump is a device that moves the fluid by mechanical action, typically converted from electrical energy into hydraulic energy. Pumps are operated by the mechanism that is reciprocating or rotary and consumes energy to perform mechanical work of moving the fluid.

Measuring Beaker

Beaker is generally a cylindrical container with a flat bottom and has a reading in vertical direction. It is mostly used to hold the liquids.

Tubes

Tube is a long, hollow and cylindrical object used for the passage of fluids or as a container made up of several materials like metal, glass and plastic. In this project we are going to use both types of tubes that is metal as well as plastic.

Types of Shell and Tube Heat Exchanger According to flow Arrangement:

Parallel Flow: In this type the inlets for the hot fluid and cooler fluid are kept at the same end of the heat exchanger and the working medium are allowed to move in the same direction towards the outlet.

Counter Flow: On the same end of the heat exchanger inlet of one pipe and outlet of another pipe is made. Hence by this configuration fluids will be travelling in vice versa direction to each other.

Cross Flow: If fluids are made to move perpendicular to each other this is called cross flow.

Material Selection for Tube: Among the two fluids one is made to pass through the tubes so it becomes necessary to choose a tube which is capable of facing every possible condition. For this the tubes must be having a good thermal conductivity. As the temperature along width of the tube varies thermal stresses are observed by the tubes. So the tubes must be designed in such a way that it can hold the thermal stresses. And the tube material must be compatible with the pH of the fluid. In addition to all this tube must be corrosion resistant. Commonly used tube materials are, aluminum, copper alloy, stainless steel, Carbon steel and titanium. Fluoropolymers are also used viz, Perfluoroalkoxy alkane (PFA) and Fluorinated ethylene propylene (FEP).

Applications of Shell and Tube Heat Exchanger

These are highly used to make heat transfer possible between two fluids or mediums. These are used in industrial sectors for heating or cooling purpose. The main applications are:

- Space heating
- Refrigeration
- Air conditioning
- Power plants
- Chemical plants
- HVAC
- Air processing

ADVANTAGES

1. They can be designed and manufactured to bear very high pressures.
2. They have extremely flexible and steady design.
3. They have no dimension limit.
4. Pressure loss is at a minimum and can be maintained at a minimum in line with the process purpose.
5. They can easily be disassembled and assembled back for maintenance, repair and cleaning.
6. Easy maintenance and repair.

LIMITATIONS

1. Heat exchange effectiveness is less

2. Requires more space
3. Capacity of tube cooler can't be expanded.

5. RESULT

1. Inlet of hot water (t₁)= 50⁰C (323K)
2. outlet of hot water (t₂)= 33⁰C (306K)
3. Inlet of hot water (t₃)= 30⁰C (303K)
4. outlet of hot water (t₄)= 34⁰C (307K)
5. Mass flow rate of hot water (m_h) = 2.6l/min (43.3kg/sec), Mass flow rate of hot water (m_h) = 5/min (kg/sec)

6. CALCULATIONS

1. Length of copper pipe = 762mm
2. Cp of water = 4.182 KJ/KgK 3. (T_h) = t₁ – t₂ = 323 – 306 = 17k4. (T_c) = t₄ – t₃ = 323 – 306 = 3k
5. LMTD = T_h-T_c / ln (T_h/T_c)= 8.07K6. Q= mcp (t₁ – t₂) = 3.078W
7. A= 3.14.r²h = 1.11m²
8. Q = U.A.LMTD
- 3.078 = U. 1.11. 283.45U=9.78*10⁻³ W/M²K
9. Efficiency = Q/ QMAX = mhcp(t₁ – t₂)/ Cmin(t₁ – t₃) = 85%

7. CONCLUSION

After finding wide applications in industrial sector shell and tube heat exchangers were taken as key topic by many researchers to work on. In order to increase performance of these heat exchangers the numerical and experimental simulations were carried out by changing different parameters. As according to its use there is still some work needed to make shell and tube heat exchangers less economic and more efficient. Shell and tube heat exchangers do have many parameters on which some more work can be done. Compact heat exchangers are available in a wide variety of configuration to suit most processes heat transfer requirements. Shell and tube heat exchanger are preferred as they have no dimension limit. They are used for variety of applications.

8. FUTURE SCOPE

- STHXs are widely used and if designed properly with better efficiencies it can give a promising feedback.
- STHXs are used for many works i.e. they are multi-purpose and will definitely give a vast field to research on.
- STHXs have various parameters which can be configured in different ways and better experimental results could be found out. These results could prove fruitful to many industries.

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LITERATURE REVIEW ON: DEVELOPMENT OF FLOATER MATERIAL

¹Parth Panchal, ²Punit Mewada, ³Kunjil Patel, ⁴Mihir Waghela and ⁵Mohammed Wasim Khan
^{1,2,3,4} B.E Students and ⁵Assistant Professor & H.O.D, Theem College of Engineering

ABSTRACT

Solar Energy is one of the most abundant renewable sources of energy and free on planet earth. For water mounted solar photovoltaic systems, HDPE material is found to be best suited for the manufacturing of floating bed structure. The major limitation in this regard is the effect of UV radiations present in the natural environment that leads to the degradation of plastic materials. In the present study, the Carbon nanotube is used as a additive which is mixed with the base HDPE material under different concentration. The behavior of the HDPE/ Carbon nanotube composite floats so formed is observed before and after U.V exposure. The change in properties of material will be observed from several test that is Tensile, Impact, Flexural and Hardness Test.

INTRODUCTION

Floatovoltaics is a solar power structure that floats on a body of water it may be artificial basin or a lake. This technology has had a rapid growth on the renewable energy market since 2016. The first 20 plants, of a few dozen of kWp have been built between 2008 and 2014 as reported in the MIRARCO paper that analyzed the birth of this technology.[1] The installed power reached 1.1 GW in 2018. The costs for a floating system are 20-25% higher than for ground-mounted systems.[2] Solar energy appears to be heading toward a global growth spurt, due to a combination of new technology and expanding reach to consumers as it becomes more competitive with the cost of traditional energy sources.[3] "Floating solar allows for power generation to be sited much closer to areas where demand for electricity is high," the World Bank report, published in October 2018, predicted. "This makes the technology an attractive option for countries with high population density and competing uses for available land." [3] While solar floaters are slightly more expensive than arrays built on land, they are more efficient producers of electricity because their nearness to the water allows their solar panels to run cooler.[4] Floaters are generally made up of HDPE material used in current market and from blow moulding process. This is the most crucial component of FSPV; it supports all necessary components like solar PV during the project time. Hence selection of appropriate materials for the floating platform becomes imperative. HDPE is the most popular material being used in a majority of the FSPV power plants across the globe. Other materials like FRP, medium density polyethylene (MDPE), and Ferro-cement are also been utilized as materials for the floating platform. Various designs of a floating platform are described below.[5] HDPE is preferred by the pyrotechnics trade for mortars over steel or PVC tubes, being more durable and safer: HDPE tends to rip or tear in a malfunction instead of shattering and becoming shrapnel like the other materials. Milk bottles, jugs, and other hollow goods manufactured through blow molding are the most important application area for HDPE, accounting for one-third of worldwide production, or more than 8 million tones. [38] A carbon nanotube (CNT) is a tube made of carbon with diameters typically measured in nanometres. Single-wall carbon nanotubes (SWCNTs) Single-wall carbon nanotubes are one of the allotropes of carbon, intermediate between fullerene cages and flat graphene, with diameters in the range of a nanometre. Although not made this way, single-wall carbon nanotubes can be idealized as cutouts from a two-dimensional hexagonal lattice of carbon atoms rolled up along one of the Bravais lattice vectors of the hexagonal lattice to form a hollow cylinder. In this construction, periodic boundary conditions are imposed over the length of this roll-up vector to yield a helical lattice of seamlessly bonded carbon atoms on the cylinder surface. Multi-wall carbon nanotubes (MWCNTs) consisting of nested single-wall carbon nanotubes weakly bound together by van der Waals interactions in a tree ring-like structure. If not identical, these tubes are very similar to Oberlin, Endo, and Koyama's long straight and parallel carbon layers cylindrically arranged around a hollow tube. Multi-wall carbon nanotubes are also sometimes used to refer to double- and triple-wall carbon nanotubes. Carbon nanotubes can also refer to tubes with an undetermined carbon-wall structure and diameters less than 100 nanometres. Such tubes were discovered in 1952 by Radushkevich and Lukyanovich. The length of a carbon nanotube produced by common production methods is often not reported, but is typically much larger than its diameter. Thus, for many purposes, end effects are neglected and the length of carbon nanotubes is assumed infinite. Carbon nanotubes can exhibit remarkable electrical conductivity, while others are semiconductors. They also have exceptional tensile strength and thermal conductivity because of their nanostructure and strength of the bonds between carbon atoms. In addition, they can be chemically modified. These properties are expected to be valuable in many areas of technology, such as electronics, optics, composite materials (replacing or complementing carbon fibers), nanotechnology, and other applications of materials science. Rolling up a hexagonal lattice along different directions to form

different infinitely long single-wall carbon nanotubes shows that all of these tubes not only have helical but also translational symmetry along the tube axis and many also have nontrivial rotational symmetry about this axis. In addition, most are chiral, meaning the tube and its mirror image cannot be superimposed. This construction also allows single-wall carbon nanotubes to be labeled by a pair of integers.[38]

LITERATURE REVIEW

Raneiro Cazzaniga: From beginning there were three distant options. Class 1: Hdpe pipes + steel or aluminum components for building rafts of large dimensions. Class 2: Full hdpe rafts of small dimension typically mono modules connected together by suitable hooks. Class 3: Floating pontoon structures connected together and able to support photovoltaic modules. Class 1: is robust system. Its assembly and launching is simple. The system is walkable and has large buoyancy and last but not the least the contact surfaces between plastic pipes and water is roughly only 20% of the plant surface Class 2: solution was proposed by Ceil El Terre. The floaters in class 2 very thin and water plastic contact is very large at least 50% with possible problems in terms of long term plastic defoliation.[7]

Sade K. Cromratie Clemons et al: They are made mostly from silicon, a non-toxic material. They are covered with glass and plastic and the framework is usually made from aluminum. The panels are held in place by mounting structures and create the angle at which the panels will absorb energy. The mounting members are generally made from galvanized steel or aluminum. The structures are fixed to pontoons made of high-density polyethylene (HDPE) to provide buoyancy. The material's lightweight and durable properties make it suitable for pontoon creation. The floats are made with either rotational or blow molding. HDPE has a lifetime of about 50 years. The pontoons support the modules and the cables, and additional floats are used to support the inverters.[8]

Carlos Ferrer-Gisbert et al: The pontoon is the key element of the system. It has to ensure the stability and buoyancy of the system and it is the basis of the photovoltaic plant. The platform must resist several design loads, such as dead and live loads and wind uplift and drifting, so that it must be stiffer. The top side of the module consists of several rectangular gutters. These elements divide the platform into smaller units that improve the stiffness and the load bearing capacity of the system. The floating module's geometry should be designed taking into account two main issues. First, the dimensions of the module must be adapted to commercial photovoltaic panels. Second, the modules must cover the maximum possible water surface to prevent water evaporation. The solar issues under analysis were: photovoltaic panel dimensions and tilt angle, number of units to be installed, distance between panel rows to prevent shade effects and access ways to ease operational maintenance.[6]

Giles Exley et al: To resolve the effects of FPV on lake physical properties, we simulated lake variables by adapting an existing MATLAB model. Increases in surface water temperatures occurred only in scenarios when wind speed was reduced considerably more than solar radiation. Cooler water temperatures and greatly reduced wind speeds permitted the formation of ice. In water bodies where FPV deployment could induce ice-cover, consideration would need to be given to the FPV design in order to mitigate the possibilities of compression forces and the restriction of array movement due to ice cover. FPV deployments may have impacts that are as, or more, influential than catastrophic climate change, therefore providing an opportunity to manage the effects of climate change on lake systems actively[16]

C.J. Ho et al: Since the efficiency of PV module decreases as the solar cell temperature increases. Therefore, it is necessary to enhance the heat dissipation of the PV module. The panel was placed on the lake surface and a pump was used to draw water on the PV surface because of this the PV system was 20 0C lower as compared to ground. So on lake the power output was 61.4 KW h and on ground based system was 54.6 KW h. Because of this the efficiency of panel was increased by 38%, water flow rate was 92 mL/min and air flow rate was 2.69 m/s. After that PCM (phase change material) was used. This material can release or stores large amount of heat so it is a very promising material for controlling the thermal environment. The MPCM (microencapsulated phase change material) are attached to the back of PV panel to form MPCM-PV module which floats on the water surface.[17]

Maria Ikhennicheu et al: The revolution in green energy is growing faster in recent trends around the whole world, the solar panels are in great demand, we can shift from land space to water reservoir, as water will give cooling as well it will not occupy much space on land, it also increases efficiency of solar floater if we fix in reservoirs, lakes or water basins. Aspects need to improved in Solar industry design cases dedicated to floating solar environments: a typical small lake, a typical large lake, and an offshore site, present a generic, analytical and industry-used method to determine the loads due to waves, current and wind on the floating island, discuss the main design challenge for each cases.[18]

Giles Exley et al: Increased energy demand and urgently need to be decarbonizes. One such technology , solar photovoltaic (PV) has experienced exponentially growth over the past 25 years. Conservative estimation of suggest that FPV has global potential of 400 GW peak. , demonstrating the likely widespread uptake of this renewable energy technology.FPV will both reduce the amount of solar radiation reaching the Water and shelter the water from the effects of wind mixing modifying water body temperature and stratification. When reductions to the forcing variables were 1:1 and did not exceed 45%, stratification duration was similar (\pm three days) to that of Wind-Ermere without FPV. Water temperature changes were minor for small coverage's of FPV, while more extensive FPV coverage's drove major decreases.FPV deployments may have impacts that are as, or more, influential than catastrophic climate change, therefore providing an opportunity to manage the effects of climate change on lake systems actively.[19]

Tara Hooper et al: Offshore energy infrastructure provides new substrate for species to settle on, and so functions as an artificial reef (Kogan et al., 2006; Sherwood et al., 2016). These small organisms that attach to structures form the base of food webs, which, together with the shelter offered by energy infrastructure, create environments attractive to larger and more mobile species such as crab, lobster and fish (Hooper et al., 2018). Species use the offshore structures as stepping stones to colonize larger areas or as nursery grounds, which create spill-over effects to the surrounding areas. Most studies to date have focussed on artificial reefs created by the foundations and scour protection around offshore wind farms and oil and gas platforms (and hence on species that live close to the seabed).[29]

Ayat Bozeyya et al (2021): In this paper author has worked on thermal and structural properties of HDPE & CNT nanocomposite. The author have used a material in this study is HDPE & CNT. The CNTs type used are P-SWCNT, O-SWCNT, A-SWCNT, P-MWCNT, O-MWCNT, A-MWCNT. Addition of 1%pristine increases the crystallinity of polymer from 53.6% to 56.6%. Addition of 5% functionalized MWCNT with steric acid to HDPE increases crystallization temperature and crystallinity by 28.9deg & 1.8%. Addition of 1% MWCNT to HDPE increased the temperature by 2% O-MWCNT shows the best enhancement of thermal properties without affecting the crystallinity.[32]

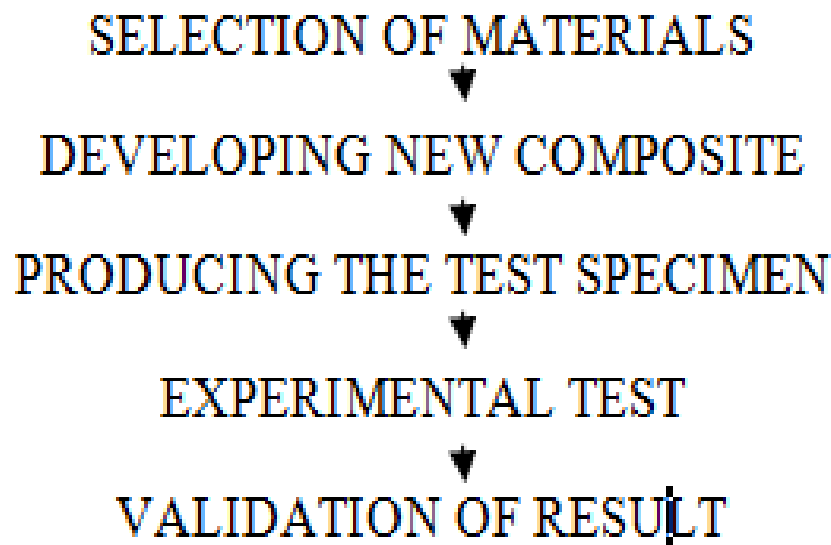
Junjin Che et al (April 2017) :The author in this paper has researched about the Improved thermal conductivity of HDPE/Expanded Graphite/Carbon Nanotubes ternary composites via filler network network Synergy. The material used in this research was HDPE/Expanded Graphite and Carbon Nanotubes in different propotion in different crieteria. This research has concluded that the mechanism increases the thermal conductivity and also optimizes the mechanical properties.[33]

Wenzhong Tang et al (2003): The authors have worked on melt processing & mechanical property characterization of MWCNT & HDPE composite films in this paper. HDPE was used as the matrix material for carbon nanotube (CNT) polymer composites. MWCNT & HDPE composite films were fabricated using the melt processing method. The nanotube in this was used in 0, 1, 3, & 5%of weight proportion. The mechanical properties of the films were measured by small punch test. The small punch test results show that the stiffness, the yield strength and the fracture toughness of MWCNT/HDPE composite films all increase with increasing percentage of MWCNTs.[34]

Filipe V. Ferreira et al (July 2016): The authors have worked on the effect that take place on the mechanical properties of (HDPE/CNT) in this paper. CNTs were treated with HCL & then with H₂SO₄ / HNO₃. CNTs are used in proportion of (0.2) % wt. the research has concluded that the mechanical properties are improved and the surface treatment of CNT with acid did not decrease the mechanical properties of composites.[35]

Brian B. Johnson et al (April 2009): Wear behavior of carbon nanotubes & HDPE composites were tested by author in this paper. The HDPE material is used with CNT to make composite by author. The material was made in varying weight % e.i (1%, 3% & 5%) through mixing & extruding. The material was test by small punch test to measure the mechanical properties. The mechanical properties and wear resistance of the composite materials increased with increasing nanotube content in the range studied.[36]

Alen Oseli et al (May 2020) : The authors in this paper have used the material named HDPE mixed with SWCNT. In first step 6g of HDPE to 1 of wt% was mixed at 220 deg cel for 10 min in the twin screw extruder same processed was performed with 0.5 of wt% at same temp. The addition of SWCNTs increased the viscosity of nanocomposite profoundly. The mechanical properties profoundly improved.[41]

METHODOLOGY

As per the proposed methodology the first step is selection of material where after reading and taking help of many research papers we got to know that as per the properties required HDPE is suitable material. So selecting it as a base material & Carbon Nanotube can be used with HDPE to enhance the properties of HDPE. Using these two material new composite will be developed by using twin screw extruder machine in form of small pellets and composite will be made in certain batches according to different weight proportions of CNT & HDPE. Using this composite, will we make specimens for different test that is Tensile, Impact, Flexural test. This several test are going to be done but before that this sample for going to be kept in wet and dry conditions under sunlight for required hours. After this process in once done the test will be performed and validate the result.

CONCLUSION

With the help of this research paper we got to learn about floaters used in floating solar system. What should be their properties and physical properties should carry. The kind of extreme high and low condition they go through for that what thermal properties a material should and many more thing about it. We learnt about the material like HDPE and many different processes and different test that are performed. We concluded that HDPE withstand in every conditions like in water, in extreme conditions, it has good tensile strength and many more characteristics. With this does not degrade in water and has flexibility. Till date in current market only pure HDPE is used for making floaters and learnt about carbon nanotubes and what the properties and purpose of using it and in what proportion it should be used.

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LITERATURE REVIEW ON: DEVELOPMENT OF COMPOSITE MATERIAL

¹Nagori Usama, ²Rajpurohit Vikas, ³Kunjal Patel, ⁴Basavaraju Mohil and ⁵Mohammed Wasim Khan
^{1,2,3,4}Students of Automobile and ⁵Assistant Professor & HOD, Theem College of Engineering, Mumbai, India

ABSTRACT

Floating solar power plant is an innovative approach of using photovoltaic modules on water infrastructures to conserve the land along with increase in efficiency of the module. Additionally, the water is also conserved due to reduction in evaporation of water from the water body. The plant can be installed on a pond, lake, reservoir, or on any other water body. This paper focuses on the floating PV technology, describing the types of floating PV plant along with studies carried out on some floating solar plants. India, In this project we are about to study, The material used in floater is mainly HDPE (high-density polyethylene). We are also going to study about different types of material used in floater and its properties. There are also different types of test in floaters and different type of designs in floater. The report also covers the best practice guidelines for installing FSPV projects.

Keywords: HDPE, floater, graphene

INTRODUCTION

FSPV also known as floatovoltaics is a solar PV application in which PV panels are designed and installed to float on waterbodies such as reservoirs, hydroelectric dams, industrial ponds, water treatment ponds, mining ponds, lakes, and lagoons. In this, solar panels are usually mounted upon a pontoon- based floating structure and to keep its location fixed, floating structure is anchored and moored. Recently there has been an interest in FSPV globally as well as in India. Further, it is also seen that if the capacity of FSPV deployment is scaled up, the tariff may also come down closer to the tariff discovered for ground-mounted solar PV. Recently, environmental problems associated with the excessive use of fossil fuel have become social issues. As an alternative energy resource, the importance of renewable energy is continuously rising. Moreover, the demands for facilities to generate renewable energy are also ever increasing. In Japan, after the Fukushima Daiichi nuclear power plant disaster, a law was enacted for the development of the solar industry, wind power industry, etc. In Korea, the renewable portfolio standard (RPS), which requires electricity providers to gradually increase the amount of renewable energy sources such as wind, solar, bioenergy, and geothermal, was enacted to ensure the growth of the renewable energy market. floating photovoltaic (FPV*) installations are forecast to increase 143% from 2019 to reach over 900 MW in 2020 according to IHS Markit's 'Floating PV Report - 2020'. The total installed capacity at the end of 2019 was estimated to have reached 1.5 GW. When combined with other demonstrated benefits—such as higher energy yield, reduced evaporation, and in certain cases improved water quality—FPV is likely to be an attractive option for many countries. Several countries with high population density are looking at large-scale floating solar deployment in order to avoid using their scarce land resources for solar power generation. It is estimated that the annual capacity addition may rise from the current installed of 1.314 GWp in 2018 to 4.6 GWp by 2022. Presently, China is the leading international market followed by Japan and South Korea. India also has very bright prospects to develop FSPV projects due to availability of large water bodies. FSPV market appears to inch forward to make its presence felt in India and the tariffs discovered through bids have already shown rapid reductions. So far large-to-medium size man-made inland waterbodies seems to have attracted initial interest to install FSPV based power plants, but all these 4waterbodies were created to serve various purposes like irrigation, water supply, fishing, hydroelectric, navigation etc., and this warrants great deal of diligence to balance out various usages of these waterbodies on the basis of accurate information. The Energy and Resources Institute (TERI), New Delhi, India with support from the Energy Transitions Commission (ETC), India, has undertaken a study to analyses data on country's medium and large reservoirs to estimate the potential of FSPV in the country. It is observed that about 18,000 km² water surface area spreading across various states and UTs is suitable for the installation of FSPV plants. The overall potential is a strong indication of the extent of the surface area than can be made available for setting up these projects, and even a capacity of about 280 GW is possible. The various factors determining the overall potential include percentage of water surface area coverage, water level variations, the purpose of the water body, and proposed plant location. A majority of the installations utilized a floating pontoon constructed either from fiber-reinforced plastic (FRP), Medium Density Polyethylene (MDPE) or Forcemat, High-Density Polyethylene (HDPE). The solar PV modules were supported on these pontoons through the use of metal structures and were inclined in a majority of cases to maximize the solar incidence.

LITERATURE REVIEW

Xian Jiang (2011) In this paper High Density Polyethylene (HDPE) based nanocomposites are reinforced by exfoliated graphene nanoplatelets, GNP, and multi-wall carbon nanotubes, MWCNT, through melt extrusion and injection molding. They are coating the low molecular weight paraffin waq on the surface of GNP and MWCNT to improve their dispersion in HDPE. After coating they fabricated by mixing wax with GNP and MWCNT in hot xylene and followed with solvent evaporation and vacuum drying. they found that wax coated GNP and MWCNT are much more efficient than the uncoated. Because coated GNP and MWCNT improving the electrical conductivity and the flexural properties of HDPE nanocomposites[4]

Zhengping Fang (2013) Graphene nanoplatelets (GNPs) are the stacks of multi-layered graphene sheets which can be incorporated with different polymers in order to gain outstanding performance in mechanical, thermal, electrical, optical and barrier properties. However, the strong van der Waals interactions between graphene sheets make GNPs tend to agglomerate in polymer matrix, resulting in the concentration of stresses. In this paper, GNPs were compounded with high density polyethylene (HDPE) and chlorinated polyethylene(CPE) in the presence of a Lewis acid catalyst (AlCl₃). The macrocarbocations in polymer chains, initiated by Friedel–Crafts reaction, formed strong interaction with delocalized conjugated p electrons of graphene sheets, which benefited to unfolding the aggregations of GNPs and improving its dispersion in the composites.[6]

Wei-Len Chou et al. (2014) Solar Cell temperature is associated with the generation efficiency of the solar irradiation energy that is converted to electricity. The efficiencies is photovoltaic (PV) module decrease as the solar cell temperature increase. It is necessary to enhance the heat dissipation of the PV module. This paper is mainly focused on solar cell efficiencies in photovoltaic module.[1]

Nader Javani et al. (2018) Floating solar (FPV) is not used to produces electricity at night time or cloudy seasons. At the day time the extra energy which is produced is used to produce hydrogen through an electrolyzer and the hydrogen is Stord in hydrogen tank. At the night time or cloudy season the stored hydrogen is used by fuel cell to generate required electricity. The study of electricity generation at night time or cloudy season by hydrogen fuel cells is done.[11]

Zhengping Fang (2016) In this paper, Fullerene (C₆₀) decorated graphene oxide (GO),and they denoted as GO-d-C₆₀, they are synthesized through a threestep chemical process, including acylating chlorination of GO, amino-functionalization of GO and additional reaction of fullerene molecules with amino groups, with the purpose of promoting the dispersion of GO in high density polyethylene (HDPE) and further improving thermal stability and flame retardancy of HDPE/ GO composite. Infrared spectroscopy (IR), transmission electron micrographs (TEM) and X-ray photoelectron spectroscopy (XPS) proved that about 2.3 wt.% of C₆₀ molecules, with the size of about 40 e70 nm, were bonded onto the surface of GO and mainly located on the edge of GO sheets. The chemical decoration made GO-d-C₆₀ to give better dispersion in HDPE than GO, favoring the formation of compact and integrated char barriers when heated or ignited. Consequently, it is improved the thermal stability and flame retardancy of HDPE more effectively than pristine GO, due to the assembly of the barrier effect of GO and the radical-trapping effect of fullerene.[30]

Tuba Evgin (2020) High-density polyethylene (HDPE)-based nanocomposites incorporating three different types of graphene nanoplatelets (GnPs)were fabricated to investigate the size effects of GnPs in terms of both lateral size and thickness. And they found the inclusion of GnPs enhance the thermal, electrical, and mechanical properties of HDPE-based nanocomposites regardless of GnP size. and the most significant enhancement of the thermal and electrical conductivities and the lowest electrical percolation threshold were achieved with GnPs of a larger lateral size. There results show that the lateral size of GnPs was a more regulating factor for the above-mentioned nanocomposite properties compared to their thickness. For a given lateral size, thinner GnPs showed significantly higher electrical conductivity and a lower percolation threshold than thicker ones. On the other hand, in terms of thermal conductivity, they aobserved remarkable amount of enhancement only above a certain filler concentration. They found the size of the GnPs had no considerable effect on the melting and crystallization properties of the HDPE/GnP nanocomposites.[20]

Guiyin Fang (2016) In this paper, formable phase change materials (FSPCMs) consisting of palmitic acid (PA) and high-density polyethylene (HDPE) were modified with graphene nanoplatelets (GNPs). The thermal properties and shape stability of composites vary with their different mixing ratios. According to the results of Fourier Transform Infrared Spectroscopy (FTIR) and X-ray diffractometer (XRD), the composites have advantages such as chemical structure and crystalline phase stability. The differential scanning calorimeter (DSC) shows that the FSPCM has a constant melting point of about 62°C and a high latent heat of at least 155.8 J/g. Using scanning electron microscopy (SEM), the layered structure and uniform dispersion of PAs were

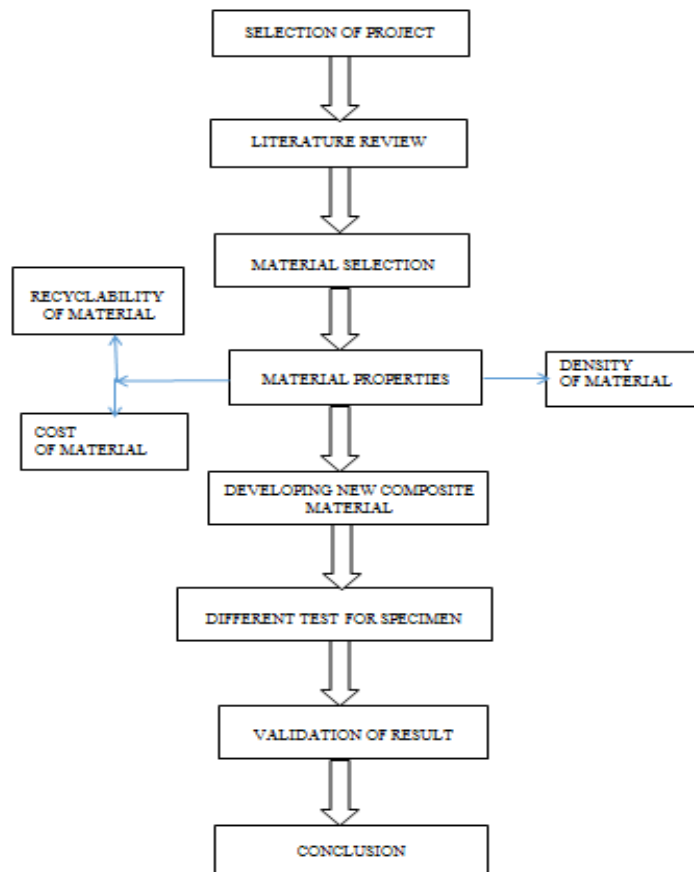
observed in the modified FSPCM. Thermal gravimetric analyzer (TGA) and cycle test results show that the modified FSPCM has good thermal reliability and the leakage of PA is greatly reduced with the help of PNB. Thermal conductivity The quality of the FSPCM was measured with a thermal conductivity meter and it increased to 0.8219 W (m K), which is close to 2.5 times higher than pure FSPCM, when the mass percent of GNP is 4%. The revised FSPCM is expected to have potential applications in solar energy and building heating systems. [21]

K. Honaker (2016) Graphene nanoplatelets (GnP) of different sizes were investigated for their ability to modify high density polyethylene (HDPE) for potential fuel system applications, focusing on compounding via melt mixing in a twin-screw extruder. Mechanical properties, crystallinity of the polymer, and permeation to oxygen and fuel were assessed as a function of GnP concentration. The surface of GnP acted as a nucleation site for the generation of HDPE crystallites, increasing the crystallinity. The flexural properties were improved, clearly influenced by platelet size and quality of dispersion. A sharp, 46% decrease of the impact resistance was observed, even at low GnP concentration (0.2 wt.%). With a 15 wt.% GnP-M-15 (platelets with a 15 μm diameter), a 73% reduction in oxygen permeation was observed and a 74% reduction in fuel vapor transmission. This correlation was similar throughout the GnP concentration range. The smaller diameter platelets had a lesser effect on the properties.[25]

Miguel Redón-Santafé et al. (2013) The system consists of polyethylene floating modules which, with the use of tension producing elements and elastic fasteners, are able to adapt to varying reservoir water levels. A full-scale plant located near Alicante (Spain) was built in an agriculture reservoir to study the behavior of the system. The top of the reservoir has a surface area of 4700 m² but only 7% of such area has been covered with the fixed solar system. The system also minimizes evaporation losses from water reservoirs. The primary purpose of the PFCS is to improve water and power efficiency of agricultural irrigation reservoirs as illustrated in. The water surface is covered with a number of floating modules which are joined together by means of pins. The floating module's geometry was designed taking into account two main issues.

- 1} The dimensions of the module must be adapted to commercial photovoltaic panels.
- 2} The modules must cover the maximum possible water surface to prevent water evaporation.[12]

METHODOLOGY



As per proposed methodology first we find some research paper and reading than we got to know that the properties we required for material that is High Density Polythelene (HDPE). So we selected HDPE as a base material and graphene can be used to enhance the properties of HDPE. After these material we develop a new composite material by using twin screw extruder machine in the form of small granules. After this we made batches of composite material with different weight.

Using this composite material we produce the specimens through vertical injection moulding machine. After producing our specimen we keep them for wet and dry condition under the sunlight for required hours. Than we applied a different test and the test are Tensile test, Flexural test, Impact test. After this all process will be done we get result of composite material validation.

CONCLUSION

The preparation of multifunctional nanocomposites by combination of HDPE and graphene has been described. The adequate combination of both components produces nanocomposites with better thermal and mechanical properties incorporating gas barrier and electrical conductivity. The importance of an appropriate selection of the type of filler and the mixing method for the preparation of HDPE/graphene nanocomposites has been highlighted. Consistent results demonstrate a clear influence of both parameters on the final properties of the nanocomposites. While thermal and mechanical properties are slightly affected, gas barrier and electrical conductivity are strongly dependent on the type of filler as well as on the mixing approach. While melt-compounding produces better membranes for gas barrier due to some orientation along the extrusion direction, this is disadvantageous for electrical conductivity at the graphene contents tested. Furthermore, the mechanical and barrier properties of the materials prepared here make them good candidates for food packaging, although in this particular case, issues related to reduced transparency must be addressed.

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3. Xian Jiang, Lawrence T. Drzal Michigan State University, Department of Chemical Engineering and Materials Science, East Lansing, MI 48824, USA
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8. Water Resource & Hydropower, Sichuan University, Chengdu 610065, China b School of Mechanical
9. Shanghai Jiaotong University, Shanghai 200240, China c Key Laboratory of Thermo-Fluid Science and Engineering of Ministry of Education, School of Energy and Power Engineering, Xi'an Jiaotong University, Shaanxi 710049, China.
10. Mert Temiz* , Nader Javani Faculty of Mechanical Engineering, Yildiz Technical University, Besiktas
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TWO WHEELER AIR BAG SYSTEM

¹Rehan Shaikh, ²Saquist Shaikh, ³Devashish Mishra, ⁴Siraj Ahmed and ⁵Uday Prajapati^{1, 2, 3, 4}Student and ⁵Assistant Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar**ABSTRACT**

The Airbag system is first introduced in 4-wheeler vehicles, this paper gives an information about the introduction of the airbag system can be used in the two wheelers(bikes) this paper shows the working, construction, installation and what will be problems can occurs are discussed. The concept of this airbag system is "To reduce the injuries to a rider when impacting with an opposing vehicle and/or opposing object in frontal collisions by absorbing rider kinetic energy and by reducing rider separation velocity from motorcycle in the forward direction." With the help of the ANGLE sensor with an angle indicator and sense of the collision and the large frequency vibration for to open the air bag.

Keywords: Typical VRF System, castor wheel, Lathe, Relay circuit, Angle sensor, Airbag.

I. INTRODUCTION

Nowadays the increment in the death rate of India is 20% because of the accidents on the highways hence this invention can help us to reduce the death rate by 7% to 10% since this can be used in the pedestrian and safety department. In 4 wheeler vehicle the operation is based on the collision of two vehicles or collision with any object. This system is installed in dashboard and the battery power is consumed for working of this system.

In the 2-wheeler system there is installation of the airbag system in between and at both sides of the bike. There is usage of the battery of bike for working of system. There are two cases when system runs by both the angle difference calculation and collision of the 2 bikes or by the any accident of bike with any object. The concept of this airbag system is "To reduce the injuries to a rider while affecting with an opposing vehicle as well as restricting object in frontal crashes by absorbing rider kinetic energy and by decreasing rider detachment speed from motorcycle the forward way." With the help of the ANGLE sensor with an angle indicator and feeling of the impact and the vast large vibration for to open the air bag. The Airbag system was first introduced in 4-wheelers. This paper gives information about the introduction of the airbag system can be used in the two wheelers(bikes). This paper shows the working, construction, installation of this system and problems that can occur in this system. Accident involving two wheeler are assuming a significant social cost and there dynamics is really more complex and diversified than accident involving only bike and there occupant .since the kinematics of biker body can influenced by a wide range of variable ,so motorcycle air bag must be compliant with far more specification than an automotive one and need a more bikeeful and accurate design often also totally different design approach is required there are two different kind of air bag for motorcyclist mounted on vehicle or fitted in bikers garment. The inflation of the device mounted on the motorbike is activated by one or more accelerometer put on the vehicle or even the wheel mount, to get earlier information when a frontal impact occurs. the bag itself is generally quite big (150liter) and to obtain acceptable inflation time a pyrotechnic inflator is used.

II. DESIGN WITH REQUIRED INSTRUMENTS

The following instruments are utilized for the 2 wheeler Airbag system –

1. Air bag (leather material with grasp innovation)
2. Chemical chambers for discharging the air or gas
3. Sensors (angle sensor)
4. Inflator

Air Bag (Leather Material with Grip Technology)

Airbags are stretchable fabrics or other materials that are tightly packed in various locations throughout your vehicle. These bags are compressed and kept in a small area. When there is an accident, the airbags fill up with air very quickly to provide a cushioning system for the people on the motorcycle so that they are not thrown around in the event of a crash. While this does not necessarily prevent total injury or death, it can be very helpful in cushioning the passengers in many cases.

Design of Strong Leather Grip Technology Air Bag:

- Strong leather with grips is used to construct the air bags.
- Especially as the lower surface of the air bags take the friction caused due to the road surface.
- The grip is used to avoid slipping or skidding of the bike on the oily or wet surface areas The shape of the air bag is semi-circular “D” shape on both sides of the bike.

Chemical Reaction behind Opening of Airbag

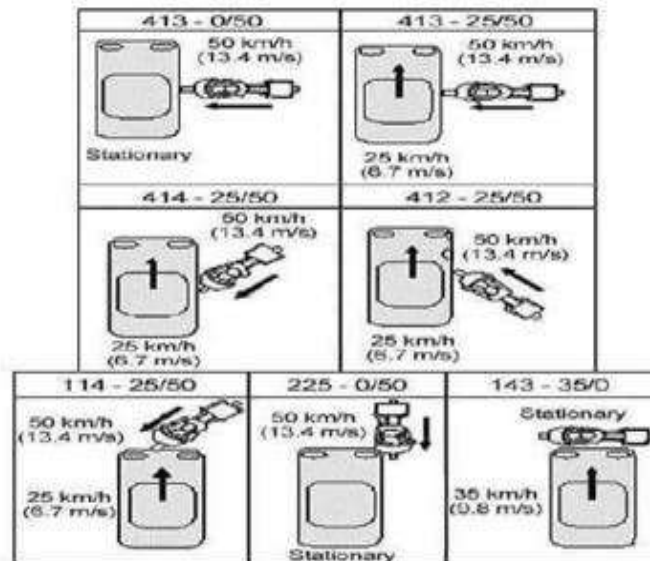
Actual opening of air bag is due to the chemical reaction occurred in between two chemical cylinders which are fitted at the bottom of bike. When an external force or collision of two objects with bike occur then those two chemical cylinders’ mixes with each other and the chemical reaction takes place inside the cylinder. At the outlet of the cylinder, the high-pressure exhaust gas (air) is expanded from exit valve. The pressure can be controlled by pressure valve in between air bag and chemical cylinder. This exhaust air or gas is used to fill the air bag and hence an air bag will open.

The signals from the various sensors are fed into the Airbag control unit, which determines from them the angle of impact, the severity, or force of the crash, along with other variables. Each restraint device is typically activated with one or more pyrotechnic devices, commonly called an initiator or electric match. The electric match, which consists of an electrical conductor wrapped in a combustible material, activates with a current pulse between 1 to 3 amperes in less than 2 milliseconds. When the conductor becomes hot enough, it ignites the combustible material, which initiates the gas generator. In a seat belt pre-pensioner, this hot gas is used to drive a piston that pulls the slack out of the seat belt.

Angle Sensor

The TLE5012B is a 360° angle sensor that detects the orientation of a magnetic field. This is achieved by measuring sine and cosine angle components with monolithic integrated Giant Magneto Resistance (iGMR) elements. High precision angle values are achieved over temperature and lifetime using internal auto calibration algorithm.

Data communications are accomplished with a bi-directional SSC Interface that is SPI compatible. The absolute angle value and other values are transmitted via SSC or via a Pulse-Width- Modulation (PWM) Protocol. Also the sine and cosine raw values can be read out. These raw signals are digitally processed internally to calculate the angle orientation of the magnetic field (magnet). The TLE5012B is a pre calibrated sensor. The calibration parameters are stored in laser fuses. At start-up the values of the fuses are written into Flip-Flops, where these values can be changed by the application specific parameters.



Inflator

Once the control unit determines there is an accident, it sends a signal to the inflator system. The inflator sets off a chemical charge, producing an explosion of nitrogen gas, filling up the airbag. As the airbag fills up, it bursts through the paneling that contains it and order to protect you. This all happens in an instant, usually within 25 or 50 milliseconds. That translates to almost 200 miles per hour. The airbag then will deflate itself on its own once it deploys.

III. How Air Bag System Protects the Human Body Parts?

The provision of air bags on motorcycles is more complex than installation in cars, because the dynamics of a motorcycle crash are more difficult to predict. But we discussed the following points on accident. These characteristics leads to act with very short reaction time and fast inflation but only if the motorcycle is involved in the accident . Limitation of this system is that they work properly only under particular conditions , especially the rider must remain on the motorcycle during the accident and the impact dynamics must lead him to hit exactly the part of his vehicle protected by airbags.[2] Normally, following kinds of bodily harms occur in the accident -Hand/leg Cracks or fractures -Head injury - Bleeding from body parts -Getting thrown from bike.

IV. WORKING METHODOLOGY

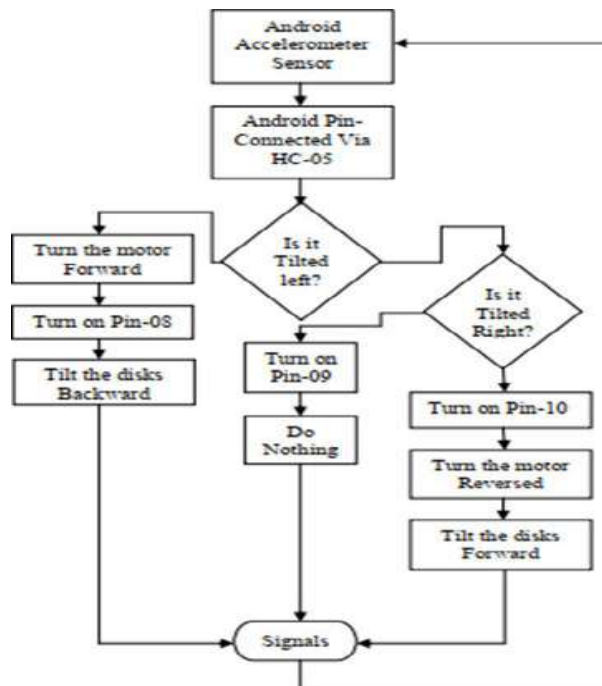


Figure 1: Flow chart of total working procedures



Figure 4.3: Assembled project

V. CONCLUSION

By providing the total safety to the motorcycle rider by implanting the airbags in both sides of the motorcycle as mention in this paper we will reduce the fatality rate by 20% to 30%.by using this technology there is not only reduce the death rate but also we give the total protection to the rider as well as motorcycle. The experimental research will show the how this system is useful and It may be published as soon as possible. The passenger can be protected from the above-mentioned bodily harms as described as, the air bag system opens from the bottom to the left or right side of bike; hence we can avoid hand/leg cracks or fractures. The diameter of the air bag when opened is more than height of the bike and that of the rider, hence head injury is avoided as the material used in the air bag construction is light weight strong leather the chances of bike skidding or slipping is diminished and external injuries like scratches are avoided. The chances of the rider being thrown from the bike are avoided as the leather belts are provided on both sides of the bike to secure the legs of the rider. The material used for manufacturing these belts is similar to those used for manufacturing seat belts of bikes.

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POWER GENERATOR THROUGH EXHAUST**¹Ubaid Khan, ²Rehan Chaudhary, ³Thahil Mendon and ⁴Yusuf Rehman**^{1,2,3}B.E Mechanical Department, Mumbai University⁴Assistant Professor, Mechanical Engineering, Theem College of Engineering, Boisar**ABSTRACT**

In this project, we modify a stationary diesel engine for producing power using turbine. Nowadays in automobile field many new innovating concepts are being developed. We are using the power from vehicle exhaust to generate the electricity which can be stored in battery for the later consumption. In this project, we are demonstrating a concept of generating power in a stationary multiple cylinder diesel engine by the usage of turbines. Here we are placing a turbine in the path of exhaust in the silencer. The turbine is connected to a dynamo, which is used to generate power. Depending upon the airflow the turbine will start rotating, and then the dynamo will also start to rotate. A dynamo is a device which is used to convert the kinetic energy into electrical energy. The generated power is stored to the battery. It can be stored in the battery after rectification. The rectified voltage can be inverted and can be used in various forms of utilities.

Keywords: Power generation, turbine, nozzle, dynamo, ecofriendly.

• INTRODUCTION

In recent the years the scientific and public awareness on environmental and energy issues has brought in major interests to the research of advanced technologies particularly in highly efficient internal combustion engines. Viewing from the socio-economic perspective, as the level of energy consumption is directly proportional to the economic development and total number of populations in a country, the growing rate of population in the world today indicates that the energy demand is likely to increase. A heat engine is a system that performs the conversion of heat or thermal energy to mechanical work. Examples of everyday heat engines include the steam engine, the diesel engine, and the gasoline (petrol) engine in an automobile. Heat engines are designed to produce useful work only. The efficiency of a modern internal combustion engine is about 37% in a normal spark ignition engine. The energy in the form of heat is rejected by means of exhaust, circulating cooling water, lubrication oil & radiation.

Substantial thermal energy is available from the exhaust gas in modern automotive engines. Two-thirds of the energy from combustion in a vehicle is lost as waste heat, of which 40% is in the form of hot exhaust gas. There are many developments and technologies on waste heat recovery of exhaust gas from internal combustion engines (ICE).

If our idea is implemented effectively, the potential for energy conservation is massive. The report deals into the Working, Hardware requirements, and the advances made so far in implementing the idea. It also hints at future modifications intended.



Figure 1: Model

• LITERATURE REVIEW

Generation of Electricity by Using Exhaust from Bike by S.Vijaya Kumar, Amit Kumar Singh, Athul Sabu and Mohamed Farhan.P[1]: - According to their study, it has been identified that there are large potentials of energy savings through the use of waste heat recovery technologies. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work.

Study and performance analysis of charging vehicle battery using bike exhaust gas by K. Kumaravel, P. Bala Shanmugam, and G. Balasubramanian [2], They had done different studies according to their practical inputs. They had approached the problem with different engine RPM. Practically for different engine speeds for different turbine power output were observed.

Power Generation by Exhaust Gases on Diesel Engine by Kranthi Kumar Guduru, Yakoob Kol ipak, Shanker. B and N. Suresh [3]: -. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work. It would also help to recognize the improvement in performance and emissions of the engine if these technologies were adopted by the automotive manufacturers.

Main Components of Model -

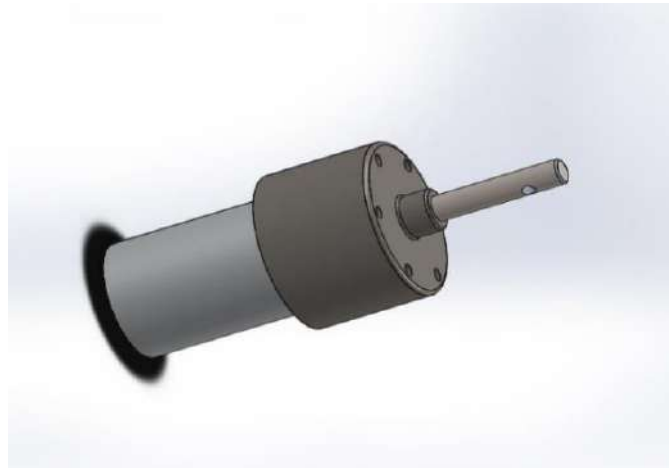


Fig. 1: PMDC Motor



Fig.2: Shaft

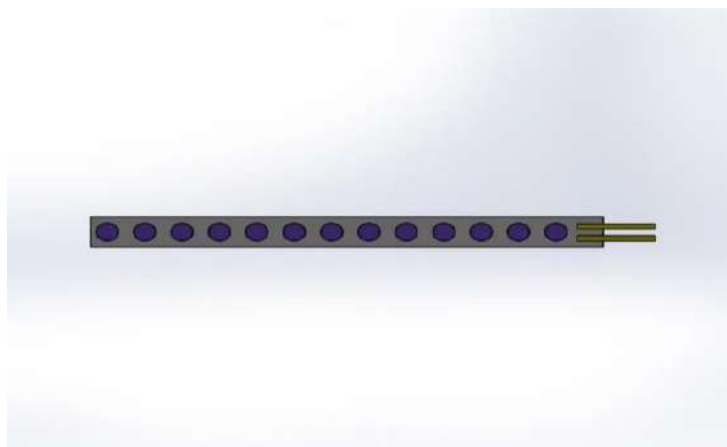


Fig 3: LED Strip

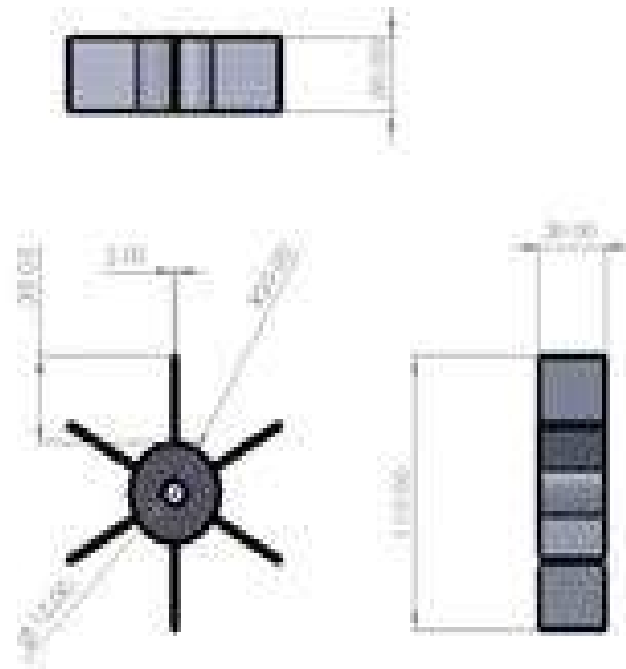


Fig.4: Turbine

• METHODOLOGY

The turbine is fixed to the shaft of the generator. It will be a mechanism of axial high-pressure turbine and backward curved fan blades with an electrical generator. The air will strike on high pressure reaction turbine and the pressure energy will convert into mechanical energy. This shaft will also rotate fan blade that will increase the discharge rate. The improvement in discharge rate will increase the engine power because high pressure discharge means low-pressure drop-in exhaust system. If the pressure drop will be low the power will increase of the engine. The electrical generator will have rotated by the same shaft and the electricity will be produced by generator. This generator converts the mechanical work into electrical energy This generator is also a DC motor of 12 volts 0.5 MA current This DC motor will give maximum output on 1000 rpm

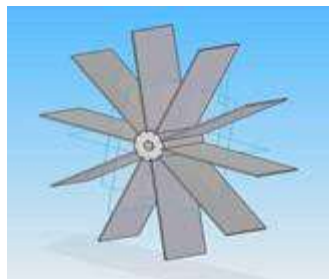
COMPONENTS

- Nozzle
- Turbine
- Dynamo
- A LED Strip
- Mild steel for constructing frames
- Connecting wires
- Sheet metal
- Bearing to mount turbine
- Shaft

Turbine

A steam turbine is a mechanical device that extracts thermal energy from pressurized steam, and converts it into rotary motion. It has almost completely replaced the reciprocating piston steam engine primarily because of its greater thermal efficiency and higher power-to-weight ratio. Because the turbine generates rotary motion, it is particularly suited to be used to drive an electrical generator – about 90% of all electricity generation in the United States is by use of steam turbines. The steam turbine is a form of heat engine that derives much of its improvement in thermodynamic efficiency through the use of multiple stages in the expansion of the steam, which results in a closer approach to the ideal reversible process.

Diesel Engine



The diesel engine is an internal combustion engine in which ignition of the fuel that has been injected into the combustion chamber is caused by the high temperature which a gas achieves (i.e., the air) when greatly compressed.

Diesel engines work by compressing only the air. This increases the air temperature inside the cylinder to such a high degree that it ignites atomized diesel fuel that is injected into the combustion chamber.

Specifications of Diesel Engine Used

Model	Tata 407
Type	Water cooled, naturally aspirated
No. Of cylinders	4 in line
Displacement	2956 cc
Maximum engine output	72 bhp
Maximum operating speed	3500 rpm
Idling speed	600 rpm
Firing order	1-3-4-2
Compression ratio	17:1

Dynamo

Dynamo is an electrical generator. This dynamo produces direct current with the use of a commutator. Dynamo was the first generator capable of the power industries. The dynamo uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current. A dynamo machine consists of a stationary structure, called the stator, which provides a constant magnetic field, and a set of rotating windings called the armature which turn within that field. On small machines the constant magnetic field may be provided by one or more permanent magnets, larger machines have the constant magnetic field provided by one or more electromagnets, which are usually called field coils.

Nozzle

Jet nozzles are also use in large rooms where the distribution of air via ceiling diffusers is not possible or not practical. When the temperature difference between the supply air and the room air changes, the supply air stream is deflected upwards to supply warm air or downwards to supply cold air. Nozzles can be described as convergent or divergent (expanding from a smaller diameter to a larger one). A de Laval nozzle has a convergent section followed by a divergent section and is often called a convergent divergent nozzle.

Battery

It is a device user to store the power. The power is stored in the form of DC current only. There are many types of batteries are used Lead acid, lithium fluoride and in this work 8Amp current and 12 voltage specification is used.

Shaft

A shaft is a rotating machine element, usually circular in cross section, which is used to transmit power from one part to another, or from a machine which produces power to a machine which absorbs power.

Bearing

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Most bearings facilitate the desired motion by minimizing friction. Bearings are classified broadly according to the type of operation, the motions allowed, or to the directions of the loads (forces) applied to the parts.

Rotary bearings hold rotating components such as shafts or axles within mechanical systems, and transfer axial and radial loads from the source of the load to the structure supporting it. The simplest form of bearing, the plain bearing, consists of a shaft rotating in a hole. Lubrication is often used to reduce friction. In the ball bearing and roller bearing, to prevent sliding friction, rolling elements such as rollers or balls with a circular cross-section are located between the races or journals of the bearing assembly

• CALCULATIONS

4.1 Exhaust Gas Flow Rate

To Determine Theoretical Nozzle Outlet Velocity:

Continuity equation,

$$Q=A_1V_1=A_2V_2$$

Velocity at nozzle outlet,

$$V_2=A_1V_1/A_2 \quad V_2=D^2V_1/D^2$$

Where A_1 is the 1^{st} cross-sectional area at section 1 A_2 is the cross-sectional area at section 2

V_1 is the velocity of exhaust gases from silencer

Trial No	Speed of engine (rpm)	Velocity of exhaust gas at silencer end (m/s)	Expected velocity of exhaust at nozzle end (m/s)
1	960	12.9	51.6
2	1125	16.1	64.4
3	1230	18.1	72.4

Table 4.1: Exhaust gas Velocity test

Flow Rate,

$$Q=A*V$$

Where A is c/s area of outlet in m^2 V is velocity in m/s

$$A=\pi*d^2/4 = \pi*(2.5*10^{-2})^2/4 = 4.9087*10^{-4}m^2$$

Therefore,

$$Q= 4.9087*10^{-4}*51.6 \quad (\text{At an engine speed of 960 rpm}) \quad Q=0.0253 \text{ m}^3/\text{s}$$

$$\text{At an engine speed of 1120 rpm, } Q=0.0316 \text{ m}^3/\text{s}$$

$$\text{At an engine speed of 1230 rpm, } Q=0.0355 \text{ m}^3/\text{s}$$

Area Swept,

$$A= (2\pi/7) \times \text{radius of turbine}^2 \quad \text{Velocity of the Turbine, } V= ((2\pi/7) * D \times N)/60$$

Where D=diameter of turbine

N=number of revolutions per minute Power available at the turbine, $P= (1/2) * \text{Density} * (\text{Velocity})^3 * C_p * \text{Area swept}$

4.2 Model Calculation

Swept area by the turbine, $A = (2\pi/7) \times \text{radius}^2$

$$A=3.14 \times (0.115)^2$$

$$A=0.04152 \text{ m}^2$$

$$\text{Velocity of the turbine, } V= ((2\pi/7) \times D \times N)/60 \quad V=3.14*0.115*60/60$$

$$V=0.3611 \text{ m/s}$$

$$\text{Power of the flowing exhaust gas } =1/2*\rho* \text{ area} \times (\text{velocity})^3 * C_p$$

$$=1/2 \times 1.23 \times 0.04152 \times (0.3611)^3 * 0.4$$

$$=4.8*10^{-4} \text{ Watts}$$

4.3 Impulse force Acting on the turbine

Mass flow rate, $m = \rho * Q$

Where ρ is the density in kg/m^3

Q is the volume flow rate in m^3/s Impulse force, $F = m * V$

Where V is the velocity of flow of exhaust gases in m/s

At engine speed of 960rpm, Mass flow rate, $m = 1.23 * 0.02503$

$m = 0.03079 kg/s$ Impulse force, $F = 0.03079 * 51.6$ $F = 1.588 N$

At an engine speed of 1125rpm, Mass flow rate, $m = 1.23 * 0.0316$

$m = 0.03886 kg/s$ Impulse force, $F = 0.03886 * 64.4$

$F = 2.503 N$

At an engine speed of 1230rpm, Mass flow rate, $m = 1.23 * 0.0353$

$m = 0.04347 kg/s$ Impulse force, $F = 0.04347 * 72$ $F = 3.129 N$

4.4 Power Generated by Turbine

Torque, $T = F * R$

Where F is impulse force in Newton

R is distance from center of shaft to the point where exhaust gas hit the blades in meter Power generated,

$P = 2\pi NT / 60$ watts

Where N is speed of turbine in RPM T is torque in Nm

At engine speed of 960rpm, Torque, $T = 1.588 * 0.09$ $T = 0.1492 Nm$

Power generated, $P = 2\pi * 70 * 0.1492 / 60$

$P = 1.0936$ Watts

At engine speed of 1125rpm, Torque, $T = 2.503 * 0.09$ $T = 0.225 Nm$

Power generated, $P = 2\pi * 125 * 0.225 / 60$

$P = 2.945$ Watts

At engine speed of 1230rpm, Torque, $T = 3.129 * 0.09$ $T = 0.2816 Nm$

Power generated, $P = 2\pi * 171 * 0.2816 / 60$

$P = 5.04$ Watts

4.1 Graphs

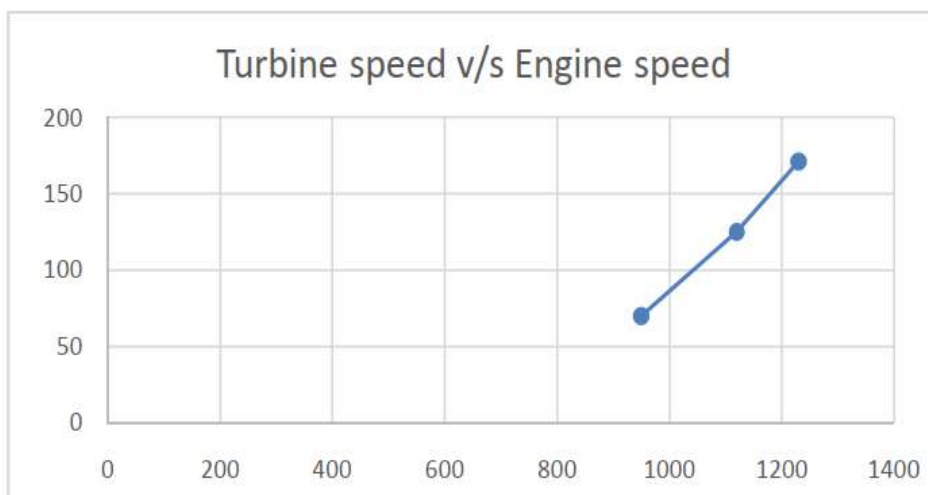


Fig. 4.1: Turbine speed (rpm) v/s engine speed (rpm)

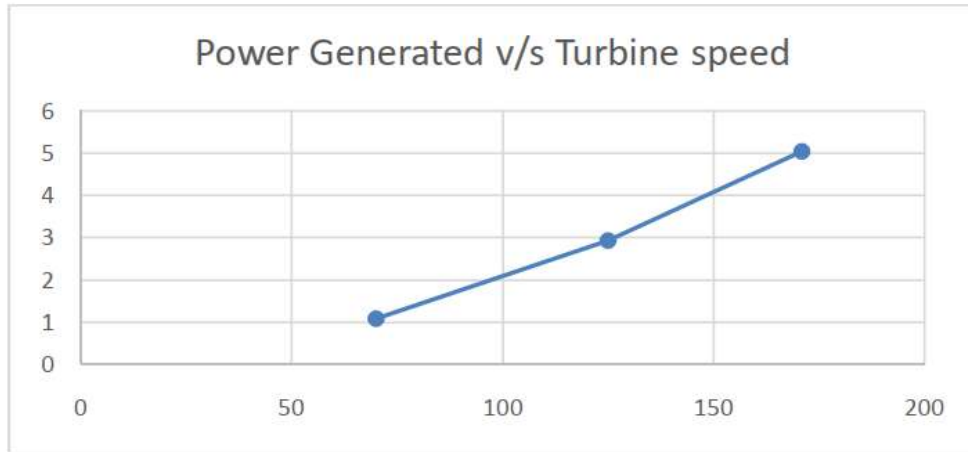


Fig. 4.2: Power generated (Watts) v/s Turbine speed (rpm)

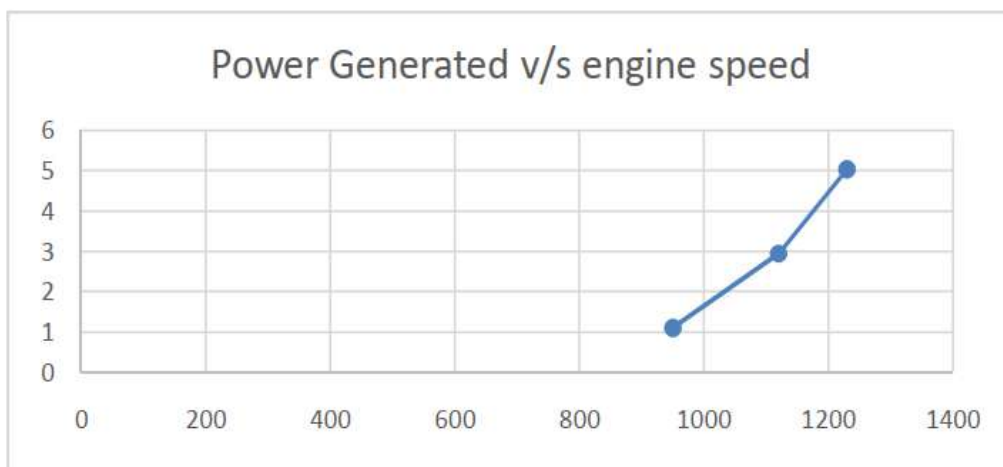


Fig. 4.3: Power generated (Watts) v/s Engine speed (rpm)

• CONCLUSIONS

From this project, it has been identified that there are large potentials of energy savings through the use of waste heat recovery technologies. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work. It would also help to recognize the improvement in performance and emissions of the engine if these technologies were adopted by the automotive manufacturers.

The study also identified the potentials of the technologies when incorporated with other devices to maximize potential energy efficiency of the vehicles. The project carried out by us made an attempt to generate electricity in engine exhaust unit. This project has also reduced the cost involved in the concern.

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SOLAR POWERED PORTABLE PELTIER REFRIGERATOR

Vinay R. Chaurasia¹, Amit Kumar S. Chaurasiya², Vidyesh T. Churi³, Gautam A. Dubey⁴ and M. A. Gulbarga⁵

^{1,2,3,4}Student and ⁵HOD, Department of Mechanical Engineering, Theem College of Engineering, Boisar

ABSTRACT

The fruits, vegetables and medicines require to store in refrigerator the continuous provision of electrical energy is require so that their efficacy is not affected. This represents an important problem for rural areas where there is no continuous electrical energy. In this work, we design a solar energy system for refrigeration of cold storage medicines to be used in rural towns without giving continuous electrical. The system uses a thermoelectric refrigerator based on the Peltier effect, which produces a temperature difference when electrical power is provided to it. It will be shown that for a typical application for food refrigeration, the required solar panel is about 100W peak connected to batteries with a storage capacity of 20Ah. The designed refrigeration system have 18 litre volume capacity of vaccines at temperatures in the range between 8° to 10°C using a Peltier cell (TEC) that consumes 30 W at 12V.

Keywords: Refrigeration, Thermoelectric, Solar energy, Peltier.

INTRODUCTION

There are Several types of Refrigeration in market that are designed to produce cooling. Thermoelectric is one of them. It is also known as Peltier Effect The main objective of our project is to produce cooling effect by using the Peltier Module. By using the vapour compression refrigeration system we neglect the harmful refrigerant and usage of green-house gases and CFC's. For protecting our environment thermoelectric refrigeration is used. The Peltier effect is the reverse phenomenon of Seebeck effect. The Peltier effect is created a temperature difference by transferring heat between two electrical junction when a circuit of two dissimilar metal and two junction is formed a current will flow between the junction or the circuit this phenomenon is known as Seebeck effect. Peltier effect is discovered by French physicist Jean-charles-Athanase -Peltier.

Due to increasing refrigeration in various field led to production of more electricity and henceforth more release of harmful gas like CO₂ all over the world which is contributing factor of global warming on climate change. Thermoelectric refrigeration is a new method the thermoelectric modules are made of many P-type and N-type semiconductor couples which are electrically connected series configuration of thermally in parallel to create cold and hot surface. Many researchers reported that the Peltier thermoelectric refrigeration system have small size, less weight, no refrigerant and no moving part such as compressor and it can be operated using DC power supply the TEC are used in like consumer product, Industrial, Science and imaging, military, aerospace thermoelectric can be used to heat and cool, depending on the direction of current In an application requiring both heating and cooling mode

Throughout the world refrigeration is a critical means for storing medicine and essential item whose require low temperature in Rural areas. Because of expensive and require high watt power electricity so rural areas people facing problem for storing medicine and food. our objective is to brought the refrigeration in rural areas for people in low cost, solar powered and portable to use everywhere so people are not deprived for essential medicine and food.

LITERATURE REVIEW

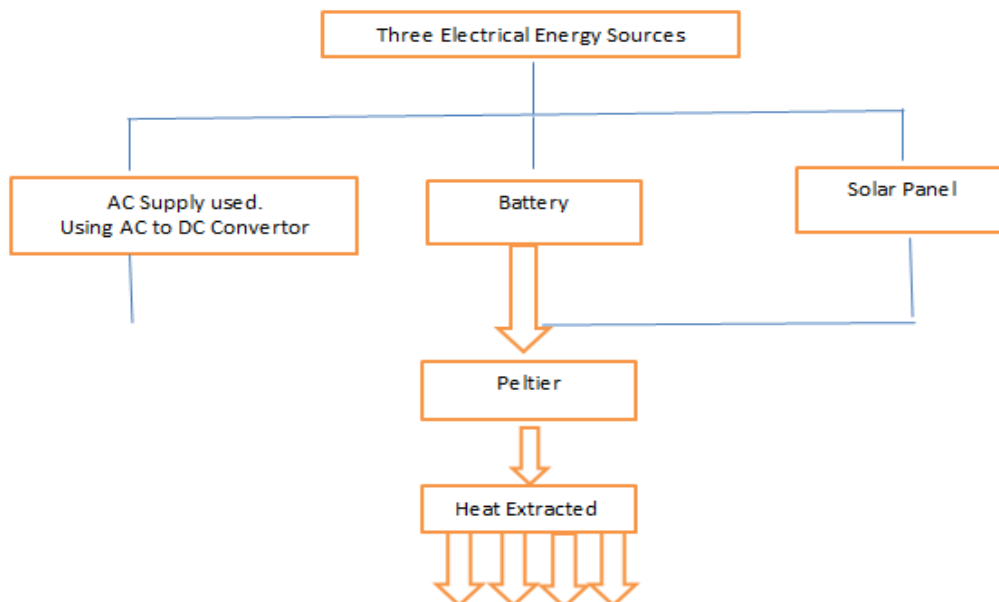
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- Chetan Jangonda, K. P. (2016). Review of various Application of Thermoelectric Module. Thermoelectric cooling added a new dimension to cooling. It has major impact over conventional cooling system. It is compact in size, no frictional elements are present, no coolant is required and weight of the system is low.
- D. SUMAN, P. H. (2020). Design And Fabrication Of Thermoelectric Refrigerator Using Peltier Module. The efficiency and life of the Peltier refrigerator are maximized by using these water pockets and the temperature was controllable by changing the input voltage and current so we can maintain the things in the required temperature. Finally, it has been recorded the minimum temperature i.e., 2°C

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- Kshitij Rokde.Mitali Patle, T. k. (2017). Peltier Based Eco-Friendly Smart Refrigerator for Rural Areas.The efficiency of the refrigerator can be increased by increasing the number of peltier plate module which will eventually help in decreasing the temperature in less time. Number of peltier plate modules used can be calculated using the heat transfer formula.
- V.Rajangam, M. (2015). Design and CFD Analysis of Thermoelectric Cooling System.The design parameters involved with thermoelectric cooling system. An experimental work is carried out to obtain a temperature up to 5 degree Celsius. An attempt made in validating the experimental work with the CFD analysis by giving sufficient boundary conditions. Further this work could be enhanced with different thermoelectric materials to attain high performance.

RESEARCH METHODOLOGY

The proposed refrigeration has three source of Electrical energy if we have electricity of 240 v Ac Supply then we directly connect to refrigeration by using SMPS (switch mode power supply) to convert 240v to 12v and if we do not have electricity we can use battery give power to peltier module or we also use solar panel to charge the battey and peltier module is a device that after giving current in two terminal one side it gave hot temperature and another side cold temperature we require cold side temperature to keep for cooling in cabin box we used aluminium cabin box. and for hot side temperature Heat Extracted by heat sink fan. we use Armaflex for insulation to decrease transfer of heat from ambient to cabin box. and to see the temperature we can use the temperature controller which can also control the temperature, and power will cut off after reaching required temperature.

Below Diagram Shows Process of Energy Supply



Calculation and Material Selection

With the above constraint imposed by objective we selected rectangular wooden box with an insulation is sandwich between the aluminium wall and its dimension of box length*breath*height = 30*25*25 cm Volume of a box is 18 cubic-meter. In this we calculate two types of load Heat absorbing load in cabin and Heat rejection load through outside Heat sink fan. First we have to calculate how much amount of power required to absorb heat of 18 cubic meter size of volume box at 35°c outside Temperature. So there heat absorbing load formula $Q = m \cdot Cp \cdot (Th - Tc)$. so we have to have calculate Mass.

Mass = Density * volume = 1000*0.018 = 18 kg. $Q = m \cdot Cp \cdot (Tamb - Tc) = 18 \cdot 4.187 \cdot (35 - 10) = 261$ watt-h

So we required total 261 watt heat absorbing load in 18 cubic meter volume box to reach 10°c. In 261 watt we select 8 peltier that each peltier would take 32 watt of load to cool up 10°c

SELECTION OF MATERIAL

Peltier

Above calculation of cabin load for per peltier we required 32 watt and 12v dc supply 2.6 ampere current for this amount of power we select TEC1-12706 Module Peltier that characteristic is

Hot Side Temperature (°c)	25	50
Qmax (watts)	50	57
Delta Tmax (°c)	66	75
Imax (Amps)	6.4	6.4
Vmax (Volts)	14.4	16.4
Module Resistance (Ohms)	1.98	2.30



Heat Sink Fan:

Heat rejection Load = $Q = h \cdot A (T_h - T_c) = 15 \cdot 5.1 \cdot (50 - 35) = 0.31 = 0.31$ watt-h per Heat sink Fan

Total we require watt-h for Heat rejection Load that's why we select 0.6 ampere 12v heat sink fan

Total Max power take to reject heat is 7.2 watt per peltier Total 8 peltier max power to reject heat $57.6 = 58$ watt

Total watt required = heat absorb load + heat reject load = $261 + 58 = 319$ watt-h

319 watt Total power required to remove the heat in 18 cubic meter volume box heat till 10°c

Selection of Battery

For 261 watt amount of load we required a battery to run this load hence we calculate capacity of battery:

Power calculation = Voltage Load * Current Load = $12 \cdot 3 (\because 3 = 2.6 + 0.6) = 36$ watt

Battery capacity = total load / battery voltage = $319 / 24 = 13.29$ Ah We select 20 Ah battery to run this refrigerator

For charge battery we select solar panel We need a Charge the battery in 4hr so, $20Ah / 4H = 5A$ $5A \cdot 12V = 60$ 60watt then 100 watt Solar Panel Require Charge Battery in require time

Output power of solar panel = 60W

Total power generated by solar panel = 100W

Total time required to charge the battery = Watt-hour of Battery / output power of solar panel = $240 / 60 = 4$ hr

Aluminium : Aluminium material is used for inside cabin box and its thermal conductivity is 239 (w m-1 k-1) it is corrosion resistance and aluminium is superb heat sink as compared to other material that heat can be drained away rapidly that why used in many application.

Insulation: we used 10mm Armaflex to resist heat from outside temperature to inside temperature and Armaflex is best material because it service temperature is -50 to +80° thermal conductivity is 0.003 (w/m.k) control condensation reduced energy loss and protect against frost on aluminium wall, light weight and flexible it is closed cell structure it means no additional vapour barrier is required

We want to calculate how much thickness insulation we required :

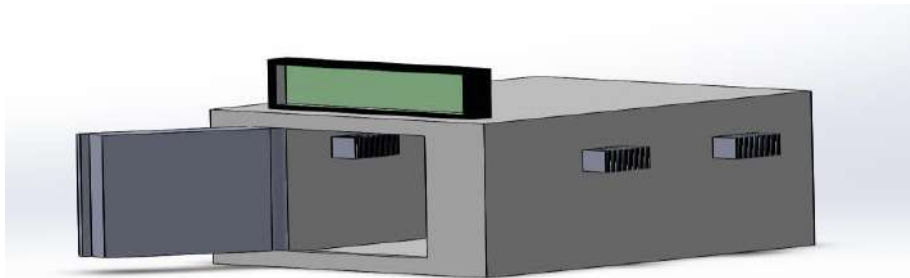
$X = k \{ [(T_h - t_a) / q_{max}] - (1/f) \} = 0.035 \cdot \{ [42 - 35] / 249 \} - (1 / 5.7) \} = 0.008m = 8mm$ Insulation thickness required

Wooden Box: wood is low thermal conductivity of material compared to other material and is best sustainable for portable

Temperature Controller: we used W1209 is an incredibly low cost yet highly functional thermostat controller. With this module you can intelligently control power to most types of electrical device based on the temperature sensed by the included high accuracy NTC temperature sensor.

Design:

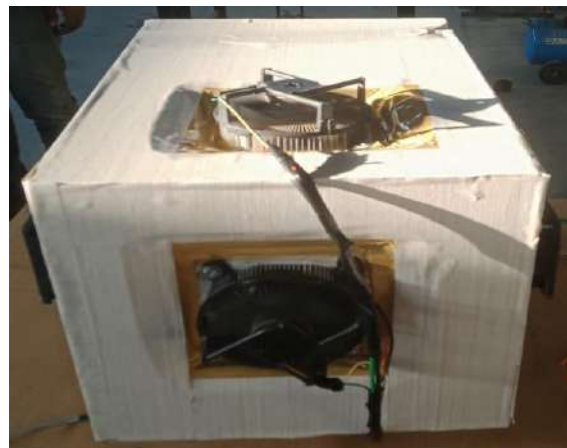
Cad Model View



Actual Design Model



Top View



Back View



Front View



Side View

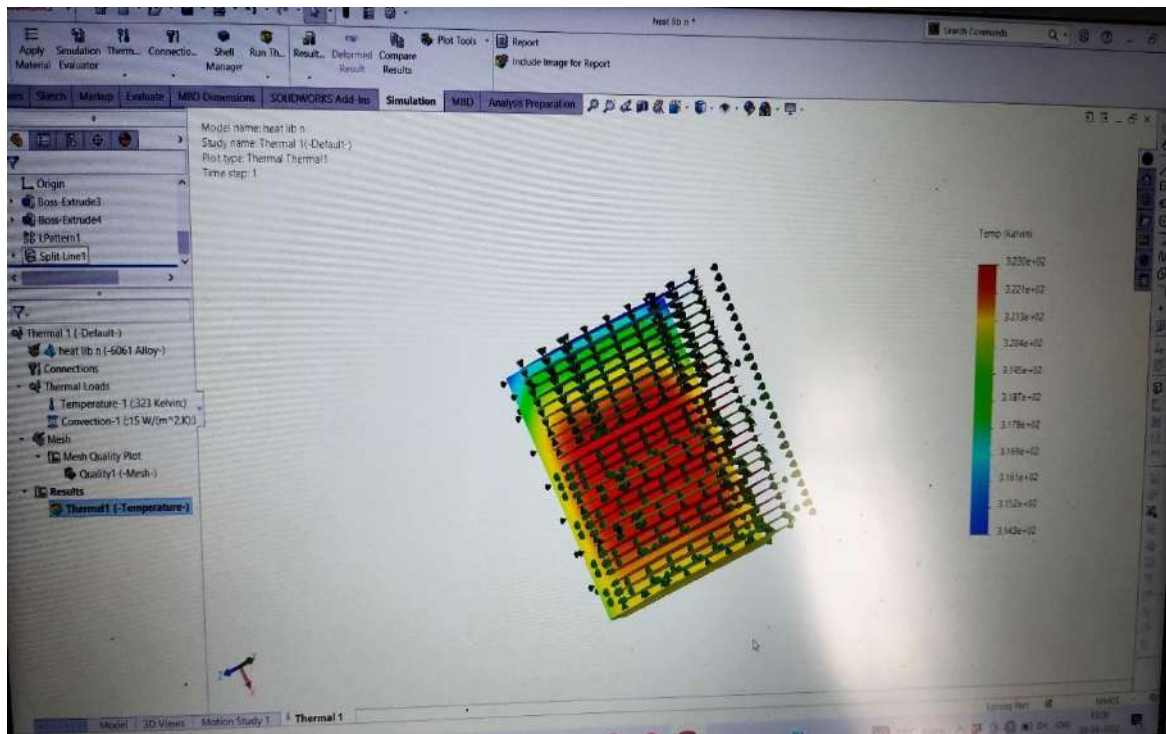
RESULTS AND DISCUSSION

To verify the above system design analysis, we designed and built a prototype thermoelectric refrigerator and perform an experiment.

For above calculation we got theoretical data of how much current required to run this system. For finding practical data test was conducted at ambient temperature 37°C. In 2 hr we get 10°C we have done this test in empty box. so In empty box total 156 watt-h load we required Per heat sink fan we get total 52 watt-h. Per peltier we require 30 watt-h and 3 ampere current. In theoretical data we calculate in full volume capacity load.

Temperature	Cooling Time (in PM)	Retention Time(in PM)
37	03:00	05:22
34	03:01	05:20
31	03:03	05:18
28	03:06	05:16
25	03:09	05:14
22	03:14	05:12
19	03:22	05:10
17	03:36	05:08
15	04:00	05:06
12	04:22	05:04
10	04:40	05:02
8	05:00	05:00

We simulate the heat rejection convection coefficient to calculate heat rejection load In simulation we find out we require 15 w/m².k to reject hat till ambient temperature.



The above figure shown that hot side peltier there is 50°C temperature. Cooled the peltier with heat sink fan at 35°C we require 15 w/m².k heat transfer coefficient.

CONCLUSION

The objective project is to achieve the long term cooling in case of power failure for refrigerator. A Peltier Cooling system is has been designed and developed to provide active cooling with help of single stage 12 V and 3A TEC module is used to provide adequate cooling. First the cooling load calculations for this TER compartment considered under study were presented. Simulation test have validated the theoretical design parameters and established the feasibility of providing cooling with single stage thermoelectric cooler was tested in the environmental chamber. The total Power required to run TEC Refrigerator in empty box is 156 watt-h. The retention time achieved was 22 min with the designed module in this project. In order to achieve the higher retention time and more cooling temperature another alternative was incorporate.

FUTURE SCOPE

We have to develop a little further in Peltier Module Which can reduce the temperature difference from hot side to cold, In hot side we must have to reduce temperature till ambient or below ambient it will increase efficiency and temperature will cool down in cold side in very less time. To increase the retention time first reduced cooling loss using best insulation and needs to be explored with quick switching mechanism from thermoelectric cell off state of heater to on state, so that temperature drop in thermoelectric cell can be reduced.

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BRIQUETTING MACHINE

Shubham Salvi, Shadabahmad Patel, Vikas Sharma and Zahid Patel
Mechanical Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

The objective of this study explores technology, implementation, and possible commercialization of charcoal briquettes derived from organic waste through thermal treatments in emerging markets. Given the lack of formal and centralized waste management system in emerging markets, we present a low-cost thermal treatment system to produce charcoal briquettes derived from organic waste. Bio digestion, composting, and other waste-to-energy technologies represent possible solutions to this problem, however due to technological, infrastructural, and logistical reasons these technologies have not hit the required scale to tackle the significant volume of organic waste generated in urban areas. With lack of infrastructure or technology for proper composting or recycling, organic waste represents little to no monetary value for waste picker cooperatives who operate and serve as de-facto waste collectors from urban households. The briquetting technology available is mostly for the upscale business for mass production and which is not feasible for the macro organizations or an individual we have also proposed a solution to it in this project, which is economical and feasible for such organizations or an individual.

Keyword: Briquettes, Renewable energy, Biomass, Agricultural residue

INTRODUCTION

Sequel to the increasing adverse environmental impacts related to the use of conventional fossil fuels, there is strong interest worldwide in the development of technologies that exploit renewable energy sources; and new measures to limit greenhouse gas emissions are continuously sought. Biomass, a naturally abundant domestic energy source is seen as the most promising energy alternative to mitigate greenhouse gas emissions. Waste agricultural biomass is often under-utilized, more also there is rapid increase in volume and types of waste agricultural biomass produced worldwide due to intensive agricultural activities in the wake of population growth and improved living standards. In Nigeria particularly, with a population of over 170 million people, agriculture is the mainstay of the economy contributing more than 40% of the gross domestic product (GDP). In addition, agricultural sector employs more than two-thirds of the total country's work force and provides livelihood for more than 90% of the rural population. The varying categories of these agricultural wastes is becoming a burgeoning problem as rotten waste agricultural biomass emits methane and leachate while open burning by the farmers to clear the lands (a practice very widely practiced in Nigeria) generates CO₂ and other local pollutants. Generally, the agricultural wastes in Nigeria could be grouped in to two major classifications; namely the crop residues and the agricultural industrial residues. The major crop residues in Nigeria are the sugarcane trash; straws of millet, corn, wheat, sorghum; maize stalks and cobs; cotton stalks; leaves; roots; barks; branches different types of fibrous materials. The common agricultural industrial residues include timbering residues; oilseeds shells such as groundnut, palm kernel and coconuts; rice husks; cotton wastes; cassava peels; sugarcane bagasse etc. The aim of this work is to use one of the ubiquitous agro-waste: the corncobs to produce and characterize briquette charcoal, and to draw comparisons with the properties of a selected biofuel.

LITERATURE REVIEW

1) Harshita Jain, Y.Vijayalaxmi, T.Neeraja, has studied in their paper named "Preparation Of Briquettes using biomass combinations and estimation of its calorific value" An experimental research design was adopted to conduct the present investigation. For the present study six biomass materials namely Charcoal Dust, Saw dust, Rice Husk, Dry Leaves, Wood Chips, Groundnut Shells and two binders namely Cow dung and Starch were identified. The commercially available briquetting machine of five horsepower motor was selected for making the briquettes. Subjective evaluation of physical properties of briquette i. e. texture, cohesiveness, moisture, shape, evenness of surface and appearance of surface was conducted by a panel of six judges comprising of staff and PhD graduate students of College of Home Science. The data obtained from the experimental tests was compiled, tabulated and statistically analysed by mean and standard deviation. The data obtained from subjective evaluation was consolidated by averages, standard deviation. The calorific value of all prepared briquettes was measured by using bomb calorimeter. The results indicate that briquettes made from charcoal dust and other biomass materials with starch combinations were found to be best in physical characteristics with highest scores whereas briquettes made from charcoal dust other biomass materials with cow dung combinations were found to be highest in calorific value. The results show that when cow dung is used as

binder with charcoal dust and other biomass materials, it was giving higher calorific value. The use of starch as binder with charcoal dust and other biomass materials was making briquettes smooth in texture, compact, dry, uniform, even without cracks and shiny.

2) J.T. Oladeji, has studied in their paper named “Comparative Briquetting of residues from corn cub, groundnut shell and their mixture” have shown that, the briquettes produced from rice husk and corncob would make good biomass fuels. However, from the study, it can be concluded that, briquette from corncob has more positive attributes of biomass fuel than rice husk briquette. Finally, the study also concluded that, both briquettes would not crumble during transportation and storage because six the values obtain

Ned for their relaxed densities are closed to the maximum densities of the briquettes from the two residues.

3) S. H. Sengar , A. G. Mohod , Y. P. Khandetod , S. S. Patil , A. D. Chendake has studied in their paper named “Performance of Briquetting Machine for Briquette fuel” have observed that the Cashew nut shell, grass and rice husk were used as major biomass in the form of raw biomass, hydrolysed biomass and carbonized biomass. Carbonized biomass was found suitable as compared to raw (as such) and hydrolysed biomass for briquetted fuel. The briquettes were prepared on screw press extruder briquetting machine for different combinations of major biomass. The prepared briquettes after sun drying were subjected to various tests for assessing the quality of fuel. Better results in cashew shell briquettes related to calorific value, shattering indices test, tumbling test, degree of densification, energy density ratio, resistance to water penetration and water boiling test as compared to grass and rice husk briquettes were observed.

4) Idah, P. A , Mopah, E. J. has studied in their paper named “Assessment of energy values of briquettes from some agricultural by-product with different binders” that the effect on environment by agricultural and other industrial wastes is on the increase and is causing a lot of problem. Adequate means of disposing these wastes are lacking, hence, converting them to other useful products such as briquettes for domestic fuel is desirable. In this work, the energy values of briquettes made from some of these agricultural by-products using two binders were assessed. The effective utilization of the agricultural by-products as high grade solid fuel can reduce environmental pollution resulting from the wastes and also help in minimizing the energy crisis resulting from non- renewable energy sources like petroleum products as domestic fuel.

PROBLEM STATEMENT

Most of the coal deposits occur in the northeaster part of the Indian peninsula. Other parts of the country have either no coal deposits or limited reserves of poor-quality coal. Coal distribution is highly uneven throughout India. Coal has to bear very high cost of transportation from the mines to the consuming centres. Thus, the coal-consuming industries have to pay a high price for coal. Much of the Indian coal is non-coking grade. This is unsuitable for metallurgical industries. The Godwin coal has high ash content, while the Tertiary coal has high Sulphur content. Railways transport more than 90 per cent of the coal. The problem in transportation arises due to lack of railway facilities, variation in gauges, shortage of wagons, slow movement of trains, pilferage, etc. There are severe health effects caused by burning coal. According to a report by the World Health Organization in 2008, coal particulates pollution are estimated to shorten approximately 1,000,000 lives annually worldwide. the list of historical coal mining disasters is a long one, although it should be noted work related coal deaths has declined substantially as safety measures have been enacted and underground mining has given up market share to surface mining. Underground mining hazards include suffocation, gas poisoning, roof collapse and gas explosions. Open cut hazards are principally mine wall failures and vehicle collisions. The briquetting technology available at present is mostly for the mass production for the big organizations, which is not economical and feasible for the small organizations or an individual and in rural area

OBJECTIVES

The study aims to evaluate the fuel properties of charcoal briquettes made from combinations of coconut shell, corn cob and sugarcane bagasse at specified ratios. In the study, single (100%) double (50%-50percentage) and triple (33%-33%-33percentage, 50%-25%-25percentage, and 50%-37.5%-12.5percentage) Constituent briquettes were produced with compaction pressures of 2.2MPa, 4.4 MPa and 6.6 MPa.

- To design and manufacture a briquetting machine that is economical and feasible for
- Small organization or an individual. With a production rate of 40kg/hr – 60kg/hr.
- To produce biomass briquettes with a calorific value of around 3700 - 4600 kcal/kg.
- To utilize the labor to produce biomass briquettes.
- To produce biomass briquettes with a lower ash content of around 0.7 – 18 % as

- Compared to that of coal, which is around 20- 40 %.
- To produce biomass briquettes of density 1000 – 1200 kg/m³ depending upon the raw
- Materials fed into the system.
- To produce solid briquettes which would burn for longer period of time as compared to
- That classical densified biomass.

DESIGN OF THE PROJECT

Fabrication of Briquetting Machine is consists of the Following components to full fill the requirements of Complete operation of the machine.

1. Motor
2. Worm and worm gear
3. Feed Screw
4. Feed Screw Casing
5. Hopper
6. Die
7. Klin

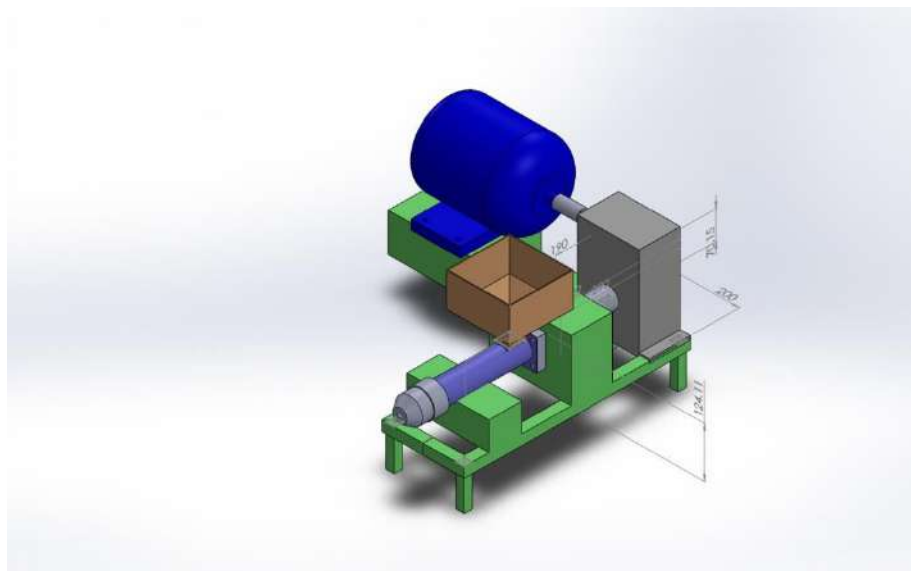


Fig: Solidworks Design

WORKING PRINCIPLE

Carbonization Process-

- For the purpose of manufacturing the charcoal briquettes we had collected dry waste such
- As sugarcane bagasse and dry leaves & branches.
- For the first batch we fed the sugarcane bagasse waste in the kiln for the carbonization
- In addition, for the second batch dry leaves & branches were fed.
- It took half hour for sugarcane bagasse to complete the process and 15 minutes for the dry
- leaves & branches, after that some water was sprinkled on the carbonized char as it was
- Hot to work with.
- After the carbonized char had been cooled, some unburnt waste was sorted from the char.
- Now the char was crushed into fine particles and the starch binder was mixed with the
- Char to give the briquettes shape.

Briquetting Process-

The Briquetting Machine is of screw type which is driven by a belt drive transmitting the power from the 1HP electric motor.

- The char mixed with the binder is then fed into the hopper of the briquetting machine.
- From there it is then carried forward by the screw which applies a force on the mixture
- along the housing which is slightly tapered towards the die end which further compress
- The mixture.
- The compressed mixture further reaches the die plate, which has two holes of 19 mm.
- Two pipes of 19 mm I.D and 40 mm in length has been welded on the die plate.
- Now as the compressed char passes through these pipes it takes the shape as the
- Cylindrical briquettes.
- These cylindrical briquettes are kept in air to dry up to two days.
- The first batch is of sugarcane bagasse, second batch is of dry leaves & branches and the
- Third batch is the mixture of sugarcane bagasse and dry leaves – branches.

CONCLUSION

A large volume of agricultural by products being generated in India and which constitute environmental hazards. Call for effective utilisation of those high grade biomass material for solid fuel called briquette. Hence it can be concluded that the waste material like dry leaves, wheat straw, saw dust, etc are feed stocks for the biomass briquette . Generally dry leaves and wheat straw are burnt to reduce waste, which causes several pollution to environment, but if wisely handled these wastes can then could be a better option for briquetting. Hence for an agricultural country like India that produces huge amount of agricultural waste every year, use of these waste as a briquette can be economically viable, sustainable and environment friendly solution. And also as machine concerned, it can be concluded that by using simple mechanism with widely available machine element the machine cost could be lowered and makes fabrication economical and portable.

FUTURE SCOPE

The machine fabricated require some human effort for compressing the raw material. The requirement of human effort can be eliminated by using a less capacity motor to actuate the telescopic jack gradually for compressing the feed stock. This increases the compression pressure which helps in obtaining the good quality briquettes. And also this high pressure causes raw material to bind stiffly and this may also lead to elimination of using binder. By some minor changes in the compressing unit, the cylinder piston arrangement and inverted position of jack will allow the operator to apply maximum pressure as much as possible. And by using this mechanism fabrication cost can be reduced. Any type of feed stock can be used apart from the saw dust, coffee husk, dry leaves and other biological and non-biological waste can be compacted to reduce waste management cost and facilitates the easy transportation of the same.

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IOT BASED AIR POLLUTION MONITORING SYSTEM

¹Avishkar Jadhav, ²Kashyap Satsangi, ³Hrishikesh Shinde, ⁴Shubham Tare and ⁵Mohd. Mustaque Ahmed

^{1, 2, 3, 4}Student and ⁵Assistant Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar

ABSTRACT

The increased level of air pollution in big cities has become a major concern for several organizations and authorities because of the risk it represents to human health. In this context, the technology has become a very useful tool in the contamination monitoring and the possible mitigation of its impact. Particularly, there are different proposals using the internet of things (IoT) paradigm that use interconnected sensors in order to measure different pollutants. In this paper, we develop a systematic mapping study defined by a five-step methodology to identify and analyze the research status in terms of IoT-based air pollution monitoring systems for cities. The study includes implementation in a real environment. We analyze and compare these proposals in terms of different parameters defined and highlight some challenges for air quality monitoring systems implementation into the city context. The system uses MQ135, MQ6 AND MQ7 and MQ6 sensor for monitoring Air Quality as it detects most harmful gases and can measure their amount accurately.

Keywords: IOT, new technology, air quality monitoring.

I. INTRODUCTION

The Air Excellence Guide (AEG) may be a common indicator of air quality. The Air Quality Indicator (AQI) is calculated and supported on air pollutants like CO and NO₂ compounds that consume opposing possessions happening the atmosphere and human health. The Air Quality Indicator may be a range that represents the very finest meditation of a specific air unused matter at a particular time. WE propose an air quality as well as air pollution monitoring system that allows us to monitor and check live air quality as well as air pollution in an area through Internet of Things (IoT). It uses air sensors (Gas Sensor MQ135, MQ6 AND MQ7 , MQ6, MQ7), DTH11 and LDR based PM sensor to sense presence of harmful gases/compounds in the air and constantly transmit this data. In addition, system keeps measuring air level and reports it. The sensors interact with Arduino Uno (Microcontroller) which processes this data and transmits it over the application. This allows authorities to monitor air pollution in different areas and act against it [1]. In addition, authorities can keep a watch on the air pollution near schools, and hospitals areas. Normally, little concentrations area unit measured exploitation ppb (parts per billion), that represents units of mass of a material per one billion units of total mass. Parts per million (ppm) may be similar and unremarkable used unit to measure concentrations of pollutants. It determines the requirements of a new system and analyze on product and resource requirement, which is required for the successful system. The product requirement contains input and output requirements it gives the wants in term of input to produce the required productivity. The resource requirements define in brief about the hardware that are needed to achieve the required functionality. In this project WE am going to make an IoT based Air Pollution Detection Monitoring System in which WE monitor the Air Quality over a web server using NodeMCU Wi-fi device and a trigger alarm when the air quality goes down a certain level means when there is amount of harmful gases is present in the air like CO₂. It shows the air quality in PPM (Parts Per Million) on APP and webpage so that WE monitor it very easily.



Figure 1: Model

II. METHODOLOGY

Sensing Node

The Sensing Node consist of the **PM sensor**, **DHT11 sensor** for Humidity and Temperature, **MQ72** for Carbon Monoxide, **MQ06** for detecting the gas concentration, **LM 35** for detecting ambient air temperature, **MQ135** which detects the Harmful gases and Smoke.

The Sensors read values of Temperature & Humidity, concentration of various gases and Particulate Matter in real time.

Data Acquisition

The ESP8266 MCU acquires and compute the data from sensors interfaced with it.

The programming sketch written in Arduino UNO helps ESP8266 in successful operations.

Data Transmission

The acquired data from all the sensors is transmitted to the cloud storage of IoT platforms through Wi-Fi protocol.

The acquired data is collected and stored at the cloud and managed for the further processing and analysis.

Data Visualization & Sharing

The collected, stored and well managed data is further shared on the mobile application.

The mobile application helps us to monitoring the measured real time concentration of the all pollutants along with temperature and humidity in real time through IoT.

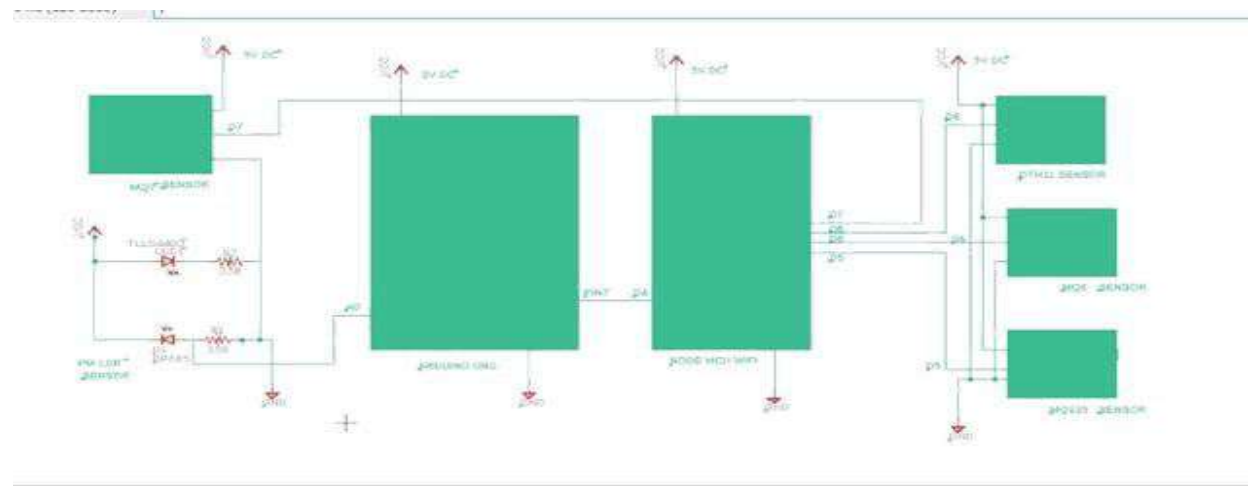


Figure 1: Circuit Diagram

III. MODELING AND ANALYSIS

Model and Material which are used is presented in this section.

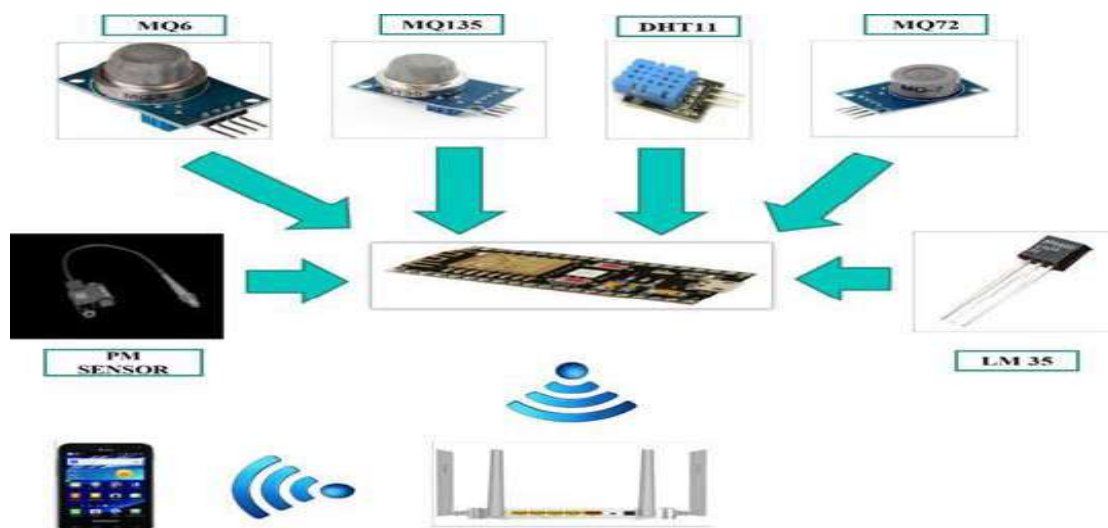


Fig (a): Proposed System

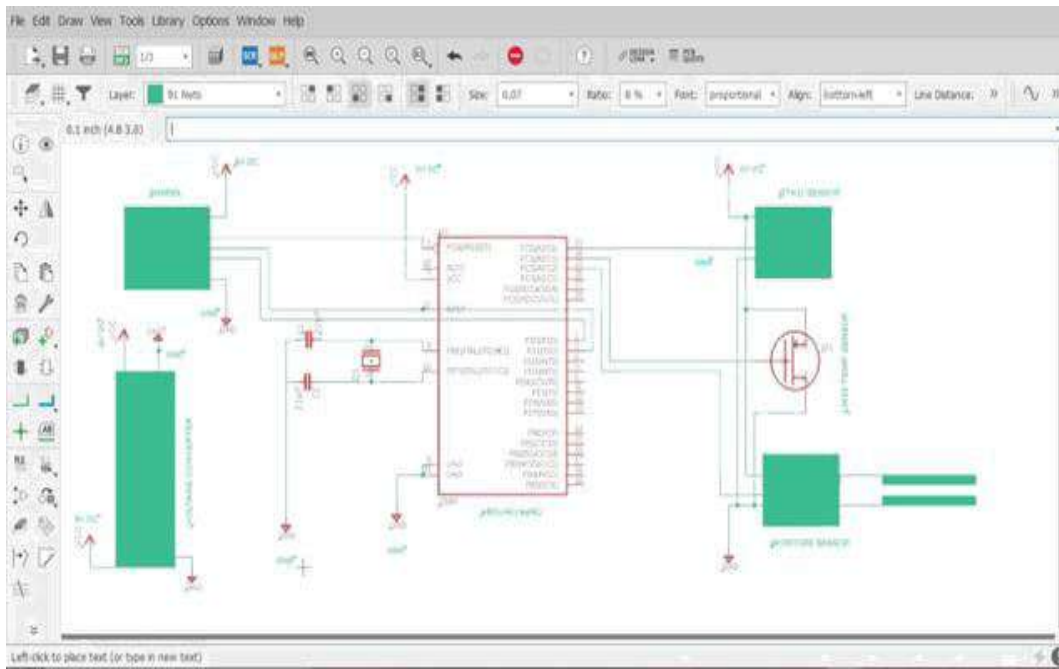


Fig (b): Drafting



Fig(c): Working Model

IV. RESULTS AND DISCUSSION

This table shows that the air quality health and its risk through a 0.1-1.0 base scale. It is divided into three parts like as Fresh Air, Poor Air & Danger Air. It detects the air pollution level and indicates the risk through this scale. When the updated data compared to the base data then it shows the result accordingly to this scale [18]. The compared data is between 0.1-0.5 it shows that health risk is low and indicate open window, when it rises up to 0.6-1.0 it shows that the pollution in the air is considered dangerous for human being and WE take some steps quickly.

Table 1: AQWE levels and Connected Health Impacts

Air Quality Indicator		
Range (PPM)	Result	Health Impacts
0-0.5	Fresh Air	Minimal impact
		May cause minor breathing discomfort to sensitive people.
0.6-0.9	Poor Air	
		May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and
1 to above	Danger Air	Older adults.

V. CONCLUSION

The system is going to be an important tool for the real monitoring of quality of ambient air. Monitoring the environment parameters especially with respect to air plays very important role to ensure healthy environment for living beings. We have seen various hazards being caused at various places due to air pollution.

There are many reasons for causing air pollution but knowing their concentration at various location helps to take decision on prevention measures. The proposed application works on the principle of IoT, data read from sensor are processed by the processor then uploaded to databased, these data are analysed and displayed to users, and user could fetch this information over phone and take proper action to prevent pollution.

The system to monitor the air of environment using Arduino microcontroller, IoT Technology is proposed to improve quality of air. With the use of IoT technology enhances the process of monitoring various aspects of environment such as air quality monitoring issue proposed in this paper. Here, using the MQ135, MQ6 AND MQ7, DHT11 gives the sense of different type of dangerous gas and Arduino is the heart of this project. Which control the entire process, Arduino module connects the whole process to APP and serial monitor is used for the visual Output.

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DEVELOPING THE RAT REPELLENT STRIPS TO MITIGATE THE PROBLEM ARISING DUE TO RAT BITING IN AUTOMOTIVE WIRING HARNESS IN ECONOMICAL AND EFFECTIVE WAY**Bhupendra Koli¹, Suraj Gupta² and Ibrahim I. Shaikh³**^{1,2}Student and ³Professor, Department of Automobile Engineering, M.H. Saboo Siddik College of Engineering**ABSTRACT**

The objective of the study is to find a cost-effective and environmentally friendly approach to address the problem of rat biting. The idea behind the creating strips is that it is readily removable and may be stuck in any desired location, increasing the product's adaptability. We are using two types of materials in our project: chemical and organic. We'll employ peppermint and Citronella in our organic material, and paradichlorobenzene in our chemical stuff. These materials include strong odorant components that irritate mice's nasal cavities, preventing them from approaching the strips. The exterior coating of the strips is made of PVC for safety reasons. PVC is a naturally fire-resistant substance.

Keywords: Automotive wiring harness, harness Damage, Rat biting, Rat Repellent, Removable Strips.

INTRODUCTION

As everyone knows, the auto business is booming, and new models are being introduced on a regular basis. Every day, new technology that is cutting-edge and comfy is introduced into automobiles to improve their visual and ergonomic appeal. As the number of cars on the road grows, so do the challenges associated with vehicle maintenance. The most common problem that owners overlook is rat biting/gnawing. These small rodents do considerable damage to automobile wiring harness, causing major problems at critical times.

People prefer to greet visitors in their cars the same manner they do in their homes, especially if the vehicle is new. Friends and relatives are constantly there in one's car. Whether it's for a road trip, a romantic night drive, or a group of friends visiting their favorite cuisine restaurant, cars are commonly the mode of transportation of choice. However, not everyone is welcome in the car. Rats, mice, and other rodents can cause a lot of damage, so no one wants them in their car. It's unclean, and if things go worse, it might be dangerous.

In today's world, a car is an essential method of transportation that allows us to get to work, hospitals, road trips, outings, and other destinations on time. But what if your automobile can't move an inch because of damaged or incorrect wires? Rats wreak havoc on people's automobiles as well as their bank accounts. Electrical systems in automobiles are among the most delicate components, and even minor damage to them can cause the vehicle to fail. We've seen numerous situations when a rodent or rat bite has caused damage to a car's electrical system, necessitating repairs. A rodent or rat may eat the wires in the car's electrical system, causing the vehicle to malfunction and the electrical system to be damaged.

Rats prefer dark, warm environments, so your automobile engine becomes their favorite hangout. Rats usually build a nest in the engine and stay there. They clog up your engine and cause damage to it by chewing through wiring, which may be expensive. Rats like to nibble on wire insulation, which can cause problems with the car's electrical system. Another big issue is that rats can use the automobile as a food storage facility, resulting in strewn food all over the engine, as well as damage to the car interior from food, droppings, and other debris, making it an unsanitary environment [1].

Although no one keeps track of rat damage to automobiles, there are indicators that it is becoming more of an issue as a result of a statewide rat population increase, which scientists believe is being exacerbated by a warming climate [1].

In the fall, rodents set fire to a vehicle in Manhattan. College students' automobiles have been mutilated in Florida. A half-dozen class action lawsuits have been brought against auto manufacturers in recent years, alleging that today's environmentally friendly wiring is tempting to mice. Rats have a "smorgasbord of delights" in modern cars, according to AAA [1].

LITERATURE SURVEY

Because our concept is so fresh and unique, no study has been done regarding it, however, there have been some studies done on certain oils and chemicals to see how effective they are at repelling rats. Peppermint oil, citronella oil, and paradichlorobenzene are all utilized individually, and their work is done separately, employing the same chemical and organic substances but without combining them. Organic oils of peppermint and citronella are known insect and rodent repellents, while paradichlorobenzene is a registered pesticide. Various research publications say that this assertion is true based on extensive laboratory testing on rats.

A. Peppermint and Peppermint Oil Profile

The culinary and medicinal plant peppermint (*Mentha piperita*) is extensively grown and utilized in a variety of cuisines. The main source of menthol is its essential oil. Menthone and pulegone are two further active ingredients in peppermint and peppermint essential oil. The main active component, menthol, has biocidal characteristics and is effective against mites, mosquito larvae, and other pests when used as a pesticide. Insects, dogs, and cats are all repelled by it. Antimicrobial properties of peppermint oil Peppermint and peppermint oil are regarded safe when used correctly due to its history as a flavoring ingredient [2]. In comparison to a no-treatment control and four different combinations of natural plant repellents under inks, including chili, geranium oil, and bergamot oil, cardboard treated with a combination of peppermint and wintergreen oils with ink repelled numerous rats in field conditions (Kalandakanond-Thongsong et al. 2011) [3].

B. Aversion to Food is A Measure of Citronella Oil's Potential as a Rodent Repellent

Repellents work by causing the meal to be rejected by triggering the primary or secondary defense mechanisms. Rattus, mature and healthy house rats of both sexes, were given the option of being exposed to 5, 10, or 20% citronella oil sprayed as paint in laboratory pens, or no oil. Each concentration was applied using three distinct methods (daily, once and alternatively in a week). The repellent effect of oil was determined by comparing food consumption on the treated and untreated sides. Food consumption was tracked over a four-day period. Overall, food consumption was considerably ($p < 0.05$) lower on the treatment side than on the control side, demonstrating that the oil had a considerable repelling effect. The repellent effect of oil, on the other hand, was not significantly different across the sexes. When oil was administered daily in both female and male rats, a significant difference in average percent repellent effect was detected between 5 and 10% concentrations, with treatment at 10% having a greater effect. The experiments demonstrated that daily application of citronella oil as a paint had a greater capability for repelling rats of both sexes [4].

C. Two-Year Inhalation Exposure to Para-Dichlorobenzene Caused Carcinogenicity and Chronic Toxicity in Mice and Rats–

The carcinogenicity and chronic toxicity of para-dichlorobenzene (p-DCB) were investigated by inhaling p-DCB vapor at a target concentration of 0 (control), 20, 75, or 300 ppm for 6 hours per day, 5 days per week, and for two years in 50 BDF1 mice and 50 F344 rats of both sexes. In the 300 ppm-exposed male mice, the incidence of hepatocellular carcinomas, hepatoblastomas, and hepatic histiocytic sarcomas increased, while the incidence of hepatocellular adenomas and carcinomas, as well as hepatoblastomas, increased in the 300 ppm-exposed female mice. Most of those liver tumors had a dose-related rise in their occurrence. In any p-DCB-exposed rat of either sex, no increase in tumor incidence was seen. The 300 ppm-exposed male rats showed hepatocyte centrilobular enlargement, papillary mineralization, and kidney pelvic urothelial hyperplasia. Incidences of eosinophilic globules of the respiratory and olfactory epithelia in female rats, as well as respiratory metaplasia of the nasal gland epithelium in mice and rats, and the olfactory epithelium in mice, were shown to be treatment- and age-related. The most sensitive endpoint of prolonged inhalation toxicity was the nasal lesion. The present study's findings of induction of mouse hepato-carcinogenicity and lack of rat nephron-carcinogenicity were compared to the mouse liver tumors and rat renal tumors reported in the NTP gavage study and discussed considering the estimated p-DCB uptake into the body via inhalation and oral administration [5].

Car Mechanics Use Market-Available Solutions to Get Rid of Rats in Automobiles. (Models Implemented) –

The methods listed below can be used to eliminate rats from automobiles to safeguard electrical harnesses and maintain a pleasant atmosphere in the vehicle.

A] Ultrasonic Rodent Repellent Devices –

Rats despise ultrasonic sounds because they can hear them, and they bring them extreme auditory stress. Humans and other pets are oblivious to the ultrasonic frequency. The electric auto repellent makes your car uninhabitable for rodents by creating a hostile atmosphere for them.

B] Rat Repellent Sprays –

Nowadays, you may buy rat repellent spray. Mechanics advise squirting it beneath the hood, particularly on the wires. It has a two-week impact before needing to be reapplied.

C] Rat Repellent Compounds –

Rat repellents come in a variety of forms, including cake, granules, and gels. Some of them are poisonous, but the majority aren't. They primarily target the mucous membrane of the rat. As a result of this long-term exposure, rats gradually develop a phobia of this odor and migrate away from the area where Rat Repellent is placed.

D] Rat Glue Pads –

The glue pads are square-shaped pads with a strong sticky coating. Rats become trapped on it when they walk across it.

E] Rodent-Repellent Tape from Honda Company –

Honda Cars sells rat repellent. This is a fiery Capsaicin-infused electrical tape (Chilly substance extracted from capsicum). The Capsain causes rodents to become irritated. The part number for this anti-rodent tape is 4019-2317. (Available in US Honda dealerships).

PROPOSED METHODOLOGY

The major purpose of developing these strips, is to solve the problem of rat bites in automobile wiring harnesses in a cost-effective and efficient manner. Also, rodents should not be allowed to create shelters in standing, irregularly moving automobile. These strips can also be used to maintain the cosmetics of both high-end and low-end vehicles. The goal of this research is to keep the non-moving car in a pleasant state despite the presence of filthy rats. to keep rats from gnawing into the car's primary harnesses and electrical circuits Strips can be used in home settings such as kitchens, cupboards, food storage warehouses, and a variety of other places where rats can cause major damage.

A. SIZE OF STRIPS –



Fig. 1: Trapezoidal design of strip

To maintain optimum inclination while opening and shutting the bonnet, we contemplate a trapezoidal shape from the start of our project. The reasoning behind this is that because our perforated holes were on the front side of our strips, the chemical ingredient should not come out in an unpleasant circumstance. However, to ensure a cost-effective manufacturing process, we chose a rectangular form because it will be easier to build in bulk and will require fewer complex machinery. It will become versatile to use and attach to any surface if you use double sided foam tape.



Fig. 2: Rectangular design of strips

Volume of rectangle = 10 cm x 3 cm x 3 cm

Volume of rectangle = 90 cm³

Density of PARADICHLOROBENZENE = 1250 kg/m³

Density of Peppermint oil= 900 Kg/ml

For PARADICHLOROBENZENE:

Mass=Density x volume

30 gm= 1250 kg/m³ x v₁

Actual volume covering = 24 cm³

For Oil:

Mass = Density x volume

15 ml = 900kg/ml x v₂

Actual volume covering = 16.67 cm³

total volume covered by chemical = 40.73 cm³

clearance area for chemicals to sublimate= volume of rectangle – total volume covered by chemical

$$90\text{cm}^3 - 40.73\text{cm}^3 = 49.27 \text{ cm}^3$$

The rationale for the huge clearance area is to account for the bending moment that occurs owing to the weight of the chemicals. The strips should not lose its adhesive over time and should provide solid, correct sticking and robust adhesion. For the strip's adhesiveness, we gave a huge sticking surface.

B. Odour Intesity of Paradichlorobenzene –

1,4-Dichlorobenzene is a colorless substance with a strong odor and a sweet flavor [6]. For 1,4-dichlorobenzene, the odor threshold is 0.18 parts per million (ppm) [7]. The molecular weight of 1,4-dichlorobenzene is 147.02 g/mol [6]. The solid crystal of paradichlorobenzene is colorless to white and has a strong unpleasant odor[8,9]. 2,3 At room temperature, it will sublimate, converting from a solid to a gas [9].3 The average sublimation rate was $1.6-4.6 \times 10^{-3}$ g/minute during 19 days at 21-24 °C [10]. 4 Humans can detect paradichlorobenzene at concentrations of 15 parts per million in the air [11].

Pressure of vapor 3: 4×10^{-1} mmHg at 20 degrees Celsius [9].

Partition Coefficient of Octanol and Water (log K_{ow}) (unitless) 3.52 [11].

1.74×10^{-3} to 2.63×10^{-3} Henry's constant (atmm³/mol) 2, 6: 1.74×10^{-3} to 2.63×10^{-3} [8,12].

C₆H₄Cl₂ = 147.0 g/mol molecular weight [12].

At 25 °C, solubility (water) 6 is 0.08 g/L (80 mg/L) [12].

275 to 833 (unitless) Soil Sorption Coefficient (K_{oc})[8].

Factors that affect conversion:

To convert ppm to mg/m³ concentrations in air (at 25°C)

Mg/m³ = (ppm) × (molecular weight of the compound)/ (24.45).

For 1, 4-dichlorobenzene: 1 ppm = 6 mg/m³.

Ppm value for 30gm mass and 90 cm³ volume is:

Ppm=(mg/m³) × (24/molecular Weight)

$$=(30000/0.0001) \times (24/147.01) \text{ ppm} = 48976260.12$$

$$1 \text{ ppm} = 1.225083 \times 10^{-7} \text{ mg/m}^3$$

C. Odour Intensity of Menthol –

Crystals or granules, depending on their physical state. The molecular weight of this substance is 156.27.

Factors that affect conversion 6.4 mg/m³ = 1 ppm.

$$0.16 \text{ ppm} = 1 \text{ mg/m}^3$$

Melting Point: 41-43 degrees Celsius (106-109 degrees Fahrenheit) There is no information about the isomer. Menthol is found in two polymorphs, one of which melts at 28 degrees Celsius and the other at 38 degrees Celsius.

Freezing point: 27 to 28 degrees Celsius, rising to 30 to 32 degrees Celsius with continuous stirring. Not specified isomer.

212°C (414°F) is the boiling point. Not specified isomer

0.890 g/cm³ density/specific gravity There is no information about the isomer.

CAS# 1490-04-6 (0.895 g/cm³ at 20 °C).

At 25 °C, vapor pressure is 8.5 Pa (0.064 mm Hg) (L-menthol, Isomer not specified); at 55 °C, vapor pressure is 30 Pa (0.975 mm Hg) (D/L menthol).

84 ppm (538 mg/m³) Saturated Vapor Concentration at 22-25°C (calculated; = Vapor Pressure X 1315); 132 ppm (845 mg/m³) Saturated Vapor Concentration at 55°C (calculated; = Vapor Pressure X 1315)

Partition Coefficient of Octanol/Water: log K_{ow} = 3.2–3.4 CAS No. 1490-04-6, 2216-51-5, 15356-70-4, Isomer not defined.

Description and Threshold of Odor: Aroma of peppermint.

0.14–0.26 ppm detection threshold odor concentration, 0.9–1.7 mg/m³

0.002–11.6 mg/ m³ is the threshold odor concentration.

Recognition threshold odor concentration 0.33 ppm, 2.1 mg/m³ Peppermint flavor

Limits on flammability: None available

(Closed cup; isomer not stated; purity > 99.7%) Flash Point: > 100°C

Temperature of autoignition is unavailable.

Other features include: +49.2 degree/D specific optical rotation (alcohol, 5 percent, D menthol)

635 UV (Sadtler Research Laboratories Spectral Collection) 410 NMR [13,14,15,16,17,18,19,20,21,22,23,24,25].

D. Odour Intensity of Citronella Oil –

Properties:

Clear liquid, pale yellow to dark yellow in color (Est)

No specific food chemicals are included in the Codex. @ 25.00 °C, gravity ranges from 0.85000 to 0.92000.

7.073 to 7.655 pounds per gallon (estimated)

At 20.00 °C, the refractive index ranges from 1.43000 to 1.52000.

Optical Rotation: -7.00 to +7.00 Optical Rotation: -7.00 to +7.00

@ 760.00 mm Hg, boiling point: 215.00 °C

At 25.00 °C, the vapor pressure is 0.100000 mm/Hg.

TCC (79.00 °C.) Flash Point: 175.00 °F.

Shelf Life: 24.00 month(s) or more if properly stored.

Store in tightly sealed containers in a cool, dry area away from heat and light.

38.94 mg/L @ 25 °C soluble in paraffin oil, murky water, and very weakly water (Est)

Propylene glycol is insoluble. In most media alkali, it is non-discoloring.

Medium odor strength; advised smelling in a 10% solution or less.

28 hour(s) at 100 percent fresh sweet citrus powdered rose weedy green dewy tomato woody at a concentration of ten percent in Di propylene glycol, the odor is described as follows: weedy green dewy tomato woody geraniol fresh sweet citrus powdery geraniol.

William tgs Luebke (1985) CA Aromatics Company Inc. odor sample [26].

E. Damaged Cause by Rats as Well as Possible Entry Points for Rats Inside Automobile –

The vehicles were severely damaged by rats. Electrical equipment in the engine area is mostly damaged by rats. Rats devour the blowing motor plastic and the PVC plastic coating on the wiring harness with ease.

Damaged Area



Fig.3: Viper tray



Fig.4: Blowing Motor



Fig.5: Rear side harness

Potential Entry Point in Car



Fig.6: Under viper Tray



Fig.7: Behind Covering Cap



Fig.8: Behind Glovebox in Car

EXPERIMENTAL RESULTS

After speaking with a garage mechanic, we discovered that most irregular and motionless cars are found in garages because of catastrophic car breakdowns, engine malfunctions, unpaid vehicle owner bills, and a lack of spare parts. With 30gm of PARADICHLOROBENZENE and 15ml of citronella oil, we conducted our experiment on FIAT LINEA and DATUS GO PLUS cars. We ran the experiment for 6 days and recorded the results using a SQ8 tiny DV camera in the engine compartment. We weight the chemicals before and after they are placed, and we take a reading before and after 12 hours. We physically documented garage employees' statements regarding the presence of rats in the proximity of the car. We chose a garage that has a lot of rodents. In the six days that our camera has been recording around the engine area compound, there has been no evidence of rat presence.

Conducted first experiment on 1st vehicle for 3 days of duration.

FIAT LINEA	No of Days	Chemical Combination (Citronella Oil + PDCB)	Study Length	Position	Visible Effect by Owner	Weight Of Chemical before		Weight Of Chemical After	
	Day 1	C	12 HR	On ECM	Rats didn't appear in Strips vicinity area	30	15	30	15
Day 2	C	12 HR	30			15	30	15	
Day 3	C	12 HR	30			15	29	15	



Fig.9: Strips on ECM of Fiat Linea



Fig.10: Fiat Linea in Open Garage Area

Conducted second experiment on 2nd vehicle for next 3 days in same garage with different location of car.

DATSUN GO PLUS	No of Days	Chemical Combination (Citronella Oil + PDCB)	Study Length	Position	Visible Effect by Owner	Weight Of Chemical before		Weight Of Chemical After	
	Day 4	C	12 HR	On Car Battery	Rats didn't appear in Strips vicinity area	29	15	28	15
Day 5	C	12 HR	29			15	28	15	
Day 6	C	12 HR	28			14	27	14	



Fig.11: Strips on Car Battery of Datsun Go Plus **Fig.12:** Datsun Go Plus in open garage area

MODEL DEPLOYMENT

After completing proper experiments on rats legally in government-certified laboratories, we will release our product to the market. Because we conducted our research in an open environment, the possibility of rats entering in vicinity of strips and testing the strips repellency impact was highly unpredictable. Based on previous several literature studies conducted by professional research scholars, we are using these chemicals and organic oils.

CONCLUSIONS

Due to heavy traffic, most drivers prefer two-wheeler rides to four-wheeler rides, hence rat biting is a prevalent problem in city areas. Our strips are inexpensive, so anyone can afford them, and they can also be used to maintain the beauty of high-end cars from placing sachets and poring mothballs in the garage. Our strips are removable, allowing the owner to apply and remove them as needed. Natural oils create a fresh atmosphere in odor-prone areas. It can also safeguard your car from rat bites due to the long life of the strips.

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DRAG REDUCTION SYSTEM ANALYSIS ON TATA NEXON

¹Dave Pritkumar, ²Devgadkar Abel, ³Gaikwad Prasad, ⁴Mahetar Ejaj Ilyas and ⁵Mohd. Mustaque Ahmed

^{1, 2, 3, 4}Student and ⁵Assistant Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar

ABSTRACT

Aerodynamic styling of the vehicle is one of the promising technologies which can not only improve the fuel efficiency, but also ensure better stability and good handling characteristics of vehicles at higher speed especially on highways. The paper includes assessment of drag force (Fd) and drag coefficient (Cd) by the conventional wind tunnel method. The experimental calculations were performed using subsonic wind tunnel having a test section of 100cm x 30cm x 30 cm. An exact replica of a model of Sports Utility Vehicle (SUV) on reduced scale 1:32 was used to conduct and perform the experiment for calculating Fd and Cd. Three-dimensional (3D) computational analysis was carried out using Gambit as the preprocessing software and Fluent as the solver and post-processor. The comparison of computational approaches with experiment shows that the computed Fd agrees well with the experimental values over the entire range of air velocities. The design and development of an active Drag Reduction System (DRS) for multielement wings in a race car application is described. Such systems are currently allowed within certain racing categories, including Formula 1, and provide the opportunity to run increased down force levels for cornering and braking events, whilst minimizing drag during straight line acceleration. Switching from the high down force to the low drag mode is achieved by individual rotation of the trailing edge flaps. This aerodynamically decouples the multielement configuration and converts it to a staggered multi-plane assembly, reducing the lift-induced drag produced by the wing. In the present example, DRS is applied to both the front and rear wings of the car in an effort to retain an acceptable aerodynamic balance when the system is deployed, thereby retaining aerodynamic stability and allowing DRS to be used in partial cornering situations. Numerical models are developed to predict the quasi-static aerodynamic performance of the wings in isolation as the flaps are progressively rotated. These results are correlated with full scale wind tunnel tests. Maximum drag reductions of 70% and 83% are predicted for the front and rear wings respectively. Down force was found to be reduced by 37% for the front and 67% for the rear wing, with the large difference attributed to the fact that the front wing is operating in ground effect. A numerical simulation of the full car with front and rear wings, driver and underbody diffuser predicted that the application of DRS resulted in a maximum full car drag reduction of 62%. However, this mode was found to produce an unacceptably large forward shift in the aero balance, which would make the car extremely unstable and prone to over steer. By reducing the magnitude of DRS applied to the rear wing a configuration was found which slightly improved the aerodynamic balance and stability of the car at high speeds whilst still delivering a total drag reduction of 54%. In fluid mechanics, drag related problems aim to reduce fuel consumption. This paper is intended to provide guidance for drag reduction applications on cars. The review covers papers from the beginning of 2000 to April 2020 related to drag reduction research for ground vehicles. Research Papers were collected from the library of Science Direct, Web of Science, and Multidisciplinary Digital Publishing Institute (MDPI). Achieved drag reductions of each research paper was collected and evaluated. The assessed research papers attained their results by virtual wind tunnel measurements or calculating validated numerical models. The study mainly focuses on hatchback and notchback Shaped ground vehicle drag reduction methods, such as active and passive systems. Quantitative Analysis was made for the drag reduction methods where relative and absolute drag changes were used for evaluations.

INTRODUCTION

Recently automobile fuel economy, emissions, and recycling have become an important social concern. At the meantime, automotive industry competition has become more brutal and automotive companies began to put more effort on advanced vehicle design. Engineers believe that the automobile should be affordable, yet appealing, safe, and inexpensive to drive. The well-designed aerodynamic vehicle consumes not only less fuel in overcoming the drag exerted by air while running at higher speeds, but also offers good stability and handling. Aerodynamic styling of a car is one of the most crucial aspects of car design—a highly complex Phenomenon, encompassing the task of an artful integration of advanced engineering and stylish aesthetics. A lot of emphasizing is laid on the aerodynamics in car design as an aerodynamically well-designed car spends the least power in overcoming the drag exerted by air and hence exhibits higher performance—cruises faster and longer, that too less fuel.

There are different types of forces acting on a vehicle when it is in motion such as drag force and lift force. Drag force being the more prominent one is more responsible for increased fuel consumption and lower top speed of a vehicle. There are various types of drag forces acting on a vehicle namely: Parasitic drag, lift, induced drag and wave drag. Parasitic drag is further sub divided into form, skin friction and interference drag. These individual drags are very difficult to calculate and hence most people are concerned in finding the overall drag coefficient of a vehicle. This can be found out in wind tunnels by making numerous scaled models of vehicles to be tested or in nowadays we prefer by calculating coefficient of drag force on any analysis software.

The advantage over wind tunnel with scale model is that we can also save money and time. The fuel prices are rapidly increasing and the regulation of greenhouse gasses to control global warming gives tremendous pressure on the design engineers to enhance the current designs of the automobile using minimal changes in the shapes. To fulfill the above requirements, design engineers have been using the concepts of aerodynamics to enhance the efficiency of automobiles, and it was found that drag causes many problems in the performance of SUV models like instability, noise and fuel consumption.

In 2011, in a bid to increase the opportunities for passing, Formula 1 re-introduced actively controlled aerodynamics in the form of a Drag Reduction System (DRS) for the rear wing. This system was essentially a moveable flap on the rear wing which could be turned out to reduce drag along the straights. Unlike a typical commercial aircraft wing which uses a multi-element configuration that retracts into a single element configuration, race cars have adopted a different approach. As most race car wings are simply supported between endplates and skin friction is of little consequence, a reduced drag (and down force) configuration can be achieved more easily by rotating and aerodynamically decoupling each element within an existing multi-element configuration. When each element is rotated to $\sim 0^\circ$ angle of attack, the assembly becomes multi-plane with both vertical spacing and stagger of the order of the flap chord lengths. The effectiveness of these systems has inspired various road car manufacturers and after-market suppliers to re-examine and develop actively controlled wings.

There is also growing interest in actively controlled aero amongst Formula SAE and Formula Student competitions, which have always allowed such devices. In 2011 at the FSAE-WEST competition the Oklahoma Formula SAE team (Sooner Racing) debuted the first actively controlled wings seen in Formula SAE history, with front and rear wing flaps dynamically actuated by micro-servos.

“We are planning to increase speed by reducing drag of Passenger vehicle by applying addition body parts on it. The main body part will be a Spoiler or Rear wing. The idea came in our mind from Formula 1 Race car, they are using **DRS** (Drag Reduction System) under certain parameters to overtake front vehicle by converting their turbulent air flow into streamline airflow.”

For testing aerodynamics on the vehicle in virtual wind tunnel we're using **ANSYS workbench**. In that by the help of **FLUENT** module we will achieve our result.

AIMS AND OBJECTIVES

The aim of this project is to implement the DRS System (Drag Reduction System) in Public Cars. As the DRS system has many different advantages from improved Aerodynamics to improved vehicle performance. This system allows the vehicle to induce a down force on the vehicle and will increase the top speed by 10% - 20%. It increases the traction also while running at top speed.

We are trying to implement this on SUV, sedan or hatchback cars and will analyse the result we get accordingly at various speeds. We have selected TATA Nexon for this analysis. This an SUV type of car. We will implement the DRS and will try to improve the down force of the vehicle at top speed. This in result will also improve the efficiency of Engine will running at top speed on highways. As now a days it is important to make the vehicle as efficient as it can be by making a perfect body design which can resist the turbulence of the wind.

While analysing this on the Sedan, SUV vehicles there will be some kind of complications which have to face. As the vehicle design is stream lined. Finding out the flow separation will be very difficult. Whenever there is relative movement between a fluid and a solid surface, whether externally round a body, or internally in an enclosed passage, a boundary layer exists with viscous forces present in the layer of fluid close to the surface. Boundary layers can be either laminar or turbulent.

So, we have to calculate the boundary layer separation at different regions of the vehicle and have analyse it very closely. This will also help us to understand the low-pressure points at the vehicle body.

The objective is to convert a passenger car into a super-efficient vehicle with the help of aerodynamics.

METHODOLOGY

• **Problem Identification**

High fuel consumption due to poor aerodynamic design in commercial vehicle

• **Previous History**

In 2011, in a bid to increase the opportunities for passing, Formula 1 re-introduced actively controlled aerodynamics in the form of a Drag Reduction System (DRS) for the rear wing [5]. This system was essentially a moveable flap on the rear wing which could be turned out to reduce drag along the straights [6].

• **Brain-storming Ideas**

Implement of movable spoiler at rear end, with diffuser and fins if needed. Create model of car and run simulation to check existing aerodynamic result, and after that design suitable rear wing and improve existing aerodynamic result. To test it import car model into Ansys 15.0 Fluent, by analyzing CDF check comparison between drag and lift force.

• **Basic Calculations**

Check necessary calculation data from other research papers. Drag Force predominantly depends upon the velocity, frontal area, and coefficient of drag of the body

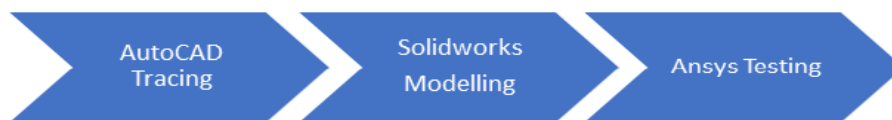
• **3D Modeling**

Our aim is to prove existing cars up gradation so we are not actually making car 3D model because it is time consuming, we will download the existing design from internet and import it into SOLIDWORKS 2016 to check surface quality. We will design an aerofoil for particular commercial car because we cannot use F1 rear wing into commercial vehicle.

• **Analysis Study**

The three-dimensional car model was imported to ANSYS™ workbench. If necessary, we will repair car surface to gain good meshing quality. Computational Fluid Dynamics (CFD) was carried out in the FLUENT module. In Design Modeler, an enclosure is developed to form a virtual wind tunnel.

• **Design and Analysis Methodology**



• **Research and Developments**

After analysis there might be some error or not as expectation so we will learn from mistakes by modify some data, design etc. and will develop to get expected as well as revolutionary results.

- Model Modification.
- Meshing.
- Inflation Layer.

RESULTS

Analysis on Tata Nexon XE

Contour of Velocity Magnitude

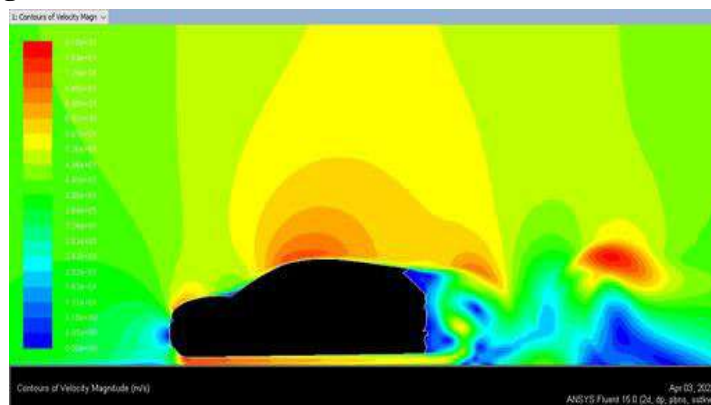


Figure 10: Existing Model

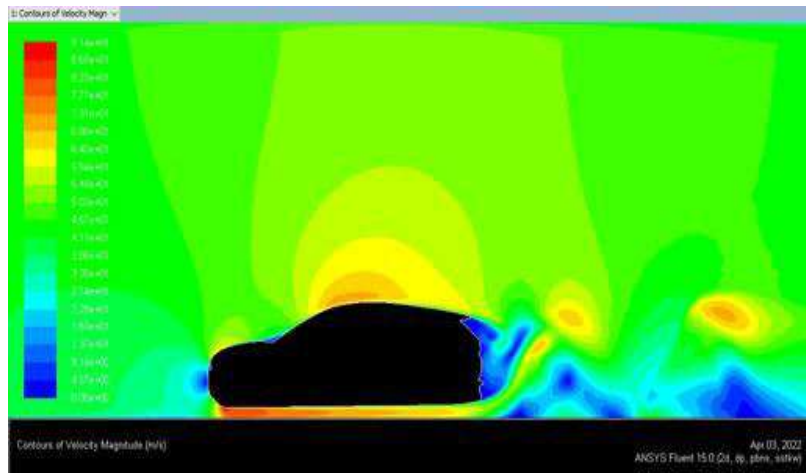


Figure 11: Upgraded Model

- Above results are found at 150 kmph speed.
- The figure 4a shows existing design of TATA Nexon XE.
- In other hand figure 4b shows upgraded design of TATA Nexon XE.
- We can easily observe the flow at afterbody, In figure 4a the velocity of air is much more disturbed than that of figure 4b.
- Basically we ignore the effect of wheels, but the Thumb rule which is accepted by aerodynamic researchers, i.e. if you get drag value $C_d = X$ (without wheels) then the value of C_d is equal to $1.5 X$ (with wheels).

Drag Force on Existing Model

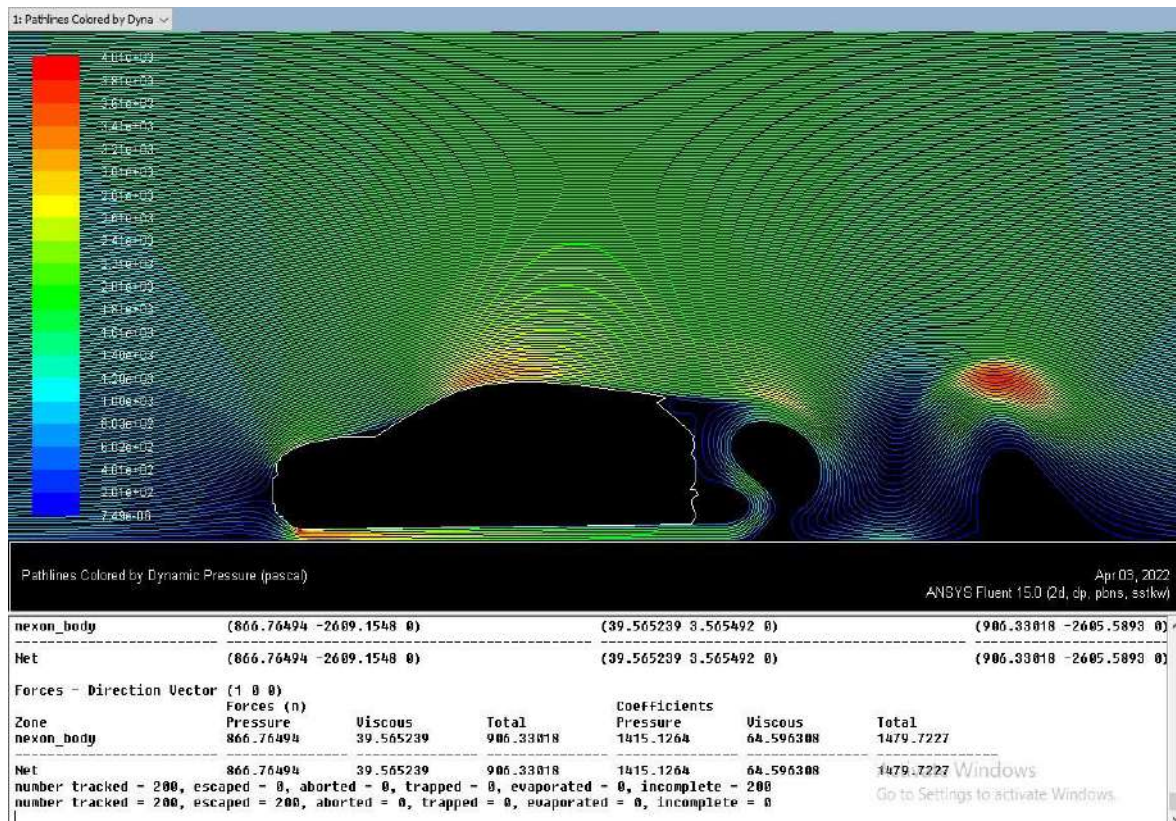


Figure 12: Drag Force on existing Model, Showing Pathline.

- The total drag value on exiting model is 906.3 N.
- The flow coming from underneath the body is get disturbed and we can see the eddies formation after body.
- Our target is to delay the boundary layer separation meaning the low-pressure loop is created just at the after body, resulting increases the drag value.

- There will be more fuel consumption to achieve the speed of 150kmph.

Drag Force on Upgraded Model

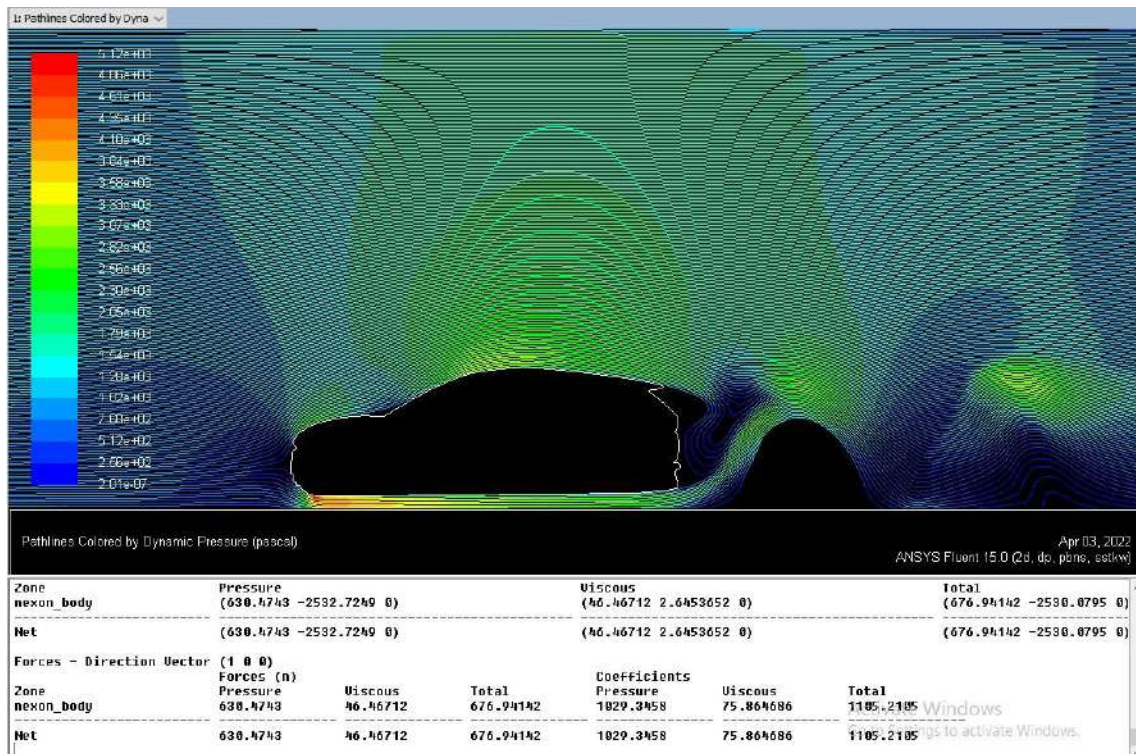


Figure 13: Drag Force on Upgraded Model, Showing Pathline

- The total drag value reduced on upgraded model is 677 N. It almost reduced by 25% than previous one.
- The flow coming from under body is smoothly transferred and we can see the formation of eddies have been decreased.
- The boundary layer separation has been delayed successfully at rear end spoiler and diffuser.

Boundary Layers at Rear Bottom End

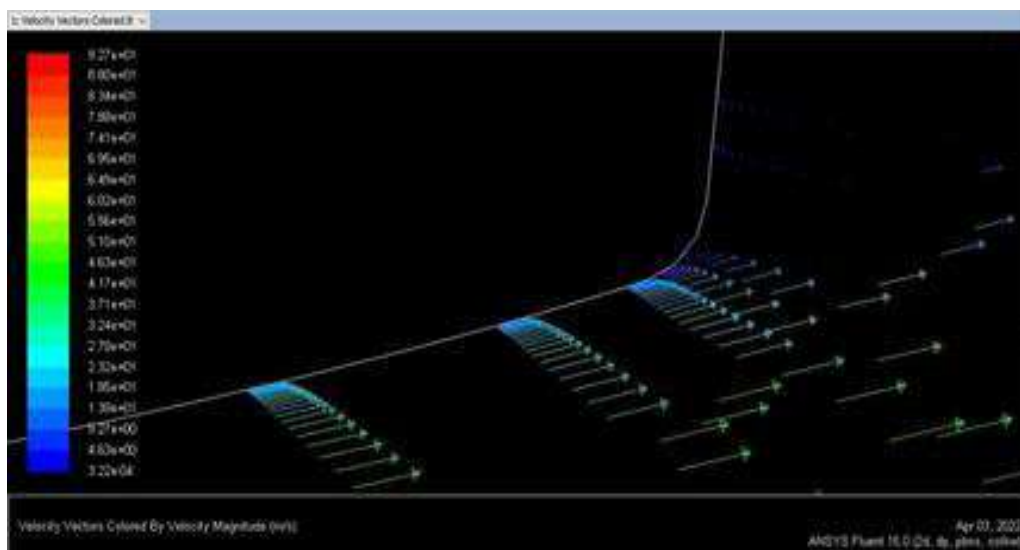


Figure 15: Boundary Layer Separation at Rear End Bottom

- The diffuser acts as an expansion chamber to manage the air as it exits from underneath the car and reintegrates it with higher-pressure ambient air. Smoothing this transition reduces turbulence and drag in the car's wake and improves airflow under the car.
- As we observed previous results after introducing a diffuser the flow is smoothly passing with minimum boundary layer separation.

- In figure 6b we can see how the boundary layers are created without separation on the curvature of diffuser. To know more about diffuser check figure 6a.

Boundary Layer at Spoiler End

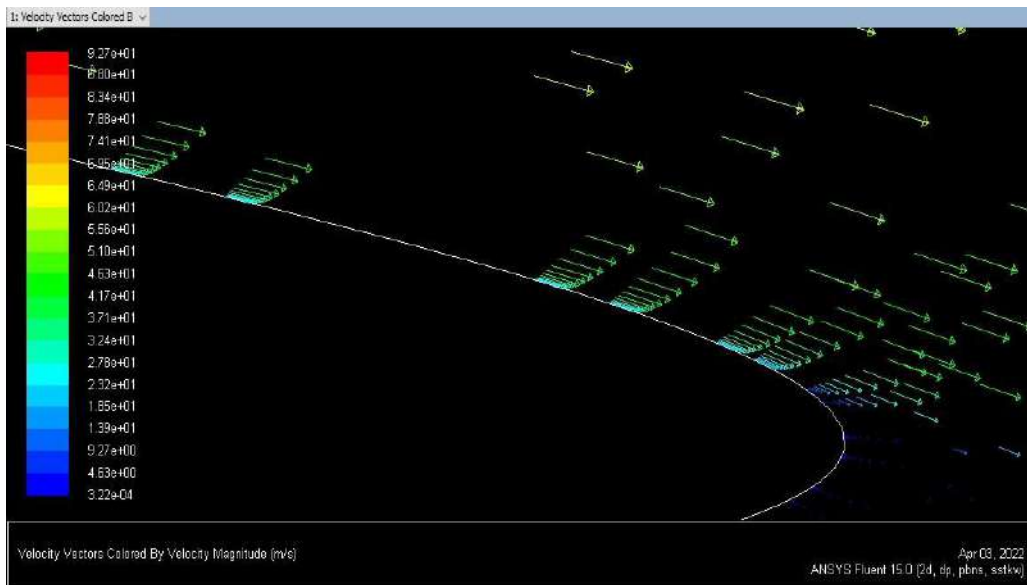


Figure 16: Boundary Layer Separation at Spoiler End

- As we observed previous results after enlarging the spoiler flow is smoothly passing with minimum boundary layer separation.
- In figure 7 we can see how the boundary layers are created without separation on the curvature of spoiler.

Area Consideration for Coefficient of Drag

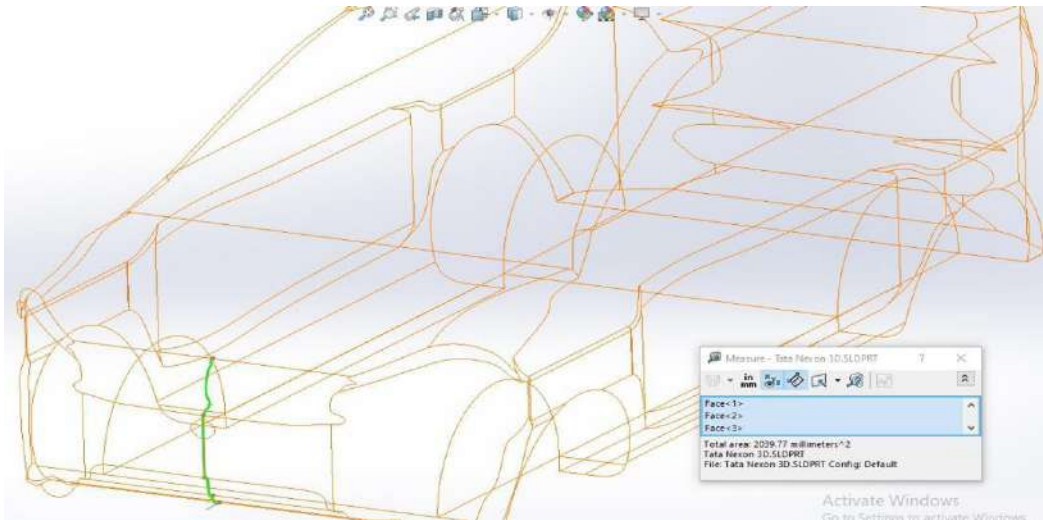


Figure 17: Figure Showing the Area Consideration.

- Due to 2D analysis we can not consider whole frontal area, we have considered an elemental strip on frontal area.
- In figure 8 we can observe the area we have got for elemental strip is about 2 m². This is the area we have consider for calculating drag coefficient value.

CALCULATION

Coefficient of drag $C_d = 2D / (\rho * v^2 * A)$

Were,

D = Drag (N)

ρ = Density of fluid (kg/m³)

v = Velocity of fluid (m/s)

A = Contact area (m²)

Given

D before = 906.3 N

D after = 677.0 N

ρ = 1.225 kg/ m³

v = 42 m/s

A = 2 m²

Note: All units are in Metric.

Coefficient of drag for Existing TATA Nexon XE

$C_d \text{ before} = 2 * 906.3 / (1.225 * 42^2 * 2)$

$C_d \text{ before} = 0.41$

Coefficient of drag for Upgraded TATA Nexon XE

$C_d \text{ before} = 2 * 677 / (1.225 * 42^2 * 2)$

$C_d \text{ after} = 0.31$

CONCLUSION

The constant evolution in the history of vehicle aerodynamics has led to the development of certain devices which led to the enhancement of the overall aerodynamics characteristics of the vehicles. Not only it improves the efficiency of the vehicle but also reduces fuel consumption. The drag has been reduced by 25%. This equates to a 25% reduction in fuel consumption. It will provide a speed advantage of 10-12 kmph while overtaking at high speeds. While turning, the traction and stability will be excellent.

The drag on the rear wing can be decreased by utilizing a drag reduction system (DRS) as observed from the results. Further investigation of computational fluid dynamics and aerodynamics is recommended to compliment the result. There is uncertainties in the results due to inadequacy in the mesh and design of the rear wing. By addressing these uncertainties better results can be achieved.

This is a 2D Analysis so we didn't examine elements like varied mechanical losses, spoiler and diffuser orientation, effect on wheels, environmental conditions, etc. In conclusion, it may be regarded as proper optimization can lead to better aerodynamics of the vehicle in different scenarios.

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DESIGN AND FABRICATION OF ADAPTIVE HEADLIGHT SYSTEM USING LDR AND ARDUINO NANO

Zain Ansari¹, Uzair Bagdadi², Taher Jawadwala³, Ahmed Ansari⁴ and ⁵Dr. Ibrahim I. Shaikh⁵
^{1,2,3,4}Student and ⁵Professor, Department of Automobile Engineering, M.H. Saboo Siddik College of Engineering

ABSTRACT

Bright lights coming from the upcoming vehicles on a night highway road give rise to fatal glare and dazzling effects. These effects have always been discomforting to the drivers. Also, the lack of illumination by the headlights leads the blind spots on a steep curvy road. To overcome these phenomena, many measures have been taken place in Asian as well as American countries. The concept of the Adaptive Headlight System is one of the effective solutions built by many car brands to tackle the problem. The system works by actively monitoring upcoming traffic and giving outputs accordingly to enhance the driving experience as well as reduce the high accident rates due to bright lights. The future scope of this system can include adaptive headlights being controlled by vehicle speed. High speed can correspond to the headlights being more divergent, and at low speed, headlights can be made to converge to get a better lit area while driving. In this paper, the fabrication of an Adaptive Headlight System using Light Dependent Resistor(LDR) and microcontroller Arduino NANO has been discussed.

Keywords: Blind Spots, Dazzling effect, Glare effect, Headlight Movement, Intensity Control.

INTRODUCTION

The bright lights from the upcoming vehicle directly fall on the driver's eyes. This results in temporary vision loss, which is undesirable while driving at a high speed at night. As per the Royal Automotive Club (RAC) in Western Australia, almost 70% of the drivers feel that these dazzling and glare effects are very risky and 300 collisions occur every year due to dazzling bright headlights. As per the surveys conducted by the Ministry of Road Transport and Highways (MoRTH), more than 700 blind spots have been identified on Indian highways. According to Fortune India, 74% of cars use high beam lights which can lead to catastrophic accidents. In the current scenario, many cars brand have developed their unique Adaptive Headlight Systems. Some of the Adaptive Headlight Systems which currently exist in the automobile industry are Mercedes Benz Intelligent Lighting Systems (ILS), Mazda Adaptive LED Headlights (ALH), and Porsche Dynamic Lighting System (DLS), etc.

In this project, we have developed an Adaptive Headlight System that works on two aspects, movement of the headlights by the steering wheel input and simultaneous intensity control of headlights by active monitoring of upcoming traffic through Light Dependent Resistor (LDR). The existing Adaptive Headlight Systems are very expensive and complex. These systems cannot be implemented on low-end car versions. Thus, a convenient and budget-friendly Adaptive Headlight System, which can be easily installed in normal mid-range cars is essential. After thorough research in the past work on the topic, we designed an Adaptive Headlight System which is extremely simple yet an effective working model. It needs no manual operation for switching ON and OFF. When the LDR detects the light from an oncoming vehicle, it automatically dims the light and when the vehicle passes by, it automatically switches back to the normal or bright headlight. The main objective of this project is to reduce the accidents caused by headlight glare and dazzling effects, as well as blind spots. It is also aimed to ensure high safety along steep curves and sharp turns.

LITERATURE REVIEW

Li. Y. et al., (2011) proposed a model using two machine learning-based approaches, Servo Vector Machine (SVM) and AdaBoost. Frame-level beam decision making with temporal smoothing was incorporated. The system has been extensively tested both online and offline to validate the robustness and effectiveness of the two proposed approaches. They compared model with Mobil-eye and Mercedes Benz night-view headlight system. They trained both SVM and AdaBoost models with the same set of data.

Mohite H., et al., (2015) proposed an Electronic Control Power Steering (ECPS) was used which turns the headlights as per the steering wheel rotation along with various light sensors. They built a mechatronic system by using microcontroller, relay, sensor and motor. The light sensor senses the intensity of light and turns on the headlight whenever the intensity of light falls below a certain value.

Wu Y. and He. L. (2019) proposed multi-sensor fusion technology in which the NCV78663 chip is used as the main chip of the LED headlamp driving unit. They measured data by changing the number of lamp beads or the

current setting. They developed a relationship between illuminance and headlamp turn-on ratio at different times. They also compared the model with Audi A8L and BMW Q series.

Omkar P. et al., (2017) presented a hardware in the loop simulation of an Adaptive Headlight System (AHS) for motor vehicles, which is an active safety system where the headlamp orientation control system rotates the right and left low beam headlights independently and keeps the beam as parallel to the curved road as possible to provide better visibility at night.

Aishwarya J. et al., (2020) proposed an automation system that illuminates the headlight beam towards the concerned area when taking a steep turn. They developed an automated headlight system using Arduino Uno which automatically detects traffic from the opposite direction and switches the light to low beam. This helps for a better and safer driving experience.

Priyanka D. and Dr. Alam S. (2018) emphasized on the Adaptive Front Lighting System (AFLS) which detects the information about the corners in advance with help of sensors and sends information to the motor to adjust headlamps to get the lighting beam suitable for the corners, thus avoiding blind spots.

Ashiq K. A. and Ranganathan A., (2015) proposed controlling the brightness of headlights using vehicle speed by varying the current flowing from the battery to the headlights. The voltage and current obtained from the alternator was varied with speed. This varying power from the alternators according to speed is directly supplied to the headlights so that brightness changes according to speed.

EQUIPMENT

The steering rack and steering wheel needed for this setup have been taken from a Maruti Suzuki Wagon R model. Mild Steel (MS) is used to build the main-frame on which the steering system is to be assembled. Two separate frames have been built to fix headlights to the main-frame. The battery needed to power the electronic circuitry of the system has a 12 Volt output and is fitted on the main-frame. The electronic circuitry of the Arduino NANO has been elevated via a rod on the main-frame to give better exposure to the LDR which is meant to capture the light from the oncoming vehicle. The headlights are taken from the Royal Enfield Classic 350 X model. The description of all the equipment is given below.

Steering Rack: The steering rack looks like a long metal tube that is located near the front of the vehicle. As the pinion gear rotates, the steering rack moves left or right between the two front wheels. This transfers the steering wheel input into the energy that moves the vehicle's front wheels to steer.

Steering Wheel: A steering wheel and the system it connects to primarily controls the direction of a vehicle. It converts the rotational commands of the driver into swivelling movements of the vehicle's front wheels.

Main-Frame: The function of the main-frame in this system is to support the mechanical components and other accessories and deal with the loads without undue deflection or distortion.

- Material: Mild Steel
- Dimensions: 900 x 500 x 300 mm
- Frame rod cross section: 40 x 40 mm

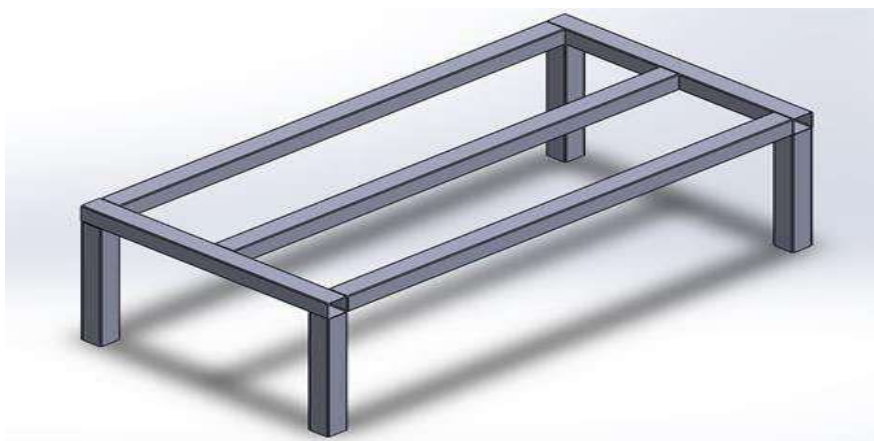


Figure 1: Proposed main-frame CAD model

Headlights: A headlight is attached to the front of a vehicle to illuminate the road ahead. The primary task of headlights on cars is to illuminate the roadway and facilitate fatigue-free and safe driving.

Headlight Frames: Two square frames were built for holding the headlights. These frames were fixed on the main-frame and connected to the linkages via fasteners.

Linkages: Two linkages have been used to connect the headlight frames to the steering system. The length of the linkages is 300 mm and the material used to make them is mild steel.

Battery: A 12 Volt battery has been used as a DC power supply source to run the Arduino NANO. The charging current of the battery is 3.5 Amps and it is fitted on the main frame.

Microcontroller: The Arduino NANO is a small, complete, and breadboard-friendly board based on the. It offers the same connectivity and specs as the Arduino Uno board in a smaller form factor.

- Microcontroller: Arduino NANO
- Operating voltage: 5 volts
- Input voltage: 7-12V
- Digital I/O pins: 22 (6 optional PWM outputs)
- Analog input pins: 8
- Power consumption: 19 mA

LDR: Light Dependent Resistor (LDR) is a type of semiconductor and its conductivity changes with a proportional change in the intensity of light. It is a resistor whose resistance decreases with increasing incident light intensity; thus, it exhibits photoconductivity.

Resistors: A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, divide voltages, bias active elements, and terminate transmission lines, among other uses. In this system, the resistors used in the electronic circuitry are specified as R1, R2, R3 and R4. All resistors are 0.25 W.

PCB: It is a non-conductive material with conductive lines printed or etched. Electronic components are mounted on the board and the traces connect the components to form a working circuit or assembly.

METHODOLOGY

The main-frame was built using mild steel on which all the components are welded to bear a high amount of load by the steering system. Then the steering rack was fixed on the main frame using U-clamps, screws and bolts. The linkages were set at both the ends of the steering rack which connects the headlights to the steering rack. These linkages were bolted to the headlight frames fixed at a symmetric distance from the main-frame centre. Thus, on steering wheel rotation, the mechanical linkages cause the headlights to rotate as well. This was followed by the fitting of the battery on the main frame. A plate of size bigger than the battery base was cut and drilled with two holes. This plate was then fitted on the main-frame with the help of screws and bolts and the battery was placed on it. The battery was given plugs with red and black colour codes on both terminals. The plate for holding the circuit of Arduino NANO was welded on a rod and elevated on the main-frame. The circuit was then glued to the plate on the rod. Finally, the wire connections from the battery to the electronic circuitry and the headlights were provided.



Figure 2: Final Assembly Model of the Adaptive Headlight System

Coding of Arduino NANO:

```

Step 1: int LED = 10;           [LED with 220 Ohm resistor on Pin 10]
Step 2: int PIN = 0;          [LDR on Analog pin 0]
Step 3: int VALUE;           [variable to store inputted analog voltage values]
Step 4: void setup () {}     [No setup needed]
Step 5: void loop ()
Step 6: {                     [Open this special bracket]
Step 7: VALUE = analogRead (PIN); [Read analog value at "PIN"]
Step 8: VALUE /= 4;          [Converts 0-1023 to 0 – 255]
Step 9: analog Write (LED, VALUE); [Outputs PWM signal to LED]
Step 10 : }                  [Close this special bracket]
    
```

Electronic Circuitry and Explanation of the Code

The LDR is connected to the analog pin zero of the Arduino NANO module via a pull-up resistor of 10 kilo Ohms. The voltage at analog pin zero varies with ambient light conditions i.e., more intense light falling on LDR will lower the voltage at analog pin zero of Arduino NANO module, while no light or less light determines the voltage accordingly at analog pin zero. No light on LDR will produce closer to 5-Volt at analog pin 0 of the Arduino NANO module. The voltage at analog pin zero varies inversely.

To read the Analog voltage value available at analog pin zero of the Arduino NANO module, the command used is “analogRead(pin)”, where pin is the integer declared globally in the code as “PIN” and the syntax used to declare it is “int PIN = 0;”. The next process is to store inputted analog voltage values in the variable declared as “VALUE” in the Arduino NANO module.

The Arduino NANO module has an internal Analog to Digital Converter (ADC) of 1024 bits i.e., 0 to 1023 bits. Though Arduino NANO module’s internal ADC register is 1024 bits wide, but internal Pulse Width Modulation (PWM) register of Arduino NANO module is 8 bits wide, which can accept a maximum value of 255. Hence ADC value requires dividing it by 4 to shrink the entire span of 0 to 1023 bits in 0 to 255 range for digital write at output. Dividing the “VALUE” by 4 and storing the new 8-bit value in the same register name “VALUE” is executed by issuing the command “VALUE /= 4.

Final step is to reflect PWM signal concerning the new 8-bit value stored in the register declared as “VALUE” in the form of PWM, we issue a command “analogWrite(LED, VALUE);”, where LED is declared as an integer globally at pin D10 by issuing a command “int LED = 10;”. The code is executed in loop function “void loop()”. It goes on executing forever. Hence no code is required in setup function called “void setup() {}”. As mentioned, D10 pin of Arduino NANO is the output pin where LED is connected via series resistor which gives output in terms of brightness according to light intensity falling on the LDR. The same output is extended via an NPN power switching transistor to drive higher watts of LED load. The inputted voltage applied to Arduino NANO Module via diode D1, D2, D3 each are forward bias and have a voltage drop of 0.7 Volt, so total voltage drop achieved comes out to be

$0.7V \times 3 = 2.1V$. The appearing voltage at the Arduino module is $12V - 2.1V = 9.9V$ DC.

In addition to this, a 3mm green LED at 12-Volt input shows the status of power of the circuit.

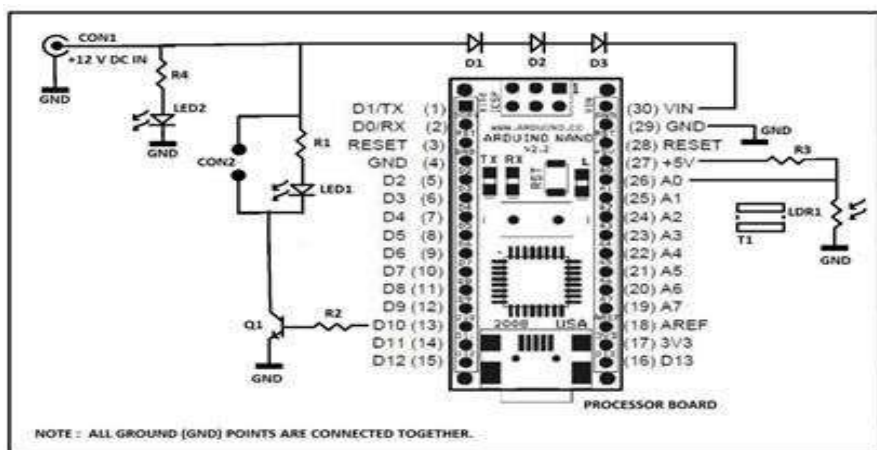


Figure 3: Circuitry of Arduino NANO

Testing of the Model

- Plug-in the terminal wires of the battery.
- Plug-in the other end of the terminal wires to the electronic circuitry of the Arduino NANO.
- Connect both the LEDs to the three-phase wires which goes inside the electronic circuit via screw tightening connections.
- The LED will start glowing depending on the light falling on the LDR.
- When you fully cover the LDR, this complete lack of light will give the output of the LED glowing at its maximum luminosity.
- When an external light falls on the LDR, it dims according to the luminosity of light falling on it.

Thus, when a vehicle's light coming from the opposite direction falls on the LDR of our car, the proposed Adaptive Headlight System will automatically activate and make our headlights glow dim according to the amount of light falling on the LDR and will remain dim till the opposite vehicle's light is being appeared on LDR. When the opposite vehicle passes away, LDR will experience zero light falling on it on the road at night, thus LDR will glow brightly.

The system works best at night and also on highways where lighting on the road is an issue. The system was tested at different times of the day and the output of the LED was noted. It was found out that the system also catches the sunlight and dims accordingly, hence it is not suitable to opt for this system in daylight. The model glows dim enough to light the area near own vehicles vicinity and at the same time reduces glare and dazzling effect from being experienced by the driver of the oncoming vehicle. Thus, giving a perfect output as desired at night.

CONCLUSION

The system works best at night and also on highways where lighting on the road is an issue. The system will be efficient at night when drivers feel the dazzling and glare effects from upcoming vehicles. The model glows dim enough to lit the area near own vehicles vicinity and at the same time reduces glare and dazzling effect from being experienced by the oncoming vehicles driver. Thus, giving a perfect output as desired at night. It was found out that the system also catches the sunlight and dims accordingly, hence it is not suitable to opt for this system in daylight. The counter product of this system is the advanced camera dependent adaptive headlights which gives much faster results as they capture satellite information of the roads and upcoming vehicles. As the fancy and extreme bright LEDs are coming in market, the significance of this project will be visible in the near future. The upcoming versions of Adaptive Headlights System can be built depending on the traffic and lighting system of the roads and specific highways and also taking into consideration the new LEDs that have potential effects on drivers while driving.

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KIDNEY STONE DETECTION USING DEEP LEARNING

Murtaza Ratlamwala¹, Amin Shaikh², Ayesha Shaikh³ and Najmuddin Aamer⁴^{1,2,3}Student and ⁴Assistant Professor, Department of Engineering, Theem College of Engineering, Boisar, India**ABSTRACT**

Ultrasound scanning is that the foremost often used tool to appear at the patient for abnormalities, especially the presence of stone, within the kidney. Kidney abnormalities are a bit like the formation of stones, cysts, blockage of urine, congenital anomalies, and cancerous cells. Kidney stone ailment (nephrolithiasis) is a not unusual trouble among the western population. Most kidney stones are small and skip spontaneously. These sufferers often need no treatment. However, a few nephrolithiasis sufferers expand big stones, which could reason enormous morbidity with inside the shape of acute signs and continual headaches if they're now no longer treated. Convolutional Neural Networks (CNN or ConvNet) are complex feed forward neural networks. CNNs are used for image classification and recognition because of its high accuracy. The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully connected layer where all the neurons are connected to each other, and the output is processed.

Keywords: Kidney Stone Detection, Convolutional Neural Networks (CNN or ConvNet)

I. INTRODUCTION

Kidney stone disease is one of the major life threatening ailments persisting worldwide. The stone diseases remain unnoticed in the initial stage, which in turn damages the kidney as they develop. A majority of people are affected by 11 kidney failure due to diabetes mellitus, hypertension, glomerulonephritis, and so forth. Since kidney malfunctioning can be menacing, diagnosis of the problem in the initial stages is advisable. Kidney stone also called as nephrolithiasis is a small, hard deposit that forms in the kidneys and is often painful when passed. Kidney stones are hard deposits of minerals and acid salts that stick together in concentrated urine. They can be painful when passing through the urinary tract, but usually don't cause permanent damage. The most common symptom is severe pain, usually in the side of the abdomen, that's often associated with nausea. Treatment includes pain relievers and drinking lots of water to help pass the stone. Kidney stone is formed when salts and certain minerals such as calcium and uric acid are accumulated in urine. It is caused because of inadequate intake of water. It mainly occurs when our body lacks fluid and accumulates a lot of waste. Medical procedures may be required to remove or break up larger stones. There are various methods for the diagnosis of kidney stone such as urine test, blood test, CT scan, MRI scan etc. By human inspection and operators, it is impossible to produce result for large amount of data. During surgical processes, it's vital to acknowledge the truth and precise location of kidney stones. Ultrasound imaging is one of the available imaging techniques used for diagnosis of kidney abnormalities. Nowadays a discipline of automation got here into lifestyles which additionally getting used with inside the clinical discipline. Rather many not unusual place issues rose because of automated analysis along with the usage of correct and accurate outcomes and additionally the usage of right 12 algorithms. The clinical analysis manner is complicated and fuzzy through nature. Convolutional Neural Networks are complex feed forward neural networks. Among all strategies, the smooth computing approach referred to as a neural community proves blessings because it will analyze the ailment through first gaining knowledge of after which detecting on a partial i.e., Feature extraction.

II. METHODOLOGY

CNN is a type of neural network model which allows us to extract higher representations for the image content. It is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image 16 and be able to differentiate one from the other. The pre-processing required in a ConvNet is much lower as compared to other classification algorithms. While in primitive methods filters are hand-engineered, with enough training, ConvNets have the ability to learn these filters/characteristics. The architecture of a ConvNet is analogous to that of the connectivity pattern of Neurons in the Human Brain and was inspired by the organization of the Visual Cortex. Individual neurons respond to stimuli only in a restricted region of the visual field known as the Receptive Field. A collection of such fields overlap to cover the entire visual area. Unlike the classical image recognition where you define the image features yourself, CNN takes the image's raw pixel data, trains the model, then extracts the features automatically for better classification.

The First Block makes the particularity of this type of neural network since it functions as a feature extractor.

The **Second Block** is not characteristic of a CNN: it is in fact at the end of all the neural networks used for classification.

The **Convolutional Layers** are the major building blocks used in convolutional neural networks. The convolutional layer is the key component of convolutional neural networks and is always at least their first layer.

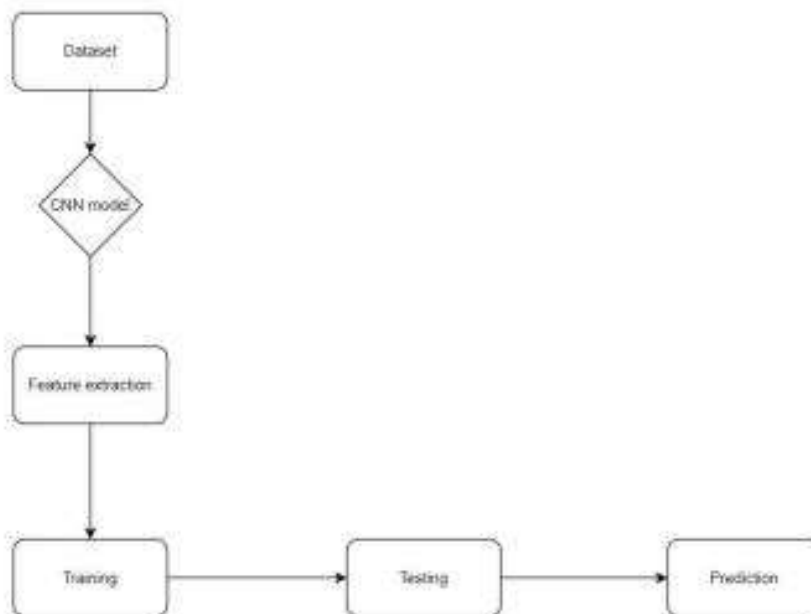
The **pooling layer** is often placed between two layers of convolution: it receives several feature maps and applies the pooling operation to each of them.

The **Relu Correction Layer** (Rectified Linear Units) refers to the real non-linear function defined by $ReLU(x)=\max(0,x)$. The ReLU correction layer replaces all 19 negative values received as inputs by zeros. It acts as an activation function.

The **Fully-Connected Layer** is always the last layer of a neural network, convolutional or not — so it is not characteristic of a CNN. This type of layer receives an input vector and produces a new output vector.

III. IMPLEMENTATION

CNN architectures are designed and proposed for classification tasks using publicly available data sets. The first of these architectures is used to decide whether a given CT image of a patient has stone or not. The proposed CNN architecture consists of weighted layers, in which there are two convolutional layers and one fully connected layer, as shown in Fig. 4.1. The convolutional layer is the most important CNN layer and is also known as the transformation layer. This transformation is performed by moving a particular filter over the whole input image (64, 64). The convolutional layers are followed by the rectified linear units' layer (ReLU layer) and maxpooling layers. The ReLU layer follows the convolution layers and is used as a rectifier unit. The RELU layer's effect on the input data is that it takes negative values to zero. In all architectures, ReLU is used as an activation function, since it is already a standard activation function in image classification tasks. A pooling layer is generally placed after the ReLU layer, and its main task is to decrease input size (width × height) for the subsequent convolution layer. In the CNN architecture, the consecutive convolution, ReLU, and pooling layers are followed by a fully connected layer (64, 64). This layer is connected to all neurons of the previous layer. The fully connected layer, resulting in a two-dimensional feature vector, is fed as an input to Softmax classifier, which makes the 29 final prediction whether there is the novel coronavirus or not. There are two neurons in the output layer, as this model tries to classify an image into two classes: Stone present or No Stone.



IV. CONCLUSION

Prevention of kidney stone formation and recurrence is still a significant problem for human health. Impairment of kidney function due to the formation of kidney stones endangers human life. Therefore, early diagnosis of kidney stones is critical. In recent years, machine learning and deep learning approaches have been widely adopted to diagnose diseases thanks to the development of technology. These methods provide a reliable tool for making definitive diagnostic decisions that require long and complex 34 processes, as they shorten the diagnosis time and increase the diagnostic accuracy. Region of interest detection within the ultrasound image could even be a challenging task due to the heterogeneous texture than the presence of speckle noise. Ultrasound scanning is that the foremost often used tool to appear at the patient for abnormalities, especially the presence of stone, within the kidney. The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully connected layer where all the neurons are connected to each other, and the output is processed.

V. FUTURE SCOPE

In future work, the proposed technique is probably designed for real-time implementation through interfacing it with the scanning machines. Training deep learning neural network models on more data can result in more skilful models. The captured kidney image can be subjected to the proposed set of policies to end up aware about the affected location and for correct class of kidney stone. For undertaking higher accuracy, we're capable of evaluate the outcomes of different neural networks.

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DESIGN AND FABRICATION OF PORTABLE PPE KIT STERILIZATION

Abhishek Mane¹, Siddhi Cheulkar², Romil Arora³, Aarti Singh⁴ and M. A. Gulbarga⁵^{1,2,3,4}Student and ⁵Head of Department of Mechanical Engineering, H. J. Thim Trust's Theem College of Engineering**ABSTRACT**

Medical demands during the COVID-19 pandemic have triggered a grave shortage of medical-grade personal protective equipment (PPE), especially, N95 respirators. N95 respirators are critical for the personal protection of medical providers and others when being exposed to individuals with infections caused by the SARS-CoV-2 coronavirus. To address the shortage of PPE Kit & N95 respirators, innovative methods are needed to decontaminate coronaviruses from N95 respirators & PPE Kit, allowing them to be safely reused by healthcare workers.

Keywords: UV, UV-C LED, Sterilize, Ultraviolet-C; decontamination; N95 respirator; peracetic acid; SARS-CoV-2, ozone

1. INTRODUCTION

Personal protective equipment (PPE) is essential for protection of personnel and patients in healthcare settings. The pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has resulted in shortages of critical supplies, including PPE. These shortages have led many facilities to consider strategies to extend or reuse PPE, particularly N95 filtering facepiece respirators. The Centers for Disease Control and Prevention and the National Institute for Occupational Safety and Health (NIOSH) have provided guidance the acceptability of extended use or limited reuse of N95 respirators & PPE Kit. The guidance document includes a discussion of potential concerns regarding these practices, particularly the risk for contact transmission from touching a contaminated respirator. There is an urgent need for evidence regarding the effectiveness of decontamination strategies for PPE. The goal of the current study was to examine the effectiveness of UV-C light and a high-level disinfection cabinet for decontamination of PPE Kit & N95 respirators.

2. LITERATURE REVIEW

A. Effectiveness of an Ozone Disinfecting and Sanitizing Cabinet to Decontaminate a Surrogate Virus for SARS-CoV-2 on N-95 Masks | Megan S. Beaudry (4 April 2020)

Author Writes, Effectiveness of an Ozone Disinfecting and Sanitizing Cabinet to Decontaminate a Surrogate Virus for SARS-CoV-2 on N-95 Masks that the COVID-19 pandemic has dramatically reduced the availability of PPE. During this global emergency, decontamination and reuse of FFRs may be necessary when access to PPE is limited. We have demonstrated that ozone sterilization is an effective method for the decontamination of N95 mask materials.

B. Ultraviolet-c and other methods of decontamination of 2 filtering facepiece n-95 respirators during the covid-19 pandemic | Henry W. Lim (24 April 2020)

Author Writes, The current COVID-19 pandemic, extreme measures are needed to keep those on the front line protected. UVC, hydrogen peroxide, microwave, and dry heat systems are all viable options to kill microorganisms on N95 FFRs to enable their reuse. These options are cost-effective, quick to employ, and have the potential to save many lives and valuable resources. These methods have demonstrated good biocidal activity against many viruses including influenza, SARS-CoV and MERS-CoV however, their efficacy against the novel coronavirus SARS-CoV-2 specifically has not been tested.

3. METHODOLOGY AND UVC RADIATION APPLICATION

Ultraviolet Radiation is an electromagnetic wave with low wavelength and high energy lying between X-ray and Visible Light spectrum. The wavelength of UV rays is 400 nanometers to 100 nanometers. This spectrum is divided into UV-A, UV-B and UV-C bands. The wave length of UV-A is from 400nm to 315nm, UV-B is from 315nm to 280nm. UV-C radiation covers wavelength spectrum from 280 nm to 200 nm. The UV radiation below 200nm does not propagate in air and can only pass-through vacuum, so this band is called Vacuum-UV. Ultraviolet germicidal irradiation (UVGI) with wavelength of 254 nm can kill or destroy the DNA of bacteria or virus like SARS-CoV-2 more efficiently, but this particular wavelength radiation can penetrate into human skin and eye and causes damage to both. But the far UV-C with wavelength between 222nm to 207nm, have almost similar germicidal properties and very less impact on human body. So, the disinfectant UV-C radiators are designed to operate in this spectrum.

4. OZONE PRODUCTION

When oxygen comes in the contact with UVC Lamp it slips into single molecule of ozone, that single molecule combine with O_2 and forms ozone.

5. CHOICE OF UVGI EXPOSURE DOSE

We chose 1.0 J/cm² as a minimum UV-C dose for mask decontamination, which is also consistent with recently released guidance from governmental and non-governmental agencies. The UV-C unit used at the VA Portland Health Care System delivers 1.0 - 2.0 J/cm² to each PPE Kit.

6. DESIGN AND CONSTRUCTION

First of all, wooden cabinet of (lxbxh)=(50x50x80) with one side door opening with hinges and door opening and locking with the help of door magnetic catcher and one more wooden box of (lxbxh)=(14x14x50) for circuitry and dc fan. Now cover the edges with the help of sealing rubber and add 4 wheels on the cabinet and place hook on under the top of the cabinet drill the cabinet with suitable holes for circuitry and now place UVC lamp with adapter and attach to the cabinet with the help of UVC light holder in left right and middle of the cabinet attach a wiring to the adapter to connect to the circuitry also make a drill for a bulb holder make a connection up to the circuitry.

Now add ozone sensor to the cabinet for sensing the ozone level now at the second wooden box add circuitry and the wires of the cabinet and attach lcd display to it with ozone sensor once the circuitry complete and aluminum foil inner surface of the cabinet and from outer add wall paper for better design.

And now hang the PPE Kit and start the process of sterilization wait for 240 seconds to sterilize and now PPE kit is free from all types of viruses and bacteria.



Fig: Testing with PPE Kit

7. COMPONENTS

1. UVC Lamp

UVC lamps used for disinfection purposes may pose potential health and safety risks depending on the UVC wavelength, dose, and duration of radiation exposure.



Fig: UVC Lamp

2. LCD Display

An electronic device that is used to display data and the message is known as LCD 16x2.



Fig: LCD Display

3. Ozone Sensor

MQ131 **ozone gas sensor** has high sensitivity to ozone, and also has sensitivity to strong oxide such as Cl₂, NO₂ &etc. Use for sensing ozone in the cabinet.



Fig: Ozone Sensor

4. W1209 Digital Temperature Controller Thermostat Module

The **W1209 Digital Temperature Controller Thermostat Module** W1209 thermostat module has a temperature sensor, keys, LED display, relay and requires DC 12V power supply. It is an affordable, good quality thermostat controller.



Fig: W1209 Digital Temperature Controller Thermostat Module

5. Arduino UNO

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects.

This board contains a USB interface i.e., USB cable is used to connect the board with the computer and Arduino IDE (Integrated Development Environment) software is used to program the board.



Fig: Arduino UNO

8. WORKING

Main function of our project is sterilization of PPE kit for instant use in 240 seconds. And to meet this condition, we have designed a cabinet who is capable to sterile it in 240 seconds. In our cabinet a process take place. Process of ozone formation air inside the cabinet will interact with the UVC light and form ozone as we all know that ozone is disinfectant than ozone formed in cabinet will disinfect the PPE and make it ready for instant use. Ozone is a gas that can reach all areas of the PPE kit so that it is sterilized inside out. Ozone is a proven disinfection and has the ability to disinfect surfaces of bacteria and viruses. The system can generate ozone out of air and no need for water or chemicals or any other inputs. The system makes use of a UV based ozone generator. UV or ultraviolet light (185 to 200nm) can generate ozone gas from air.

When air comes in contact with this UV frequency, the oxygen in air is converted to Ozone. The ozone is then reverse passed through UV chamber this time with a different light frequency to convert it back to oxygen. The system uses ozone sensors in sterilization chamber to check for ozone levels ozone is a harmful gas if inhaled in certain quantity.

9. MAINTENANCE

1. Clean the inner and outer surface of sterilizer cabinet with the help of lint free cloth soaked in disinfectant solution. Once in a month check the intensity of UV lamp by using LUX meter.
2. Replace UV lamp of the sterilizer cabinet after 2000 hours of burning.

10. ADVANTAGES AND LIMITATIONS OF DECONTAMINATION METHODS**Advantages:**

- Good germicidal activity
- Short treatment duration
- Has activity against coronaviruses

Disadvantages:

- Not readily available
- Degrades polymers

11. DISCUSSION

Shortages of PPE are a grave concern for many healthcare facilities in the setting of the global COVID-19 pandemic. Our findings have important implications for facilities that are considering decontamination of PPE as a potential strategy to maintain adequate supplies. Using a rigorous test method, we found that UV-C reduced contamination of PPE Kit with E.Coli and MS2 bacteriophages and MRSA. However, there was considerable variability in reductions achieved on different respirator brands and on different locations on the respirators. The efficacy on the interior surface of the respirator was reduced in comparison to the outer surface, possibly due to the permeability of the inner surfaces to the liquid suspensions resulting in reduced access by UV-C. Our results suggest that facilities might consider use of the UV-C box or room decontamination devices to reduce contamination on respirators that will be reused by individuals. However, the levels of reduction did not meet our pre-established criteria for decontamination (i.e., >3-log₁₀ reduction on inoculated respirators), and more over would not have met a >2-log₁₀ reduction requirement for decontamination. Thus, the level of reduction would not be adequate to allow shared use of respirators by different individuals.

The high-level disinfection cabinet was more effective than UV-C and provided 2.1 or greater log₁₀ reductions in bacteriophage MS2 on both outer and inner surfaces of the respirator with a single cycle. It is not able that this level of reduction is substantially lower than the 6-log₁₀ reductions in bacteriophage MS2 achieved on solid carriers in previous studies with this technology. Moreover, the single cycle resulted in >6-log₁₀ reductions in MRSA and C. difficile spores inoculated on the respirator, despite greater UV-C resistance of these organisms on solid surfaces. Taken together, these data suggest that reduction in viral pathogens on PPE Kit might be challenging, in part because the small size of viral particles allows them to penetrate beneath the respirator surface to a greater extent than bacteria resulting in partial protection from technologies such as UV-C and aerosolized peracetic acid. These data also highlight the importance of including viruses in the testing of technologies proposed for PPE Kit decontamination. With 3 consecutive cycles or an extended cycle, the high-level disinfection cabinet met criteria for disinfection, achieving >6-log₁₀ reductions on PPE Kit.

12. RESULTS

S.No.	Test Organism	Duration of Exposure to UV radiation		
		120 sec	180 sec	240 sec
1	E.coli MTCC 68 (bacterium)	99.99996	Not Applicable	Not Applicable
2	MS2 phage ATCC1559781 Surrogate Virus – MS2 phage	99.91 % Reduction	99.975 %	≥99.9883

Table: Microbial Reduction with Different Exposure Timing to UV Treatment

A Report was taken up to assess the efficacy Sample of PPE Kit's using E.coli MTCC 68 (Bacterium) and MS2 phage ATCC15597B1 (Surrogate Virus - bacteriophage). Different time of exposures were given in separate trials with reference to MS2 phage viz. 120 sec, 180 sec, 240 sec and only 120 seconds in case of E.coli organism. Tested Sample was found to be effective.

13. OBSERVATION

Observed that UvC light is effective towards the viruses and bacteria's E.coli MTCC 68 (Bacterium) and MS2 phage ATCC15597B1 (Surrogate Virus - bacteriophage).

14. CONCLUSION

After sterilization found that the its effectively sterilize the PPE kit and kill all type of viruses and bacteria with the help of ozone and UVC light.

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¹Sandeep Maurya, ²Soham Deshmukh, ³Rais Ansari and ⁴Sneha Sankhe^{1,2,3}UG Student and ⁴Professor, Department of Information Technology, TCOE, MU, Maharashtra, India**ABSTRACT**

Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer or consumer-to-business. Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include: overcoming geographical limitations, lower costs, 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers.

Ecommerce is becoming increasingly popular in Arab countries due to its various advantages over traditional brick and mortar retailing. Sultanate of Oman is one of the important economies in this region and is a key emerging market. Oman has witnessed a boom in Ecommerce activities including B2B and B2C activities. Attaining customer satisfaction is one of the keys to success in today's crowded and competitive online market. This study attempts to find and analyse the important factors affecting customer satisfaction with Ecommerce websites and online purchasing in Oman. The study shows that Price and Ease of Use and availability of multiple payment options are the important factors that positively influence customer satisfaction.

Keywords: Ecommerce, Customer Satisfaction

I. INTRODUCTION

Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer or consumer-to-business. The terms e-commerce and e-business are often used interchangeably. The term e-tail is also sometimes used in reference to the transactional processes for online shopping. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. (www.wikipedia.org).

Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle although it may also use other technologies such as e-mail. There are three areas of e-commerce: online retailing, electronic markets, and online auctions. Whereas e-business refers to all aspects of operating an online business, ecommerce refers specifically to the transaction of goods and services.

A. Benefits of E-Commerce

Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include : overcoming geographical limitations, lower costs , 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers. However, some customers prefer purchasing physical products as it enables them to touch, feel and try them out prior to buying.

B. Customer Satisfaction with Ecommerce Services

At a global level, customer satisfaction leading to loyalty (e.g. customer retention) is generally very strongly related to the profitability and long-term growth of a firm [Reichheld ,1995]. Small increases in customer retention rates can dramatically increase profit [Huffmire, 2001]. Loyal customers visit their favorite websites twice as often as non- loyal customers, and loyal customers spend more money [Dialscore.com 2000]. According to analysts, 35 to 40% of e-commerce website sales revenue comes from repeat visitors [Rosen , 2001]. As such, it is not surprising that customer loyalty has been found to be a critical asset for retailers. Reichheld and Schefter [2000] found that the high cost of acquiring new online customers could lead to unprofitable customer relationships for up to three years. Consequently, it is very useful to determine the key antecedents or factors that influence customer satisfaction with ecommerce websites.

Previous research found that e-retailers experience difficulty maintaining customer satisfaction despite the recent rapid growth in B2C e-commerce [Hoffman and Novak, 2000]. Although there are certainly challenges shared by both traditional retailers and e-retailers, e-retailers face greater competition due to the fact that on the Internet a competitor is only a click away [Mithas, Ramasubbu, Krishnan, and Fornell, 2007]. Due to the ease of surfing websites, e-retailers face an uphill task in attracting, satisfying and retaining customers. This study looks at some of the key factors affecting customer satisfaction with regards to E-commerce websites in Sultanate of Oman.

Though numerous studies have been conducted to determine the factors affecting customer satisfaction with E-commerce in several countries, the number of such studies in Arab countries is quite limited. At the same time, the number of people buying products online has seen a steady increase in the Sultanate of Oman, with websites like Namshi, Roumaan and Souq becoming increasingly popular among people, especially the youth, who are internet savvy. Thus the motivation of this study is to determine the key factors affecting the satisfaction and loyalty of customers of online services in the Sultanate of Oman. In addition it aims to determine whether access, ease of use of website and online payments, safety and security and pricing of products are direct antecedents of customer satisfaction. The research questions addressed in this study are as follows:

1. What are the key factors affecting customer satisfaction with e-commerce websites in Sultanate of Oman?
2. Do access and quality of interface, ease of use and payments, safety and security and pricing of products affect the satisfaction of customers with e-commerce websites?

As there are very few studies on the key factors affecting customer satisfaction with e-commerce websites in the Gulf region in general and Oman in particular, this study will play a role in addressing this gap in the extant literature. Also, the managers of e-commerce companies can utilize the findings to identify the gaps and shortcomings in their service offerings in order to improve customer satisfaction levels and customer loyalty. From an academic perspective, this study provides insights that will improve our understanding of the impact of various factors related to e-commerce customer loyalty in the context of Sultanate of Oman as one major developing country in the Middle East. The study will add value to the literature of e-commerce in terms of improving our understanding of the impact of ease of access, website user interface design, e-payments, e-security and price on e-satisfaction.

II. LITERATURE REVIEW

Firdaus Khan and Noura Al Jahwari (2018) in their study on factors affecting customer satisfaction of online shopping in Oman concluded that the perceptions of the youth confirming the product quality & service guarantee influenced comfort and satisfaction to the online customers. The study also revealed that the service tangibility concerning the guaranteed package and delivery process along with the lowest price motivated them to go for online shopping repeatedly. The study illustrates through Quality Safety Assurance (QSA) model, the factors viz. Product Quality, Application Safety, Delivery Guarantee, and Offers should be focused to improve the online customer satisfaction, and the best-buy offers are the factors which need more attention to increase the Omani clientele.

Zatalini and Pamungkas (2016) pointed out that the factors leading to customer loyalty and the successful implementation of online retailing are the privacy of customer information and security and the speed of service. According to Suh and Han (2003), security is the biggest issue, the online shopping customers worried about and so higher the system security; higher will be the customer

satisfaction. According to Suh and Han (2003), security is the biggest issue, the online shopping customers worried about and so higher the system security; higher will be the customer satisfaction.

Oxley and Yeung (2001) confirmed that online shopping is widely preferred because it provides easy access to a large amount of information at reduced costs. AlGhamdi, Nguyen, Nguyen, and Drew (2012) claimed that the factors encouraging companies to engage in online retailing are the Government action in the form of reliable and secure online payment option, e-commerce support, strong ICT infrastructure, and educational e-commerce awareness programs in the country.

Christian & France (2005) proves that customers satisfied the most were privacy (Technology factor), Merchandising (Product factor), and convenience (Shopping factor); also followed by trust, delivery, usability, product customization, product quality and security. Surprisingly, security was chosen as the last choice comparing to others. Thus customers assume that security is a standard attribute present in all websites and other factors take precedence over it. David J. Reibstein (2002) did a study on the role of price in attracting

customers to the site and retaining them. However, it was found that price alone is not a decisive factor as customers tend to shop at other sites unless the vendors provide them good customer service and on-time delivery. Interestingly, e-shopping site using low prices or price promotions to attract customers do mostly tend to draw price-sensitive customers who are well known as having low loyalty and are prone to switching.

Jarvenpaa & Todd (1997) in their study found that convenient and dependable shopping and ease of use of website are the most significant factors to satisfy online customers since the shoppers make their purchase decision depending on the process of delivery starting from accurate information of merchandise availability, anticipated delivery date, and confirmation e-mail for specific order. Hence it is necessary to explain all policies including returns and refunds clearly and this will increase the trust of the customers

III. METHODOLOGY

A. Conceptual Framework and Hypotheses

I. Conceptual framework

This study aims to investigate the impact of the antecedent factors on customer satisfaction with ecommerce sites with variables shown in Fig. 1.



Fig 1: Conceptual Framework

i. HYPOTHESES

1. Easy access to the website has positive effect on Customers' satisfaction with Ecommerce websites.
2. Ease of use of site and availability of multiple payment options has a positive effect on Customers' satisfaction with Ecommerce websites.
3. Safety and security of online transactions has a positive effect on Customers' satisfaction with Ecommerce websites.
4. Prices of products and offers have a positive effect on Customers' satisfaction with Ecommerce websites.

B. Population and Sampling

The population of the study are citizens and residents in the Sultanate of Oman who have at least a onetime experience in shopping online. The sample size of this research is 150 and descriptive research design has been utilized in this study as it is found to be most appropriate for the research problem. Convenience sampling has been used to collect the data for analysis.

C. Research Instrument

The data collection instrument used in this study is structured questionnaire. This questionnaire consists of 20 questions to measure the customers perceptions about the variables used in the study. A 5 point Likert scale has been used to measure the responses.

D. Reliability and Validity

The most popular test of reliability used by numerous researches is Cronbach’s coefficient alpha (Cronbach’s alpha) which will test the consistency of respondent’s answers to all the items in the measurement. The Cronbach alpha of all the variables exceed 0.7 which makes them acceptable for the study.

Table 1: Kmo Measures

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	840.055
	df	190
	Sig.	.000

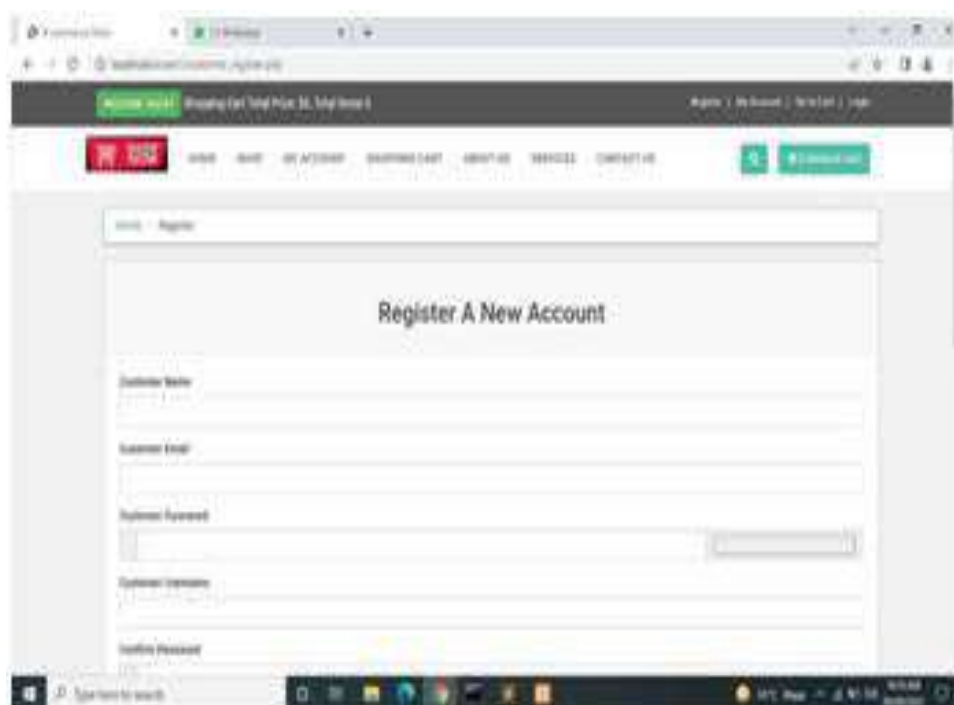
KMO Measure of sampling adequacy is a statistic that indicates the proportion of variance in the variables that maybe caused by underlying factors. Any value above 0.6 is considered adequate. The KMO of the variables in this study is 0.832 which shows that the variables are highly appropriate for the analysis.

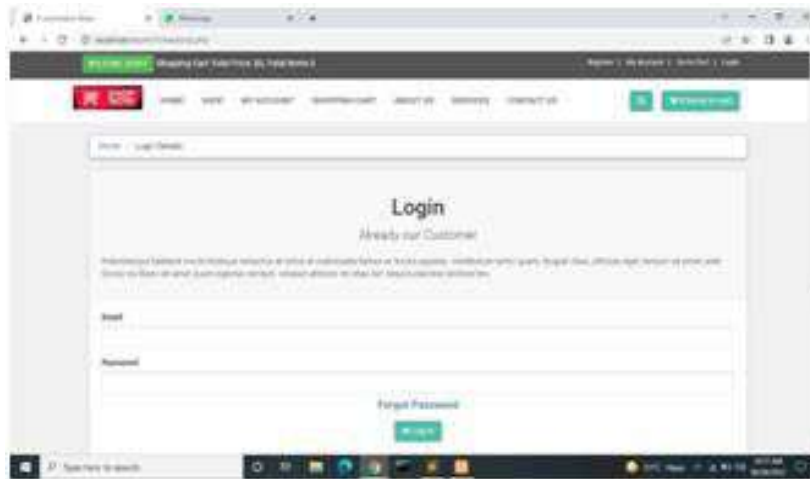
IV.RESULTS

A) Home Page



B) Login Page





Multiple Regression Analysis

Multiple regression analysis is employed in this study. All variables hypothesized are entered in the single step. The enter method enables to include all variables in the proposed model.

HO: Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have no significant positive effect on customers’ satisfaction with Ecommerce websites.

H1: Access, Ease of Use and availability of multiplepayment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers’ satisfaction with Ecommerce websites.

Table 2: Model Summary

Model Summary				
Model	R	R Square	AdjustedR Square	Std. Error oftheEstimate
1	.672 ^a	.451	.422	.93799

a. Predictors: (Constant), Price, Safety and Security, Ease of Use and Payment Options, Access

The coefficient of determination (R^2) is .422 which means that 42.2% of variation in customer satisfaction with Ecommerce websites in Oman can be explained by the predictor variables Access, Price, Safety and Security, Ease of Use and Payment Options. The remaining part is explained by various other factors.

ANOVA ^a						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	68.047	5	13.609	15.468	.000 ^b

Table 3: Anova

Shown in Table 3, F- value of 15.468 is significant at 0.05 levels indicating that there exists at least one independent variable affect to dependent variable. Hence, this research rejects the Ho and accepts H1 that Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers’ satisfaction with Ecommerce websites.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficient s	t	Sig.
		B	Std. Error	Beta		
1	Constant	.937	.377		2.488	.015
	Access	.008	.099	.008	.081	.936
	Safety	-.058	.093	-.059	-.627	.532
	Ease of Use	.291	.093	.301	3.109	.002
	Price	.504	.097	.502	5.205	.000

Table 4: Table of Coefficients

The variables having the highest standardized beta coefficients are Price (.502) followed by Ease of Use (.301), Access (.008) and Safety and Security (-.059). Thus, Price has the highest influence on customer satisfaction followed by Ease of Use and Payment Options, Access and Safety and Security respectively. The variables Ease of Use and Price have got the maximum t – values of 3.109 and 5.205 respectively. This shows that Price and Offers has the maximum impact on customer satisfaction followed by Ease of use and multiple payment options. The p values of Ease of Use are .002 and for price it is .000 at .05 level of significance. However, the p values of Safety and Access are .532 and .936 respectively which indicate that they are not significant at this level of confidence.

Thus the model is:

Customer Satisfaction with Ecommerce Sites = .008 (Access) + .301 (Ease of Use and Payment Options) +.502 (Price) -.059 (Safety and Security).

CONCLUSION

This study was conducted to analyse the key factors affecting satisfaction of customers in Sultanate of Oman with Ecommerce firms and online purchases. Four variables namely, Access , Ease of Use of the website and availability of multiple payment options, Safety and Security and Price were identified as antecedent variables affecting satisfaction of online customers. The analysis shows that these factors together explain 42.2% variation in the customers' satisfaction with Ecommerce websites in Oman. Out of these predictor variables, Price and Ease of Use and availability of multiple payment options have been found to have a significant impact on customers' satisfaction while the impact of Safety and Security and Access was not so significant. This finding is consistent with the study of Thomas and Harry (2004) revealing that the respondents with experience in purchasing were more likely to be influenced by price. This may be due to the fact that most customers buy online to avail of the significant offers and discounts offered by retailers. Luxury products are rarely sold online . At the same time, a website that is user friendly and easy to navigate will further encourage customers to spend more time online and look at more products. A choice of payment options like credit and debit cards as also Cash on Delivery increase the convenience of customers. This is in line with the findings of Jiradilok, Malisuwan, Madan, and Sivaraks (2014) who claim that that the shopping experience plays an important role in attracting customers as the experienced customers have sufficient knowledge of the price, the reliability of the website and the payment security. Access to online websites is not an issue these days due to easy availability of affordable internet services including mobile data in Oman. Additionally, safety and security are assumed to be the responsibility of all Ecommerce platforms and this may explain its relative insignificance.

In addition to these factors, reliability, quality and assurance are also key factors that attract customers to online retailers. Thus Ecommerce companies have to formulate consistent policies and ensure that these are properly communicated to customers at all times. Innovative pricing strategy is the key to success in the online retail scenario. The retailers have to formulate the right mix of offers, discounts and allowances that will keep customers coming back for repeat purchases. This is very important considering that the cost of customer acquisition is significantly higher than that of retention. An attractive and user friendly website is also a key prerequisite to a successful online venture. The site has to be kept fresh and updated regularly. All possible payment options should be offered to increase the attractiveness of the offering. The other attributes like appropriate pricing, responsibility, website information quality, and reliability should also be added into the websites .

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SHOP NOW ECOMMERCE WEBSITE

¹Sandeep Maurya, ²Soham Deshmukh, ³Rais Ansari and ⁴Sneha Sankhe^{1,2,3}Student of B.E and ⁴Professor, Information Technology, Theem College of Engineering, Maharashtra, India**ABSTRACT**

Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer or consumer-to-business. Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include: overcoming geographical limitations, lower costs, 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers.

Ecommerce is becoming increasingly popular in Arab countries due to its various advantages over traditional brick and mortar retailing. Sultanate of Oman is one of the important economies in this region and is a key emerging market. Oman has witnessed a boom in Ecommerce activities including B2B and B2C activities. Attaining customer satisfaction is one of the keys to success in today's crowded and competitive online market. This study attempts to find and analyse the important factors affecting customer satisfaction with Ecommerce websites and online purchasing in Oman. The study shows that Price and Ease of Use and availability of multiple payment options are the important factors that positively influence customer satisfaction.

Keywords: Ecommerce, Customer Satisfaction

I. INTRODUCTION

Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer or consumer-to-business. The terms e-commerce and e-business are often used interchangeably. The term e-tail is also sometimes used in reference to the transactional processes for online shopping. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.(www.wikipedia.org).

Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle although it may also use other technologies such as e-mail. There are three areas of e-commerce: online retailing, electronic markets, and online auctions. Whereas e-business refers to all aspects of operating an online business, ecommerce refers specifically to the transaction of goods and services.

B. Benefits of E-Commerce

Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include : overcoming geographical limitations, lower costs , 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers. However, some customers prefer purchasing physical products as it enables them to touch, feel and try them out prior to buying.

C. Customer Satisfaction with Ecommerce Services

At a global level, customer satisfaction leading to loyalty (e.g. customer retention) is generally very strongly related to the profitability and long-term growth of a firm [Reichheld ,1995]. Small increases in customer retention rates can dramatically increase profit [Huffmire, 2001]. Loyal customers visit their favorite websites twice as often as non- loyal customers, and loyal customers spend more money [Dialscore.com 2000].According to analysts, 35 to 40%of e-commerce website sales revenue comes from repeat visitors [Rosen , 2001]. As such, it is not surprising that customer loyalty has been found to be a critical asset for retailers. Reichheld and Schefter [2000]found that the high cost of acquiring new online customers could lead to unprofitable customer relationships for up to three years. Consequently, it is very useful to determine the key antecedents or factors that influence customer satisfaction with ecommerce websites.

Previous research found that e-retailers experience difficulty maintaining customer satisfaction despite the recent rapid growth in B2C e-commerce [Hoffman and Novak, 2000]. Although there are certainly challenges shared by both traditional retailers and e-retailers, e-retailers face greater competition due to the fact that on the Internet a competitor is only a click away [Mithas, Ramasubbu, Krishnan, and Fornell, 2007]. Due to the ease of surfing websites, e-retailers face an uphill task in attracting, satisfying and retaining customers. This study looks at some of the key factors affecting customer satisfaction with regards to E-commerce websites in Sultanate of Oman.

Though numerous studies have been conducted to determine the factors affecting customer satisfaction with E-commerce in several countries, the number of such studies in Arab countries is quite limited. At the same time, the number of people buying products online has seen a steady increase in the Sultanate of Oman, with websites like Namshi, Roumaan and Souq becoming increasingly popular among people, especially the youth, who are internet savvy. Thus the motivation of this study is to determine the key factors affecting the satisfaction and loyalty of customers of online services in the Sultanate of Oman. In addition it aims to determine whether access, ease of use of website and online payments, safety and security and pricing of products are direct antecedents of customer satisfaction. The research questions addressed in this study are as follows:

1. What are the key factors affecting customer satisfaction with e-commerce websites in Sultanate of Oman?
2. Do access and quality of interface, ease of use and payments, safety and security and pricing of products affect the satisfaction of customers with e-commerce websites?

As there are very few studies on the key factors affecting customer satisfaction with e-commerce websites in the Gulf region in general and Oman in particular, this study will play a role in addressing this gap in the extant literature. Also, the managers of e-commerce companies can utilize the findings to identify the gaps and shortcomings in their service offerings in order to improve customer satisfaction levels and customer loyalty. From an academic perspective, this study provides insights that will improve our understanding of the impact of various factors related to e-commerce customer loyalty in the context of Sultanate of Oman as one major developing country in the Middle East. The study will add value to the literature of e-commerce in terms of improving our understanding of the impact of ease of access, website user interface design, e-payments, e-security and price on e-satisfaction.

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customers tend to shop at other sites unless the vendors provide them good customer service and on-time delivery. Interestingly, e-shopping site using low prices or price promotions to attract customers do mostly tend to draw price-sensitive customers who are well known as having low loyalty and are prone to switching.

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III. METHODOLOGY

E. Conceptual Framework and Hypotheses

i. Conceptual framework

This study aims to investigate the impact of the antecedent factors on customer satisfaction with ecommerce sites with variables shown in Fig. 1.



Fig 1: Conceptual Framework

ii. HYPOTHESES

1. Easy access to the website has positive effect on Customers’ satisfaction with Ecommerce websites.
2. Ease of use of site and availability of multiple payment options has a positive effect on Customers’ satisfaction with Ecommerce websites.
3. Safety and security of online transactions has a positive effect on Customers’ satisfaction with Ecommerce websites.
4. Prices of products and offers have a positive effect on Customers’ satisfaction with Ecommerce websites.

F. Population and Sampling

The population of the study are citizens and residents in the Sultanate of Oman who have at least a onetime experience in shopping online. The sample size of this research is 150 and descriptive research design has been utilized in this study as it is found to be most appropriate for the research problem. Convenience sampling has been used to collect the data for analysis.

G. Research Instrument

The data collection instrument used in this study is structured questionnaire. This questionnaire consists of 20 questions to measure the customers perceptions about the variables used in the study. A 5 point Likert scale has been used to measure the responses.

H. Reliability and Validity

The most popular test of reliability used by numerous researches is Cronbach’s coefficient alpha (Cronbach’s alpha) which will test the consistency of respondent’s answers to all the items in the measurement. The Cronbach alpha of all the variables exceed 0.7 which makes them acceptable for the study.

Table 1: Kmo Measures

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	840.055
	df	190
	Sig.	.000

KMO Measure of sampling adequacy is a statistic that indicates the proportion of variance in the variables that maybe caused by underlying factors. Any value above 0.6 is considered adequate. The KMO of the variables in this study is 0.832 which shows that the variables are highly appropriate for the analysis.

IV. RESULTS

Multiple Regression Analysis

Multiple regression analysis is employed in this study. All variables hypothesized are entered in the single step. The enter method enables to include all variables in the proposed model.

HO: Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have no significant positive effect on customers’ satisfaction with Ecommerce websites.

H1: Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers’ satisfaction with Ecommerce websites.

Table 2: Model Summary

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.672 ^a	.451	.422	.93799	

a. Predictors: (Constant), Price, Safety and Security, Ease of Use and Payment Options, Access

The coefficient of determination (R^2) is .422 which means that 42.2% of variation in customer satisfaction with Ecommerce websites in Oman can be explained by the predictor variables Access, Price, Safety and Security, Ease of Use and Payment Options. The remaining part is explained by various other factors.

Table 3: Anova

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.047	5	13.609	15.468	.000 ^b
	Residual	82.703	94	.880		
	Total	150.750	99			

Are .532 and .936 respectively which indicate that they are not significant at this level of confidence



Thus the Model Is

Customer Satisfaction with Ecommerce Sites = .008 (Access) + .301 (Ease of Use and Payment Options) +.502 (Price) -.059 (Safety and Security).

a. Dependent

Variable:

Customer Satisfaction

With

V. CONCLUSION

This study was conducted to analyse the key factors

Ecommerce Sites

b. Predictors: (Constant), Price, Safety and Security, Ease of Use and Payment Options, Access

Shown in Table 3, F- value of 15.468 is significant at

0.05 levels indicating that there exists at least one independent variable affect to dependent variable. Hence, this research rejects the Ho and accepts H1 that Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers' satisfaction with Ecommerce websites

Table 4: Table of Coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficient s	t	Sig.
		B	Std. Error	Beta		
1	Constant	.937	.377		2.488	.015
	Access	.008	.099	.008	.081	.936
	Safety	-.058	.093	-.059	-.627	.532
	Ease of Use	.291	.093	.301	3.109	.002
	Price	.504	.097	.502	5.205	.000

a. Dependent Variable: Customer Satisfaction with Ecommerce sites.

The variables having the highest standardized beta coefficients are Price (.502) followed by Ease of Use (.301), Access (.008) and Safety and Security (-.059). Thus, Price has the highest influence on customer satisfaction followed by Ease of Use and Payment Options, Access and Safety and Security respectively. The variables Ease of Use and Price have got the maximum t – values of 3.109 and 5.205 respectively. This shows that Price and Offers has the maximum impact on customer satisfaction followed by Ease of use and multiple payment options. The p values of Ease of Use are .002 and for price it is .000 at .05 level of significance. However, the p values of Safety and Access affecting satisfaction of customers in Sultanate of Oman with Ecommerce firms and online purchases. Four variables namely, Access , Ease of Use of the website and availability of multiple payment options, Safety and Security and Price were identified as antecedent variables affecting satisfaction of online customers. The analysis shows that these factors together explain 42.2% variation in the customers' satisfaction with Ecommerce websites in Oman. Out of these predictor variables, Price and Ease of Use and availability of multiple payment options have been found to have a significant impact on customers' satisfaction while the impact of Safety and Security and Access was not so significant. This finding is consistent with the study of Thomas and Harry (2004) revealing that the respondents with experience in purchasing were more likely to be influenced by price. This may be due to the fact that most customers buy online to avail of the significant offers and discounts offered by etailers. Luxury products are rarely sold online . At the same time, a website that is user friendly and easy to navigate will further encourage customers to spend more time online and look at more products. A choice of payment options like credit and debit cards as also Cash on Delivery increase the convenience of customers. This is in line with the findings of Jiradilok, Malisuwan, Madan, and Sivaraks (2014) who claim that that the shopping experience plays an important role in attracting customers as the experienced customers have sufficient knowledge of the price, the reliability of the website and the payment security. Access to online websites is not an issue these days due to easy availability of affordable internet services including mobile data in Oman. Additionally, safety and security are assumed to be the responsibility of all Ecommerce platforms and this may explain its relative insignificance.

In addition to these factors, reliability, quality and assurance are also key factors that attract customers to online retailers. Thus Ecommerce companies have to formulate consistent policies and ensure that these are properly communicated to customers at all times. Innovative pricing strategy is the key to success in the online retail scenario. The rretailers have to formulate the right mix of offers, discounts and allowances that will keep customers coming back for repeat purchases. This is very important considering that the cost of customer acquisition is significantly higher than that of retention. An attractive and user friendly website is also a key prerequisite to a successful online venture. The site has to be kept fresh and updated regularly. All possible payment options should be offered to increase the attractiveness of the offering. The other attributes like appropriate pricing, responsibility, website information quality, and reliability should also be added into the websites.

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ANALYSIS AND OPTIMIZATION OF PERVIOUS CONCRETE**¹Anvay Patil, ²Harsh Bari and ³Arsalan Khan**^{1,2}Student, ³Assistant Professor, Department of Civil Engineering, Theem College of Engineering, Boisar**ABSTRACT**

Pervious concrete is a mixture of cement, water, coarse aggregate and little to no sand. It is also called as porous concrete and no fines concrete. This paper deals with the experimental results of pervious concrete based on three different sizes of aggregates with three sand contents. A mix design of Grade M25 was developed. The sizes of aggregate taken are 10, 12 and 16mm and the sand content is reduced to 5%, 10% and 15%. Three cubes and three cylinders were casted for each size and sand content respectively. A total of 27 cubes are casted which are tested for compressive strength and infiltration rate. Based on the analysis of the results obtained, applications of pervious concrete will be recommended

INTRODUCTION

A Conventional Concrete is a composite material composed of fine and coarse aggregate bonded together with a fluid cement (cement paste) that hardens or cures over time. Pervious concrete is a type of concrete that has a low water to cement ratio and contains none or very little amount of sand. It is usually a mixture of 9mm to 19mm average diameter aggregate, hydraulic cement, other cementitious materials, admixtures and water. Pervious concrete also called as permeable or no fines concrete has a high porosity which can be used for concrete flatwork applications that allows water from precipitation and other sources to pass directly through, thereby reducing the runoff from a site and allowing groundwater recharge.

Pervious concrete is been used in European countries since the 1800s for pavement surfacing and load bearing walls. Due to its cost efficiency, it was also used for two storey homes in Scotland and England. It was introduced in India only in the late 2000s and due to its low strength and structural capacity, the use of pervious concrete in India is limited mostly to parking facilities, low volume roads, sidewalks etc. As for highly developed expressways and heavy volume roads, pervious concrete may not conform to the required structural and bearing capacity. Taking this issue into account various researches and studies are being carried out at different institutions for its implementation on a larger scale for roadway applications.

AIM AND OBJECTIVE

- To develop mix design for Pervious concrete by reduction of sand.
- To carry out test for infiltration and compressive strength of pervious concrete
- To analyse its suitability for various applications.

LITERATURE REVIEW

High porosity is one of the basic characteristics of pervious concrete. This property of pervious concrete was enhanced during research conducted in the year 2015 at Indonesia by using volcanic pumice which is a waste material as aggregate replacement on porous concrete. Materials used were OPC, normal coarse aggregate, volcanic pumice, water and plasticizer. In this study the effect of varying proportions of volcanic pumice per normal aggregate and the proportion of aggregate to cement with a constant water cement ratio was evaluated on the mechanical properties of volcanic pumice porous concrete and on porous concrete with normal aggregates. The tests were conducted for void content, compressive strength and flexural strength. Thus, based on the test results it was concluded that volcanic pumice could be effectively used to improve the porosity of pervious concrete without much reduction in its strength.

In the year 2014, research conducted in states suggested the application of pervious concrete in the construction of highway shoulders for effective storm water management. The study was conducted on three different types of permeable shoulders with stone reservoirs, Porous Asphalt and Pervious Concrete Pavement with Permeable interlocking concrete pavements for full infiltration, partial infiltration and no infiltration systems. In Full infiltration system since there was no provision of outlet pipe the entire water was allowed to pass to the sub-grade. In the next system the excess water above infiltration capacity was removed via outlet pipe. While in the third one that is No infiltration system the entire water was removed by outlet pipe and no water was allowed to pass to the sub-grade by provision of impermeable geo-synthetic material. The result of the research conducted showed that Pervious concrete pavements with partial infiltration system was the most suitable for roadway applications. The design of pervious concrete pavements was based on Street pave system (2012). Thus, pervious concrete pavements can be used to minimize the environmental impacts, to minimize the runoff and

flooding, to reduce the erosion and improve the ground water recharge. Also, the use of stone-reservoirs helps in removing the pollutants. Hence it can be concluded from this study that pervious concrete can be effectively used in pavements like roadway shoulders for sustainable development.

METHODOLOGY

The Methodology Adopted for the Study is as Follows;

- Identification of the problem.
- Testing of aggregate and calculating the mix proportion and forming a mix design
- Casting of concrete cubes and cylinders
- Testing of concrete

Identification of Problem

There is no specific code for the design of pervious concrete. Hence the mix design is developed by following the IS codes 456-2000, 10262-2009 but making some modifications according to the requirements to make the concrete pervious.

Mix Design

Concrete mix design can be defined as the process of finding the right proportions of materials for concrete to achieve target strength in structures.

Concrete mix= Cement:Sand: Aggregates

STEP1: Calculation of target mean strength.

$$\text{Characteristic strength} = 25 \text{ N/mm}^2 \quad \text{Target mean strength} = f_{ck} + 1.65 \cdot s$$

$$= 25 + 1.65 \cdot 4 = 31.6 \text{ N/mm}^2$$

STEP2: Calculation of water/cement ratio (w/c); Based on strength criteria, w/c ratio= 0.48
(IS10262-1982) Based on

Experience criteria, w/c ratio= 0.43

Based on grade of concrete,

Max. w/c ratio=0.5 (IS456-2000, Tab.5)

Least of the above values, we adopt w/c ratio value of 0.43.

STEP3: Calculation of water and cement content; Water content,

Max. water content=186kg (IS10262-2009, Tab.2) This value of water content is for 50mm slump.

So for every 25mm increase in slump, water content is increased by 3%. Therefore for 125mm slump there will be increase in water content by 9%, Water content= 186 + 186*9/100 = 202.74kg~ 203kg. Cement content,

w/c ratio= 0.43 Water content= 203

Cement content= 203/0.43= 472.09~ 473kg/m³

STEP4: Calculation of content of Coarse and Fine aggregates;

Volume of coarse aggregate per unit volume of Total aggregates=0.62 (IS10262, Tab.3)

The above value is for w/c ratio of 0.5. So the coarse aggregate is increased at a rate of 0.01 for every decrease in w/c ratio of 0.05.

Adopted w/c ratio=0.43 Difference=0.07

% Increase in volume of coarse aggregate=0.07x0.01/0.05=0.014 Volume of Coarse aggregates= 0.62+0.62x 0.014= 0.629~0.63

Volume of fine aggregates=1-0.62=0.37. STEP5: Calculation of mix proportion;

Assuming 1m³ of concrete,

Absolute volume of cement=473/3.15x1000=0.150m³ Absolute volume of water=203/1000=0.203m³

Absolute volume of total aggregates= $1-(0.15+0.203) = 0.647m^3$

Weight of coarse aggregates= $0.647 \times 0.63 \times 2.6 \times 1000 = 1059.78 \sim 1060kg/m^3$ Weight of Fine aggregates= $0.647 \times 0.37 \times 2.75 \times 1000 = 658.32 \sim 659kg/m^3$ Mix proportions,

Cement -473kg/m³ Water -203kg/m³

Fine aggregates -659kg/m³ Coarse aggregates -1060kg/m³

Wet density of concrete-2395kg/m³ w/cratio: 0.43

STEP6: Site corrections;

Absorption of fine aggregates=2%

Amount of water absorbed = $659 \times 2/100 = 13.18lit$ Absorption by coarse aggregates=1.4%

Amount of water absorbed= $1060 \times 1.4/100 = 14.84lit$. Total absorption= $13.18 + 14.84 = 28.02lit$

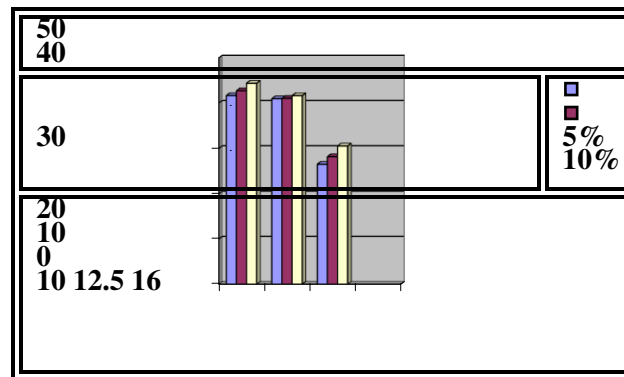
Actual amount of water to be used= $203 + 28.02 = 231.02kg/m^3$ Actual weight of fine aggregates= $659 - 13.18 = 645.82kg/m^3$

Actual weight of coarse aggregates= $1060 - 14.84 = 1045.16kg/m^3$

STEP7: Calculation of Mix Design; Proportion of materials,

Sr. No	Materials	Proportions
1.	Cement	473kg/m ³
2.	Water	231.02kg/m ³
3.	Fine Aggregate	645.82kg/m ³
4.	Coarse Aggregate	1045.16kg/m ³

RESULT



Test results for infiltration rate are obtained by performing tests on cylinders.

Sand Content	Size of aggregate	Infiltration rate mm/hr.		
		5%	10%	15%
10mm		57	44	31
12.5mm		92	76	49
16mm		113	98	85

CONCLUSION

Pervious concrete is a mixture of cement, water, coarse aggregate and little to no sand. It is a special type of concrete with a high level of porosity that allows water from precipitation and other sources to pass directly through the sub grade. It helps to reduce the run off thereby allowing ground water discharge.

Experimental results of pervious concrete, for compressive strength and infiltration rate, based on three different sizes of aggregates with three sand contents were analyzed. A mix design of Grade M25 was developed. The sizes of aggregate taken are 10, 12.5 and 16mm and the sand content is reduced to 5%, 10% and 15%. Three cubes and three cylinders were casted for each size and sand content respectively. A total of 27 cubes and 27 cylinders are casted which are tested for compressive strength and infiltration rate respectively

It was found that the compressive strength of concrete increases with the increase in sand content and decrease in the size of aggregates. Infiltration rate of concrete increases with the increase in size of aggregate and decrease in sand content.

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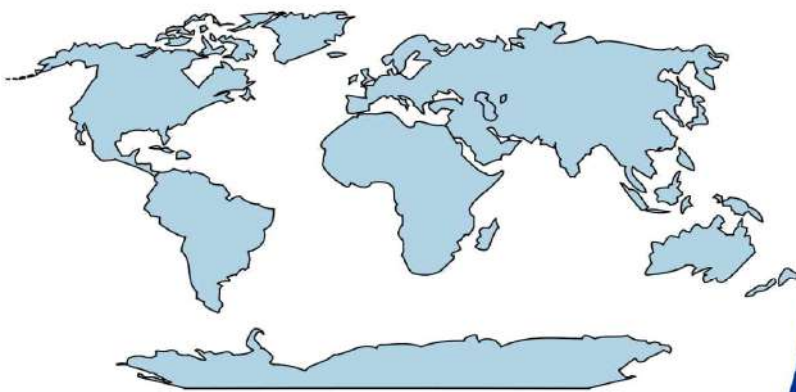
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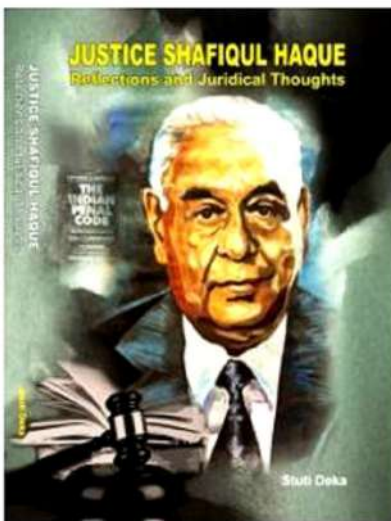


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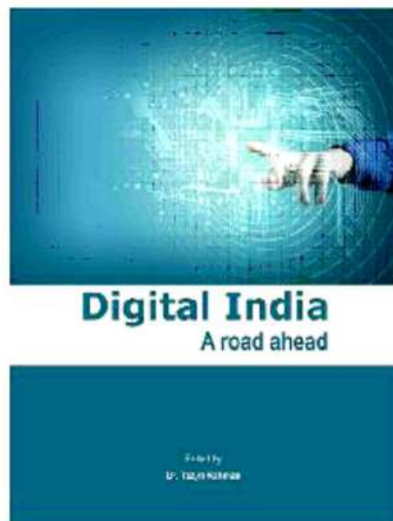
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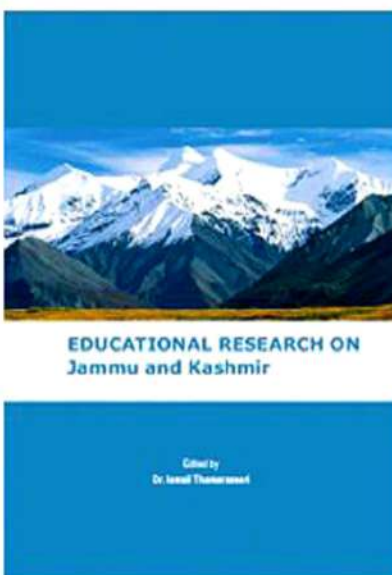
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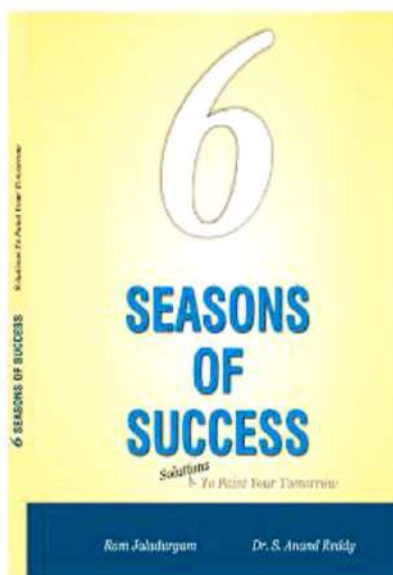
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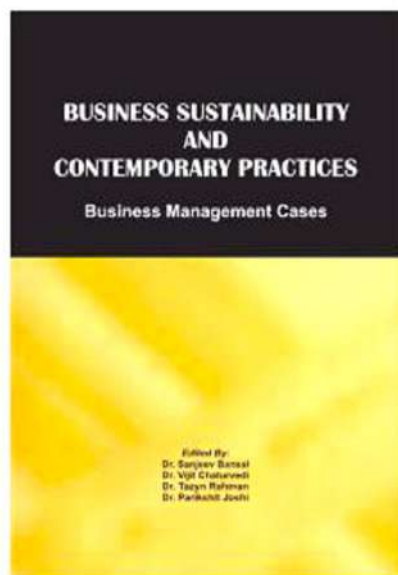
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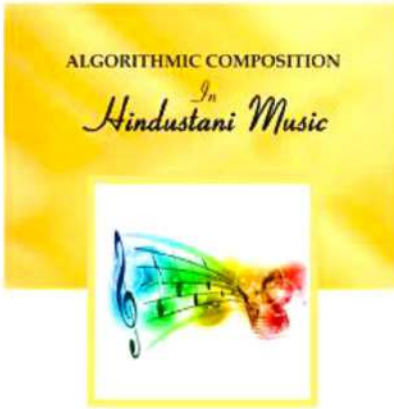
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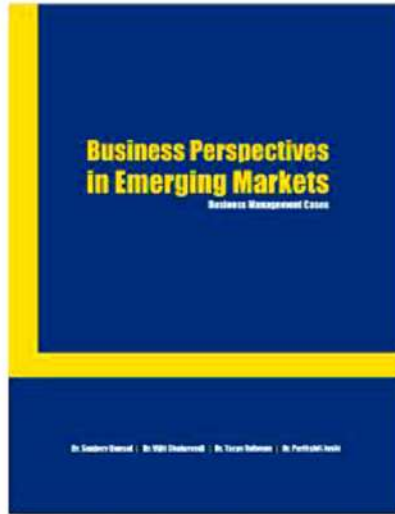
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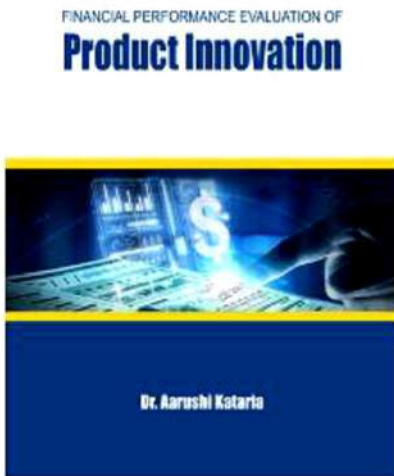


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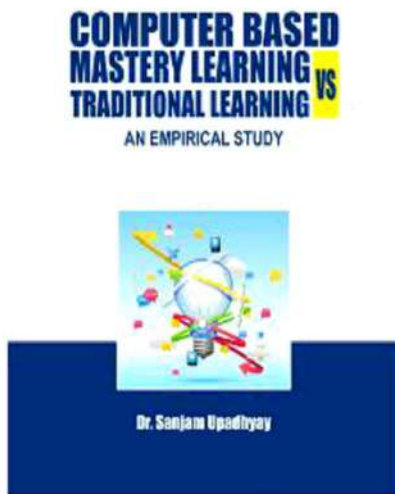
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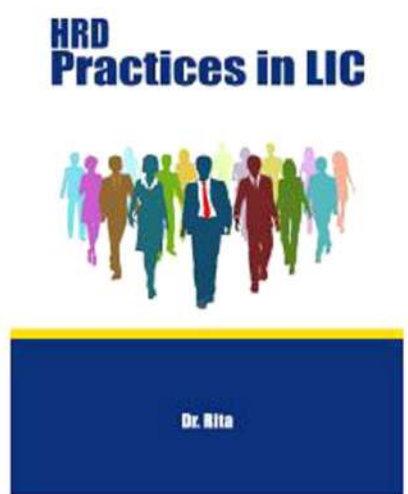
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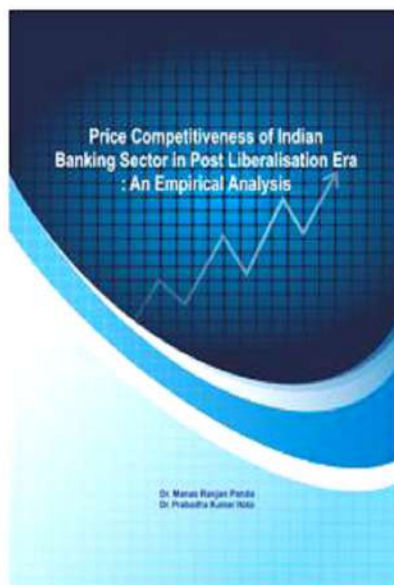
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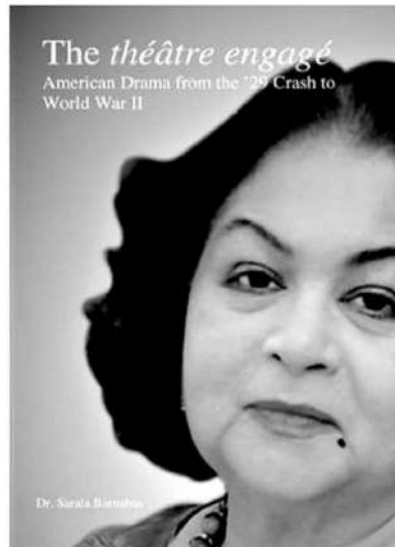
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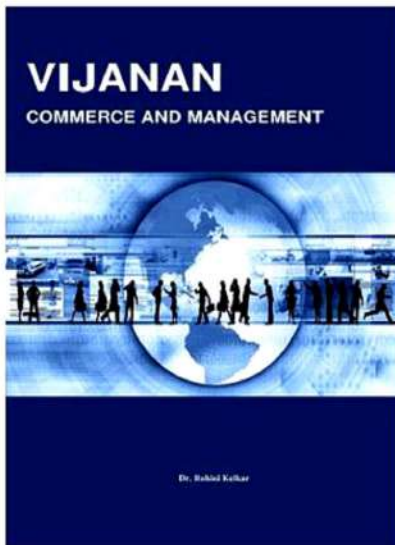
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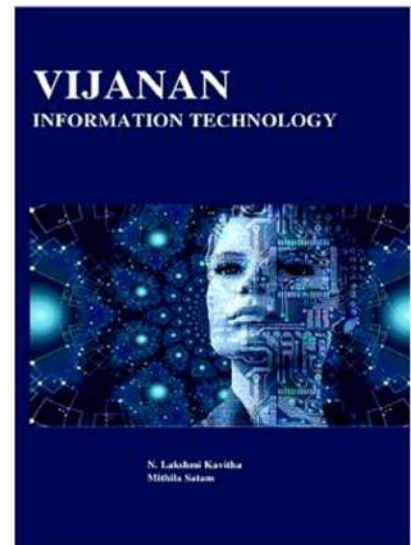
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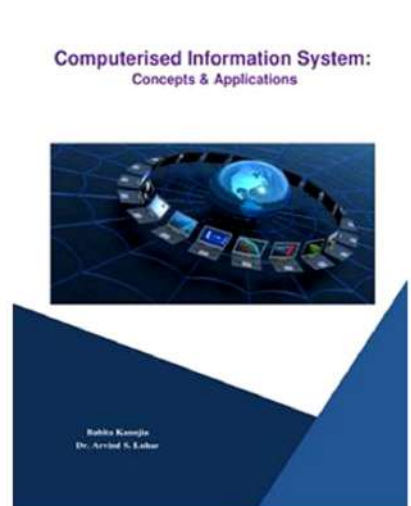
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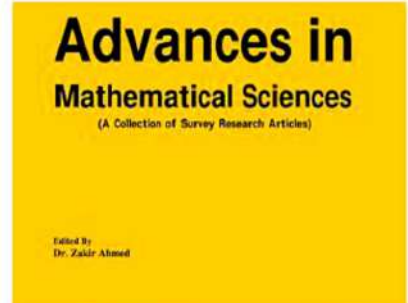
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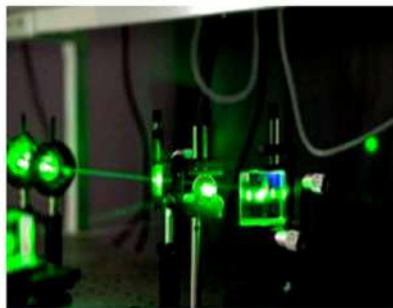


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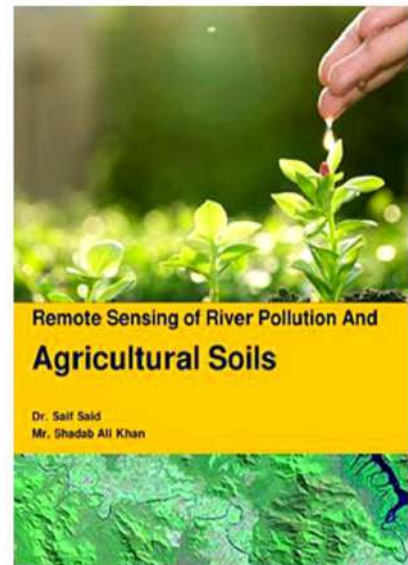
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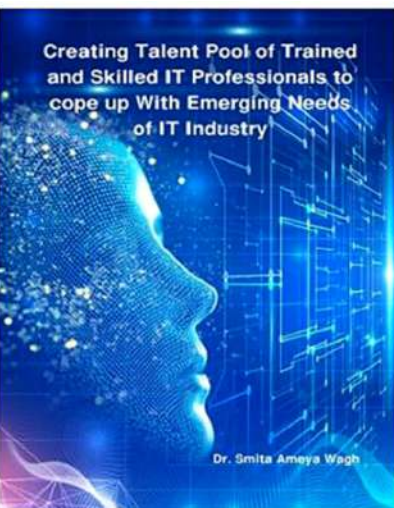
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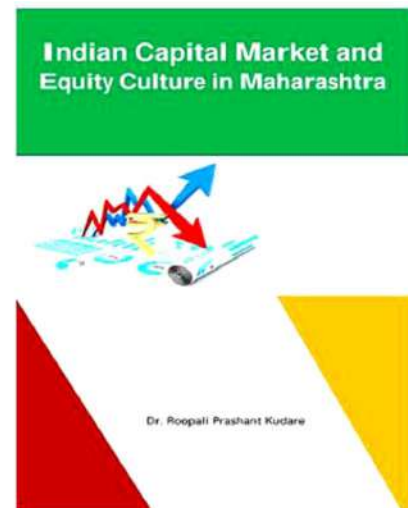
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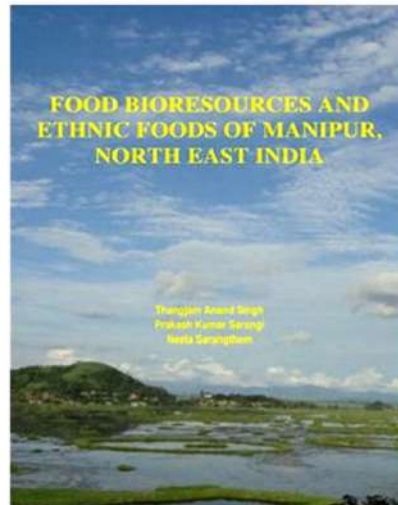
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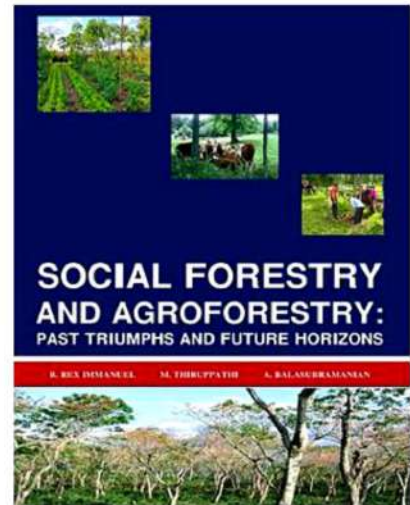
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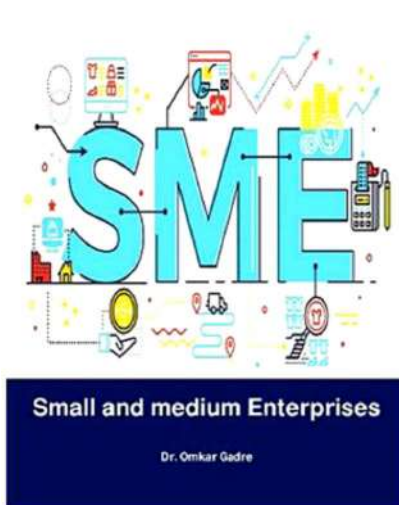
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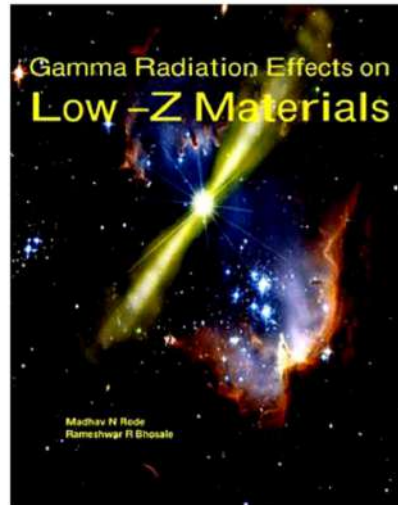
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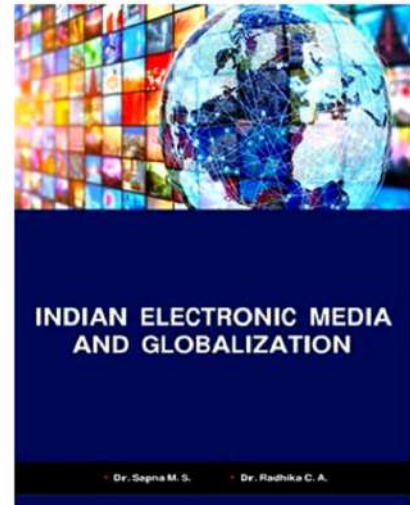
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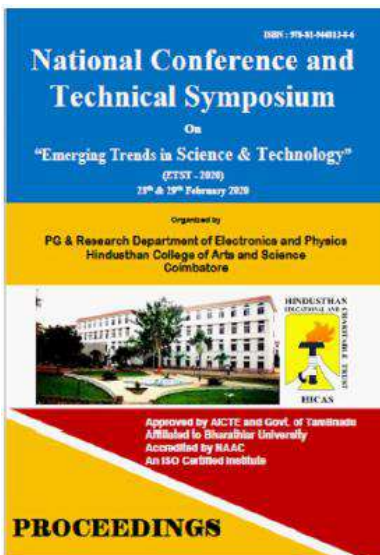
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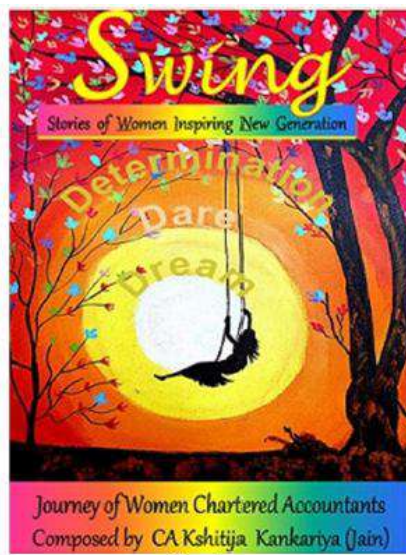
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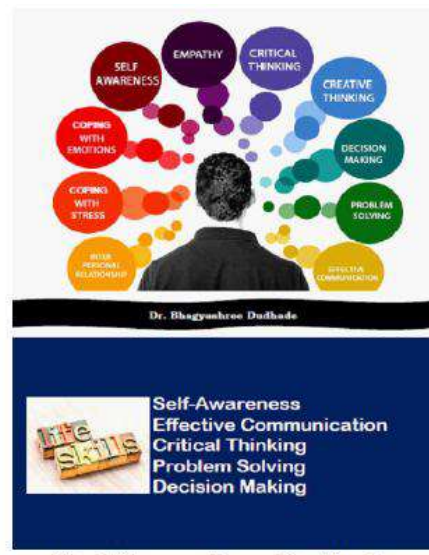
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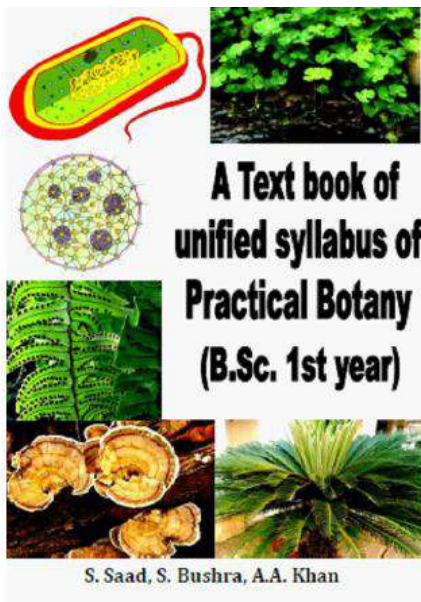
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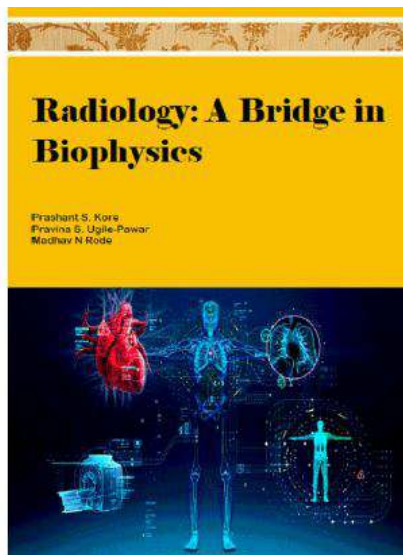
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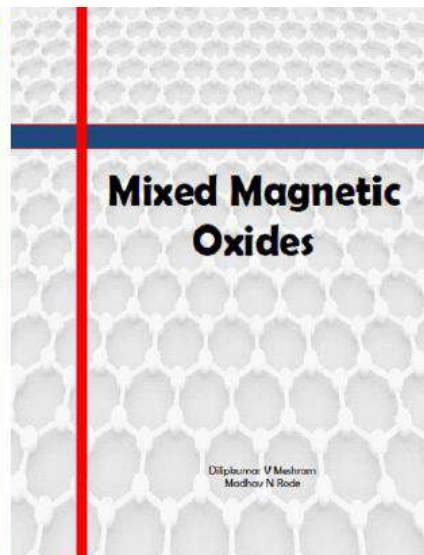
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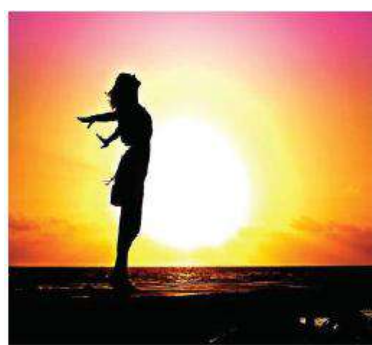
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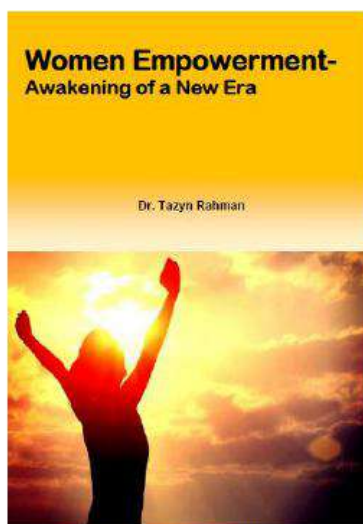
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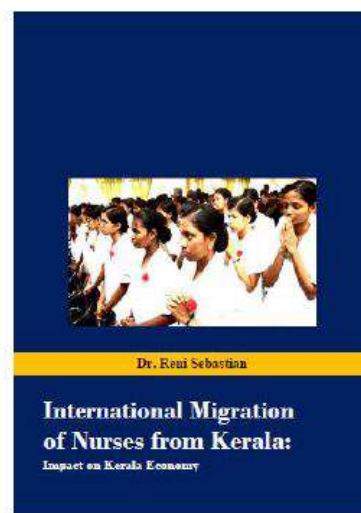
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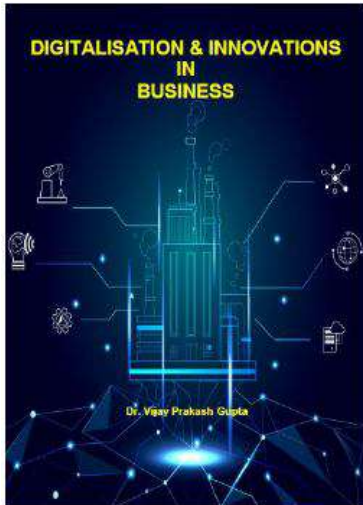
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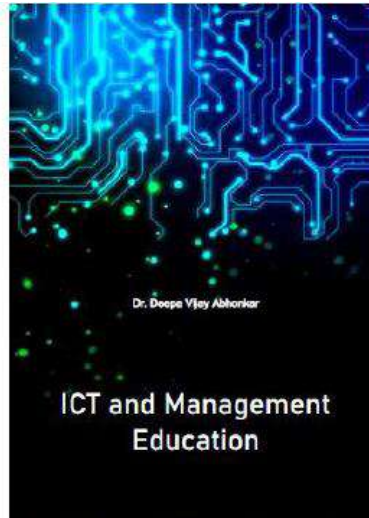
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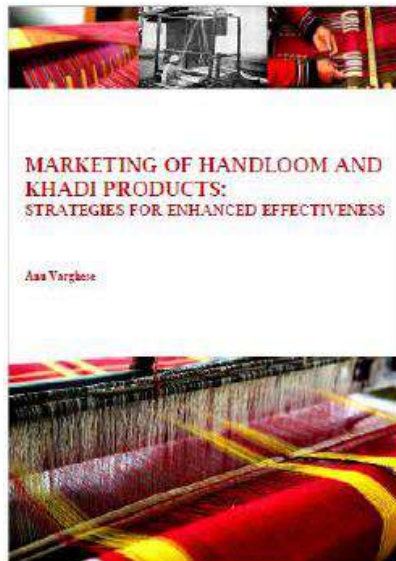
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Preparing a Composite Material Wire Made of Copper and Graphene Nanomaterial

Kaivalya Yogesh Sawant¹, Naushad Ahmad Juber Ahmad Mansuree², Vashialam Tara Shah³, Akash Vijay Jadhav⁴, Mohammed Wasim Khan⁵

^{1,2,3,4}UG Student, Department of Automobile Engineering, Theem College of Engineering, Boisar, India

⁵Assistant Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar, India

Abstract— Nanotechnology is an emerging technology that is a new future of life. Various materials have their unique property and a wide range of applications in different fields including engineering as well as medical. In our developing world, we are facing problems such as the emission of CO₂ and many hazardous gases due to petrol vehicles. Thus, replacing these conventional petrol vehicles with electric vehicles (EV) helps to reduce this hazardous emission. But people are not approaching the use of EVs due to some disadvantages, like slow battery charging, limited charging stations. Graphene is the lightest and thinnest material that possess solid properties such as high mechanical strength, high corrosion resistance, high electrical conductivity, etc. Thus, it has its wide range of applications in the field of biomedical, electrical, construction, etc. These problems may be solved by replacing the inner cable material of wire on the EV charging cable. The research work develops a composite material by ball milling and Hot Press Sintering (HPS) followed by drawing it into a ductile wire which helps the advancement in the field of Electric Vehicles.

Keywords—composite material; copper; electric vehicle; graphene; nanomaterial

I. INTRODUCTION

Nanomaterials can be defined as materials possessing dimension measuring 1-100nm. The definition proposed by European Commission states that the particle size of at least half of the particles in the bulk must measure upto 100nm or less. Nanomaterials can occur naturally, as the by-products of combustion reactions, or can be produced in labs through engineering to achieve their goal they are made for. Nanomaterials can have different physical and chemical properties when its processed to form part. The properties of nanomaterials, particularly their size, offer various advantages compared to the bulk-form of the materials, and their versatility in terms of the ability to tailor them for specific requirements accentuates their usefulness. Nanomaterials are also set to introduce several advantages in the electronics and computing industry. Their use will permit an increase in the accuracy of the construction of electronic circuits on an atomic level, assisting in the development of numerous electronic products [1].

In today's world, we see that scarcity of fuel is near, and to eliminate this problem engineers started to search for renewable sources of energy. As the traditional method of producing electricity is from burning coal and as coal is a natural resource it may perish to avoid this, we started generating electricity from wind and solar energy. Also, to

avoid perishing of crude oil electric cars were manufactured but they were not up to customer's demand as it takes several hours to fully charged. This problem can be solved by replacing the core wire material of the EV charging cable with graphene composite as it enhances the electrical properties of conducting material. By this charging time can be reduced and the barrier between the choice of EV can be removed.

II. LITERATURE REVIEW

In 2019, Salvo *et al.* [2] demonstrated the experiment that the graphene loading into the Cu matrix clearly influenced the mechanical and electrical conductivity by varying the sintering temperature. After testing, the graphene loaded Copper composite prepared by sintering at 600°C exhibits a minimal change in the mechanical property with a remarkable increase in the electrical conductivity when compared to the pure Cu sample. By adding 1 wt.% of GNS to the copper, the electrical conductivity was improved around 22% by comparing with the pure Cu consolidated at 600 °C. We achieved increased conductivity values of around 22% even with the lower temperature and higher applied load in the consolidation (600°C, 30 MPa, 30 min).

In 2020, Tran *et al.* [3] showed Carbon fibre(CF)/ Gold(Au)/ Copper(Cu) composite wires were successfully fabricated by sputtering Au and electrodepositing Cu on PAN-based CFs. Due to the increase of Cu layer thickness with increase in deposition time, the electrical properties of the CF/Au/Cu composite wire raised remarkably to reach metallic performance while its mechanical strength experienced a remarkable drop. Since the composite wires had CF volume fraction higher than 20%, they were lightweight (up to 70% lower than Cu mass density) and possessed the combined properties of high strength (~4 - 10 times higher than that of the pure copper) and effective electrical conductivity (up to 75% of that for pure copper). This work illustrate that CF/Au/Cu composite wire have great potential to be the next-generation electrical wires for the future demand.

In 2019, Yang *et al.* [4] successfully prepared the Silver (Ag)/graphene (G) composite wire based on the HQG, via high-energy ball milling and subsequent SPS treatment. Due to high crystallinity and integrated structure of the high quality graphene (HQG), the Ag/HQG composite exhibits an enhancement of conductivity and mechanical properties. The composite has an increase in the electrical conductivity

of 11% and the microhardness of 48%, when compared with pure Ag.

In 2019, Wang *et al.* [5] used Copper powder and graphene powder and sintered to prepare three G/Cu composites with graphene contents of 0.5 wt.%, 1 wt.% and 1.5 wt.%. The influence of graphene contents on the microstructure and properties of the G/Cu 6 composites was investigated. In summary, the addition of 0.5 wt.% graphene can effectively improve the hardness, thermal conductivity, electrical conductivity, and corrosion resistance of the G/Cu composite.

In 2010, Fan *et al.* [6] fabricated fully dense graphene nanosheets (GNS)/Al₂O₃ composites from ball milled expanded graphite and Al₂O₃ by spark plasma sintering (SPS). The conductivity achieves 5.709×10^7 S/m when composite has 15 vol.% GNS. The as-prepared composites behaved as semimetal as indicated by the temperature dependence of electrical conductivity in a temperature range from 2 to 300 K.

In 2019, Guo *et al.* [7] successfully prepared Mo₂C and GNPs reinforced Cu matrix composites by impregnation reduction, in-situ reaction and subsequent forming processes. A new distribution form of hybrid reinforcing phases with uniform distribution of Mo₂C at/near the interface between the graphene nanoparticles (GNPs) and Cu matrix was obtained. As a result, the 0.11 vol% Mo₂C at 1.6 vol% GNPs/Cu composites had good mechanical properties. The Yield Strength of the composites reached 303 MPa, which were 72% and 23% higher than that of pure Cu and the 1.6 vol% GNPs/Cu composites, respectively. The electrical conductivity of the composites reinforced with Mo₂C and GNPs is above 90% IACS because the interface improvement effect of Mo₂C is dominant.

In 2020, Dhar *et al.* [8] successfully prepared Si-graphene (0.5–1.5 wt.%) composites in his experiment by dry planetary ball milling process without addition of hazardous chemicals. Samples were ball milled by using a dry planetary ball 7 milling for 6 hrs. The graphene is found to be present in the Si-graphene (1–1.5 wt.%) composites in bi-layer form. While microstructure of silicon (Si)-graphene (0.5 wt.%) composite shows random distribution of graphene, Si-graphene (1 wt.%) composite shows uniformly distribution of graphene on matrix of Si. When graphene (0.5–1.5 wt.%) is added, it is observed that the specific surface area is improved significantly from 87 to 304 m² g⁻¹. Si-graphene (1 wt.%) composite was found to exhibit 11% more electrical conductivity than pure Si. This experiment opens new scope for using Si with improving electrical property at elevated temperature under critical load because of presence of graphene in composite.

In 2017, Chyada *et al.* [9] prepared the graphene paper (GP), which is obtained by pyrolysis method of asphalt and ethanol mixing in the percentage of (70%) and (30%) respectively. Graphene reinforced aluminium matrix composites have been applied as reinforcing phase in molten pure aluminium (99.5%). Investigation of effects of artificial aging and cold rolling on the conductive and tensile properties of (Al-0.5% graphene) alloy was done. The aging treatment after cold rolling can improve both the

electrical conductivity and tensile strength. The best electrical conductivity (36.8 MS/m) and tensile strength (180 MPa) of wire rod were obtained in alloy after the 90% cold rolling+aging at 200°C for 1hr. Adding (0.5% graphene), the improvement of electrical conductivity and tensile strength of alloy comparing with alloy is 8.9% and 168.6% respectively. The results of this study, concludes that the graphene is a essential material to improve the electrical conductivity of electric wire.

In 2015, Yun *et al.* [10] successfully prepared GNS/aluminium nitrides (AlN) composites via a hot-pressing process. The experimental outcomes showed that GNSs have symbolic effects on the microstructure, mechanical, electrical, and thermal properties of the composites. The grain size of AlN obviously decreased as the GNSs content escalated, which would produce a fine-grain-size effect with little addition of GNSs. The fracture and flexural strength of the composites containing 1.49 vol% GNSs were obviously increased, respectively, compared to monolithic AlN. the compositional dependence of the electrical conductivity displayed a percolation-type behaviour, with a percolation GNS volume threshold of 8 2.5070.4 vol%. GNSs are distributed along the grain boundaries, which would cause photon scattering. With the addition of more GNSs, the thermal conductivity of the composites decreased.

In 2017, Chen *et al.* [11] prepared highly dense GNSs/MgO composites with enhanced electrical conductivity, dielectric property and superior microwave absorbing property by hot-pressing sintering. The homogeneously distributed GNSs significantly inhibited the grain growth of MgO. The electrical conductivity of the composites showed a typical percolation-type behaviour with a percolation threshold at GNSs content of 3.34 vol%. The complex permittivity and dielectric loss of 3 vol% GNSs/MgO composite exhibited a notable variation compared to low GNSs content composites, which is ascribed to the near-percolation threshold of GNSs content. The microwave absorption of the GNSs/MgO composites can be regulated by controlling the GNSs content, i.e., electromagnetic parameters.

In 2020, Lee *et al.* [12] done the synthesis of monolayer, bi-layer, and multilayer graphene on copper (Cu) wire samples and their performances for copper wire protection were characterized. Optical images show significant oxidation of unprotected Cu wire at 200 °C, while multilayer graphene provides anti-oxidation protection up to 350 °C for at least 30 minutes. Similar as the anti-oxidation performance, multilayer graphene significantly impedes the dissolution of Cu wire in 1M ammonium persulphate (APS) solution. The etching time of copper wire with multilayer-graphene protection was doubled by comparing to pure Cu wire. Besides, multilayer graphene remarkably reduced the contact resistance between twisted-pair copper wires at both room and elevated temperatures.

In 2015, Dada *et al.* [13] For lead acid battery cathode, Interconnected graphene/PbO composites appearing sandwich was developed. Facile processing technique which is solution base, enabled the interaction between graphene

oxide nano-sheets and PbO submicron particles under mechanical stirring producing sandwich like structures containing graphene nano-sheets. The affection and interaction between graphene oxide and PbO in solution were distinct by change in graphene surface chemistry. Electrodes appeared porous and interconnected, and recording approx. 15% increase in discharge performance. By going throughout this article, we got that 16 Interconnected graphene/PbO composites had been developed for positive active material of lead acid battery. Graphene sheets co-existed with PbO₂, and appeared as submerged interconnected plates. Changes in the surface functionalities and carbon structure of the graphene indicated bonding and interaction with PbO. There was about 15% increase in performance on discharge.

In year 2016, Chen *et al.* [14] done the work for synthesis of solution process, based on graphene/Ag NPs composite ink is presented. Very first, different weight ratio (wt.%) of graphene with respect to Ag-NPs was taken which was followed by ultrasonic process for dispersion. The effect of the wt.% of graphene and ultrasonic process time towards well dispersion ink are investigated. Then, hot-press sintering process was applied to achieve the final linked structure on the paper surface. We can achieve fairly low electrical resistivity under low sintering temperature (120°C). The effects of different wt.% of graphene and Ag NPs as well as ultrasonic pre-process time for the electrical resistivity of sintered Ag tracks were investigated. The 17 proposed Graphene/Ag Nanoparticles composite ink preparation and sintering method is promising for potential applications in flexible electronics. By this research we got that in this paper, the effect of sonication process time and wt.% between Ag NPs and graphene for the electrical property of sintered composite inks is investigated. It is found that the electrical resistivity of sintered tracks decreases as the increase of sonication process time. Additionally, the larger wt.% of Ag NPs obtained better electrical property. Nevertheless, the effect of sintering time, pressure and temperature to the electrical property of sintered sample require to further investigate. Moreover, the optimal wt.% between Ag NPs and graphene needs to explore as well in the future work.

In year 2014, Kara *et al.* [15] prepared a report for an investigation on the possibility of using graphene nano-ribbon (GNR) as a conductive material in MMIC applications in the range of 2-20 GHz. GNRs main advantage to the applications of MMIC transmission lines is that the impedance of line can be controlled by their dimensions. The structural characteristics of graphene films grown on Ni film deposited on Si/SiO₂ wafers after nickel removal were analysed by optical, FSEM and Raman spectroscopy. Graphene co-planar waveguide (G-CPW) transmission lines of various dimensions were then constructed on silicon wafers, as they are used in the integration of passive and active components in microwave monolithic integrated circuits. And by going through this We have successfully fabricated graphene co-planar waveguide transmission lines in this work using processing steps that are compatible with semiconductor processing. Optical, FESEM and Raman spectroscopy results indicated graphene films of high quality. We have also demonstrated the use of a new

technique in calibrating the probe measurements which led to improved characterization of graphene nano-ribbons at microwave frequencies. Subsequent comparison with simulation suggested graphene conductivity of about 900 S/m in the microwave region, in good agreement with other researchers. The losses of the transmission lines were mostly due to the substrate, which take up most of the structure volume, and thus contribute the most of signal losses in high frequency integrated circuit structures. This is also due to the fact that, in contrast to conventional conductors, skin effect is almost negligible in graphene, as such most of the losses here is due to the substrate. The use of graphene nano-ribbon as interconnects for passive and 18 active elements thus could improve MMIC performance since the skin effect has been minimized, and this makes graphene a good candidate for microwave conductors in the future.

In year 2015, Phokaratkul *et al.* [16] presents a novel supercapacitor (SC) material based on 3D graphene foam-polyaniline (Pani)-Carbon nanotubes (CNTs) composite for supercapacitor applications. Graphene foam was produced by chemical vapor deposition (CVD) on Ni foam using acetylene carbon source and hydrogen gas carrier at 700°C for 3 min. Further, the foam was etched in 3M HCl for an hour to take out most of Ni support. Multi-wall CNTs powder were then dispersed in 1M HCl and addition of 0.2 M aniline monomer was done, then it was stirred and filtered to eliminate non-dispersed CNTs. Electro-polymerization in the CNTs-aniline monomer solution was then performed at working electrode potential of 0.55V. SEM and Raman characterization confirmed the incorporation of CNTs in Pani/graphene foam network with a number of nanowire features appeared on graphene foam surface and dominant D and G carbon's peaks. CV results showed that PANI's redox peaks were broadened due to the presence of CNTs, indicating amplification in pseudo capacitance. From GCD readings, it is disclosed that CNTs-Pani-graphene foam displays a high specific capacitance of 920 Fg⁻¹ at a specific current of 0.8 Ag⁻¹, which is more than twice higher than that of Pani-graphene foam. Through this, a novel supercapacitor (SC) material based on 3D graphene foam polyaniline (Pani)-Carbon nanotubes (CNTs) composite has successfully been developed for supercapacitor applications. Characterizations by SEM and Raman spectroscopy confirmed the incorporation of CNTs in Pani/graphene foam network. CNTs-Pani-graphene foam exhibits a high specific capacitance of 920 Fg⁻¹ at a specific current of 0.8 Ag⁻¹, which is more than two times as large as that Pani/graphene foam. Therefore, graphene foam-PaniCNTs composite prepared by electro polymerization is highly promising for advanced SC applications.

In year 2021, Sharma *et al.* [17] used modified hummers' method to synthesis the graphene oxide (GO) and over the concern of eco-friendly reduction method voltage application reduction process was used. Graphene oxide was reduced by dipping of Cu electrodes in the GO solution with biasing of 10V for 2hr. The result of XRD peak for GO at 10.4° and rGO at 25.9° confirm the desired material formation. The Raman spectroscopy determines the GO and rGO G-peak at 1597 cm⁻¹, 1608 cm⁻¹ and D peak at 1353 cm⁻¹, 1347 cm⁻¹ respectively. The shifting in

the Raman peaks may arise due to removal of functional groups and impurity formation. The intensity ratio (I_D/I_G) increased after reduction from 0.89 to 0.96 indicated the increasing in disorderliness after reduction of graphene oxide. The absorbance peak is changed after reduction from 230 nm to 270 nm. The transmittance of graphene oxide is reduced from 85% to 75% after reduction. The bandgap value is also decreased from 3.84 eV to 2.87 eV for graphene oxide after reduction. The bandgap value is also decreased from 3.84 eV to 2.87 eV for graphene oxide after reduction. The measurement of resistance of graphene oxide (GO) and reduced graphene oxide (rGO) were taken from desktop bench multimeter that gives the value $2M\Omega$ and $1.5k\Omega$, respectively.

In year 2020, Zhang *et al.* [18] done the work to show, the simultaneously enhanced electrical conductivity and mechanical properties of Al were successfully achieved in this study by using graphene as the reinforcement. The properties such as electrical conductivity, tensile strength, and elongation of graphene/Al nanocomposite were increased by 2.1%, 17.3% and 35.4% respectively than that of pure Al. The observed advance of trade-off tendency between mechanical properties and electrical conductivity was due to the homogeneously dispersed graphene in nanocomposite and formation of high-quality graphene/Al interfaces. This study shares new approach for preparing high-strength and highly-conductive graphene/Al nanocomposites.

In year 2018, Bai *et al.* [19] explored in this paper, change rules between the compressive strength as well as electrical resistivity and the silica fume content. Silica fume can not only act as an effective dispersing agent to improve the dispersion of graphene, but also increase the interfacial strength between graphene and hydration products. The suitable amount of silica fume ease the pore refinement of cement paste. In the case of composite containing low content of graphene, addition of appropriate amount of silica fume will boost the mechanical and electrical performances. However, the extra amount of silica fume had a bad impact on these properties. Combination of low amount of graphene and appropriate amount of silica fume improved the compressive strength by a significant level. As for electrical properties, relatively more amount of silica fume will result in drop of electrical resistivity of the composite. Incorporation of high amount of graphene and sufficient amount of silica fume helped in achieving superior electrical conductivity of the composite.

In year 2019, Bhanuprakash *et al.* [20] fabricated Hierarchical epoxy composites with Graphene Oxides (Gos) coated carbon fibres through VARTM technique and studied for their mechanical and electrical properties according to the relevant ASTM standards. A simple and easy EPD technique was applied to achieve continuous and homogenous coating of GOs and rGOs onto the CF surfaces. Further, GOs coated CFs were thermally annealed in a vacuum oven at 200°C for 2hrs to create thermally reduced GOs-CFs (TrGOs-CFs). Coating of GOs onto the carbon fibres had remarkably enhance the interfacial interactions between the fibres and the matrix resin, where ILSS properties of their composites exhibited an

augmentation of 47% with GOs coated CFs, 44% with TrGOs-CFs and 41% with rGOs-CFs. The coating of GOs has improved surface properties such as surface roughness, surface area and surface energies, which gave rise to affinity between the fibres and the matrix, in turn, improved the interfacial adhesion. Electrical conductivity measurements of composites demonstrated a substantial improvement of 127% in through-thickness conductivity values for TrGOs-CFs. It is confirmed that the treatment of thermal annealing caused defunctionalisation of GO by partially rehabilitating the graphitic structure in material, thus, a network of conductive channels was realised in the system which in turn intensified the conductivity values of their composites.

In year 2021, Osman *et al.* [21] explored the synergy between the outstanding thermal and mechanical properties of graphene with the excellent insulation and mechanical properties of alumina was found to be a promising hybrid filler to improve the thermal insulation and mechanical properties of polymers. By the means of ultrasonication, seven different ratios of RGO and alumina were immersed into the epoxy polymer to decide the best desirable ratio between both to produce multi-functional epoxy packaging materials. Although the epoxy polymer filled with a constant filler loading at 1wt%, the properties are changed significantly by manipulating the ratio of the RGO-alumina hybrids. By using a decision-making tool, it was discovered that the ratio of 6:4 between RGO and alumina was the supreme. At 6:4, the thermal conductivity was uplifted by 23.4%. While, the insulation properties of epoxy composites were retained remarkably as variation to RGO/epoxy composites. Besides, the tensile strength was enhanced by 22.56%. Also, the storage modulus was enhanced by 4.6% compared to the pure epoxy. Generally, the insertion of alumina nanoparticles between the graphene sheets not only subdues the electron transfer but also reduces the accumulation of graphene sheets, which is the major reason for better properties of the hybrid/epoxy composites in variance to graphene/epoxy composites.

III. EXPERIMENT PROCEDURE

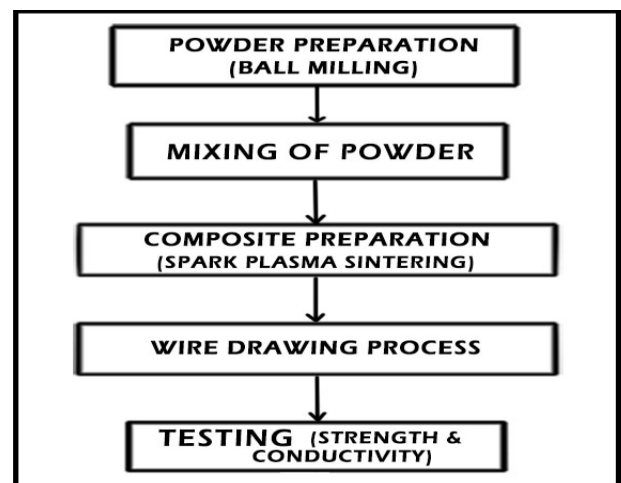


Fig. 1. Procedure to be followed for drawing CuG wire

A. Sample Powder Preparation:

The materials are bought from two different companies viz. AdNano technologies & Sarvottam Enterprises. Taking the calculated amount powder in the Petri dish. The mixture is poured in the mixing box and then in powder mixing machine with help of Steel balls into it, the Powder is properly mixed for having proper distribution in all over composition. The ratio of capital Cu: G is 99:1 i.e., 100 gram of composite have 1 gram of graphene and 99 gram of copper.

B. Sintering:

After preparation of powder, using the graphite die the sintering is done using hot press sintering (HPS) machine. The Powder material is poured into the die with lower punch act as base and using the upper punch arrangement which is fixed into fixture or supporting frame. Then the frame is placed in the sintering machine. The initial parameters are set. The initial temperature is starting from room temperature and raised to up to 600 °C or 700 °C. This is done by step wise manner. The temperature is being increase by 3°C/minute up to 100°C, after 100°C the temperature has to increase at rate of 10°C/minute. After this, the pressure of 106kg/cm² is being applied for about

half an hour. And finally, the stack like structure is prepared.

C. Wire Drawing:

This stack like structure has to be converted into elongated form and thus preheating and hammering is done for this purpose. The preheating temperature is lower than sintering temperature (below 600°C). The elongated structure has to be drawn into the wire. For this purpose, wire drawing machine is used. The one end of that elongated path is passed from the machine towards the other way where machine holds the other end and then the machine automatically draws the wire according to input given to the machine. The input is set to give the output of 1.382 mm of wire. Thus, wire is prepared successfully.

D. Testing:

The testing was done for calculating resistivity. The material wire of 1m length and diameter of 1.382 mm was taken. By using the ohm meter, the resistance was successfully calculated i.e., $1.4866 \times 10^{-5} \Omega$ and for traditional wire it was $1.14 \times 10^{-2} \Omega$. Here, the resistance was decreased thus increases the conductivity. Also, the coating of thermoplastic elastomer is done on the material wire.

IV. RESULTS AND DISCUSSION

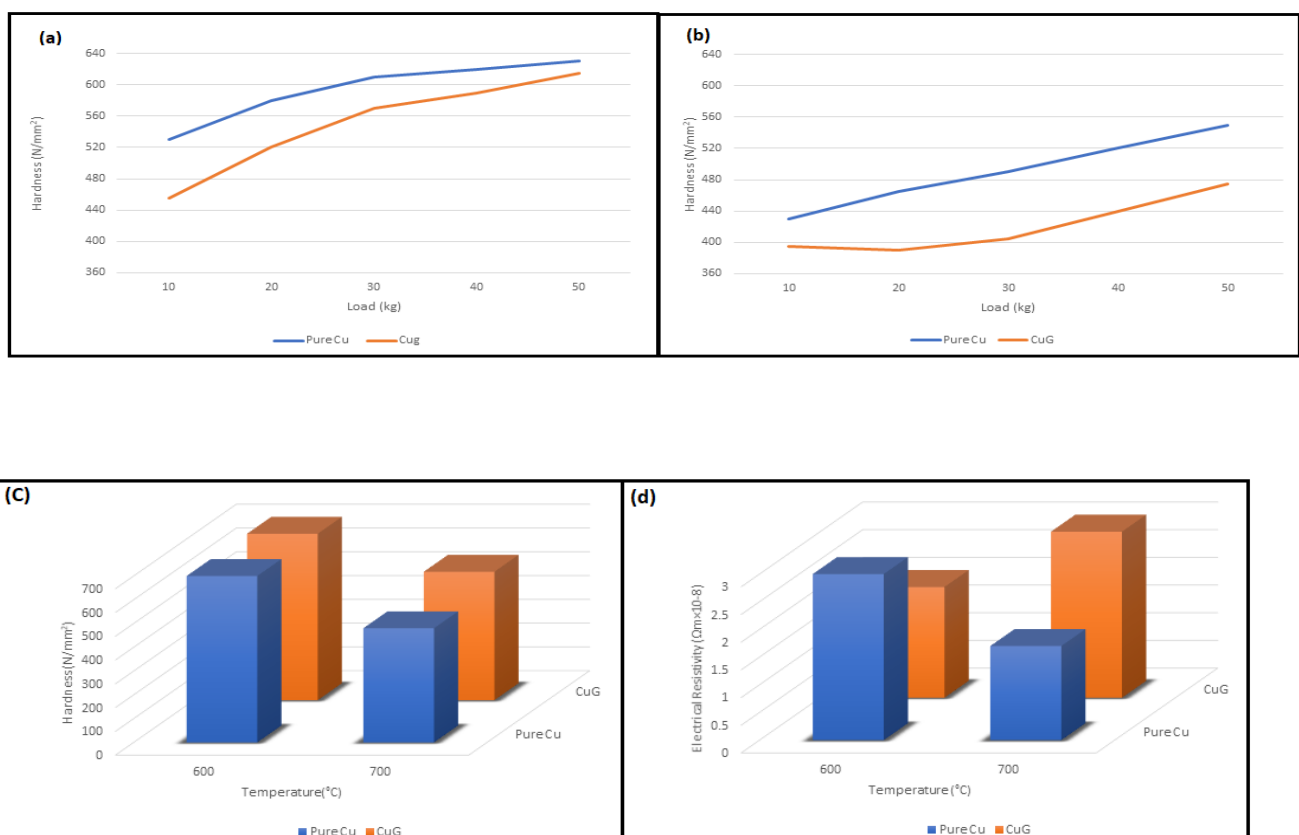


Fig. 2. (a)Hardness v/s applied load for pure Cu and CuG at 600°C, (b) Hardness v/s applied load for pure Cu and CuG at 700°C, (c) Hardness v/s applied load for pure Cu and CuG at 600°C and 700°C Using Bar graph and (d) Electrical resistivity v/s applied load for pure Cu and CuG at 600°C and 700°C Using Bar graph.

A. Characteristics of CuG wire:

As the powder of both (Cu & G) was sintered to form composite which physically appeared as a pellet size and of brownish-grey colour. The powder was sintered at two different temperatures i.e. 600°C and 700°C, they both showed different properties.

The composite sintered at 600°C showed the resistivity of $1.83 \times 10^{-8} \Omega m$, and the composite sintered at 700°C showed the resistivity of $2.22 \times 10^{-8} \Omega m$. Whereas the resistivity of pure copper is $1.75 \times 10^{-8} \Omega m$. at 700°C, while it is $2.23 \times 10^{-8} \Omega m$. at 600°C. This concludes that the resistivity for CuG material wire is higher at 700°C than 600°C. Thus this wire can help in conducting electricity more efficiently and thus saving time.

The hardness of material in terms of HV heated upto 600°C and 700°C was found to be 63.45 and 47.5 for the pure one and for the composite of CuG was found to be 63.3 and 55.2 respectively while in term of Gpa for pure material heated upto 600°C and 700°C, and CuG composite material are found to be 0.64, 0.482, 0.621 and 0.54 respectively.

B. Future Scope:

- Using the CuG composite wire material in circuit may improve the performance of that circuit.
- Gold circuit wiring used in satellites increases the cost of overall project, while replacing it with thin nanosheets of this wire can reduce the cost.
- Electric circuit boards' wiring used in computers can also be replaced with the thin sheet of this wire.

CONCLUSION

In summary, CuG wire is fabricated successfully by using the wire drawing process. The powder of G and Cu are mixed and thus homogenous mixture is formed by using ball milling and by sintering in the graphite die the stack like structure is prepared. This stack is further hammered to make it elongated by further wire drawing process the wire is drawn. By applying the coating of thermosetting plastic, the wire is insulated. Experimentally the resistance is reduced by 18%, thus enhancing its conductivity.

NOTE: The result we found is based on the experimental condition provided which may vary when dealing in actual condition.

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COOLING USING THERMOELECTRIC COOLER WHEN VEHICLE IS PARKED

Saurabh Manohar, Kalpesh lade, Shreenath Padiyachi, Kamlesh Lohar

Mohd. Raees
Asst. Professor,

Automobile Engineering Department,

Department of Automobile Engineering, Theem college of engineering and technology, Boiser-401501, India

Abstract

This study aims to facilitate successfully in automobile air conditioning system using Thermoelectric Cooler for its effectiveness, comfort, efficiency environmental friendliness and convince. Heating up of vehicle cabin parked under direct sunlight causes discomfort to the passenger when they enter the cabin. The design analysis the heating methodology of a passenger car parked under direct sunlight by doing some experiment methods taking into consideration, the solar radiation, temperature in the cabin. On the basis of which, design an air conditioning system by the use Thermoelectric Cooler and make effective use to perform more efficiently with less power consumption. Suited for coming technology in automotive industry. If we use the convention cooling system to keep vehicle cabin cool we have to leave the vehicle engine running. This is not possible when we keep vehicle in parking. So to overcome this problem we are specially designing a cooling system for vehicle. Which is parked in direct sunlight. In this design we are using a solar panel to power the cooling system and for cooling purpose we are using Thermoelectric Cooler, Heat sink, and fans/blowers. This system will only use renewable source of energy i.e. it's run free of cost and the system is reliable and maintenance free. To design a cooling system, the program's used in this project for designing are SolidWorks and ANSYS for analysis. Consequently, of using these programs, this project allows us to apply, learn and link technical knowledge of automobile and Electrical knowledge.

Keywords: TEM (Thermo Electric Module), TEC (Thermo electric cooling)

1. INTRODUCTION

Nowadays, thermoelectric technology has wide application in commercial as well as domestic sectors such as high-quality temperature control, such as precision instruments for medicine and research. In automotive sectors thermoelectric cooler are future of tomorrow due to portability, low power consumption, durability and economically viable solution as compared to conventional devices. Thermoelectric cooler is a device that can be used for cooling purposes and it is referred to as thermoelectric refrigeration. Thermoelectric refrigeration offers several advantages with respect to conventional vapour compression technology, since thermoelectric devices are more compact, free of noises and vibrations, provide high-quality temperature control and require far less maintenance. The design should achieve the primary goal of maintaining ambient temperature in the cabin and also maintain minimum space requirements. The secondary goal is to maintain the interior parts and to protect the goods and products kept at the cabin from aging and damage respectively.

2. RESEARCH METHODOLOGY

We are using renewable source of energy that is solar energy, as explained earlier when vehicle is parked under the sun using that sunlight we will power are cooling system by means of solar panel. This solar panel will power the whole cooling system. By this way we have zero load on vehicle's battery. The module will contain Peltier modules specifically cooling modules. Which are also known thermoelectric cooler, this modules act like cooling coils when we supply electricity to its positive and negative terminals its starts absorbing heat from one side and pump it to other side. Now the side from which the heat is getting absorb it will start getting cool. Now on other side to which the heat is pumped will start getting hot. To keep hot side at operating temperature we need to use heat sinks, and fan's so it doesn't get overheated an burn itself. Now other side that is cool side the temperature can go below 5 degree Celsius. Now on cool side we will mount blower fans so that we can blow the cool air into the vehicle's cabin. In this we way we can maintain the vehicle's cabin temperature at an ambient temperature. We will also design a breaker circuit which will

automatically shut down the circuit as the temperature on hot side goes above operating temperature. In this way we can achieve a long lasting circuit which we increase the overall life of the cooling module.

3. EXPERIMENTAL SURVEY

The temperature range inside the cabin due to radiations incident on glass and heating up of cabin space are recorded for over a period of Week. During this period we measured the temperature inside the cars cabin. The temperature was measured during afternoon hours that is between 12:00PM to 03:00PM. Reason being that heat radiation from the sun is at max during this period. We got an average temperature reading of 45-50 degree Celsius. Ambient outside temperature ranging between 34 to 38 degree Celsius.

4. CALCULATION

4.1 Cooling load calculation

$$Q_c = mC_p\Delta T$$

$$m = P.l \quad \text{Where, } P=1.455 \text{ kg/m}^3 \text{ at } 34^\circ\text{C}$$

$$a = v.A$$

Velocity of air passing through duct is 3m/s^2 .

Cross section area of the rectangular duct (W×H) was calculated as 0.0054128 m^2

$$\therefore l = 0.0216512 \text{ m}^2/\text{s}$$

Mass flow rate of air(m)= $P.l$

$$m = 0.02480144 \text{ kg/s}$$

$$\Delta T = T_{in} - T_{out} \quad (\text{Assumed})$$

It is assumed that there will be drop in temperature of air from 35°C to 28°C . When it passes thru the cooling fins.

$$\therefore \Delta T = 7^\circ\text{C}$$

$$C_p \text{ at } 35^\circ\text{C} \text{ is taken } 718 \text{ J/Kg.k}$$

$$\therefore Q_c = mC_p\Delta T$$

$$\therefore Q_c = 124.65 \text{ W}$$

Therefore based on calculations we have selected Peltier module

4.2 Selection of Peltier

Thermoelectric Cooler -12706 operates with an optimum voltage of 12V. It has maximum voltage of 15.4V. At 12V it draws and maximum DC current of 6A. The maximum power is 92W. It has a maximum operating temperature of 138°C . The charts from the Peltier module manufacture were also analysed while choosing the Peltier module. It had been decided to choose 2 Peltier modules of the same model so that when the power of all the 4 Peltier modules is higher than the calculated cooling load. The minimum power rating for 2 Peltier modules added together was more than the cooling load calculated. So it was acceptable to select the $92\text{W} \times 2 = 184\text{W} > 124.65 \text{ W}$. The Peltier module was selected considering few factors such as dimensions, Q_c , power supply and etc. The model no. of Peltier module is Thermoelectric Cooler 1-12706. The idea was to select a Thermoelectric Cooler which has a cooling power greater than the calculated Thermoelectric Cooler

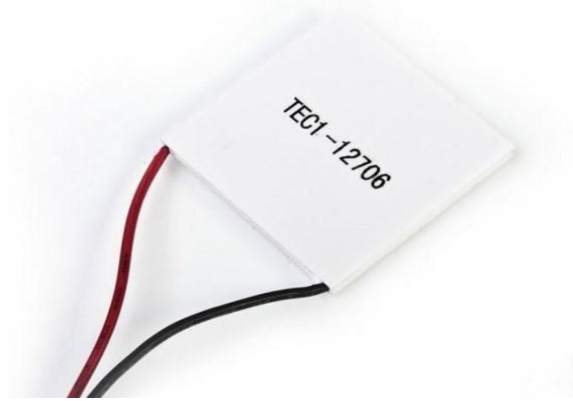


Fig 1: Peltier module

4.3 Design analysis and calculation of heat sink and cooling fins

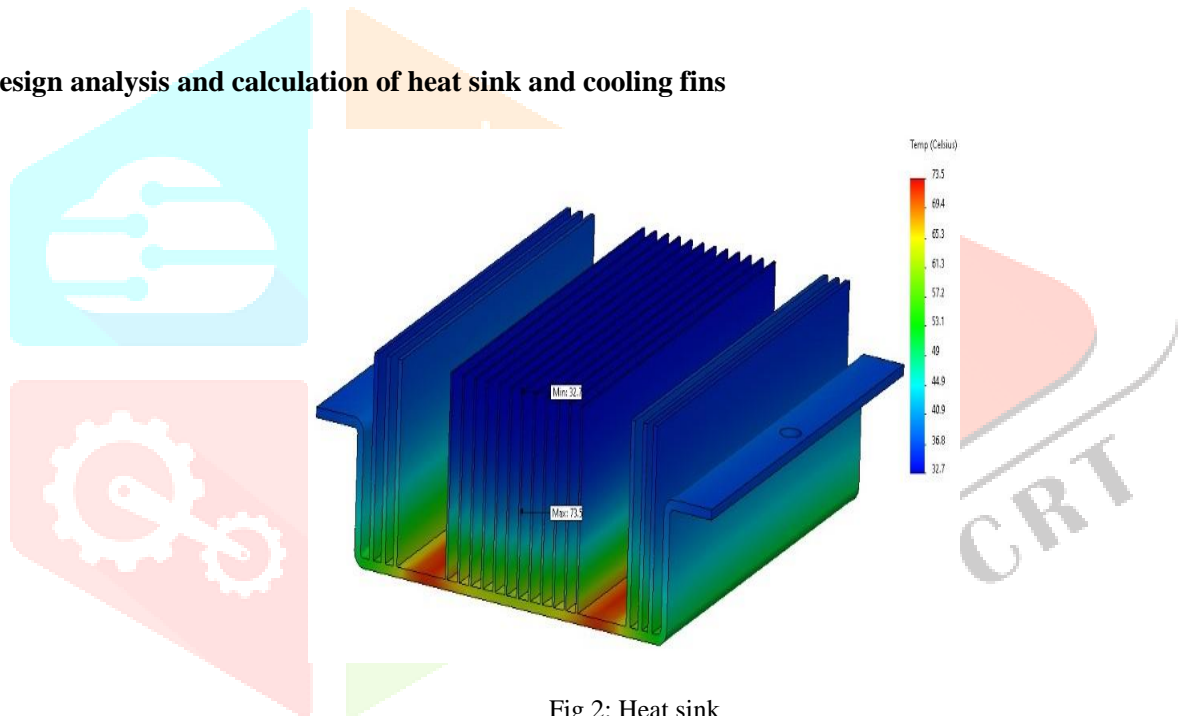


Fig 2: Heat sink

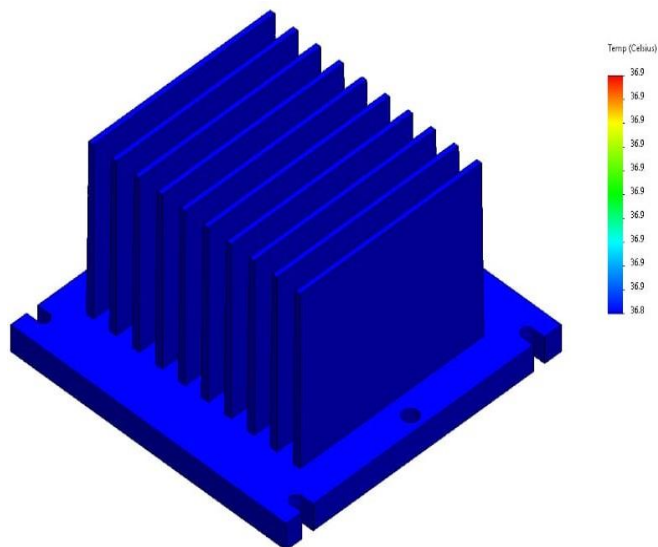


Fig 3: Cooling fins

$$N = 21 \text{ fin}$$

$$L = 2 \text{ cm} = 20 \text{ mm}$$

$$W = 10 \text{ cm} = 100 \text{ mm}$$

$$T = 1 \text{ mm}$$

$$T_B = 70^\circ\text{C}$$

$$T_A = 34^\circ\text{C}$$

$$h = 210 \text{ W/m}^2\text{k}$$

$$k = 205 \text{ W/mk}$$

$$m = \sqrt{\frac{2h}{kT}}$$

$$m = 45.2634 \text{ m}^{-1}$$

$$L_c = 0.0205$$

$$n_{\text{eff}} = \frac{\tanh(m.L_c)}{m.L_c}$$

$$n_{\text{eff}} = 0.786 = 78\%$$

*Calculating area of fin

$$\text{Area of fin} = 2.w.L_c$$

$$\text{Area of fin} = 4.1 \times 10^{-3} \text{ m}^2$$

*Rate of heat transfer at ($T_A = 34^\circ\text{C}$)

$$\dot{Q} = n_{\text{fin}} . h_a . A_{\text{fin}} (T_B - T_A)$$

$$\dot{Q} = 24.36 \text{ W}$$

*Rate of heat transfer at ($T_A = 36^\circ\text{C}$)

$$\dot{Q} = 23.009 \text{ W}$$

*Rate of heat transfer at ($T_A = 38^\circ\text{C}$)

$$\dot{Q} = 21.65 \text{ W}$$

*Rate of heat transfer at ($T_A = 40^\circ\text{C}$)

$$\dot{Q} = 20.30 \text{ W}$$

4.3.1 Now for complete heat sink

Consider $h = 154 \text{ W/m}^2\text{k}$

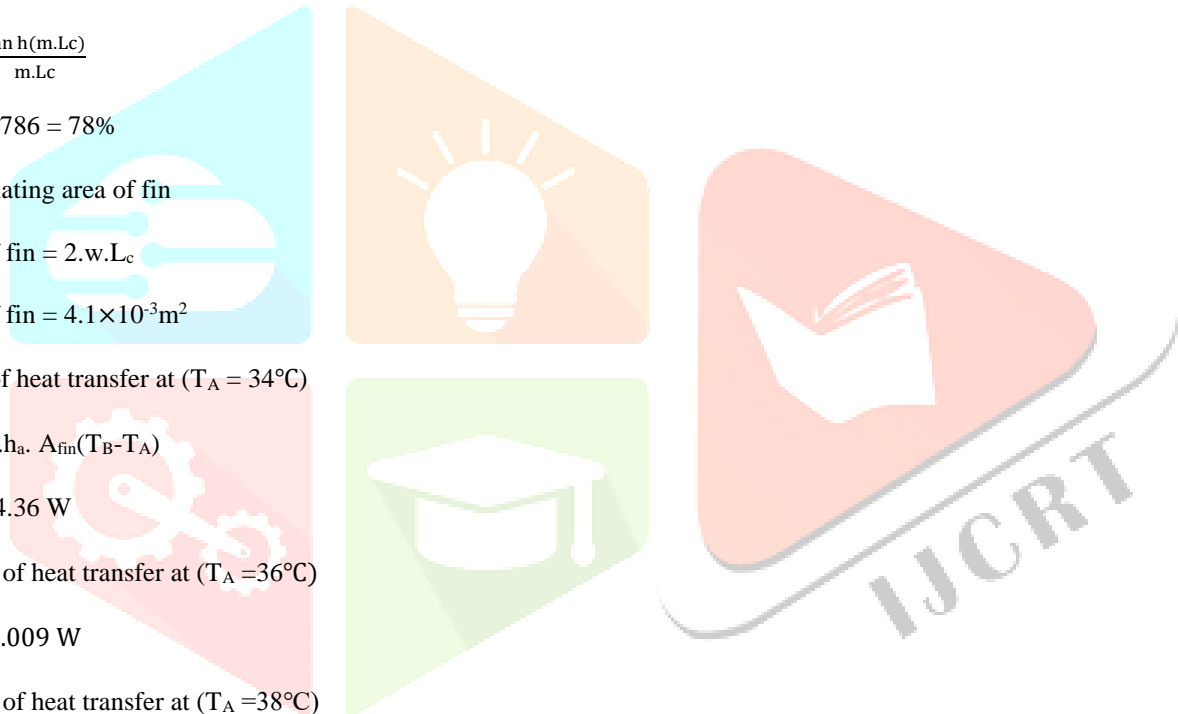
$$m = \sqrt{\frac{hP}{kA}}$$

$$= 38.95$$

*Efficiency of fin

$$n = \frac{\tanh(m.L_c)}{m.L_c}$$

$$= 0.830$$



= 83%

*Effective area, A_{ea}

$$A_{ea} = A_b + (n_a \times A_f \times N)$$

$$= 8.59 \times 10^{-3} \text{ m}^2$$

$$\dot{Q} = h \times A_{ea} \times (T_B - T_A)$$

$$= 47.62 \text{ W}$$

$$\text{Now, } T_A = 36^\circ\text{C}$$

$$= 44.98 \text{ W}$$

$$\text{Now, } T_A = 38^\circ\text{C}$$

$$= 42.33 \text{ W}$$

$$\text{Now, } T_A = 40^\circ\text{C}$$

$$= 89.68 \text{ W}$$

4.3 Cooling fan

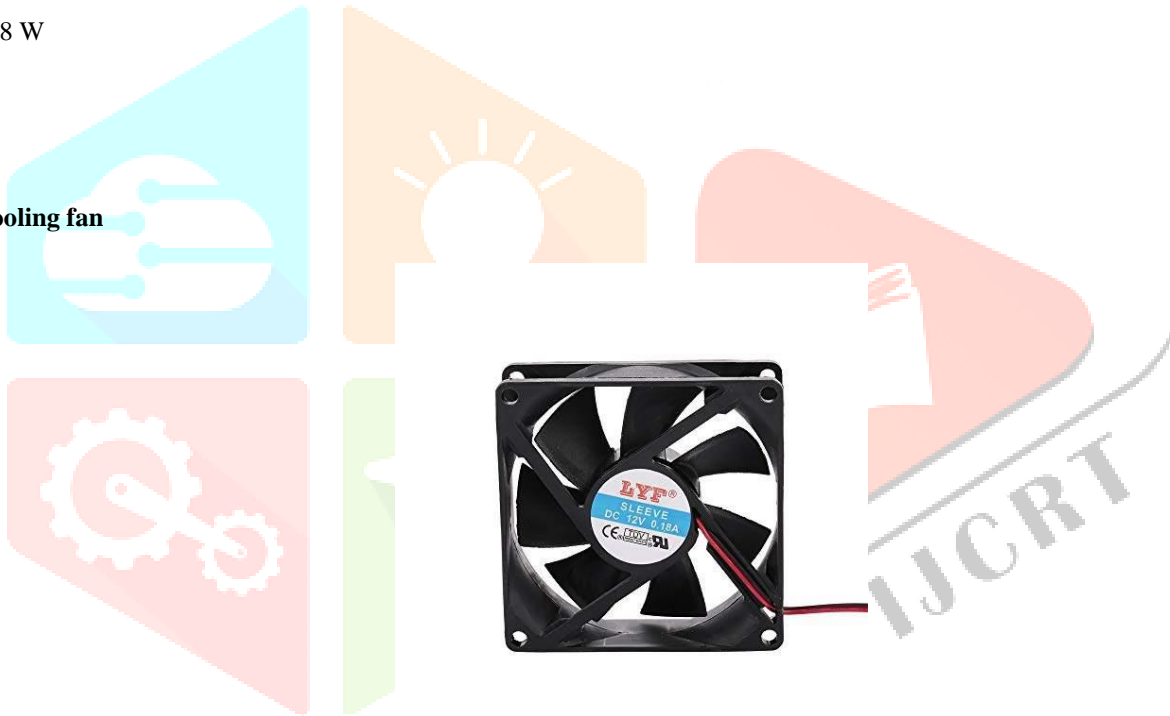


Fig 4: Cooling fan

Cooling fan Dimensions: 40×40×40 mm

Airflow: 20CFM

No. of fans: 2

These will be mounted on the heat sinks of the hot side their purpose is to blow cool air onto the heat sink so that the Peltier module doesn't get overheated and burn itself.

5. DESIGN OF HOT AIR OUTLET



Fig 5: Rear passenger window



Fig 6: ventilation duct



Fig 7: ventilation duct

This will be used for removing the hot air that would be generated on the hot side of the Peltier module. This will be mounted on rear passenger window. First the window needs to be rolled down partially and then place the ventilation device between the glass and the glass seal of the window. A cooling module is placed inside cooling chamber. This will throw cool air inside the cars cabin.

6. DESING OF COOLING UNIT

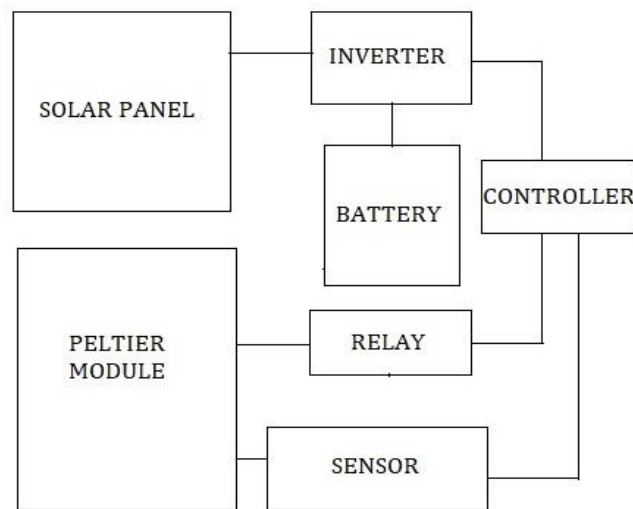


Fig 8: cooling unit

The design of the cooling unit it is designed using solid works this is how the setup is of the cooling unit will look after its complete fabrication. It will be placed inside the ventilation duct the cool side will be inside the cars cabin and hot side will be

outside the cars cabin. The cooling side consist of two small DC fans that will blow cool air inside the cars cabin to achieve maximum cooling of the cabin air and reduce the cabin temperature

7. BLOCK DIGRAM OF CIRCUIT



8. RESULTS

The system as per our calculations will be able to maintain temperature close to ambient temperature. The system is power efficient and reliable as well. It will meet the expectations of the consumer requirements. The implementations and ergonomics of the system are easy. This project was just an effort to demonstrate how Thermo electric cooler can be used for cooling in a non-conventional way and there is a future scope for this technology with new and more efficient Peltier modules.

9. CONCLUSION

As per the decided aim the system was able to achieve acceptable results of maintaining ambient temperature. By the method of air recirculation air was drawn into the cooling chamber and passed over the cooling fins where the temperature of the air dropped and then the air by means of blower fans again thrown back into the cabin. On the other side the cooling fans blow onto the heat sink and kept the Peltier module in operating temperature. The system used two thermos electric cooling unit running in parallel to achieve maximum cooling. System has efficiency of 80-85 percent with all the accessories included. This system works on solar power. So there is no stress on any of the cars electric component.

ACKNOWLEDGEMENT

I express my sincere thanks to our Principal Dr. Aqueel Shah of Theem college of Engineering and Technology, Boiser, for supporting us all along. We would like to especially acknowledge our Project Guide Mohd Raees, Asst. Professor in Automobile Engineering for their guidance and steering us to the successful completion of this project.

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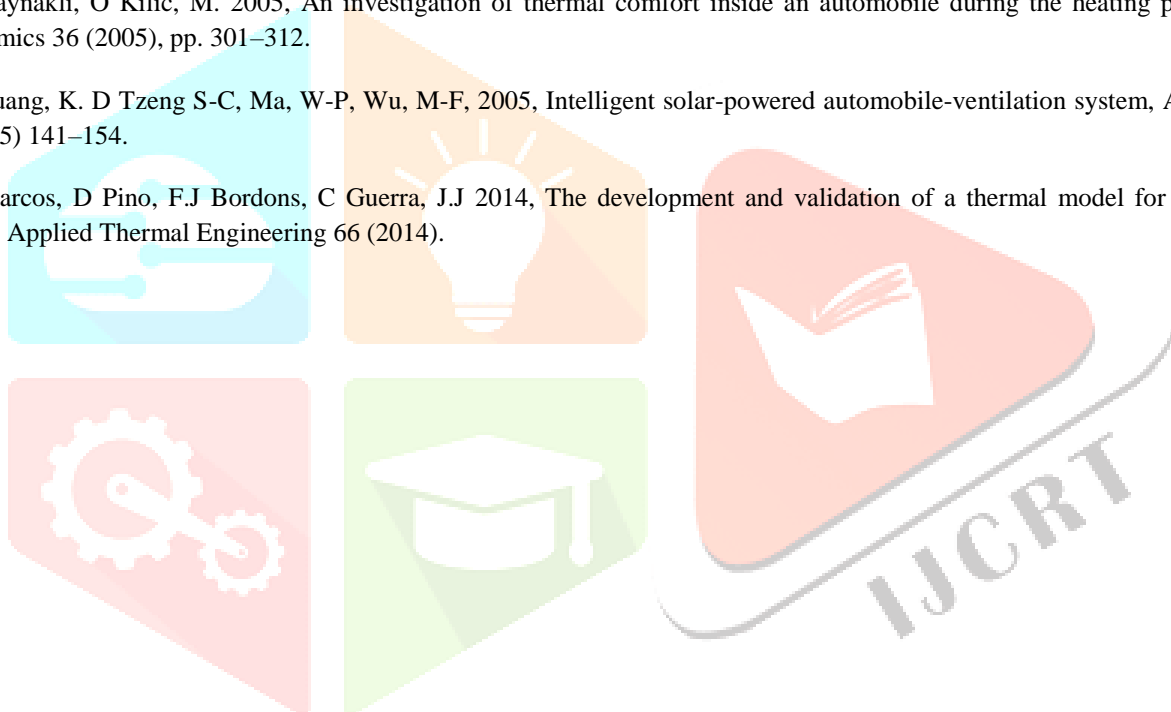
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Fabrication of Automatic Pneumatic Braking System

Avinash V. Khadye, Hardik A. Thakur, Akash S. Waghdhare, Abhishek K. Yadav, HOD. Wasim Khan

Department of Automobile Engineering,

Theem College of Engineering, India,

akspartanx283@gmail.com, hardikthakur964@gmail.com, akudiwagh1100@gmail.com, abhishekyadav271094@gmail.com, wasim.khan@theemcoe.com

Abstract- Most of the accidents in four wheeled vehicles occur because of failure of braking systems. Manual method of applying brakes is always dangerous as it leads to accidents. Unconsciousness of driver, failure in the linkages of braking systems, road conditions, uncontrollable speed of the vehicle and manual operation of braking systems are the reasons of accidents. It is necessary to control brakes automatically through electronics devices to minimize the accident problems. In this project report we propose an effective methodology for automatic control of braking system to avoid accidents. In this technology we used Arduino, relays, IR transmitter and IR receiver for effective function of braking control system. This Braking system consists of IR transmitter and receiver circuit and the vehicle. The IR sensor is used to detect the obstacle. There is any obstacle in the path, the IR sensor senses the obstacle and giving the control signal to the Arduino Board which in turn sends signal to relay circuit and actuate solenoid which actuates the flow control system from the pneumatic circuit by actuates the pneumatic cylinder so as to stop the vehicle as programmed. This complete system can be fitted on to dashboard of a vehicle and effectively used for automatic control of braking system. The prototype has been prepared depicting the technology and tested as per the simulated conditions. In future the actual model may be developed depending on its feasibility.

Keywords- wheeled vehicles , IR sensor , flow control system etc.

I. INTRODUCTION

Driving is a common activity for most of the people. The number of vehicles is increasing day by day. Nowadays, the technology has got vast changes which leads increase in speed. The speed plays a vital role to maintain time for longer distances. But, this speed also getting a major problem for causes of road accidents.

The common braking is not sufficient for avoidance of accidents when driver is not active. Further improvement has to done in braking system in order to brake a vehicle when driver is not able to brake i.e., it may need automatic braking system. This automatic braking system allows the vehicle to brake without support of the driver.

The main target of the Infrared braking system is that vehicles should automatically brake when the sensors sense the obstacle. This is a technology for automobiles to sense an imminent forward collision with another vehicle or an obstacle, and to brake the vehicle accordingly, which is done by the braking circuit. This system includes two Infrared wave transmitter and Infrared wave receiver. The Infrared (IR) emitter provided in front portion of an automatic braking system vehicle, producing and emitting IR waves in a predetermined distance in front of the vehicle. IR wave receiver is also provided in front portion of the vehicle, receiving the reflected IR wave signal from the obstacle. The reflected wave (detection pulse) is measured to get the distance between vehicle and the

obstacle. This reflected wave triggers the Relay as the Arduino is coded that way. By switching the relay on, the solenoid valve is turned on by this the pneumatic system is controlled for actuation and the braking of the vehicle is achieved. Thus, this new system is designed to solve the problem where drivers may not be able to brake manually exactly at the required time, but the vehicle can stop automatically by sensing the obstacles to avoid an accident.

In order to reduce the emission levels, more work is going on for the modification of engine work functions and all. There are several kinds of braking mechanism systems that would only can be applicable mechanically, to move the ideology more deep and brief the automatic braking system will be more sufficient and satisfactory in addition to mechanical braking system. In present generation, number of vehicles are coming into existence with newer technologies for implementation of human comfort and other conditioning. To extend the ideology in more brief manner and to take the step in different way, may automatic braking system would full-fill the methods of extension of technical existences.

II. PROBLEM DEFINATION

The conventional friction brake system is composed of the following basic components the master cylinder which is located under the hood is directly connected to the brake pedal, and converts the drivers foot pressure into hydraulic

pressure. Steel brake hoses connect the master cylinder to the slave cylinders located at each wheel.

Brake fluid, specially designed to work in extreme temperature conditions, fills the system. Shoes or pads are pushed by the slave cylinders to contact the drums or rotors, thus causing drag, which slows the car.

Two major kinds of friction brakes are disc brakes and drum brakes. Disc brakes use clamping action to produce friction between the rotor and the pads mounted in the caliper attached to the suspension members. Disc brakes work using the same basic principle as the brakes on a bicycle as the caliper pinches the wheel with pads on both sides, it slows the vehicle. Drum brakes consist of a heavy flat-topped cylinder, which is sandwiched between the wheel rim and the wheel hub. The inside surface of the drum is acted upon by the linings of the brake shoes.

When the brakes are applied, the brake shoes are forced into contact with the inside surface of the brake drum to slow the rotation of the wheels. Air brakes use standard hydraulic brake system components such as braking lines, wheel cylinders and a slave cylinder similar to a master cylinder to transmit the air-pressure-produced braking energy to the wheel brakes. Air brakes are used frequently when greater braking capacity is required. All the above mentioned conventional brakes have two chief problems one is the wear and tear and other is unnecessary excessive temperature in the service is attained. Excessive heating of brakes can result in fade. It causes temporary changes in the friction as they get hotter. Normally efficiency is regained when they cool again. Brake pads and linings also wear away faster at higher temperatures.

III. BENEFITS

- Avoid pedestrian accidents.
- Safety over roads and passengers.
- Stopping the vehicle at shorter distance.
- Prevent damage of vehicle body.
- Quickly sense the obstruction.
- Acts instantaneously in-case of emergency.
- Acts with the least effort from the driver.
- Free from wear adjustment.
- Brake cost will be less.
- Less power consumption.
- Less skill technicians is sufficient to operate.

IV. SCOPE AND APPLICATION

The scope of this project is to develop an IR sensor to detect the obstacle and to process the output from the Infrared Sensor to turn the relay ON and provide flow of the air from the compressor to the cylinder. Vehicles can automatically brake due to obstacles when the sensor senses the obstacles. The focus of this project is designing

an automatically braking system that can help us control the braking system of a vehicle. The automatically braking system also needs to work with an ultrasonic sensor, which produce sound pulse by a buzzer. The infrared wave is generated from a transmitter and sends to a receiver.

V. CONCLUSION

Most of the accidents can be avoided if proper braking is applied in right time. In our project, the proximity sensors (Sharp IR sensors used in the project) monitor the distance of nearby obstacles from vehicle, and gives signal to the comparator circuit (LM 358) which gives output to the transistor circuit. The transistor circuit output is coupled to the relay, which controls the pneumatic circuit actuator, such as a solenoid valve (connected to normally open switch).

The compressed air from the compressor at the pressure of 5 to 7bar is passed through a pipe connected to the Solenoid valve with one input. The Solenoid Valve is actuated with Control Timing Unit. The Solenoid valve has two outputs and one input. The air entering into the input goes out through the two outputs when the timing control unit is actuated. Due to the high air pressure at the bottom of the piston, the air pressure below the piston is more than the pressure above the piston. So these moves the piston rod upwards which move up the effort are, which is pivoted by control unit. So this project is the prototype of the system of Automatic and Pneumatic Braking System which can be installed in a vehicle to have an autonomous braking experience and have a safe journey for both the rider and the pedestrians.

VI. FUTURE ENHANCEMENT

In order to reduce the emission levels, more work is going on for the modification of engine work functions and all. There are several kinds of braking mechanism systems that would only can be applicable mechanically, to move the ideology more deep and brief the automatic braking system will be more sufficient and satisfactory in addition to mechanical braking system.

In present generation, number of vehicles are coming into existence with newer technologies for implementation of human comfort and other conditioning. To extend the ideology in more brief manner and to take the step in different way, may automatic braking system would fulfill the methods of extension of technical existences. Thus this System can be installed and thus have a safe driving experience and can be taken into full call module and placed in the dashboard of the automobile electronics.

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HYBRID POWERED SELF BALANCING PERSONAL TRANSPORTER

Khan Ishaque¹, Shah Umair², Shaikh Riyanuddin³, Suraj Sawant⁴, Mohammad Sami Malik⁵

¹⁻⁴Student, Department of Automobile Engineering, TCOE Boisar, Maharashtra, India

⁵Assistant Professor, Department of Automobile Engineering, TCOE Boisar, Maharashtra, India

Abstract - The personal transporter is self-balanced with an aid of a motion Processing Unit (MPU6050) which include a gyroscope and an accelerometer sensor for automated calibration and orientation. The personal transporter is driven by two 350 watt DC motors that's powered by using 25volt~10amp lithium- ion (Li-ion) battery and 20watt~12volt solar panel. The solar panels are one of the charging source. by means of using solar strength added through solar panels the using range of this transporter has been prolonged. A solar charger controller is used to modify the charging output of the solar panels. A Motor driving force Module is connected to DC motors, it act as a Differential to govern the speed and path of rotation of the DC cars. A dead man's switch is used as a safety characteristic, to keep away from any accident in case a driving force fall off from the transporter whilst driving. private transporter currently available is highly-priced, so we have determined to design and fabricate it at low-cost. The goal of the venture is to layout and deliver zero pollutants, compact, handy, sensorized, and cost-effective cars.

Key Words: DC motors, gyroscope, accelerometer, solar panel, lithium-ion.

1.INTRODUCTION

In 2001, Dean Kamen invented the first electric powered, self-balancing personal transporter. it is a zero-emission vehicle, hence its use in every day life will cause no harm to the environment. it's far quicker than pedestrians and might pass across the streets hastily. because it runs on electric powered electricity, it's far green and comparatively cheap to keep. however the personal transporter presently to be had in the marketplace is high-priced to buy, in an effort to make it much less-costly and comparatively greater efficient this challenge is being fabricated. The concept of this challenge is stimulated by means of the currently available personal Transporter through using a Hybrid supply of strength to run it.

The personal transporter is driven in forward and backward path with the aid of motive force leaning the handle in the direction of the respective direction. And can be turned in both direction by simply tilting the handle towards the corresponding direction. The device that keeps the personal transporter in upright function at the same time as driving, is called MPU (motion Processing Unit). The MPU is commonly consist of Gyroscope sensor and Accelerometer sensor,

each those sensors calibrates the location and orientation of the personal transporter to keep it balanced and in upright position. The Microcontroller acts as the brain of the personal transporter. It receives the important data from Motor driver Module and MPU, and commands them correspondingly.

This Hybrid Powered vehicle is the one of the most convenient and environment-friendly mode of transport. As it is convenient to experience, it is able to also be driven by youngsters of unique age and old people. it can run with the rate of 25-30 Km/h.

1.1 COMPONENTS:

1.1.1. CHASIS:

Chassis plays an important role in this vehicle, as it has to withstand the load of the driver and all the components that has to be mounted on it. The factors that were taken under consideration while selecting the material for chassis are:-It should have considerable amount of strength and hardness. It should be of light-weight. It should be easily Machine-able to carry out various machining operations. It should be cost-effective. Fig-1

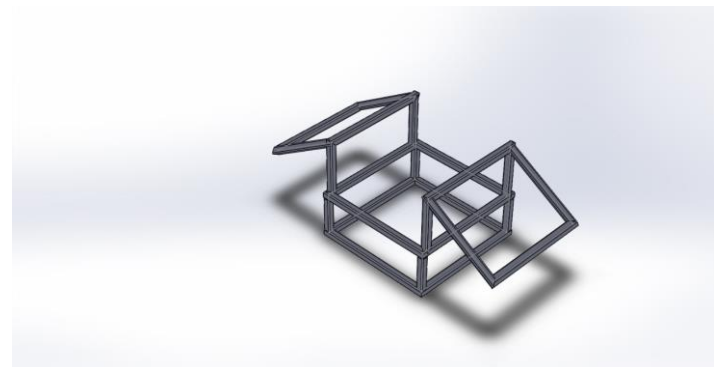


Fig-1:Chasis.

1.1.2. DC MOTOR:

The major reason for selecting this PMDC motor is due to its high power output and torque. It has high load carrying capacity. It has required magnitude of speed,

since this project has a driving speed of 25-30 Km/hr.Fig-2



Fig-2: DC motor.

1.1.3. BATTERY:

Battery is a used as main power source. Factors that were taken under consideration while selecting the suitable battery, Fig-3

✓ **SPECIFICATIONS :-**

- OUTPUT VOLTAGE :- 25 V
- RATED CAPACITY :- 10 Amp
- CHARGING TIME :- 4 Hours.



Fig-3: Battery.

1.1.4. TYRES:

The tyres are one of the essential member of a vehicle as it transfer a vehicle's load from the axle through the wheel to the ground and to provide traction on the surface over which the wheel travels.Fig-4

✓ **Specifications :-**

- RIM SIZE: - 16 in.
- ASPECT RATIO :- 90/90
- SPEED RATING :-100kph.



Fig-4: TYRES.

1.1.5. SOLAR PANEL:

Solar panel is an assembly of photovoltaic cells mounted in a framework. These photovoltaic cells uses sunlight as a source of energy and generate DC electricity. It is also known as PV module. In this project, solar panels are being used as an additional power source or in other words, as a power backup source. Two Solar panels are being used, each mounted on the either sides of the vehicle, above the tyres.Fig-5

Specifications :- 12volt 20WATT.



Fig-5: Solar Panel

1.2 ELECTRONIC COMPONENTS:

1.2.1 AURDUINO:

The signal from the gyroscope is coupled with the Arduino. That signal gets verified with Arduino. The output from the Arduino is given as input signal to the motor driver circuit.

Fig-6 AURDUINO.



Fig-8: Bts 7960 motor driver.

1.2.2. MPU 6050:

In this project, MPU6050 sensor is used. Because, it has an additional feature of on-chip Temperature sensor. It is a complete 6-axis Motion Tracking Device. It is a combination of 3-axis Gyroscope, 3-axis Accelerometer and Digital Motion Processor. The supply to the sensor is given by the battery. The gyroscopic sensor is used to sense all the 3 axis X, Y, Z axes at the same time. The MPU6050 consists of 3-axis Gyroscope with Micro Electro Mechanical System (MEMS) technology. It is used to detect the rotational velocity along the X, Y, Z axes. When the gyroscope is turned left, the low signal is given to the Arduino, based on the Arduino programming one relay gets ON and the chariot turns left and vice versa. For forward motion of the chariot, both relay gets ON and the chariot moves forward. Fig-7

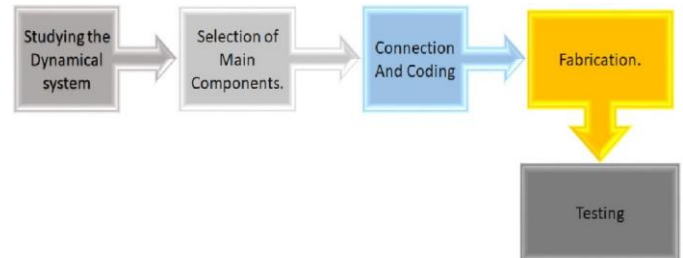


Fig-7: MPU 6050

1.2.3. BTS7960 MOTOR DRIVER:

The Motor Driver 7960 is a fully integrated high current half-bridge, to drive motor. Motor Driver act as an interface between the motors and the control circuits. The function of motor drivers is to take a low current control signal and then turn it into a higher current signal that can drive a motor. Fig-8

2. METHODOLOGY:



2.1. HOW IT WORKS?

It mirrors simple human actions. To move it in forward and backward direction, the driver has to simply lean in the respective direction. To turn it, the driver has to tilt the handle towards the desired direction.

2.2. BLOCK DIAGRAM:

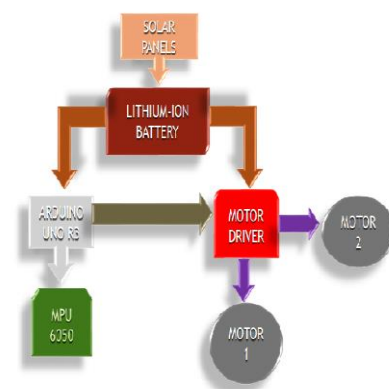


Fig-9: Block diagram.

The above figure shows the flow diagram of the hybrid two wheeler self-balancing vehicle. The polymer-lithium-ion battery is connected to solar panel through a charge/ discharge switch to control the flow of solar power and deliver it when required. The battery is directly connected to the control module which consists of the microcontroller. The microcontroller obtains and process the data from the Motion Processing Unit (MPU) which includes Accelerometer and Gyroscope sensors. The primary function of these sensors is to send information about current orientation which includes pitching, yawing and rolling angles of the vehicle to the microcontroller. Thus, the motors are controlled by microcontroller after processing all these data.

A D.C motor is driven by solar energy. Solar energy is a natural resource available free of cost and in adequate quantity. The balancing of vehicle is achieved by using balancing wheels and other functions are carried out by using different electrical components. Whereas for turning and braking two separate switches are used which is connected to motor controller which controls speed of motor? A motor controller is attached at lower side of platform. Here battery, motor & pedestal bearing is mounted over platform. And using chain sprocket system transmission system is done and transmission is done to separate wheels using shaft.

2.3. TORQUE CALCULATIONS:

Maximum weight of rider = 80 kg

Chassis weight including batteries = 40 kg

Therefore, Total weight=120 kg (approx.)

Coefficient of friction between road and tire = 0.3

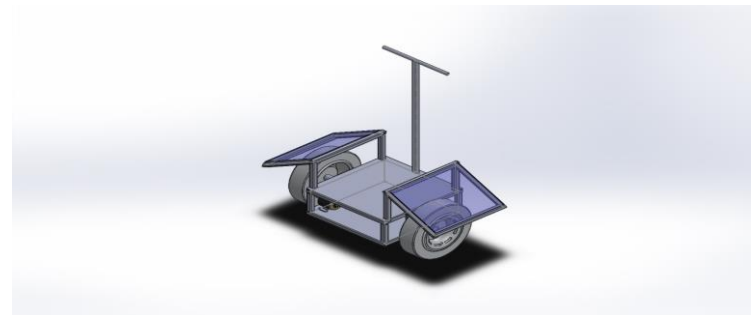
Torque required = Friction Force * Radius Of Wheel

$T = 120 * 0.3 * 25\text{cm}$ $T = 9 \text{ kgf-m}$ (Approx.)

As two motor are used.

Therefore torque required by each motor = 4.5 kgf – m(Approx.)

2.4. 3D CAD MODEL:



3. PROBLEM DEFINATION:

The present two wheeler self-balancing vehicle is expensive, less efficient and uses only one power source to operate i.e. electric. This made us to think and design such a two wheeler self-balancing vehicle which is comparatively cheap, more efficient, and will uses two power sources i.e. electric and solar. Thus, making it more economical, environmental friendly and beneficial to the society.

4. CONCLUSION

Design and fabrication of personal transporter with motor aimed zero pollution environment for considerable distance at very lower cost or zero cost. Solar energy are used at the place of top of mudguard to overcome the space issues to make it compact. Combination of solar energy and electric charging also known as hybrid technology will play an active role in personal transporter in the future.

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- [4] DESIGN & DEVELOPMENT OF SEGWAY- Mr. Velaji Hadiya , Mr. Aakash Rai , Mr. Sushant Sharma, Miss. Ashwini More
- [5] DESIGN AND FABRICATION OF BATTERY POWER OPERATED SEGWAY Mr. Muthu Vijayan I , Mr. Anirudh S ,Mr. Kameshwaran K , Mr. P. Sethuramalingam

- [6] Mechanical Segway Ankit S. Khanzode, Ashish G. Masne, Mohd. Shahzad Gulam Ali, Akshay P. Tale, Kamalkishor G Maniyar
- [7] SOLAR SEGWAY WITH GRASS CUTTER N.Harini , K. Sandeep Reddy, N. Sai Kumar, G. Mahesh, K. Chandra Shekhar Reddy

SECURITY ON PUBLIC CLOUD FOR FILE STORING

Jyoti Pawar¹, Sariya Damanwala², Tushar Kesare³, Khalil Pinjari⁴

¹⁻⁴Department of Computer Engineering, Theem College of Engineering

Abstract: Cloud computing refers to a computing model in which a large number of systems are linked together in private or public networks to provide dynamically scalable infrastructure for application, data, and file storage. It is a modern type of computing in which dynamically scalable and often virtualized resources are made available as services over the Internet. The user will upload the data to the cloud storage. However, since users no longer have physical control of the outsourced data, maintaining data integrity security in cloud computing is a difficult task, especially for users with limited computing resources. Furthermore, the consumer should not be concerned about the data's integrity and should instead use cloud storage. The customer employs a Third-Party Auditor (TPA), who verifies the data's accuracy. The user employs the services of a Third-Party Auditor (TPA), who verifies the data's accuracy and provides the results to the user upon request. The user can access the data without having to go through the hassle of checking it online, and they can use it without fear. The TPA's trustworthiness is checked, so the cloud user doesn't have to worry about sending a request to an untrustworthy individual. Furthermore, the error's localization is defined so that the misbehaving server can be detected and the user can easily change the data for future use if necessary.

Keywords: Data Security, Cloud Computing, Data Protection, Privacy, Risks and threats.

1. INTRODUCTION

This project focuses on creating a Java-based application that allows the user to perform various cryptographic operations in a GUI (Graphical User Interface) mode. The developed application is a desktop application that, when given various cryptographic keys, generates a report. The user's requests will be processed and executed as required. To make it a standalone application, all of the digital features of Public Key Infrastructure, such as key generation, certificates, message digest, encryption, and signatures, have been combined with the application itself. With large-scale cloud computing in use, the issue of whether computation can be delegated to servers in a safe manner is both a practical and theoretical concern. Another intriguing question is whether we can construct efficient schemes in which the server has no idea what function we want to compute but still computes it for us and returns a response that we can decode to get our desired output. Another intriguing question is if we can devise efficient schemes in which the server has no idea what function we want to compute but yet computes it for us and returns a response that we can decode to obtain our desired performance. A Completely Homomorphic Encryption (FHE) scheme is a protocol (encryption scheme) that allows us to encrypt inputs a, b in such a way that $\text{Eval}(\text{Enc}(a), \text{Enc}(b)) = \text{Enc}(\text{Eval}(a, b))$ for all functions Eval on inputs, where $\text{Enc}(a)$ represents the encryption of input a using our scheme. Only the meaning of FHE is conveyed by this concept. Since we use randomness in our schemes to make them semantically stable, the actual correctness requirement for FHE is slightly different.

2. RELATED WORK

In 2016, Ahmad Albugmi, Robert Walter Published an Research paper name Data security in cloud computing: This paper discusses the safety of knowledge in cloud computing, it's a study of data within the cloud and aspects regarding it concerning security. The paper will enter to details of knowledge protection strategies and approaches used throughout the world to confirm most knowledge protection by reducing risks and threats. Availability of knowledge within the cloud is useful for several applications however it poses risks by exposing knowledge to applications which could have already got security loopholes in them. Similarly, use of virtualization for cloud computing may risk knowledge once a guest OS is run over a hypervisor while not knowing the reliability of the guest OS which could have a security loophole in it. The paper also will offer Associate in Nursing insight on knowledge security aspects for Data-in-Transit and Data-at-Rest. The study relies on all the degree of SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service).

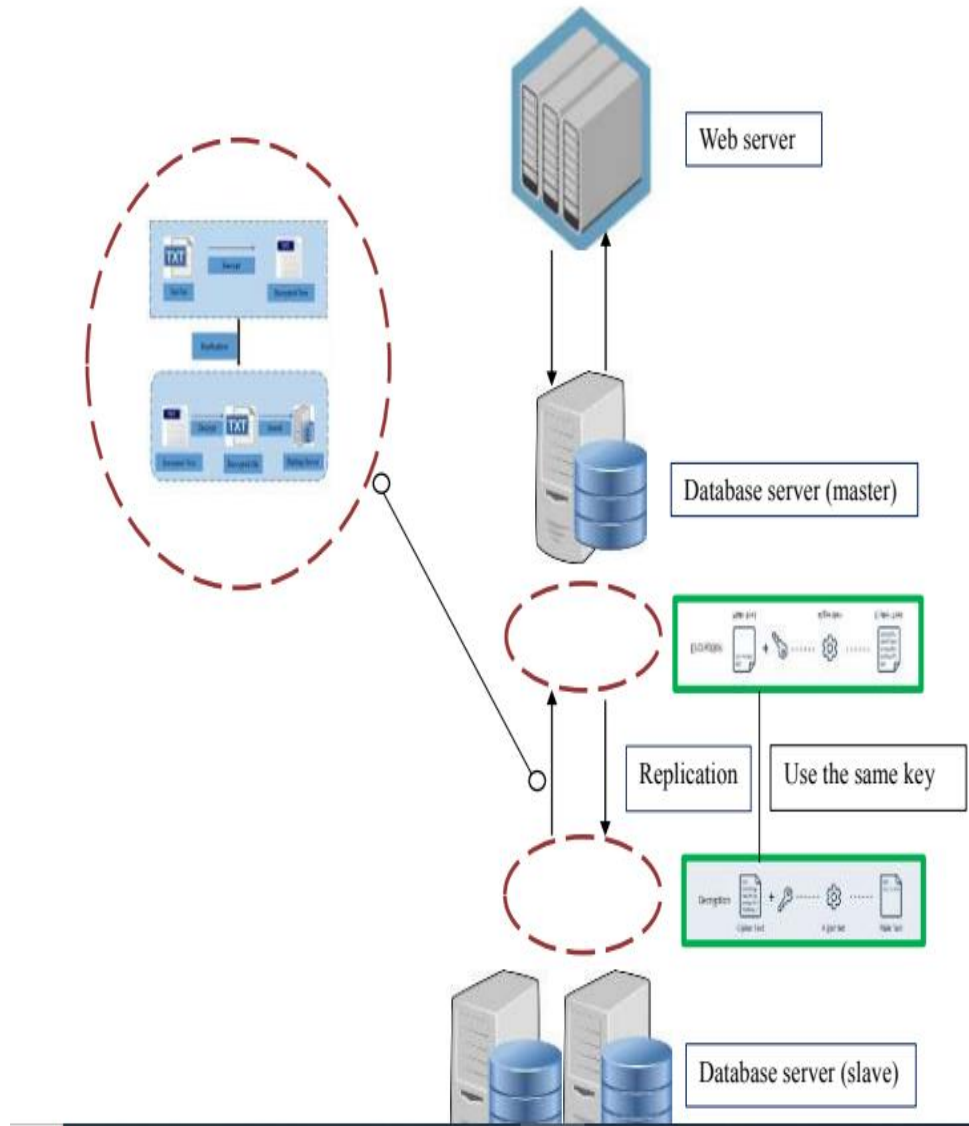
In 2018, Yue Shi Published a Research paper name Data Security and Privacy Protection in Public Cloud: This paper discusses approximately the challenges, benefits and shortcomings of present answers in records protection and privateness in public cloud computing. As in cloud computing, oceans of records could be saved. Data saved in public cloud might face each out of doors assaults and internal assaults on account that public cloud issuer themselves are untrusted. Conventional encryption may be used for storage, but maximum records in cloud desires similarly computation. Decryption earlier than computation will reason big overheads for records operation and plenty of inconvenience. Thus, green strategies to shield records protection as properly as privateness for big quantity of records in cloud are necessary. In the paper, extraordinary mechanisms to shield records protection and privateness in public cloud are discussed. A records protection and privateness enabled multi-cloud structure is proposed.

In 2014, Kirti A. Dongre, Roshan Singh Thakur and Allan Abraham Published a Research paper name Secure Cloud Storage of Data: Cloud computing is one in every of the approaching technologies that may upgrade generation of Internet. the info stored within the good phones is multiplied as a lot of applications are deployed and executed. If the phone is broken or lost then the data hold on in it gets lost. If the cloud storage is integrated for normal information backup of a mobile user in order that the danger of knowledge lost is minimized. The user will store data within the server and retrieve them at anytime from anywhere. the info would possibly be uncovered by attack throughout the retrieval or transmission of knowledge victimisation wireless cloud storage while not correct authentication and protection. So, to avoid this during this paper we tend to style a mechanism that has a security requirement for information storage of mobile phones.

In 2012, Wentao Liu Published a Research paper name cloud computing security problem and strategy: The cloud computing could be a new computing model which comes from grid computing, distributed computing, parallel computing, virtualization technology, utility computing and different laptop technologies and it's additional advantage characters similar to massive scale computation and information storage, virtualization, high expansibility, high reliableness and low worth service. the safety downside of cloud computing is incredibly necessary and it will prevent the fast development of cloud computing. This paper introduces some cloud computing systems and analyzes cloud computing security downside and its strategy in keeping with the cloud computing ideas and characters. the information privacy and repair handiness in cloud computing are the key security problem. Single security methodology cannot solve the cloud computing security problem and lots of ancient and new technologies and techniques should be used together for safeguarding the entire cloud computing system.

3. METHODOLOGY

In figure shows that a general process of encryption of data replication. Its involves two databases which are master sever and slave server and base server has original copy data information while slave database server act backup server because they contain replicated copy of data information. For this project, employee data information will be used as a collection data. After that it stored the data in database server (master). Generally, authorize user access the web server and make a change to data input whether to add, delete, update about the data information. The data might be in semi-structured or unstructured condition. So, it needs to be in sorted first and stored in database server. For the first step, we have to select text file that saved on database server (master) because we want to encrypt it and replicated to another database which is slave database. The reason why text file needs to be encrypted because to ensure That data selected is secured during the process occur. Next, the encrypted text files need to replicate to backup server. So, the process of replication occur start from database server (master) to backup server (slave). This is can increase data availability, performance and enhances data access. Besides, the response time also will be faster. For example, if sudden damage happens to the server the other server already has that backup. So, the time taken to wait for maintenance to process it again is shorter.



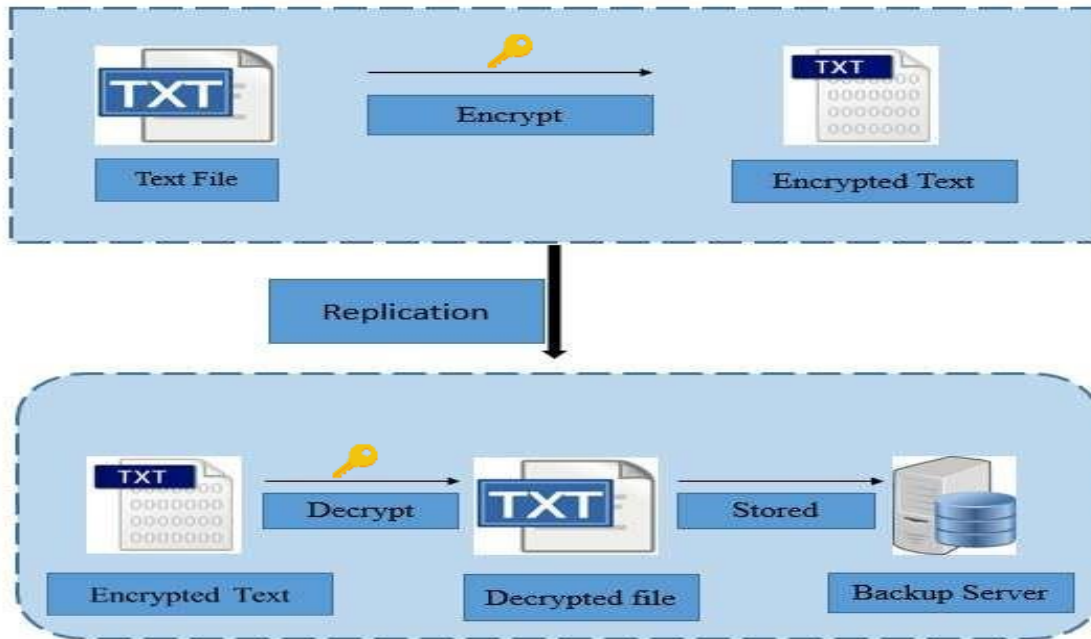


Figure 3.2.2

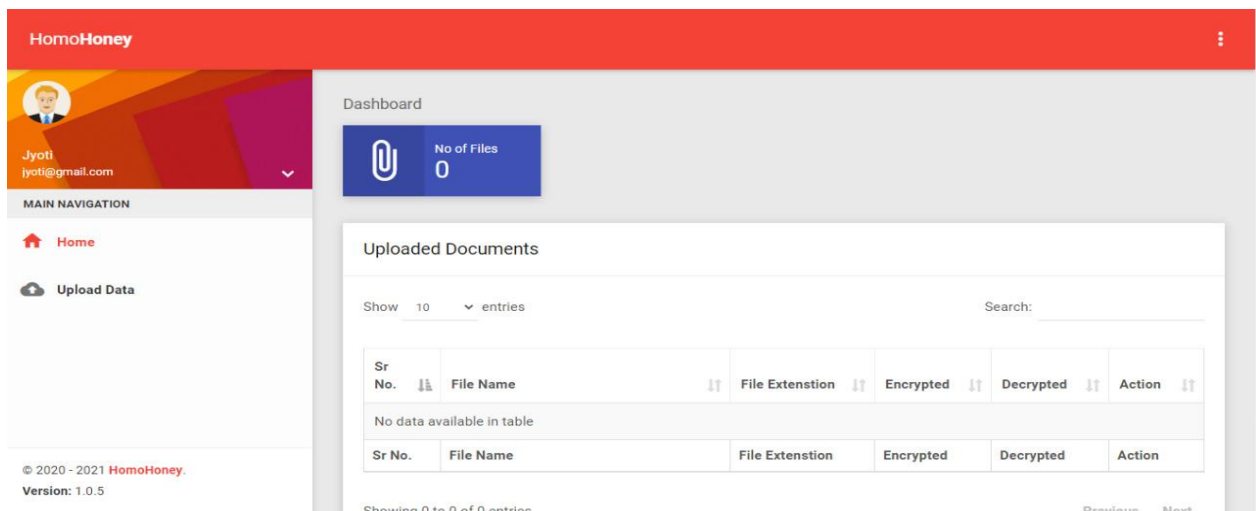
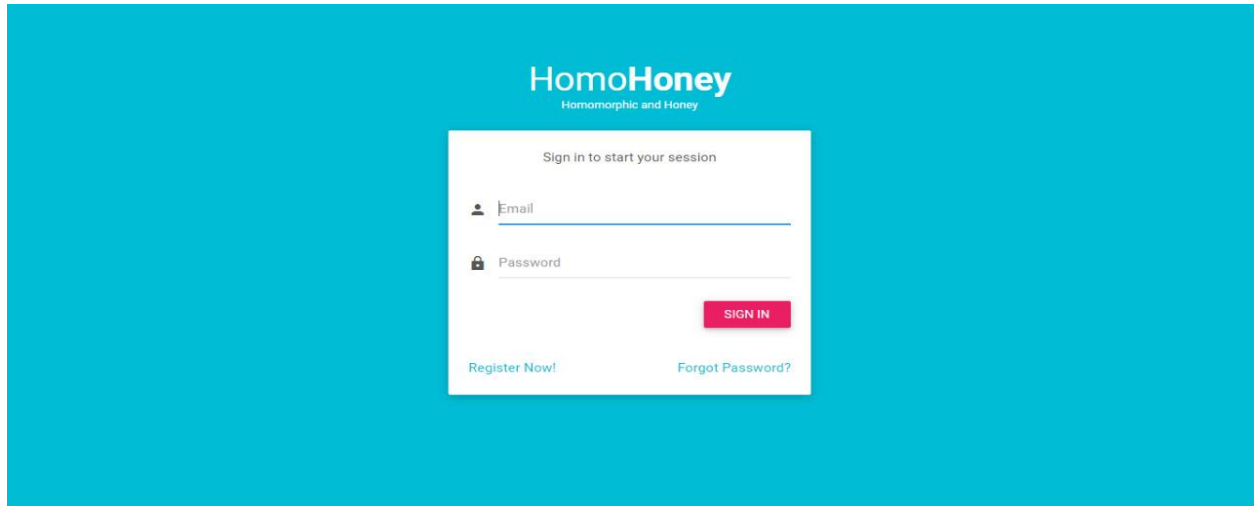
In figure 3.2.2, show that employee data which are located at database table in database server need to encrypt. After that, send the encrypt data to the database server (slave) which is also known as backup server. Data encryption must change to decrypt first. This is because decryption of data is a one way to make the data information as human-readable. Thus, they can be read and people will be understanding the data all about. The process of encryption and decryption of data replication are using the same key.

1. Start
2. Select text file from database
3. Encrypt text file (for first 9 round)
4. Perform XOR operation with sub key for encryption
5. Divide input bit into 4 parts
6. Byte substitution
7. Shifting rows is a simple byte transposition
8. Mix the data with a column of static key
9. Perform XOR operation with sub key
10. At last round mix column will not involved
11. Data send to the slave server (backup)

implementation of algorithm in this data replication is AES algorithm. AES is a symmetric block cipher which used same key for encryption and decryption process. Most of the AES encryption use same block bits which 128 bits. But, it depends of us to

use other key length like 192 bits and 256 bits. It is important to use AES encryption in both software and hardware. Form figure 3.2.2 shows the algorithm used in this project which is AES encryption

4. RESULT



5. CONCLUSION

As a conclusion, hopefully that this project can be upgraded using the suggestion method or other suitable method that can increase the availability of the data. Besides, this project can be improved with the solution to the situation and focus more on big data. This is because the real world now requires the replicating of data in financing or banking. The cryptographic algorithm, Advance Encryption Standard (AES) had been proposed and used in this project. Data replication is more secured by using AES as AES provides a strong level of security. To prevent the data sent through the unsecured channel, data encryption is very useful. Encryption turns the readable data into unreadable form. Data becomes useless since people do not understand. To retrieve the encrypted data, user must have the key to perform decryption.

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STOCK MARKET PREDICTION USING MACHINE LEARNING

Abhinit Davane¹, Shailesh Bhagat², Mehul Bhoi³, Prajaktee Rane⁴

^{1,2,3} Student, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India

⁴ Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India

Abstract - In the finance international stock trading is one of the maximum crucial activities, our goal is to predict the future value of the stocks of a company. The latest trend in stock market prediction technologies is the use of machine learning which makes predictions primarily based totally at the values of present-day stock market indices by training on their previous values. Machine learning gaining knowledge to make prediction less complicated and authentic. The programming language is used to predict the stock market using machine learning is Python. The paper makes a specialty of the use of Decision Tree and LSTM primarily based totally on Machine learning to predict stock values. Factors taken into consideration are open, close, low, high & volume.

1. INTRODUCTION

Predicting the Stock Market has been the bane and intention of buyers since its existence. A accurate prediction of stocks will cause immense profits for the vendor and therefore the broker. Everyday billions of dollars are traded at the exchange, and behind each dollar is an investor hoping to profit in a way or another. Frequently, it is brought out that prediction is chaotic instead of random, which suggests, it can be foretold by rigorously analysing the history of the various stock market. Machine learning is an efficient way to represent such processes. It predicts a value near to the tangible value, thereby increasing the accuracy. The introduction of machine learning the realm of stock prediction has appealed to several researchers due to its efficient and accurate measurements.

The important a part of machine learning is the dataset used. The dataset ought to be as concrete as attainable as a result of a little change within the knowledge will carry on huge changes in the outcome. In this project, supervised machine learning is used on a dataset obtained from Tiingo or Yahoo. This dataset contains of following 5 variables: open, close, low, high, and volume. Open, close, low, and high are totally different bid costs for the stock at separate times with nearly direct names. The amount is that the range of shares that passed from one owner to a different during the amount time. The model is then tested on the test data from Tiingo or Yahoo.

Long Short-Term memory is one of the most successful RNNs architectures. LSTM introduces the memory cell, a unit of computation that replaces traditional artificial neurons within the hidden layer of the network. With these memory cells, networks are able to effectively associate recollections

and input remote in time, thus suit to know the structure of data dynamically over time with high prediction capacity.

2. ALGORITHM

The stock market prediction looks a complex problem as a result of several factors and it doesn't appear applied math at first. however, by correct use of machine learning techniques, one will relate previous data to the present data and train the machine to learn from it and build acceptable assumptions. Machine learning as such has several models however paper focuses on the 2 models' predictions.

2.1 Decision Tree Model

Decision Tree analysis is one among predictive modelling approaches employed in Statistics, Data Processing and Machine Learning.

A Decision Tree will be wont to visually and expressly represent selections and decision making. In data mining, a decision tree describes data however the resulting classification tree are often associate input for decision making.

Work is finished on CSV format of data through panda library and calculated the parameter that is to be predicted, the value of the stocks regarding time. The data is split into completely different train sets for cross-validation to avoid overfitting. The test set is mostly kept 20% of the whole dataset. Linear regression as given by the above equation is performed on top of the data and so predictions are made, that are plotted to indicate the results of the stock market prices vs time.

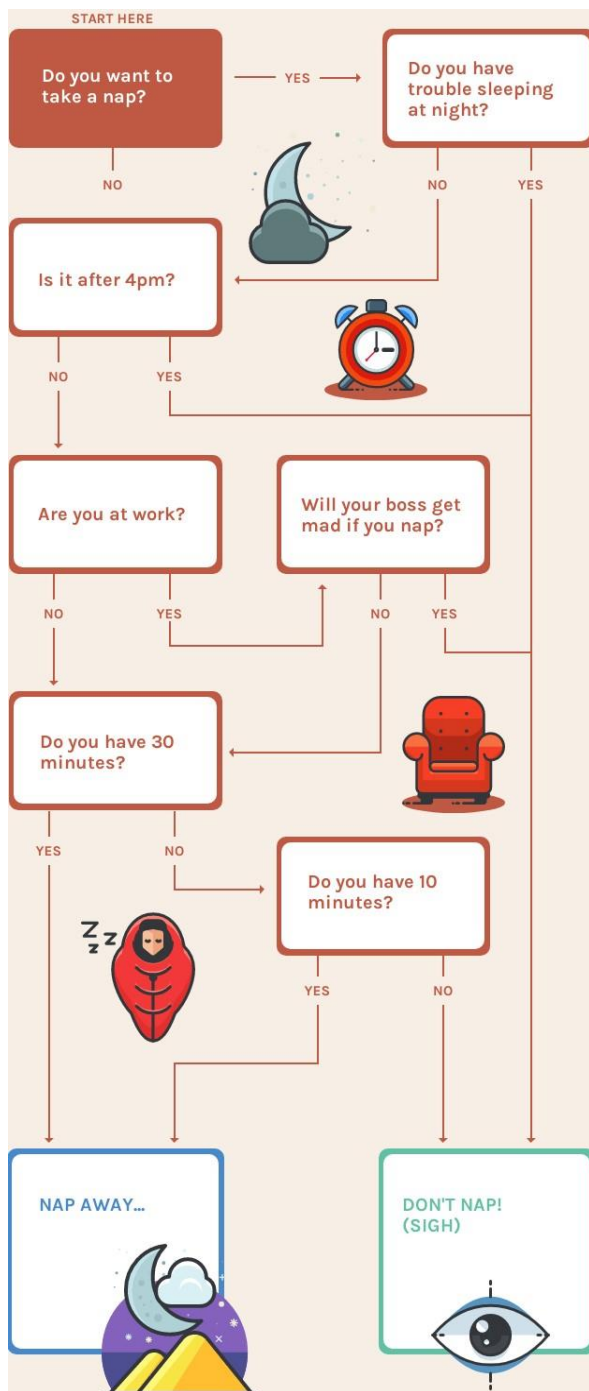


Fig -1: Decision Tree Examples

2.2 Long Short-Term Memory (LSTM) Network Based Model

Long short-term memory (LSTM) is an artificial recurrent neural network (RNN) architecture

The main reason behind exploitation this model in stock market prediction is that the predictions rely upon giant amounts of data and are generally dependent on the long-term history of the market. offer aid to the RNNs through

retentive information for older stages creating the prediction additional accurate.

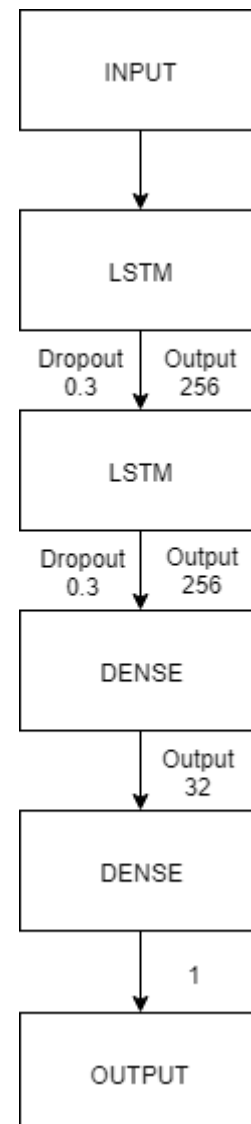


Fig -2: LSTM Layers

Since the stock market have the processing of giant data, the gradients regarding the weight matrix may become terribly tiny and will degrade the training rate of the system. This corresponds to the matter of Vanishing Gradient. LSTM prevents this from occurrence. The LSTM consists of a memory cell, input gate, output gate and a forget gate. The cell remembers the worth for long propagation and therefore the gates regulate them.

Work is finished on CSV format of data through panda library and calculated the parameter that is to be predicted, the value of the stocks regarding time. The data is split into completely different train sets for cross-validation to avoid overfitting. The test set is mostly kept 20% of the whole dataset. Linear regression as given by the above equation is performed on

top of the data and so predictions are made, that are plotted to indicate the results of the stock market prices vs time.

3. EXPERIMENT AND RESULT

The proposed system is trained and tested over the dataset taken from Tiingo or Yahoo. It is split into 2 (training and testing) sets respectively and yields the results upon passing through the different models:

3.1 Decision Tree Based Model Results

The plot in Chart -1 is the result of application of Decision Tree algorithm on the dataset to predict varying prices with respect to the time.

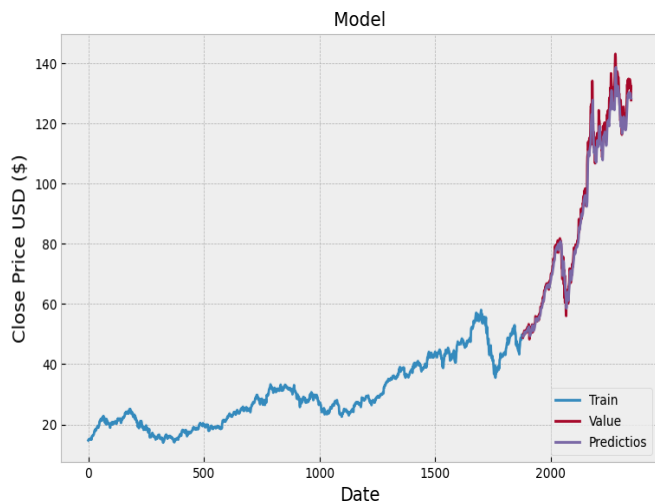


Chart -1: Plot between Price and Date Using Decision Tree

3.2 LSTM Based Model Results

The plot in Chart -1 is the result of application of LSTM algorithm on the dataset to predict varying prices with respect to the time.

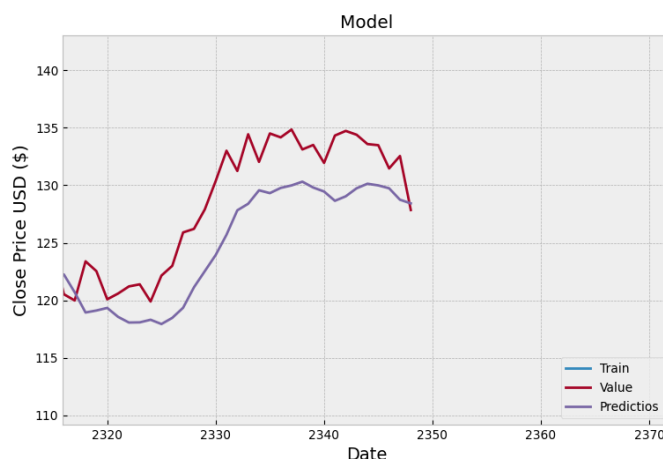


Chart -2 Plot between Actual and Predicted Trend of LSTM

The on top of graph in figure 3 and 4 is a plot over the information having batch size 512 and 90 epochs. The prediction is shown by a purple line and also the actual trend is shown by red. The proximity of these 2 lines tells, however economical the LSTM primarily based model is. The prediction approximates the real trend once a substantial quantity of time has passed. The more the system is trained the bigger the accuracy which is able to be attained.

4. CONCLUSIONS

This article uses two methods: LSTM and Decision Tree, on the Tiingo or Yahoo dataset. Each method showed an improvement in forecast accuracy and provided positive results. The use of recently introduced machine learning techniques to predict stocks has shown encouraging results, marking their use in profitable trading systems. The conclusion drawn from this is that machine learning techniques can be used to predict the stock market very accurately and effectively. The prediction system can be further enhanced by using a data set that is much larger than the currently used data set. This makes it easier to improve the accuracy of our forecasting model. In addition, you can even check alternative machine learning models to understand their accuracy.

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Online PetShop Mobile Application(O'Pet) To Get Your Desire Pet !!

Ashlesha Matkar¹, Anjali Gharat², Bhagyashree Mhatre³, Prof.Surayya Shaikh⁴

¹⁻³Student, Dept. Computer Engineering, Theem College of Engineering, Maharashtra, India

⁴Professor, Dept. Computer Engineering, Theem College of Engineering, Maharashtra, India

Abstract: We all know that our generation have more mental sickness than physical one. every person needs love, care, happiness in their life, so for that they need someone to be with them all the time with whom they can find their happiness. Having a pet is the most satisfactory part of those people who need happiness and enjoyment in their life. The pet can be part of our family in very short time period, because their loving nature attracts each and every person. If people feel stressed they should spend time with their Pet and family then they can feel better. Another reason to must have a pet in life is most of the working people work for more than 10 hours in a day, they get exhausted by working all the day. They need some quality time to be happy, to minimize their stress. And you know who can decrease your stress! Obviously a pet. As we know that in our country there are most of the street animals who don't have anyone to feed them, so we need some application or platform where we can think about this street animals. Because by spending lots of money on foreign breeds of pets we need to adopt such street animals who don't have anyone to take care. Also the author of this paper found that still buying a pet is a manual process in most of the areas, so they face difficulties in finding their desired pet. By analysing such problem the author of this paper decided to make a petshop mobile application which will help people to buy and sell their pet online. The main goal of making this application is to provide an online platform for customers for buying and selling the pets from which they do not need to do manual work for buying and selling the pet.

Keywords: Petshop- online Pet application.

1. INTRODUCTION

In this era as we know that every person is busy doing their day to day activities. Some people are not too much affected by their work load or with any other life issue but some people definitely want someone or something that will keep them happy or from that they don't get affected much. Also some people want someone with whom they can spend their lots of time. Good

suggestion of that is to have a pet that will keep you happy all the time. You definitely do not regret to having pet in your life.

Also we know that in our country we see that stray animals are not treated well all the time. So every person who loves animals can feel that we need to do something for them to give them better life. Because we know that animals can't express their feelings to us, we need to understand their feelings. So rather than buying foreign breeds as your pet you can take animals which don't have anyone to take care of them. From which you can save your money and also help someone who needs you. From this we can say that pets are a very essential part of our life.

The main purpose of our project is to provide an easy interface to get your desired pet. From our application you can get your pet with fast delivery.

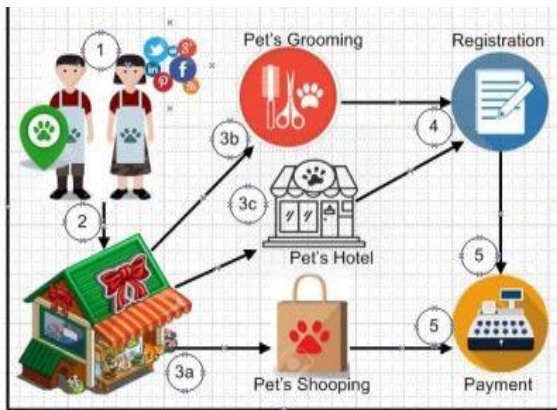
As we are purchasing pets from our users, the user can sell their own pets or they can inform us if they get street animals. We are all available for your service.

The idea for making this application was to provide an online platform to users for buying and selling of pets. Because authors of this paper researched on many pet shops from different areas. And they found that to buy any pet people still go to pet shops and still they don't get their desired pet. By using this application no user has to go to different pet shops searching for their desired pet, they can search and buy it at their home.

To add different features in application, authors of this paper met different pet lovers who wanted to buy pets and what problems they face in the process of searching for pets on different pet shops.

By analysing problems from different people the author of this paper tried to implement advanced features in their application such as grooming and information about how to maintain good health of their pet. Also they understand that their application should be user

friendly,so tried to implement such features that users can handle easily.



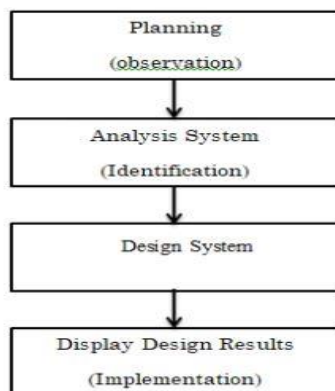
The image above describes that users get 3 options to select.if user user wants to shop pet they can select pet's shopping option and another 2 options if they want grooming and pet's hotel.

To use any of the service users must be registered first.after selecting the desired option the user can move towards payment and complete the process.

2. METHODOLOGY REVIEW

For making this application the author of this paper preferred some ieee papers and other data which helped them for making this application.

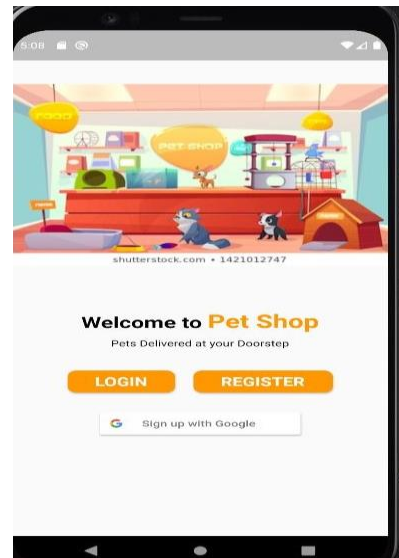
As the author of this paper first observed, many papers get more information about how to design an online pet Shop application.



and they analysed the different scenarios of their application.and finally after lot of researching the author of this paper designed their application.And after

completing it successfully they displayed results of their application.

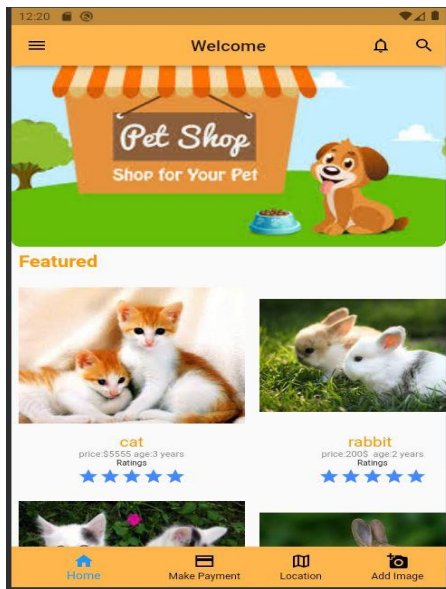
3. RESULT



This design display shows login and registration buttons if a user is already registered on application he needs to directly login and if not needs to register first.when user login in application login details first authenticate with database details if match then only the user is able to log in to application.

After successful login user redirect to homepage where he gets lots of options to search pet, notification, Add pet, make payment, check location etc.

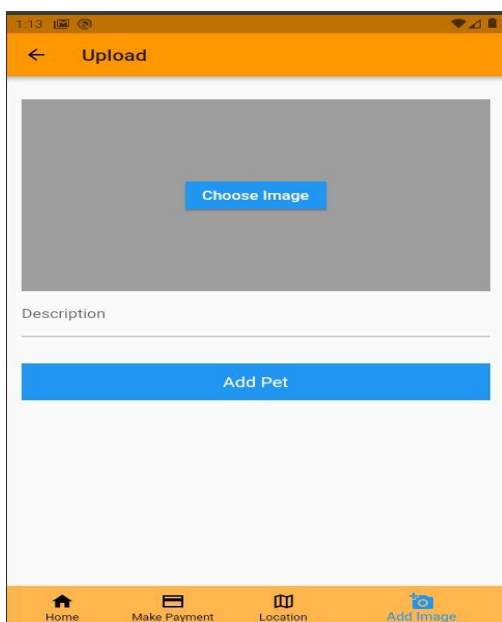
When a user wants to search for a pet he can search any pet on the search bar in application.



Users are able to select their desired pet by clicking the search icon on the homepage.

Also the author of this paper provided different features for their user like online payment, location etc.

As if a user wants to check their pet delivery location he will able to check live location of his pet. And after choosing desired pet user do not need to pay manual payment as author of this paper provided online payment gateway through which user can pay very easily.



4. FUTURE SCOPE

As we know that still in some areas pet buying is manual so this application will be helpful in future also. Also author of this paper buys street animals who will fit into their requirement so it will be very helpful for street animals.

5. CONCLUSION

After analysing different pet shops where selling pets is still offline, the author of this paper decided to make this application. From this they concluded that for buying and selling of pets users need to have interactive application that will help them to buy pets online. The o'pet application helps user to find their desired pets online also user can sell their pet from this application. After selecting their desired pet they can purchase it by doing online payment, for that author of this project provided payment gateway where user can pay. Author of this paper provided a map feature to check the location of their pet delivery. Author of this paper provided a variety of features to their users from their o'pet (online pet shop) application.

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DESKTOP VIRTUAL ASSISTANT

Mohd Talib Ansari¹, Ansar Ahmed², Aadil Jiwani³, Prajaktee Rane⁴

^{1,2,3} Student, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India

⁴ Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India

Abstract - Everything in the twenty-first century is automated, including items we use every day like bus doors, air conditioning systems, and turning everything on with a single click, among other things. The current study provides a newer notion of voice-controlled gadget that detects one's speech, processes the request, and details of other associated information in this fast-paced environment. We need to develop gadgets with built-in speech recognition that can recognize a person's speech even in a crowded environment, as well as a facial recognition system. We thought making a personal assistant in Python would be fun. The device will take sounds through the device's microphone, process the human's query, and respond to the human with the necessary results. If you ask the gadget to play a video on your computer, for example, it will open YouTube and play the video you choose. The Python Speech Recognition module can be used to do speech recognition. Because of its high quality, we use the Google Speech API.

1. INTRODUCTION

The concept of a smart assistant has become widely known and popular over the last decade. Commercial devices such as Amazon Alexa, Google Home, and Mycroft can interact with users through speech recognition and synthesis, provide a variety of network-based services, and can interface with smart home automation systems, providing them with an advanced user interface. The availability of a large number of network services and an increasing number of additional skills, or capabilities that can be easily added to smart assistants is driving the spread of such speech-enabled smart assistants. Their potential is still limited, however, by their inability to extract real-time visual information from video data, either concerning the user or the environment. Spoken dialogue systems are intelligent agents that can assist users in completing tasks more efficiently through spoken interactions. Personal assistants, also known as virtual personal assistants, intelligent personal assistants, digital personal assistants, or voice assistants, are devices that help people. Personal assistant agents are a new type of software that acts on the user's behalf to find and filter information, negotiate for services, easily automate complex tasks, and collaborate with other software agents to solve complex problems. If the laptop/desktop has the ability to learn and adapt to the user's behavior, this can be developed. The laptop/desktop must collect training data from a user's daily activities and apply machine learning techniques to the data. The model

that is created would be able to predict the behavior ahead of time such features in a laptop/desktop could make life easier for the user, such as notifications based on location rather than time. Such features in a laptop/desktop could make life easier for the user, such as notifications based on location rather than time. Time-based reminders are more popular and static, but they are inconvenient to use. It will show your current position as well as recognize your face. The programmers that run on your desktop and laptop must make effective use of resources in order to avoid unnecessary power consumption.

2. MOTIVATION

The main goal is to improve the efficiency of the personal assistant application by giving the agent the ability to learn. Because the agent typically performs a large number of repetitive activities, previous experiences can be applied to similar future scenarios. We propose a learn-by-doing agent that will aid the user in completing tasks. The task at hand is to manage the user's desktop or laptop profile. Every user has a daily schedule that requires them to place their desktop or laptop at a distance for a period of time.

3. LITERATURE SURVEY

There have been some significant advancements or innovations in the field of virtual assistants with speech recognition. This is primarily due to its popularity in devices such as smart watches or fitness bands, speakers, bluetooth, earphones, mobile phones, laptops or desktop computers, televisions, and so on. Almost all digital devices on the market today include voice assistants that allow users to control the device solely through speech recognition. A new set of techniques is constantly being developed to improve the performance of voice automated search. As the amount of data increases exponentially, now known as Big Data, the best way to improve the results of virtual assistants is to incorporate machine learning into our assistants and train our devices based on their uses. Other major techniques that are equally important include Artificial Intelligence, the Internet of Things, Big Data access and management, and so forth. We can easily automate the task with the use of voice assistants; simply provide the input to the machine in the form of speech, and it will perform all of the tasks, from converting your

speech into text form to extracting keywords from that text and executing the query to return results to the user.

Artificial Intelligence is a subset of Machine Learning. This has become one of the most beneficial technological advances. We were the ones who upgraded technology prior to AI. Perform a mission, but now the computer is capable of counteracting new tasks. And solve it without the need for humans to be involved in the evolution process. This has proven to be beneficial in everyday life. These assistants are in high demand for automating tasks and growing productivity in everything from cell phones to personal computers to technical industries.



Figure A: Voice Controlled Appliances Affecting Our Daily Life

4. SYSTEM ARCHITECTURE

```
import speech_recognition as sr
import datetime
import wikipedia
import pyttsx3
import webbrowser
import random
import os
```

Figure B: Module Imported

Modules imported:-

- **Speech_recognition :-**

The speech recognition module made use of the Google Speech Recognition API, which can be imported into Python with the command "import speech recognition as sr." This module is used to recognize the voice inquiry that the user has provided as input. This is a Google-provided and supported API that is available for free. This is a small API that aids in the compression of our application.

- **Datetime :-**

To support date and time formats, the date and time module was imported. The Datetime module contains classes for manipulating dates and times. These classes offer a variety of capabilities for working with dates, times,

and time intervals. In Python, date and datetime are objects. The user may, for example, want to know the current date and time or schedule a task for a specific time. In short this module supports classes to manipulate date and time and perform operations according to it only.

- **Pyttsx3 :-**

The pywhatkit module is a Python module. It is in charge of playing everything you wish to search for on YouTube. For example, if a user wants to play a song from YouTube, they can say "play song ms dhoni" and the song will be played immediately.

- **Web Browser :-**

This module enables the system to show information from the internet. It is a Python built-in module that provides every assistance to the user in obtaining information from the internet. For example, if a user says "open youtube," the query is processed through the webbrowser module, and youtube is opened.

- **Random :-**

The random module is a built-in module that is used to produce pseudo-random variables. It may be used to do random actions such as generating a random integer, picking random elements from a list, and shuffling elements at random. As an example,

```
import random
random.seed(2)
```

- **OS :-**

The OS module in Python provides functions for communicate with the operating system. OS comes under Python's standard utility modules. This module provides a portable way of using os-dependent functionality. The *os* and *os.path* modules include many functions to interact with the file system.

For example if you want to current directory: os.getcwd ()

If you want open some application simple you do this:

```
os.startfile (adobe.exe)
```

5. PROPOSED SYSTEM ARCHITECTURE

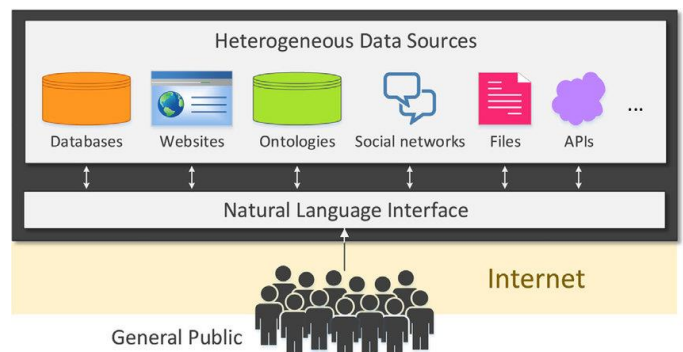


FIGURE C: Natural language interface for general public

While working on data-intensive apps, I frequently run across input/output (I/O) issues, which are the bottleneck for any performance-critical programme. With the growing

number of data stored, it is necessary to store data on discs in order to compensate for a lack of RAM by loading data from disc to RAM and vice versa. When it comes to processing financial data or other scientific data, I/O activities are therefore critical. Python provides built-in facilities for storing objects on disc and reading them from disc into RAM. As a result, Python is capable of handling both text files and SQL databases. The Pandas library includes many classes and methods for reading and writing files in a variety of formats.

6. FUTURE SCOPE

Virtual assistants are now available and are quick and responsive, but there is still a long way to go. The current systems' understanding and reliability need to be greatly enhanced. In crucial situations, the helpers available now are still unreliable. Virtual assistants will be merged with Artificial Intelligence, such as Machine Learning, Neural Networks, and IoT, in the future of these assistants. We will be able to reach new heights by incorporating these technology. What virtual assistants can accomplish is far beyond what we have accomplished thus far. Although Jarvis, a voice-activated virtual assistant created by Iron Man, is fictional, it has set new expectations for what we can achieve with voice-activated virtual assistants.

7. CONCLUSION

In this paper, we discussed a Python-based Voice Activated Personal Assistant. This assistant currently works online and performs basic tasks such as weather updates, music streaming, Wikipedia searches, opening desktop applications, and so on. The current system's functionality is limited to working only online. Machine learning will be incorporated into the system in future updates of this assistant, resulting in better suggestions with IoT to control nearby devices, similar to what Amazon's Alexa does.

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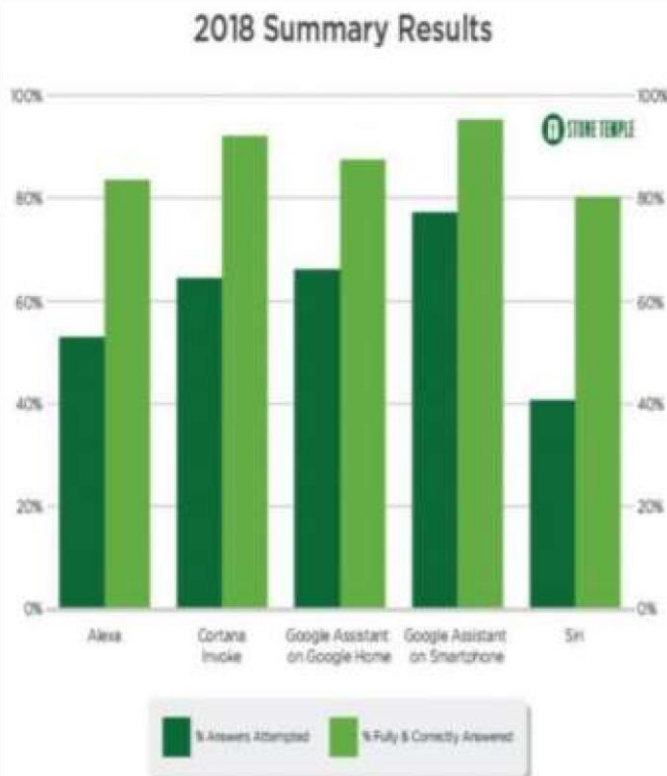


Figure D: Accuracy of Results over Time

AR BASED SIGNATURE VERIFICATION

Waseem Shaikh¹, Raghuvar Nishad², Shobha Rai³, Surayya Shaikh⁴

Department of Computer Engineering, Theem College of Engineering

Abstract - Human signatures have been shown to be the most significant factor in gaining entry. The importance of a person's signature as a biometric feature that can be used to authenticate human identity has been confirmed. Face recognition, fingerprint detection, iris examination, and retina scanning are only a few of the biometric characteristics that can be used to establish one's identity. Among the non-vision-based ones, voice recognition or signature authentication are the most well-known. Since signatures are becoming increasingly important in financial, commercial, and legal transactions, truly secure authentication is becoming increasingly important. The "seal" is described as a signature by an approved individual. and is still the most common method of identification. Online signature systems make use of complex information captured at the time the signature is generated. The scanned picture of a signature is used by offline systems. We've been working on Offline Signature Verification using a collection of shape-based geometric features. Baseline Slant Angle, Aspect Ratio, Normalized Area, Center of Gravity, number of edge points, number of cross points, and the Slope of the line connecting the Centers of Gravity of two halves of a signature picture are the features that are used. Preprocessing of a scanned image is needed before extracting the features in order to isolate the signature part and eliminate any spurious noise. The system is trained using a database of signatures collected from those whose signatures must be authenticated by the system at first. A mean signature is calculated for each subject by combining the above features extracted from a collection of his or her genuine sample signatures. This bogus signature serves as a template for comparing it to a claimed test signature. In the feature space between the two, there is a Euclidian gap between them. If the difference between the signature and the claimed subject is less than a predetermined threshold (corresponding to the minimum reasonable degree of similarity), the signature is validated to be that of the claimed subject; otherwise, it is detected as a forgery. The report includes information on pre-processing as well as the above-mentioned functionality, as well as implementation details and simulation performance.

Key Words: Augmented Reality, Signature, Biometric, Computational Intelligence

1. INTRODUCTION

Throughout history, a person's signature has served as a distinguishing characteristic for identifying them. Signatures have long been used for au, which has now spread throughout the country. Since commercial banks pay no attention to systems capable of detecting forgeries, documents would be proved authenticated by the owner's handwritten signature. Signature authentication methods are divided into two groups based on how the data is collected: online and offline. On-line data tracks the movement of the stylus as it creates the signature, including location, velocity, acceleration, and pen pressure as functions of time. Online applications make use of the data gathered during the acquisition process. These complex characteristics are unique to each individual and are both stable and predictable. A 2-D image of the signature is stored as off-line info. Since there are no stable dynamic characteristics, processing off-line is difficult. The fact that it is difficult to segment signature strokes due to extremely stylish and unusual writing styles adds to the difficulty. The problem is exacerbated by the non-repetitive nature of signature variance caused by age, disease, geographic location, and perhaps to some degree the person's emotional state. When both of these factors are combined, there is a lot of intra-personal variation. A robust framework must be developed that can not only take these factors into account but also identify different forms of forgeries. The machine should not be too sensitive or overly coarse. It should strike a reasonable balance between being neither too sensitive nor too coarse. It should strike a good balance between a low False Acceptance Rate (FAR) and a low False Rejection Rate (FRR).

2. RELATED WORK

In 2008, Wayne Read Alan McCabe Jarrod Treva than developed Handwritten Signature Verification using Neural Network: In the past, a variety of biometric methods for personal recognition have been suggested. Face recognition, fingerprint recognition, iris scanning, and retina scanning are examples of vision-based technologies. Among the non-vision-based ones, voice recognition or signature authentication are the most well-known. Given the importance of signatures in financial, commercial, and legal transactions, truly safe authentication is becoming increasingly necessary. A seal of approval is called a signature by an approved individual, and it is still the most common method of authentication. Image preprocessing, geometric feature

extraction, neural network training with extracted features, and verification are all part of the approach discussed in this paper. The extracted features of the test signature are fed into a qualified neural network, which classifies it as genuine or forged.

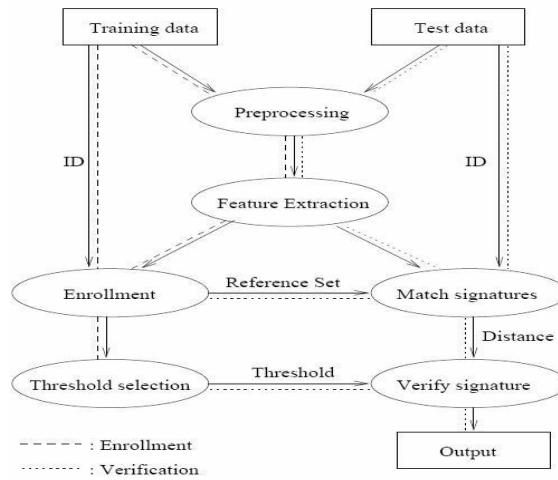
In 2016, Samit Shivadekar, Stephen Raj Abraham developed Document Validation and Verification System: 'The e-Government system will be an online platform for delivering government services to citizens and storing digital certificates, records, and other information. The framework is made up of a Digi Vault [Digital Storage] website that can be connected to various government departments' websites. Documents created by the government will be digitally signed and validated by government authorities who are authorized to do so. Public Key Infrastructure can be used to introduce document digital signatures. Certificates act as proof of an individual's identification for a specific purpose; for example, a driver's license recognizes someone who is legally permitted to drive in a specific nation. Similarly, you can use a Digital Signature Certificate (DSC) to confirm your identity or your right to access information or services on the Internet. Document validation would be available at the user's end when applying for government documents such as Pan cards and licenses.

In 2017, Luiz G. Hafemann, Robert Sabourin and Luiz S. Oliveira developed Offline Handwritten Signature Verification: Handwritten Signature Verification has gotten a lot of attention in recent decades, but it's still a work in progress. Signature verification systems are used to determine if a signature is genuine (created by the alleged individual) or a forgery (produced by an impostor). This has proven to be a difficult task, especially in the offline (static) scenario, which uses images of scanned signatures and does not have access to dynamic information about the signing process. In the last 5-10 years, several advances have been proposed in the literature, most notably the use of Deep Learning approaches to learn feature representations from signature images. In this paper, we discuss how the issue has been addressed over the last few decades, as well as recent advances in the field and future research directions.

In 2018, Raul Sanchez-Reillo, Judith Liu-Jimenez, Ramon Blanco-Gonzalo developed Forensic Validation of Biometrics Using Dynamic Handwritten Signatures: Handwritten signature forensic analysis is a vital task that has been used to settle disputes for decades. The introduction of emerging technology into the signing process has posed new challenges for this mission. The use of electronic capture devices, in particular, can jeopardise forensic analysis capabilities. However, if the temporal signals produced during the signing process are recorded in addition to the signature graph, the forensic analysis will not be questioned and may even be strengthened. The acquisition and processing of such temporal signals is referred to as dynamic signature biometric recognition in biometric terminology. Unfortunately, the information is stored in a format that a forensic investigator cannot comprehend. As a result, this data must be adapted in order for a forensic examiner to manipulate it and obtain the necessary measurements. This paper illustrates this requirement by focusing on the design and creation of a desktop application. After addressing this requirement, a forensic examiner may extract the pertinent graphometry features required for applying graphonomics to signatures and evaluating the validity of a questioned signature in comparison to a known signature

3. PROPOSED SYSTEM

The problem is approached in two stages. Initially, the subject's signatures are collected and fed into the device. These signatures are collected, as well as the mean value of these functions. The device is then fed the scanned signature image that needs to be checked. It has been pre-processed to make it suitable for feature extraction. It is fed into the machine, and different characteristics are extracted. The mean features that were used to train the device are then compared to these values. The Euclidian distance is determined, and for each user, a suitable threshold is selected. The device either accepts or refuses the input signature depending on whether it meets the threshold condition. Prepared in advance the pre-processed images are then used to extract relevant geometric parameters that can be used to differentiate between various people's signatures. These are used to train the machine, deal with the prep-processing steps, and clarify the features that are extracted, all of which are followed by the verification procedure described below. There are also implementation information and simulation results mentioned. Below is a flow chart that depicts the different measures that were taken.



4. Data Collection & Pre-processing

The study uses a database of approximately 22 signatures that was generated by gathering signatures from 22 different individuals. The database was compiled using a form of survey that asked for information such as name, address, office address, photograph, designation, and two signatures per person. The data was then saved in JPG format for use in future research projects. The following are a few examples from the Database of 22 Respectful Individuals that was used in this study.

The following are examples of one of 22 signatures and forms filled out by the respective individuals:

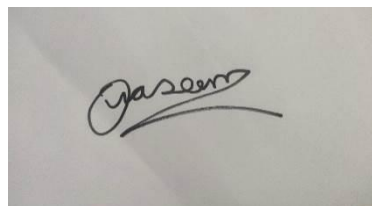
SHAIKH WASEEM AHMAD ZULFIQUARUDDIN

Mobile: +91 8779241069, +91 8793210085
Mail ID: shaikhwaseem822@gmail.com



Name : Waseem Ahmad Shaikh
Father's Name : Zulfiqaruddin Shaikh
D.O. B : 25-02-2000
Sex : Male
Marital Status : Single
Nationality : Indian
Languages : English, Hindi, Urdu, Marathi.
Permanent address : Mumbai.

(states)



4.1 Pre-processing:

To prevent errors in the subsequent processing steps, spurious noise in the scanned signature image must be eliminated. The grey image I_o of size $M \times N$ is inverted to produce an image I_i , with the signature element consisting of a row averaging process to produce the row averaged image I_{ra} , which is provided by values between background and foreground. Higher grey levels from the foreground are used to suppress these.

$$I_i(i, j) = I_o, \max - I_o(i, j)$$

Where I_o, \max is the highest gray-level and I_o is the maximum gray-level. The backdrop, which should preferably be black, may be made up of grayscale pixels or groups of pixels..

$$I_r(i, j) = I_i(i, j) - I = 1 \sum I_i(i, j) / M$$

$$I_{rn}(i, j) = I_r(i, j) \text{ if } I_r(i, j) > 0 \\ = 0 \text{ otherwise}$$

To generate the cleaned image, a $n \times n$ averaging filter is used to remove more noise and smooth it out.

1. Using automatic global thresholding, the grey image is transformed to a binary image. The global threshold was calculated automatically using the following algorithm [5]: For the threshold T , a value was chosen that was halfway between the maximum and minimum grey level value.

$$I_a(i, j) = 1/9 \sum_{l=i-1}^{i+1} \sum_{k=j-1}^{j+1} I_r(l, k)$$

1. Image was segmented using T .
2. Average gray level values 1 and 2 for the two groups of pixels was computed.
3. Based on step 3, new threshold value was computed.

$$T = 0.5 * (u_1 + u_2)$$

Steps 2 through 4 were repeated until the difference in T in successive iterations was smaller than 0.5.

5. VERIFICATION:

Each subject's mean signature is calculated using the values obtained from each sample set. Many of the features' mean values and standard deviations are measured and used for final verification. Each person's minimum appropriate degree of similarity was manually calculated using a user-defined threshold. Since users don't like it when their original signatures are rejected, we set the threshold low to prevent rejection of original signatures. Let μ and σ stand for the feature's mean and standard deviation, respectively, and for the query image's value. In feature space, the Euclidian distance determines how near a question signature

image is to the stated person's mean signature image.

$$\delta = \left(\frac{1}{n}\right) \sum_{i=1}^n [(F_i - \mu_i)/\sigma_i]^2 \dots (9)$$

If this distance is below a certain threshold then the query signature is verified to be that of the claimed person otherwise it is detected as a forged one.

6. EXPECTED RESULT:

Below are the results that has been captured from the Desktop Windows screen with their respective inputs.

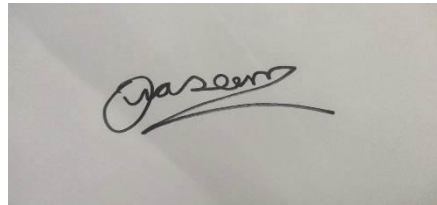


Figure 6.1: Input Signature 1

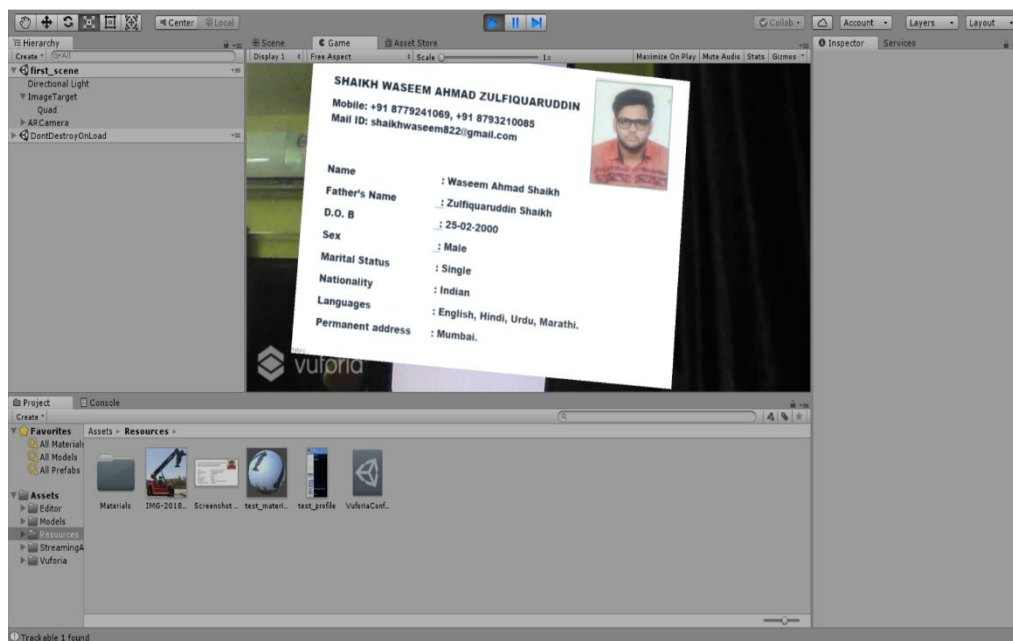


Figure 6.2: Output 1 on Windows

7. CONCLUSION AND FUTURE WORK

Signatures are verified based on parameters extracted from the signature using various techniques in which we will collect small databases of signatures and our first step will be to capture a human signature and scan it using a webcam, presenting it in image format, and then we will do pre-processing of that capture image, using techniques such as Scaling. Our next step will be to remove features from the images after we've completed all of these functions. Our next step is to extract some important features from that image, such as global features, texture features, and mask features. The algorithm we developed uses a variety of geometric features to classify signatures, which effectively distinguishes signatures from one another. The system is reliable and can detect forgeries that are random, plain, or semi-skilled, but its efficiency degrades when it comes to skilled forgeries. Using a higher-dimensional feature space and integrating dynamic data collected during the signature process can also help to enhance efficiency.

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AI Meets Mental Health

Hasim Pathan¹, Irshadahmad Mansuri², Khalil Pinjari³

^{1,2} Student, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India

³ Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharashtra, India

Abstract - Mental health indicates the degree of psychological prosperity. When a person faces an unbalanced mental health, it results in mental disorder. In India, the number of cases regarding the mental disorder is increasing every year, and there is a shortage in the mental healthcare professionals, also still considered as taboo. In such situations, technologies like Artificial Intelligence helps to fill the gap. As Artificial intelligence is dedicated to developing systems that perform cognitive processes characteristics of humans, we can use this in Mental health related issues. As we are going through a tough time of COVID-19 where everything has been online, why not use this opportunity to help people online. Chatbots are expected to rise in popularity as the demand for mental health treatment grows in tandem with technological advancements. While an AI chatbot can provide a person with tools and a platform to address difficulties, as well as a mechanism to track moods and improve mental health literacy, it is not a substitute for a therapist or other mental health provider. Finally, if AI chatbots have a positive impact on mental health, they must be regulated, and society must resist techno-fundamentalism when it comes to AI. Many businesses have recently begun to use chatbots to answer user questions via chat interfaces. Although it has become easier to construct a chatbot application thanks to recent technological advancements, the application itself is a complex system. While designing a chatbot, it is difficult to attain efficiency, efficacy, and user satisfaction. Chatbots have usurped the role of people due to their popularity and user-friendly features.

1. INTRODUCTION

Access In 2015, India's suicide rate of 15.7 per 100,000 people was higher than the regional average of 12.9 and the worldwide average of 10.6. In India, suicide is the biggest cause of mortality among those aged 15 to 29. In less-developed nations, the treatment gap, as defined by the absolute difference between the prevalence of mental diseases and the treated proportion, has been shown to be between 76 and 85 percent. to mental health care and treatment continues to be a problem in all countries and cultures. Major depression is the top cause of disability-adjusted life years (DALYs) and the fourth greatest cause of years lived with disability worldwide. Mental health is a huge concern around the world, and India is not far behind.

The problem of insufficient resources is one of the key reasons for such a large treatment gap. Infrastructure and human resources are both insufficient in India. More than

one in every ten persons in the world suffers from mental health problems, and this number is predicted to, there are insufficient mental health experts to treat all of these folks. Is artificial intelligence (AI) a viable option? While many doctors rise in the wake of the Coronavirus disease 2019 (COVID-19) pandemic. Unfortunately, many psychiatrists hold differing ideas on this subject. However, recent advancements imply AI may alter the practice of psychiatry for both professionals and patients. Shortages of psychiatrists and therapists around the world may lead to an increase in ai-based mental health solutions.

2. MOTIVATION

As human-computer interfaces, chatbots are crucial. It's a piece of software that simulates typed communication with the aim of fooling the user into believing they're conversing with another person. Chatbots are conversational agents that can converse with any user in any area using Natural Language Processing. According to the World Health Organization (WHO), stress is the leading cause of mental disorders worldwide, threatening over 300 million people each year. With the growing demand for assistance, the bot aims to build a less programmed and more conversational atmosphere. As a result, the chatbot offers insights and positive reinforcement to help you overcome your stress.

3. LITERATURE SURVEY

A Dementia Patient's Companion: As dementia progresses, many people maintain a significant portion of their conversational skills. However, the guilt and anger that many dementia patients feel makes regular, daily conversations with even near family members difficult. That's why Endurance, a Russian technology firm, created a companion chatbot. Short-term memory loss is a common symptom of Alzheimer's disease. As a result, the chatbot attempts to detect anomalies in conversational branches that could suggest a problem with immediate recall - a technically challenging task for an NLP-based machine.

Furthermore, since the chatbot is a cloud-based solution, physicians and family members can access contact logs at any time. Surprisingly, the as-yet-unnamed conversational agent is currently an open-source project, which means that anyone may contribute to the bot's codebase's growth. While the project is still in its early stages, it has a lot of promise in terms of helping scientists, researchers, and

care teams better understand how Alzheimer's disease affects the brain.

What's New in Medicine: Making Medical Diagnoses Faster: If you're the kind who bookmarks WebMD, Med What might be worth a look.

This chatbot aims to make medical diagnoses for both patients and doctors quicker, simpler, and more straightforward – think of it as a more sophisticated version of WebMD that you can speak to. MedWhat is operated by a sophisticated machine learning system that provides increasingly accurate answers to user questions based on behaviours it "learns" from communicating with people. MedWhat not only answers an increasing number of medical questions, but it also consults huge amounts of medical literature and peer-reviewed scientific articles to supplement its already extensive knowledge. The bot also consults a large body of medical literature and peer-reviewed science articles to supplement its already extensive medical knowledge. MedWhat is more like a virtual assistant (like Google Now) than a conversational agent in several respects. It also represents a new area of chatbot creation that combines intelligent natural language processing systems with machine learning technology.

ALICE: The Bot Who Started a Thousand Others:

ALICE, one of the very first bots to go online – and one that has held up remarkably well despite being created and released more than 20 years ago – will be missing from any list of groundbreaking Chatbots. ALICE (Artificial Linguistic Internet Computer Entity) is an acronym for Artificial Linguistic Internet Computer Entity, an acronym that sounds like something out of an episode of The XFiles, was created and launched by Dr. Richard Wallace in the early days of the Internet in 1995. Despite the fact that ALICE is based on an outdated codebase, the bot provides a surprisingly accurate conversational experience to its users.

UNICEF: Making a Difference in the Lives of Marginalized People: The chatbots we've looked at so far, with the exception of Endurance's dementia companion bot, have mostly been fun novelty items. Chatbots, on the other hand, are being used by UNICEF, an international child advocacy organization, to assist people in developing countries in speaking out about the most pressing needs in their communities. The bot, called U-Report, focuses on large-scale data collection through surveys – this isn't a chatty bot. U-Report sends out prepared polls on a variety of pressing social issues on a regular basis, and users can answer with their thoughts. UNICEF then uses this information to formulate policy recommendations. Approximately 86 percent of the 13,000 Liberian children surveyed by U-Report said their teachers were engaging in this heinous activity, prompting UNICEF and Liberia's

Minister of Education to collaborate on a project to put an end to it.

4.PERFORMANCE OF CHATBOT

The chatbot's efficacy can differ depending on how the conversation is conducted. In dialogue systems, there are text-based chatbots and chatbots that use natural-language, speech-based interfaces. From a technological standpoint, speech-based chatbots are text-based chatbots with speech recognition and synthesis capabilities (machine reading aloud). The more basic chatbots rely on understanding specific key words in order to direct a conversation. More efficient chatbots can evaluate user feedback and contact patterns in greater depth, allowing for more accurate responses and the extraction of contextual data such as users' emotions.

Relational chatbots, also known as contextual chatbots, mimic human abilities such as social, cognitive, and relational aspects of natural conversations. In the creation of a chatbot identity, computer-generated characters, or avatars, are frequently used; these imitate the main characteristics of human conversations and are frequently studied under the name embodied conversational agent.

The greater the chatbot's resemblance to humans, the more mental qualities it has (anthropomorphism). Anthropomorphism is the ability of a chatbot to mimic the behavioural characteristics of a therapist. Social qualities and the chatbot's ability to convey empathy tend to be significant factors in cultivating a viable foundation for mental wellbeing promotion in the psychotherapeutic sense.

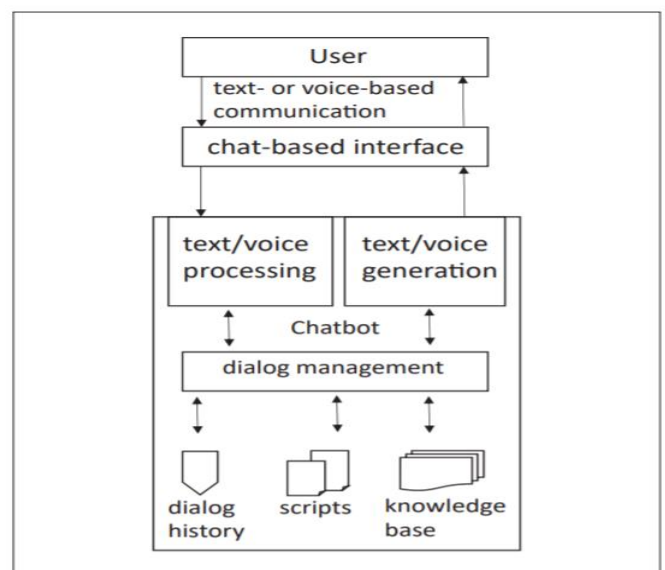


Fig. 1. Graphical Representation of Technical Implementation of Chatbot.

5. RESULT AND DISCUSSIONS

This project's outcome is as follows: the user must engage in text-to-text contact with the chatbot in order to receive the specific illness, and users can also access their previous chat history by entering their information into the database.

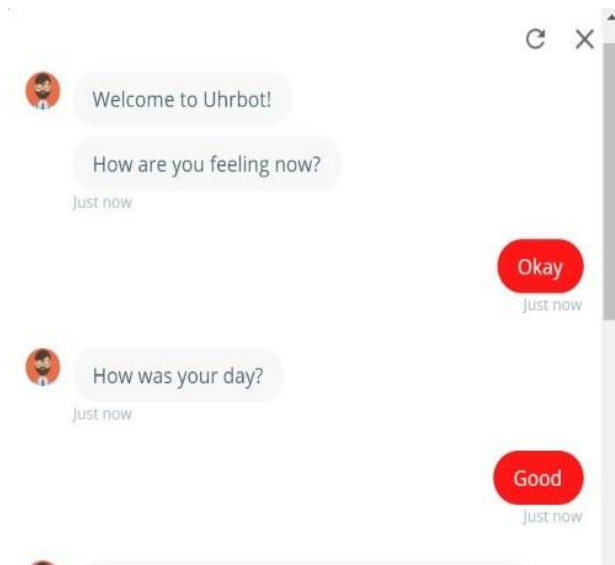


Fig. 2(a). GUI of Working Chatbot

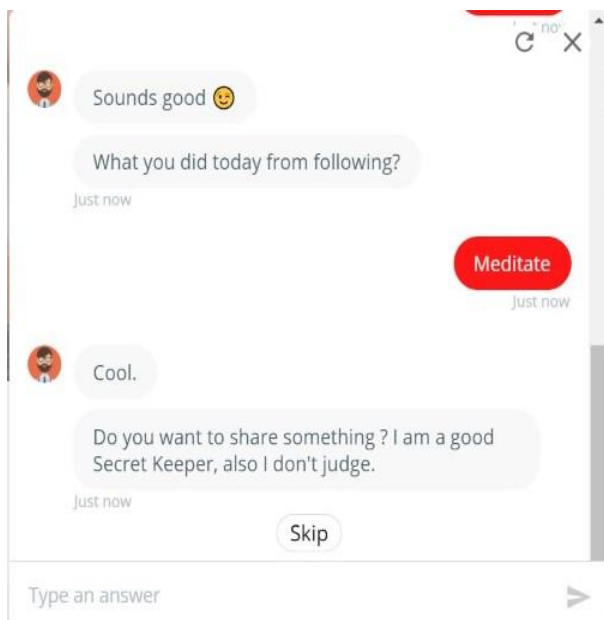


Fig. 2(b). GUI of Working Chatbot

6. CONCLUSION

Mental health wellbeing refers to a person's psychological, emotional, and social well-being. It is important at all stages of life because it influences how one thinks, feels, and behaves. It is considered safe to see a therapist on a regular basis to keep one's mental health in check. Many people suffer from mental illness but are

unaware of it because they are too preoccupied to see a therapist. Monitoring Chatbot Public health is mostly designed to keep track of people's mental health. The user can use this once or twice a week, depending on their needs. The chatbot will begin by asking a series of questions. The program then analyses the responses and advances the user to the next step, where he or she can record responses to a new set of questions about his or her daily routine. As a result, anyone can use the built chatbot. Answering those questions, which will then be processed by the chatbot, takes just 5-10 minutes. If the user's mental wellbeing is serious or very serious, the chatbot would recommend that they see a doctor as soon as possible. If the outcome is mild or moderate, the chatbot will recommend any things for the user to do in order to maintain his or her mental health. This saves the user time while also assisting them in keeping track of their mental health.

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CAR RENTAL SYSTEM

Suraj Yadav¹, Samrat Pawar², Duhita Raut³, Ruchi Rahi⁴

¹⁻⁴Department of Computer Engineering, Theem College of Engineering

Abstract - Our Aim is to style and build a information for you-drive Application. this permits admin rents a car and additionally the person can rent his/her car in our application that may be employed by a client. By paying the money throughout a such as amount of time. this method will increase customer retention and modify vehicle and workers Management in an economical way. you-drive System Application is predicated on a plan to book car online. Here initially the user should login or check in to urge access. Then the user can list, seek for cars according to their needs, check every automobile's description, booking costs and book simply with help of varied payment methods. All the accessible cars may be rated by the users too. the appliance also displays reserved car's list. With the assistance of this application, the net car booking has become easier for the customers. It can be utilized in many mechanical man gadgets akin to smartphones, tablets, television. mechanical man is an open supply in order that developer realize it easy to determine and expand new features. This project is straightforward to work and understood by the user. the shoppers also can use the system to get automobile rent. The client ought to produce a replacement account before work in or he / she will log into the System with his/her created account. Then he/she can read the accessible cars in a very branch and create a reservation for a Car. this method will useful to the admin in addition on the customer also.

Key Words: GPRS, SMS, GPS, DB

1. INTRODUCTION

We aim to become a pioneer within the vehicle rental business by utterly specializing in customers, our employees, growth, innovation and efficiency. All of those parts will drive US towards success and show us in concert company that may perform and provides price for money. once it involves cab rental services, Cool Service is that the most sure and reliable name in the travel business. the foremost advanced travel agents providing cab rental and automotive rent in India, creating full use of data technology to boost the amount of our efficiency. However, this is often only 1 facet of services. And this project frequently strives to supply the most effective of services - each in terms of man and machine, tour consumer Moreover, this project encompasses a fleet of cars starting from luxury to budget cabs. While, it offers on-line cab rent service for company houses. And this project claim to offer the best of rates, that are tailor- created relying upon the facilities, availed and offer both intercity and intra-city cab facilities. All cabs have correct permits and documentation in order that the shoppers couldn't be hassled for the dearth of documents. However, this project has strategic backup system for any eventuality. Cab drivers are educated, polite, and reliable and are trained to handle acute breakdowns. The cab service includes all classes of cars from luxury to budget. Further, this project's utmost priority is quality. to realize this, vehicles are well maintained and tested for delivering optimum and uninterrupted performance. Team of execs within the travel business allows this technique to style journeys that suits to all or any budgets and preferences of the travelers. In addition, hands together with drivers and body workers are well trained to discharge their duties with plenty of efficiency. trying from social perspective it offers you likelihood to grasp additional students Associate in Nursingd move with them throughout your ride. it's an android-based application. It asks for the stripped-down personal information. Since we've got deep coupled the application You need to choose the timeslot to travel, from and to places and range of person travelling.

2. PROBLEM STATEMENT: -

The manual u-drive system provides services solely throughout workplace hour. So, customers have restricted time to form any transactions or reservation of the cars. The existence of the web car rental systems today has overcome the limitation of the business operation hour. Manual automobile hiring system is tedious, a consumer should be gift physically or a minimum of decision the assistance table of a corporation so as to book a car for rental. Records are entered into books by suggests that of paper and pen therefore data storage is manually done. Manipulations of information together with calculations are done manually and typically accuracy is comprised. Deletion and update of information is somehow troublesome and if possible, it ends up in untidiness.

3. JUSTIFICATION: -

The proposed system can reduce travel expenses to the company's car rental center. Customers can install the application on their mobile phones and create an account with a company that provides car rental services. Therefore, when creating an account, you only need to enter the details once. After creating an account, you can comfortably book a car using your phone, cancel the transaction, confirm the transaction and receive an invoice. They have a central database where they can receive car rental applications and can book cars upon customer request. The system automatically generates a report on the number of cars available for lease in a given period, reports how much funds have been raised in a given period, and reports the total cost of the company during that period. The system can provide reports to analyze how much each customer contributes to the company's annual revenue and predict how many customers will join the company each year. System users must provide authentication details. Access to various menu items is restricted, especially for employees. Therefore, each employee can only access permitted content, and each employee is responsible for the transactions they conduct.

4. RELATED WORK: -

D. Kesrarat, S. Songcharoenkit, P. Nanthapornpisut has developed good Matching for rent-a-car in 2017. The aim of writing is to develop applications that permit users to decide on the vehicle consistent with their desires and to process the rental of vehicles each motorbike and cars. The event methodology used is that the water method that consists of communication, planning, modelling, construction, deployment. The results are evaluated with eight golden rules of interface style and also the results of the form show that the appliance may be utilized by users and suppliers to create the method of rental and renting a vehicle. It absolutely was concluded that this application may be used well and might perform the method of rental and renting vehicles for cars and motorbikes.

Jia-Ning Luo, Ming-Hour rule, Ming-Chien Yang has developed anonymous you-drive protocol supported NFC technology in 2013. Our main contributions include: (1) Anonymity. Users offer their personal info to a trusty third party (TTP) only. The car rent suppliers will not get users' real identity. (2) Unlink ability. you-drive corporations are unable to determine any link between users' rental records and users' identity just by analyzing the rental history. (3) Trace ability. If there are client disputes or accidents, the rental company can request that TTP reveal users' identity. (4) Flexibility. Users are liberal to select their most well-liked vehicle. A client must register his identity with a TTP via his NFC phone. He ought to request a short lived anonymous license from TTP and sends it to the rental company. If the license is valid, the corporate problems a price tag for a particular vehicle to the user over the air. The vehicle authenticates the ticket through the user' NFC phone.

5. Functional Requirements: -

Requirement analysis could be a package engineering technique that's composed of the assorted tasks that confirm the wants or conditions that are to be met for a brand new or altered product, taking into thought the attainable conflicting requirements of the various users. useful requirements are those requirements that are accustomed illustrate the inner operating nature of the system, the outline of the system, and rationalization of every subsystem. It consists of what task the system ought to perform, the processes involved, that knowledge should the system holds and also the interfaces with the user. The functional requirements known are:

- Customer's registration: the appliance ought to permit new users to register on-line and generate membership card.
- on-line reservation of cars: Customers should be able to use the application to form booking and online reservation.
- Automatic update to info once reservation is created or new client registered: Whenever there's new reservation or new registration, the system should be in a position update the database with none extra efforts from the admin.
- Feedbacks to customers: It should give means that for patrons to go away feedback.

6. Non-Functional Requirements: -

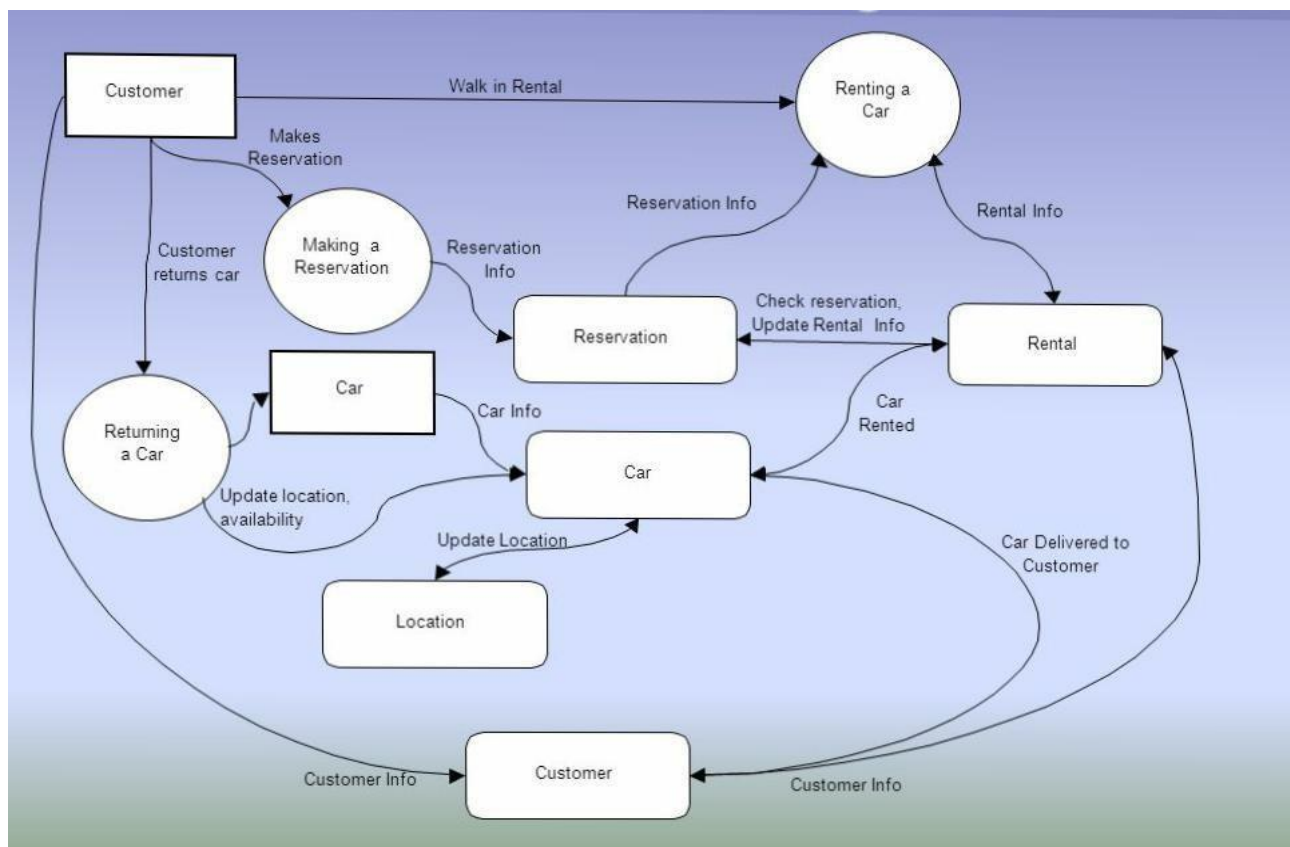
- Security: The system should provide a high level of security and integrity of the information control by the system, solely licensed personnel of the corporate will gain access to the company's secured page on the system; and only users with valid watchword and username can login to look at user's page.
- Performance and Response time: the applying should have high performance rate once capital punishment user's input and will be able to provide feedback or response among a brief time span sometimes fifty seconds for highly sophisticated task And

20 to twenty five seconds for fewer complicated task.

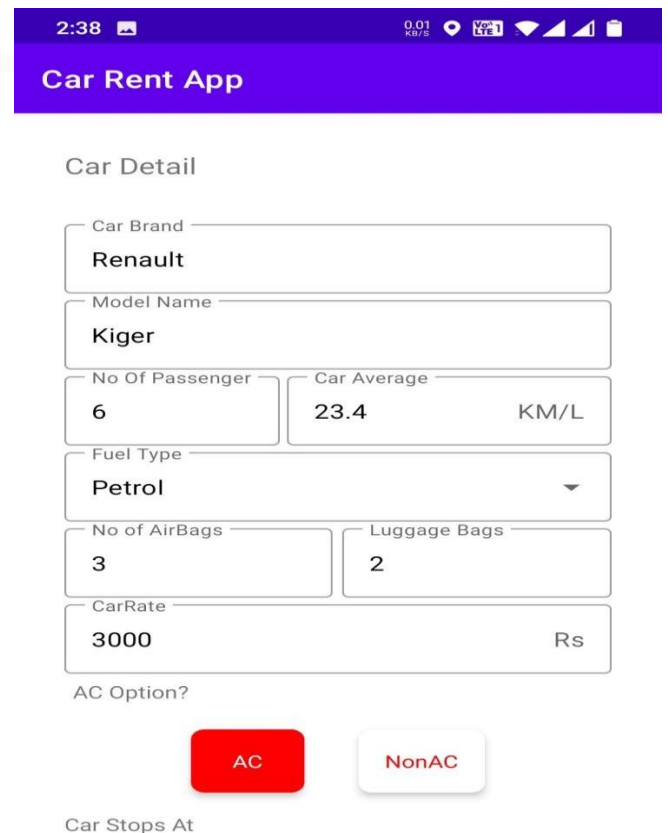
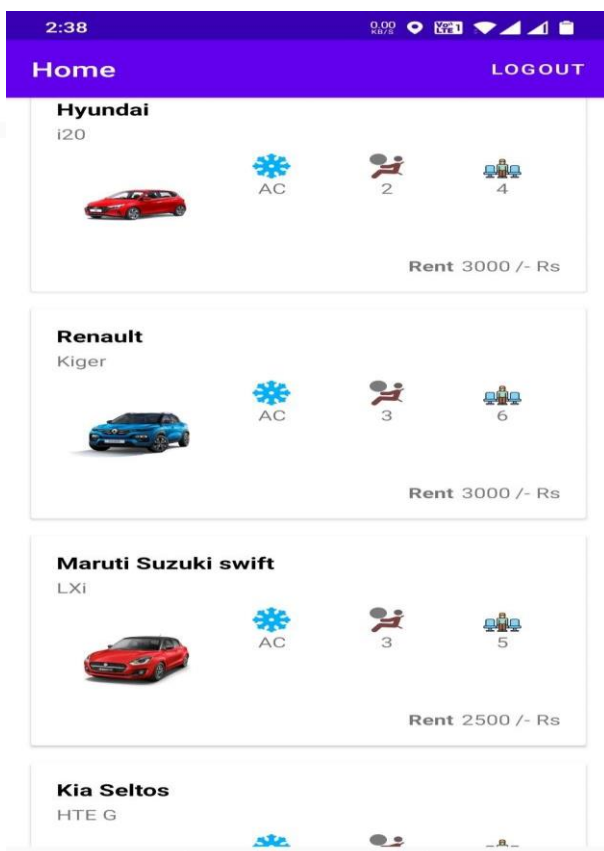
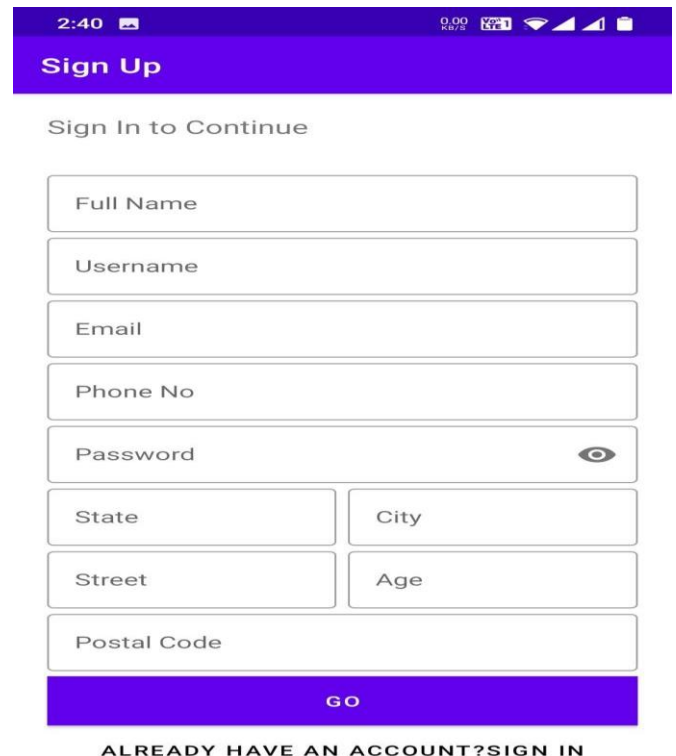
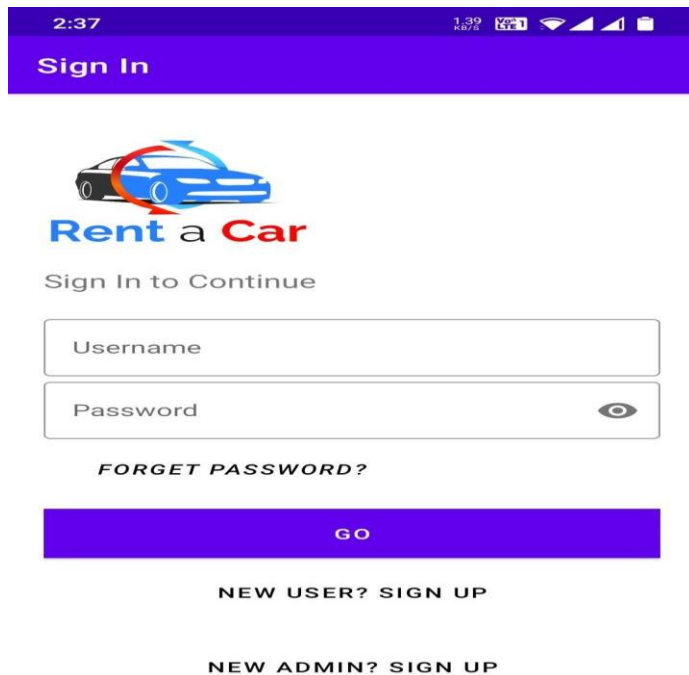
- Error handling: Error should be significantly reduced and an applicable error message that guides the user to pass though miscalculation should be provided. Validation of user’s input is very essential. conjointly the quality time taken to recover from an error should be fifteen to twenty seconds.
- Availability: This application must always be obtainable for access at twenty four hours, seven days a week. conjointly within the incidence of any major system malfunctioning, the system should be available in 1 to a pair of operating days, in order that the business method isn't severely affected.
- easy use: thought-about the extent of information possessed by the users of this system, a straightforward however quality computer program ought to be developed to form it easy to know and needed less training.

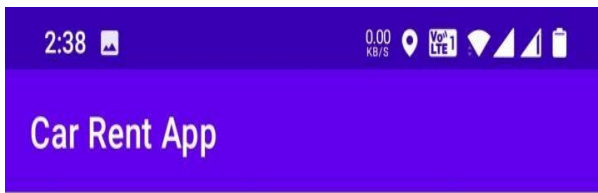
7. SYSTEM DESIGN: -

Software design constitutes the technical basis of the software development process, and software design can be applied regardless of the development paradigm and application field. Design is the first step in the development phase of designing a product or system. The designer's goal is to create a model or representation of the object that will be created later. Starting from the definition and analysis of system requirements, system design is the first of three technical activities: design, code, and testing, which are necessary to create and verify software. Use one word for "quality". In terms of design, the quality of software development has been improved. Design gives us an in-depth understanding of software that can measure quality. Design is the only way to accurately transform the customer's vision into the final product or software system. Software design is the basis for all subsequent software development stages. Without a reliable design, we risk building an unstable system that is difficult to test and can only assess its quality in the final stage. In the design stage, the data structure, program structure and process details will be gradually improved, verified and recorded. The system design can be viewed from a technical perspective or from a project management perspective. From a technical point of view, design includes four activities: design, data structure design, interface design and process development.



8. RESULT: -





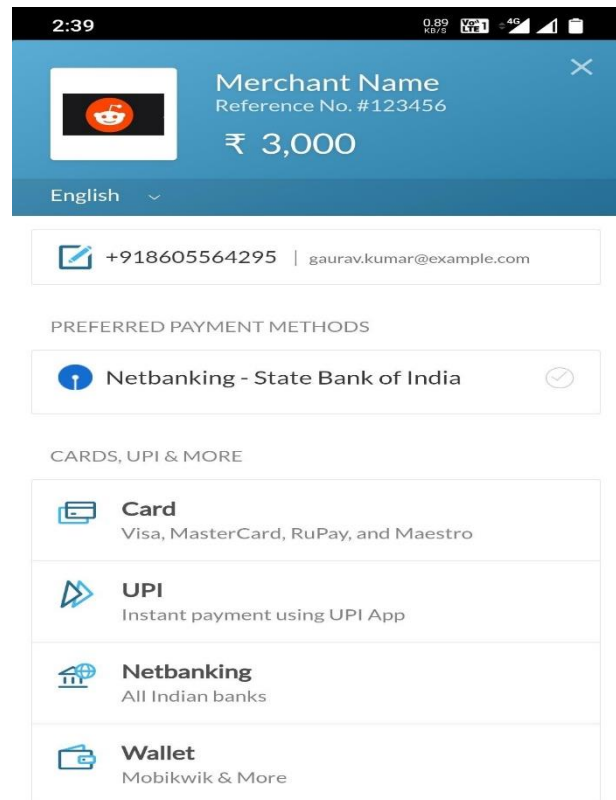
LicenceVerification

DriverName

LicenceNo

SELECT IMAGES

SAVE AND CHECKOUT



9. CONCLUSION: -

Thus we've got developed Associate in Nursing automaton app for letting system .Using this app user has the freedom of booking any car of his choice as per the occasion .Also we have provided a payment entrance victimization that user will build payment either by using debit or mastercard .Also user has the selection for choosing a driver .The user can either choose a driver or not opt for a driver .Our system is largely fabricated from 3 apps .One is given to the user, one to the Admin and different to the motive force .The user app permits user to decide on from the range of cars, choose the pick-up purpose and also the destination .Also it contains the payment choices .The admin app is alone controlled by the administrator .He/She is accountable for adding deleting cars, settle foring/rejecting booking so on .The driver app is controlled by the drivers .They will accept or reject the request created by the admin to the driver. Our application is restricted solely to the users within the automaton eco system. within the future perhaps the applying will be developed for iOS. conjointly Machine learning can be used. Machine learning algorithms can analyse the user's behaviour patterns and looking requests to create recommendations for him. you'll conjointly optimize searching method by applying machine learning to your automaton app. Add a voice search, writing system corrections, suggestions and also the searching process for your users can become additional intuitive and fewer troublesome.

10. CONCLUSION: -

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Electrical Power Quality Enhancement of Grid Interfaced with Wind Power System Using STATCOM - Control Scheme

Prof. Rahatullah Khan
Theem College Of Engineering, Boisar,
India
E-mail: rahatullah.khan@theemcoe.org

Mamta Rathod
Theem College Of Engineering, Boisar,
India
Email: mamtar96654@gmail.com

Krupesh Vedpathak
Theem College Of Engineering, Boisar,
India
E-mail: krupesh.vedpathak@gmail.com

Abstract - Infusion of the wind power into an electric grid influences the power quality. The exhibition of the wind turbine in this way power quality are resolved based on guidelines and the standards followed by the rule indicated in International Electro-technical Commission standard, IEC-61400. The impact of the wind turbine in the grid connected wind energy generation system are the active power, reactive power, voltage variations, harmonic distortion, flicker. The paper study exhibits the power quality issues due to establishment of wind turbine with the grid. In this proposed paper, STATCOM (Static Synchronous Compensator) is connected at point of common coupling (PCC) with a battery energy storage system (BESS) to reduce the power quality issues. The STATCOM control scheme for the grid associated wind energy generation system for power quality improvement is simulated utilizing MATLAB/SIMULINK. The viability of the proposed control scheme reduces reactive power from the load and induction generator. The advancement of the grid coordination rule and the plan for development in power quality standards as per IEC-standard on the grid has been introduced.

INDEX TERMS- Power Quality, Renewable Energy, PCC (Power of Common Coupling), STATCOM (Static Synchronous Compensator), BESS (Battery Energy Storage System).

I. INTRODUCTION

Since the past decade, there has been an immense concern between certain countries on the sustainable power source for control time. The market progression and government's forces have also revived the sustainable power source segment advancement. As of late, wind energy has gotten quite possibly the most significant and promising sources of renewable energy, which requests extra transmission limit and better methods for looking after system reliability. To have practical development and social advancement, it is important to meet the energy need by using the renewable energy assets like wind. The need to integrate the renewable energy like wind energy into power system is to make it conceivable to limit the ecological effects. Wind energy conversion systems are the quickest developing renewable source of electrical energy having huge natural, social, and financial advantages.

Power Quality is characterized as power that makes equipment to work appropriately. A power quality issue can be characterized as any deviation of magnitude, frequency, or purity from the ideal sinusoidal voltage waveform. Great power quality is advantage to the activity of electrical gear; however poor power quality will create extraordinary damage to the power system. In any case, the created power from wind energy conversion system is continually fluctuating because of the fluctuation nature of the wind. Consequently infusion of the wind power into an electric grid influences the power quality. The significant components to be considered in power quality estimation are the active power, reactive power, voltage variation, flicker, harmonics, and electrical conduct of switching operation.

STATCOM-based control technique for power quality change in network is related with wind generation system and with the non-linear load. The power quality issues on the sender-end and electric utility are presented in this paper. Along these lines the proposed scheme in the network related system fulfills the power quality principles according to the IEC standard 61400-21. The FACTS device based control technique for power quality change in system is related wind generating system and with non-linear load. The compensator is expected to inject reactive power to beat control quality issues and besides for better grid operations. The connection of STATCOM into the system backings to keep up the dynamic power, responsive power and terminal voltage are steady.

In this proposed scheme Static Synchronous Compensator (STATCOM) is connected at a Point of Common Coupling with a Battery Energy Storage System (BESS) to relieve the power quality issues. Consequently, STATCOM gives Reactive Power backing to wind generator and load. The battery energy storage system is connected to support the real power source under fluctuating wind power. The STATCOM control scheme for the grid connected wind energy generation system for power quality improvement is simulated utilizing MATLAB/SIMULINK.

In this paper there will be the analysis of elements which are liable for the power quality issues in the wind energy transformation system and execution of the proposed control scheme for power quality improvement in the wind energy generation system connected to the grid. The paper is coordinated as follows. The

section II presents the power quality standards and problems. The section III presents the grid coordination rule for grid quality cut-off points. The section IV depicts the system configuration for power quality improvement. The section V depicts the control scheme. The section VI and VII depicts the simulation, control system performance and conclusion respectively.

II. POWER QUALITY STANDARDS AND PROBLEMS

A. INTERNATIONAL ELECTRO- TECHNICAL COMMISSION GUIDELINES

The guidelines and norms are provided for measurement of wind turbine’s power quality. The International standards are developed by the working group of Technical Committee-88 of the International Electro-technical Commission (IEC), IEC Standard 61400-21 describes the procedure for determining the power quality characteristics of the wind turbine.

The standard norms are specified:

- 1) **IEC 61400-21:** Wind turbine generating system, part-21. Assessment and Measurement of power quality characteristic of grid connected wind turbine.
- 2) **IEC 61400-13:** Wind Turbine—measuring procedure in determining the power behavior.
- 3) **IEC 61400-3-7:** Assessment of emission limit for fluctuating load
- 4) **IEC 61400-12:** Wind Turbine performance.

The data sheet with electrical characteristics provides the base for the utility assessment regarding a grid connection with electrical network.

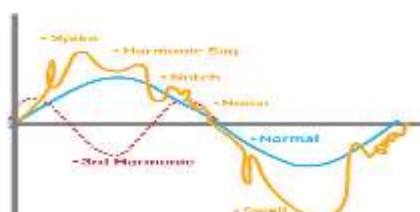
B. VOLTAGE VARIATION

Voltage variations are a power quality problem caused due to wind velocity and to generator torque. The voltage variation is distinguished under the following categories –

- Voltage sag
- Voltage Swell
- Long Time
- Voltage Interruptions
- Voltage spike
- Voltage Transients

The voltage flicker problem is caused by wind generators within the network. So the power fluctuation from wind turbine causes problems during the entire process throughout. Grid strength, phase angle and resistance in a network define the magnitude of fluctuations. Employment of ineffective methods of reactive power management causes voltage swells/ voltage sag. Voltage transients are caused due to fault in the power system network or sometimes due to capacitor switching. STATCOM responds well to voltage transients. Power disturbances can be classified as following shown in figure (1)

Figure 1. Power Disturbances



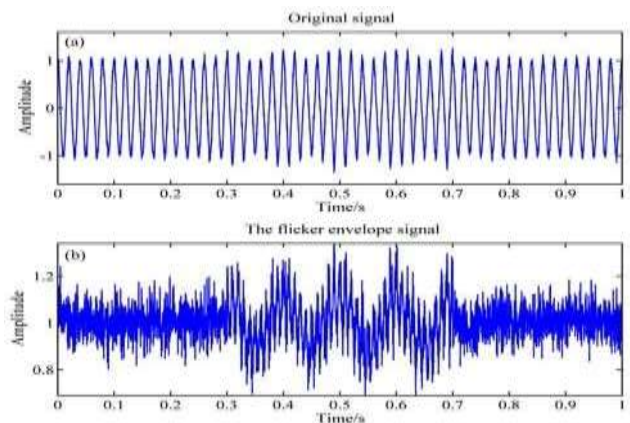
C. HARMONICS

Harmonics are being caused because of operation of power converters. The harmonic voltage and current should be accepted to a limit at the point of wind turbine connection to the network. According to the IEC-61400-36 guideline, limited contribution is allowed by individual sources of harmonic current to ensure harmonic voltage is within limits.

D. FLICKER

Electric power is required to run equipment and appliances in domestic and industries. Power distribution system connected to appliances and equipment should be measured through acceptable quality which is electrical power. The IEC 610002-1 standard distinguishes low frequency conducted disturbances in the subsequent 5 groups out of which flicker is one of them. Flicker is a voltage fluctuation generated inside the illumination intensity of light source. Voltage fluctuations are cyclic variations in voltage with amplitude below 100% of the face value. Flickers is illustrated in figure (2).

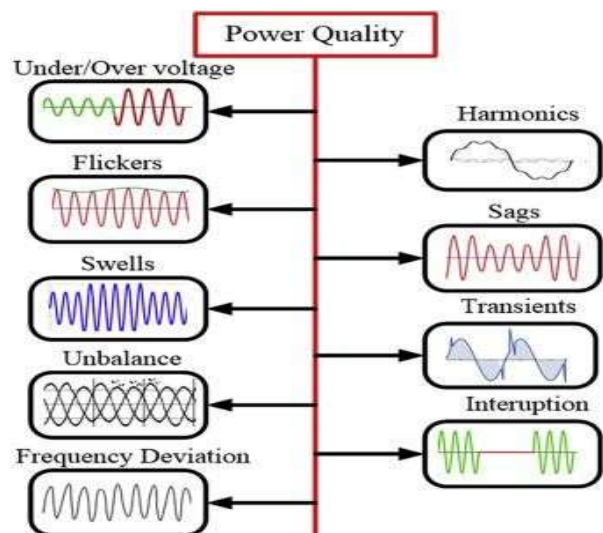
Figure 2. Voltage Flicker



E. IMPACT OF POWER QUALITY ISSUES

Power quality can be basically characterized as represented in the exhibited graph in figure (3).

Figure 3. Impact of Power Quality Issues



III. RULE FOR GRID COORDINATION

IEC-61400-21 defines the rules for grid coordination in a wind generator system at the grid connected electrical network. The customer and the utility grid expects grid quality limits and characteristics for references. The operator of the transmission grid is responsible for the organization and for interconnected systems as per Energy- Economic Law.

1. Voltage dips (d): As the wind turbine starts, there are voltage dips and it causes reduction of voltage suddenly. Switching operation of wind turbine causes relative % voltage change. The voltage changes nominally decreases as given in the equation (1)

$$D = K_u \cdot S_n / S_k \tag{1}$$

Where *d* is relative voltage change, *S_n* is rated apparent power, *S_k* is short circuit apparent power, and *K_u* sudden voltage reduction factor.

2. Voltage rise (u): At the point of common coupling, there is a voltage rise. It can be calculated as a function of maximum apparent power *S_{max}* of the turbine, the grid impedances *R* and *X* at the point of common coupling and the phase angle *φ*. It's given in the equation (2).

$$\Delta u = S_{max} (R \cos\phi - X \sin\phi) \tag{2}$$

Where *U* is the nominal voltage of grid, *Δu*-voltage rise, *S_{max}* – maximum apparent power, *φ*- phase difference.

3. Flicker: The measurements are done for the maximum number of specified switching operation of the wind turbine with 2h period and 10 min period. It's been specified in equation (3)

$$P_{fl} = C (\Psi K) S_n / S_k \tag{3}$$

Where *P_{fl}* -Long term flicker, *C(ΨK)*-Flicker coefficient calculated from the wind speed of Rayleigh distribution.

4. Grid Frequency: Frequency change in the grid connected network is known as grid frequency. In India, grid frequency is between the range of 47.5–51.5 Hz for wind generator networks.

5. Harmonics

At PCC (Point of Common Coupling), the harmonic distortion is assessed for variable speed turbine with an electronic power converter.

The total harmonic voltage distortion is given as in (4):

$$V_{THD} = \sqrt{\sum \frac{I_n}{I_1} 100} \tag{4}$$

Where *V_n* is the *n*th harmonic voltage and *V₁* is the fundamental frequency (50) Hz.

THD of current is given as in (5)

$$I_{THD} = \sqrt{\sum \frac{I_n}{I_1} 100} \tag{5}$$

Where *I_n* is the *n*th harmonic current and *I₁* is the fundamental frequency (50) Hz.

IV. SYSTEM CONFIGURATION AND OPERATION PRINCIPLE:

A. STATCOM PRINCIPLE:

The Static Synchronous Compensator (STATCOM) could be a shunt device of the adaptable AC Transmission Systems (FACTS) family utilizing power gadgets to control power flow and improve transient stability on power grids as displayed in figure 4. The STATCOM is directing voltage at its terminal by controlling the measure of reactive power infused into or ingested from the power system. When system voltage is low, the STATCOM produces reactive power (STATCOM capacitive). Once system voltage is high, it retains reactive power (STATCOM inductive). In synchronization with the interest to balance out the voltage of the facility network.

Typically a STATCOM is introduced to help electrical networks that have a poor power issue and at times poor voltage guideline. The most widely recognized utilization of this device is for voltage stability. Basically it is a voltage source converter (VSC) based device, with the voltage source behind a reactor. The voltage source is framed from a DC capacitor and consequently the device has minimal active power capability. Notwithstanding, its active power capability might be expanded if a reasonable energy storage device is associated across the DC capacitor.

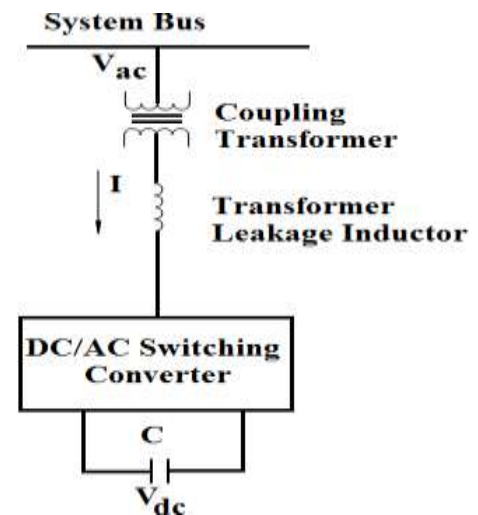


Fig (4). single line diagram of the STATCOM

B. SYSTEM OPERATION

The STATCOM interfaced with capacitance at DC side regulates as a three phase voltage source inverter (VSC). The basic principle of operation of STATCOM located in power system is to generate controllable ac voltage source by a Voltage Source Inverter connected to dc capacitor. Here the paralleled connected STATCOM is operated in current control manner and is connected with non-linear load and wind turbine induction generator at the

Point of Common Coupling (PCC) in the grid system as represented in figure 5. The STATCOM based on current controlled voltage source inverter inserts the current into the grid in such a manner that the source current are free from harmonic distortions leading to reduced Total Harmonic Distortions and they are accordance in phase-angle with regard to source voltage. The inserted current will terminate their active part and harmonic part of the induction load current and generator current, thus it upgrades the system power quality.

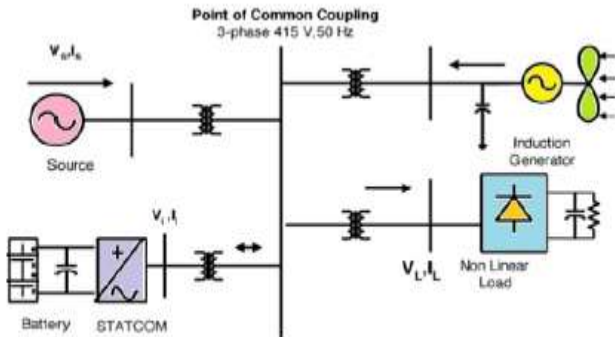


Figure 5. System operational scheme in grid system

IV.I. WIND GENERATING SYSTEM SPECIFICATIONS IN PROPOSED SCHEME

In the presented system induction generator is utilized since separate excitation field circuit in not required, it accepts constant values and variable load values. Induction generator and Battery Energy Storage System are interfaced at Point of Common Coupling. The shunt connected STATCOM in the proposed system is preferred. This system has natural shielding against sudden occurring short circuits. The wind power available is represented by:

$$P_{air} = 0.5\rho A V_{wind}^2 \quad (1)$$

Where P_{air} is represented as density (Kg/m^3), A represents the Area swept out by turbine blade (m), V_{wind} represents the wind speed in m/s.

It is not practicable to draw out all kinetic energy of wind. Thus extraction of a fractional power is termed as Power Coefficient 'Cp' of the wind turbine which is given by:

$$P_{mech} = C_p P_{wind} \quad (2)$$

The mechanical power generated by wind turbine is given by:

$$P_{mech} = 1/2 \pi R^2 V_{wind} C_p \quad (3)$$

Where R represents Radius of the Wind Turbine Blade (m).

IV.II. BESS INTEGRATION WITH STATCOM

The Battery Energy Storage System (BESS) is used as an energy repository element designed for the aim of better voltage regulation. The BESS will conventionally maintain dc capacitor voltage constant and is best acceptance in STATCOM since it rapidly inserts or absorbs reactive power to stabilize the grid system. When power fluctuation occurs in the system, the BESS is used to maintain the level of power fluctuation by charging and discharging operations. The battery is coupled in parallel to the dc capacitor of STATCOM.

IV.III. ARRANGEMENTS MADE IN PROPOSED SYSTEM

The shunt connection for STATCOM with Battery Energy Storage System is connected at the interconnection of the induction generator and non-linear load at the Point of Common Coupling. The Figure (5) presents the system operational scheme in grid system. The STATCOM output is deviated in consonance to the control strategy, so as to maintain the power quality norms in the grid system according to IEC Standards. The current control scheme for STATCOM practiced in the proposed paper is Bang-Bang controller which is derived from the Hysteresis Current Controller. A single STATCOM designed using Insulated Gate Bipolar Transistors (IGBT's) is practiced to have a reactive power support to the no-linear load and induction generator in the grid system.

IV.IV. CONTROL SCHEME

In this proposed control scheme, bang-bang current controller is being used to inject wind into a grid connected electrical network. A hysteresis current controlled derived technique is used. By utilizing this technique, the controller keeps the control system variable between correct switching signals and boundaries of hysteresis area for STATCOM operation. The current controller block accepts reference current and actual current as inputs and are subtracted so as to start-up the operation of STATCOM in current control mode.

IV.V. GRID SYNCHRONISATION

In the three-phase balance system, the RMS source voltage amplitude is calculated from the source phase voltages (V_{sa} , V_{sb} , V_{sc}) and is expressed as sampled peak voltage- V_{sm} :

$$V_{sm} = \sqrt{2/3(V_{sa}^2 + V_{sb}^2 + V_{sc}^2)} \quad (4)$$

In-phase unit vectors are calculated from source voltage in each of the phases and the RMS value of unit vector is shown below:

$$\begin{aligned} U_{sa} &= V_{sa}/V_{sm} \\ U_{sb} &= V_{sb}/V_{sm} \\ U_{sc} &= V_{sc}/V_{sm} \end{aligned} \quad (5)$$

The in-phase reference currents produced are acquired using in-phase unit voltage template as shown below:

$$i_{sa}^* = I^* U_{sa}, I_{sb}^* = I^* U_{sb}, i_{sc}^* = I^* U_{sc} \quad (6)$$

Where 'I' represents the proportionality magnitude of filtered source voltage for respective phases. This makes sure that the source current is controlled to be sinusoidal.

IV.VI. BANG – BANG CURRENT CONTROLLER

The proposed control system scheme of STATCOM-BESS is bang-bang controller is shown in the figure (6). The reference current is generated and actual current is detected by current sensors. Then both the current are subtracted for obtaining a current error for a hysteresis based bang-bang controller. Thus the ON/OFF switching signals for Insulated Gate Bipolar Transistors of STATCOM are obtained from hysteresis controller.

The switching function S_a for phase 'a' is expressed as:

$$I_{sa} < (i^*_{sa} - HB) \rightarrow S_A = 0 \quad (7)$$

$$I_{sa} > (i^*_{sa} + HB) \rightarrow S_A = 1 \quad (8)$$

This is similar for phases 'b' and 'c'.

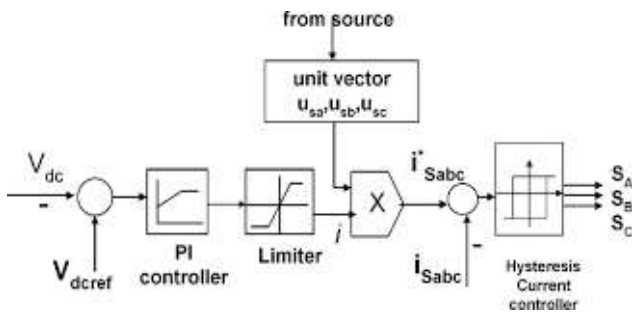


Figure 6. Control System scheme of STATCOM-BESS

V. SYSTEM PERFORMANCE AND ITS PARAMETERS

The proposed control scheme is simulated utilizing SIMULINK in power system block set. The system parameter for given system is given Table I. The system execution of proposed system under dynamic condition is additionally introduced.

Sr. No	Parameters	Ratings
1	Grid Voltage	3-Phase, 415V, 50Hz
2	Induction Motor/Generator	3.35kVA, 415V, 50Hz, P=4, Speed=1440rpm, $R_s=0.01\Omega$, $R_r=0.015\Omega$, $L_s=0.06$, $L_r=0.06H$
3	Line Series Inductance	0.05mH
4	Inverter Parameters	DC Link Voltage=800V, DC Link Capacitance= 100 μ F, Switching Frequency=2kHz
5	IGBT Ratings	Collector Voltage=1200V, Forward Current=50A, Gate Voltage= 20V, Power Dissipation=310W
6	Load Parameter	Non-Linear Load 25kW

Table 1. System Performance Parameters

A. VOLTAGE SOURCE CURRENT CONTROL—INVERTER OPERATION:

The three phase injected current into the grid from STATCOM will counterbalance the distortion brought about by the non-linear load and wind generator. The IGBT based three-phase inverter is coupled with grid through the transformer. The Generation of switching signals from reference current is simulated inside hysteresis band of 0.08. The decision of thin hysteresis band switching in the system improves the current quality and control signal of switching frequency inside its operating band.

B. STATCOM—PERFORMANCE UNDER LOAD VARIATIONS:

The wind energy generating system is associated with grid having the non-linear load. The execution of the system is estimated by exchanging the STATCOM at time $t=0.5s$ in the system and how the STATCOM reacts to the progression change order for expansion in extra load at 1.0 s is appeared in the simulation.

At the point when STATCOM controller is made ON, without change in some other load condition boundaries, it begins to response for demanded harmonic current. This extra demanded harmonic current is satisfied by STATCOM compensator. The simulation model of proposed control scheme with STATCOM is appeared in Figure (7). The Control system used for STATCOM operation is appeared in Figure (8). The source current and load currents waveform in simulated model is examined and displayed in figure (9). Power Factor Improvement and Reactive power Compensation is illustrated in figure (10) while the Source currents, Load currents and STATCOM injected currents are displayed in figure (11). The DC link voltage controls the source current in the grid system, so the DC link voltage is kept up steady across the capacitor which is displayed in figure (12). Total Harmonics distortion with STATCOM and without STATCOM operation is displayed in Figure (13) and (14) respectively. The above tests with proposed scheme have power quality improvement include as well as has support capability to help the load with the energy storage system through the batteries.

VI. SIMULATIONS AND RESULTS:

Figure 7. MATLAB model of the proposed scheme

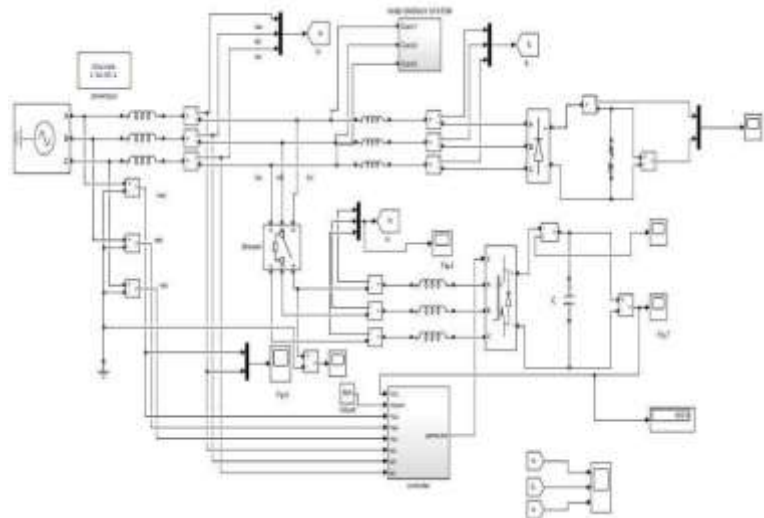


Figure 8. Control System Design in MATLAB Model.

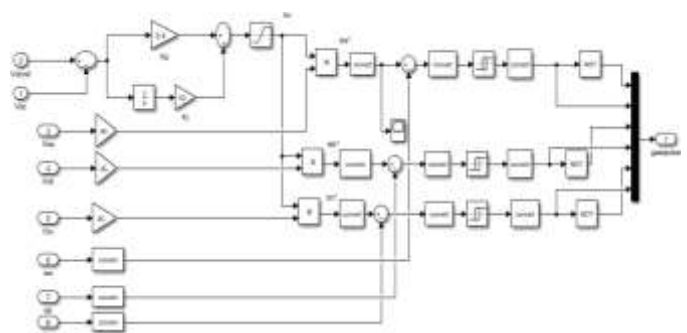


Figure 9. Load currents and Source Currents

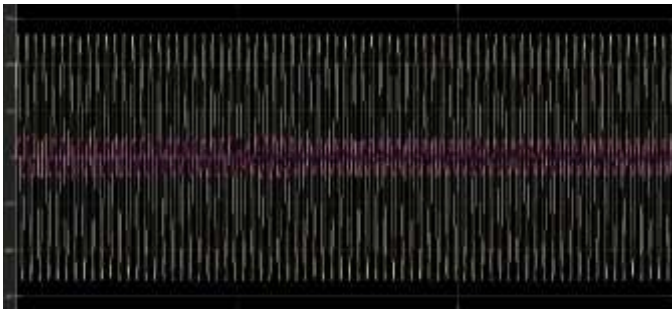


Figure 10. Power Factor Improvement and Reactive power Compensation

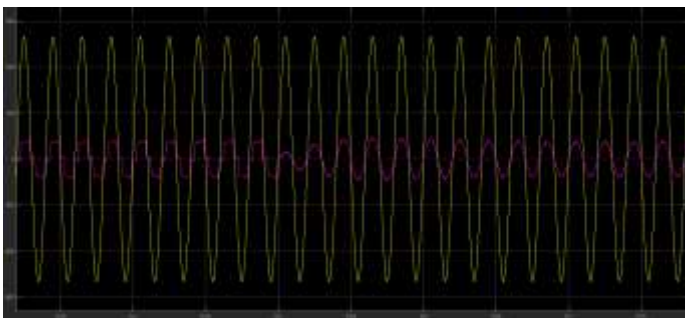


Figure 11. Source currents, Load currents and STATCOM injected currents

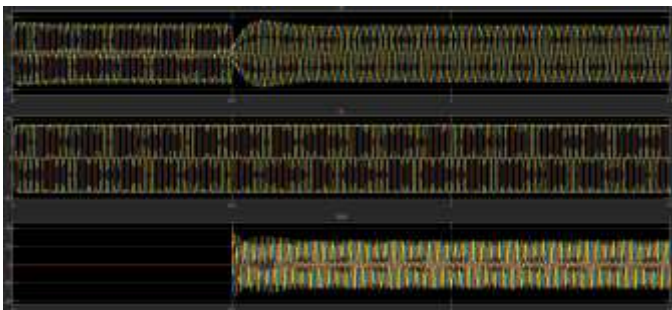


Figure 12. DC link Voltage

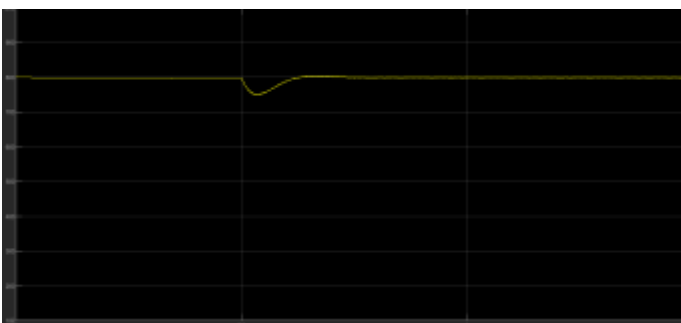


Figure 13. Total Harmonics Distortion without STATCOM

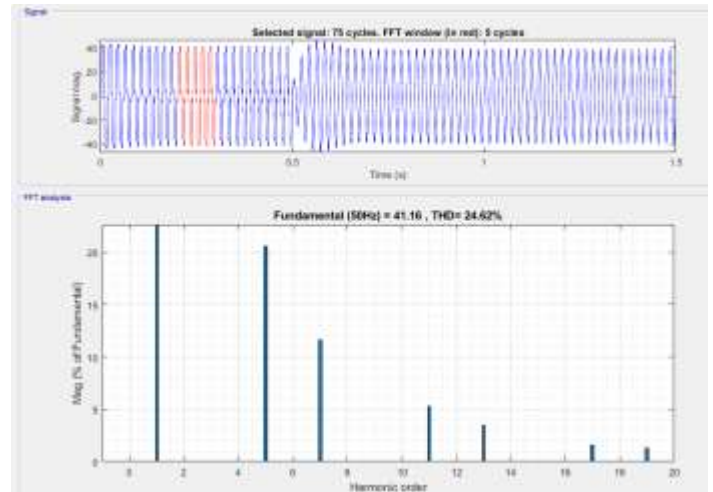
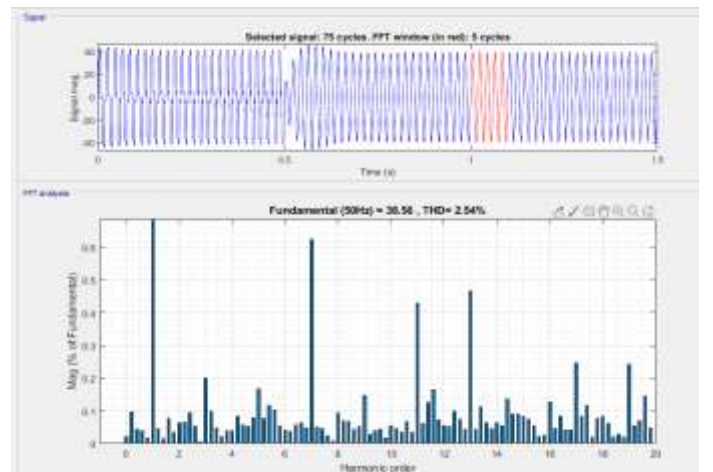


Figure 14. Total Harmonics Distortion with STATCOM



VI. CONCLUSION

The paper analyses the elements which influences the power quality in the wind energy generation system. Likewise this paper examines the execution of STATCOM-Control scheme for power quality improvement in grid associated wind energy generation system. The simulation of the proposed control scheme for the grid associated Wind energy generation is simulated utilizing MATLAB/SIMULINK. The control scheme has an ability to dispense with the harmonic parts of the load current and reactive power. Total Harmonic Distortion before the STATCOM connected was observed to be 24.62%, whereas, after STATCOM connection it was observed to be 2.54%. It additionally assists with keeping up the source voltage and current in-stage which makes maintaining power factor at source-end and thus supporting the demanding reactive power injection for the load at PCC and wind generator in the grid interfaced wind energy generation system. It allows an opportunity to upgrade the use factor of transmission lines.

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HOME AUTOMATION WITH SECURITY SYSTEM

Mr. Nikhil Satish Yadav¹, Mr. Chandrashekhar Rajbhar², Mr. Kaif Salim Shaikh³, Mr. Abdul Rahman Shaikh⁴, Prof. Rahatullah Khan⁵

¹⁻⁵Electrical Engineering, Theem College of Engineering, Boisar, Maharashtra India.¹²³⁴

Abstract - This project gives an idea about a futuristic method for automation and security system with help of a wireless network. automation and security system work on the internet connection as well as the operator can operate from any location. In this project there are 5 different systems or circuits are used. For the automation system, we used Alexa as AI (artificial intelligence) to control all home or office switches. And we can command Alexa to control the appliances by using the English language.

The next thing is fan speed control using a wireless network. Now a day fan speed control is using manually and we can call hand to operate but it difficult for Childers, aged person, and patient to move and operate fan speed. To reduce the effort and easy to operate Childers, aged person and hospitalized patient we make this thing fan speed control using a wireless network. In this system, users can operate fan speed by using an android phone. It's had an application (in android phone) name is blynk. This blynk application has a slider of 1 to 5 points to speed control.

Our next system is a security system. In this system, we install 2 hidden cameras in the home or office one is indoor and the other cameras outdoor as well as we also install an android fingerprint base magnetic door lock system. The camera is operating on an internet connection. And user can check the video log by using the given IP address by a camera. And fingerprint door lock system uses user android cell phone fingerprint. To open or close the door. And we also provide a locker system that has a biometric security system. The locker lock system is based on an Arduino UNO development kit to secure our expensive material or important documents.

1. INTRODUCTION

Now a day's electricity consumption is increasing and operating and controlling equipment is getting complicated and time-consuming operation as well as same electrical equipment required fast response or fast operating speed to reduce the response time of equipment to get a proper response at a time. To reduce the response losses and get the instant response we use automation to solve time-consuming and switching time problems.

Automation is now part of life. and now automation is important to big factories, industrial as well as home. Now a day's automation is the main part of a big industry because everything operates automation. (Etc. PLC, SCADA, DCS). But this automation system also wants a big house and big

bungalow to operate switching and fan and motor speed control using manual or automatic operations.

So, we introduce new things that can handle home automation. And it is at a reasonable price for customers or users. That system is known as Home automation with a home security system using Wi-Fi for home automation.

In this system, we control the fan speed control and switches using a Wi-Fi network. And Also, we provide a home security system and this system is user-friendly as well as easy to operate at a particular location (Depends on the Wi-Fi range).

In this system, we use four different types of units(program) 1st unit is used for the Alexa base vice commanded system. 2nd unit is fan speed control using Wi-Fi. 3rd unit is belonging to the security system. In this unit, we use two hidden camera systems. 4th unit is an android fingerprint base door lock system. And we also provide a biometric base safety locker. The locker lock system is based on an Arduino UNO development kit to secure our expensive material or important documents.

2. PROBLEM STATEMENT.

Home automation refers to manage the house appliances by using technology. Computer Systems enable device of lighting through to complex micro-controller or computer-based networks with varying degrees of intelligence and automation. Home automation provides security, energy efficiency, and simple use hence, it's adopted more. It also provides a foreign interface to home appliances to supply control and monitoring on an internet browser.

3. RELATED THEORY.

In this system, we use five different types of units(program) 1st unit is used for the Alexa base vice commanded system. 2nd unit is fan speed control using Wi-Fi. 3rd unit is belonging to the security system. In this unit, we use two hidden camera systems. 4th unit is an android fingerprint base door lock system. And we also provide the 5th unit is a biometric base safety locker. The locker lock system is based on an Arduino UNO development kit to secure our expensive material or documents important.

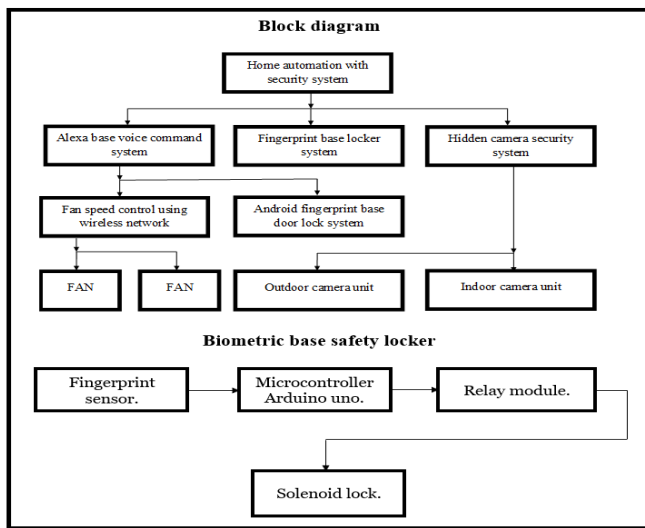


Figure no.1

4. ALEXA BASE VOICE COMMAND SYSTEM.

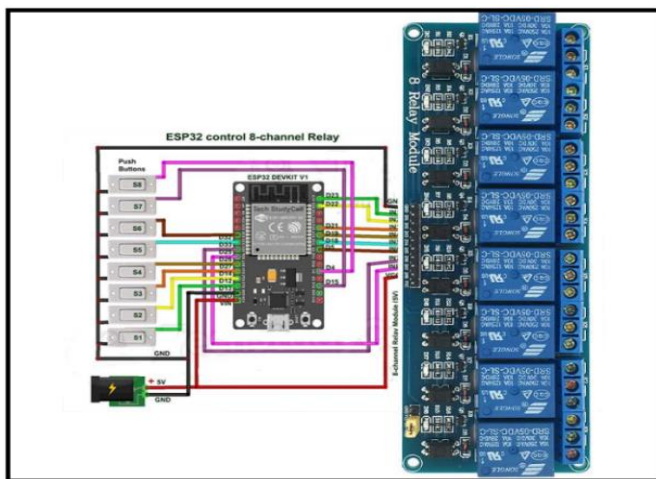


Figure no.2

In this IoT project, we've got explained a way to make a NodeMCU Alexa home automation system with Sinric. With this NodeMCU ESP8266 project, you'll be able to control 8 home appliances from the Amazon Alexa App and manual switches. you'll control the relay module from the manual switches if there's no internet available. And you don't need an Amazon Echo Dot device for this voice control home automation project. With this IoT project, you'll be able to control & monitor the real-time feedback of the relays within the Alexa App from anywhere within the world. If the Wi-Fi is out there, the NodeMCU will automatically connect with the Wi-Fi and also the blue LED will activate.

The circuit is incredibly simple, I've got used D23, D22, D21, D19, D18, D5, D25 & D26 GPIO to manage the 8-channel relay module. and therefore, the GPIO D13, D12, D14, D27, D33, D32, D15 & D4 connected with manual switches to manage the relay module manually. I've got used the

INPUT_PULLUP function in Arduino IDE rather than using the pull-up resistors with each switch.

As per the program code, when the control pins of the relay module receive the LOW signal, the respective relay will activate and also the relay will put off for the HIGH signal within the control pin. I've got used a 5V 2Amp mobile charger to produce the circuit.

If the NodeMCU is connected with Wi-Fi, then you'll control the relay module from Amazon Alexa App and manual switches. you'll control the appliances like light, fan, etc. with voice commands, and also monitor this status of the switches from anywhere within the world from the Alexa App.

If the Wi-Fi not available, the blue LED on NodeMCU will close up. Then you'll be able to control the relays manually only using switches. The NodeMCU will check for the Wi-Fi after every 3 seconds. When the net comes back, the NodeMCU will automatically connect with the Wi-Fi. and therefore, the blue LED will activate.

5. FAN SPEED CONTROL USING WIRELESS NETWORK.

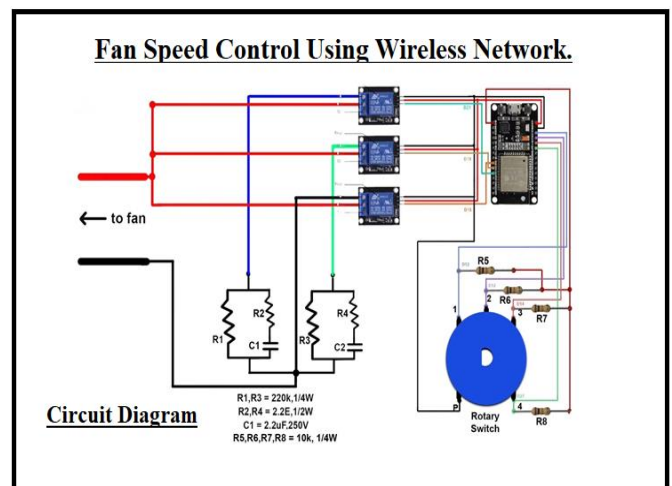


Figure no.3

In this project, we made a devotee regulator circuit using an ESP32 board during which you will be able to control the speed of your ceiling fan over the net using Blynk app on your smartphone. And not only that you just also can control the speed with the regular fan speed regulator which you employ in your day-to-day life and you will also get Real-time feedback of the manual control on your blynk app. And just in case your internet isn't working, then also you may be able to control the speed of the fan manually using that fan regulator

6. HIDDEN CAMERA SECURITY SYSTEM.

ESP-EYE Development Board evaluates ESP32 series devices. the event board also measures image recognition utilized in various computer science of Things (IoT) applications. the event board features an ESP32 chip, a 2-Megapixel camera, and a microphone. The board provides 8Mbyte PSRAM and 4Mbyte flash storage. It also supports image transmission via Wi-Fi and debugging through a Micro-USB port.

Taking a primary take a look at the ESP-EYE board, we used to be impressed by how small it absolutely was. Just with 21mm by 41mm, it's equipped with a 2 MP camera, on-board microphone, reset, boot, and performance buttons, and two LEDs. It features 4MB Flash, 8MB PSRAM, and a Micro USB Type-C connector.

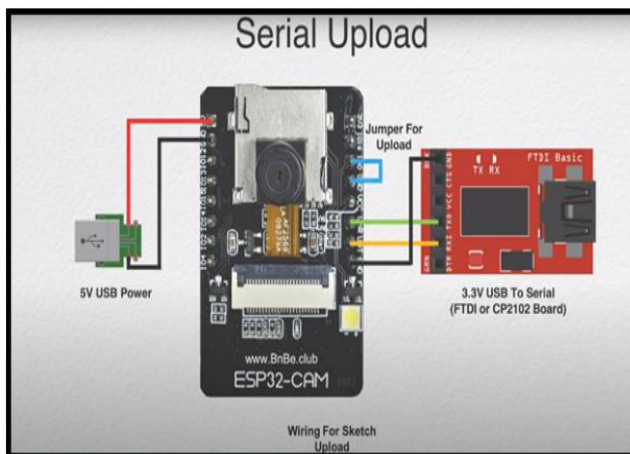


Figure no.4

The ESP-EYE came flashed with the ESP-WHO biometric authentication software. this enables us to create an IP camera which will detect faces and distinguish people.

It creates an access point that you just can connect with. After connecting to the ESP-EYE access point, you'll be able to access the camera video streaming in your browser using the subsequent URL: 192.168.4.1/face stream.

7. ANDROID FINGERPRINT BASE DOOR LOCK SYSTEM

These days, you'll improve your home or office security using state-of-the-art technology. Using smartphones and smart devices becomes easier and affordable for all people and it's an honest option for us to form our stuff smarter. Each day, engineers and technicians produce new systems and tools that you simply can make smarter home automation by using and build new ways to form your life safer and easier. Probably, you have got seen smart locks for doors that have a keypad or use a fingerprint to line the door lock or unlock.

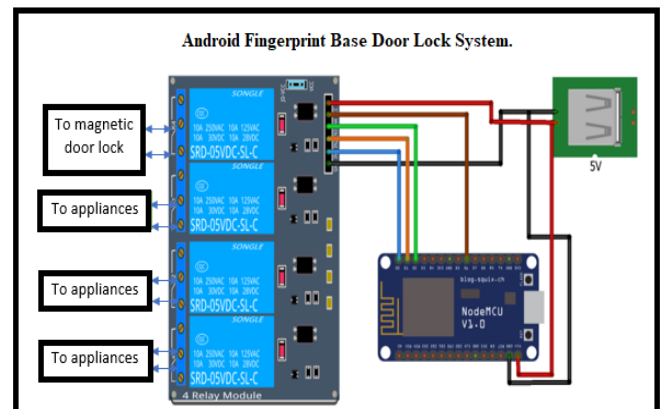


Figure no.5

During this project, we would like to form an Arduino-based system that helps you to form a login section for a door by Wi-Fi and solenoid lock. We don't use the keypad or complicated mechanical elements and these are advantages of this method. We just stick a QR code to the door and therefore the allowed people can scan it to determine the login page and enter their password. After typing the password, the solenoid lock is going to be activated. We only use an Arduino board and a driver for the solenoid and an ESP8266 to create a connection to local Wi-Fi.

8. BIOMETRIC BASE SAFETY LOCKER SYSTEM.

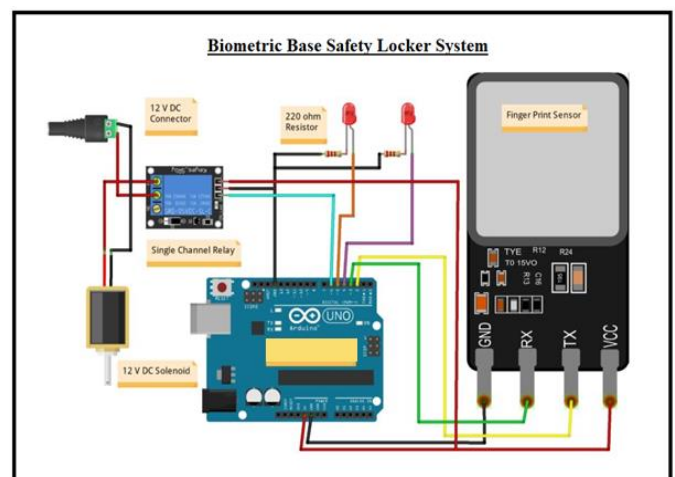


Figure no.6

Fingerprint Biometric-based safety locker system-based security system are often used at many places like Industries, Offices, and Colleges or perhaps at our home. This project may be a fine combination of "Biometrics technology" and "Embedded system technology". A fingerprint sensor is that the main a part of this technique. It makes use of a Biometric sensor to detect fingerprints. it's also called a Biometric sensor. The fingerprint sensor uses various varieties of techniques like ultrasonic method,

optical method, or thermal technique. during this project, we've got used an optical fingerprint sensor.

The main blocks of this project are Microcontroller, Fingerprint module, Relay, Arduino Uno, Solenoid. The user needs to place his/her finger on the optical sensor a part of the fingerprint module. the most feature or specialty of the fingerprint is that it's unique. It gives this project the high-level security than other security systems. Person recognition using Fingerprint identification is employed for a protracted time. the foremost common example is employed in criminal cases.

CONCLUSION

The conclusion focuses on connecting all components and sensors as well as a suitable amount of internet speed provides to the system then it performs given task. And properly provide a given task with a good feedback response.

ACKNOWLEDGEMENT

We take this chance to precise our deep regards to those that offered their invaluable assistance and guidance in hours of need.

After the method of our project "HOME AUTOMATION WITH SECURITY SYSTEM.". We glance back in regard to those who have helped us in our work. Without their guidance and invaluable help, the completion of this project would be difficult task.

We'd prefer to express our sincere gratitude towards the people that guided us through our project Coordinator and guidance of our internal guide Prof. Rahatullah Khan. And our project Coordinator Prof. Rahatullah Khan who helped us sail smoothly to completion of our project and provided us an aid all told technical aspects.

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2. Home Automation and Security System Using Android ADK by Deepali Javale, Assistant Professor, Dept. of Computer Engg, MAEER's MITCOE, Pune, India; Mohd. Mohsin Student Dept. of Computer Engg MAEER's MITCOE Pune, India; Shreerang

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6. <https://github.com/espressif/arduino-esp32> live streaming
7. <https://www.viralsciencecreativity.com/> Android Fingerprint Base Door Lock System
8. <https://harshsharmatechnicals.com/> Biometric base safety locker system

POWER GRID FAILURE DETECTION BASED ON VOLTAGE AND FREQUENCY VARIANCE DETECTION

Shweta Pawar¹, Jaiee patil², Krushita Ambhire³, Jijesh Hambire⁴

PROJECT GUIDE: Prof. Jayshree H. Sali

Email: jayshree.sali@theemcoe.org

^{1,2,3,4}Student, Department Of Electrical Engineering, Theem College Of Engineering, Boisar.

¹ Email: shwetapwr23@gmail.com, ² Email: jaieep1999@gmail.com

³ Email: krushita19@gmail.com, ⁴ Email: jhambhire8@gmail.com

Abstract- *In present-day power system, electrical energy from the generating station is delivered to the supreme consumers through a huge network of transmission and distribution. There are many power generation units connected to the grid such as hydro, thermal, solar, wind, etc. to supply power to the load. Thus, for successful operation of loads, it is desirable that consumers are supplied with constant voltage and frequency. In this paper we present a system which can detect the synchronization failure of any external supply source to the power grid on sensing the abnormalities in frequency and voltage. For attainable transmission, the frequency and voltage of the AC supply should be within the limits as decided by the grid, depending upon the needs of the power supply. According to the CENTRAL ELECTRICITY AUTHORITY OF INDIA Regulations 2010, variation of the system voltage should be of $\pm 5\%$ and that for frequency close to 50 Hz and should not allow it to go beyond the range 49.2 to 50.3 Hz or a narrower frequency band specified in the Grid Code, except during the transient period following tripping. In case these limits are surpassed and the demand for power is more than the demand for supply, it results in grid failure. In such situations, the feeder unit is completely detached from the grid, causing islanding situation. Thus synchronization is needed between the grid and the feeder unit, so as to avoid the major scale brown out or black out of the grid power. In this paper, we are introducing a system which can notify*

the grid in advance so that alternate arrangements are kept on standby to avoid complete grid failure.

Keywords: *Islanding, Grid, Microcontroller, Synchronization*

I.INTRODUCTION

Energy provides the power to progress. Accessibility of enough energy and its proper use in the country can result in its people rising from existence level to highest standard of living. Energy exists in various forms in nature but the most crucial form is the electrical energy. The modern society is so much relied on the use of electrical energy that it has become a part and parcel of our life. Several new modes have already employed in the electricity infrastructure. It includes the growth of the existing grid with micro grids and mega grids, extensive sensors, data processing, visualization tools, etc. Increasing electrical energy demand, modern lifestyles and energy usage patterns have made the world fully dependent on power systems thus the need of a reliable and stable power system grid. However, the power system is a highly unpredictable system, which changes its operations continuously. Therefore, it is very demanding and inefficient to make the system be stable for all disturbances. At present, the curiosity toward the distributed generation systems, such as photovoltaic arrays and wind turbines, rises year after year. But wind turbines and generally DGs will have effects in the power system network that one of these factors is an islanding phenomenon. Islanding depicts to the state in which a distributed generator (DG) will

continue to power a system even though electrical grid power from the electric source is no longer present. Islanding situations can damage the grid itself or equipment's connected to the grid and can even compromise the security of the maintenance personnel that service the grid. According to IEEE1547 standard, islanding state should be encountered and disconnected in 2 seconds. This leads to concept of Automatic detection of Grid synchronization failure. Thus, the main consideration in our paper is to detect voltage and frequency failure in a grid.

II. LITERATURE VIEW

Rohan Solanki, Divyesh Patel, Yuvraj Gharia, Daivik Sailor, Bhunit Patel, AshishChaudhari[1], generated Detection And Protection of power grid synchronization failure system in which they gave the idea if any deviation From the acceptable range limit of the grid it is mandatory that some feeder should unfailingly get detached from the grid which in termed as islanding, these prevent in large scale brownout or blackout of the Grid power so it is recommended to have a system which can alert the grid in advance so that backup arrangements are kept on standby to avoid complete grid failure.

Karan Gupta, Shreyas Gupta, Kummad Verma, Anil Singh, Abhimanou Sharma[2], gave an idea of Detection Power Grid Synchronization Failure on Sensing Bad Voltage or Frequency Documentation in which they described in modern power system, electrical energy from the generating station is delivered to subsequent consumers through a large network of transmission and distribution. There are various power generation units connected to the grid such as hydro, thermal, solar, wind etc. to supply power to the load. Thus, for adequate operation of loads, it is acceptable that consumers are supplied with mainly constant voltage and frequency.

Shubhdeep Joshi, Tushar Parihar, Varun Kumar Shakya, Pradeep Kumar , Upendra Pal Singh[3] gave an idea of detection of power grid synchronization failure of sensing frequency and voltage beyond

acceptable range in which they described that. The rules of grid involve sustaining a voltage variation within limits and also the frequency. If any deviation from the acceptable limit of the grid it is mandatory that the same feeder should automatically get disconnected. This avoids in large-scale brown out or black out of the grid power by sensing faults in voltage and frequency.

Laukik S. Raut, Shahrukh B. Pathan, Gaurav N. Pawar, Mandar V. Pathak [4], gave a concept of Detecting Power Grid Synchronization Failure on Sensing Frequency or Voltage beyond Acceptable Range. The system to verify the synchronization failure of any external supply source to the power grid on sensing the irregularities in frequency and voltage. There are many power generation units connected to the grid such as tidal, thermal, solar etc. to supply power to the load. These generating units need to supply power in accordance to the rules of the grid. These rules involves sustaining a voltage variation within limits and also the frequency. If any fault occurs then automatically the grid line should get disconnected. So it is preferable to have a system which can alert the grid in advance so that alternate arrangements are kept on standby to avoid complete grid failure. This system is formed on a microcontroller of 8051 family. The microcontroller observes the under/over voltage being derived from a set of comparators. As the frequency of the mains supply cannot be altered, so by using variable frequency generator (555-timer) frequency can be changed. A lamp load (indicating a predictable blackout, brownout) being driven from the microcontroller in case voltage/frequency going out of acceptable range.

III. METHODOLOGY

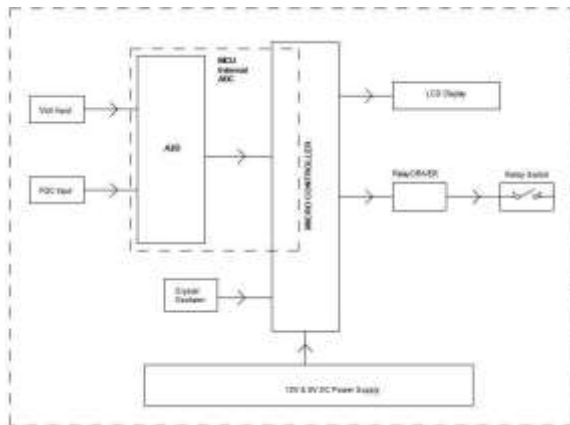
This system is form on a microcontroller of 8051 family. The microcontroller observes and checks the under/over voltage being derived from a set of comparators. As the frequency of the mains supply cannot be changed, the project uses a variable frequency generator (555-timer) for changing the

frequency, while a standard variances is used to change the input voltage to test the operation of the project. A lamp load (indicating a predictable blackout, brownout) is being driven from the microcontroller in Case of voltage/frequency going out of acceptable range. Further the project can be improved by using power electronic devices to isolate the grid from the faulty supply source by sensing cycle by cycle variation for more sophisticated means of detection [4]

If the voltage and frequency exceeds beyond the desired limits then it will affect the grid and causes grid failure. This feeder unit is completely isolated from grid causing islanding condition to maintain synchronization needed between the grid and feeder unit. [4-7]

diode rectifier converts 6V AC into pulsating DC. Bridge rectifier is used to convert negative cycle of sine wave into positive cycle because microcontroller cannot read negative voltage.

After bridge diode rectifier, voltage divider is used to divide 6v pulsating dc into two equal parts because microcontroller cannot work on voltage more than 5 volt. Output of voltage divider is given to timer 1 pin of microcontroller. Timer 1 Microcontroller is used as a counter in this project which measures time between two consecutive zero crossings. Time measured by counter is divided by two since frequency of pulsating full bridge rectifier is double than sine wave frequency. All calculations are done in programming. After calculating frequency microcontroller displays measured frequency on LCD



(fig 1)

See the block diagram (fig 1) of the unit. It's based on a preprogrammed Arduino micro controller. The complete system divided in six sections. The finger print sensor interfacing, key board interface (input section), Relay and buzzer interface, and power supply section AC supply whose frequency is to measure connected with potential transformer. Potential transformer step down the AC voltage from 220V AC to 6V AC. Output of potential transformer is connected with bridge diode rectifier. Full bridge

IV. RESULTS

Voltage detection is by done by varying the potentiometer after reaching the acceptable range the LCD displays that the voltage exceeded 230V and the relay will be tripped and load of AC is protected. The frequency detection is done before the tripping of the light load the light flicker and frequency change will be displayed on the LCD. Hence a continuous monitoring load and faults in frequency and voltage is done by using microcontrollers. In this case the load variation will be detected. For changing the load in this prototype we are using LED's and lamp load.

V. CONCLUSION

This paper concludes that it is possible to have a power grid system that is smarter, more effective as well as efficient in its operation, thus proving to be more economical as compared to be the present installations. The challenge is a continuous and uninterrupted transmission which can be very well achieved with the implementation described by this project and in addition to the continuous transmission

several other parameters i.e. the passive parameters are being observed regularly and any issues occurring in these, are taken into consideration and accordingly worked upon, thus making the process of management and recovery easier and effective. This system is less expensive as compared to the other systems.

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Transformer-Less Inverter

Mr. Memon Abdulla Iqbal
Student: Electrical Engineering
Theem College of Engineering
Mira Road, India

Mr. Saquib Multani
Student: Electrical Engineering
Theem College of Engineering

Mr. Zahran Shaikh
Student: Electrical Engineering
Theem College of Engineering

Mr. Rahatullah Khan
Head of Electrical Engineering Department
Theem College of Engineering
Boisar, India

Abstract— We are going to construct a transformer-less inverter circuit which can be power via solar panels and also using batteries. As the name suggests, an inverter circuit that converts a DC input into AC without depending on an inductor or a transformer is called a transformer-less inverter. The proposed transformer-less inverter design is a modified sine wave type which is better than square wave counterpart. Electricity is becoming a central need of human being. Presently maximum electricity is generated at thermal and hydro power plants. These plants depend upon coal which is limited on earth's crust causing shortage of power supply. To overcome these shortcomings use of non-renewable sources is very much useful. In Asian countries solar energy is abundantly available. Applications using solar energy will minimizes energy crisis. As solar energy is clean source of energy, power generation is easy and eco-friendly. Also for energy conversion moving part or heavy machinery is not required. For efficient conversion of solar energy into an electrical power various inverter topologies were proposed. A PV converter system with standby distributed generation system is proposed, which is more useful for rural and agricultural applications in a developing country like India.

I. Introduction

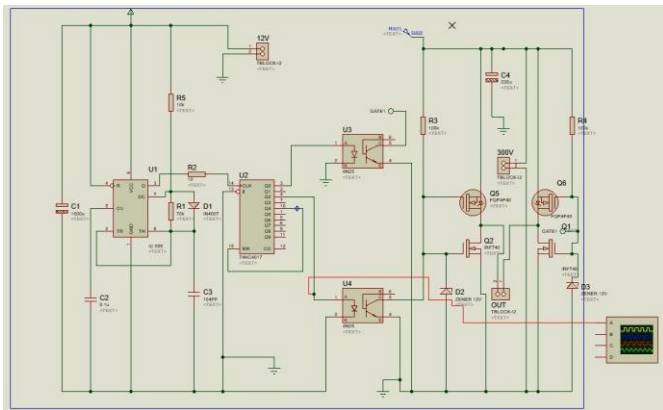
Inverter is a power electronic device or circuitry that changes direct current (DC) to alternating current (AC). The resulting AC frequency obtained depends on the particular device employed. Inverters do the opposite of "converters" which were originally large electromechanical devices converting AC to DC. The input voltage, output voltage and frequency, and overall power handling depend on the design of the specific device or circuitry. The inverter does not produce any power; the power is provided by the DC source. A inverter can be entirely electronic or may be a combination of mechanical effects (such as a rotary apparatus) and electronic circuitry. Static inverters do not use moving parts in the conversion process. Inverters are primarily used in electrical power applications where high currents and voltages are present; circuits that perform the same function for electronic signals, which usually have very low currents and voltages, are called oscillators. Circuits that perform the opposite function, converting AC to DC, are called rectifiers. In the past, galvanic isolation in photovoltaic grid-connected inverters was mainly realized through employing line frequency transformers between the photovoltaic system and the grid. These transformers were not only difficult to install, but also large and heavy. In addition, they increased system complexity and were

inefficient due to several power stages. To solve the problems of efficiency, cost and size of inverters, transformer-less inverters were introduced. Removing the transformer causes a galvanic connection between the photovoltaic system and the power grid. Thus, the common mode leakage current may follow through the parasitic capacitors between photovoltaic system and ground. This leakage current increases system losses and grid current harmonics and leads to serious unsafety. Therefore, the common mode leakage current must be taken into account in designing transformer-less PV inverters. The efficiency of a PV system is directly affected by the intensity of sun radiation and ambient temperature. In power applications, the efficiency of a PV systems needs be high if it is to deliver the power to the grid. Therefore, it is necessary to track the maximum power under changing surrounding conditions. In a two-stage inverter, the first stage – DC/DC boost converter –delivers maximum power to the second stage and regulates the DC-link voltage. There are various types of controllers, e.g., P&O, Fuzzy, Neural network, sliding mode controller etc., to track the maximum power in the first stage. In the second stage, the controller system controls power stability and quality. In PV applications, good inverter controllers are essential for enhancing the inverter performance since the conversion process depends on control algorithms. This paper reviews the better version of transformer-less inverter.

II. OBJECTIVE OF STUDY

The main aim of the transformer-less inverter is to eliminate the losses taking place in inverter due to the presence of transformer by utilizing the high voltage–power electronic switches, and as an outcome, it also leads to decrease in size, weight and cost of the inverter system.

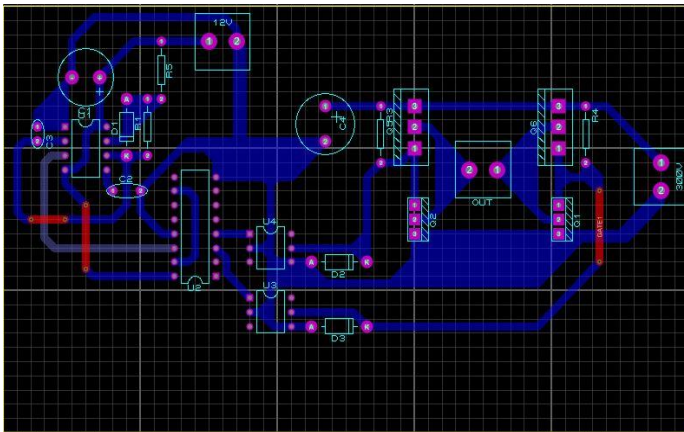
III. PROPOSED TRANSFORMER-LESS INVERTER



Before implementing the project, a number of past research paper and project material were studied by us. We designed the circuit diagram on proteus software and we carried out simulation. Then we designed pcb layout in proteus.

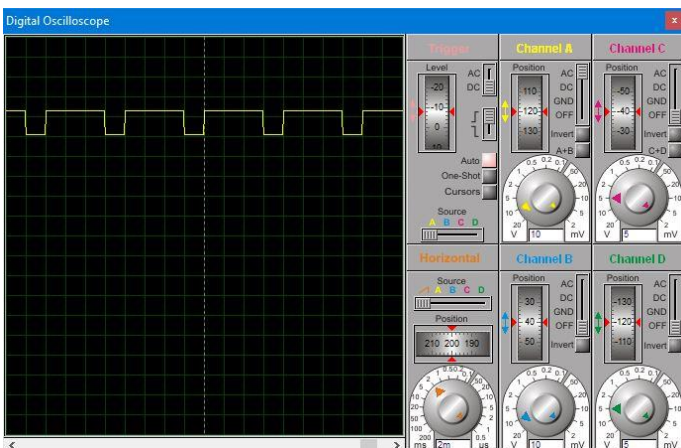
NOTE: While performing simulation we tackle error that the simulation cannot be run by CPU. So we divided the circuit into two half and then perform simulation.

IV. PCB LAYOUT



While making PCB layout we tackle many difficulties. The main difficulty is to arrange component in PCB. Make sure that no wire is left unconnected or short circuited. And try to make as compact as possible.

V. OUTPUT



This is the output of our circuit.

VI. CONCLUSION

Our main goal of the project is to create loss less inverter which can give better efficiency as compared to normal transformer inverter.

Therefore, we have remove transformer form circuit and we have placed it with alternative options. Hardware implementation of a proposed system is process, suitable high speed microcontroller shall be used to regulate wave of desired RMS value and frequency. Since transformer has not been used, poor isolation will be demerit of the system.

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E-voting System victimization Blockchain (Smart Contract)

Omkar Ghatge¹, Tabish Khan², Sohail Bhati³

¹⁻³Student, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

⁴Mrs. Sneha Sanke, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

Abstract —Building associate degree electronic electoral system that satisfies the legal necessities of legislators have been a challenge for an extended time. Distributed ledger technologies be associate degree exciting technological advancement within the info technology world. Blockchain technologies supply associate degree in infinite vary of applications making the most of the sharing economies. These aims to gauge the applying of blockchain as service to implement distributed electronic vote systems. This elucidates the wants of building electronic vote systems and identifies the legal and technological limitations of victimization blockchain as a service for realizing such systems. This starts by evaluating a number of the popular blockchain frameworks that supply blockchain as a service. We to tend to then propose a unique electronic electoral system supported blockchain that addresses all limitations we to tend to discover. A lot of typically this evaluates the potential of distributed ledger technologies through the outline of a case study, specifically the method of associate degree election and implementing a block chain-based application that improves the safety and reduces the value of hosting a nationwide election.

1. INTRODUCTION

During this paper we to tend to square measure discussing a very redistributed, open, and online electoral systems created victimization blockchain. Blockchain is redistributed peer to look network. It's a system of recording info during a means that produce it is tough to vary, hack Or cheat the system. The applications of blockchain square measure still being studied and therefore, the analysis square measure applying in several fields like medical Or health care, logistics, security and privacy etc. the thought behind associate degree e electoral system comes from digital wallets like phone pay, paytm etc.

The system will issue ID for every participant when corroboratory it's identity. The ID should contain user credentials and one user are going to be solely given single probability of vote. This opportunity will be shown as a coin or purpose all participants can have single coin or purpose to explain the prospect of vote at the top of election no. of points or coins are going to be counted the candidate with the very best no. of coins/points are going to be a winner of election. In this system, we to tend to

square measure victimization blockchain to eliminate the requirement of central server to manage the network.

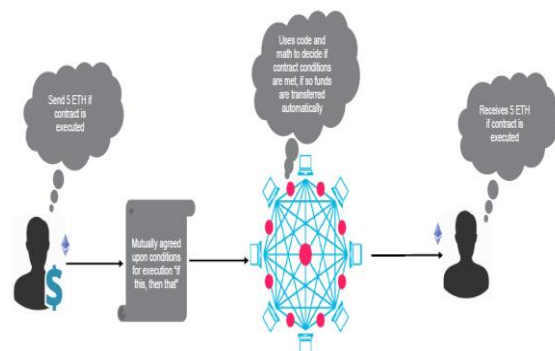
Central server means that central info structured by victimization central structure it's like we to tend to square measure inviting hackers to hack into the system and alter the result. To eliminate this threat we to tend to square measure victimization Block chain. Blockchain is totally First State centralized open ledger system.

Public ledger records all the votes casted and it's permanent it cannot be modified when it's casted. If somebody needs to hack Or manipulate the ledger he should hack all previous blocks before adding new block of manipulating current block that is sort of not possible.

2. LITERATURE SURVEY

Traditionally, the information is maintained by a central authority or organization that has then complete management over the central info. That organization has the power to tamper the info and alter the entire outcome of the election. That's why it's not acceptable to relinquish full command to any single authority or organization.

Albeit the authority or organization is warranted on not create any changes to info however it's easier for hackers to hack into the system and manipulate the central info. To avoid such state of affairs blockchain makes the information makes the info public, a person will store the copy of the info and it will be continuously compared to ascertain for manipulations.



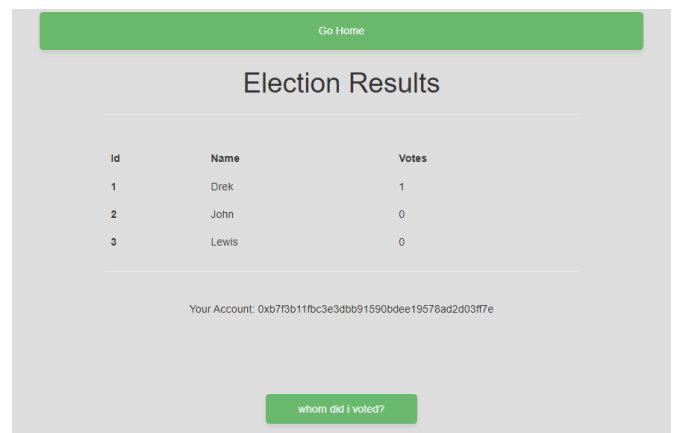
3. METHODOLOGY

The blockchain technology was introduced in 2008 by Satoshi Nakamoto once he created initial cryptocurrency referred to as bitcoin. The bitcoin blockchain technology uses a redistributed public ledger combined with Pow (proof of work) primarily based stocastic accord protocol with monetary incentives. 1) Sensible contracts: it's a traceable and irreversible application that execute during a redistributed setting. One among its feature is once contract is deployed no one will modification the code, or it's execution behavior. Sensible contract guarantees to bind parties along to associate degree agreement as written.

The phrase and an idea have of a sensible contract a square measure has introduced by Nick Szabo, Nick Szabo encompasses a degree during a law, and applied a science. His goal was to bring extremely evolved practices of a law to the look of electronic commerce between strangers on the net.

2) Non-Interactive zero an information proof: Another idea that's essential for making an associate e a legal system. Zero an information proof is an associate cryptanalytic methodology by that one a celebration proves one a thing to a different party while not reveling the data.

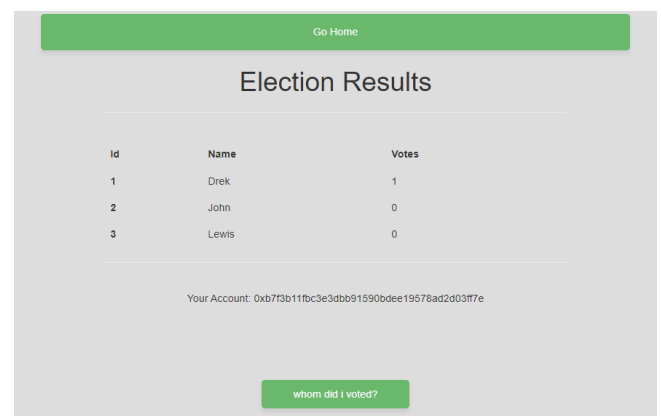
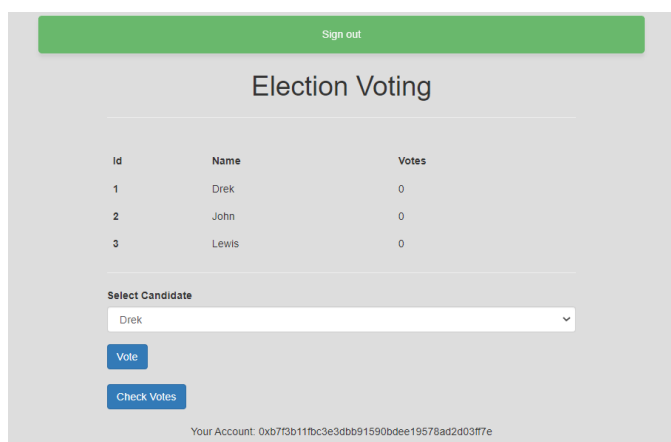
For a checking of votes submitted :-



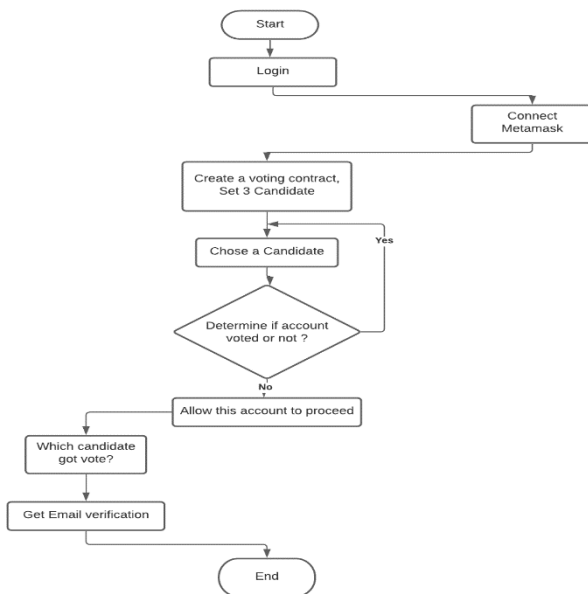
SMTP (a Simple Mail Transfer Protocol) :-

The Simple Mail Transfer Protocol is an online commonplace communication protocol for a piece of an email transmission. The straightforward Mail Transfer Protocol (a smtp) is an online commonplace communication protocol for a piece of an email transmission.

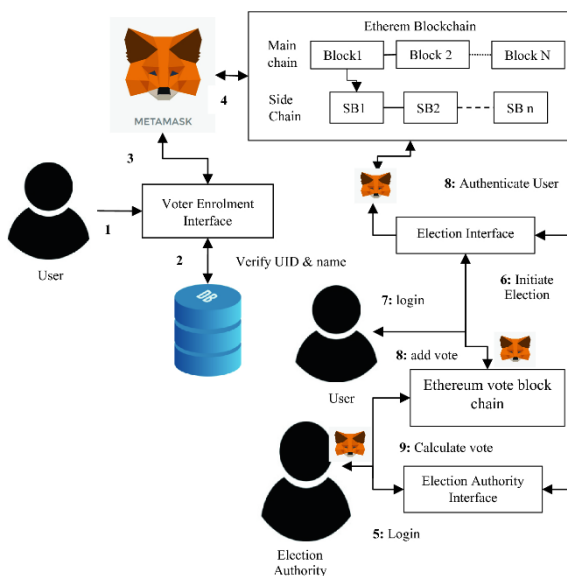
Mail servers and a different message transfer agents use a smtp to sends and receive mail messages.



A. flowchart :-



B. Working :-



4. RESULTS AND DISCUSSION

Block chain based E voting system provides to many benefits. It secures voters privacy. It improves efficiency and allow faster results. It provides transparency. Voting results are publically Auditable. The main disadvantage of this system is this system is complex in nature which may hinder it's acceptability. Another issue can be digital user skills.

5. CONCLUSION

This system can overcome the limitations of centralized voting system using block chain. This implementation uses smart contract. This system is tested on virtual network using small no. Of clients in feature it can be tested on Ethereum test net with large no. Of accounts. The feasibility of this system can be tested large scale election.

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Blind Stick for Visually Impaired People

Ronak Panchal¹, Sneha Sankhe², Saad Khan³, Vishal Singh⁴

^{1,2,3,4}Dept. of Information Technology, Them College of Engineering, Boisar, Maharashtra, India

Abstract - The main object of this project is to come up with an idea to help blind and visually impaired society people. Using blind stick the blind person can walk independently on his own and stick will assist the person to navigate. People with visual disabilities often depend on external assistance for their help like humans, trained dogs, or some kind of electronic device as their support systems. We accomplished this goal by adding buzzers and ultrasonic sensors which will help the user to overcome this difficulties. The proposed system will guide the user where the object is with the help of ultrasonic sensors. In case of the emergency situation the location of the person is shared to their family members so that they can track them easily.

Key Words: GPS-GSM, Blind Stick, Ultrasonic sensors, Arduino Uno

1. INTRODUCTION

Independence plays the most important role in our lives in achieving our goals, dreams and objectives in our lives. Blind people are people who find it difficult to recognize the things around them difficult with the healthy eyes, so the stick which we have built will help them recognize things easily and make them feel comfortable. Blind or visually impaired person always looks for some kind of helping hand from the other person whenever they go out of the house which make them feel less independent. Blind people goes through a lot of problems while walking on the streets. This system design and develops a stick which will help the blind person navigate easily on the streets and make them more comfortable and independent. Most of the blind guide systems use ultrasound sensors because of the immunity to the environmental noise. The blind stick which we have developed will help visually impaired people roam easily and comfortably without any problem. With the rapid advancement in the technologies both in hardware and software it has become much easier to provide intelligent navigation system for the visually impaired peoples.

2. PROBLEM STATEMENT

For people like us, who are healthy it is very easy to find and reach to its destination but for the blind people it is very difficult to reach the destination they constantly look for someone to help them reach their destination. By this their problem will overcome using Blind Stick.

3. OBJECTIVE

The objective of this project idea is to make blind people lifestyle easier because they face many hinderance in day to day life while travelling or while doing any activity. So this proposed system will help the individual to detect any obstacles as well as sending messages when the individual is in emergency with use of gsm module. Location can also be shared using gps location integrated with the module.

4. PROTOTYPE

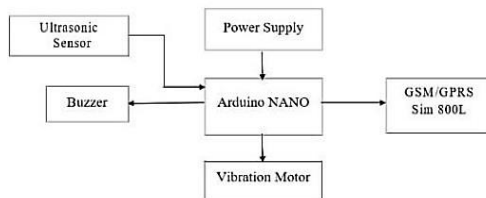
Blind stick is an innovative stick designed for visually disabled people for improved navigation. We here propose an advanced blind stick that allows visually challenged people to navigate with ease using advanced technology. The blind stick is integrated with ultrasonic sensor along with buzzer and gsm module. Our proposed project first uses ultrasonic sensors to detect obstacles ahead using ultrasonic waves. On sensing obstacles the sensor passes this data to the microcontroller. The microcontroller then processes this data and calculates if the obstacle is close enough. If the obstacle is not that close the circuit does nothing. If the obstacle is close the microcontroller sends a signal to sound a buzzer. It also sends emergency message using gsm module to assigned contact numbers. It is embedded as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices in common use today. 98 percent of all microprocessors are manufactured as components of embedded systems. with general-purpose counterparts are low power consumption, small size, rugged operating ranges, and low per-unit cost. This comes at the price of limited processing resources, which make them significantly more difficult to program and to interface with. However, by building intelligence mechanisms on the top of the hardware, taking advantage of possible existing sensors and the existence of a network of embedded units, one can both optimally manage available resources at the unit and network levels as well as provide augmented functionalities, well beyond those available.



5. METHODOLOGY

The working behind blind stick is that it is used for some special purposes like sensing device for blind person. The circuit provides 5V of power supply and maintains its output at the constant level. It is used to detect object using Ultrasonic sensors. If any object is sensed near the person, the ultrasonic sensors will sense it and will send the data to the Arduino.

6. ARCHITECTURE



7. FUTURE SCOPE

The future scope the existing system is that it guides visually impaired people to his desired destination and will ensure full safety to the person. We can also add the camera in the stick which will help the blind person more easily and guide him even more safely. GPS can help to find the best and the shortest possible path accordingly with the help of a Google map. GSM attachment can also help on future for any kind of immediate casualty help.

8. CONCLUSION

This paper presents the implementation of the blind stick that assists a visually impaired person to its destination safely and securely. We use various sensors to detect the obstacles and guide the person accordingly. As the person nears the obstacles, the beep sounds will keep on increasing, warning the person that he might get into danger. We have also used GSM and GPRS modules which help to trace the blind person with the data collected by it.

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PORTAL FOR FARMER TO SELL PRODUCT AT BETTER RATE

Chirag Namdeo Mande^{#1}, Sneha Sankhe^{#2}, Nitesh Uday Talekar^{#3}, Vaibhav Vishwas Neman^{#4}

^{#1#2#3#4}Dept. of Information Technology, Theem College of Engineering, Boisar, Maharashtra, India

Abstract - Around many years, farmers in the India have had a little freedom in choosing markets and buyers for their product. All states in the country, mandate that marketing and selling of the farm product must be routed through state-owned man is, retail markets where middlemen will not occur so farmers can increase margins. Agricultural Marketing in India has evolved from being restricted to catering to local demand by having market yards within the range of farm stone which now aim to have an interconnectivity between the markets of the other States to have a value dispersion between farms and the consumers. Many changes in the field of agriculture marketing of the country which is electronic market, Online warehousing, loans, contract farming and many more, are growing opportunities for new formats of market which are effective in responding to demand and supply. These changes will require investment in infrastructure, technology and building awareness and capacity building. This system also contains a very interactive Chat Bot. Which provides general queries for users such as any product related query or shipment tracking. This website also includes weather broadcast feature for everyone to see live weather updates.

Key Words: Middleman, Agriculture Marketing, Electronic Market, Chat Bot, Weather Broadcast.

1. INTRODUCTION

Portal for farmer to sell product at better rate System is to help farmers to update farm product related information in the website. Portal for farmer to sell product at better rate System is farmer product management website application which helps farmers to get best price for farming products. It will also help farmers to improve their product and profit. It enables farmers to sell their product direct to customer or farmers can do direct delivery of product to the seller. Farmers can view labors profile and they direct by the farmer. The Farmers Portal of the Department of Agriculture & Co-operation is a platform or farmers to seek any information related to agriculture. Detailed information on agricultural storage, crops, extension activities, selling the product, interaction with the buyers or wholesaler to get better rate, etc. We are developing an 'CHATBOT' for a rapid

communication purpose for customer. And also we are adding weather broadcast report in this portal for farmer for corps production. The farmer can be deal with the customer directly so the price of the products offered by the farmer to the customer will also be affordable to customer, it will help both the farmer as well as the customer where the customer can save some money and the farmer will gain extra profit.

2. IMPORTANCE

- The main importance of this Project is to give the better rate to the farmer from the whole seller or from any user.
- Also the one most important thing in this project is that the farmer can sell the product by himself no need of the agent is required to sell the product.
- Also farmer can deliver the product by himself only so that he can get more profit rather than deliver by the agent.
- Also there is an "Chat Bot" is placed inside the application for the communication purpose for the user or to the whole seller in this project.

3. OBJECTIVES

The main aim of our project is to built a bridge of communication between the farmers and customers across the country so that they can get communicate together and can talk about any product related queries for both ends. The main task will be a challenge to the most of the farmers because they are lacking the knowledge about the new technology and trends which is used in this fast developing world. The main success of our project is to provide the fruitful benefits for both the customer as well as to the farmers, providing the knowledge and covering different aspects of the resources that they are unaware of till date. The objectives of this project are:

- The main objective of this project is that there is an direct communication is done in between the User and the farmer.
- Also farmer can sell the product direct to the customer and the profit will get to the farmer.

- Also the weather information is get to the farmer, in which weather did farmer should grow the particular crop.
- Also user can communicate for buying the crop or order the particular crop User can communicate through “Chat bot”

4. PLANNING

This project is totally based on the INFORMATION TECHNOLOGY i.e. an online farm product to sell product at a better rate. In this project the farmer can sell the product directly to the user without help of the agent because of that the farmer will get the huge amount of profit also he can deliver that product by himself so again there is an profit for a farmer. Also there is an “CHAT BOT” is situated in application through which the user can communicate with it. Also There is an Weather broad is there for farmer to check which crop has to grow for that particular time in this project.

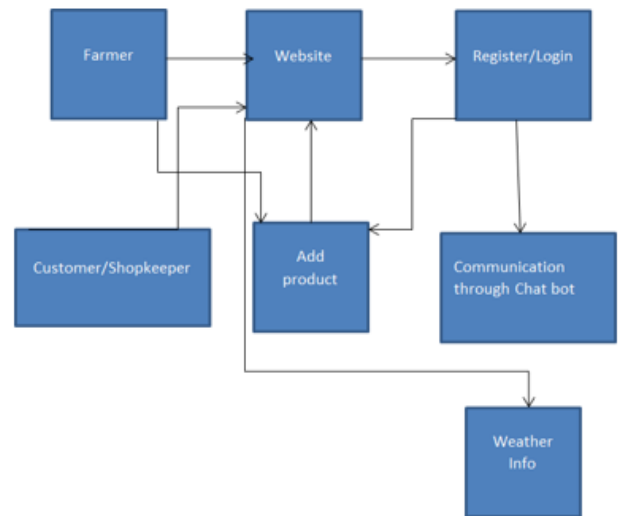
5. METHODOLOGY

In this methodology its a practice that helps of continuous development and testing of the products by breaking them into smaller units .This is what we are doing we work on our project one unit at a time like if we are dealing with front end we just deal with how front end looks and then after making it we work on it test it and have a conversation among the three of us as to what to do next how to improve it further.

6. SYSTEM ARCHITECTURE DIAGRAM

Website:

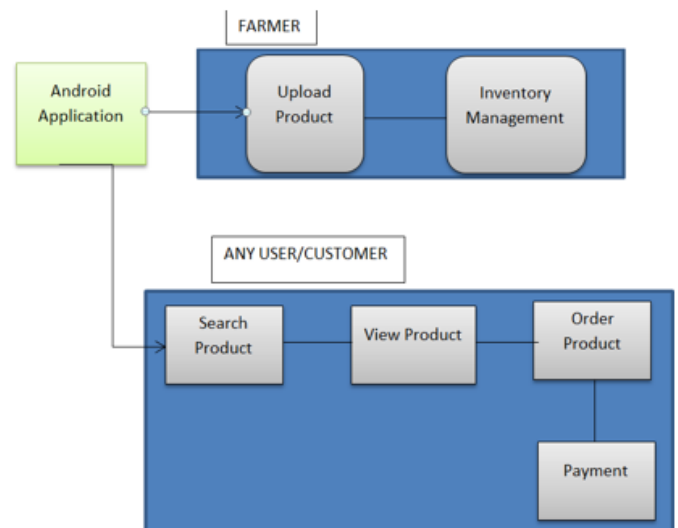
In the above website diagram, there is both farmer and customer or whole seller register & login option is available. In which farmer can add the product and also he can see the live weather in the website. While the customer or the whole seller can communicate to the farmer if he/she has any query related to farm products in the website.



Block diagram for Website

Application:

In the below application diagram, there is again register & login option is available for both farmer and customer or whole seller. In which here also farmer can add product also see the product inventory. And the customer or whole seller can search product which they want also the can view the product which they selected after that they order the product which they want and after that they will do payment to that ordered product in the application.



7. CO-ORDINATION BETWEEN BUYER & SELLER



8. Major Features

Chat Bot:

A 'chat bot' in portal can act as a virtual assistant for farm business. They can it as for conversation purpose, to interact with customers, it also allow agriculture companies to improve customer service, productivity, and operational efficiency. Chat Bots are also useful in industries like farming, because they can help to customer to give any response about the product queries and preset tasks that were earlier only performable by strict calculating and old-produced human testing.

Chat bot For Farmer:

- Save time.
- Attract possible new clients.
- Clearly communicate with customers and possibilities.

Save time:-

With a Chat bot, you will be no longer need for human agent to waste their time answering to the same inquiries from customers over and over. It's simple to provide a Chat bot with beneficial answers to all the commonly asked questions your professional receives, related to your farm, your products, or any other information.

- Attract possible new clients:

Chat bot-building stage has a feature called User Characteristics, which allocates you to collect information about possibilities who engage with your bot. Using that knowledge, you can then have your bot section these

prospective new customers to make future outreach efforts more affected and successful.

For example: If a possibility asks your bot about your cheese products, the bot will think of that. So next time you announce a new cheese product, you can simply be able to connect with that user and others who have already spoken an interest.

- Clearly communicate with customers and possibilities:

Persons already feel at comfort communicating via portal 'chat bot'. It's a stage where they're used to chatting with family and friends. Using the same familiar, informal style, a bot can make your customers sense comfortable as it answers their questions, gives them info, and encourages offers.

Weather Broadcast:

The aim of the project is to provide report regarding state of the atmosphere at a particular place and time with respect to heat, cloudiness, dryness, sunshine, wind, rain, etc.

Though, not like other productions, the weather is the most important component that involves farm production. It can affect crop development, amount to produce, pest amount, water and fertilizer need, and all farm activities taken out during the increasing season.

These project aims on providing instant weather report about the weather and nearby effects and advantages on the crops with addition to current weather details for current situations so that farmer can learn from earlier incidents that other farmers have gone through and learn from it.

This project will also provide farmer with suggestions about what can be produced during the current weather and also alarm the farmer about bad weather and how to protect crops from the bad weather.

9. OUTCOME

In this project the main outcome is for the farmer that ha can sell the product by himself at better rate and the whole profit will get to the farmer and also he cannot take help of agent also he had not to gave any amount to agent.

Also he can deliver product himself and can get more profit.

Agriculture is the utmost important area especially in the mellowing country like India. Use of information technology in agriculture can change the scenario of decision making and framers can yield in a better way.

10. FUTURE SCOPE

This Portal can be further upgraded adding more features, where different sellers can sell their agriculture related products such as fertilizers and agriculture tools, etc.

A more advanced way of this portal can be made by providing farmers to sell their products to other countries.

Also another feature may contain that the buyer can see the location of farmer product.

11. CONCLUSION

Agriculture is the utmost important area especially in the mellowing country like India. Use of information technology in agriculture can change the scenario of decision making and framers can yield in a better way. In this project, we will suggested for to farmer to get the better profit for the farmer to sell product with the help of this project directly to the customer or a user. We have also discussed that he can deliver the product by himself only to get the better rate too. So this will be the better project for the farmer for his profit.

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SECURED HOME USING RASPBERRY PI

Ketan Thakur¹, Zakir Farooqui², Jeet Patel³, Asst. Prof. Sonali Karthik⁴

^{1,2,3}Dept. Of Information Technology, TCOE College, Maharashtra, India

⁴Dept. Of Information Technology, TCOE College, Maharashtra, India

Abstract - Secured home using raspberry pi is a mobile app based that basically allows to monitor the house using mobile device. The proposed system requires a Micro SD card with Raspbian OS for the Raspberry Pi. This system embeds on 2 modules android application and raspberry pi in which they communicate with each other. In this design we have merged security modules such as live streaming, intrusion detection, face recognition, Text to Speech. The core working of the proposed system is raspberry pi and its OS. Raspberry pi camera monitors, operate and grant access in the associated design. It captures real time images, performs facial recognition based on pixel patterns, live streaming video services as per client request, Also text to speech is provided for using the speaker as a voice of raspberry pi. Tracking, pattern matching and image Processing with pixel data plays a huge part. Secured home system is developed to maintain the CIA principle of Information Security. This Raspberry pi based security system presents idea of monitoring a place in remote area. This proposed solution offers a cost effective and Indifferent security solution which is efficient and easy to implement. The advantage of this system is that it can be handled well from many different remote locations.

Key Words: Surveillance, image recognition, pixel patterns, live streaming, text to speech, Notification.

1. INTRODUCTION

It's a brilliant idea to create a device that can be regulated and tracked from anywhere in the Internet of Things (IoT) world, since we have all the technology to revolutionise our lives. There are several different types of good security systems and cameras available for home security, but they are all very costly, so we will create a simple Raspberry Pi based Intruder Warning System that not only sends you an notification, but also sends you a picture of any intruders it detects. Home automation has been a common term since the late 1970s. People's perceptions of what a home should do or how utilities should be delivered and accessed at home have evolved dramatically over time as technology and services have advanced, as has the concept of home automation systems. When we examine various home automation systems over time, we can see that they have

always attempted to provide reliable, easy, and secure ways for residents to access their homes. The purpose of a home automation system has remained the same regardless of changes in user preferences, technological advancements, or the passage of time.

1.1 Problem Statement

People nowadays have an excessive amount of trouble securing their surroundings. Despite the fact that we live in a digital environment with many technological choices, thieves and intruders have also become highly advanced. With a few taps, the attacker will gain access to your device. As a result, we are constructing a machine that is much more efficient in every way. There is only one administrator for this device, and he or she can operate it from anywhere. Furthermore, since we are combining modules, intrusion detection, face recognition, text to speech and live streaming into one project, the protection provided by the device will be better than previous ones.

2. Literature Survey

Padmashree A. Dhake and Sumedha S. Borde [3] proposed an embedded home surveillance system that evaluates the implementation of a cost-effective alerting system based on small motion detection. Their framework makes it possible to track household activities in real time from any place, and it is based on a microcontroller, which is now considered a restricted resource and an open source solution as compared to Security Based Camera.

D. Jeevanand [4] worked on the development of a Raspberry Pi-based networked video capture system. The proposed system captures video and distributes it via networked systems, as well as alerting the administration person via SMS alarm, as the client requests. Their concept is based on the Raspberry Pi Security Based Camera and was developed to function in real-time situations. In contrast to other embedded systems, their real-time implementation uses an alerting module and an Security Based Camera platform to provide client video monitoring.

Sneha Singh and her [5] team identified a Raspberry Pi-based IP Camera Video Surveillance system. The researchers wanted to create a system that could capture real-time images and view them in a browser via TCP/IP. On the Raspberry Pi, a face recognition algorithm is being introduced, allowing for live video streaming as well as the detection of human faces. Surveillance reactions were not included in the study.

Gharge Anuradha and Mahima.F.Chauhan [6] offered to design and build a real-time video surveillance system based on the Raspberry Pi B+ Board's embedded web server. Their framework is low-cost, free, and portable, as well as simple to maintain and update. As a result, this application framework offers more secure solutions. This method can be used in banking halls, manufacturing, the environment, and military arts.

Uday Kumar [7] worked on the Raspberry Pi-based implementation of a low-cost wireless remote surveillance system. Traditional wireless CCTV cameras are commonly used in low-cost surveillance systems. He and his team used a Raspberry Pi camera to create a low-cost, reliable surveillance device, and the images captured had to be transferred to a drop box using a 3G internet dongle. This was accomplished with the aid of a Raspberry Pi and a 3G dongle.

2.1 OBJECTIVE

The main goal is to provide homeowners with a secure device that can be used while they are not at home. To provide new tools for understanding current and emerging threats to the IoT-based economy and citizens' networks.

To investigate and analyze how Blockchain can help improve IoT solutions. Furthermore, to comprehend how to fix well-known IoT and blockchain problems.

To add a second, security-focused physical layer to the manufacturing of existing IoT platforms and devices in order to provide a secure-by-design architecture and network monitoring capabilities. To investigate the use of Blockchain as a protection and privacy layer for IoT. Along with addressing the flaws in the current initiatives devoted to it.

To present a methodology and a toolchain for the automated generation of design-driven security features monitors and validators for IoT platforms and networks using IoT architecture and behaviour model specifications.

2.2 REQUIREMENTS

i) SOFTWARE REQUIREMENTS:

A) Operating system:

LINUX (The Raspberry Pi uses a Linux-based operating system to have a smooth user interface.)

B) Programming languages:

R-Pi Library has a Python library installed.

C) Raspbian OS:

Raspbian is a Debian-based operating system. It is basically free OS for Raspberry pi module. Raspbian offers more than just an operating system; it also includes pre-installed applications, with over 35000 packages packaged in a convenient format for Raspberry Pi installation.

ii) HARDWARE REQUIREMENTS:

A) VGA to HDMI Converter:

HDMI to VGA convertor allows HDMI output from a laptop or tablet to be connected to a VGA display or projector, saving the cost of upgrading to HDMI compatible.

B) Relay Interface Circuit:

The relay interface circuit connects household electronic or electrical equipment to the R-Pi board. A relay (12v, 50A), a transistor, and a freewheeling diode are used to drive the relay input in this circuit.

C) SD Card & LAN:

Since the R-Pi has no internal storage, it needs an SD Card to store the operating system.

Increased Connectivity: (Internet) This could be a standard RJ45 Ethernet/LAN cable or a USB Wi-Fi adaptor.

A Virtual environment through VNC viewer can also be installed to access the raspberry pi.

PI Camera: Used to capture and record images.

PIR sensor: For human motion detection (basically, it scans for motion and then sends a signal).

2.3 METHODOLOGY

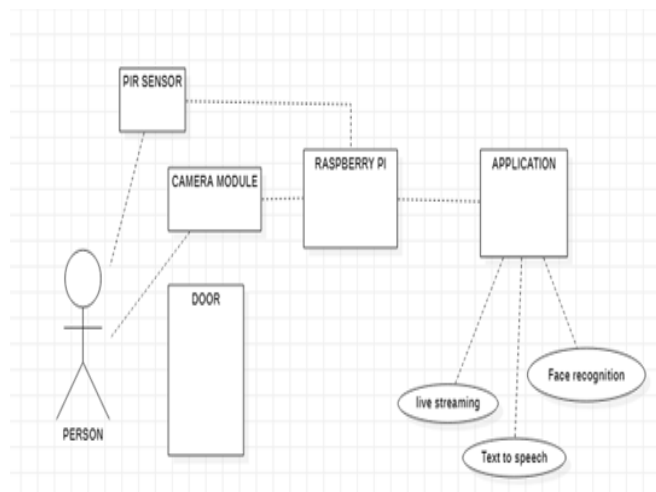


Fig-1: Methodology Used

The Intrusion detection system, which consists of a Raspberry Pi model 3B, a PIR sensor, and a PI camera, will be installed outside the door first. It is equipped with additional microphone and speaker modules. When someone stands in front of the door, the PIR sensor detects human activity and notifies the Raspberry Pi then instructs the pi camera to take a picture and launch a live stream, as well as sending an intruder warning to the administrator. PI gathers the images of the intruder from the different angles and compares them with the pre saved ones in the database .If they match, then user can give the permission to the person to enter or admin can deny the access.

The steps shown below is the formal working of secured home system:

- Step 1: Use a PIR sensor to detect human activity.
- Step 2: Notify the Raspberry Pi, switch on the camera, and take pictures.
- Step 3: Compare the images to the database-stored images.
 - Step-3.1: If they match, grant the access to the person
 - Step-3.2: If the images don't match, reject the access.

2.4 FLOWCHART

This project's flow chart is simple to comprehend. If the system in the project activates, the registered user will be

notified via email and smartphone, and the user will be able to access the live system through the use of the project's app.

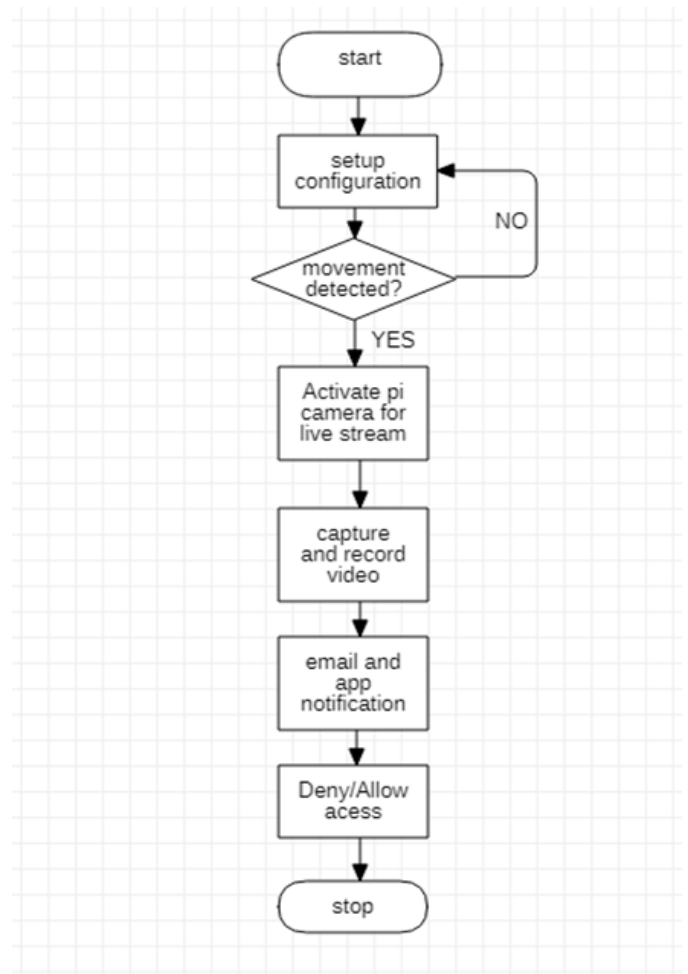


Fig-2: Flowchart for Secured Home

2.5 RESULT

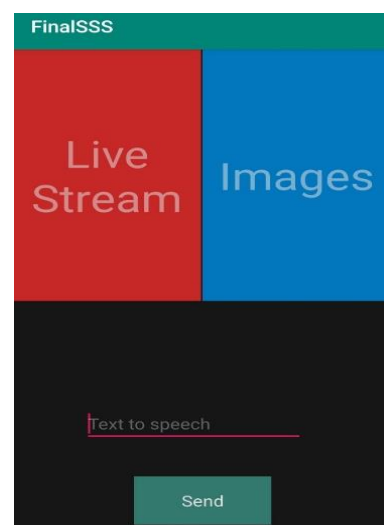


Fig-3: App interface

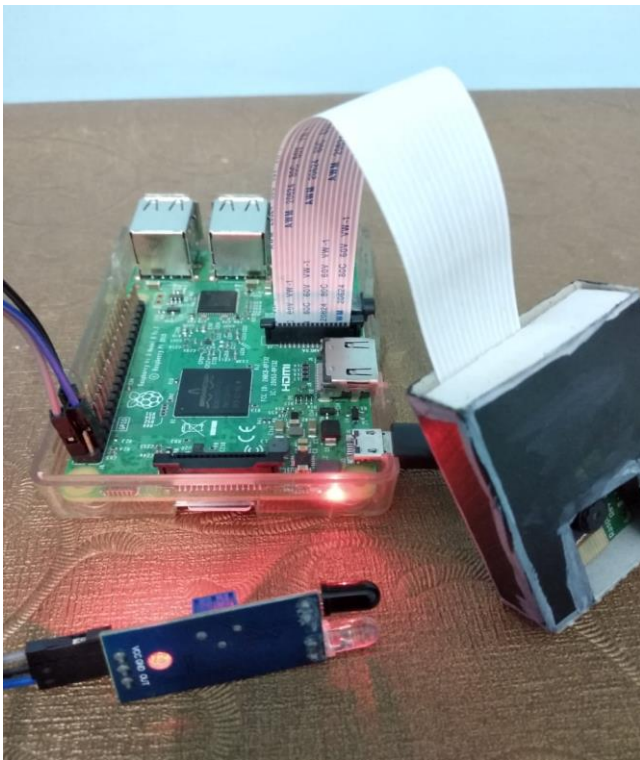


Fig-4: Secured Home System

3. CONCLUSION

Our analysis focuses on the current home system's security and highlights its shortcomings. It demonstrates how the context of the word "intruder" and the sense of protection have evolved in modern homes. The paper highlights the inadequacies of current home security systems in detecting and preventing unwanted individuals. For future work in the field of home automation security, we encourage the researchers to consider a home automation system as a whole and develop behaviour Prediction and advanced sensing parameters that can help to identify and prevent skilled and professional intruders. For the proper implementation and development of home automation systems, security is essential. Furthermore, it gives residents of a home a sense of security and puts their minds at ease. This paper compares and contrasts all of the proposed systems, revealing some of the systems' advantages and disadvantages.

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FUZZY BISECTING MIN MAX CLUSTERING ALGORITHM

Krunal Pimple*¹, Mohammed Jawad Nathani*², Sayali Sankhe*³, Vivek Bhardwaj*⁴

*^{2,3,4}Department of Information Technology, Theem College of Engineering, Palghar, Maharashtra, India.

*¹Guide, Department of Information Technology, Theem College of Engineering, Palghar, Maharashtra, India.

ABSTRACT

Now-a-days in the busy life it is quiet necessary to get faster and accurate results for any desired search. Our project is a step towards developing an algorithm which gives the purity of output in minimum time. The inspiration for the Fuzzy Bisecting Min-Max algorithm came from the Divisive Hierarchical Bisecting Min-Max Algorithm. As in the Bisecting Min-Max algorithm to bifurcate the two clusters it is necessary to split them each time to bisect the clusters using the Euclidean distance formula. The redesigned Fuzzy C Strange Clustering algorithm uses the membership function to find the two different points & also to establish the clustering of the same dataset in minimum time as opposed to the traditional Fuzzy C strange points Clustering algorithm which uses the Euclidean distance to find the strange points to group the points into Clusters.

Keywords: Algorithm, Clustering, Bisecting, Dataset, Min-Max.

I. INTRODUCTION

Clustering is that the task of dividing the population or data points into a variety of groups such data points within the same groups are more almost like other data points within the same group than those in other groups. In simple words, the aim is to sort into groups with similar characteristics and assign them into different clusters. Let's understand this with an example. Suppose, you're the top of a rental store and need to know preferences of your customers to proportion your business. Is it possible for you to seem at details of every customer and devise a singular business strategy for every one among them? Definitely not. But, what you'll do is to cluster all of your customers into say 10 groups supported their purchasing habits and use a separate strategy for customers in each of those 10 groups. And this is often what we call clustering. The Fuzzy C Strange (FCS) points clustering algorithm takes a broad view of the improved K Strange points clustering algorithm to allow some extent to partially slot into varied clusters thereby generating an assortment for a given set of elements. To understand this, the target function of the Enhanced K Strange has been created by incorporating fuzzy membership degrees into different clusters into the formula and an extra parameter p was brought in as a weight proponent within the fuzzy membership. The proposed algorithm was found to offer a far better quality of clusters than the Fuzzy C Means and therefore the K Means clustering methods.

II. METHODOLOGY

K-MEANS CLUSTERING ALGORITHM:

Let $X = \{x_1, x_2, x_3, \dots, x_n\}$ be the set of knowledge points and

$V = \{v_1, v_2, \dots, v_c\}$ be the set of centers.

1. Randomly select 'c' cluster centers.
2. Calculate the space between each point of the dataset and cluster centers.
3. Assign the info point to the cluster center whose distance from the cluster center is minimum of all the cluster centers.
4. Recalculate the space between each point and the new obtained cluster.
5. If no data point was reassigned then stop, otherwise repeat from step 3.

BISECTING MIN-MAX CLUSTERING ALGORITHM:

Input: The number of user-specified count of clusters $K = T$ and a data repository having n data items or objects.

$S = \{S_1, S_2, S_3, S_4, \dots, S_n\}$

Output: A set of K clusters.

1. Initialize the clusters to contain clusters of all points.

2. Initialize clustNo = 1:
3. While (clustNo != K)
4. Bisect S using Min-Max Clustering
5. Increment clustNo by 1
6. Calculate the SSE of the two clusters using

$$SSE = \sum_{i=1}^n (x_i - m)^2,]] > \sum_{i=1}^n (x_i - m)^2,]] >$$

Where m is the mean of the cluster and given as

$$m = \frac{\sum_{x \in C_1} x + \sum_{x \in C_2} x}{\sum_{x \in C_1} 1 + \sum_{x \in C_2} 1}$$

7. If (SSE1 > SSE2)
8. Assign Cluster1 as data S
9. Else
10. Assign Cluster2 as data S
11. End while.
12. Output K clusters.

FUZZY BISECTING MIN-MAX CLUSTERING ALGORITHM:

It uses the Fuzzy Membership Function to form clusters from the given dataset.

$$\mu_{c_s(x)} = \frac{1}{\sum_{t=1}^k \left(\frac{\|x - u_s\|^2}{\|x - u_t\|^2} \right)^{\frac{1}{p-1}}} \quad 1 \leq s \leq k, x \in E \dots(1)$$

The Fuzzy C- Means clustering algorithm works by allocating membership values to each data element corresponding to each cluster mean with respect to the distance between the cluster mean with respect to the distance between the cluster mean and the data element. Nearer the element to the cluster means more is its membership towards the particular cluster mean. The degree of membership and cluster means are recomputed after each and every iteration. This process is repeated till the convergence criterion is fulfilled.

Fuzzy C- Means (E, c, p, ε)

E: An unclassified element set

C: the number of user invokes clusters

P: the factor in the objective function

ε: a threshold limit for stopping criteria

Set prototype U = {u1, u2, u3.....uc} Repeat

UPrev ← U

Calculate membership functions using equation (1)

Bring up to date prototype Us in U using equation (2)

Until $\sum_{s=1}^c \|u_s - u_{s-1}\| \leq \epsilon$

III. MODELING AND ANALYSIS

- The proposed algorithm summarizes the given dataset as input which can be images, documents, etc.
- It has changed the Euclidean Distance to Distance matrix.
- Helps to speed up which will be much faster than Bisecting K-means and comparably to the Bisecting Min-max.
- Helps to get the better Purity for Clustering Output.

- The Implementation and Analysis of our Algorithm would be accurate.
- Hardware Requirement
 - Laptop
 - Computer
- Software Requirement
 - Operating System: Windows 7, 8, 10.
 - Coding Language: Java

IV. RESULTS AND DISCUSSION

The impulse for the Fuzzy Bisecting Min-Max Clustering Algorithm originates from the Redesigned Fuzzy C Strange Points Clustering Algorithm. The proposed algorithm summarizes the given dataset as input which can be images, documents, etc. It has changed the Euclidean Distance to Distance matrix. This algorithm also helps to speed up which will be much faster than Bisecting K-means and comparably to the Bisecting Min-max. It will help to get the better Purity for Clustering Output with this proposed system. The Implementation and Analysis of the Algorithm would be accurate. It can be programmed using a variety of programming languages.

V. CONCLUSION

This proposed algorithm provides an alternative to the Bisecting Min-Max clustering algorithm by replacing the Bisecting K-Means method for the selected cluster to bifurcate with the Fuzzy Bisecting Min-Max algorithm. This algorithm convincingly performs better than the Bisecting Min-Max algorithm method as it is evident from the comparison of the two algorithms. This algorithm is much faster than the Bisecting K Means method and gives better purity in the clustering output than the Bisecting Min-max method. This will prove to be a better algorithm for applications of Hierarchical Clustering.

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Online Voting System Based on QR Code

Rajavi Mhatre¹, Akshay Kahar², Vivek Yadav³, Asst Prof. Sonali Karthik⁴

¹⁻³Student, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

⁴Asst Professor, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

Abstract -- The problem with legal system is we have a tendency to still use previous strategies for choice and there are tons of issues in terms of safety and security. By mistreatment net technology we have a tendency to be creating legal system a lot of sensible. The projected on-line legal system permits elector to scan their fingerprint, aadhar card, pan card and voter-id, that is then matched with Associate in Nursing already saved pictures of documentation inside an info that's retrieved from aadhar-card info of the govt. The choice system is managed during a less complicated method as all the user should login by aadhar-card variety and word and click on his/her favorable candidates to solid the vote. This may increase share the share the proportion} of choice percentage In Asian nation and additionally it cut back the price of choice method, it's additionally increase the protection and security of choice method. By mistreatment Biometric fingerprint it provides enough security to cut back the false count of votes. By the employment of net choice technology there'll be no false count and any quite corruption concerning choice method. It'll create choice method a lot of biased and safer for the elector yet because the government.

Key Words: Biometric fingerprint, Aadhar card ID, Online elections

1. INTRODUCTION

Voting system has bit by bit modified from ancient ballot that enclosed paper system, punch card, and mechanical lever to currently ballot via Electronic mechanical device (EVM). Electronic balloting Machines, that is susceptible to fraud and it's tedious to handle the balloting machines. EVMs that are utilized in Asian nation don't have any mechanism by that the elector will verify their identity before casting votes, because of those faux voters will forge various faux votes. EVMs are often tampered throughout producing in such case it will manipulate the particular balloting. On-line electoral system can offer a lot of improved options and characteristics over ancient balloting patter with flexibility, privacy, mobility, conveniences, accuracy. On-line balloting can overcome drawbacks like time overwhelming, sizable amount of paper wastage, and want for election authorities to be gift physical the least bit the booth from morning to evening, harm of machines because of lack of attention at place. By on-line electoral system any eligible elector will use his/her balloting rights from anyplace within the country. Elector will forged their votes from anyplace within the

country while not visiting to balloting booths, in extremely secured method. that creates balloting a fearless of violence which will increase the proportion of balloting. This project aims at developing an electoral system that gives security and a truthful election. Each national or voters of Asian nation has the proper to precise their own decisions as vote to elect a rightful person as our leader. To permit the exercise of this method, the majority balloting systems embrace the subsequent steps: elector identification and authentication, balloting and recording of votes forged, vote enumeration, publication of election results. A Secured electronic mechanical device victimization distinctive number i.e. AADHAR variety has been developed. To produce extra security alongside the AADHAR variety identity verification is employed. At the time of balloting within the elections, the elector authentication is often done through biometric pattern. If the biometric data of the elector matches the info of the AADHAR then the person is allowed to forge their vote for the election.

1.1 Problem Background

In the recent times there are many literatures on online voting has been developed. While online voting has been an area of research in the recent years, there are efforts made to make online voting system more secure. The use of insecure Internet, and the resulting security Breaches have been reported recently.

1.2 Problem Statement

Our online voting system will make all voting process easy because in this system we will provide Chabot, which will help every user during the voting process. If any user has any kind of issue during the process the Chabot will provide efficient solution for that issue. Our voting system will make the whole voting process cost efficient. Our voting system will give instant and unbiased poll result. Our voting system will help us to keep track of voter. And our system is time efficient.

2. OBJECTIVES

Use the plurality technique of selection to work out a winner.

Use the plurality with elimination technique of selection to work out a winner.

Use the moment run-off technique of selection to work out a winner.

Use the Board count technique of selection to work out a winner.

Use the pair wise comparison technique of selection to work out a winner.

3. LITERATURE REVIEW

During the course of this project development we've got referred varied papers to analyze the issues within the existing system and discern solutions that are economically viable. Background analysis on the organization and comparative studies of existing systems is additionally done to a lot of perceive the system necessities before the system was developed. There are heap of practices created to introduce the variations in electronic wherever totally different techniques and methodologies are used. a number of them guarantees the confidentiality and security to the system at some extent, still the pick info and method have to be compelled to be management and manage with advanced systems which will ensures and guarantees the protection and privacy of voter's and voter's info. And by learning varied papers we tend to designed system that is delineate during this paper. The primary and also the foremost issue to make sure correct pick is by accurately authenticating each elector. It's necessary to spot that each person coming back to vote is exclusive otherwise it'll violate the terribly principle of pick and a person would be pick on behalf of others. so once reading all the mandatory papers from the past, United Nations agency all have worked associated with this subject we've got inferred that in on-line legal system a really robust secured system would be required in any kind to keep up the confidentiality and integrity of on-line legal system.

4. METHODOLOGY

Every voter will be provided by a personal identification number. This number will be automatically checked along with the ID stored on the database. For the verification of identification number we ask for voter id and also user's fingerprint. If both the information matches with the database documentation then only further he will be authorized for voting else he cannot login in our system.

In this research, we proposed an authentication using a Face Detection and Recognition system and thumb impression scanning in online voting to achieve the rules of supreme Electoral Council as follow: Only eligible persons vote, No person is allowed to Vote more than once and at more than one place. The vote is secret, and each (correctly cast) vote gets counted and to achieve the aims of online voting as follow: increase participation, lower the costs of running election, and improve the accuracy of results.

5. RESULTS AND DISCUSSION

The planned legal system had several blessings over the normal methodology of option. This method affords extra security by permitting citizen to vote one time by transmission distinctive identification at the side of biometric info. This method avoids dishonest option and prohibited practices throughout the elections that is that the key issue within the ancient legal system. This method provides transparency within the reckoning method. The benefits of this method area unit economic, quicker tabulation of results, improved accessibility, larger accuracy, and lower risk of human and mechanical errors. Information consisting of the small print like age, biometric of the folks ought to be updated when before election. Info concerning the casted vote are often sent to the citizen through the electronic messaging system. The user authentication method of the system is improved by adding each face recognition and secret security. The popularity portion of the system is secured by the quilt image. This method can preclude the prohibited practices like rigging. Thus, the voters are often certain that they alone will opt for their leaders, therefore exertion their right within the democracy. The usage of on-line option has the potential to cut back or take away unwanted human errors. Additionally to its dependableness, on-line option will handle multiple modalities, and supply higher measurability for big elections. On-line option is additionally a superb mechanism that doesn't need geographical proximity of the voters. as an example, troopers abroad will participate in elections by option on-line. Hence, by this option proportion can increase drastically.



Fig 1: Admin login



Fig 2: User Registration

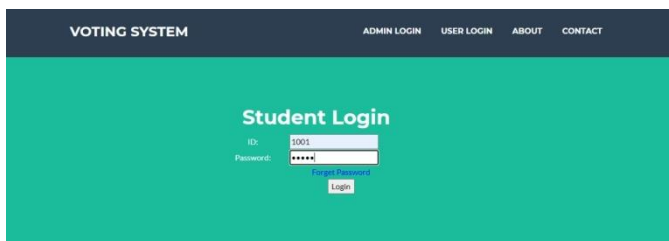


Fig 3: Student login

International Conference on ICT and Knowledge Engineering.

6. CONCLUSION

This paper describes the planned model for on-line voting system for India. The planned system is far secure and economical than the standard legal system. Manipulation of votes and delay of results are often avoided easily. A novel AADHAAR identity is the centre purpose of our planned model. It ends up in the simpler verification of both voters and candidates. In the planned framework, we've got tried to make a secure on-line legal system that's free from unauthorized access whereas casting votes by the voters. The server aspects of the planned system have such distribution of authority that server doesn't alter to govern the votes. It's expected that the planned on-line pick system can increase the transparency and responsibility of the existing voting system.

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Ghost Cloud - Imaging and installing different Operating Systems using Cloud

Shoaib S. Shaikh¹, Rajkumar G. Mishra², Mohd Kashif M.A. Shaikh³, Syed Tanzeem⁴

^{1, 2, 3}Student, ⁴Professor, Dept. of Information Technology, Theem College of Engineering, Maharashtra, India

Abstract: We have a problem while installing operating systems on PCs in masses. We need people to manually insert bootable drives into the system so as to boot it. It takes a lot of time as well as memory devices. Another problem with this approach is that whenever a system is replaced or needs a change in OS, we manually have to reboot the system with another OS. This can be overcome by implementing a hybrid technology consisting of Ghost Imaging, LAN booting and Cloud service. We will be creating a centralized cloud where the users will create accounts. We will have different OS for motherboards preinstalled with user specified software and drivers on this server. User can be able to save their own image files on this cloud. Users will be able to select the system that needs to be booted, the operating system which needs to be installed on it to a desired system through Cloud. This System can be used in: Different Schools and Colleges, Various Organizations, Personal Work places, offices, etc. This idea will prove to be helpful for system administrators to perform OS related tasks by just sitting at one PC.

Keywords: booting, cloud, imaging, LAN booting, PXE.

I. INTRODUCTION

As we all know that in today's world how time is important and redundancy is required in work, and to reduce the burden of human work with the technology known as ghosting I.e. "CLOUD GHOSTING". This idea will prove to be helpful for system administrators to perform OS related tasks by just sitting at one PC, the purpose is as follows, we have a problem while installing operating systems on PCs in masses. We need people to manually insert bootable drives into the system so as to boot it. It takes a lot of time as well as memory devices. Another problem with this approach is that whenever a system is replaced or needs a change in OS, we manually have to reboot the system with another OS. This can be overcome by implementing a hybrid technology consisting of Ghost Imaging, LAN booting and Cloud service. We will be creating a centralized cloud where the users will create accounts. We will have different OS for motherboards preinstalled with user specified software and drivers on this server. User can be able to save their own image files on this cloud. Users will be able to select the system that needs to be booted, the operating system which needs to be installed on it to a desired system through Cloud.

II. DOCUMENT CONVENTIONS

- 1) OS: Operating System
- 2) System / Software: The product being discussed
- 3) Machine: User's Computer
- 4) Source Machine: The PC from where the imaging is to be done
- 5) Target Machine: The PC on which the image is to be installed
- 6) PC: Personal Computer
- 7) UML: Unified Modelling Language

III. DESIGN & METHODOLOGY

A. Creating Images of OS and Configurations

The user desires to change his/her workstation so he opts to create the image of his/her machine so as to relocate the entire system and its contents to another PC to which the software responds as per the feature.

The system will create image files of the target machine and also of the configuration files in it. The image creation script will be responsible for this.

The priority of this function is high as it's one of the main functions of the software.

B. *Uploading the Image over the Cloud*

The created image is then uploaded on the cloud and stored in the database.

The priority of this function is high as it's one of the main functions of the software.

C. *Managing the images*

The user decides to manage the existing images.

The system can create, update and delete the images from the cloud. It can also modify the image as per the target machine requirements. The configuration files can be modified and then installed on the target machine.

The image management script will be responsible for this job.

D. *Installing and Running the OS*

The modified image then can be downloaded on target machine then installed and run on it so as to boot the target machine with the desired OS.

IV. CONCLUSION

As we all know that in today's world how time is important and redundancy is required in work, and to reduce the burden of human work with the technology known as ghosting I.e. "CLOUD GHOSTING". This idea will prove to be helpful for system administrators to perform OS related tasks by just sitting at one PC, the purpose is as follows, we have a problem while installing operating systems on PCs in masses. We need people to manually insert bootable drives into the system so as to boot it. It takes a lot of time as well as memory devices. Another problem with this approach is that whenever a system is replaced or needs a change in OS, we manually have to reboot the system with another OS. This can be overcome by implementing a hybrid technology consisting of Ghost Imaging, LAN booting and Cloud service. We will be creating a centralized cloud where the users will create accounts. We will have different OS for motherboards preinstalled with user specified software and drivers on this server. User can be able to save their own image files on this cloud. Users will be able to select the system that needs to be booted, the operating system which needs to be installed on it to a desired system through Cloud.

V. APPENDIX

A. *What is Network Booting?*

Network booting, or booting from LAN as it is also called, is a process which allows a computer to start up and load an operating system or other program directly from the network without any locally attached storage device, like a floppy, CDROM, USB stick or hard drive. On Intel architecture computers this is made possible with the PXE standard. PXE extends the features of the BIOS so that it can run software directly from the network. PXE support is now so common that you can expect it to be present in any reasonably modern computer that comes with an Ethernet jack (commonly known as RJ45). This fact alone makes it possible to boot an Intel-based computer from the network without having to burn an EEPROM on your network card, like you had to do in the past.

B. *The BIOS boot process*

When your computer powers on and starts running your operating system, it goes through a series of operations before it actually starts your operating system. Your operating system is a very sophisticated boot program that takes total control over your computer. But a boot program can also be a fairly simple program, like a memory diagnostics program, a hardware stability checker, or even a simple game like Pong or Tetris.

VI. ACKNOWLEDGMENT

It is optional. The preferred spelling of the word "acknowledgment" in American English is without an "e" after the "g." Use the singular heading even if you have many acknowledgments. Avoid expressions such as "One of us (S.B.A.) would like to thank" Instead, write "F. A. Author thanks " *Sponsor and financial support acknowledgments are placed in the unnumbered footnote on the first page.*

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Fake News Detection Using Machine Learning

Pragnesh Bugade¹, Pooja Sarode², Tanvee Pimple³

¹²³Student, Department of IT, Theem college of Engineering, Boisar, Maharashtra, India
Asst Professor. Shaikh Ansar Ahesanuddin, Department of IT, Theem college of Engineering, Boisar, Maharashtra, India

Abstract - Fake news nowadays is an important aspect in the life of social media, and in the political world. Fake news detection is an important research to be done for its detection but it has some challenges too. Some challenges can be due to less number of resources like an available dataset and published literature. We propose in this paper, a fake news detection using machine learning techniques. We compare three different machine learning classification techniques. Not only that, but We will be working with three different models that are Logistic Regression, Decision Tree Classifier and Random Forest Classification. According to our project's finding we have achieved various accuracy of each method respectively. Our project can highly benefit to detect whether the given news is true or fake.

Key Words: Fake news, Machine learning, News Detection, Algorithms

1. INTRODUCTION

A great deal of fake news is roaring through the various social media platforms. During this case classification of any news, post, story, journal into fake or real one has become a crucial them as fake and true and it's conjointly attracted a good interest from researchers round the world. In line with several analysis studies that are administered to hunt out the impact of any false and fictional news on of us upon returning through such fake news details. Falsified news or news is used in such how that individual begin basic mental process in one issue that may not true.

The best example for fake news is that the pandemic situation occurring within the entire world. There are variant of news articles till presently that are falsified and used merely to create confusion and disturbance inside the minds of individual and to misguide their minds to believe that false news. However, can anyone perceive if it's fake or real?

False information on Indian social media caused form voters to drink cow weve or eat dung, thus on stop infection, whereas in Country, artiodactyl weewee with lime was hailed as a protection against the coronavirus. The scientists put together looked into completely different rumors, like uptake garlic, sporting heat socks and spreading goose fat on one's chest, as treatment for the likely fatal virus. Conspiracy theories were put

together monitored, just like the notion that it's a bio-weapon funded by enterpriser to further antigen sales.

1.1 Style of Knowledge in social media posts

As mentioned by the authors of [1] there are three major forms in which social media networking Sites scan a point:

Text (Multilingual) is analyzed by computational linguistics which focuses the genesis of text semantically and consistently. since a lot of the posts are made within the type of texts a lot of work has been administered on its analysis.

Multimedia: Multiple forms of media are integrated during a single post. This might embody audio, video, images, and graphics. This is very much attractive and it fetches the eyes of the viewers while not bothering concerning the text.

Hyperlinks change the mastermind of the post to cross regard to totally different sources and so gains viewers the trust by certifying genesis of the post. Even cross regard to alternative social media networking sites and embedment of snapshots is in observe.

2.2 Fake News Varieties

The various styles of fake news by Authors of paper [2] , in their recent paper is summarized below.

1. Visual-based: These fake news posts use graphics plenty additional as content, which can embrace morphed picture, doctored video, or combination of both [3].

2. User-based: This sort of invented news is generated by fake accounts and is targeted to specific audiences which can represent sure age teams, gender, culture, political affiliations.

3. Knowledge-based: these types of posts give scientific (so referred to as) rationalization to some unresolved problems and create users believe it's authentic. For instance, natural remedies of increased sugar level within the physical body.

4. Style-based posts are written by photojournalists UN agency fake and replica kind of some licensed journalists

5. Stance-based: It really is illustration of truthful statements in such some way that changes its which means and purpose.

2. Aim

This paper intends to:

(1) Identifies a fake and true news detection using a machine learning;

(2) The Review previous studies have that employed a machine learning for identifying fake and true news; and

(3) Attempt to guides future work on the topic in this section, the author describes the previous research works in the form.

3. Literature Review.

Their square measures some tools that have been developed to spot fake news that spreads through examining lexical selection that seems in headlines and different intense language structures (Chen, Conroy, and Rubin 2015b). Another tool, developed to spot fake news on Twitter, includes an element known as the Twitter Crawler that collects and stores tweets in a very info (Atodiresei, Tănăselea, and Iftene 2018). Once a Twitter user desire to ascertain the accuracy of the news found they'll copy a link into this application, when that the link are going to be processed for fake news detection. This method is made on associate degree rule is a known as the NER (Named Entity Recognition) (Atodiresei, Tănăselea, and Iftene 2018).

Their square measure several on the market approaches to assist the public to spot fake news and this paper aims to reinforce understanding of those by categorizing these approaches as found in existing literature.

4. Methodology

This project is concerning building a fake news detection model using the three machine learning algorithms. This project isn't constant developing different typical package systems because the focus of its towards model development in a machine learning using jupyter notebook. Machine learning usually requires a good amount of time for model training and testing, and also a huge and good quality of dataset. In different words if we're saying, the model is counted pretty much as good in accuracy if the model produces foreseen outcomes, that is the prediction of fake and true news.

Management of Data

In this section, a collection of knowledge (dataset) is collected that may be a set of report articles, stories, news, posts. Once the dataset is collected, nltk is foreign and corpus is used to identify a collection of written or spoken material keep on a PC and accustomed to determine however language is used: the information is explored to induce a much better data of its structure and that means so the stopwords are removed.

Data Exploration

In the information exploration section, it's main concerning the plotting of graphs according to the fake and trues news predicted by the machine learning algorithm. Word clouds are generated that essentially may be information visual image technique used for representing text information within which the scale of every word indicates its frequency or importance.

Important matter information points is highlighted employing a word cloud. During this method tokenization is completed.

Model Training

After the data is properly explored and managed, the machine learning model is then able to be trained. During this Model Training phase, completely different approaches are thought of and a learning task is determined that is a prediction task. No matter obtainable options within the training data set are there they're then studied. Then, an acceptable algorithm is selected to train the model. In our case, we have used three algorithms Logistic Regression, Decision Tree Classifier and Random Forest Classifier is chosen. Then the dataset is match into the rule of algorithm for training purposes so the testing is finished.

Model Assessment

In assessing the model, the output of the model created is measured severally. Accuracy grading of the model is conducted using performance metrics like F1 score, precision, recall and accuracy rate that relies on confusion matrix report. Some changes are often created among the model till satisfaction is achieved in creating the model yield in smart accuracy of output.

5. Results and Discussion

On the basis of three machine learning algorithms that we used in this project; each algorithm has its own accuracy percentage when implemented on the dataset. The accuracy according to the each algorithm implemented are:

Classifier	Accuracy
Logistic Regression:	98.8%
Decision Tree Classifier	99.6%
Random Forest Classifier	98.9%

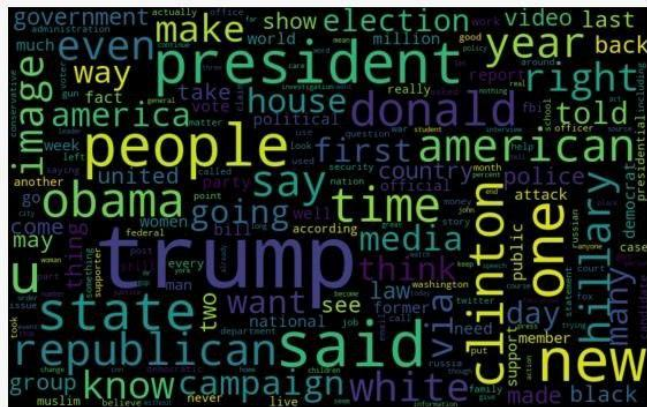


Fig 1: Word Cloud

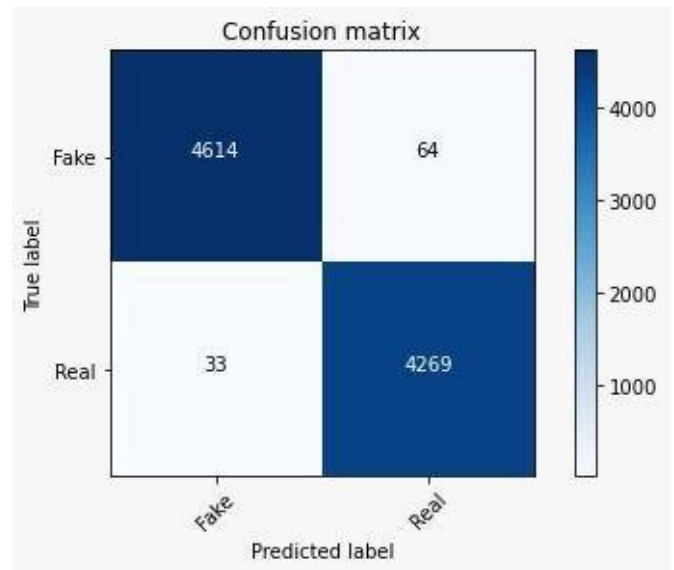


Fig 3: Confusion Matrix of Logistic Regression

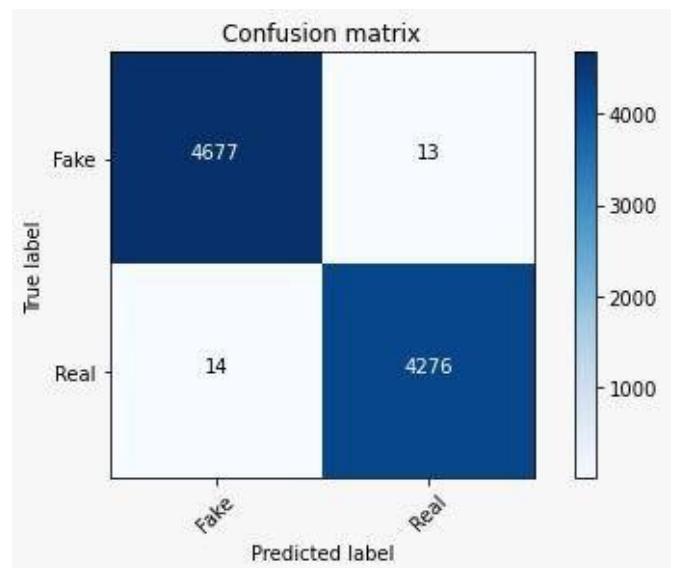


Fig 4: Confusion Matrix of Decision Tree Classifier

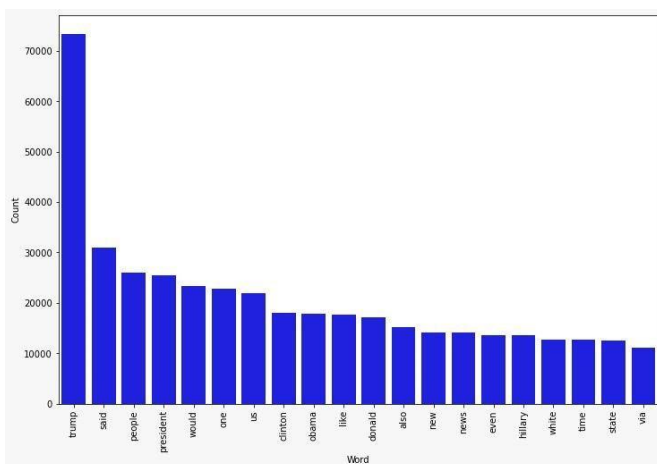


Fig 2: Graph of Words Count

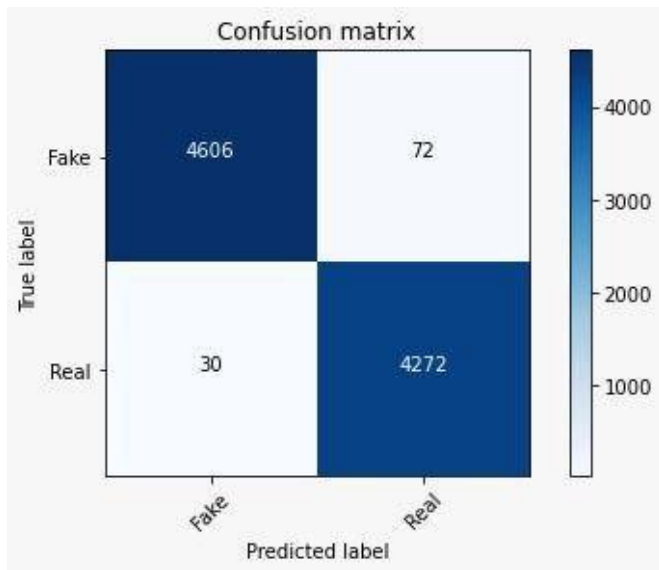


Fig 5: Confusion Matrix of Random Forest Classifier

6. Conclusion and Future Scope

Spreading of fake news always deliver a bad and negative impact to a society. Is still lots and lots of a confusion in a society, when it comes to differentiating between fake and true news. Fake news really is a false alarm to any person as it always just misleads the readers, and the person always ends up being confused and not acting in the right way. Their daily life with their naked eyes. So, this is when our project can use certainly to predicts whether project the given news is fake or not? By considering our project's ideology people can at least be able to check whether the news they have got in the front of their eyes are legit or not and the people will become more aware of the fake news circulation. This system has been completed in this final year which certainly needs more improvements in the near future by using a flask.

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Online Voting System Based on QR Code

Rajavi Mhatre¹, Akshay Kahar², Vivek Yadav³, Asst Prof. Sonali Karthik⁴

¹⁻³Student, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

⁴Asst Professor, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

Abstract -- The problem with legal system is we have a tendency to still use previous strategies for choice and there are tons of issues in terms of safety and security. By mistreatment net technology we have a tendency to be creating legal system a lot of sensible. The projected on-line legal system permits elector to scan their fingerprint, aadhar card, pan card and voter-id, that is then matched with Associate in Nursing already saved pictures of documentation inside an info that's retrieved from aadhar-card info of the govt. The choice system is managed during a less complicated method as all the user should login by aadhar-card variety and word and click on his/her favorable candidates to solid the vote. This may increase share the share the proportion} of choice percentage In Asian nation and additionally it cut back the price of choice method, it's additionally increase the protection and security of choice method. By mistreatment Biometric fingerprint it provides enough security to cut back the false count of votes. By the employment of net choice technology there'll be no false count and any quite corruption concerning choice method. It'll create choice method a lot of biased and safer for the elector yet because the government.

Key Words: Biometric fingerprint, Aadhar card ID, Online elections

1. INTRODUCTION

Voting system has bit by bit modified from ancient ballot that enclosed paper system, punch card, and mechanical lever to currently ballot via Electronic mechanical device (EVM). Electronic balloting Machines, that is susceptible to fraud and it's tedious to handle the balloting machines. EVMs that are utilized in Asian nation don't have any mechanism by that the elector will verify their identity before casting votes, because of those faux voters will forge various faux votes. EVMs are often tampered throughout producing in such case it will manipulate the particular balloting. On-line electoral system can offer a lot of improved options and characteristics over ancient balloting patter with flexibility, privacy, mobility, conveniences, accuracy. On-line balloting can overcome drawbacks like time overwhelming, sizable amount of paper wastage, and want for election authorities to be gift physical the least bit the booth from morning to evening, harm of machines because of lack of attention at place. By on-line electoral system any eligible elector will use his/her balloting rights from anyplace within the country. Elector will forged their votes from anyplace within the

country while not visiting to balloting booths, in extremely secured method. that creates balloting a fearless of violence which will increase the proportion of balloting. This project aims at developing an electoral system that gives security and a truthful election. Each national or voters of Asian nation has the proper to precise their own decisions as vote to elect a rightful person as our leader. To permit the exercise of this method, the majority balloting systems embrace the subsequent steps: elector identification and authentication, balloting and recording of votes forged, vote enumeration, publication of election results. A Secured electronic mechanical device victimization distinctive number i.e. AADHAR variety has been developed. To produce extra security alongside the AADHAR variety identity verification is employed. At the time of balloting within the elections, the elector authentication is often done through biometric pattern. If the biometric data of the elector matches the info of the AADHAR then the person is allowed to forge their vote for the election.

1.1 Problem Background

In the recent times there are many literatures on online voting has been developed. While online voting has been an area of research in the recent years, there are efforts made to make online voting system more secure. The use of insecure Internet, and the resulting security Breaches have been reported recently.

1.2 Problem Statement

Our online voting system will make all voting process easy because in this system we will provide Chabot, which will help every user during the voting process. If any user has any kind of issue during the process the Chabot will provide efficient solution for that issue. Our voting system will make the whole voting process cost efficient. Our voting system will give instant and unbiased poll result. Our voting system will help us to keep track of voter. And our system is time efficient.

2. OBJECTIVES

Use the plurality technique of selection to work out a winner.

Use the plurality with elimination technique of selection to work out a winner.

Use the moment run-off technique of selection to work out a winner.

Use the Board count technique of selection to work out a winner.

Use the pair wise comparison technique of selection to work out a winner.

3. LITERATURE REVIEW

During the course of this project development we've got referred varied papers to analyze the issues within the existing system and discern solutions that are economically viable. Background analysis on the organization and comparative studies of existing systems is additionally done to a lot of perceive the system necessities before the system was developed. There are heap of practices created to introduce the variations in electronic wherever totally different techniques and methodologies are used. a number of them guarantees the confidentiality and security to the system at some extent, still the pick info and method have to be compelled to be management and manage with advanced systems which will ensures and guarantees the protection and privacy of voter's and voter's info. And by learning varied papers we tend to designed system that is delineate during this paper. The primary and also the foremost issue to make sure correct pick is by accurately authenticating each elector. It's necessary to spot that each person coming back to vote is exclusive otherwise it'll violate the terribly principle of pick and a person would be pick on behalf of others. so once reading all the mandatory papers from the past, United Nations agency all have worked associated with this subject we've got inferred that in on-line legal system a really robust secured system would be required in any kind to keep up the confidentiality and integrity of on-line legal system.

4. METHODOLOGY

Every voter will be provided by a personal identification number. This number will be automatically checked along with the ID stored on the database. For the verification of identification number we ask for voter id and also user's fingerprint. If both the information matches with the database documentation then only further he will be authorized for voting else he cannot login in our system.

In this research, we proposed an authentication using a Face Detection and Recognition system and thumb impression scanning in online voting to achieve the rules of supreme Electoral Council as follow: Only eligible persons vote, No person is allowed to Vote more than once and at more than one place. The vote is secret, and each (correctly cast) vote gets counted and to achieve the aims of online voting as follow: increase participation, lower the costs of running election, and improve the accuracy of results.

5. RESULTS AND DISCUSSION

The planned legal system had several blessings over the normal methodology of option. This method affords extra security by permitting citizen to vote one time by transmission distinctive identification at the side of biometric info. This method avoids dishonest option and prohibited practices throughout the elections that is that the key issue within the ancient legal system. This method provides transparency within the reckoning method. The benefits of this method area unit economic, quicker tabulation of results, improved accessibility, larger accuracy, and lower risk of human and mechanical errors. Information consisting of the small print like age, biometric of the folks ought to be updated when before election. Info concerning the casted vote are often sent to the citizen through the electronic messaging system. The user authentication method of the system is improved by adding each face recognition and secret security. The popularity portion of the system is secured by the quilt image. This method can preclude the prohibited practices like rigging. Thus, the voters are often certain that they alone will opt for their leaders, therefore exertion their right within the democracy. The usage of on-line option has the potential to cut back or take away unwanted human errors. Additionally to its dependableness, on-line option will handle multiple modalities, and supply higher measurability for big elections. On-line option is additionally a superb mechanism that doesn't need geographical proximity of the voters. as an example, troopers abroad will participate in elections by option on-line. Hence, by this option proportion can increase drastically.

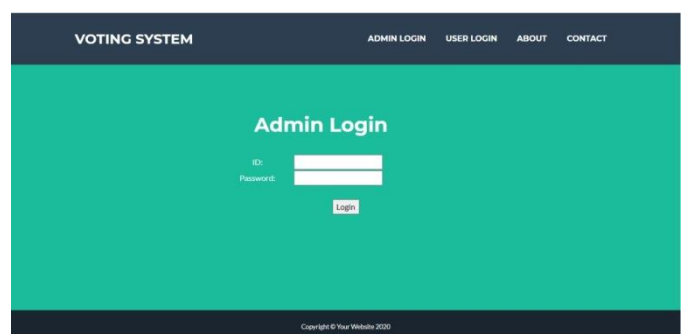


Fig 1: Admin login



Fig 2: User Registration

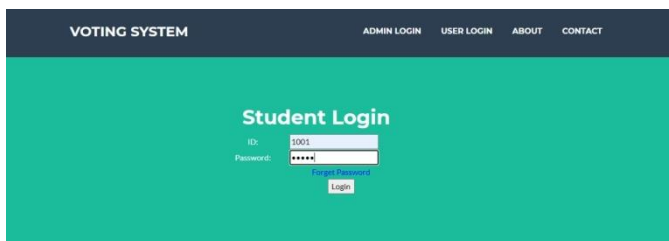


Fig 3: Student login

International Conference on ICT and Knowledge Engineering.

6. CONCLUSION

This paper describes the planned model for on-line voting system for India. The planned system is far secure and economical than the standard legal system. Manipulation of votes and delay of results are often avoided easily. A novel AADHAAR identity is the centre purpose of our planned model. It ends up in the simpler verification of both voters and candidates. In the planned framework, we've got tried to make a secure on-line legal system that's free from unauthorized access whereas casting votes by the voters. The server aspects of the planned system have such distribution of authority that server doesn't alter to govern the votes. It's expected that the planned on-line pick system can increase the transparency and responsibility of the existing voting system.

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Ghost Cloud - Imaging and installing different Operating Systems using Cloud

Shoaib S. Shaikh¹, Rajkumar G. Mishra², Mohd Kashif M.A. Shaikh³, Syed Tanzeem⁴

^{1, 2, 3}Student, ⁴Professor, Dept. of Information Technology, Theem College of Engineering, Maharashtra, India

Abstract: We have a problem while installing operating systems on PCs in masses. We need people to manually insert bootable drives into the system so as to boot it. It takes a lot of time as well as memory devices. Another problem with this approach is that whenever a system is replaced or needs a change in OS, we manually have to reboot the system with another OS. This can be overcome by implementing a hybrid technology consisting of Ghost Imaging, LAN booting and Cloud service. We will be creating a centralized cloud where the users will create accounts. We will have different OS for motherboards preinstalled with user specified software and drivers on this server. User can be able to save their own image files on this cloud. Users will be able to select the system that needs to be booted, the operating system which needs to be installed on it to a desired system through Cloud. This System can be used in: Different Schools and Colleges, Various Organizations, Personal Work places, offices, etc. This idea will prove to be helpful for system administrators to perform OS related tasks by just sitting at one PC.

Keywords: booting, cloud, imaging, LAN booting, PXE.

I. INTRODUCTION

As we all know that in today's world how time is important and redundancy is required in work, and to reduce the burden of human work with the technology known as ghosting I.e. "CLOUD GHOSTING". This idea will prove to be helpful for system administrators to perform OS related tasks by just sitting at one PC, the purpose is as follows, we have a problem while installing operating systems on PCs in masses. We need people to manually insert bootable drives into the system so as to boot it. It takes a lot of time as well as memory devices. Another problem with this approach is that whenever a system is replaced or needs a change in OS, we manually have to reboot the system with another OS. This can be overcome by implementing a hybrid technology consisting of Ghost Imaging, LAN booting and Cloud service. We will be creating a centralized cloud where the users will create accounts. We will have different OS for motherboards preinstalled with user specified software and drivers on this server. User can be able to save their own image files on this cloud. Users will be able to select the system that needs to be booted, the operating system which needs to be installed on it to a desired system through Cloud.

II. DOCUMENT CONVENTIONS

- 1) OS: Operating System
- 2) System / Software: The product being discussed
- 3) Machine: User's Computer
- 4) Source Machine: The PC from where the imaging is to be done
- 5) Target Machine: The PC on which the image is to be installed
- 6) PC: Personal Computer
- 7) UML: Unified Modelling Language

III. DESIGN & METHODOLOGY

A. Creating Images of OS and Configurations

The user desires to change his/her workstation so he opts to create the image of his/her machine so as to relocate the entire system and its contents to another PC to which the software responds as per the feature.

The system will create image files of the target machine and also of the configuration files in it. The image creation script will be responsible for this.

The priority of this function is high as it's one of the main functions of the software.

B. *Uploading the Image over the Cloud*

The created image is then uploaded on the cloud and stored in the database.

The priority of this function is high as it's one of the main functions of the software.

C. *Managing the images*

The user decides to manage the existing images.

The system can create, update and delete the images from the cloud. It can also modify the image as per the target machine requirements. The configuration files can be modified and then installed on the target machine.

The image management script will be responsible for this job.

D. *Installing and Running the OS*

The modified image then can be downloaded on target machine then installed and run on it so as to boot the target machine with the desired OS.

IV. CONCLUSION

As we all know that in today's world how time is important and redundancy is required in work, and to reduce the burden of human work with the technology known as ghosting I.e. "CLOUD GHOSTING". This idea will prove to be helpful for system administrators to perform OS related tasks by just sitting at one PC, the purpose is as follows, we have a problem while installing operating systems on PCs in masses. We need people to manually insert bootable drives into the system so as to boot it. It takes a lot of time as well as memory devices. Another problem with this approach is that whenever a system is replaced or needs a change in OS, we manually have to reboot the system with another OS. This can be overcome by implementing a hybrid technology consisting of Ghost Imaging, LAN booting and Cloud service. We will be creating a centralized cloud where the users will create accounts. We will have different OS for motherboards preinstalled with user specified software and drivers on this server. User can be able to save their own image files on this cloud. Users will be able to select the system that needs to be booted, the operating system which needs to be installed on it to a desired system through Cloud.

V. APPENDIX

A. *What is Network Booting?*

Network booting, or booting from LAN as it is also called, is a process which allows a computer to start up and load an operating system or other program directly from the network without any locally attached storage device, like a floppy, CDROM, USB stick or hard drive. On Intel architecture computers this is made possible with the PXE standard. PXE extends the features of the BIOS so that it can run software directly from the network. PXE support is now so common that you can expect it to be present in any reasonably modern computer that comes with an Ethernet jack (commonly known as RJ45). This fact alone makes it possible to boot an Intel-based computer from the network without having to burn an EEPROM on your network card, like you had to do in the past.

B. *The BIOS boot process*

When your computer powers on and starts running your operating system, it goes through a series of operations before it actually starts your operating system. Your operating system is a very sophisticated boot program that takes total control over your computer. But a boot program can also be a fairly simple program, like a memory diagnostics program, a hardware stability checker, or even a simple game like Pong or Tetris.

VI. ACKNOWLEDGMENT

It is optional. The preferred spelling of the word "acknowledgment" in American English is without an "e" after the "g." Use the singular heading even if you have many acknowledgments. Avoid expressions such as "One of us (S.B.A.) would like to thank" Instead, write "F. A. Author thanks " *Sponsor and financial support acknowledgments are placed in the unnumbered footnote on the first page.*

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Fake News Detection Using Machine Learning

Pragnesh Bugade¹, Pooja Sarode², Tanvee Pimple³

¹²³Student, Department of IT, Theem college of Engineering, Boisar, Maharashtra, India
Asst Professor. Shaikh Ansar Ahesanuddin, Department of IT, Theem college of Engineering, Boisar, Maharashtra, India

Abstract - Fake news nowadays is an important aspect in the life of social media, and in the political world. Fake news detection is an important research to be done for its detection but it has some challenges too. Some challenges can be due to less number of resources like an available dataset and published literature. We propose in this paper, a fake news detection using machine learning techniques. We compare three different machine learning classification techniques. Not only that, but We will be working with three different models that are Logistic Regression, Decision Tree Classifier and Random Forest Classification. According to our project's finding we have achieved various accuracy of each method respectively. Our project can highly benefit to detect whether the given news is true or fake.

Key Words: Fake news, Machine learning, News Detection, Algorithms

1. INTRODUCTION

A great deal of fake news is roaring through the various social media platforms. During this case classification of any news, post, story, journal into fake or real one has become a crucial them as fake and true and it's conjointly attracted a good interest from researchers round the world. In line with several analysis studies that are administered to hunt out the impact of any false and fictional news on of us upon returning through such fake news details. Falsified news or news is used in such how that individual begin basic mental process in one issue that may not true.

The best example for fake news is that the pandemic situation occurring within the entire world. There are variant of news articles till presently that are falsified and used merely to create confusion and disturbance inside the minds of individual and to misguide their minds to believe that false news. However, can anyone perceive if it's fake or real?

False information on Indian social media caused form voters to drink cow weve or eat dung, thus on stop infection, whereas in Country, artiodactyl weewee with lime was hailed as a protection against the coronavirus. The scientists put together looked into completely different rumors, like uptake garlic, sporting heat socks and spreading goose fat on one's chest, as treatment for the likely fatal virus. Conspiracy theories were put

together monitored, just like the notion that it's a bio-weapon funded by enterpriser to further antigen sales.

1.1 Style of Knowledge in social media posts

As mentioned by the authors of [1] there are three major forms in which social media networking Sites scan a point:

Text (Multilingual) is analyzed by computational linguistics which focuses the genesis of text semantically and consistently. since a lot of the posts are made within the type of texts a lot of work has been administered on its analysis.

Multimedia: Multiple forms of media are integrated during a single post. This might embody audio, video, images, and graphics. This is very much attractive and it fetches the eyes of the viewers while not bothering concerning the text.

Hyperlinks change the mastermind of the post to cross regard to totally different sources and so gains viewers the trust by certifying genesis of the post. Even cross regard to alternative social media networking sites and embedment of snapshots is in observe.

2.2 Fake News Varieties

The various styles of fake news by Authors of paper [2] , in their recent paper is summarized below.

1. Visual-based: These fake news posts use graphics plenty additional as content, which can embrace morphed picture, doctored video, or combination of both [3].

2. User-based: This sort of invented news is generated by fake accounts and is targeted to specific audiences which can represent sure age teams, gender, culture, political affiliations.

3. Knowledge-based: these types of posts give scientific (so referred to as) rationalization to some unresolved problems and create users believe it's authentic. For instance, natural remedies of increased sugar level within the physical body.

4. Style-based posts are written by photojournalists UN agency fake and replica kind of some licensed journalists

5. Stance-based: It really is illustration of truthful statements in such some way that changes its which means and purpose.

2. Aim

This paper intends to:

(1) Identifies a fake and true news detection using a machine learning;

(2) The Review previous studies have that employed a machine learning for identifying fake and true news; and

(3) Attempt to guides future work on the topic in this section, the author describes the previous research works in the form.

3. Literature Review.

Their square measures some tools that have been developed to spot fake news that spreads through examining lexical selection that seems in headlines and different intense language structures (Chen, Conroy, and Rubin 2015b). Another tool, developed to spot fake news on Twitter, includes an element known as the Twitter Crawler that collects and stores tweets in a very info (Atodiresei, Tănăselea, and Iftene 2018). Once a Twitter user desire to ascertain the accuracy of the news found they'll copy a link into this application, when that the link are going to be processed for fake news detection. This method is made on associate degree rule is a known as the NER (Named Entity Recognition) (Atodiresei, Tănăselea, and Iftene 2018).

Their square measure several on the market approaches to assist the public to spot fake news and this paper aims to reinforce understanding of those by categorizing these approaches as found in existing literature.

4. Methodology

This project is concerning building a fake news detection model using the three machine learning algorithms. This project isn't constant developing different typical package systems because the focus of its towards model development in a machine learning using jupyter notebook. Machine learning usually requires a good amount of time for model training and testing, and also a huge and good quality of dataset. In different words if we're saying, the model is counted pretty much as good in accuracy if the model produces foreseen outcomes, that is the prediction of fake and true news.

Management of Data

In this section, a collection of knowledge (dataset) is collected that may be a set of report articles, stories, news, posts. Once the dataset is collected, nltk is foreign and corpus is used to identify a collection of written or spoken material keep on a PC and accustomed to determine however language is used: the information is explored to induce a much better data of its structure and that means so the stopwords are removed.

Data Exploration

In the information exploration section, it's main concerning the plotting of graphs according to the fake and trues news predicted by the machine learning algorithm. Word clouds are generated that essentially may be information visual image technique used for representing text information within which the scale of every word indicates its frequency or importance.

Important matter information points is highlighted employing a word cloud. During this method tokenization is completed.

Model Training

After the data is properly explored and managed, the machine learning model is then able to be trained. During this Model Training phase, completely different approaches are thought of and a learning task is determined that is a prediction task. No matter obtainable options within the training data set are there they're then studied. Then, an acceptable algorithm is selected to train the model. In our case, we have used three algorithms Logistic Regression, Decision Tree Classifier and Random Forest Classifier is chosen. Then the dataset is match into the rule of algorithm for training purposes so the testing is finished.

Model Assessment

In assessing the model, the output of the model created is measured severally. Accuracy grading of the model is conducted using performance metrics like F1 score, precision, recall and accuracy rate that relies on confusion matrix report. Some changes are often created among the model till satisfaction is achieved in creating the model yield in smart accuracy of output.

5. Results and Discussion

On the basis of three machine learning algorithms that we used in this project; each algorithm has its own accuracy percentage when implemented on the dataset. The accuracy according to the each algorithm implemented are:

Classifier	Accuracy
Logistic Regression:	98.8%
Decision Tree Classifier	99.6%
Random Forest Classifier	98.9%

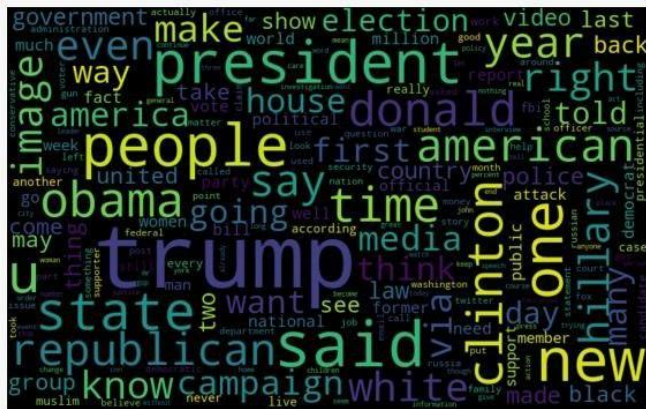


Fig 1: Word Cloud

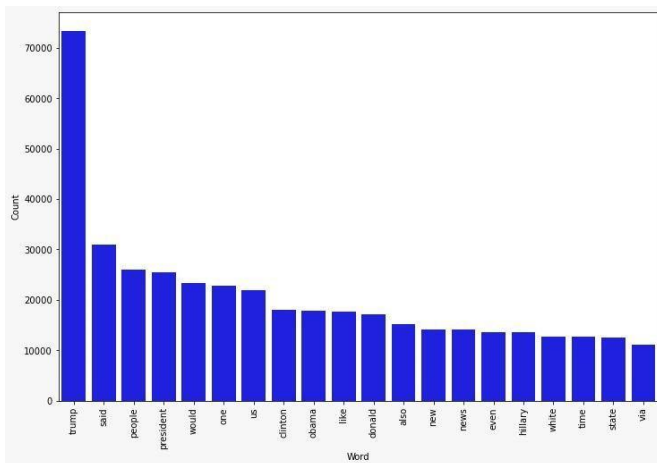


Fig 2: Graph of Words Count

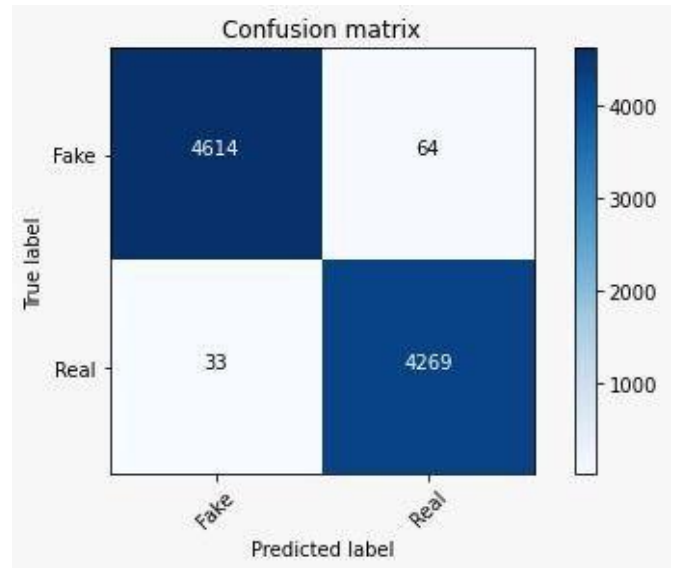


Fig 3: Confusion Matrix of Logistic Regression

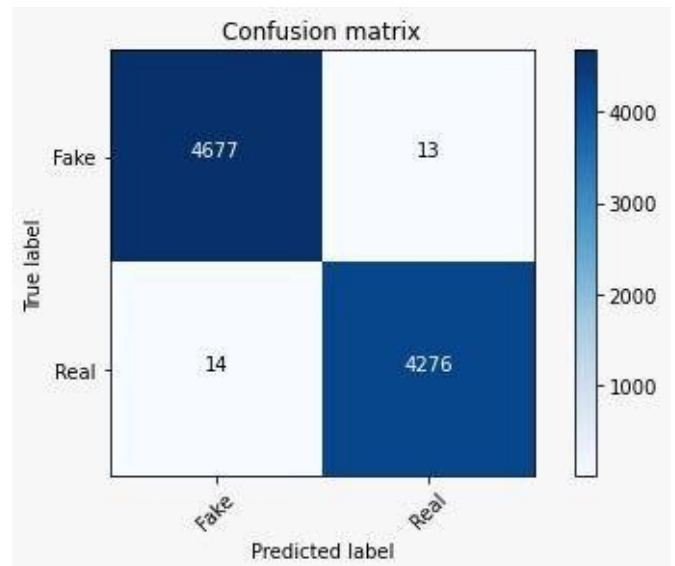


Fig 4: Confusion Matrix of Decision Tree Classifier

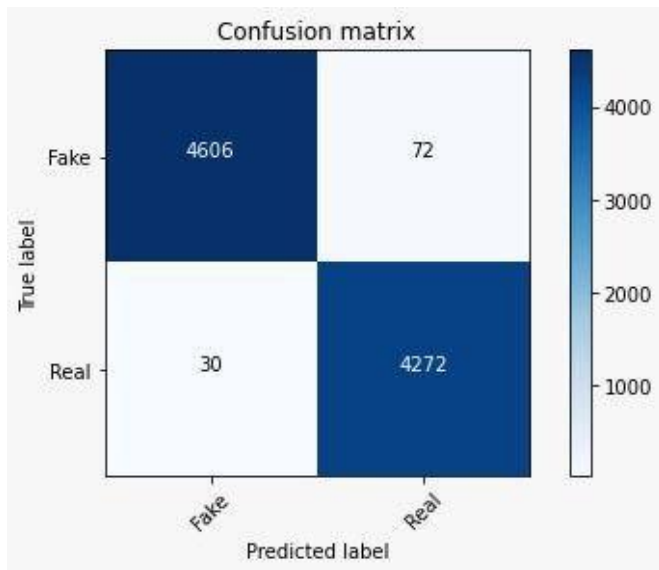


Fig 5: Confusion Matrix of Random Forest Classifier

6. Conclusion and Future Scope

Spreading of fake news always deliver a bad and negative impact to a society. Is still lots and lots of a confusion in a society, when it comes to differentiating between fake and true news. Fake news really is a false alarm to any person as it always just misleads the readers, and the person always ends up being confused and not acting in the right way. Their daily life with their naked eyes. So, this is when our project can use certainly to predicts whether project the given news is fake or not? By considering our project's ideology people can at least be able to check whether the news they have got in the front of their eyes are legit or not and the people will become more aware of the fake news circulation. This system has been completed in this final year which certainly needs more improvements in the near future by using a flask.

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Fake News Detection Using Machine Learning

Pragnesh Bugade¹, Pooja Sarode², Tanvee Pimple³

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1.1 Style of Knowledge in social media posts

As mentioned by the authors of [1] there are three major forms in which social media networking Sites scan a point:

Text (Multilingual) is analyzed by computational linguistics which focuses the genesis of text semantically and consistently. since a lot of the posts are made within the type of texts a lot of work has been administered on its analysis.

Multimedia: Multiple forms of media are integrated during a single post. This might embody audio, video, images, and graphics. This is very much attractive and it fetches the eyes of the viewers while not bothering concerning the text.

Hyperlinks change the mastermind of the post to cross regard to totally different sources and so gains viewers the trust by certifying genesis of the post. Even cross regard to alternative social media networking sites and embedment of snapshots is in observe.

2.2 Fake News Varieties

The various styles of fake news by Authors of paper [2] , in their recent paper is summarized below.

1. Visual-based: These fake news posts use graphics plenty additional as content, which can embrace morphed picture, doctored video, or combination of both [3].

2. User-based: This sort of invented news is generated by fake accounts and is targeted to specific audiences which can represent sure age teams, gender, culture, political affiliations.

3. Knowledge-based: these types of posts give scientific (so referred to as) rationalization to some unresolved problems and create users believe it's authentic. For instance, natural remedies of increased sugar level within the physical body.

4. Style-based posts are written by photojournalists UN agency fake and replica kind of some licensed journalists

5. Stance-based: It really is illustration of truthful statements in such some way that changes its which means and purpose.

2. Aim

This paper intends to:

(1) Identifies a fake and true news detection using a machine learning;

(2) The Review previous studies have that employed a machine learning for identifying fake and true news; and

(3) Attempt to guides future work on the topic in this section, the author describes the previous research works in the form.

3. Literature Review.

Their square measures some tools that have been developed to spot fake news that spreads through examining lexical selection that seems in headlines and different intense language structures (Chen, Conroy, and Rubin 2015b). Another tool, developed to spot fake news on Twitter, includes an element known as the Twitter Crawler that collects and stores tweets in a very info (Atodiresei, Tănăselea, and Iftene 2018). Once a Twitter user desire to ascertain the accuracy of the news found they'll copy a link into this application, when that the link are going to be processed for fake news detection. This method is made on associate degree rule is a known as the NER (Named Entity Recognition) (Atodiresei, Tănăselea, and Iftene 2018).

Their square measure several on the market approaches to assist the public to spot fake news and this paper aims to reinforce understanding of those by categorizing these approaches as found in existing literature.

4. Methodology

This project is concerning building a fake news detection model using the three machine learning algorithms. This project isn't constant developing different typical package systems because the focus of its towards model development in a machine learning using jupyter notebook. Machine learning usually requires a good amount of time for model training and testing, and also a huge and good quality of dataset. In different words if we're saying, the model is counted pretty much as good in accuracy if the model produces foreseen outcomes, that is the prediction of fake and true news.

Management of Data

In this section, a collection of knowledge (dataset) is collected that may be a set of report articles, stories, news, posts. Once the dataset is collected, nltk is foreign and corpus is used to identify a collection of written or spoken material keep on a PC and accustomed to determine however language is used: the information is explored to induce a much better data of its structure and that means so the stopwords are removed.

Data Exploration

In the information exploration section, it's main concerning the plotting of graphs according to the fake and trues news predicted by the machine learning algorithm. Word clouds are generated that essentially may be information visual image technique used for representing text information within which the scale of every word indicates its frequency or importance.

Important matter information points is highlighted employing a word cloud. During this method tokenization is completed.

Model Training

After the data is properly explored and managed, the machine learning model is then able to be trained. During this Model Training phase, completely different approaches are thought of and a learning task is determined that is a prediction task. No matter obtainable options within the training data set are there they're then studied. Then, an acceptable algorithm is selected to train the model. In our case, we have used three algorithms Logistic Regression, Decision Tree Classifier and Random Forest Classifier is chosen. Then the dataset is match into the rule of algorithm for training purposes so the testing is finished.

Model Assessment

In assessing the model, the output of the model created is measured severally. Accuracy grading of the model is conducted using performance metrics like F1 score, precision, recall and accuracy rate that relies on confusion matrix report. Some changes are often created among the model till satisfaction is achieved in creating the model yield in smart accuracy of output.

5. Results and Discussion

On the basis of three machine learning algorithms that we used in this project; each algorithm has its own accuracy percentage when implemented on the dataset. The accuracy according to the each algorithm implemented are:

Classifier	Accuracy
Logistic Regression:	98.8%
Decision Tree Classifier	99.6%
Random Forest Classifier	98.9%

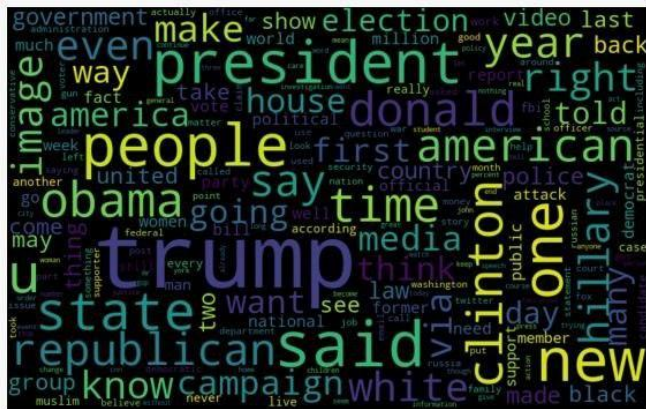


Fig 1: Word Cloud

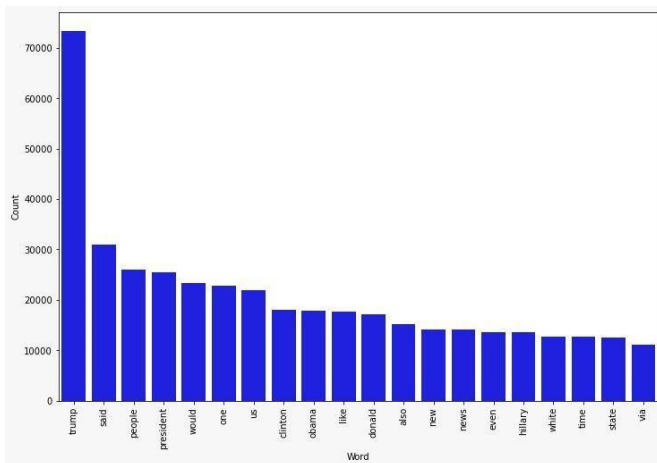


Fig 2: Graph of Words Count

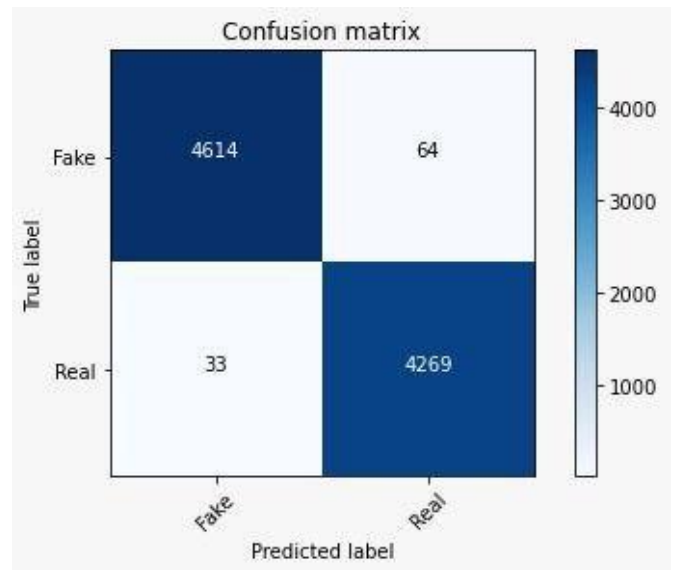


Fig 3: Confusion Matrix of Logistic Regression

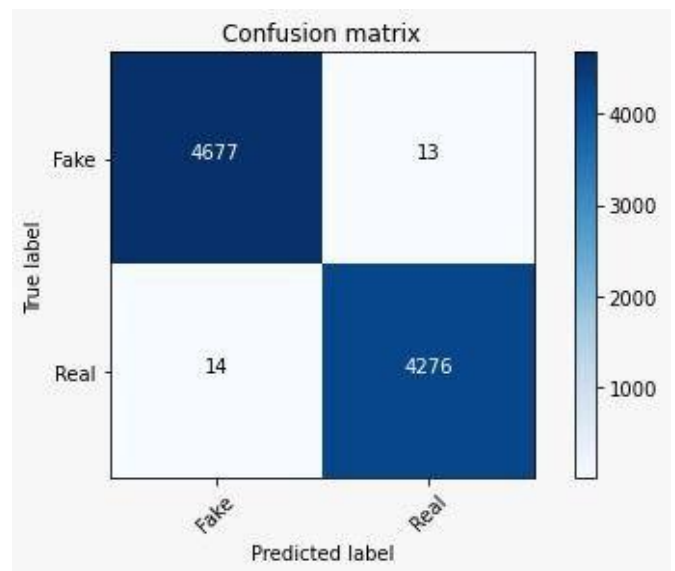


Fig 4: Confusion Matrix of Decision Tree Classifier

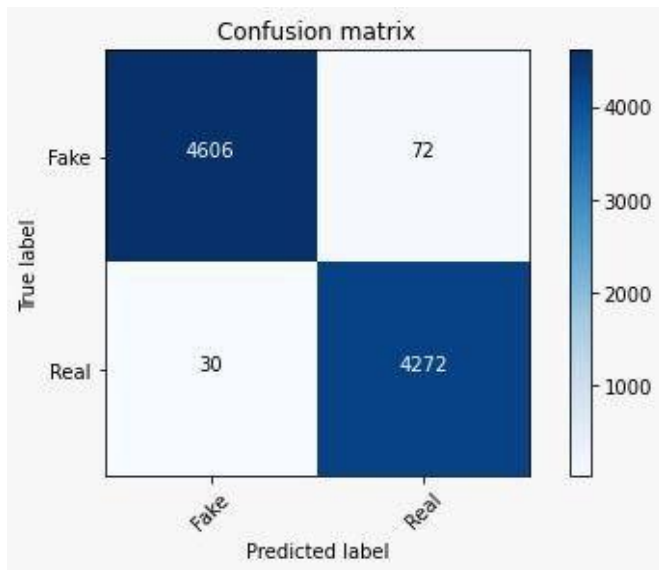


Fig 5: Confusion Matrix of Random Forest Classifier

6. Conclusion and Future Scope

Spreading of fake news always deliver a bad and negative impact to a society. Is still lots and lots of a confusion in a society, when it comes to differentiating between fake and true news. Fake news really is a false alarm to any person as it always just misleads the readers, and the person always ends up being confused and not acting in the right way. Their daily life with their naked eyes. So, this is when our project can use certainly to predicts whether project the given news is fake or not? By considering our project's ideology people can at least be able to check whether the news they have got in the front of their eyes are legit or not and the people will become more aware of the fake news circulation. This system has been completed in this final year which certainly needs more improvements in the near future by using a flask.

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COLLEGE STUDENT SMART CARD

Vaishali Dehure¹, Pritesh Patel², Ansari Gulam Zilani³, Associate Professor Tanzeem Sayed⁴

¹⁻³Student, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

⁴Professor, Department of IT, Theem College of Engineering, Boisar, Maharashtra, India

Abstract - Nowadays Smart cards has become part of our daily life; it became popular because it is easy to use and extremely portable. Nowadays we are using Smart cards in almost every field except college field. College Student Smart Card Projects Aims to create a system in which smart card will become daily part of their life. We are developing this project to ease the work load of student's. Smart Card will contain QR/Barcode which will be unique for every student. Smart card will contain three details on it name of the student, photo of student and QR/barcode. QR/barcode will contain every information and documents regarding that unique student. This smart will also contain wallet for student's students just have to recharge their Smart Cards. This Smart Card can be recharged though any site, UPI or Wallet ex. Google Pay, Paytm, PayPal, BHIM UPI or you can just go to College office, and pay cash to recharge your card. Once recharged this Card can be used for any kind of payment within college, like in Canteen, Penalty for Late submission, Fine for Late submission of borrowed book and so on.

Key Words: Student data, Smart card, multipurpose college ID

1. INTRODUCTION

We have been using registers, and diaries to store student data. That includes personal data of student, marks, attendance, library records, etc. in register and diaries system there is no easy way to retrieve data because of this system turns out only for logging of data to retrieve data for a single student, administrator has to search to from many registers which takes quiet time.

The smart card will reduce pressure from both student and administrators if any student came to pay fees or for any other purpose student will not require to carry any document, he just need to show his smart card as for the administrator, he does not require to search the register for student's personal information he just need to scan his/her smart card.

This card can be used in many places like canteen, library, office, etc. This can be also used for attendance management we just have place one QR/barcode reader outside/inside of class students just have to scan their id while entering/leaving the classroom for attendance. With this project we are trying to achieve maximum use of smart card as well as to ease the work for students. It is

easy for students to just a carry smart card except for all Documents and Cash. When making payments through smart card student will require a pin which will be set by student themselves so even if your smart card is lost you don't have to about unwanted transactions, you can just inform the administrator and ask him/her to issue new smart card for you.

2. LITERATURE SURVEY

A. Multi-purpose Student Card System victimization sensible Card Technology:

Magnetic strip cards are accustomed to doing utile work like attendance, paying digitally storing record in information, storing scanned documents at a centralized location for ease of access of and reduces tedious manual work. The motivation is being taken from observing case wherever there are completely different cards like permit, PAN card, ID card, library and lots of additional to avoid this case the multi-purpose revolving credit is introduced which is able to contain all the small print of the user in single card.

Benefits of this method are:

- quicker and additional correct.
- Digital group action of bills and fine.
- movableness and simple access to documents.

Disadvantage of this system:

- whereas, accessing the system if the server goes down information winning would be tough.
- Initial investment needed in hardware.

B. utile revolving credit system:

Chip cards that are of ordinary size created plastic is used to store information. This plastic chip card contains details of the card owner that is in encrypted type preventing misuse or unauthorized access of information. This type of card is basically employed in ATM cards. It's terribly appropriate during a country likes Asian nation wherever population is very dense thus carrying such utile card is much higher possibility then carrying Aadhaar card, pan card, etc.

Benefits of this system:

- It provides security because it cannot be tampered thus the only thanks to access the knowledge is by victimization PIN code.
- this method is correct, quick and additional economical.
- revolving credit is being encrypted and given distinctive id; hence, the knowledge is protected.

Limitations of this system:

- Initial investment has to be worn out hardware.
- coaching has to incline to admins and students in initial part.

C. Barcode based mostly Student attending System:

This system accommodates a card with barcode written on it, this card will be directly scanned by the scholars. Usually attending is taken manually by the lecturers in colleges. There’s would like of machine-controlled attending system which records attending and stores it in information and calculates and displays attending to the scholars while not any human intervention.

This method will be enforced using differing kind barcode are as follows

1. Linear Barcodes
2. Matrix Barcodes

Benefits of this method are:

- It’s terribly straightforward technology compared to RFID.
- It’s price effective.

3. RELATED WORK

A. Traditional system.

Traditional system uses registers and diaries to store data. So, a college has to store lot of registers and diaries to keep data. This system is too slow. Updating any kind of changes in existing data in difficult. To retrieve any piece of data stored in this kind of system is very difficult. This kind of system has very limited scope.

B. Cloud based System

Cloud based system is an upgrade added to the traditional system. In this system some IT organizations provide cloud based services for management of a student data. This system replaces registers in Traditional system because this system uses a temporary created sheet using web application to manually enter the data. In this system the process of insertion and retrieve of data become fast. The major drawback of this system it requires lot of human intervention for manual insertion and updation of data.

C.RFID based System

RFID based systems use RFID tag to identifies a user. RFID systems consist of two components tag and reader. RFID reader reads the tag and stores the information on database. Drawback of this system is proxy attendance.

4. PROPOSED SYSTEM

Proposed system uses RFID tag to uniquely identify the student. After tag has been scanned by RFID reader the contents stored in the tag will be shown to the specially created software/application installed in administrator’s computer system. The data stored in the RFID tag will be Personal information of a Student, Documents of Students (Aadhar card, pan card, mark sheets) which will be scanned and uploaded by administrators.

5. ARCHITECTURE OF SYSTEM

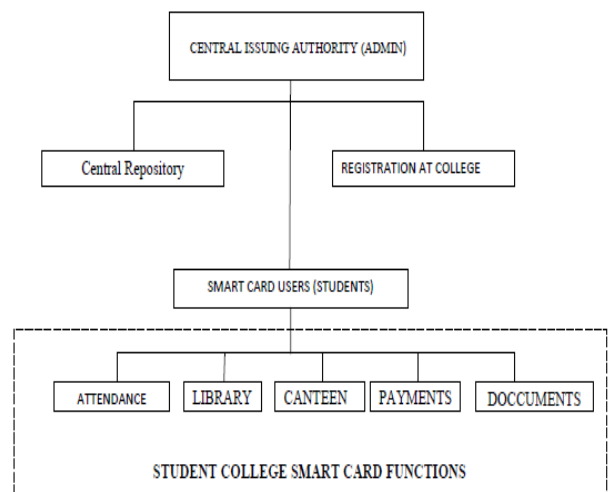


Fig.1: Basic architecture of the system.

The planned system integrates all numerous modules as shown in fig.1. It contains of various modules that square measure connected and handled centrally by planned system. The on top of figure shows the essential operating of the planned intranet system for student’s group action management system: The below figure shows the essential operating of the proposed computer network system for student’s group action management system.

6. WORKING

The system is divided into 1 Central module, 3 modules and 5 sub modules.

A. Central module (Central issuing module) or (ADMIN):

Working of Admin is to scan, verify and generate the smart cards for students. It is the central module or the module with the highest authority in the system. The work of Admin is to observe and maintain every other modules.

B. Central repository:

Central Repository is the central Database in which data and documents for every student is stored.

C. Registration at college:

It is the stage when the students are just admitted in the college. At this module students is register for the first time in college. Administrators scans the documents of the student and saves in the central database. At this password for payment in canteen and library also generated.

D. Smart card users (students)**E. Attendance:**

This module records the attendance of every student with the help of RFID tag present in their ID card. The attendance taken using card entered directly into the Central Repository or central database. It reduced the human intervention during the manual attendance present current system. The data stored in the database can be further used for operations.

F. Library:

In this module the book keeper can assign the book to a student using their smart card using the Unique ID that would be generated during the book assign process. This module will track time period for which the book is rented and automatically generate the fine upon the particular student.

G. Canteen:

This module will be operated by the members of canteen. This module will take order from the student and take care of the payment using card.

In this module students can also be recharge their card.

H. Payment :

This module handles the payment of the student using point based system which can be recharged in canteen, library, and admin office

7. CONCLUSIONS

The Concept of student smart card is to ease the pressure of the students and the admin. We can also use this kind of systems in office for employees, in hospital for patients and doctors or staff. In this System we are combining many applications in one system.

By using this smart card student only need to carry only one card, except for large no. of documents, cash or cards for payments. Student just need to carry single card for all college or university operations. Only a single card can do many different operations from attendance to fine payment, from canteen payments to fees payment and every other operation required in daily life of student can be completed using this single card.

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Mentorship Interaction System

Omkar Agrawal¹, Neha Sharma², Anchal Tiwari³, Syed Tanzeem Ahmed⁴

^{1,2,3} Student, Theem College of Engineering, Maharashtra, India

⁴Professor, Dept. of Information Technology, Theem College of Engineering, Maharashtra, India

Abstract - Mentorship programs around the world were affected due to covid-19. This shift, in the working conditions, demands a new solution. Our research paper aims to provide a solution to this problem, and make mentorship programs accessible to everyone. Mentorship program will help students learn online easier and will make them grow and they can analyze their performance and growth easily.

Key Words: Mentors, Mentees, Mentorship program, Mentorship, mentor mentee interaction program

1. INTRODUCTION

Mentorship Management System is a bridge between mentor and mentee which eradicates the communication gap between the mentor and mentee(student). This project is a common platform to bring both mentor and mentee together and have a free conversation regarding their query or any other problems related to their subjects and so can help them give solutions to their problems.

The main aim of the project is to ease out the mentorship program, for mentors, mentees and both the institute. Mentorship Interaction system is the system that provides guidance to students (mentee) on academic matters. The project focuses on making the interaction between mentor and students completely online and hassle free. This will reduce the headache of interacting physically and therefore will save time. Nowadays colleges approach industries to have mentors for their students. It becomes a tedious task to connect every student to all the available mentors. Also it is very disturbing for the mentors, since the students ping them very frequently. Students sometimes feel uncomfortable to confront mentors directly.

2. MODULES

2.1. Admin/s

They will be a system administrator. He/She/They will maintain the overall system activity. This will be the person appointed for complete system management.

They will monitor the connection between mentee and mentors and will take immediate action in case of any connection loss or issue with mic or anything related to the network. They will be also responsible for any failure in the network connectivity and any background job running.

Any issue faced in connectivity then mentor or mentee can reach out to this team to get their issue resolved as soon as possible.

2.2 Mentor

The Mentor is responsible for resolving queries and issues raised by mentee's under him/her/they. He/She/They will be able to have chats with mentee's in order to resolve their issues. He/She/They is responsible for the growth of the mentee and he must analyze and record each and every point and details of the mentee in which the mentee is good or needs any improvement. He/She/They can be any person from the mentorship providing organisation which means they will only be appointed from mentorship providing site and he can not be anyone from the staff as it will some or the other way will hinder or affect the quality of mentorship providing site. He/She/They can have a word or can give a piece of advice to any mentee if he thinks that the mentee needs improvement or guidance. He/She/They can also give his valuable advice to other mentees who are not under him. Mentors will make a report of mentees performance and will share that with mentee and the end of every month so that even mentee can have a look at his performance and realise where he or she needs to improve and can accordingly make changes in his schedule or lifestyle and this will help Mentee in a long run.

2.3. Mentee

Mentee is the person or student from the user side who will facilitate this facility and access this mentorship site in order to grow and upskill themselves. Mentees can post their doubts and issues to any mentee they want and get the solution for the same. There will be a button as "Login to this class" which when clicked by mentees will enter them into the class of mentor and here they can have chat with mentor and get their issues resolved. The very

valuable and amazing point of this mentorship site is that the mentees can even share their personal problem with mentor and mentors will help them so that the mentee won't be affected example now a days students face many social problems and get themselves into depression and stress which may lead to suicidal cases

- Mentors have to dedicatedly give time out of their work schedule for giving the guidance, which can be very hectic and burdening.

This is the most followed system currently. The complete program takes place offline.

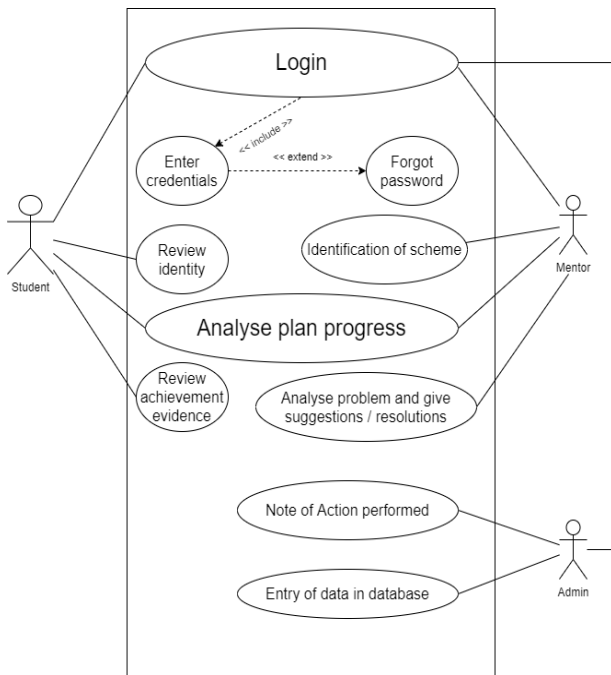


Fig -1: Use Case diagram of mentorship site

3. EXISTING SYSTEM

- Existing systems require the mentor to be physically available with the mentee.
- They report to their respective PoCs (Point of Contact) only.
- Generally Mentees visit the mentor's organisation for the mentorship program.
- Inversely, sometimes mentors have to visit the learner's institute.
- If one of the participants misbehaves, generally the whole mentorship program is affected, since both of the participant's have their own story, and their organisations supporting them.
- No proper reporting of projects and tasks are done, since most of the tasks are manually completed.

4. PROPOSED SYSTEM

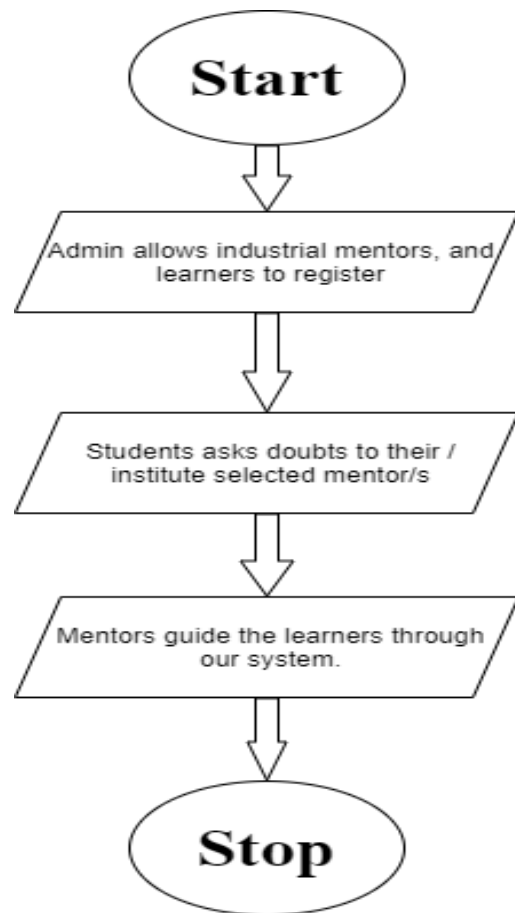


Fig 2. Flow chart of proposed system

In this proposed system what happens is the students will register themselves on the mentorship site portal and the mentors will be registered by the admin team on the mentorship site portal.

The students or mentee are free to choose not only the subject of their interest but also they are free to choose the mentor of their choice. This will build a great connection between mentee and mentor and accordingly will boost the confidence of the mentee and make it comfortable to communicate. Mentee will choose mentors for their respective subject as per their choice.

At first the mentors will be assigned to mentees by the admin but if a student or mentee wishes to take advice or help from another mentor then they are free to have that and there is no restriction as such that any mentee of a particular mentor can not take help from another mentor.

In this proposed system the students or mentees are the main users as they will be posting the queries and ask doubt to the mentors using this proposed system.

The mentee can get the solution of their queries and doubts with the help of mentors using this mentorship site.

On the other side the mentor will be the person who will have access to all the students data and will analyze it and guide the mentee accordingly. The mentor is responsible to answer all the queries and doubts posted by the mentee. He/She/They will provide a solution to the mentee and in case students need to connect again regarding that doubt then the mentee can connect again.

5. ADVANTAGES

- We can access this system on the web so there will be no storage issue.
- We can learn through this system anytime anywhere.
- This will reduce the overhead of interacting physically and therefore will save time.
- No misbehaviour is missed.
- Mentor's don't need to exclusively dedicate time.
- Student's can be frank and open towards asking queries.
- Useful at times of pandemic, hence making mentoring available even in times like these.
- Helps keep private life private for mentors as well as learners.

6. CONCLUSION

Handling and remembering all the queries along with the job is quite a difficult task for mentors too.

There are cases where some students or mentors break the code of conduct and act inappropriately.

To overcome all these problems, we have come up with a solution to help institutes manage all of this.

This Management System is a bridge between mentor and mentee which eradicates(overcomes) the communication gap between the mentor and mentee(student).

This project is a common platform to bring both mentor and mentee together and have a free conversation regarding their query or any other problems related to

their subjects and so can help them give solutions to their problems.

ACKNOWLEDGEMENT

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A Literature Review on Smart Assistant

Edwin Shabu¹, Tanmay Bore², Rohit Bhatt³, Rajat Singh⁴

^{1,2,3}B.E Student, Theem College of Engineering Boisar (E) India.

⁴Assistant Professor, Theem College of Engineering Boisar (E) India.

Abstract - Smart assistants are a boon for everyone in this new era of 21 st century. Where we can ask questions to machines and interact with smart assistants. This Technology attracts almost everyone in the world in many ways like smart phones, laptops, computers, etc. It is a Smart Assistant with Voice Recognition Intelligence, which takes the user input in the form of voice or in the form of text and processes it after processing it will return the output in various forms like search result is dictated to the end user. Some of the smart assistants are like Google Assistant, SIRI and Alexa. They cannot do Voice recognition, and human interaction are the issues which are not solved yet. The issues with Google assistant, SIRI that they need WIFI and internet connection for user interaction. Google Assistant” which is used in Android Phones. But this Application always works with Internet Connections. But our Proposed System has the capability to work with without Internet Connectivity as well.

Key words: SIRI, Google Voice Search, Mobile Device, Internet.

I. INTRODUCTION

Nowadays the Mobile Technology is being very famous for the User Experience, because it is very easy to access the applications and services from anywhere of your geolocation. Smart Assistant is “an application that uses information, for example, the user’s voice and data. The Smart assistant is nothing but an implementation of assistant virtually on the user’s Personal Computer. The software can be used through voice, keyboard input, and also using the internet as remote access. A Smart Assistant Voice Command System essentially means a system that processes voice as an input or understands the aim of that input, processes it and generates voice output. Any voice command system needs few basic components which are speech to text converter, query processor, and a text-to-speech converter. Voice has been the main part of communication. Since, it is faster to process sound and voices than to process written to text, hence voice command systems are internal in computer devices. Some hardware that are used in smart assistant raspberry pi, SD card, cooler, GSM module.

In this project we are using this following components:

1. Raspberry Pi: Raspberry Pi 4 is a dual-display, single-board low-cost computer that is used in robotics and automation. We are using raspberry pi for the private cloud for data storage also we are using SD cards for the operating system and image restoration during facial recognition. The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse.
2. GSM Module: The Global System for Mobile Communications (GSM). If possible we can implement a GSM module in smart assistant for 2g, 3g mobile phones where internet connectivity is unavailable. The GSM module is interfaced with the Raspberry pi 4. GSM module reads the data from the GPS module and sends coordinates to mobile via SMS using a SIM card enabled in the GSM module. Then the location of the user is detected easily using data that has been sent through SMS.

II. LITERATURE VIEW

Speech recognition has several waves of major innovations. Speech recognition for dictation of voice, search, and voice commands has become a standard feature on smartphones and various other devices.

To this aim, a conversational assistant, capable of answering common questions, has been combined with a content discovery engine that is more suitable for finding the proper answers from a collection of heterogeneous sources [1]. Many companies of voice assistants are trying to improve interaction and more features to the next level and many of the youth started using a voice assistant in daily life and from many sources the result showed very good feedback [2]. Smart assistants are useful in many fields such as education, home appliances, etc. and the voice assistant is also useful for blind people. They can get any information just by telling the assistant, and this is possible because voice-based Smart assistants. We are using raspberry pi for SSH and different module connections. Raspberry pi is a low cost and small size computer that plugs into a computer or monitor with the help of connectors and standard keyboard and mouse. Raspberry pi having 40 GPIO pins on its

hardware module [3]. It is based on the voice as the research object, it allows the machine to automatically identify and understand human spoken language through speech signal processing and pattern recognition [4].

III. METHODOLOGY

This section represents a detailed project plan and its implementation carried out to design the smart assistant. The following block diagram for project:

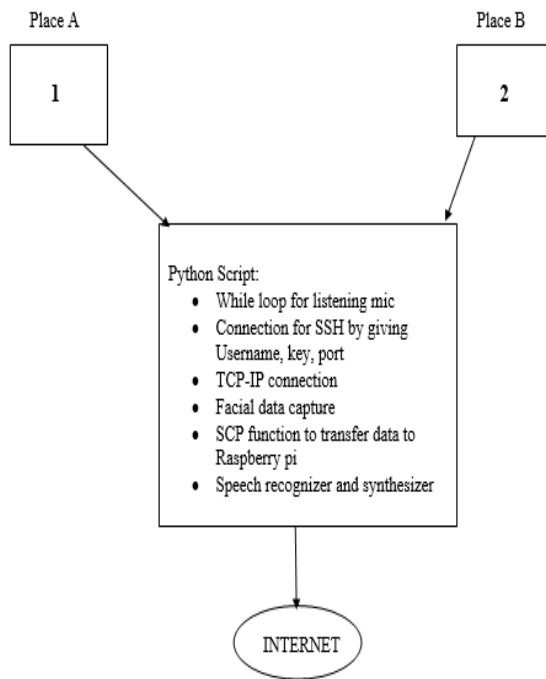
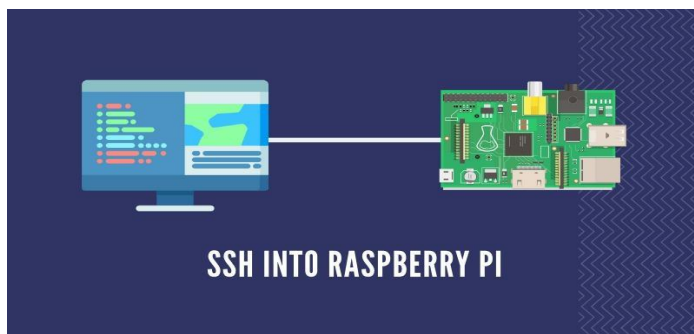
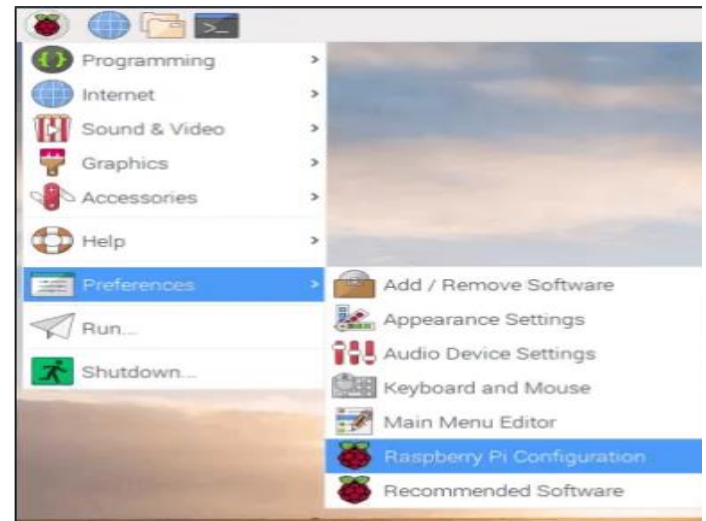


Fig. 1: Front END



window through the menu. After that go to Advanced Options to select enable SSH.



Step 2: Find the IP Address of Raspberry Pi 4 using the old if configuration command or you can also use the IP address.

```

pi@Pi05:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.2.105 netmask 255.255.255.0 broadcast 192.168.2.255
    inet6 fd04:636e:6311:ba27:ebff:fea0:d48c prefixlen 64 scopeid 0x0<global>
    inet6 fe80::ba27:ebff:fea0:d48c prefixlen 64 scopeid 0x20<link>
    ether b8:27:eb:a0:d4:8c txqueuelen 1000 (Ethernet)
    RX packets 2519 bytes 211449 (206.4 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 5743 bytes 6757404 (6.4 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 21 bytes 1244 (1.2 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 21 bytes 1244 (1.2 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

pi@Pi05:~$
  
```

Step 3. SSH into your Raspberry Pi 4 Now that you have enabled SSH and found out your IP address you can go ahead and SSH into your Raspberry Pi 4 from any other computer. Also need a password and username for the Raspberry Pi 4.

Username and Password is:

Username: pi

Password: raspberry

Steps:

Step 1: Enable SSH on Raspberry Pi SSH is disabled by default in Raspberry Pi 4, hence you'll have to enable it when you turn on the Raspberry Pi after an installation of Raspberry. Go to the Raspberry Pi configuration

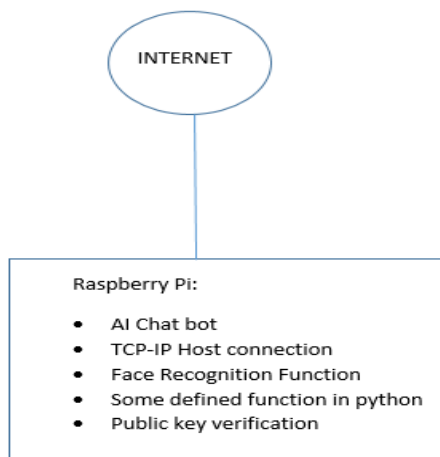
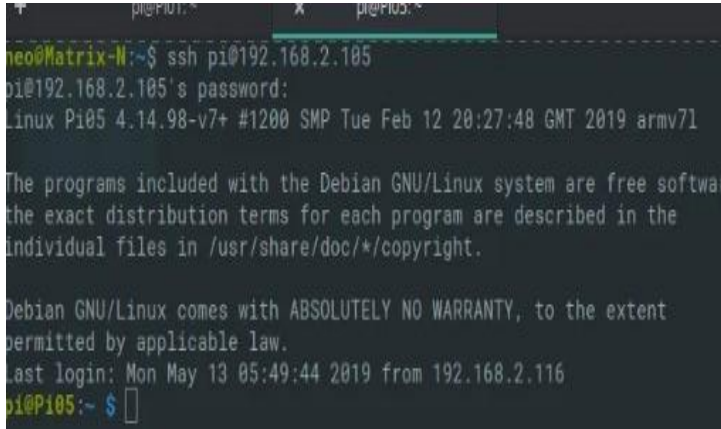


Fig. 2: Back END

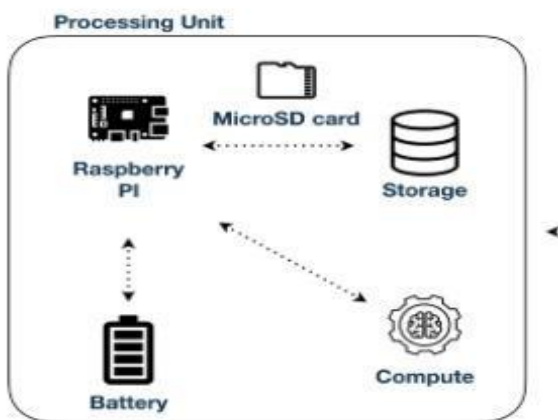


Fig. 3: Face detection using OpenCV and raspberry pi 4

Install open-source face recognition library on Raspberry Pi Connect two Internet of Things devices.

In the end, we have two devices that will communicate with each other using Socket Programming in order to capture and process the images.

It will help to set up Raspberry Pi 4 connect via Wi-Fi and enable SSH.

- First we have to install OpenCV-python. To start, we need to get OpenCV onto your Raspberry Pi.
- We need a 32 GB SD card for operating system installation and for image storage
- The way image recognition works are we first need to "train" a classifier like we would with any machine learning algorithm.
- In the case of faces, we'd want to grab 100 images of faces. After image processing, smart Assistants find the data if you are registered they are allowed using the smart assistant.

IV. CONCLUSION

In This paper, we have discussed voice recognition algorithms and how we enable SSH on Raspberry Pi 4 and Face detection using OpenCV and raspberry pi. Smart Assistant has various functionalities of mobile devices like network connection and managing various applications on just the voice commands. Smart Assistant Contains various key features like Voice Detection, Keyword Learning, etc. which are helpful for end-users to use Multiple functionalities. All the technical and implementation details are described to understand the system. Thus we have developed a Smart assistant such that most of the user tasks are now implemented at the user's command easily.

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YouTicle

Mayur Patil¹, Aditya Patil², Heena Surti³, Asst. Prof. Rajat Singh⁴

^{1, 2, 3}Student, ⁴Assistant Professor, Them College of Engineering, India

Abstract: YouTicle. This app is very helpful for both type of users i.e., Creators and Quality content seekers. YouTicle is stands for YouTube+Article creators can submit their videos and related article to us, and our app will show the videos in segregated way in various types of categories.

Keywords: YouTicle, Watch time gainer, YouTube video playlist, Watch time userbase gainer, Custom Article

I. INTRODUCTION

YouTicle is nothing but a platform to the creators and audience who wants personalized content in easiest way., This is a Android based application with lots of personalized content. Having various types of categories, it is the treasure of quality and original content to the content seekers, and it is helpful for the new creators to gain the audience.

II. MOTIVE

The YouTicle app is all about its audience and the creators whose content will be featured on the YouTicle app with respect to the video's category. The main motive behind this application is beneficial both for Content creators and the Audience. This application will bring the most creative and original content handed to the end users.

III.PLAN OF ACTION

The plan behind this is to get more exposure to the new content creators and to give better content to the end user. This app is having Three Dimensional good for content creators, good for end users and good for the app developers. The app is having free listening on the platform in various categories which will be freely accessible to the app users.

IV.MODE OF WORKING CONCLUSIONS

This application is work on Android System on front end and It is having Php Admin panel in backend. The admin is having permission to submit the videos submitted by creators. For this YouTicle.in website is formed, and it cover all necessary steps for the creators. The End user can download the app from play store by searching YouTicle and can install it on their smartphone. The app is very user friendly and having dark mode as well as light mode with customized notification for users to get notification whenever there is any new video is featured.

V. CONCLUSION

The YouTicle app is helpful for creators and its bug free also the app is the booster for the new creators. The slogan of the app Watch, Grow, and Support fulfills the meaning of the motive behind the app. This app is having potential of commercial success as Startup.

VI.ACKNOWLEDGEMENTS

Thanking our project guide Mr. Rajat Singh Sir for the extended support in the development of our App YouTicle. We acknowledge our HOD Mr. Tanzeem Sayyed and Principal Dr. Aqueel Shah for giving this opportunity.

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Biometric Attendance using Face Recognition

Aditi Mulik¹, Priyanka Katkar², Sapna Mishra³, Prof. Ansar Shaikh⁴

^{1, 2, 3}Student, ⁴Guide, Information Technology Dept, Theem College of Engineering, Boisar(E), Thane

Abstract: Facial recognition attendance have made great impact in today's changing world. Attendance using Real-Time Face Recognition is the need of the hour for efficient management of handling student attendance. Face recognition-based attendance system is a process of recognizing the students face for taking attendance by using face biometrics based on high-definition monitor video and other information technology. In our project a system will do human faces detection and recognition efficiently and accurately through the images or videos that are being captured through a surveillance camera.

Keywords: Attendance, biometrics, recognition.

I. INTRODUCTION

In face recognition various algorithms and techniques have been developed for detection of face. Here image processing along with open-cv is used for face detection. Images of students faces are generated for new user registration and training the model. Biometric is being widely used in various sectors due to its effectiveness in attendance system and easy working. With the wide use of image processing and LBPH algorithm the machine trains itself for identification purpose. Attendance is an important aspect in every sector for tracking and maintaining data of people along with their availability.

Also, with great improvement in the field of the machine learning training the machine and overall attendance system working. Previously the attendance of the students was maintained in manual form. The traditional method was very time consuming for teachers where teachers were required to take attendance by calling names and numbers. So to improve the attendance experience along with efficient attendance automated attendance system using biometric proves beneficial.

System and Automated Attendance System. Biometrics has boost up the attendance system which was previously very time consuming due to traditional old methods. Due to automated attendance lot of time is saved along with secure and precise attendance.

Many private, commercial as well as government sectors make use of biometrics. Attendance system has become much easier and more convenient due to use of biometrics.

II. LITERATURE SURVEY

A. Attendance using Artificial Neural Network

In this paper we learned about attendance system using neural network. In the implementation of neural network pca algorithm for data extraction and for identifying face images. Thus, artificial neural network is used for identifying output from the given input values. It works like a human brain for performing any activity and training the system. Artificial neural network is widely used due to its performance as per the human brain and its accuracy.

B. Biometric Attendance based on Speech

In this paper we learned about attendance system based on speech biometrics. In this attendance system IVR system is used for new user registration and for verification purpose. IVR system allows users to interact with the system through the use of voice i.e speech-based form. IVR system works on the basis of recorded or generated voice notes. The response generated through IVR system is also precise.

With IVR technology attendance has become much simpler. The database of the user is recorded and stored for attendance and verification purpose. A unique code is assigned to each user for attendance purpose. When the user attendance is being marked the code is verified from the database. If the code matches with the code from the database user attendance is marked. Thus, multiple attendance of the users can be marked through this technique. It is very convenient and widely used technique.

C. Attendance using Face Recognition

In this paper we learned about a method where student attendance is done through face recognition technology by using Discrete Wavelet Transform and Discrete Cosine Transform for retrieving facial features of students with use of applying Radial basis function for face recognition. This technique is very precise and gives accurate results by using dwt and dct transform methods.

III. METHODOLOGY

The attendance system based on face detection and face recognition algorithm involved. Here are some of the modules as followed:

- A. Image or video will be recorded to know that every student is present in the image should be seen.
- B. Separate as per the detected images in the class attendance.
- C. Applying lbph algorithm along with image processing for face detection model detect the students faces as output.
- D. In this module automatic attendance, the students seating order should be fixed, so that there will not be any contrast their faces. The device can easily identify the faces.
- E. The proposed system uses OpenCV library. It is an Open-Source Computer Vision Library that is free for both academic and commercial use.
- F. Open CV has a face recognizer class library for face recognition and manipulation.

IV. USE-CASE VIEW OF SYSTEM

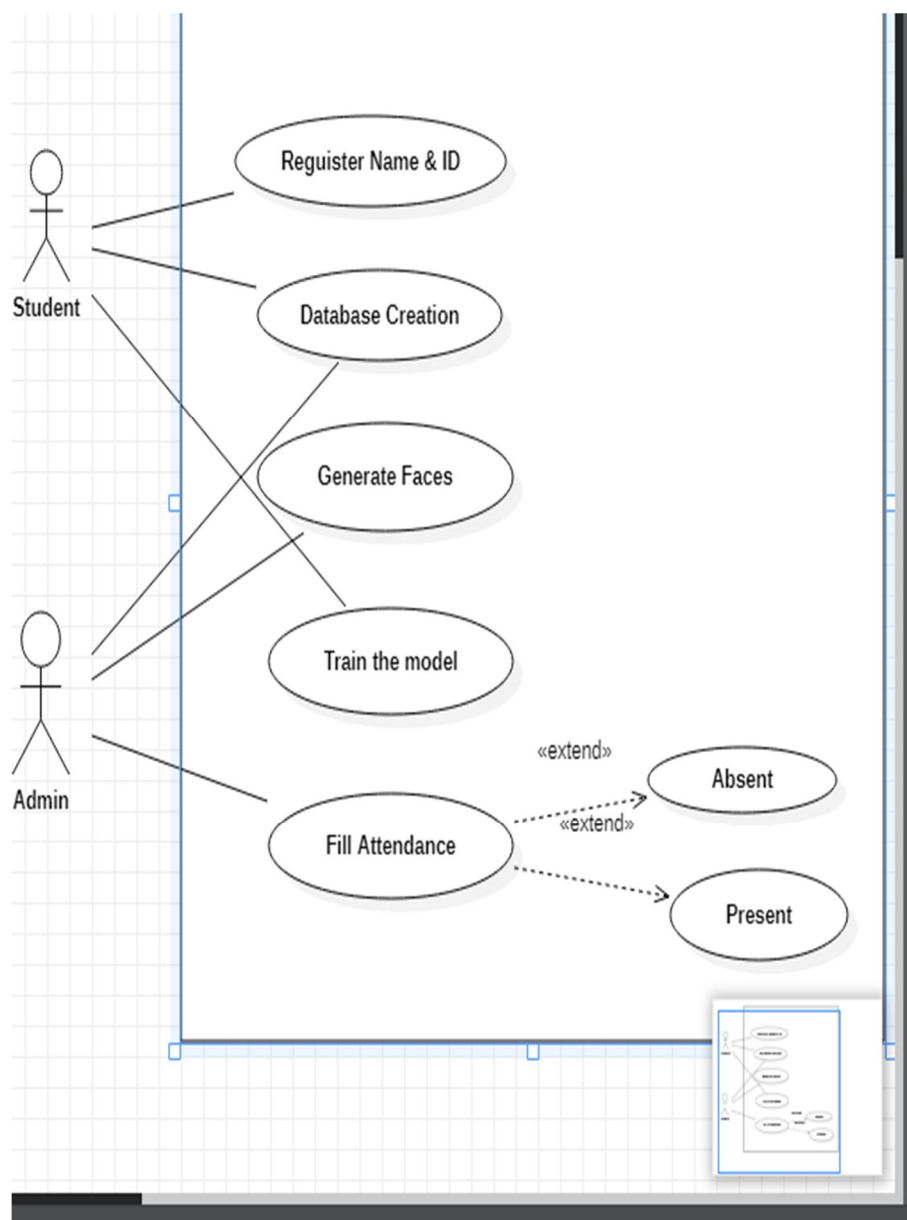


Fig 1 .Use case diagram of attendance system

V. DESIGN PHASE

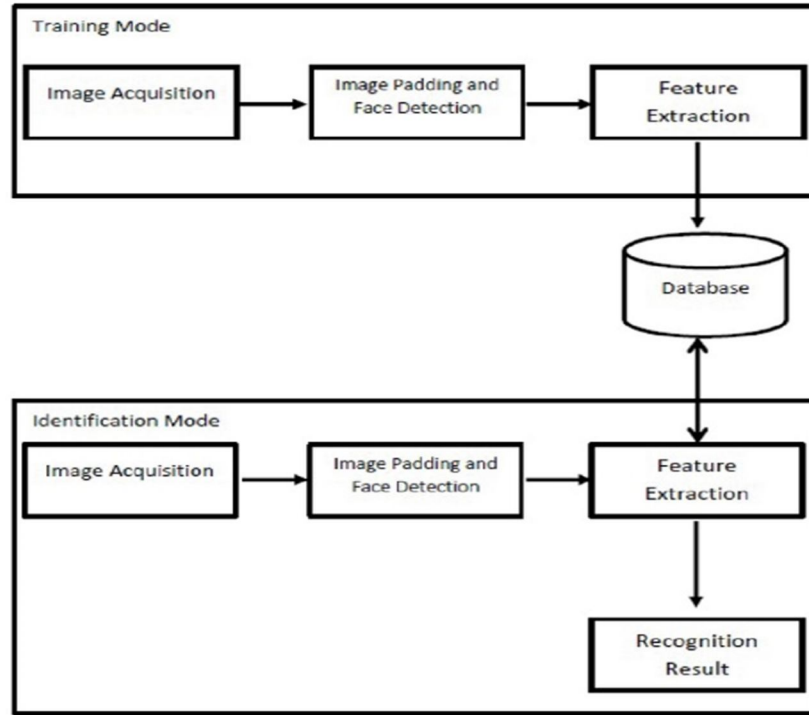


Fig 2. Biometric Attendance System Working

VI. IMPLEMENTATION

The Proposed System has been implemented with the following steps:

- A. Register for new student registration using student id and name.
- B. Generate faces for new user registration through webcam.
- C. Face images will be generated in various angles for identification of person.
- D. Train the model after generation of faces.
- E. All the details of registered students will be stored students in csv file.
- F. After registration and training of model for attendance of the students will be done automatically next time the student face is recognised through webcam and details of the students will be verified with the registered student.
- G. If details match identification and attendance will be done automatically.
- H. After attendance is done students detailed will be displayed along with name, date and time.

VII. ADVANTAGES

A. Increased Productivity

With biometric clocks in place, the need to keep time manually is eliminated. This saves employees time, reduces staffing overhead and provides an accurate picture of labor data to the payroll department.

B. Increased Return on Investment (ROI)

When a company implements the use of a biometric time clock, it will help it achieve a positive ROI.

This is done by eliminating employee theft, eliminating buddy punching and a number of other problems caused by loopholes and inaccuracies in the older types of attendance and time keeping systems.

C. Enhanced Job Satisfaction

There are some situations where employees must work overtime in certain situations so their dedication towards work must be recognized this is possible due to biometrics.



VIII. CONCLUSION

In order to reduce the faculty effort and to manage the time we proposed the Biometrics Attendance System Using Face Recognition. The system takes attendance in a very effective manner automatically through facial recognition improving the efficiency in attendance system than the traditional manner.

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HOME AUTOMATION USING GSM MODULE AND MOTION DETECTOR SENSORS

Vishakha Pagare *¹, Novel Itur*², Rahil Khan*³, Krunal Pimple*⁴

*¹Student, Department of Information Technology Engineering, Theem College of Engineering
Mumbai, Maharashtra, India.

*²Student, Department of Information Technology Engineering, Theem College of Engineering
Mumbai, Maharashtra, India.

*³Student, Department of Information Technology Engineering, Theem College of Engineering,
Mumbai, Maharashtra, India.

*⁴Assistant Professor, Department of Information Technology Engineering, Theem College of
Engineering, Mumbai, Maharashtra, India.

ABSTRACT

Home automation framework accomplished incredible ubiquity somewhat recently and it expands the solace and personal satisfaction. In the current paper, we have planned and executed an ordinary and straightforward Home Automation System using GSM (Global System for Mobile Communication) Innovation that controls electrical gadgets at home from a far-off area by a straightforward cell phone. We accomplished this by sending an SMS to a beneficiary present at home, which is thus associated with an Equipment unit. The SMS got by the beneficiary is communicated to the microcontroller which peruses the message and controls the suitable gadget. This created framework works when there is any movement inside the characterized sensor reach, and it can likewise be controlled through the Portable application. Likewise, we are utilizing an ESP8266 Wi-Fi module used to communicate information over the web, electromagnetic transfers, and the PIR sensor.

The last model is as of now designed with google colleague and GSM Module so the transfers can be set off with the voice as well, and this framework has been effectively evolved, and the functioning model has been tried with different experiments.

Keywords: GSM Module, Arduino UNO, Node MCU, PIR, Wi-Fi, relays, Arduino, IR, Home Automation.

I. INTRODUCTION

Internet of Things (IoT) is an idea that assists with building a remote organization among the various gadgets got to through the web and different IP conventions. Essentially, IoT makes a biological system among gadgets that makes it available distantly and things in IoT addresses the gadgets, similar to sensors, miniature regulators, and cell phones that are associated with a remote organization. The subsequent organization generally alludes to the Internet of things (IoT). The development of IoT has tackled plenty of continuous issues and have improved the adaptability of different existing frameworks. The advancement of innovation has consistently empowered the utilization of Wi-Fi kills the requirement for wired association and subsequently decreasing the expense and intricacy of the framework. Furthermore, this Internet-based and furthermore off-Internet home computerization framework has been coordinated with an inactive infrared sensor (PIR sensor) which makes the framework work when there is any physical movement. Mainly the project is a concept to bring automation to the home. With an existing home automation system with Google assistant commands, we have upgraded it to a more sophisticated and progressed version. All GSM is one of the most widely used cellular technologies in the world

Also, the status (turn ON or turn OFF) of the associated gadgets can be changed by sending an SMS from the cell phone. After accepting SMS orders through the GSM module, Arduino will change the status (turn ON/OFF) of the gadget that is referenced in the SMS.

II. METHODOLOGY

Basically, our system consists of two systems one is offline and another online system. The offline system consists of a GSM module connected to Arduino UNO. The offline system consists of PIR Sensor and IR Sensor connected to the Node MCU. Both of these systems are connected to a common power supply. In the proposed offline system design, an incoming SMS message is sent from the user phone to the GSM modem as a text message via the cellular network. The GSM modem then sends the commands in text mode to the PIC microcontroller using an RS232 interface. The RS232 voltage levels are at $\pm 12V$, whereas both the microcontroller input and output operate at 0V to +5V. Since RS232 is not compatible with the micro-controller, MAX232 is utilized to enable the communication between both the GSM modem and PIC micro-controller by converting RS232 level signals to TTL level signals. Outgoing messages from the system containing the home appliances status is delivered to the mobile phone through a GSM modem. Among the cellular technologies, the

GSM network is preferred for the communication between the home appliances and the user due to its widespread coverage which makes the whole system online almost all the time.

Another advantage of using the GSM network in home automation is its high-security infrastructure, which provides maximum reliability whereby other people cannot monitor the information sent or received. Hence, this research work implements SMS based control for home appliances using the GSM architecture without accessing the local network. Also, in the online system, a PIR movement sensor has been added to the Node MCU, which identifies the movement inside a defined reach and controls the machines depending on the recognized information sources. This innovation is continually redesigning its adaptability by coordinating modernized highlights to satisfy the expanding requests of individuals. The key role of a home automation framework is to save power. Understanding home automation works with the client open to living and energy management executives includes just as added benefits for debilitated people. Home automation frameworks have a shifting level of knowledge and mechanization. It can go from basic controller of lighting to complex micro controller-based organizations. The basic quality of a home robotization framework is distant observing and access of home machines and frameworks. The proposed home automation framework is moderate, simple to use and agreeable. It has upgraded execution energy-saving highlights. Different techniques have been proposed for the advancement of home automation frameworks. Some Home automation frameworks depict the IoT way to deal with control different home appliances. It utilizes Bluetooth, Wi-Fi and GSM for collaboration between android portable applications and the machines heavily influenced by the framework.

III. PROPOSED SYSTEM OF HOME AUTOMATION USING GSM AND PIR SENSOR.

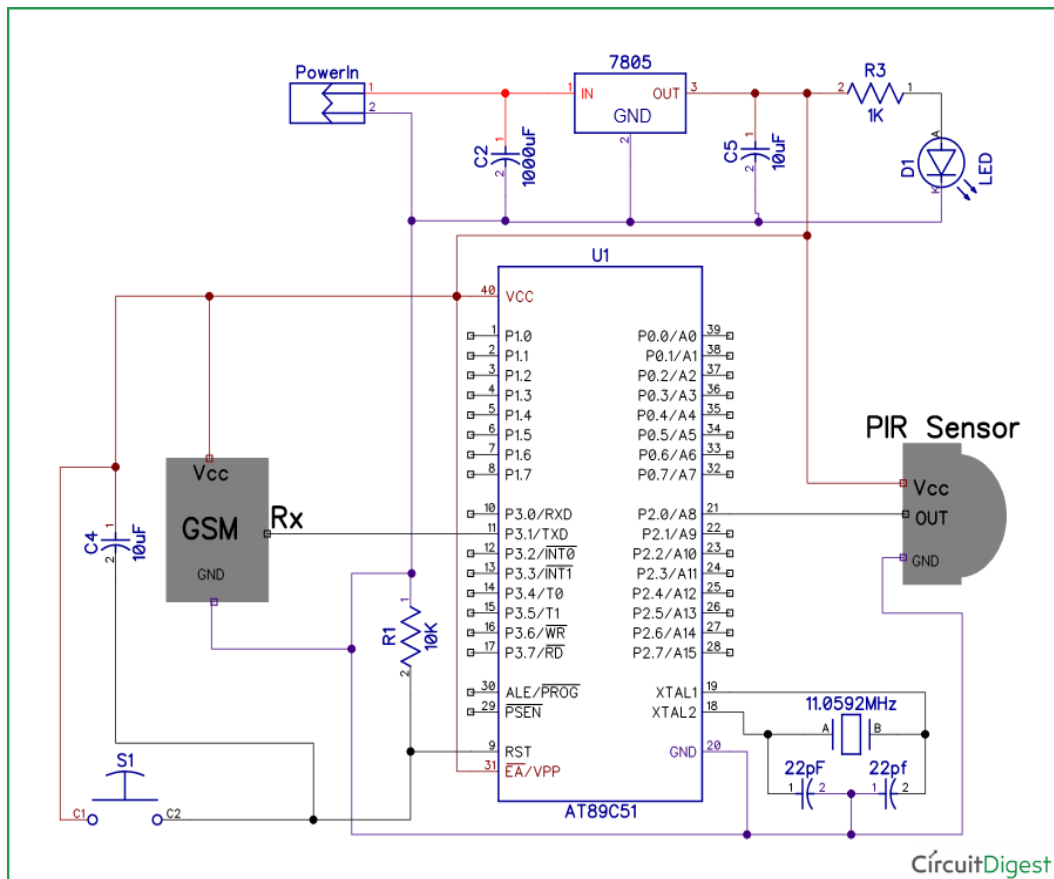


Figure 1: Circuit Diagram of the System.

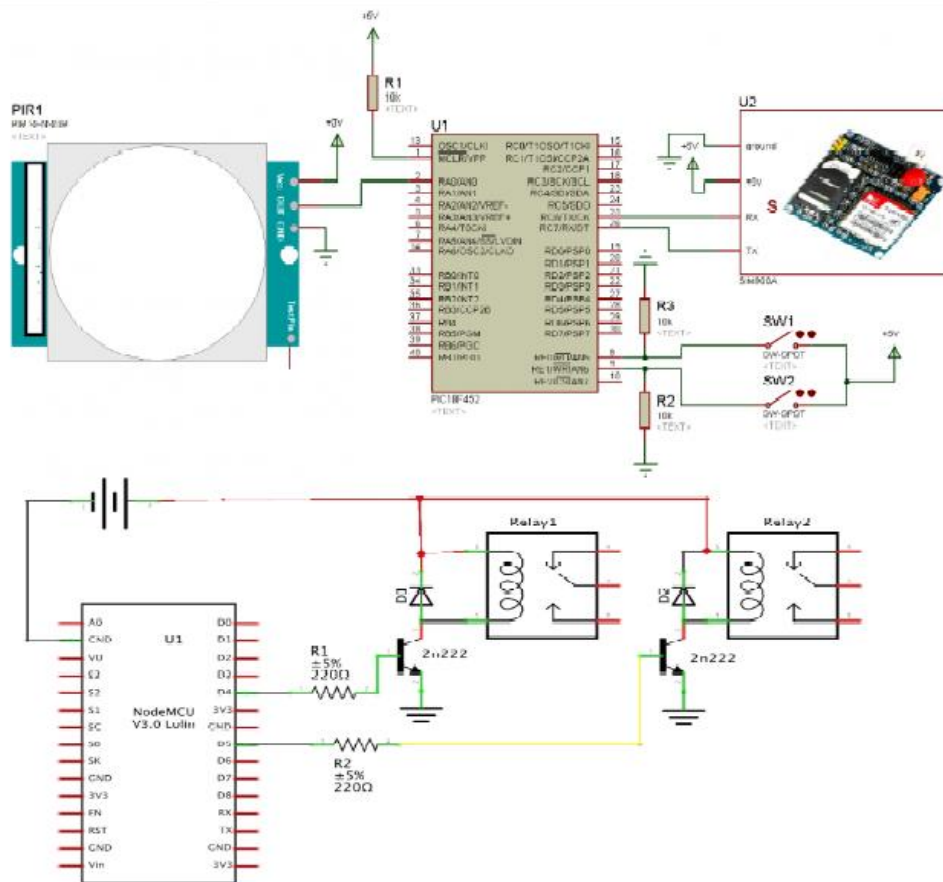


Figure 2: Circuit Diagram of the Entire System.

The Hardware design comprises an independently installed framework that depends on an 8-Bit miniature regulator (ATMega2560) Arduino UNO, Node MCU, a GSM module with GSM Modem (SIM900), a hand-off module, sensors (PIR and IR). The product part includes programming in Arduino and an android put together application run with respect to an android telephone. The GSM modem gives the correspondence media between the mortgage holder and the framework through SMS. The SMS includes orders to be executed. The arrangement of the message is pre-characterized. The SMS message is shipped off the GSM modem by means of the GSM module as an instant message with a distinct pre-characterized design. When the GSM modem gets the message, the orders sent will be separated and executed by the microcontroller. The framework will decipher the orders and turn the machines ON/OFF as needs are through the exchanging module. For the home security and wellbeing framework, if there should be an occurrence of security penetration, fire and gas spillage microcontroller will ring the caution and send a criticism message through the GSM modem to the GSM handset. Home apparatuses are interfaced with NO/NC of the transfer module. Outer 5 volts power supply is accommodated by the Arduino and transfer module and 12 volts power supply for GSM module.

IV. HARDWARE AND SOFTWARE USED

HARDWARE

1. GSM MODULE

SIM 800L is a GSM/GPRS module. It is intended for the worldwide market. At the point when a particular catch is pushed on the GSM home module screen of the application, SMS from Smartphone is shipped off the GSM module SIM800c interfaced with Arduino. In light of SMS sent machines are turned ON/OFF. Simultaneously, Arduino sends the current status of the gadgets by SMS through GSM module to Smartphone.



Figure 4: GSM Module

2. GSM Mobile Handset

A phone containing SIM (Subscriber's Identifying Module) card has a particular number through which correspondence happens. The method of correspondence is remote, and the instrument deals with the GSM (Global System for Mobile correspondence) innovation. Here, the client sends guidelines to the framework to control the machines as SMS through an android application.

3. Relay Module

A relay module is utilized to turn on or turn off home appliances, using voltage and additionally current considerably more than Arduino could deal with. This is likewise utilized for giving segregation between the low-voltage circuit on the Arduino side and the high-voltage circuit side controlling home machines. The hand-off module is actuated by utilizing an outside 5V force supply, which thus controls electrical apparatuses like fans, lights, stoves, and so on in this undertaking 8-channel, DC 5V transfer module is utilized. It is furnished with a high current transfer, AC250V 10A and DC 30V 10 A.



Figure 5: Relay Module

4. Power supply circuit

The fundamental unit of any electronic framework is the force supply, which gives the capacity to the framework's activity. In this project, a +5V supply is utilized for the Arduino and hand-off module. +12V power supply is utilized for GSM module SIM 800L.

5. PIR Sensor

A Passive infrared sensor (PIR sensor) is an electronic sensor that acts infrared (IR) radiation in its field of view from objects. They are the most used moving identifiers dependent on PIR. These sensors are generally used in security alerts and programmed lighting. PIR sensors sense general development, yet don't have data on who moved for sure. A functioning IR sensor is important for this reason. PIR sensors are for the most part alluded to as "PIR" or now and then as "PID" for "detached infrared finders." The term aloof alludes to how PIR gadgets for identification don't transmit energy, all things considered, they work completely by identifying infrared radiation (brilliant warmth) discharged by objects or reflected from them.



Figure 6: PIR Sensor

6. IR Sensor

IR sensor is an electronic gadget that emits light to detect some object of the environmental factors. An IR sensor can quantify the warmth of an item just as to recognize the movement. Typically, in the infrared range, every one of the items passes off warm radiation. The producer is essentially an IR LED (Light-Emitting Diode) and the locator is just an IR photodiode. The photodiode is touchy to IR light of a similar frequency which is transmitted by the IR LED. At the point when IR light falls on the photodiode, the protections and the output voltages will change in relation to the extent of the IR light.

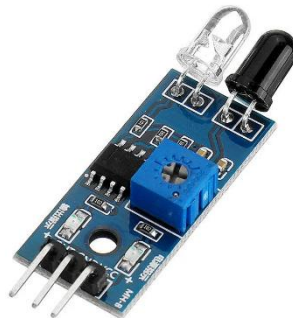


Figure 7: IR Sensor

7. Node MCU

ESP8266 is an open-source Wi-Fi empowered module that is based on top of the maker's exclusive SDK. The firmware gives a basic programming climate, which is an extremely straightforward and quick rearranging language that makes the ESP8266 champion. The board has an implicit micro-USB port, a hard reset button, Wi-Fi radio wire, LED lights, and standard-sized GPIO (General Purpose Input Output) sticks that can be connected to our planned board. It has a Processor called the L106 32bit RISC chip centre dependent on the Tensilica Xtensa Diamond Standard 106Micro running at 80 MHz and has a memory of 32 Kbit guidance RAM. IEEE 802.11 b/g/n Wi-Fi module proves to be useful with this module, which acknowledges most of the data transmission



Figure 8: Node MCU(ESP8266)

8. Led Bulb

The incandescent light bulb or lamp is a source of electric light that works by incandescence, which is the emission of light caused by heating the filament.



Figure 9: Light Bulb

Flowchart of GSM Module Connected with the Arduino Board and Home Appliances.

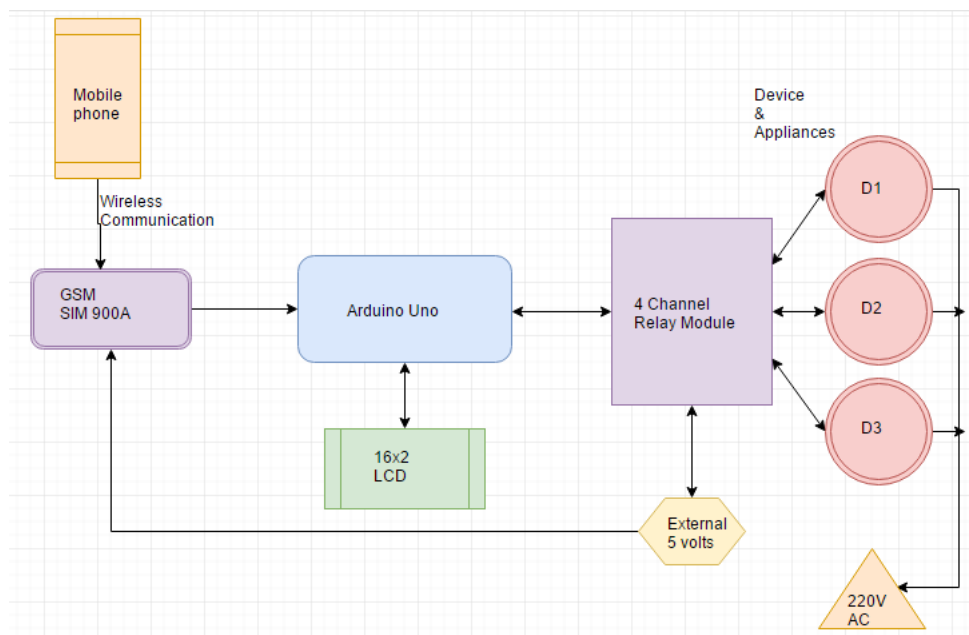


Figure 10: Flowchart of Arduino and Appliances.

Diagram of PIR Sensor and Node MCU

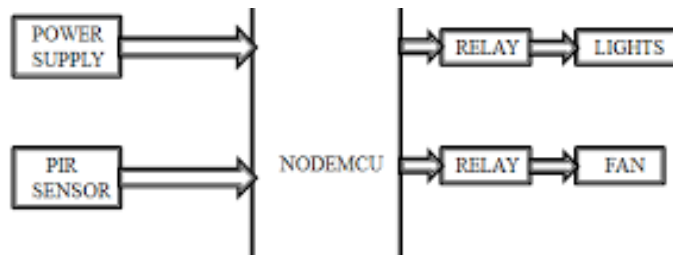


Figure 11: Flowchart of PIR Sensor and Node MCU.

SOFTWARE

Arduino IDE

The program created through Arduino's IDE has been utilized as an interface between the micro-controller, node MCU, and Arduino UNO of this task to improve its exactness. We have transferred the created program into the hub MCU and Arduino UNO through Arduino's IDE and interfaced the module to their separate on the web and disconnected frameworks. Moreover, the program to adjust the PIR sensor has been taken care of into the Arduino and furthermore the PIR sensor has been associated with the hub MCU module through Arduino UNO using its I\O pins. At long last, this interaction proceeds with the activity and the framework shapes a circle to its underlying condition.

GSM Receiver (SMS)

Another software is sending messages through the GSM module. The point is to control electrical gadgets at home, from a distant area by a straightforward cell phone. We accomplished this by sending an SMS to a recipient present at home, which is thus associated with an equipment unit. The SMS at that point got by the collector is sent to the microcontroller (present in the unit) using a sequential port. The miniature regulator at that point peruses the message got and controls the gadget. To accomplish this, Microcontroller (Arduino UNO) is coded with a program (written in Arduino IDE). This program is put away in the flash memory which is inbuilt into the microcontroller. The micro-controller additionally has I/O ports, which are used to control the condition of the output gadgets. The gadgets are associated with the microcontroller through relay circuits so the motherboard is shielded from solid opposite flows on the off chance that high voltage apparatuses are utilized.

V. IMPLEMENTATION

The final project was implemented successfully with internet and without internet, the messages were successfully sent and received at the mobile phone through our GSM module and the program loaded in the Arduino UNO. The bulb was turned on and off after sending the commands to do so, Home appliances can be connected easily through our GSM module and can be operated easily without internet which solves the problem of internet issues. The second implementation was successful too with our sensors. Our hand gesture program was already loaded into the node MCU and when the sensors sensed the hand wave, they turned on the light as per added into the program.

It was a major difference to upgrade a whole existing system into a much more capable system. We acquired the problems based on the research and then we thoroughly put forth the idea where these problems can generally be solved. The first step we took was to implement this operating home appliances through a mobile phone without internet. After that to make a system more reliable we put hand gestures to be sensed by the sensors and that will make the appliances work more easily. The whole system implementation was taken out perfectly and carefully.

VI. CONCLUSION

Nonetheless, the functioning model of our home automation framework has been tried and executed. Since it includes a PIR sensor, the equipment works just if there is any actual movement inside the defined range. As a future upgrade, we are likewise chipping away at designing the ultrasonic sensor (HC-SR04) with this model permitting us to evoke information, for example, distance to and from an article/human and with that information the exactness of human movement discovery can be improved. To summarize everything, maybe this model may sound basic, yet the idea driving this is a huge change. We have worked on the planned home automation framework to control electrical gadgets using an inserted circuit found distantly through an SMS. This anyway is just a model of the innovation that has sweeping results. Further step-up of the work is to break down the continuous reaction to occasions dependent on the speed viewpoint. Likewise, more gadgets are to be

incorporated for control. Further, the organization for SMS records and their important fields is to be very much characterized.

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Experimental Analysis of Agricultural Data using Data Mining

Sakshi Sankhe¹ Kanchan Sharma² Kaushalya Shettiyar³ Sagar Bhavsar⁴

^{1,2,3,4}Department of Information Technology

^{1,2,3,4}Theem College of Engineering (Mumbai University), India

Abstract— In the agriculture field farmers and agribusinesses have to make numerous decisions every day and complexities involve the various factors impacting them. Data mining techniques are the approach necessary for fulfilling effective solutions for this problem. Data Mining is a technique that focuses on large datasets to extract information for the prediction and discovery of hidden patterns. Agriculture mainly depends on climate or weather, agricultural topography, etc. The current study presents the numerous data mining/refining techniques and their role in the context of soil fertility, nutrient analysis. A decision tree is a good way for classification in data mining. C4.5, Classification and Regression Trees (ID3) are two mostly used decision tree algorithms for classification. ID3 algorithm produces misclassification, the main drawback of the C4.5 algorithm is that errors when the domain of the target attribute is very large. This paper therefore presents a modified decision tree algorithm to reduce limitations. The model is tested with the data set of soil samples. The test proves that the modified decision tree algorithm has higher classification accuracy when compared to C4.5 and ID3 algorithms. Classification of soil is that the separation of soil into classes or groups each having similar characteristics and potentially similar behavior. Classification of soil is needed so that farmers can know the type of soil and can plough the crops depending on the type of soil.

Keywords: Data mining, agriculture, data analysis

I. INTRODUCTION

Data mining is the technique by analyzing the interesting and unknown patterns in a large volume of datasets from outlining the useful information from various perspectives. Extracted knowledge from different data sets is used for better decision-making in critical situations. Data Mining techniques will be used for prediction the longer-term trends of agricultural processes. Data mining techniques are of two types, one is descriptive which considers the existing data and another is predictive which depends on probability for future analysis.

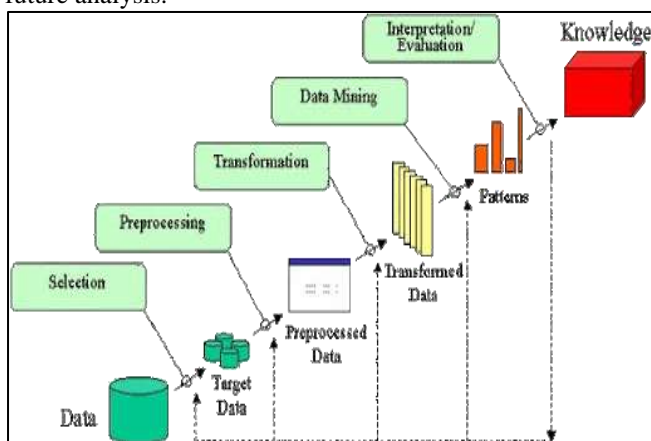


Fig. 1: Typical Data Mining Processing

The Data Mining process involves

- (1) Collect, clean, and load the data into the data warehouse system
- (2) Stores the data in multidimensional format
- (3) Provides information access to analysts and decision-makers
- (4) Analysis of data using different applications
- (5) Presents the data using different Patterns

II. BACKGROUND

Today, India ranks second worldwide in farm output. Agriculture is the widest economic sector and it plays a crucial role in the overall socio-economic of India. The analysis of comparing organic and conventional agriculture yield data showed that currently, individual crops of organic yields are on average 80% of conventional yields. The analysis of 362 datasets also showed a high difference of the yield gap of organic agriculture standard deviation is 21%. Some of this variation seems systematic. E.g. soybean, some other pulses, rice, and corn score higher than 80%, and wheat, barley, and potato scoring lower than 80%. Most regions have relative yields fairly on the point of general average.

III. PROBLEM DEFINITION

In the current scenario, there's no such recommendation system available online. And also farmer has to physically go and get a recommendation based on their soil report by quality executives. In this project, we've got suggested an analysis of the soil information using Decision Tree algorithms and prediction technique. By using the Decision tree algorithm, we recommend farmers about their field soil quality and suggest crops that are suitable to grow in that soil. The use of information technology in agriculture can change the scenario of decision making and farmers can yield in a better way.

IV. OBJECTIVE

The objective of the proposed work is to analyze the agriculture data using data mining techniques were to characterize and classify the soil to provide more details about the quality information of soil. An additional objective of this study was to seek out approximate crops that can be growing in that field. This study was to characterize and classify the soil to provide more details about the subsurface morphological information.

An additional objective of this study was to seek out an approximate value of soil loss from the Lower Moshe Irrigation Scheme using Universal soil loss.

V. LITERATURE SURVEY

We have undergone certain research papers based on the Experimental Analysis Of agricultural Data Using Data Mining and found out a certain methodology and key

findings. During the process, we have also identified certain research gaps which we can overcome while implementing our project.

Ref no.	Paper Title	Author	Year Of Publication	Key Findings	Research Gaps
1	Analysis Of agriculture data Using Data Mining	Lucinda Edwards & Carolina Eriksson	2017	Various data mining techniques are implemented on the input data to assess the best performance yielding method. The present work used data mining techniques PAM, CLARA and DBSCAN to obtain the optimal climate requirement of wheat like optimal range of best temperature, worst temperature and rain fall to achieve higher production of wheat crop.	Clustering is considered as an unsupervised classification process. A large number of clustering algorithms have been developed for different purposes. Clustering techniques can be categorized into Partitioning clustering, Hierarchical clustering, Density-based methods, Grid-based methods and Model based clustering methods.
2	Analysis Of Soil Behaviour and Prediction of Crop Yield using data mining approach	Sugriya Dm., Karnataka	2016	The researcher express that large amount of data which is collected and stored for analysis. Making appropriate use of these data often leads to considerable gains in efficiency and therefore economic advantages.	The researchers implemented K-Means algorithm to forecast the pollution in the atmosphere, the K Nearest Neighbour is applied for simulating daily precipitations and other weather variables and different possible changes of the weather scenarios are analyzed using Support Vector Machines.
3	A Survey On Predictive Analysis in Agricultural soil data to predict the best fitting crop	A. Agrawal, J. Basak, V. Jam R. Kothari	2018	Soil classification was measured serious to study due to depending upon the fertility class of the soil domain knowledge experts determines which crops should be taken on that particular soil and which fertilizers should be used for the same.	suggested an analysis of the soil data using different algorithms and prediction technique.
4	Data Mining Technique to Predict the Accuracy Of the Soil fertility	Dr. S Hari, Dr. Jayashree	2017	The research studies on application of data mining techniques in the field of agriculture. Some of the techniques, such as ID3 algorithms, the k nearest neighbour, artificial neural networks and support vector machines applied in the field of agriculture were presented.	This article explores the applications of data mining techniques in the field of agriculture and allied sciences. Historical crop yield information is important for supply chain operation of companies engaged in agriculture were presented.
5	Data Mining in Agriculture prediction soil fertility	Dr. Shrivashi M., Dr. Maithili M.	2017	A soil test is the analysis of a soil sample to determine nutrient content, composition and other characteristics. Tests are usually performed to measure fertility and indicate deficiencies that need to be remedied.	In this paper demonstrated a comparative study of varied classification algorithms i.e. Naive bayes, J48 (C4.5), JRip with the assistance of data mining tool J48 is incredibly easy classifier to form a decision tree.

Fig. 2: Table of Literature Review

VI. METHODOLOGY

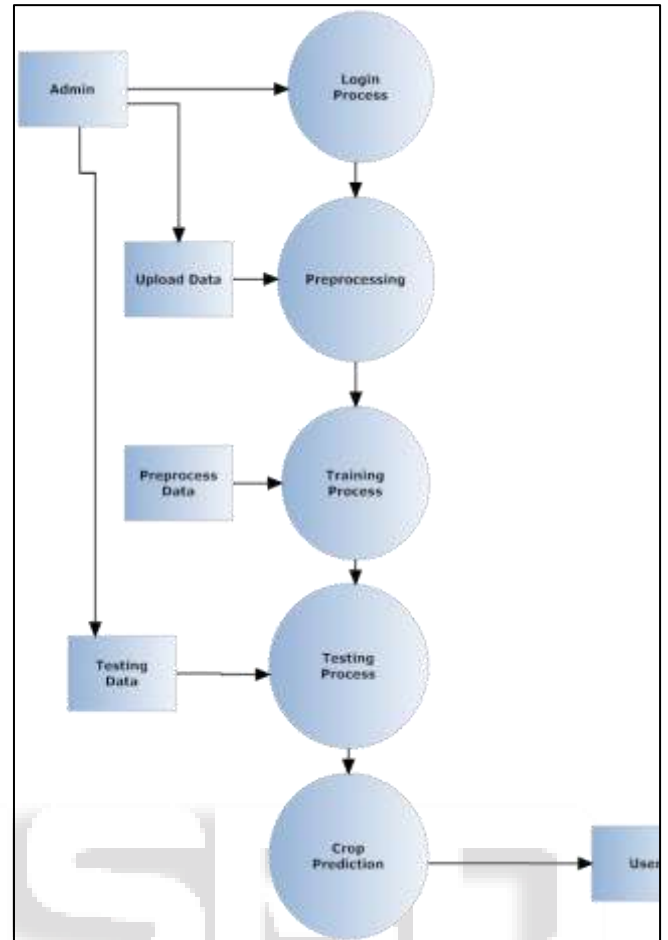


Fig. 3: Methodology Block Diagram for Analysis of Agricultural Data using data mining

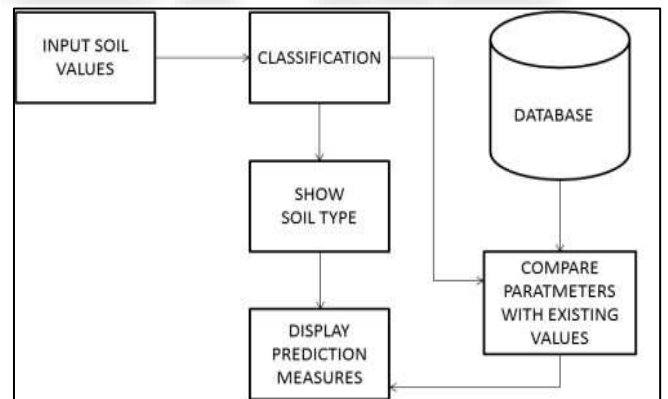


Fig. 4: Soil Classification

VII. ALGORITHM IMPLEMENTED

A. Decision Tree Algorithm

These algorithms find alternative ways to separate the information into partitions. It is the foremost widely known supervised learning technique. In this project, we've got suggested an analysis of the soil information using Decision Tree algorithms and prediction technique. By using the Decision tree algorithm, we recommend farmers about their field soil quality and suggest crops that are suitable to grow in that soil.

B. Regression Tree Algorithm

The Regression Tree Algorithm can be used to find one model those results in good predictions for the new data. These methods work by creating multiple diverse regression models, taking different samples of the initial data set, and so combining their outputs. It models a target prediction value based on independent variables linear regression performs the task to predict a dependent variable value (y) based on a given independent variable (x). We have used the algorithm to predict rainfall based on the previous year's rainfall data.

VIII. RESULT AND DISCUSSION

This project is basically related to the use of information technology in agriculture which can change the plot of decision making and farmers can yield in a better way. For decision-making on overall issues related to the agriculture field; data mining plays a vital role. The survey discussed the role of data mining in terms of the agriculture field. We have also discussed various varieties of soils, several processing techniques in agriculture and soil containment.

IX. CONCLUSION

Usage of technology during agriculture can change the standard and scenario of deciding making and farmers can yield in a better and convenient way. Data mining plays a crucial and lead role in decision-making on several issues related to the agriculture field. It discusses the role of data mining in the agriculture field and their related work in context to agriculture. It also discusses different data mining applications in solving the different agricultural problems. In this project, we've got suggested an analysis of the soil information using Decision Tree algorithms and prediction technique. By using the Decision tree algorithm, we recommend farmers about their field soil quality and suggest crops that are suitable to grow in that soil. Agriculture is of the utmost important area especially in a mellowing country like India. The use of information technology in agriculture can change the scenario of decision-making and farmer scan yield in a better way. For decision-making on overall issues related to the agriculture field; data mining plays a vital role. The survey discussed the role of data mining in terms of the agriculture field. We have also discussed various kinds of soils, several processing techniques in agriculture and soil containment.

X. FUTURE SCOPE

Due to technology become the main role in the field of agriculture there are a lot of methods and approaches to easier agricultural-related tasks. The system "crop prediction using data mining technology" is developed and tested successfully and satisfies all the requirements of the client. The goals that are achieved by the developed system are:

- Simplified and reduced the manual work.
- Large volumes of data can be stored.
- It provides a smooth workflow. We can add a device to get values directly from the soil testing lab to the server. We can add a module if any queries are there, the staff can directly interact with the administrator very easily.

- It helps farmers in providing the historical crop yield record with a forecast reducing the danger management.

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FUTURE PREDICTION OF STUDENT PLACEMENT USING MACHINE LEARNING

Rajat Dharmandra Singh*¹, Monarsh Patil*², Jayant Naik*³, Kajal Kadam*⁴

*¹Guide, Department Of Information Technology, Theem College Of Engineering, Palghar, Maharashtra, India.

*^{2,3,4}Department Of Information Technology, Theem College Of Engineering, Palghar, Maharashtra, India.

ABSTRACT

Students in college aspire to obtain job before they leave the college. The machine learning techniques can be used to predict a student's placement performance. The ability to predict the performance of a student in placement is a very important task for educational institutions. Prediction about the probability of a student getting placed can be determined by applying different machine learning algorithm. Different classifiers used in system predict the results independently and then compare results for increasing the accuracy of the algorithms, which is based on the data set. After performing analysis on different matrices by different machine learning algorithms, we are able to compare various algorithm and can find which algorithm is performing better on the student data set. Hence it can be helpful to improve the student placement performance in education sector.

Keywords: Machine Learning, Data Mining, Prediction, Multiple Linear Regression, Random Forest.

I. INTRODUCTION

Engineering students starts to feel the pressure of placement as they approaches fourth year of engineering. They constantly feel the need to improve their skills and to know where they stand among pool of students graduating in the same year. The main objective to build the system is that it can be helpful to increase progress in student performance, So students can analyse their strengths and weakness and work on it inorder to secure a good placement in the near future. With the increased use of computers and internet, there has been a huge increase in data that is publicly available. Large amount of data present can be problem as well as opportunity; it depends on how it is used. The problem is that it is strenuous for humans to analyse such large amount of data while the opportunity is that this data can be very easily processed by computers as it is stored digitally in a specific format. Also computers can process data efficiently and faster than humans. The machine learning basically revolves around this concept. This paper presents an overview of the various machine learning techniques that can be used to predict a performance of student's placement. The ability to predict the performance of a student accurately and effectively is an essential for all educational institutions as future of students depends on it and also reputation of colleges depends on it. The proposed system can be used to predict the probability of students for the getting placed. This system uses the machine learning classifier: Random Forest Classifier, Multiple Linear Regression.

II. LITERATURE SURVEY

In Indian education system having good overall performance is a very important for higher education. We don't have any fixed standard to evaluate the student performance. Institutions evaluate the student performance on basis various criteria, like some institution uses of internal assessment and examinations as well as co-curricular activities to evaluate the performance of students. In India, good academic record forms basis for everything specially jobs and getting admission in an institution with the higher degree of reputation. There are multiple of definitions of student's academic performance prediction according to different authors. Different authors use different student factors and attributes for analysing student performance. Most of the author used CGPA, Internal assessment, External assessment, Examination final score and extra co-circular activities of the student as prediction criteria. Syed Tanveer Jishan, Raisul Islam Rashu, Naheena Haque and Rashedur M Rahman puts more emphasis on academic performance for prediction of student performance. They have used algorithms like Naïve Bayes, Decision Tree and Neural Network. The efficiency of the system is also increased as they are using multiple algorithm [1].

Shreyas Harinath et al. used two different machine learning algorithms. They used Naive Bayes' classifier, and K-Nearest Neighbours(KNN) algorithm for predicting the placement of student. These algorithms predict the placement of students using machine learning individually and then results are compared for increasing the efficiency of the overall system. This model focuses on improving the technical skills of the students. [2]

K. Prasada Rao et al. proposed the system classification techniques that are used on student database to predict the learning behaviour of the student. This study helps in identifying various types of learners, especially slow learner. So that special attention can be given to them and rectify the failures as early as possible. This paper uses of J48, Naive Bayes, and random forest algorithm. It also compares the result of various algorithm. [3]

Ajay Kumar Pal and Saurabh Pal collected the data for the study and analysis of the student's educational performance basically for training and placement. The authors used different classification algorithm and used WEKA data mining tool. They compared various algorithm and finally stated that naive Bayes classification model is the better algorithm for data based on the placement for students with accuracy of 86.15% and overall time taken to build the model is at 0 sec. As compared with others Naïve Bayes classifier had lowest average error i.e. 0.28. [4]

A.S. Sharma presents the design of a placement predictor using the predictive analysis model called as Logistic Regression. Logistic regression is commonly used for statistical model. It is also used as a classifier in the field of machine learning. The tool used here successfully predicts the probability of a student being placed. It also classifies the dataset based on whether student will get recruited into a company or not. The dataset for determining whether the student can be placed or not consists of variables such as marks obtained in secondary examination and graduation examinations, their demographic information such as resident status and gender of student. The dataset also consist of a placement indicator variable to identify the placement status. [5]

R. Sangha proposed a system to which predicts the eligibility and also the improvement and action that are required by students to get placed in the campus placement. It uses a combination of Fuzzy approach and Rule based classification method. The combinations of this two approaches is applied on the student dataset, which includes academic details and placement details and requirement, to perform the prediction. Initially the values of attributes are defined in terms of linguistic variables, e.g., an attribute "eligibility" could take linguistic values such as {High, low etc.} indicating the possible chances of the students eligibility. A set of rules are built from the dataset using Rule based classification. All the rules in the knowledge base are evaluated to identify the necessary improvements required to become eligible for placement for the required students. [6]

Usually for Educational data mining field, a prediction about student performance is done on academic basis. We need to use different data mining techniques like classification, clustering, rule mining and regression analysis for building such a predictive model. Maria Koutina and Katia Lida Kermanidis, has found the 100% accuracy in prediction the student academic performance with Naive Bayes and K-Nearest Neighbor algorithm. They used attributes like Gender, Age, Marital Status, Number of children, Occupation, Job associated with the computer, Bachelor, Another master, Computer literacy, Bachelor in informatics for predicting the student academic performance. [7]

Hitarthi Bhatt, Shraddha Mehta and Lynette R. D'mello identified attributes that are relevant for predicting the student performance based on quantitative and qualitative aspects of a student's profile. It mainly attributes like CGPA, academic results, technical knowledge and communication skills. They designed a model which can predict the placement of a student successfully. [8]

III. PROBLEM STATEMENT

The general Placement Prediction System considers academic performances as main criteria to predict whether a student can be placed or not. Judging the student only on his academic performances is not the sufficient and also would be unfair for the student, as student may various skills that are extremely important for job. He could be have good aptitude, technical knowledge and good communication skills but might not be good in academic performances. In these case it would be wrong to judge a student based only on his academic performances, also it can be waste of useful talent skills and knowledge. Hence for predicting the placement of a student needs a lot of parameters to be considered. From various literature survey and papers it has been seen that most important criteria for getting selected in campus placements are good technical skills and aptitude

skills. Also academic performances is important but it is not the highest most important in the outcome of student placement.

IV. EXISTING SYSTEM

There are huge number of engineers that graduate every year in India. According to statistics 1.5 million engineers are graduate each year in India. Also there is constant increasing need and demand for IT engineers in the IT industry. But quality of engineers that are produced are not as par the industry standards. There is skills gap between industry standards and graduating engineer. Mostly students are unaware about the skills and relevant knowledge that is required for IT industry. The graduates that have relevant skills and knowledge according to standards of industry is very low. The biggest challenge faced by the student after completing the college or during the final year is getting placements. Also educational institutions plays an important role for helping the students to get placed in good company. It is the responsibility of the institutions to provide maximum chance for its students for placement. The placement cell of an institutions and professor of an institute should take proper and necessary steps to produce a set of students suitable for each company's requirements. A placement prediction system can be used by institutions to aid professors and placement cell to identify the capability of a particular student for the specified job and to bridge gap between demand and supply of skills.

V. PROPOSED SYSTEM

Proposed system predicts student placement with help of historic data of previous students. System analyse the previous years student's historical data and predict placement chances of "current students" and percentage of placement chance of the institution. Students that are having better chance of placement are characterized as "Eligible", if not then "Not Eligible". Proposed system mainly focuses on student knowledge, skill and attitudes for predicting student placement. Proposed system clusters the students based on the various characteristics that are required for job and company. We mainly focus on knowledge, skills and attitude of the students. System makes use of previous data to predict the future. Proposed system is an educational based application that helps the institutes to know the percentage of placements this year and also with little effort of professors and students the chances of increasing the percentage of placement can be increased. The proposed system also minimizes the human effort and is more accurate as it compares he current student's data with the historical data of student getting placed.

VI. METHODOLOGY

The sample data has been collected from our college placement department which consists of all the records of previous year's students. The dataset that is collected consists of over 1000 instances of students. Data is pre-processed. It is a technique that is used to convert raw data into a clean dataset. The data is gathered from multiple sources is in raw format and might not be compatible with system. Hence it is not feasible for the analysis. Pre-processing mainly consist 4 simple yet effective steps.(1).Attribute selection(2)Cleaning missing values(3)Training and Test data(4)Feature Scaling. Processing sense is applying different algorithms to the raw data to find the best results. The software is programmed on JavaScript and Python and Node.js is used as a server-side language.

RANDOM FOREST ALGORITHM: For predicting a value based on history of data, it is necessary to train the prediction model. We chose logistic model as a predictor system hence we will be training the logistic model using following algorithm. It is always good to understand the terms used in algorithm before starting the algorithm. The random forest algorithm acts as an ensemble method in machine learning. The input of a random forest algorithm is a dataset which consists of records, with attributes. Random subsets of the input are created. A decision tree is constructed on each random subset created. The final class of a test record will be decided by the algorithm. Algorithm uses the majority vote technique.

Random forest algorithm makes use of the out of bag error technique. For constructing tree the following algorithm is followed:

1. Let the number of training cases be N , and the number of variables in the classifier be M .
2. We are told the number m of input variables to be used to determine the decision at a node of the tree; m should be much less than M .

3. Choose a training set for this tree by selecting N times with replacement from all N available training cases (i.e. take a bootstrap sample). Use the rest of the cases to estimate the error of the tree, by predicting their classes.
4. For each node in the tree, randomly choose m variables on which to base the decision at that node. The best split is calculated based on these m variables in the training set.
5. Each tree is fully grown and not pruned.

MULTIPLE LINEAR REGRESSION (MLR):

Multiple linear regression (MLR) is also known as multiple regression. It is a statistical technique that uses various explanatory (independent) variables to predict the outcome of a response variable. The main goal of multiple linear regression (MLR) is to represent the relation between the explanatory (independent) variables and response (dependent) variable.

Simple linear regression is a function helps to make predictions about one variable based on the information that is available about another variable. Linear regression can be used only when one has two continuous variables—an independent variable and a dependent variable. The independent variable is the parameter that is used to calculate the dependent variable or outcome. A multiple regression model can be used to several explanatory (independent) variables. MLR tests how multiple independent variables are related to one dependent variable.

The multiple regression model is based on the following assumptions:

1. There is a linear relationship between the dependent variables and the independent variables
2. The independent variables are not too highly correlated with each other
3. y_i observations are selected independently and randomly from the population
4. Residuals should be normally distributed with a mean of 0 and variance σ .

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_p x_{ip} + \epsilon$$

y_i = dependent variable

x_i = explanatory variables

β_0 = y-intercept (constant term)

β_p = slope coefficients for each explanatory variable

ϵ = the model's error term (also known as the residuals)

VII. CONCLUSION

The campus placement activity is incredibly crucial from institution point of view as well as student point of view. The proposed system successfully predicts the percentage of students that are eligible for getting placement. With little effort and steps these percentage can also increase, which is beneficial for student as well as institution. Also to improve the student's performance and chances of getting placed a work that need to be done has been analyzed and predicted using the classification algorithms Decision Tree and the Random forest algorithm are used to validate the approaches. The algorithms are applied on the data set and attributes used to build the model. The accuracy obtained after analysis for Decision tree is 84% and for the Random Forest is 86%. Hence, from the above said analysis and prediction its better if the Random Forest algorithm is used to predict the placement results.

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Cricket Bowling Machine without Electricity

Chandan Pandey¹, Jason Joseph², Noumaan Hawaldar³, Furkan Haji⁴, Prof. Harshal Ahire⁵

^{1, 2, 3, 4}Students of B.E. Mechanical Theem College of Engineering, Boisar

⁵Guide, Prof of Department of Mechanical Engineering Theem College of Engineering, Boisar

Abstract: *In our project, a cricket bowling machine is designed which can provide support to the batsmen to develop their batting skill. The machine will be capable of generating different patterns of bowling. This machine is capable of bowling with season ball also.*

Ball pitching devices have been used in sport practice from many years. The aim of this project is to design a cheapest ball pitching system ever to throw the balls by using manual power at different suitable adjustable speeds for the cricket practice. Typically, balls are thrown from a device using motors, discs and swing can also be set by the operator. The report shows all the design criteria to develop a professional manual powered cricket-pitching machine.

Keywords: *Surprise element, Ball pitching, aerodynamic, dimpled polyurethane ball, gunpowder-powered.*

I. INTRODUCTION

Cricket as you would expect, a lot of the work is invested in one's cricket skills on practice pitches in the nets. To actually be able to improve, every batsman either needs a skilled bowler to bowl at them or a bowling machine.

There is a big difference between a bowler and a bowling machine. A bowler will keep bowling different deliveries, vary the point and pace of delivery, and use a real cricket ball so the batsman can practice. Electric bowling machines, on the other hand, can't be moved around much, and can't use real cricket balls. They use a dimpled polyurethane ball that looks like a slightly large golf ball, which players say doesn't behave like a real cricket ball. It's great at bowling a consistent length so you can work on specific weaknesses, but it isn't ideal to simulate a match situation.

Our bowling machine looks like a metal contraption that belongs on the sets of a medieval fantasy film, but when it bowls should be much harder to face than electric bowling machines. They will get to practice with a real cricket ball, which adds a lot to their training. At the international level, 130kph is not a pace that will trouble any batsman. Bowling machine can't hit 140-150kph, which is the speed most international team fast bowlers bowl at.

The art of cricket bowling is complex and arduous owing to the run-up and ball release time energy requirement to achieve speed and variations. Therefore, human bowlers cannot bowl for extended periods and numerous mechanical bowling machines have been built to help batsmen improve their skills during practice sessions. However, most of these existing machines are designed for spherical balls ignoring the distinguishing physical feature of a cricket ball: the raised equatorial seam, which makes it less of a sphere. The bowlers are known to often benefit from this seam in their pursuit to taking the batsmen's wicket by imparting swing, spin and bounce variations along-with other bowling variables. This lack of the seam consideration creates a void between human and mechanical bowling. In this work, we present design and development of an automatic bowling machine to make mechanical bowling more realistic. This machine ensures ball seam position as well as fulfils other constraints. Ball pitching and seam position accuracy results underscore the suitability of this design to enhance the capabilities of mechanical bowling. This is very close to playing in the nets with a real ball, they don't want the batsman to anticipate and be ready. The surprise element which the bowler creates, that should come in the machine. If I tell (a batsman) that I am going to bowl good-length for 100 balls, mentally he already is going to be prepared. Nobody is going to tell you that in a real match.

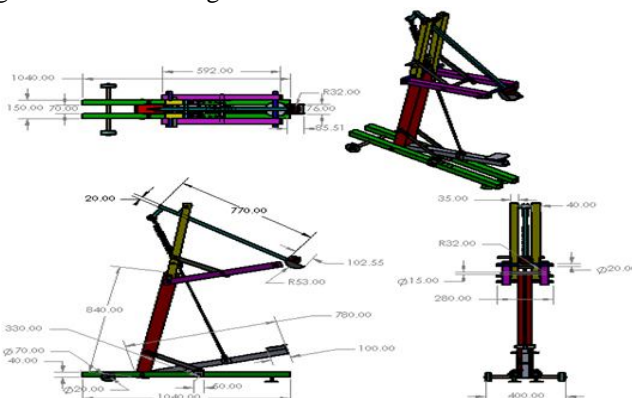
II. LITERATURE REVIEW

The research works related to this problem in several sports are explained below.

In 1897, mathematics instructor Charles Hinton designed a gunpowder-powered baseball pitching machine for the Princeton University baseball team's batting practice.[1] According to one source it caused several injuries, and may have been in part responsible for Hinton's dismissal from Princeton that year.[2] However, the machine was versatile: it was capable of throwing variable speeds with an adjustable breech size and firing curve balls by the use of two rubber-coated steel fingers at the muzzle of the pitcher.[3] Hinton successfully introduced the machine to the University of Minnesota where he worked as an assistant professor until 1900. The arm-type pitching machine was designed by Paul Giovagnoli in 1952, for use on his driving range. Using a metal arm mounted to a large gear, this type of machine simulates the motion of an actual pitcher, throwing balls with consistent speed and direction. One- and two-wheel style machines were originally patented by Bartley N. Marty in 1916.

III. PROPOSED METHODOLOGY

The structure of the architecture diagram is shown in Figure.



When assembled and armed for delivery, it's around 1.7m tall. To arm the Bowling machine, you have to pull its sling down and lock it in position. Then, you push a metal plate down with your leg to lock it in place. Now you can place a ball on the plastic cup on the sling and signal to the batsman that you are ready to bowl. This signal is very important as the Bowling machine's sling moves much faster than any bowler's arm. Then, you pull the trigger and "bowl" the delivery. The rotation of the Bowling machine's arm is quicker than the arm rotation of a bowler. "Playing with this improves (a batsman's) reaction time. You can place the ball with the seam in different positions to simulate different deliveries that bowlers bowl. There's a screw under the plastic cup on the sling, which can be tightened or loosened to adjust the length of the delivery. Similarly, the machine has three hooks, which let you vary the speed between 110 and 140 kmph.

IV. RESULTS

- A. We developed a non-powered system at low cost lightweight, portable, accuracy, repeatability and precision both outdoor and indoor use safety guard is also designed to that machine for safety use
- B. We have make a market research or analysis of the existing products
- C. We designed a new cricket-bowling machine for practice to develop reaction and techniques.
- D. We have set out a comprehensive design methodology for all the phases of the product specification, product planning, product design, and development of the manufactured processes for the technical system.
- E. We now know the aerodynamic of the ball and the force applied to the ball.
- F. We created a conceptual drawing and how to find out a non-powered system to propel the ball in the proper way.
- G. We developed, design and test a non-powered system for controlling the speed.
- H. We created detail CAD drawings.
- I. We produced an assembly drawing for the device.
- J. We defined the manufactured processes and calculated the costing.
- K. We drawn up the conclusion and results for the machine.

Parameters	Traditional bowling machine	New bowling machine
Power required	Consumes electricity	Consumes man power
Weight	45 – 50 kg	30 kg
Size	Bulky	Compact
Mobility	Since it is not foldable, it has less mobility.	It can be folded, hence easy to carry around.
Cost	Over Rs 1 lakh.	Around Rs 20,000
Ball used	Dimpled polyurethane ball.	Leather ball.
Surprise element	Batsman knows which type of ball will be bowled.	Batsman doesn't know which type of ball will be bowled (like in real match).



V. ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to our teacher Mr. Harshal Ahire, who gave us the golden opportunity to do this wonderful project of BOWLING MACHINE WITHOUT ELECTRICITY.

Who also helped us in completing our project. I came to know about so many new things, we are really thankful to them.

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Heat Transfer Analysis of Automobile Disc Brake using Simulation Software

Sanil Kalekar¹, Devendra Prabhu¹, Tejal Raut², Ninad Pande⁴

¹Research Scholar, Theem College of Engineering, Boisar (India)

²Professor, Mechanical Engineering, Theem College of Engineering, Boisar (India)

³FEA & CFD Consultant, (India)

Abstract - Heat dissipation rate of automobile brake disc is studied in this paper. Large amount of heat is dissipated during automobile braking action. The braking energy is converted to heat due to clamping action of the brake pad with the disc. The amount of brake force required to stop the vehicle is calculated in this paper. Heat dissipation through conduction is studied using finite element analysis, also the braking system is optimized by ducting the brakes for forced convection due to inlet ramming air is studied. The effect of forced air, convection and radiation analysis is studied using computational fluid dynamics. Four different cases studies are analyzed and compared in this paper.

Key Words: Finite element analysis, Computational fluid dynamics, Forced convection

1. INTRODUCTION

The braking system is one of the crucial system in an automobile experiencing high forces and wear and tear. The braking force is actuated by the master cylinder in correlation with the brake pedal. A high pressure is created in the brake lines which press the brake pad against the disc. Thus the braking action is achieved.

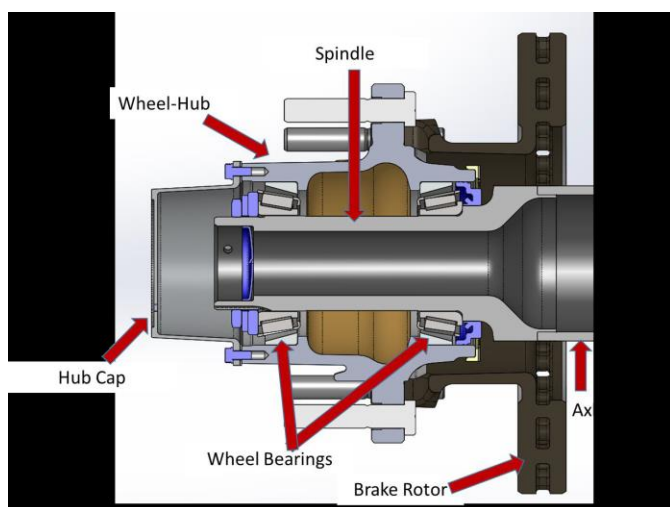


Fig -1: Shows the components and assembly of braking system [2]

The braking system consist of brake calliper, pads, master cylinder, brake lines, brake oil and brake disc. The brake disc is connected with the wheel. Thus reducing speed on the disc

by braking action reduces speed of wheel which in turn stops the vehicle. This action produced tremendous amount of heat energy, which not taken care of introduces fatigue thermal failure in disc.

2 Literature survey

Daniel Das.A. et al, The aim of this paper was to investigate the temperature fields and also structural fields of the solid disc brake during short and emergency braking with four different materials. The distribution of the temperature depends on the various factors such as friction, surface roughness and speed. The effect of the angular velocity and the contact pressure induces the temperature rise of disc brake. The finite element simulation for two-dimensional model was preferred due to the heat flux ratio constantly distributed in circumferential direction. We will take down the value of temperature, and deformation for different pressure condition using analysis software with four materials. The Disc brakes are made up of cast iron. [1]

Mit Patel et al. Thermal FEA analysis of car disc if performed in this paper. Brake disc of a car is considered for analysis. Kinetic energy produced by the vehicle and corresponding braking force is calculated. Also, the heat generated by the disc is calculated using specific heat of the disc material. Thermal distribution of the disc is studied. [3]

O FP Lyons et. Al. An experiment is performed to study the heat transfer of disc brake using a jet. A duct is fabricated which ensured the supply of air to the disc. Various conditions such as no air-flow and angular flow are analyzed. A transient model is studied for investigating temperature profile with time. Effective cooling and reduced hot spots, thereby increasing the efficiency of the rotor. The results from the experiment show that the life cycle of the braking system is increased. Effect of forced convection reduces the maximum temperature and heat will be removed from the disc at a faster rate. [4]

3. Methodology

3.1 Kinetic energy and heat flux calculations

Vehicle for study taken as Renault Clio

$$\text{Kinetic energy [K.E.] = } \frac{1}{2} * m * v^2$$

$$= \frac{1}{2} * 1670 * 33.332$$

$$= 927592.33 \text{ Joules}$$

[Taking mass of vehicle as 1670 Kgs and speed as 120 km/hr = 33.33 m/s]

Braking torque of disc

$$\begin{aligned} \text{Braking force on each wheel} &= \text{Mass} \times \frac{\text{Radius of wheel}(R)}{\text{Radius of rotor}(r)} \\ &= 316.6 \times \frac{228.6}{156.1} \\ &= 463.64 \text{ N.m} \end{aligned}$$

[Taking 18" wheels. Only the relevant calculations required for analysis are shown]

Heat flux produced = Mass of disc X Specific heat X Change in temperature

$$\begin{aligned} \text{K.E.} &= 9.2 \times 584 \times \delta T \\ \delta T &= 172.64 \text{ }^\circ\text{C} \end{aligned}$$

$$\begin{aligned} \text{Thus Temperature (max)} &= \delta T + T (\text{ambient}) \\ &= 172.64 + 25 \\ &= 197.61 \text{ }^\circ\text{C} \end{aligned}$$

Assuming lowest air inlet velocity (v) = 5km/hr = 1.4 m/s

Taking r.p.m. of disc

$$v = \text{Radius of disc} \times \omega$$

$$\begin{aligned} \text{r.p.m.} &= \frac{1.4 \times 60}{0.3 \times 2 \times 3.14} \\ &= 45 \text{ r.p.m.} \end{aligned}$$

3.2 2D file from which the 3D geometry is made.

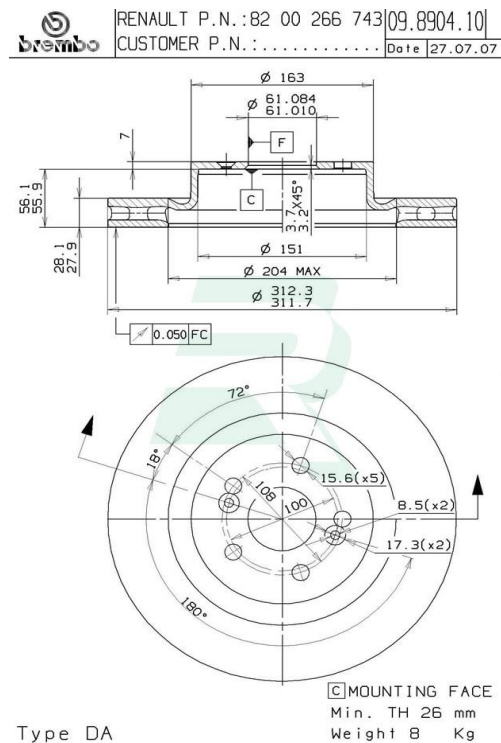


Fig -2: Shows the 2 D drawings of the component

3.3 Following are the details of 3D geometry

First a sketch is drawn as per the 2D drawings and then the sketch is revolved to obtain the desired dimension. The inner blocks are cut extruded and an arrangement of four holes to mount the disc is made. Commands such as extrude and revolve are used to complete the 3D disc model.

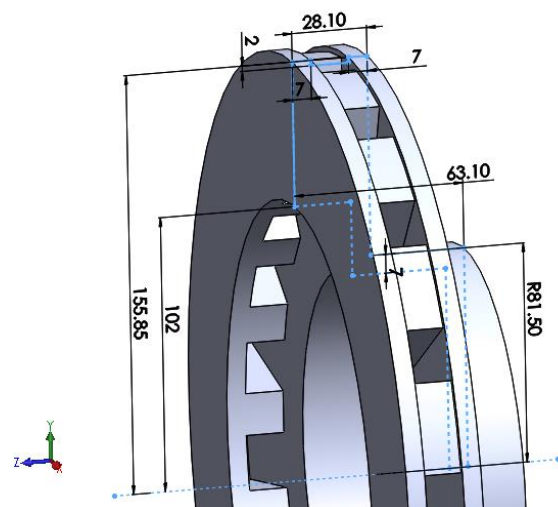


Fig -3: Shows the 3 D model of the disc for FEA analysis

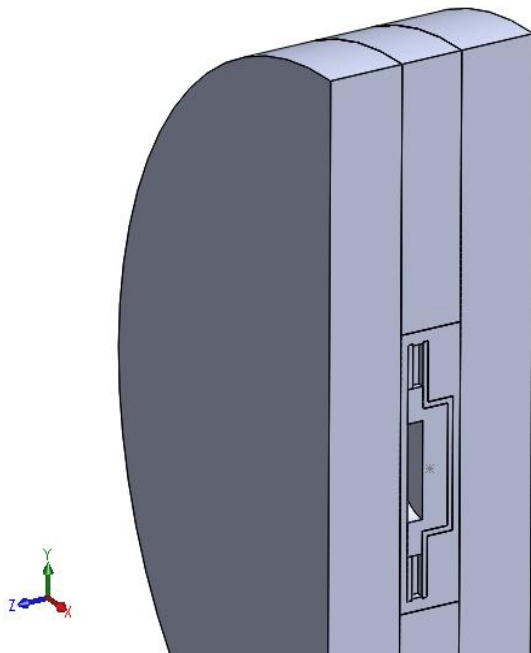


Fig -3: Shows the 3 D model of the disc for CFD analysis

We have taken same geometry for case 0 and case 1. The only difference is inlet velocity. Case 0 is assumed as ideal conditions without forced cooling and hence velocity taken as 0.1 m/s. Case 1 is assumed as forced cooling and thus velocity is taken as 1.4 m/s. Case 2 as more number of vanes thereby increasing the surface area. Case 3 has curved vanes to enhance the heat transferred to surrounding.

Disc cross section for case 1 & case 2

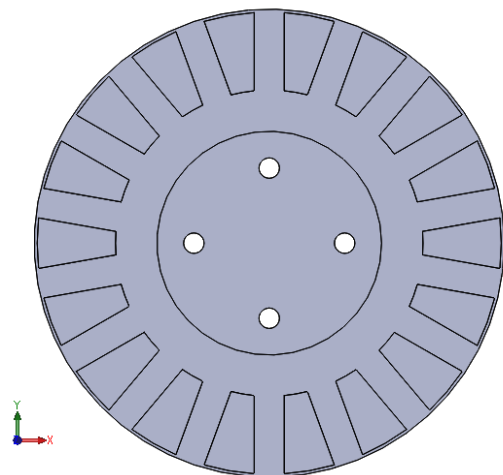


Fig -4: Shows the 3 D model of the disc for case 1 & 2 for CFD analysis

Disc cross section of case 3

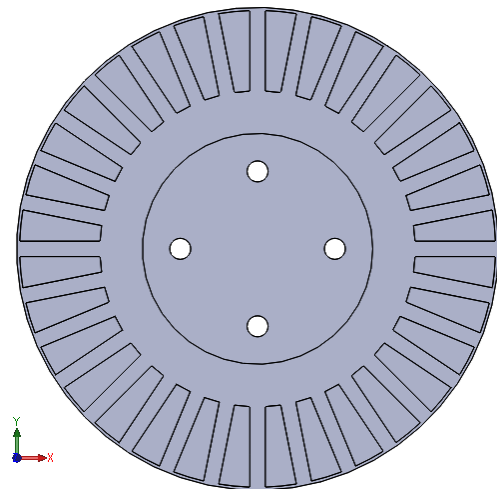


Fig -5: Shows the 3 D model of the disc for case3 for CFD analysis

Disc cross section of case 3

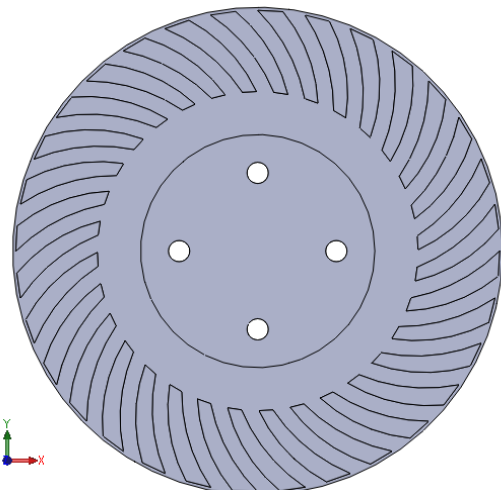


Fig -6: Shows the 3 D model of the disc for case 4 CFD analysis

Table -1: Shows different cases studies

Case 1	18 straight perforation	0.1 m/s inlet air velocity
Case2	18 straight perforation	1.4 m/s inlet air velocity
Case 3	31 straight perforation	1.4 m/s inlet air velocity
Case4	31 curved perforation	1.4 m/s inlet air velocity

3.4 Mesh parameters

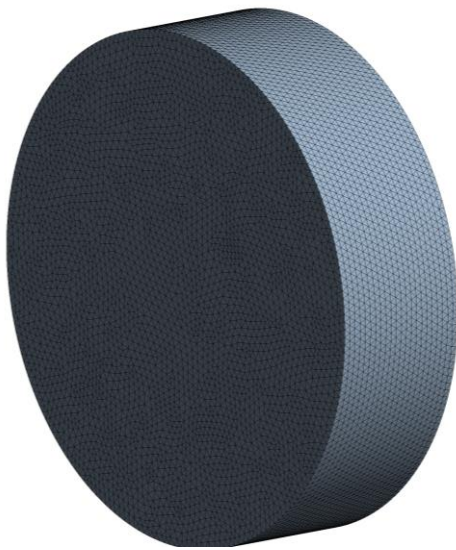


Fig -7: Shows the mesh model

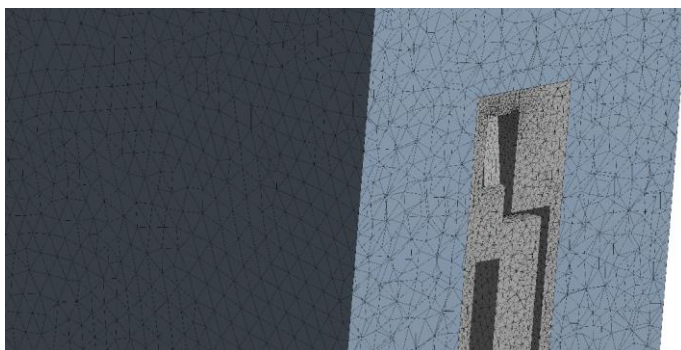


Fig -8: Shows the cross-section of mesh model

Proximity and curvature features are used for discretization of the domain. Proximity features covers the edges and cut features whereas curvature features take care of the curved edges. Curvature of 18 Degree is defined with minimum elements across the gap for proximity feature. The proximity and minimum element size is taken as 2 mm. The growth rate is taken as 1.1 for smooth transition of elements overall.

The mesh type used is 3D tetrahedral mesh. Tetrahedral elements are best suited for complex geometries. In this case study, there are lot of curved profiles and tetrahedral elements are best suited for such applications. This element has four vertices, six edges and four triangular faces. These elements are stiffer than hexahedral elements, but due its shape, it has more application in CFD problems. These elements have lower aspect ratio and are thus easily accepted by the CFD solvers.

3.5 Solver boundary conditions

FEA analysis

First thermal analysis is carried out to check the temperature distribution in the disc. Following images show the boundary conditions applied on the disc. Temperature is applied on the surface which is in contact with the disc pad. Heat will be generated once the pad comes in contact with the disc. Thus contact surface will get heated first and this heat will transfer to the remaining areas.

A: Steady-State Thermal
Temperature
Time: 1 s
Temperature: 197.61 °C

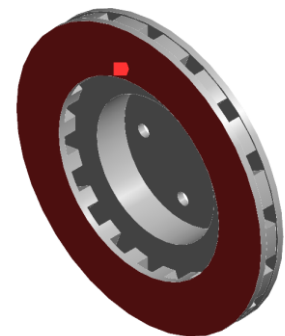


Fig -9: Shows the temperature applied at the face

A: Steady-State Thermal
Steady-State Thermal
Time: 1 s
Temperature: 197.61 °C
Convection: 25 °C, 5 e-006 W/mm²°C

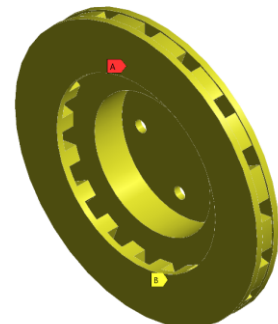


Fig -10: Shows free convection applied on all faces

B: Static Structural
Static Structural
Time: 1 s
Fixed Support
Moment: 4.6364e+005 N mm

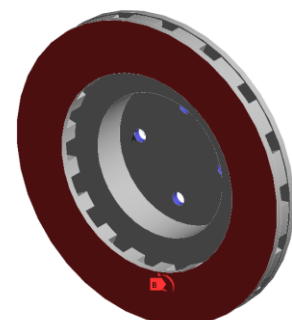


Fig -11: Shows the mechanical boundary condition

The above figure shows the boundary conditions use in mechanical analysis. The disc is fixed at the center. Moment of 463.64 N-m is applied on the disc surface which comes in contact with the pad. The stresses and deflection can be seen in the following images.

CFD analysis

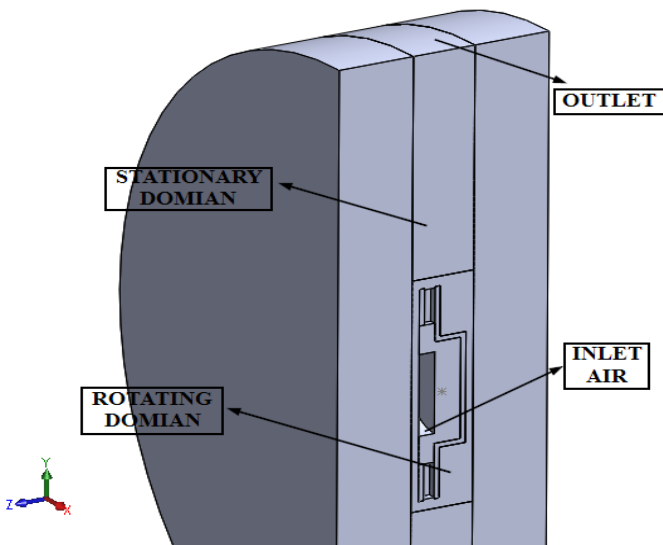


Fig -12: Shows the description of CFD model

Air is supplied from the inlet side at the center of the disc. This inlet air will pass over the vanes, carry heat and exit from the outlet. There are two domains, rotating domain and stationary domain. The rotating domain implies the rotating disc part and the stationary domain represents the stagnant air around it.

After conducting the FEA thermal analysis as per the temperature distribution within the disc, we majorly observe two temperature regions. One near to the disc the other one away from the disc.

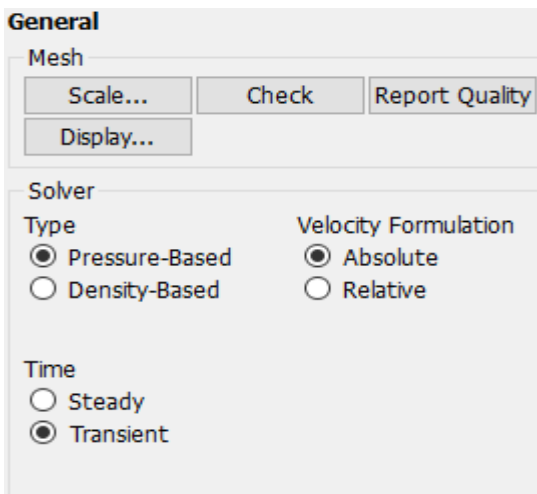


Fig -13: Shows the solver boundary conditions

The solver type determines the quantity which will be taken into consideration for calculating the flow parameters. Pressure based solver is used in applications where the fluid has low velocity and density based solver is used during higher Mach number flows. Thus as per our application we will be using pressure based solver. Velocity formulation is the method where velocity is formulated. Absolute method is used where the domain is stationary and relative method is

used during rotating domain. It can be formulated with respect to first and last values (Absolute method) or after each and every point (relative method). Transient solver is used for time dependent analysis.

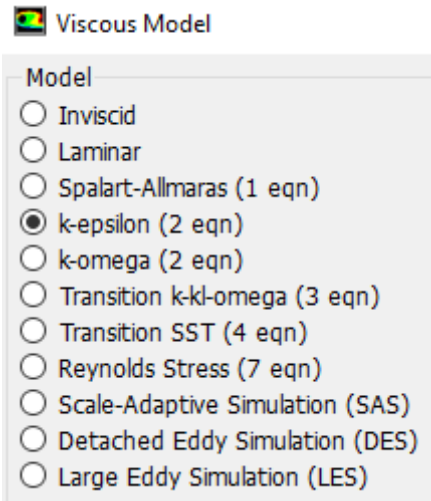


Fig -14: Shows the flow boundary conditions

The most commonly used turbulent module is K-epsilon. The flow will not follow a laminar pattern due to cross-section of the geometry. The flow of the medium depends upon velocity, pressure and change in cross-section. The k-epsilon model for turbulence is the most common to simulate the mean flow characteristics for turbulent flow conditions. This is a two equation model which gives a general description of turbulence by means of two transport equations. The 2 transported variables are turbulent kinetic energy k, which determine the energy in turbulence, and turbulent dissipation, which determines the rate of dissipation of the turbulent kinetic energy. For the wall function parameters, enhanced wall treatment functions is used which formulates the equations near wall using velocity formulations.

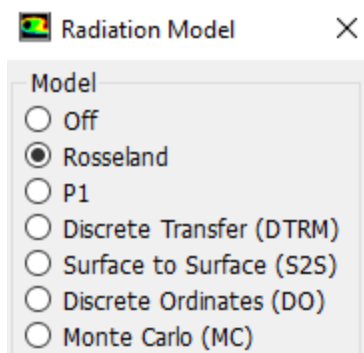


Fig -15: Shows the radiation boundary conditions

The Rosseland radiation model can be used to account for the radiation exchange in an enclosure of gray-diffuse surfaces. The energy exchange between two surfaces depends on their size, separation distance, and orientation. The energy flux leaving a given surface is composed of directly emitted and reflected energy. The reflected energy flux is dependent on the incident energy flux

from the surroundings, which then can be expressed in terms of the energy flux leaving all other surfaces. The Rosseland model works on gray body concept.

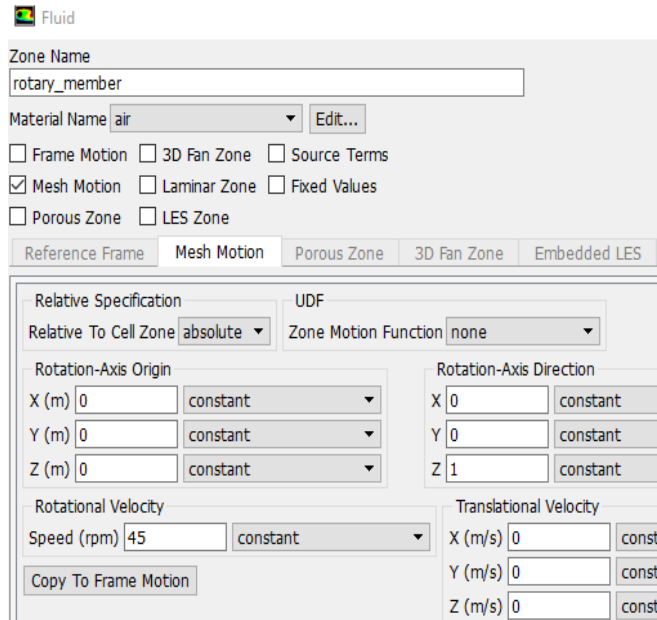


Fig -16: Shows the rotary boundary conditions

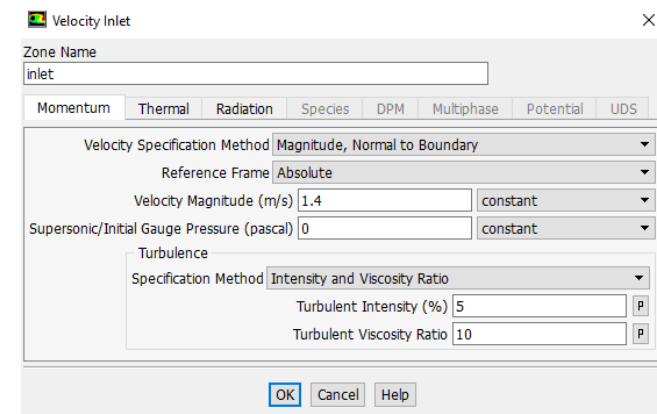


Fig -17: Shows the inlet boundary conditions

As per the calculations performed, the rotational speed of rotor was found to be 45 r.p.m. The disc is at the origin. A rotating reference frame method will be used to move the disc as per the r.p.m.

The inlet air velocity is taken as 1.4 m/s at ambient conditions

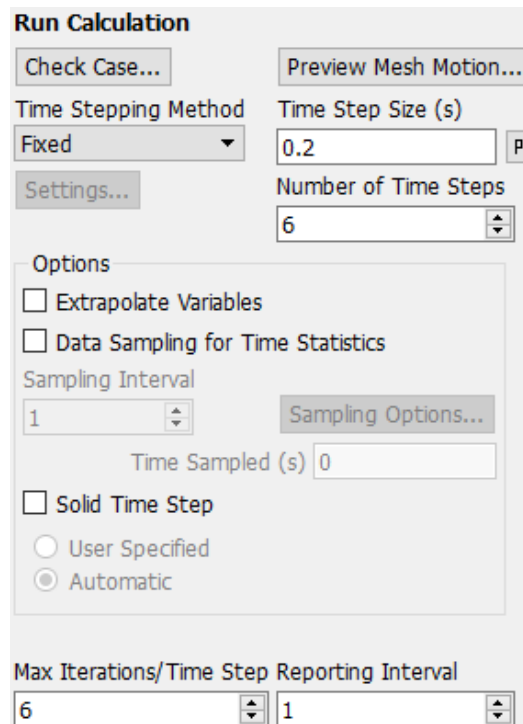


Fig -18: Shows the Time step boundary condition

As per said earlier, a transient analysis approach is considered. The time step for the analysis is considered as 0.2 sec & the number of time steps and iterations are 6 continued for 3.6 sec.

4. Analysis results

4.1 FEA results

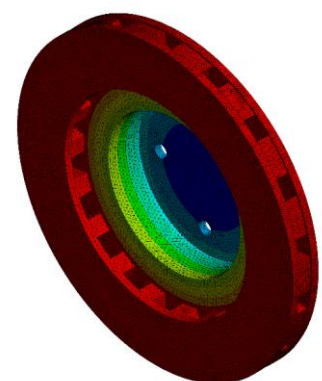
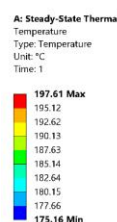


Fig -19: Shows the temperature distribution

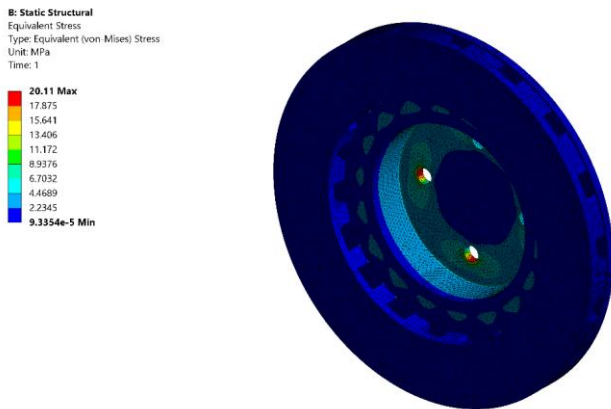


Fig -20: Shows the stress in disc

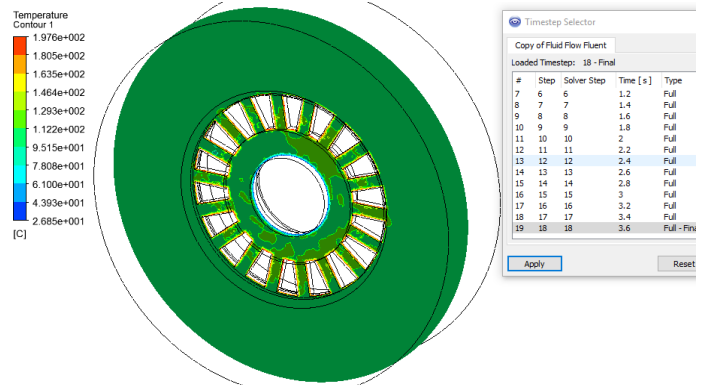


Fig -22: Shows temperature of disc, case 1 at 3.6 sec

Case 2

Velocity of air taken as 0.1 m/s

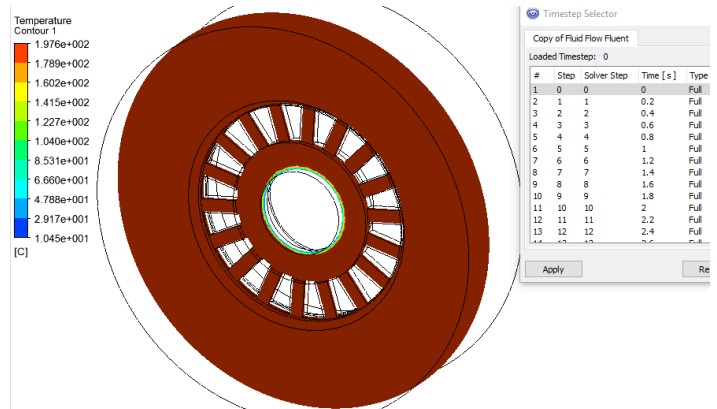


Fig -23: Shows temperature of disc, case 2 at 0 sec

Table -2: Shows results of FEA analysis for different cases studies

FEA results	Max temperature in Degree Celsius	Stress in MPA
Case 1 & Case 2	197.61	20.11
Case2	193.61	20.4
Case 3	201.48	20.64

4.2 CFD results

Case 1

Velocity of air taken as 0.1 m/s

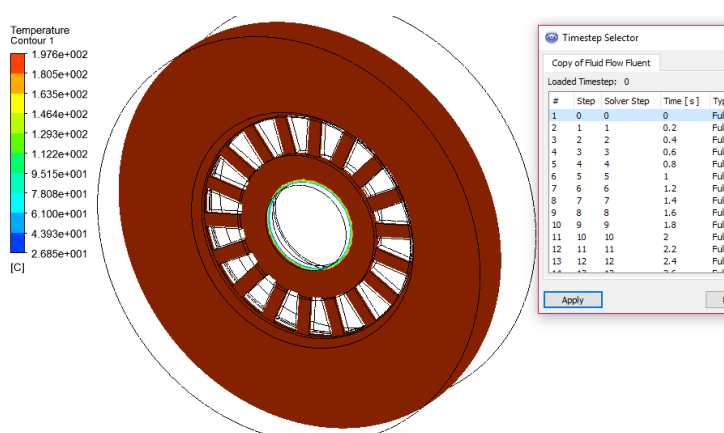


Fig -21: Shows temperature of disc, case 1 at 0 sec

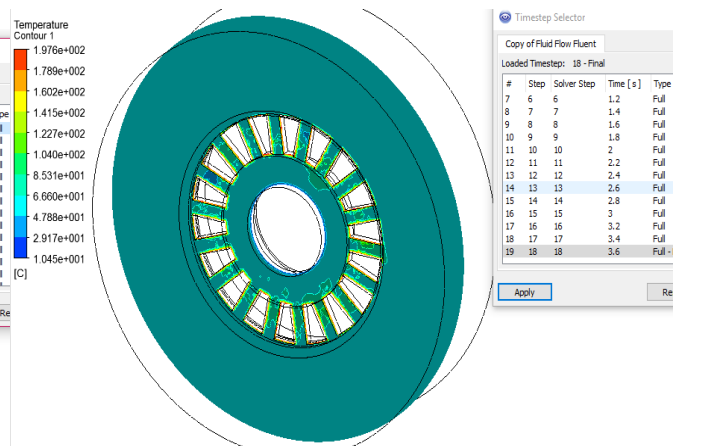


Fig -24: Shows temperature of disc, case 2 at 3.6 sec

Case 3

Velocity of air taken as 0.1 m/s

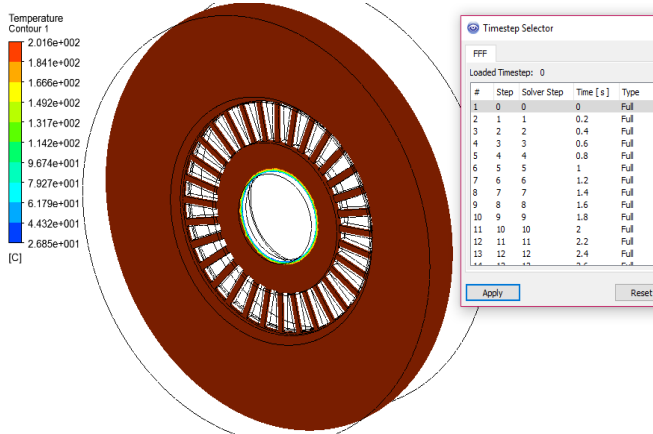


Fig -25: Shows temperature of disc, case 3 at 0 sec

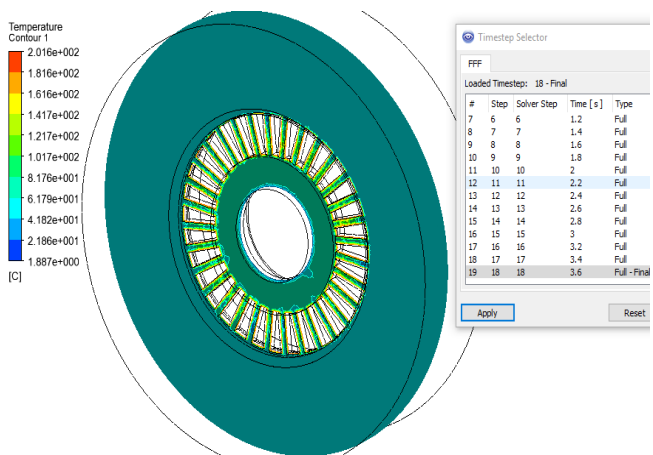


Fig -26: Shows temperature of disc, case 3 at 3.6 sec

Case 4

Velocity of air taken as 0.1 m/s

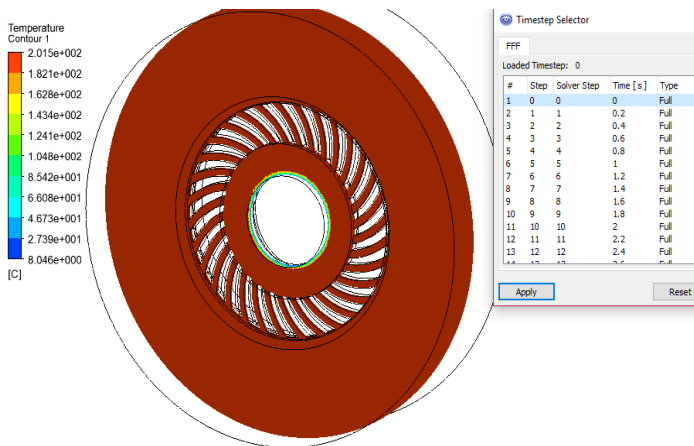


Fig -27: Shows temperature of disc, case 4 at 0 sec

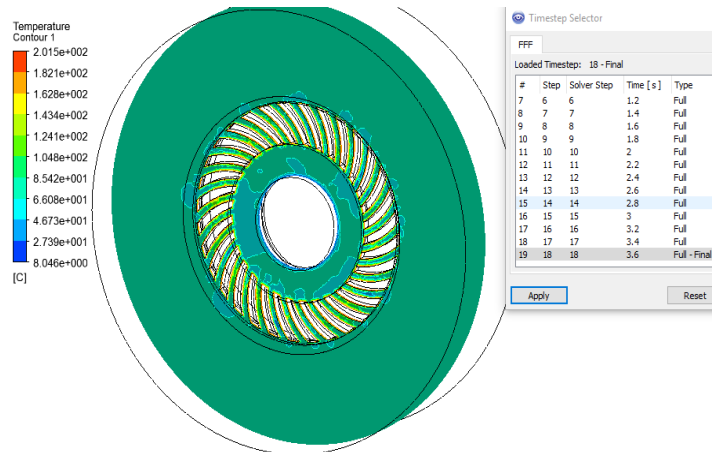


Fig -29: Shows temperature of disc, case 4 at 3.6 sec

5. CONCLUSIONS

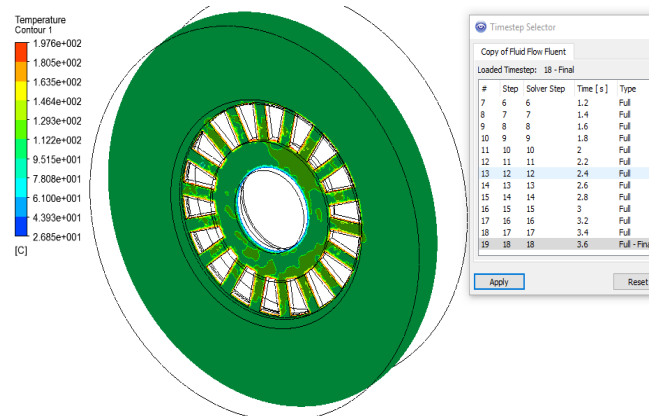


Fig -30: Shows the cross-section of mesh model

The above image is of case 0 where we have less/least air movement. We can see from the image that there are hot spots near the disc center. As there is less air velocity (0.1) at the inlet side, heat is not dissipated at the faster rate.

Less heat dissipation leads to hot spots. Higher temperatures at certain regions are termed as hot spots and these variations lead to higher difference in temperature which result in thermal fatigue. Thermal fatigue can lead to crack which result in failure of component. Following are comparative results as per cases.

These temperature and velocity probes are taken at the center of vane which is our main concentration area.

Table -3: Shows temperature plots of different case studies

Temperature	0	1	2	3.6
cases	sec	sec	sec	sec
case 0	465	435	410	390
case 1	465	424	379	358

case 2	462	420	364	325
case 3	470	424	362	326

Higher velocity is observed at the last case. As more air entering the unit, forced convection is achieved. Also more air reduced the temperature drastically, thus reducing the hot spots.

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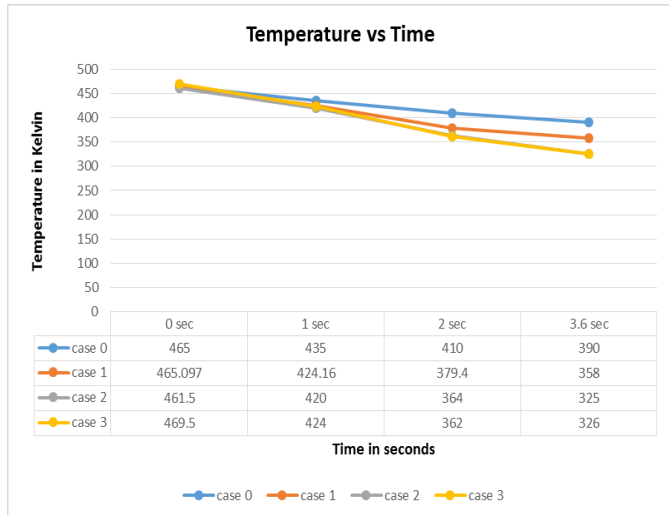


Chart -1: Shows Temperature versus time of all cases

Table -1: Sample Table format

Velocity				
cases	0 sec	1 sec	2 sec	3.6 sec
case 0	0.01	0.3	0.3	0.2
case 1	0.15	0.5	0.44	0.49
case 2	0.16	0.4	0.35	0.44
case 3	0.18	0.6	0.58	0.6

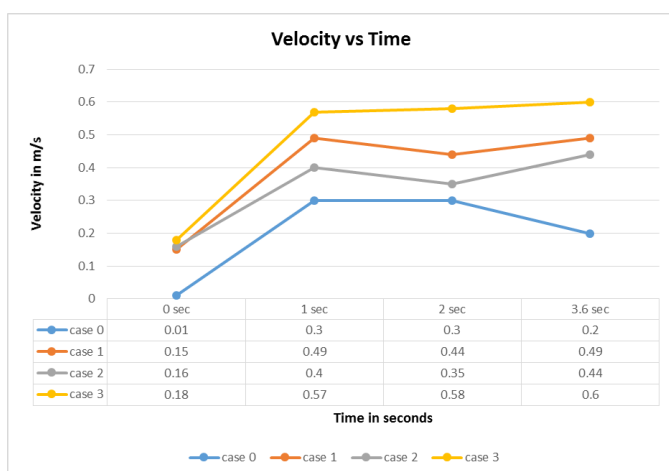


Chart -2: Shows Velocity versus time of all cases

From the above figure we observe that as we proceed from case 0 to case 3, we have better heat dissipation rates and velocity profile of the disc. Introducing air helps to increase the heat transfer from disc to the surrounding.



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Intelligent Braking System

Ashutosh Raut¹, Vinit Poojary², Jayesh Vanarse³, Adarsh Raut⁴, Iqbal Mansuri⁵

^{1, 2, 3, 4} Student, ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar

Abstract: *The braking system was designed and applied on a car to make the driving process safety using embedded system design. Most of the accident occurs due to the delay of the driver to hit the brake, so in this project work braking system is developed such that when it is active it can apply brake depending upon the object sensed by the ultrasonic sensor and speed of vehicle. Currently, vehicles are often equipped with active safety systems to reduce the risk of accidents, many of which occur in the urban environments. The most popular include Antilock Braking Systems (ABS), Traction Control and Stability Control. All these systems employ different types of sensors to constantly monitor the conditions of the vehicle, and respond in an emergency situation. An intelligent braking system includes an ultrasonic wave emitter provided on the front portion of a car producing and emitting ultrasonic waves frontward in a predetermined distance. An ultrasonic receiver is also placed on the front portion of the car operatively receiving a reflective ultrasonic wave signal. The reflected wave (detected pulse) gives the distance between the obstacle and the vehicle and RPM counter gives speed of vehicle. The microcontroller is used to control the braking of the vehicle based on the detection pulse information to push the brake pedal and apply brake to the car stupendously for safety purpose.*

Keywords: *safety breaking, ultrasonic sensor, microcontroller, solenoid valve*

I. INTRODUCTION

Braking systems of commercial vehicles were always given the highest importance concerning safety issues and in particular active safety. Inappropriate braking of these vehicles may cause heavy accidents due to relatively longer stopping distances and higher energy output of brakes particularly in the case of vehicle combinations. The traditional medium used for brake system (compressed air) can be now controlled with the speed and precision offered by modern electronic abilities. "Intelligent Braking System (IBS)" introduced in commercial vehicles providing rapid brake response and release for every single wheel therefore ensuring safety. The extremely rapid response time provided by the electronic control can be used for crucially shortening the braking distance by introducing advanced control of braking system operation. Such a complex task imposed to the control of braking system cannot be based on the driver abilities and need to be done independently of the driver. An improved IBS braking forces management would certainly enable to reach the given task. The advanced strategy for the braking force management, proposed here, is based on intelligent controlling of the braking forces distribution between the front and rear axle of power-driven vehicle and/or between towing/trailer combination and/or between tractor/semitrailer. Intelligent braking system has a lot of potential applications especially in developed countries where research on smart vehicle and intelligent highway are receiving ample attention. The system when integrated with other subsystems like automatic traction control system, intelligent throttle system, and auto cruise system, etc. will result in smart vehicle maneuver. The driver at the end of the day will become the passenger, safety accorded the highest priority and the journey will be optimized in term of time duration, cost, efficiency and comfortability. The impact of such design development will cater for the need of contemporary society that aspires quality drive as well as to accommodate the advancement of technology especially in the area of smart sensor and actuator. The emergence of digital signal processor enhances the capacity and features of universal microcontroller. The overall system is designed so that the value of inter-vehicle distance from infrared laser sensor and speed of follower car from speedometer are fed into the DSP for processing, resulting in the DSP issuing commands to actuator to function appropriately. The most popular systems like "Antilock Braking Systems (ABS)", Traction Control and Stability Control employ different types of sensors to constantly monitor the conditions of the vehicle, and respond in an emergency situation. An intelligent mechatronic system includes an ultrasonic wave emitter provided on the front portion of a car producing and emitting ultrasonic waves frontward in a predetermined distance.

An ultrasonic receiver is also placed on the front portion of the car operatively receiving a reflective ultrasonic wave signal. The reflected wave (detected pulse) gives the distance between the obstacle and the vehicle. Then a microcontroller is used to control the speed of the vehicle based on the detection pulse information to push the brake pedal and apply brake.

II. PROBLEM STATEMENT

Now-a-days, accident prevention is the major sector of research. We are seeing the most of accidents, occurred due to drivers mistake. To avoid that mistake, some arrangements are needed to help driver in critical condition. So, Intelligent Braking System is such type of system which applies brake without the permission of driver by sensing the obstacle in the given path and helps to avoid accidents. Intelligent Braking System is introduced for providing safety and comfort to driver during driving. The main aim of the system is avoid damage of life and property.

III. METHODOLOGY

- 1) The Intelligent braking system uses ultrasonic sensor mounted on the front end of the automobile to detect the distances of obstructions from the automobile.



Fig 1. Ultrasonic sensor

- 2) This signal input along with the speedometer input is send to the microcontroller. Microcontroller uses the algorithm provided and the two information signals to decide whether to take braking action or not if the driver does not apply.

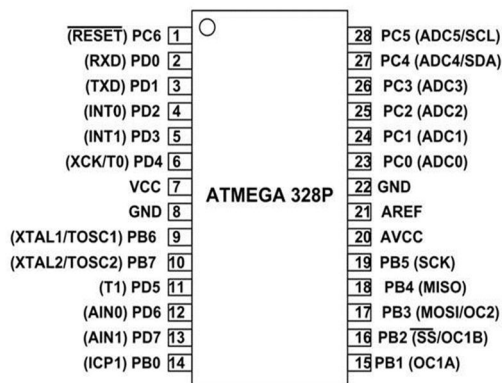


Fig 2. Microcontroller

- 3) Brakes are applied by controlling a solenoid valve.



Fig 3. Solenoid valve

- 4) The whole system consists of a prototype of a vehicle which consists of a chassis made of Aluminium angle.



Fig 4. Aluminium angle

- 5) Wheels we have used is of rubber and plastic which is easy to mount durable and cheap



Fig 5 .wheels

- 6) 12v motor of 100 rpm drives the system consists of



Fig 6.motor

- 7) Power supply is used to convert 230V/7A power supply to 12V/5A power which is required for solenoid piston and dc motors and then 12V supply is converted into 5V Power with the help of the regulator IC's which is required for controller and Ultrasonic sensor working



Fig no 7 SMPS

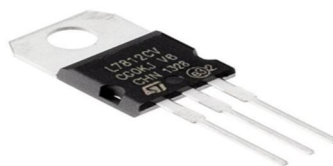


Fig no 7.1 regulator IC'S

- 8) PVC angles can be used on external or internal corners to conceal fixings and edges. Low maintenance will not rust. Can be fixed using screws, nails or adhesives.



Fig no 8.PVC Angle



Fig no 8.1. nut bolts

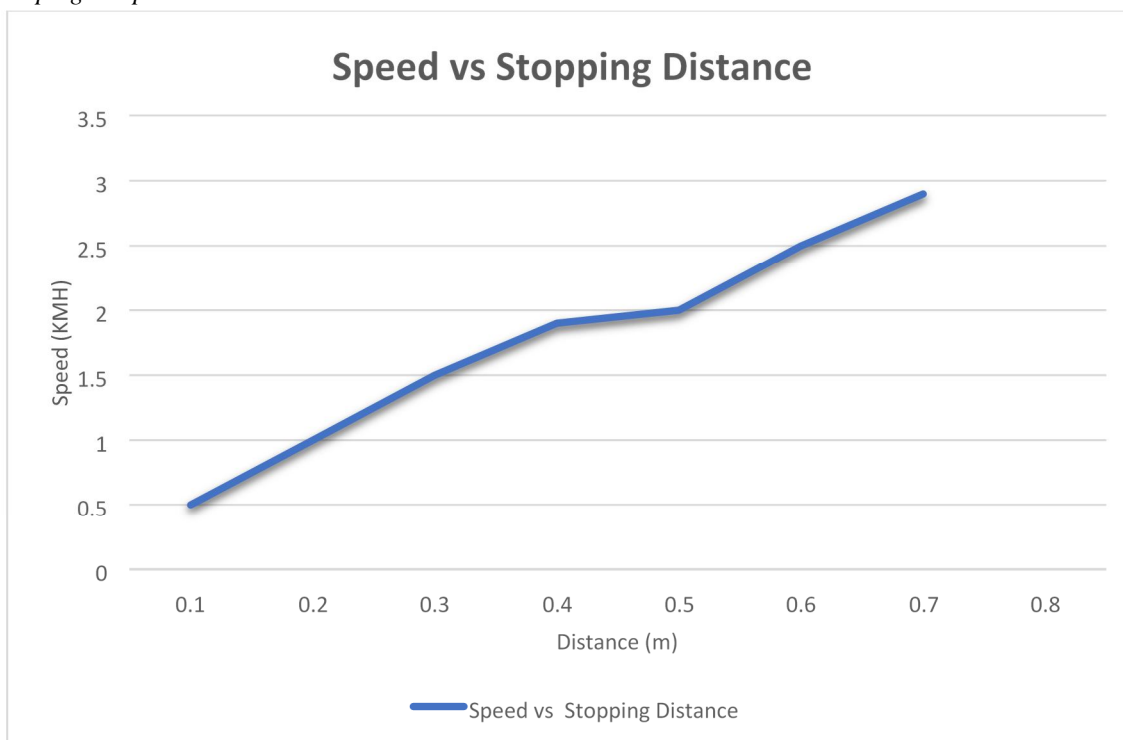
IV. RESULT

A. Time and Stopping Analysis

Table no 1

Brake Time (milli second)	Speed	Stop Time (Milli Second)	Dynamic Weight Transfer
200ms	50 rpm	300ms	0.5m
200ms	60 rpm	400ms	0.5m
200ms	90 rpm	500ms	0.5m
200ms	100 rpm	600ms	0.5m
200ms	120 rpm	800ms	0.5m
200ms	150 rpm	1000ms	0.5m

B. Speed vs Stopping Graph



Graph no 1. Speed vs stopping

We have Successfully designed a Intelligent Braking System Project. Which is able to perform the operations as detection of the obstacle located in front of the vehicle when it comes in certain range of the sensor. After detection of the obstacle in the front then our system is able to take necessary steps to stop the vehicle before collision and that step is braking of the vehicle using Solenoid Pistons. This all system works with very synchronization and the responses to the obstacle within fraction of second.

V. CONCLUSION

The prototype incorporating intelligent braking system is designed and fabricated. On testing prototype applies brake automatically when an obstruction comes in front of the range of sensors and avoid an imminent collision. This is an innovative project on modern and advanced braking system The Intelligent braking system is an automatic braking system which can be incorporated in a wide range of automobiles. This braking system can be mainly used to avoid vehicle accident that occurs due to the absent mindedness of drivers or due to lack of sleep for long distance drivers and it also offers efficient vehicle speed control on inclined roads.

VI. ACKNOWLEDGEMENTS

We would like to express our deep sense of respect and gratitude toward our guide, prof. Iqbal Mansuri, who didn't only guide the academic project work but also stood as a teacher and philosopher in realizing the imagination in pragmatic way, we want to thank him for introducing us to the field of Optimization and giving the opportunity to work under him. His optimism has provided an invaluable influence on my career and outlook for the future. We consider it our good fortune to have got an opportunity to work with such a wonderful person. He has been great source of inspiration to us and we thank him from bottom of our heart .We like to express our gratitude to our workshop staff, our head of the department, Prof. M.A. Gulbarga and our Principal Dr. Aqueel Ahmed Shah for their valuable advice and permission for carrying out project work inside the college premises. We are especially indebted to our parents for their love, sacrifices and Support. They are our teachers after we came to this world and have set great example for us about how to live, study and work.

VII. CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article

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Stair Climbing Material Handling Equipment

Kohini Saini¹, Prachit Churi², Yash Churi³, Medhaj Joshi⁴, Mr. M. A. Gulbarga⁵

^{1, 2, 3, 4}Student, Department of Mechanical Engineering, Theem College of Engineering, Boisar

⁵Head of Department, Department of Mechanical Engineering, Theem College of Engineering, Boisar

Abstract: Equipment is generally use for the carrying heavy weights with the help of less human effort. The manufacturing of the equipment deals with proper design, accurate fabrication and prescribed analysis using finite element software gives better motion which resist to high load by applying less effort this paper deals with manufacturing of such stair climbing equipment (trolley) with simple mechanism(i.e. ratchet mechanism) initially the model is sketched using solid works and imported into ANSYS software for structural analysis used to find von-mises stresses under load which deals to fabricate trolley with better performance under heavy duty with less effort.

For this we used three-star planetary wheel frame.

Keywords: Material Handling, Trolley, Three-star Planetary, wheel Frame.

I. INTRODUCTION

It requires much effort, time to lift a heavy weight component and to transport them to different locations. This type of problems raises in industrial sector, factory, manufacturing units and production sector where heavy mechanical components are to be transported from one place to another place and also from one floor to another floor using simple mechanism in involved in such operation it becomes very much difficult to move heavy components to different locations. This stair climbing trolley is one of the simplest operating vehicles which require less human effort without any external electrical power input to operate the trolley and move on the ground even though the path is uneven. The wheel mechanism adjusts itself to stair to climb different floors by vehicle and also on rough ground. Even though main researchers investigated on fabrication and design of stair climbing trolley less effort where implemented to perform analysis on cabin structure and wheel alignment. In this paper the efforts are insisted to carry analysis on entire trolley structure is including wheels and fabricated with optimal measurements with suitable materials.

II. LITERATURE REVIEW

Pratik H. Rathod et al. [1] designed and fabricated a hand truck which climb stair with less effort which is useful for library, hospital, regular goods carrier etc. the main modification in this truck where made at wheels using plat surface roller plat attached instead of traditional wheel frame. The mechanism based on retched arrangement mechanism. The maximum bending moment was calculated. The inclination of 44 degrees plays a major role which covers more than 90% of all stairways within this limit. There is an optional maximum inclination warning alarm that alerts the operator of an inclination of more than 44 degrees. When truck operated with exceeding the limit there should be taken the necessary safety precautions.

Md. A. Hussain et al. [2] designed and manufactured a stair climbing vehicle using modified form of frame arrangement i.e. a curved wheel frame which move on rough surface. To address several technical issues in designing this vehicle is stability and maintain high speed at vehicle wheel arrangement while climbing stairs. The frame arrangement consists of sun, planetary, idler wheel which are assembled to the shaft which reduces application of load. However, the steepness of the stairs is also the important concern of this study. The vehicle has four set of wheels arrangement to support its weight when it moves over the flat terrain. Each wheel frame consists of three sub-wheels attached with the sun wheel through three idler gears.

P. P. Gondole et al. [3] fabricated a stair climbing hand trolley with proper dimensions of Height 4 feet, Lower frame 38 X 38 cm, Length of each arm of trigonal wheel axial geometry 15 cm, Diameter of shaft 15 mm. The major components used to fabrication process are square bar cast iron pipe, Round bar shaft of SAE 1030, rubber rest, caster wheels (industrial rubber), iron plate, long guzzon pin. Mathematical calculations are made to this work to exhibits expected results and carried load across the stair very easily thus climbing across stairs transportation of goods very easily.

P. Jey Praveen Raj et al. [4] designed device such as hand trolley used to relieve the stresses of lifting while on flat ground. However, these devices usually fail when it comes to carrying the load over short fleet to carry heavy objects up the stairs with less effort compared to carrying them manually. The main objective of the project is to find an efficient and user-friendly method of carrying various objects through stairs using minimum effort from the user and to also provide a smooth movement while climbing the stair.

Under this project we have manufactured a stair climber with tri lobed wheel frames at both sides of the climber and three wheels on each side are used in the tri lobed frame. The wheel assembly is rotated by a gear- motor mechanism where a DC gear motor is used to provide the necessary power for rotation and a pinion-gear mesh is used for reducing the rotating speed of the wheel. The motor is connected to a lead acid battery of similar ratings and they are in turn connected to DPDT switch.

III. PROBLEM STATEMENT

- A. It is difficult to carry 100 kg load on stairs manually.
- B. The material handling equipment are costly in the market.

IV. METHODOLOGY

As a trolley using wheel additional setup three in number forming an equilateral shape on both ends of the trolley. The fabrication is made using design and modelling sketched in SOLIDWORKS software. Analysis is done on the trolley to find Von-misses stresses and deformation to find out the failure criteria on entire trolley setup. The number of nodes and elements formed by meshing component gives the fine analysis requirement.

A. Modification Of Straight To Curved Wheel Frame

The straight wheel frame shown in the figure 2a takes more thrust to tilt the wheel frame to engage next planetary wheel. The length of each arm is high and thus creates vibration and the vehicle would be unstable. In the present design, the wheel frame was made curve so that the front surface of the arm could not collide with the edge of the stair. The optimization of the curvature was done to eliminate above problem. The curve wheel frame (fig. 4.1.1) also requires less power to tilt compare to straight frame (fig. 4.1.2).

Modification of Wheel



Fig: 4.1.1:
Initial Design

Fig: 4.1.2:
Final Design

B. Standard Staircase Width

Type of Building	Minimum Width
Residential	1.00 - 1.25 m
Residential hotel	1.5 m
Assembly	2.00m
Educational	1.50 m
Institutional	2.00 m
Industrial	1.8 – 2.00 m

Table No.: - 4.2 From the above table main shaft length is 1m

V. FABRICATION

A. Fabrication Processes Used For Various Components

Fabrication process for trolley components S.NO	COMPONENT	FABRICATION PROCESS
1	Main Body	Cutting, Welding
2	Main Shaft	Polishing
3	Wheel Axel	Turning, Drilling, Tapping
4	Bushes	Boring, Drilling, Tapping
5	Bearings	Standard (25 mm)
6	Three-Star Planetary Plate	cutting, Drilling
7	Pulley	Boring

Table No.: - 5.1.1

B. Various Tools and Machinery Used

SR. NO.	Tool Used	M/C USED
1	Turning Tool	Lathe
2	Drill Bit	Drill m/c
3	Tap	-----
4	Cutting Wheel	Grinding m/c
5	Welding Electrode	Welding m/c (arc welding)

Table NO.: - 5.2.1

VI. MAIN PARTS

1) *Main Body*: This is the main body made of Mild Steel rectangular pipe having 2.2mm thickness. Total Height of project is 1400mm.



Fig No.: 6.1

2) *Shaft*: The shaft is made of mild steel of total length 1000mm & diameter 25mm.



Fig No. 6.2

3) *Wheel and Wheel Frame*: Wheel is made up of rubber wheel and it has diameter of 110mm.

Wheel Frame is made of Mild Steel having 5mm thickness & radius is 180 mm (From centre of the shaft to end of the wheel frame).



Fig No. 6.3

4) *Bearing*: It is standard bearing having diameter of 25mm. Company of bearing is Kyosho DBX. Bearing is used to support the main shaft.



Fig No. 6.4

5) *Motor*: Motor having 0.25 hp and having 50mm diameter of pulley. Motor RPM is 30mm.



Fig No. 6.5

6) *V-Belt*: Power transmission from motor pulley to main shaft pulley. 'A' type of V-Belt of dimension 13mm*8mm.



Fig No. 6.6

- 7) *Pulley*: A pulley is a wheel on an axle or shaft that is designed to support movement and change of direction of a taut cable or belt, or transfer of power between the shaft and cable or belt. Bore diameter of pulley is 25mm.



Fig No. 6.7

- 8) *Nut & Bolt*: They used to fix bearing to main body and to fix other components like Motor to main body. Size used is M06, M08.



Fig No. 6.8

- 9) *Assembly*: Final Assembly



Fig No. 6.9

VII. COSTING

Costing of parts

Sr. no.	Parts	Quantity	Price (Rs.)
1.	Square pipe	20 feet	650
2.	Wheel	6	1,440
3.	AC Motor	1	3,000
4.	Plummer Block bearing	2	280
5.	Pulley	1	300
6.	Pulley Belt	1	120
7.	Grinding wheel	3	200
8.	MS-wheel frame	4	1,800
9.	MS Shaft	1 meter	250
10.	MS Axle	0.7 meter	260
11.	Frame welding	1	400
12.	Nut & Bolt (M06, M08)	15	120
13.	Allen Key Bolt (M05)	8	50
		Total	8,870

Table No. 7.1

A. Observation Table

One revolution of manual reading = 8 Sec

One revolution with motor reading= 6 Sec

One revolution = $\pi * D = 923.63$ mm

Motor RPM= 30rpm

No. of steps= 12

Observation Table

Sr. No.	Load (Kg)	Manually Reading (Sec)	With Motor Reading (Sec)
1	0	32.05	26.8
2	25	44.30	26.4
3	50	56.75	26.6
4	100	80.04	26.5

Table No. 7.1.1

B. Result

- 1) The design of trolley is compact and hence is able to move about in almost all the stairs.
- 2) The main benefit of this project is carrying load on stairs with less effort.
- 3) This equipment carries 100kg of load.

C. Conclusion

- 1) We observed that time required for manual reading increasing as per the load whereas motor reading is to be constant.
- 2) we found some vibration problem and to overcome this we have planned to install springs and braking system, so that trolley will be in a good control.



D. Future Scope

- 1) Adjustable nut can be added in future for easy operation with uneven surface or any obstacle.
- 2) Base of the project can be lifted by means of fork lifter

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Recycle Plastic Tiles Maker

Vedant Sawant¹, Mayuresh Patil², Atish Monde³, Tanmay Lolge⁴, Imran Hassan⁵

^{1, 2, 3, 4} Student, ⁵Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar

Abstract: *The plastic is the highly used man-made material in the world due to the characteristics such as easy manufacturing shaping, cheaper cost and low density. And because of this satisfactory properties and characteristics of plastic material it is very useful in different areas such as medicine, architecture, construction and transport. Eventually later-on the used plastic is thrown away in nature without any disposal. And as we all study in school that plastic waste is a non-bio degradable substance in nature and generally, it consumes 100's of years to decompose in environment, and throwing or leaving it away in nature is not the solution for decomposing. Eventually in result, it just not harms the nature but also gets hazardous to human mankind and other living creatures which exist on earth. Instead of throwing plastic waste we can reuse it in some productive form, one of which form. The general objective of this research work was to contribute to the environment. As we know that paver block or concrete blocks are used in footpath, in building compound and likely in many other places as a flooring but according to the time the same paver blocks and concrete tiles get damaged because of water drainage, depletion of adhesive and many more reason. So instead of concrete block/tile we can use the plastic tiles made from the plastic waste which can easily moulded in any shape and as it is a plastic scrap it can easily available, production cost will be also low and as it can able to sustain the water more healthily than concert. At last, reusing the plastic waste also result in eliminating the waste from the environment.*

Keywords: *Recycle Plastic, Plastic Tile, Concert, Adhesive, Plastic Waste, Floor tiles.*

I. INTRODUCTION

Concrete Paver block flooring are very flexible, adaptable, cost effective as well as good-looking tiles that required low or comparably negligible maintenance if perfectly manufactured. Most concrete block flooring constructed in Indian infrastructure has performed adequately good unfortunately in few noticeable areas of concern get fail due to excessive surface wear, and variation in the strength of block. To overcome on such situation the sustainable development material for construction must be imply. And in result we can use Non-conventional, innovative materials, and waste materials in recycle form, in order to atone the lack of natural resources and to find auxiliary ways to protect the environment from draining of required material worldwide.

If we define a Plastic scientifically, it is a synthetic or semi-synthetic material which are polymeric and are composed of large molecules of organic substances known as monomers. During the process of polymerization, a large molecule is formed which are known as polymers. Generally, there are two main division in the plastic – Thermosetting plastic and other is Thermoplastic. Defining the thermoplastic, this form of plastic does not go under any chemical changes in their composition when subjected to the heat. And this form of plastic can be re-mold into another shape even after solidification. While in thermosetting plastic which are also known as non-recycle polymers goes under the chemical change which irreversible when subjected to the heat. And cannot be remold into any other shape after once it solidified. If we study the plastic object that are used in day-to-day life, we can understand that there is various type of polymer plastic which are manufactures according to their properties.

- 1) *High-Density Polyethylene plastic:* Due to the property of better Chemical resistance, Good low temperature resistance and have Higher tensile strength with good processability this form of plastic is use to manufactures products like motor oil containers, shampoos and conditioners containers, soap bottles, detergents, bleaches etc. which we used in day-to-day life.
- 2) *Low Density Polyethylene:* This type of plastic retains good balance of flexibility with good impact strength and so this form of plastic is used to manufacture products like cling-film, sandwich bags, and plastic grocery bags etc.
- 3) *Polyethylene Terephthalate:* This polymer has a high impact and tensile strength that makes it ideal to manufacture products like common household items like beverage bottles, water bottles, plastic medicine jars, rope, packaging films, and microwave container etc.
- 4) *Polypropylene:* Product likes lunch boxes, margarine containers, yogurt pots, syrup bottles, prescription bottles, plastic bottle caps etc. are often made from this type of plastic.

From recent CSE (Centre for science and Environment) research and analysis, around 79 percent of the use plastic enters into the land, water and environment and some of its also enters into the body of animals and humans by means of food consumption. And only 9 percent of the total waste plastic is recycled worldwide.

As per the recent 2018-19 report by a Central Pollution Control Board (CPCB) around 3.3 million metric tonnes of plastic waste is generated in India. As the result the same waste plastic haunts the human mankind as well as all the living creatures that plays the important part of balancing for the nature. So, to overcome this problem it is mandatory to eliminate the waste plastic directly or by recycling the plastic waste from the environment. And one of the ways is by replacing the concrete paver block or concrete tiles by recycle plastic block or tiles. The waste plastic that used in this project was collected from the surrounding areas.

II. PROBLEM STATEMENT

We know that the plastic is Hazardous for environment as well as for human mankind. And Plastic is easily available as a waste or scrap at cheaper value we decide to make some productive product from it. So, after some research we found the topic on “Recycle Plastic Tiles Maker” which can replace the concrete paver block or tiles by Recycled Plastic tiles/blocks. Generally, the Concrete paver block is made from the powdered Portland cement, water, sand, and gravel which is mixed in proper ratio. As you notice, the paver block that are used for footpath get damage or their adhesive get less effective when it comes in contact with water and because of it the block also gets slippery and lastly the life of paver block reduces. So instead of using concrete paver block we can replace the same with the Recycled plastic block or tiles using some binding. And as we know plastic can sustain more water compare to concrete therefore the life of the tiles will be longer. And as block or tiles are made from recycle plastic the cost will be also less compare to concrete paver block or tiles.

III. METHODOLOGY

1) *Plastic Collection*: Collecting the sufficient amount of plastic waste from the scrape or dumping area.

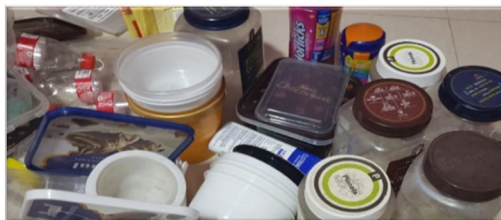


Fig.1 Waste Plastic Collection



Fig.2 Waste Plastic Collection

2) *Plastic Sorting and Segregation*: Segregating the plastic and sorting it according to the thickness, colour, shape and size.

3) *Shredding of Plastic*: The segregated plastic scrape is then cut in small pieces using the cutting machine to melt the plastic easily and evenly.



Fig.3 Shredding of Plastic

- 4) *Washing & Cleaning*: The shredded plastic is then washed to remove glue, paper labels, dirt and any remnants of the product.



Fig.4 Washing & Cleaning

- 5) *Preparing of Mold*: To give the molten plastic its final shape as per the requirement, the Mold is made by sand, wood or by MS plate.



Fig.5 Wooden Mold

- 6) *Melting*: The small shredded pieces of plastic are then liquefied gradually by melting process using the industrial heater or industrial oven to get to melt the plastic evenly.



Fig.6 Industrial Oven

- 7) *Adding Binding Agent*: Binding agent is added to the Molten plastic before pouring the molten plastic into the Mold



Fig.7 Binding Agent

8) *Pouring & Solidification:* As plastic turn into liquid form it is then pour into desire shape Mold and kept it to solidify.



Fig.8.1 Sample Specimen 1



Fig.8.2 Sample Specimen 2



Fig.8.3 Sample Specimen 3

9) *Testing:* After the solidification the same plastic tile/block will be tested on UTM machine for tensile strength, and compressive strength. For Compressive strength (N/mm²) = (Ultimate load in N / Area of cross section (mm²)).

IV. RESULT

In our project we used waste plastic as our core material and to add some strength to the tiles we also used binding agent in some percentage.

A. Dimension Table

Table - 1

Specimen No.	Length	Width	Thickness	Binding Agent (%)	Weight (gram)
1	26	14	10	20	110
2	26	14	10	30	127
3	200	100	30	35	492

B. Result After performing Drop Test and Hammer Test for Specimen 1 and 2,



Fig Sample Specimen 1 Result



Fig Sample Specimen 2 Result

Table - 2

Specimen No.	Drop Test (height in feet)	Result	Hammer Test (No. of Hits)	Result
01	7	Fail	-	-
02	7	Pass	9	Fail (After 9th Hit)

C. Data Analysis For Specimen 3,

After performing two differet test on our both specimen we got the result as Fail. So later we design our third specimen after performing the theoretical analysis on the analysis software and we got the theoretical result for our specimen 3. Depending on the collected data we create the Sample specimen 3.

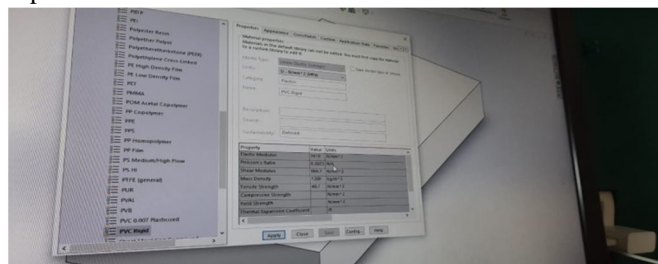


Fig Analytical Result of Specimen 3

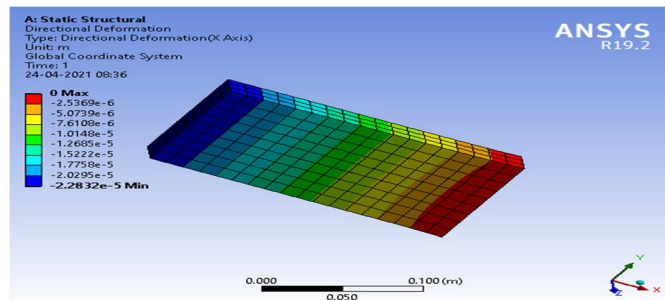


Fig. Theoretical Result of Specimen-3 on Ansys Software

Table -3

Property	Result	Units
Tesile Strength	40.7	N/mm ²
Elastic Modulus	2410	N/mm ²
Poisson's Ratio	0.3825	-
Shear Modulus	866.7	N/mm ²
Mass Density	1300	Kg/m ³

V. CONCLUSION

- A. Manufacturing the Plastic paver block is a effective way of eliminating the plastic waste from the system.
- B. Efficient usage of plastic waste in paver block has resulted in effective usage of plastic waste.
- C. The use of plastic waste in this form can result in safe disposal of plastics.
- D. This recycle Plastic paver block can be use in areas like, light traffic road or foot path, in gardens, pedestrian path, building compounds and cycle way
- E. Also, the time requires for manufacture this recycle tiles can be less
- F. And mainly this plastic block can be Cost effective as cost of cement is high compare to plastic waste which we get in free of cost.
- G. As the tiles are made up of recycle plastic it can also use in marine application like raft, floats etc. Because plastic is very light in weight.
- H. This plastic tiles also gets good machinability in finishing and cutting.

VI. ACKNOWLEDGEMENTS

We would like to express our deep sense of respect and gratitude toward our guide, prof Imran Haasan, who didn't only guide the academic project work but also stood as a teacher and philosopher in realizing the imagination in pragmatic way, we want to thank him for introducing us to the field of Optimization and giving the opportunity to work under him. His optimism has provided an invaluable influence on my career and outlook for the future. We consider it our good fortune to have got an opportunity to work with such a wonderful person. We like to express our gratitude to our workshop staff, our head of the department, Prof. Ayub Gulberga and our Principal Dr. Aqueel Ahmed Shah for their valuable advice and permission for carrying out project work inside the college premises. We are especially indebted to our parents for their love, sacrifices and Support. They are our teachers after we came to this world and have set great example for us about how to live, study and work.

VII. CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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A Survey Paper on Drowsy Driver Detection System

Vedant Jadhav¹, Vrushali Menthe², Pankaj Kumar³, Prof. Sandeep Chavan⁴

¹⁻⁴Computer Engineering Dept., Bharti Vidyapeeth College of Engineering, Navi Mumbai, India

Prof. Sandeep Chavan⁵

⁵Prof. Computer Engineering Dept., Bharti Vidyapeeth College of Engineering, Navi Mumbai, India

Abstract – This paper is a summary of the study and project undertaken in the field of computer engineering to build a framework for detecting driver drowsiness to avoid accidents caused by driver exhaustion and sleepiness. The study presented the findings and recommendations for the project's restricted implementation of the various techniques. The project's implementation, on the other hand, provides a practical understanding of how the system operates and what improvements can be made to increase the overall system's usefulness.

Keywords – Driver drowsiness; eye detection; blink pattern.

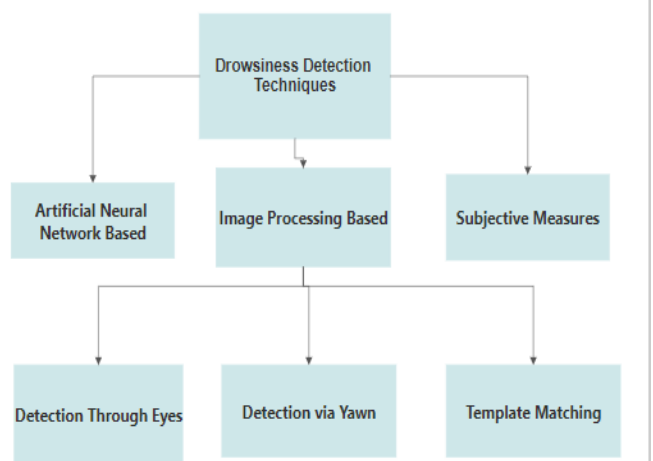
1. INTRODUCTION

In intelligent transportation systems, real-time monitoring of driving behavior is important. By reducing and minimizing the risk of possible traffic incidents, such monitoring enhances traffic safety. One of the most promising and widely used methods for detecting the driver environment is a vision-based technique that uses video cameras to identify hazardous situations. In this case, video cameras can capture pictures of a driver's facial features, such as head motions, eye state, and mouth state. In this paper, we use the smartphone's built-in front-facing camera to continuously monitor driving facial features and identify drowsiness and distraction dangerous states early. There are two forms of dangerous state recognition: online and offline. The driving dangerous states are calculated in real-time on mobile devices with the help of computer vision libraries OpenCV and Dlib while driving due to the efficiency and performance of smartphones in online mode.

1.1 SYSTEM REVIEW

This survey is being conducted to better understand the general public's needs and requirements and to do so, we combed through various websites and applications for the necessary information. We created an audit based on these results, which helped us generate new ideas and make different arrangements for our mission. We came to the conclusion that such an application is needed and that there is a reasonable amount of progress in this field as well.

2. DROWSINESS DETECTION TECHNIQUES



If a driver is sleepy or fatigued it is visible on the driver's face. Different signs indicate the drowsiness of the driver. The vital sign is given by the eyes. The eyes are either open, close, or halfway open. From the movements of the eyelids, we can take the signs. The algorithm processes the image captured through the webcam and converts them into a grey-scale image. The grey-scale image is easier to detect the eyes. This algorithm then uses the edge detection technique over the eyes. By using this technique, it calculates the area of both the eyes. This technique can give the value of the area of eyes but it won't work for every single driver. As every driver's eyes are of different shapes and sizes, the value can differ from person to person. Some drivers may have droopy eyes that can indicate that the driver is sleepy, which is not true. This can create an obstacle while detecting face and eyes

3. IMAGE PROCESSING TECHNIQUES

In image processing techniques, the driver's facial images are captured so that one can find all the details on the driver's face. Using the details of eyes and mouth, one can detect whether the driver is awake or drowsy. There are various other symptoms too through which we can conclude whether the driver is sleepy or not. Following are the explanations of some of the techniques.

3.1 DETECTION THROUGH EYES

In this technique, the eye blinking rate and duration for which the eyes are closed are taken into consideration. There is a certain difference between normal eye blinking and the blinking that occurs when the eyes are tired. Drowsy drivers sometimes close their eyes for a longer period and that's how we detect drowsiness. In this system, A camera continuously records the video of the driver, and then computer vision techniques are applied to the captured video for localization of eyes and measure its closure duration.

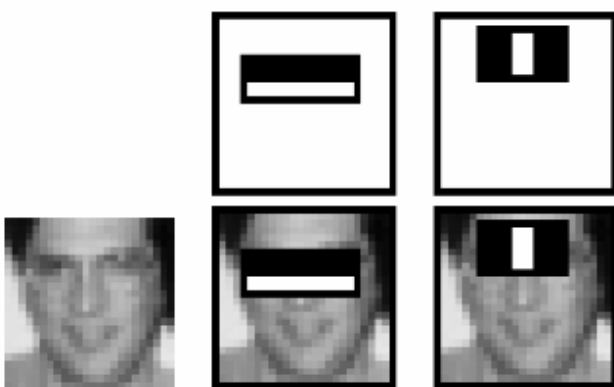
3.2 DETECTION VIA YAWN

One of the signs of exhaustion is yawning. It's believed that the yawn is modeled with a wide vertical mouth opening. When you yawn, your mouth is wider than when you talk. Yawns can be detected using face tracking and then mouth tracking. When the machine senses a yawn, it warns the driver.

Rather than relying on a single technique to detect driver drowsiness, some researchers have combined many vision-based image processing techniques to achieve better results.

3.3 TEMPLATE DETECTION

To detect the face within the image, the algorithm needs to be trained on positive and negative images. The features are required to be extracted from the image. The number of pixels under the white rectangle needs to be subtracted from the total number of pixels under the black rectangle to give each function a single value.



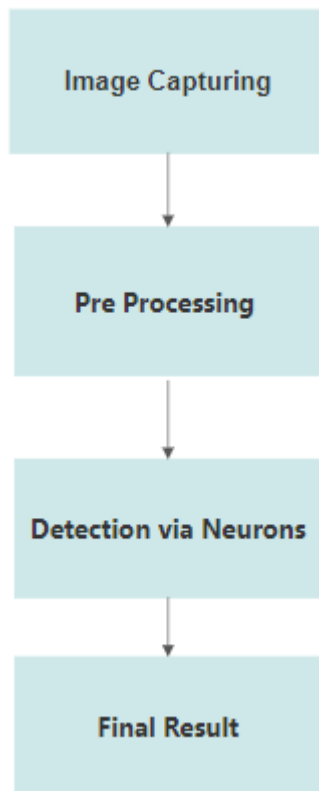
4. SUBJECTIVE MEASURES

Subjective lives that assess the amount of somnolence area unit supported the driver's estimation and lots of tools are accustomed to translating this rating to a measure of driver somnolence. The foremost usually used somnolence scale is the Karolinska temporary state Scale (KSS), a nine-point scale that has verbal anchors for every step. Some researchers compared the self-determined KSS, that was

recorded each a pair of min throughout the driving task, with the variation of lane position (VLP), and found that these measures weren't in agreement. Ingre et al. determined a relationship between the attention blink length and also the KSS collected each five min throughout the driving task. Researchers have determined that major lane departures, high inborn reflex length, and drowsiness-related physiological signals area unit prevailing for KSS ratings between five and nine [10]. However, the subjective rating doesn't coincide with vehicle-based, physiological, and behavioral measures. As a result of the amount of somnolence is measured just about each five min, fast variations can not be detected by mistreatment subjective measures. Another limitation to the mistreatment of subjective ratings is that the self-introspection alerts the driving force, thereby reducing their somnolence level. Additionally, it's troublesome to get somnolence feedback from a driver in a very real driving state of affairs. Therefore, whereas the subjective rating area unit helpful in determinative somnolence in a very simulated setting, the remaining measures could also be higher fitted to the detection of somnolence in a very real setting.

5. ARTIFICIAL NEURAL BASED TECHNIQUES

In this approach, they use neurons to observe the driver's somnolence. just one somatic cell is often not a lot correct and therefore the results of that's not smart as compared to over one neuron. Some researchers square measure finishing up investigations within the field of optimization of driver drowsiness detection victimization. Artificial Neural Network folks in fatigue exhibit bound visual behaviors that square measure simply noticeable from changes in countenance like the eyes, head, and face. Visual behaviors that usually replicate a person's level of fatigue embody lid movement, gaze, head movement, and countenance to form use of those visual cues, they created artificial neural networks to observe somnolence. They tested samples and got ninety-six results. Figure five shows that flow however be a man-made neural network system that will observe somnolence.



LIMITATIONS

- [1] This algorithm could only detect face and eyes in limited range from the webcam.
- [2] The algorithm which uses Haar Cascade could not detect eyes in a low light setting.

DISADVANTAGES

- [1] Edge detection technique used to detect drowsiness. But the set value can differ from person to person because of different eye shapes.
- [2] The use of the Haar cascade feature to detect face is not compatible with large datasets.

ADVANTAGES

- [1] Use of vision cascade to detect face even in low light setting.
- [2] Use of MATLAB for detection of eyes which helps in eyes detection even if the face is tilted.

CONCLUSION

The face of the driver has been detected by capturing the facial landmark and after that localization of eyes is done to measure its closure duration and a warning is given to the driver in the form of an alarm to avoid real-time crashes.

As a result of our research, we have concluded that combining two or more methods will help us provide the best results by reducing the weakness of other approaches. This could contribute to the development of a non-intrusive and highly effective driver drowsiness detection system.

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Microcontroller based Power Consumption Observing and Bill Supervision using Raspberry Pi

R. Krishnaveni (M.E)¹, N.Revathi (M.E)², Lithesh. R³, Hemanth Kumar. S⁴, Poovarasan.M⁵

^{1,2}Assistant Professor, Department of Electronics and Communication Engineering, Panimalar Institute of Technology, Chennai, India.

³⁻⁵Student, Department of Electronics and Communication Engineering, Panimalar Institute of Technology, Chennai, India

Abstract - In this paper, a new procedure is followed based on MICROCONTROLLER (Raspberry pi) to detect and monitor the power consumption, faults, loss. Data will be sent automatically to the utility central server through the IOT module. Here Automatic meter reading can be Proposed in the System along with Cloud data analysis and Money Management with Energy meter report and Billing Displayed in web page.

Key Words: IOT Module, Cloud, WiFi, Current Sensor, Voltage sensor, Python.

1. INTRODUCTION

Electronic metering technology greatly reduces man power and time and also makes it easy for remote area people to pay the bill. It also reduces the non-payment of the bill and avoids the mistake due to manual calculation. Power theft is one of the greatest problems that our country is facing and with the help of this AME power theft can be greatly reduced. Considering a complicated power system network, it is very usual to get faults in every branch of the network. In this system all the loads will be monitored and examined through online using IOT. In case of losses also can be determined by this system by comparing the past values or normal values with present value. If there is any variation occurring can be intimidated by this system.

1.1 IOT Consideration, Requirements and Architecture for Smart Buildings- Energy Optimization and Next Generation Building Management.

The concept of Smart City is emerging in multiple continents, where enhanced Street lighting control, Infrastructure monitoring, public safety and surveillance Physical Security, gun shot detection, meter reading and transportation analysis and optimization system are being deployed on a city wide scale. A related and cost effective user-level. IOT application is the support of IOT enabled Smart building. Commercial space has substantial requirements in terms of comfort, usability security and Energy Management. Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template will do that for you.

1.2 The Applied Research on Power Telecommunications Identifier Management System Based on QR Code.

Establishes a telecommunication Identifier data base management mode and develops a telecommunication identifier management system based on QR Code technology, which can guarantee the site date and system database synchronization. The major work of this paper including the background of the power company identifier management introduction the QR code technology and designing a power telecommunication tag based on QR code designing and implementing the power telecommunication identifier management system, finally introducing the system security mechanism.

1.3 Smart Energy Meter.

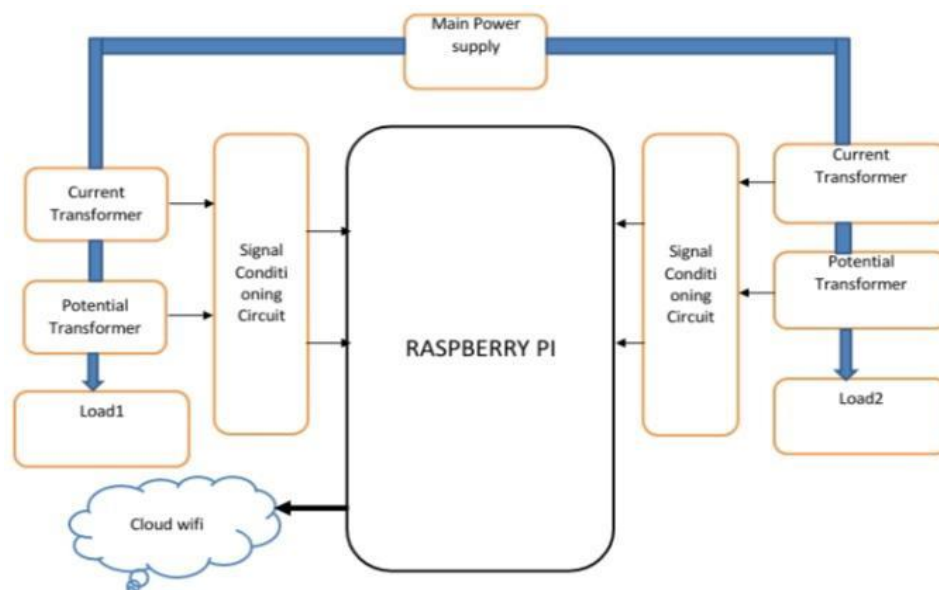
In the current working system, electricity meter reading for electricity usage and billing is done by human workers from home to home and building to building. The purpose of this project is to build a smart electricity meter using GSM, This can reduce human error and help to retrieve the real time meter value via GSM and send it to the Customers mobile phone through GSM. This also allows the electricity board to modify the variable package price in specific duration. The administrator can analyse the customer power consumption data and generate the report from the data online. The

prototype will be able to introduce a billing system to the customer, get the power consumption data from the smart meter, keep the data in centralized database and generate the report.

2. PROPOSED SYSTEM

A smart energy meter works on communication directly with wireless data protocol, so there will be precise reading. Smart energy meters can operate in divergent ways with IoT module. The proposed system consists of a digital energy meter, a Raspberry Pi (microcontroller). The data from the energy meter by the help of current and potential transformers will be transmitted to the cloud by the IoT module. The stored data can be recognized by authorized persons. Terms like power loss, over power usage, instantaneous power, total energy usage, faulty loads, can be recognized by this system. Every branch in the power system can be monitored in every instant of time.

3. BLOCK DIAGRAM



3.1 Working

There are two branches of loads. For those branches separate voltage and current transformer pairs are added each will continuously monitor the instantaneous power. Whenever loss occurs the value of the dataset will be compared with present values and the fault will be determined, fault in a particular branch can also be determined so that it will be easy for regulating those faults. If any fault occurred it can be determined by regular check-up, also faulty loads can be found through this system.

3.2 Signal Conditioning Circuit :

Voltage transformer is a normal transformer which converts high voltage to a particular voltage comfortable for us. Here the microcontroller works in 5 voltage or less than that so by using potential transformer we have to convert (0-230) volt to (0-5) voltage, for that conversion we are using signal conditioning circuit. In case of current transformers also we are converting current value to a proportional voltage value comfortable to microcontroller.

4. MODULES

4.1 Raspberry pi 3 :

Raspberry Pi is a small board Computer. Raspberry Pi is a Controller and Controlled by all sensors. The heart of the Raspberry Pi is a Broadcom System on Chip (SOC), which includes ARM Compatible CPU and on Chip graphic processing unit. The all Sensor interfacing into Raspberry Pi and the Raspberry Pi is used for controlling all sensors. The Raspberry Pi 3 model is the third generation Raspberry Pi. This power credit card size board computer can be used for many applications and supersedes the original Raspberry Pi model and Raspberry Pi 2, maintaining the popular board format.

the Raspberry Pi 3 model brings a more powerful processor, 10x faster than the first generation raspberry pi. Additionally it adds Wireless LAN and Bluetooth connectivity making it the ideal solution for power connected design.



Specifications :

- **Processor :**

Broadcom BCM 2387 chipset.

1.2 Ghz Quad-Core ARM Cortex-A53.

802.11 b/g/n Wireless LAN and Bluetooth 4.1 (Bluetooth Classic and LE).

- **GPU :**

Dual core Videocore IV Multimedia Co-Processor provides open GL ES 2.0, hardware accelerated open VG and 1080p 30 H. 264 high profile decode.

Capable of 1G pixels, 1.5 texels or 24 GFLOPs with texture filtering and DMA infrastructure.

- **Memory :**

1GB LPDDR2.

- **Operating System :**

Boots from Micro SD card, running a version of the Linux operating system or windows 10IOT.

- **Dimension :**

85x56x17mm

- **Power Micro :**

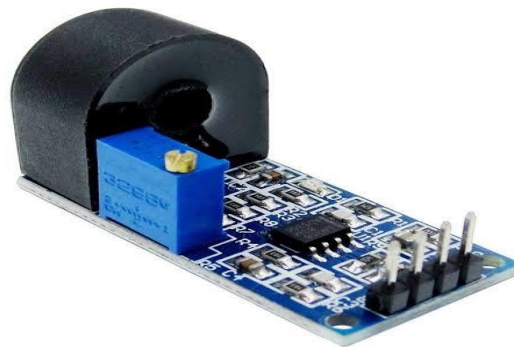
USB Socket 5V1, 2.5A.

4.2 Voltage Sensor :



Voltage sensors are used to measure or monitor the voltage on transmission lines and to isolate the metering equipment from the lines. The voltage level from the energy meter by the help of the current transformer will be transmitted to the cloud by an IoT module.

4.3 Current Sensor :



Current sensors is used to measure or monitor the current in transmission lines and to isolate the metering equipment and relay connected to secondary side. The current level from energy meter by the help of current sensor will be transmitted to cloud by IoT module

4.4 Cloud :

The entire data collections from the Current sensors and Voltage sensors are stored in the cloud. These stored data are highly secured. The stored data can be recognized by authorized persons.

A cloud service has three distinct characteristics that differentiate it from traditional web hosting. It is sold on demand, typically by the minute or the hour; it is elastic -- a user can have as much or as little of a service as they want at any given time; and the service is fully managed by the provider (the consumer needs nothing but a personal computer and Internet access). Significant innovations in virtualization and distributed computing, as well as improved access to high-speed Internet, have accelerated interest in cloud computing.

A cloud can be private or public. A public cloud sells services to anyone on the Internet. (Currently, Amazon Web Services is the largest public cloud provider.) A private cloud is a proprietary network or a data center that supplies hosted services to a limited number of people. Private or public, the goal of cloud computing is to provide easy, scalable access to computing resources and IT services.

MQTT PROTOCOL :

Multiple clients connect to a broker and subscribe to topics that they are interested in. Clients connect to the broker and publish messages to topics. Topics are treated as a hierarchy, using a slash (/) as a separator.

Terms like power loss, over power usage, instantaneous power, total energy usage, faulty loads, can be recognised by those authorized persons.

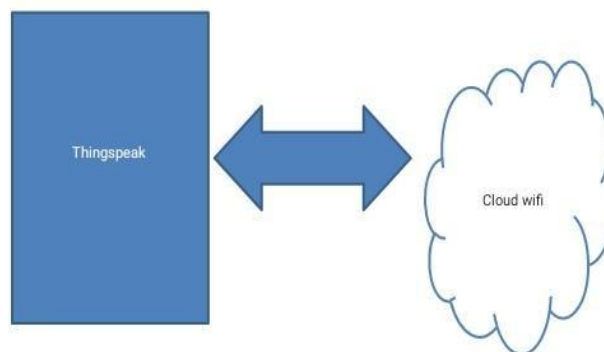
5. SOFTWARE DESCRIPTION

1. Thing Speak Cloud web page.
2. Python platform for Raspberry Pi.

5.1 Raspberry pi software

This chapter introduces the devices and software which are used in this bachelor's thesis. The chapter also contains a short introduction to the Linux operating system which is used in this thesis.

MONITORING SECTION BLOCK DIAGRAM :



● LINUX :

Linux is a free open source operating system and it belongs to the Unix operating systems. Actually Linux means the kernel itself which is the heart of the operating system and handles the communication between the user and hardware. Normally Linux is used to refer to the whole Linux distribution. (Upton, E. & Halfacree, G. 2012, 28.)

Linux distribution is a collection of software based on the Linux Kernel. It consists of the GNU-project's components and applications. Because Linux is an open source project, anyone can modify and distribute it. That is the reason why there are many variations of Linux distributions. Most popular distributions are Ubuntu, Red Hat Linux, Debian GNU/Linux and SuSe Linux. (Kuutti, W. & Rantala, A. 2007, 2.)

Raspberry Pi doesn't come with an operating system. This is not a weakness, however, rather a wide variety of OSs, each of which can be flashed to an SD card (or microSD card for the Raspberry Pi B+) in a few simple steps. Here's how to get a new OS installed and running on your Pi – and how to clone your perfect setup for quick disaster recovery. Operating systems such as the recommended Raspbian, ArchLinux, Risc OS and even Android come ready to run on your Raspberry Pi. I'll show you the two main ways to add an operating system – and once you've got your Pi set up how you want it, we'll look at how to clone the card so that it can be restored following errors (or for temporary reuse of your SD card). The following tutorials assume that you have a basic Raspberry Pi package and Windows to manage your SD card writing and cloning. Flash An OS To SD And Boot Your Raspberry Pi. Whichever operating system you download for your Raspberry Pi, the process of writing it to an SD card is the same. However, there are some differences in SD card writing between desktop operating systems. You'll also need to ensure that your card is blank and formatted, and at least 2 GB.

5.2 Python Platform for Raspberry Pi :

Python programming language was developed in the late 1980s at the National Research Institute by Guido van Rossum. Python has grown in popularity, and it is widely used commercially. (Upton, E. & Halfacree, G. 2012, 152.)

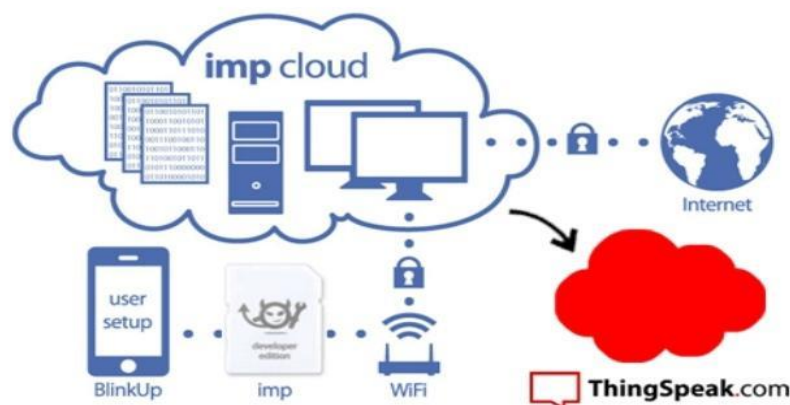
Python is a flexible and powerful programming language but still it is easy to learn and follow. The clear syntax of Python makes it a valuable tool for users who want to learn programming. This is one of the reasons why it is recommended by the Raspberry Pi Foundation. Python is published under an open-source license and it is available for different operating systems. Python runs on Linux, OS X and Windows computer systems. (Upton, E. & Halfacree, G. 2012, 152.)

Cross-platform support guarantees that the programs which are written in Python are also compatible in other platforms. There are few exceptions where the programs are not compatible. For instance, when the Python is addressed to use the specific hardware such like Raspberry Pi's GPIO. (Upton, E. & Halfacree, G. 2012, 152.)

Python can be used to create standalone programs, but the language can also be used to create programs that communicate with the outside world over a computer's network connection. This next example, written by TomHudson, offers a brief glimpse of these possibilities with a tool for monitoring the users connected to an Internet Relay Chat (IRC) channel.

5.3 USING THE GPIO PORT IN PYTHON

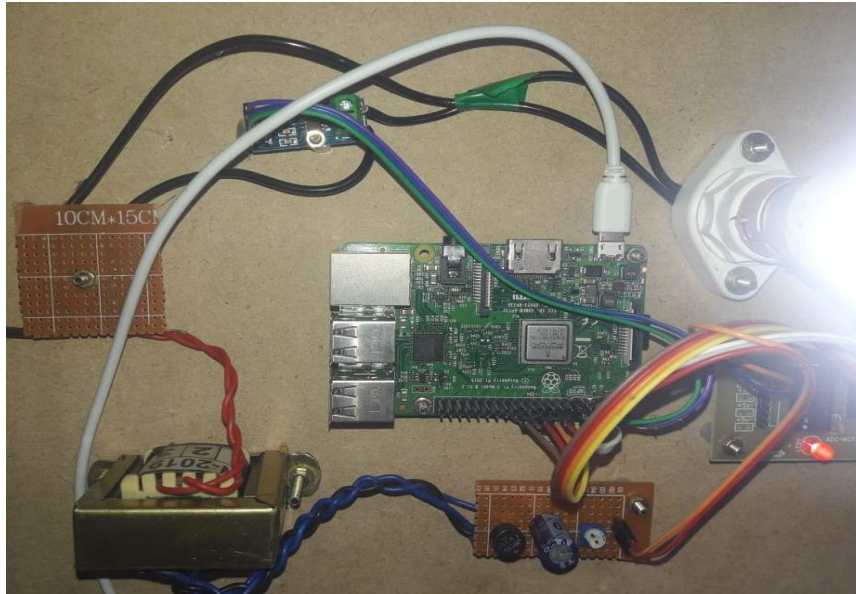
Python is a friendly yet powerful programming language. It's not, however, the perfect choice for every scenario. Although it works fine for the simple circuits you'll be creating in this chapter, it does not offer what is known as deterministic real-time operation.



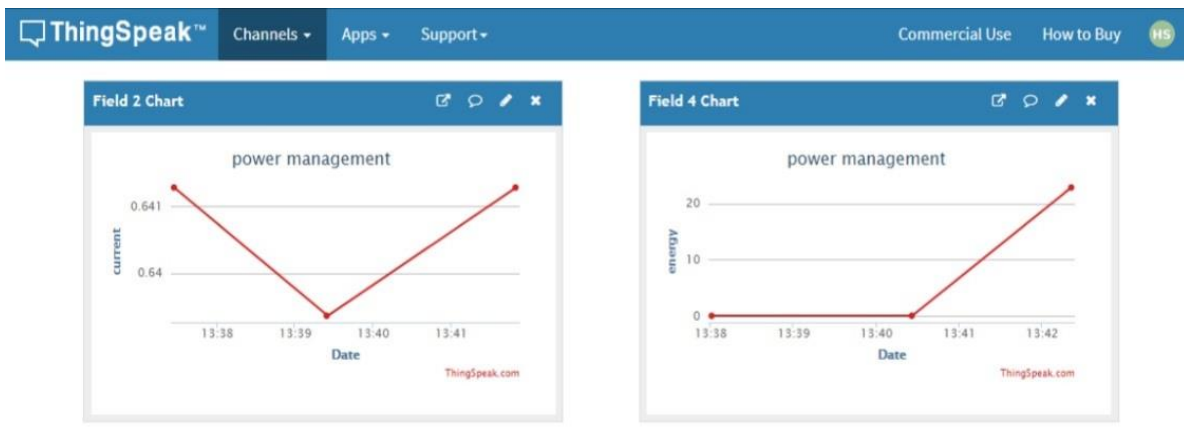
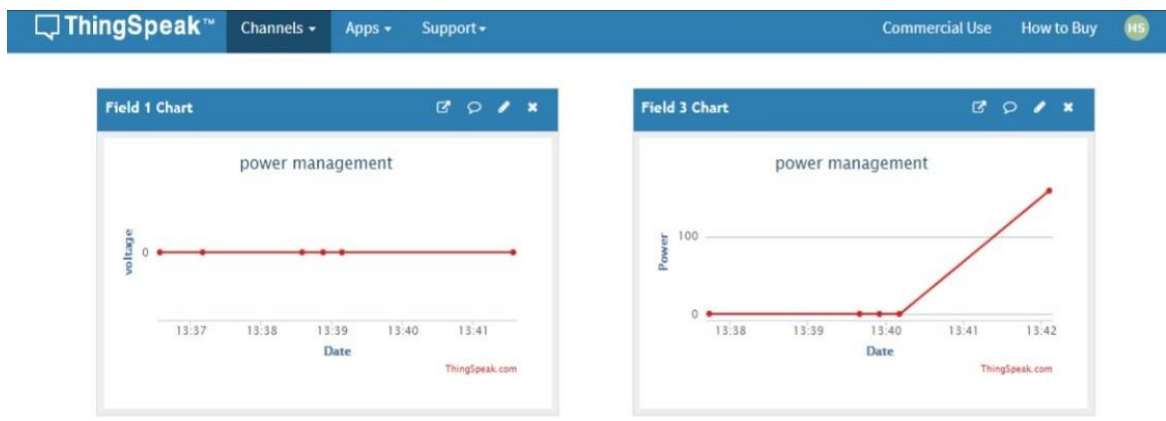
For the majority of users, this doesn't matter; if you're planning on using the Pi at the heart of a nuclear reactor or a complex robotics platform, however, you may want to investigate a lower-level language such as C++ or even assembler running on a dedicated real-time microcontroller.

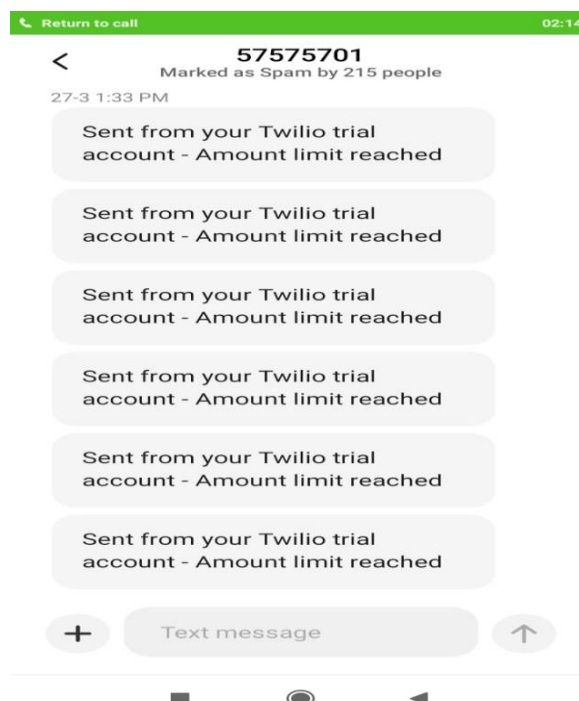
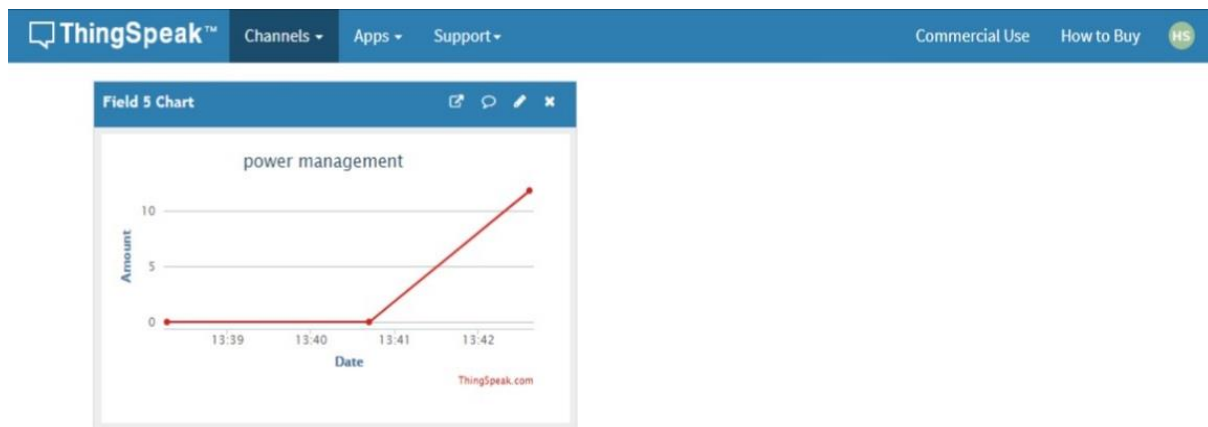
If true real-time operation is required for your project, the Pi may be a bad choice. Instead, consider using a microcontroller platform such as the popular open-source Arduino, or one of the MSP430 family of microcontrollers from Texas Instruments. Both of these devices can interface with the Pi either through the GPIO header or over USB, and provide a specialised real-time environment for control and sensing.

6. RESULTS :



Output :





CONCLUSION :

This paper is the combined hardware advantage for both utility and the customer. Raspberry pi, SSR, and IoT stationed Energy Meter for smart metering, is built which is able to read and send data via wireless protocol using IoT technology through IoT module, capable of managing and controlling the supply. In the case of faults, losses, and faulty loads, Power consumption, power quality, and its accuracy can be monitored by the consumers directly.

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Robot Navigation System with RFID and Sensors

Aditi Shinde¹, Toshita Nehete², Bipasa Patra³

¹Scholar, Electrical Engineering, GHRIEM, Jalgaon, Maharashtra, India

²Scholar, Electrical Engineering, GHRIEM, Jalgaon, Maharashtra, India

³Head & Assistant Professor, Electrical Engineering, GHRIBM, Jalgaon, Maharashtra, India

Abstract :- The paper proposed a method enable robot to navigate in indoor space is indicated. The system use RFID tags as landmarks to locate the robot. A topological map corresponding to the real environment is used for robot navigation. The robot goes along the ways, and turn to the right direction at each intersection of the hallways. The robot navigation system can be used in real life and do efficient work.

Key Words: Robot, Navigation, RFID, Sensor, Atmega16, RFID reader, RFID tags, etc.

1. INTRODUCTION

The definition of "Robot" has been confusing from the very beginning. The word first appeared in 1921, in Karel Capek's play R.U.R, or Rossum's Universal Robots. "Robot" comes from the Czech for "forced labor." These robots were robots more in spirit than form, though. They looked like humans, and instead of being made of metal, they were made of chemical batter. The robots were far more efficient than their human counterparts, and also way more murder-y-they ended up going on a killing spree.

The real-world definition of "robot" is just as slippery as those fictional depictions. A robot is an intelligent, physically embodied machine. A robot can perform tasks autonomously to some degree. And a robot can sense and manipulate its environment. But it wasn't until the 1960s that a company built something that started meeting those guidelines. That's when SRI International in Silicon Valley developed Shaky., the first truly mobile and perceptive robot. This tower on wheels was well-named-awkward, slow, twitchy. Equipped with a camera and bump sensors, Shaky could navigate a complex environment. It wasn't a particularly confident-looking machine, but it was the beginning of the robotic revolution. Robots, though, remained largely confined to factories and labs, where they either rolled about or were struck in place lifting objects. Then, in the mid-1980s Honda started up a humanoid robotics program. It developed P3, which could walk pretty darn good and also wave and shake hands, much to the delight of a roomful of suits. The work would culminate in Asimov, the famed biped, which once tried to take out president Obama with a well-kicked soccer ball. (OK, perhaps it was more innocent than that.)

2. LITERATURE SURVEY

In1997, Olaf Kibitz, Introduced Application of Radio Frequency Identification Devices to support Navigation of Autonomous Mobile Robots.

There exist two main methods to provide the RFID tag with energy for the communication and for an internal processor that might be integrated in tags. Either an internal long-life battery powers the transceiver or energy from the interrogator is transmitted to the tag as follows. The energizing field is emitted from the transmitter in the interrogator in the form of a carrier wave signal at a fixed frequency. This energy from the transmitter is collected by the transponder antenna, rectified and used to power the transponder. The transponder generates a data stream comprising a clock signal and the data to be communicated in a form of a modified Manchester code.

In1998, Wail Gueaieb & Suruz Miah . An intelligent mobile robot navigation technique using RFID technology

In2012 S. Srilakshmi & K.Venkata Phani Raja proposed A Mobile Robots Navigation System Using RFID Technology.

In2012 Shi Peng, WangDong Robot Navigation system with RFID and Sensors.

In2016 Seshanka Venkatesh & K. Vamsi Krishna Produced Robot Navigation System with RFID and Ultrasonic Sensors.

Problem Identification:

1. Accuracy in indoor navigation
2. Robot localization and navigation

3. PROPOSED TOPOLGY

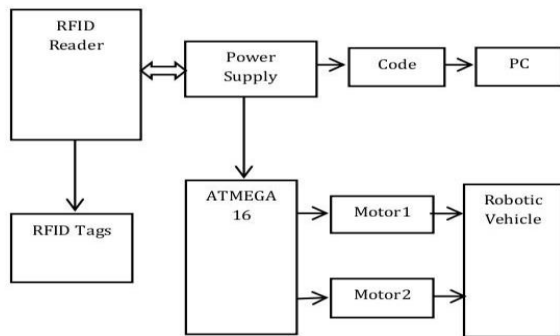


Fig -1: Block Diagram of the proposed system

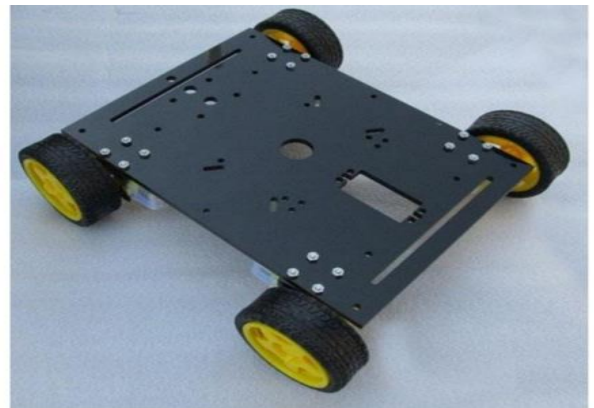


Fig -3: Base of the Robot

Atmega 16

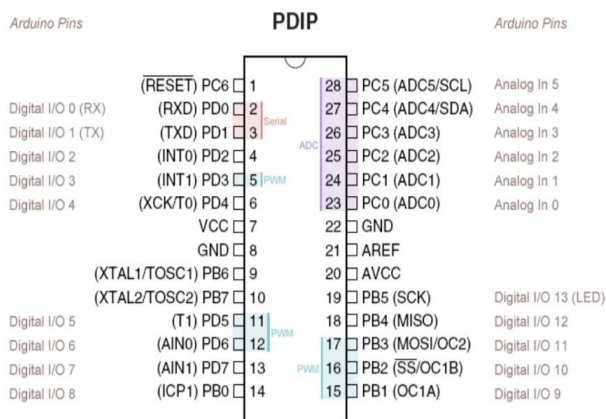


Fig -2: Pin configuration of Atmega16



Fig -4: Sample Battery of 6V

The AVR is a modified architecture 16-bit RISC single Chip microcontroller. It is one of the microcontroller which use on-chip flash memory. It is used to store the data collected from various RFIDs, such huge data cannot be stored by normal microcontrollers.

DC Motor

A 30 rpm DC motor is used. The microcontroller sends a signal to the motor driver indication the direction the robot is to be moved. Along with the 2 motors 2 dummy wheels are also used to provide balance.

Battery

A 6v/1.3A battery is used initially. This is supplied to atmega8 which is the VCC pin. Before this the battery is supposed to stepped down to 5V which drives the Atmega16.

RFID Reader and RFID Tags RFID (radio-frequency identification) is the wireless non-contact use of radio-frequency electromagnetic fields, for the purposes of identifying. A radio-frequency identification system uses tags, or labels attached to the objects to the identified. Two-way radio transmitter -receivers called interrogators or readers send a signal to the tag and read its response. RFID tags can be passive, active or battery- assisted passive.

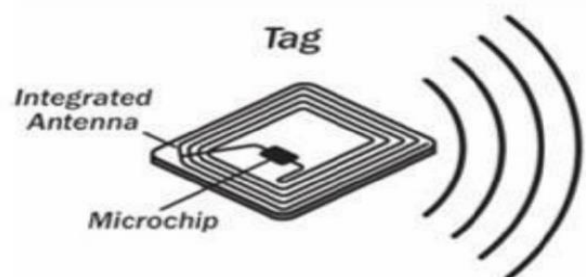


Fig -5: RFID Tag

Voltage Regulator 7805

A regulated power supply is very much essential for several electronic devices due to the semiconductor material employed in them have a fixed rate of current as well as voltage. The device may get damaged if there is any deviation from the fixed rate. The AC power supply gets converted into constant DC by this.

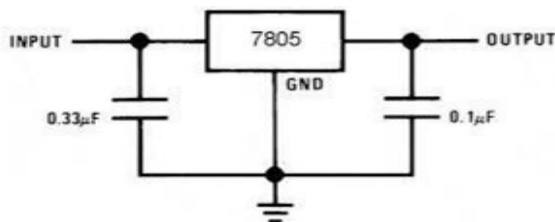


Fig -6: Circuit of Voltage Regulator

4. Application

1. **Security and Surveillance:** These robots are used for security and surveillance wherein the robot has to move around the hallways in a fixed direction / following a given route.
2. **Room service/Hospitals :**
the designed robot can also be used for room service or for replacing the staff in hospitals. This can be done by placing RFID tags outside each room or patient beds in case of hospitals and the robot can move along accordingly.
3. **For the disabled:** The navigation robot made can give directions to the disabled, with further development it can also help them get things or guide ways for them tracing the tags.

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A Review on Pagerank and Personalized Pagerank Algorithms

Roshni K¹, Dr. Unnikrishnan K²

¹Student, Master of Technology, Computer Science & Engg, RIT Engineering College Kottayam, Kerala, India

²Professor, Dept. of Computer Science & Engg, RIT Engineering College Kottayam, Kerala, India

Abstract - PageRank is an algorithm which is widely used to estimate reputations for webpages and social networks. It assigns each vertex of a graph with a rank that signifies the importance of the vertex in the graph. Personalized PageRank is a variation of PageRank used by Twitter and other services to provide personalized search results and recommendations by computing PageRank relative to a particular vertex or set of vertices. Personalized PageRank (PPR) is a widely used node proximity measure in graph mining and network analysis. Given a source node s and a target node t , the PPR value $p(s, t)$ represents the probability that a random walk from s terminates at t , and thus indicates the bidirectional importance between s and t . The main aim of this paper is to discuss the various existing page ranking algorithms, personalized pagerank algorithm techniques.

Key Words: PageRank, Personalized PageRank, Graph, Webpage, Recommendation System, Twitter

1. INTRODUCTION

PageRank is an algorithm originally developed to rank the importance of webpages by using the quantity and quality of links to a webpage. PageRank uses the hyperlink structure of the web to build a Markov chain with a primitive transition probability matrix. The irreducibility of the chain guarantees that the long run stationary vector, known as the PageRank vector, exists[1]. The values corresponding to each page in this vector gives the PageRank score of the page. Over the years, PageRank score has been widely adopted the relative importance of vertices in various graph based scenarios.

Personalized PageRank is a variation of PageRank used by many services to provide personalized search results and recommendations by computing PageRank relative to a particular vertex or set of vertices. It uses random walks to determine the importance or authority of vertices in a graph from the point of view of a given source node. Given a fixed termination probability at each step, the Personalized PageRank score of a vertex with respect to the source vertex represents the probability that a random walk from the source terminates at this vertex. This has widespread applications in areas like web search, spam detection, social networks and graph neural networks.

Personalized PageRank (PPR) is the personalized version of the PageRank algorithm which was important to Google's initial success. On any graph, given a starting node s whose point of view here take, Personalized PageRank assigns a

score to every node t of the graph. This score models how much the user s is interested in t , or how much s trusts t . More generally can personalize to a distribution over starting nodes, for example in web search we can create a distribution with equal probability mass on the web pages the searching user has bookmarked. If we personalize to the uniform distribution over all nodes, the score is no longer personalized, and recover the standard (global) PageRank score.

PPR has widespread applications in the area of data mining, including web search[2], spam detection[3], social networks[4], graph neural networks[5], and graph representation learning[6], and thus has drawn increasing attention during the past years. Studies on PPR computations can be broadly divided into four categories: 1) single-pair query, which asks for the PPR value of a given source node s and a given target node t ; 2) Single source query, which asks for the PPR value of a given source node s to every node $t \in V$ as the target; 3) single-target query, which asks for the PPR value of every node $s \in V$ to a given target node t . 4) all-pairs query, which asks for the PPR value of each pair of nodes. While single-pair and single-source queries have been extensively studied, single-target PPR query is less understood due to its hardness[7].

2. PAGE RANK ALGORITHM

Brin and Larry Page[8, 9] developed a ranking algorithm used by Google, named *PageRank (PR)* after Larry Page (cofounder of Google search engine), that uses the link structure of the web to determine the importance of web pages. Google[10] uses PageRank to order its search results so that documents that are seem more important move up in the results of a search accordingly. This algorithm states that if a page has some important incoming links to it then its outgoing links to other pages also become important. Therefore, it takes backlinks into account and propagates the ranking through links. Thus, a page obtains a high rank if the sum of the ranks of its backlinks is high.

The PageRank algorithm considers more than 25 billion web pages on the WWW to assign a rank score [10]. When some query is given, Google combines precomputed PageRank scores with text matching scores [11] to obtain an overall ranking score for each resulted web page in response to the query. Although many factors are considered while determining the overall rank but PageRank algorithm is the heart of Google.

A simplified version [8] of PageRank is defined in Eq. 1:

$$PR(u) = c \sum_{v \in B(u)} \frac{PR(v)}{N_v} \quad (1)$$

where o represents a web page, $B(u)$ is the set of pages that point to o , $PR(u)$ and $PR(v)$ are rank scores of page o and v respectively, N_v denotes the number of outgoing links of page v , c is a factor used for normalization.

In PageRank, the rank score of a page (say p) is equally divided among its outgoing links. The values assigned to the outgoing links of page p are in turn used to calculate the ranks of the pages pointed to by p .

Later PageRank was modified observing that not all users follow the direct links on WWW. The modified version is given in Eq. 2:

$$PR(o) = (1-d)d \frac{PR(v)}{N} \quad (2)$$

where d is a dampening factor that is usually set to 0.85. d can be thought of as the probability of users' following the direct links and $(1 - d)$ as the page rank distribution from non- directly linked pages.

Power Method is an iterative method for computing single source and single-target PPR queries [45]. Recall that, at each step, an α -discounted random walk terminates at the current node with α probability or moves to a random neighbor with $(1-\alpha)$ probability. This process can be expressed as the iteration formula with single-source PPR vector is shown in Eq. 3:

$$\vec{\pi}_s = (1-\alpha) \vec{\pi}_s . P + \alpha \cdot \vec{e}_s \quad (3)$$

where $\vec{\pi}_s$ denotes the PPR vector with respect to a given source node s , \vec{e}_s denotes the one-hot vector with $\vec{e}_s(s) = 1$, and P denotes the transition matrix is given in Eq. 4:

$$P(i,j) = \begin{cases} \frac{1}{dout(v_i)}, & \text{if } V_j \in Nout(V_i) \\ 0, & \text{otherwise} \end{cases} \quad (4)$$

Power Method can be used to compute the ground truths for the single-source and single-target query. After $l = \log_{1-\alpha}(\epsilon)$ iterations, the absolute error can be bounded by $(1 - \alpha)^l = \epsilon$. Since each iteration takes $O(m)$ time, it follows that the Power Method computes the approximate single-target PPR query with additive error in $O(m \cdot \log_{\frac{1}{\epsilon}})$ time. Note that the dependence on the error parameter ϵ is logarithmic, which implies that the Power Method can answer single-target PPR queries with high precision. However, the query time also linearly depends on the number of edges, which limits its scalability on large graphs.

2.1 Weighted Page Rank Algorithm

Wenpu Xing and Ali Ghorbani proposed an algorithm called weighted page rank (WPR). This weighted page rank algorithm is different from the traditional page rank algorithm in the fact that each outlink page has a page rank value proportional to its importance (number of inlinks and outlinks) instead of dividing it equally [12].

Win(v, u) = weight of link (v, u) or importance of web page due to inlinks

Wout(v, u) = weight of link (v, u) or importance of web page due to outlinks is in Eq. 5:

$$W_{(v,u)}^{in} = \frac{I_u}{\sum_{p \in R(v)} I_p} \quad (5)$$

where, I_u and I_p denote the no. of inlinks of page u and page p respectively.

$R(v)$ represents the reference page list of page v is in Eq. 6:

$$W_{(v,u)}^{out} = \frac{O_u}{\sum_{p \in R(v)} O_p} \quad (6)$$

where, O_u and O_p denote the no. of outlinks of page u and page p respectively

$R(v)$ represents the reference page list of page v

After calculating the importance of web pages, the modified page rank formula is given in Eq. 7:

$$PR(u) = (1 - d) + d \sum_{v \in B(u)} PR(v) W_{(v,u)}^{in} W_{(v,u)}^{out} \quad (7)$$

This Weighted Page Rank algorithm solves the problem of ranking web pages based on their relevancy or importance by considering the weight factor. But the problem of query independency and calculation of page ranks at indexing time still remain with WPR and with the traditional Page Ranking algorithm.

2.2 Iterative Page Rank Algorithm

It is easy to solve the equation system, to determine page rank values, for a small set of pages but the web consists of billions of documents and it is not possible to find a solution by inspection method. In iterative calculation, each page is assigned a starting page rank value. These rank values are iteratively substituted in page rank equations to find the final values. In general, many iterations could be followed to normalize the page ranks.

3. PERSONALIZED PAGE RANK

Personalized PageRank (PPR), as a variant of PageRank [8], focuses on the relative significance of a target node with respect to a source node in a graph. Given a directed graph $G = (V, E)$ with n nodes and m edges, the PPR value $\pi(s, t)$ of a target node t with respect to a source node s is defined as the probability that an α -discounted random walk from node s

terminates at t . Here an α -discounted random walk represents a random traversal that, at each step, either terminates at the current node with probability α , or moves to a random out-neighbor with probability $1 - \alpha$. For a given source node s , the PPR value of each node t sum up to $\sum_{t \in V} \pi(s, t) = 1$, and thus $\pi(s, t)$ reflects the significance of node t with respect to the source node s . On the other hand, PPR to a target node can be related to PageRank: the summation of PPR from each node $s \in V$ to a given target node t is $\sum_{s \in V} \pi(s, t) = n \cdot \pi(t)$ where $\pi(t)$ is the PageRank of t [8]. Large $\pi(s, t)$ also shows the great contributions made for t 's PageRank, the overall importance of t . Therefore, $\pi(s, t)$ indicates bidirectional importance between s and t .

3.1 Reverse Push

One local variation on Power Iteration starts at a given target node t and works backwards, computing an estimate $p^t(s)$ of $\pi_s(t)$ from every source s to the given target. This technique was first proposed by Jeh and Widom [2], and subsequently improved by other researchers [14]. The algorithms are primarily based on the following recurrence relation for π_u :

$$\pi_s(t) = \alpha e_s + \frac{(1-\alpha)}{N^{out}(s)} \cdot \sum_{v \in N^{out}(s)} \pi_v(t)$$

Intuitively, this equation says that for s to decide how important t is, first s gives score α to itself, then adds the average opinion of its out-neighbors, scaled by $1 - \alpha$. Andersen et. al. [13,14] present and analyze a local algorithm for PPR based on this recurrence. This algorithm can be viewed as a message passing algorithm which starts with a message at the target. Each local push operation involves taking the message value (or "residual") $r^t[v]$ at some node v , incorporating $r^t[v]$ into an estimate $p^t[v]$ of $\pi_v[t]$, and sending a message to each in-neighbors $u \in N^{in}(v)$, informing them that $p^t[v]$ has increased. Because we use it in our bidirectional algorithm, we give the full pseudo-code here as Algorithm 1.

Algorithm 1 : Reverse Push(t, r_{max}, α) [14]

Inputs : graph G with edge weights $(W_{u,v})_{u,v \in V}$, target node t , maximal residual r_{max} , teleport probability α

1. Initialize (sparse) estimate-vector $p_t = \vec{0}$ and (sparse) residual-vector $r_t = e_t$
(i.e $r_t(v) = 1$ if $v = t$; else 0)
2. while $\exists v \in V$ s.t. $r_t > r_{max}$ do
3. for $u \in N^{in}(v)$ do
4. $r_t(u) += (1 - \alpha)W_{u,v} r_t(v)$

5. end for
6. $p_t(v) += \alpha r_t(v)$
7. $r_t(v) = 0$
8. end while
9. return (p_t, r_t)

3.2 Forward Push

An alternative local version of power iteration starts from the start node s and works forward along edges. Variations on this were proposed in [15] and others, but the variation most useful for our work is in Andersen et. al. [16] because of the analysis they give. Because we use it a variation of our bidirectional algorithm, we give the full pseudo-code here as Algorithm 2.

Algorithm 2: Reverse Push(G, s, r_{max}, α) [16]

Inputs : graph G , maximal residual r_{max} , teleport probability α , start node s

1. Initialize (sparse) estimate-vector $p_s = \vec{0}$ and (sparse) residual-vector $r_s = e_s$
(i.e $r_s(v) = 1$ if $v = s$; else 0)
2. while $\exists v \in V$ s.t. $\frac{r_s(u)}{d_u} > r_{max}$ do
3. for $v \in N(u)$ do
4. $r_s(v) += (1 - \alpha) \frac{r_s(u)}{d_u}$
5. end for
6. $p_s(u) += \alpha r_s(u)$
7. $r_s(v) = 0$
8. end while
9. return (p_s, r_s)

To our knowledge, there is no clean bound on the error $\|p_s - \pi_s\|$ as a function of r_{max} for a useful choice of norm. The difficulty is illustrated by the following graph: we have n nodes, $(s, t, v_1, \dots, v_{n-2})$, and $2(n-2)$ edges, (s, v_i) and (v_i, t) for each i . If we run ForwardPush on this graph starting from s with $r_{max} = 1/n-2$, then after pushing from s , the algorithm halts, with estimate at t of $p_s(t) = 0$. However, $\pi_s(t) = (1)$, so the algorithm has a large error at t even though r_{max} is getting arbitrarily small as $n \rightarrow \infty$.

The loop invariant in [16] does give a bound on the error of ForwardPush, but it is somewhat subtle, involving the personalized PageRank personalized to the resulting residual vector.

3.3 Monte-Carlo

The Monte-Carlo algorithm [17] computes the approximate single-source PPR query by sampling abundant random walks from source node s and using the proportion of the random walks that terminate at t as the estimator of $\pi(s, t)$. According to Chernoff bound, the number of random walks required for an additive error ϵ is $O(\frac{1}{\epsilon^2})$, while the number of random walks required to ensure constant relative error for all PPR larger than δ is $O(\frac{1}{\delta})$. This simple method is optimal for single-source PPR queries with relative error, as there are at most $O(\frac{1}{\delta})$ nodes t with PPR $\pi(s, t) \geq \delta$. However, the Monte-Carlo algorithm does not work for single-target queries, as there lacks of a mechanism for sampling source nodes from a given target node. Moreover, it remains an open problem whether it is possible to achieve the same optimal $O(\frac{1}{\delta})$ complexity for the single-target query.

4. CONCLUSIONS

In this paper, we discussed the various algorithms and techniques mainly used by search engines in ranking web pages on the internet. That mainly deals with the traditional pagerank algorithm, personalized pagerank algorithms and its different techniques. With the course of time the traditional page rank algorithm has been modified by adding many different factors. Google Page Rank Algorithm computes the page ranks of web pages only at the time of indexing and weighted pagerank algorithm is a modification of the google's pagerank algorithm. But these modification are not sufficient to cope with the increasing data or information on every web page day-by-day. There is a need of some kind of modified algorithm that can give results at the time of indexing as well as at the time of user query is called personalized pagerank algorithm. The existing algorithms may consider the bookmarked web pages in calculating the Page Rank of web pages. The Page Ranking algorithms are now finding applications not only in ranking web pages but extensively used in ranking research papers, suggesting user accounts to follow and in many other fields. Here personalized pageranking techniques includes reverse push, forward push and finally monte-carlo.

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Impact of Globalization on Methods of Cultivation with Special Reference to Theni District

Dr.S.Velanganni¹, Dr.D.Jeba Selvi Anitha², Dr.M.Aakina Barveen³

¹Assistant Professor of Economics, Jayaraj Annapackiam College for Women
(Autonomous) Periyakulam, Theni District

²Assistant Professor of Commerce, The American College,
Maduari

³Assistant Professor of Commerce, Jayaraj Annapackiam College for Women
(Autonomous) Periyakulam, Theni District

Abstract: Globalization is a process that has brought a lot of changes in all sectors including agriculture sector. It results the interdependence of world trade through which cross border business, access to high quality technologies and new culture in both business and in personal life of an individual have been developed. Social transformation has also taken place due to globalization factors. Food habits and life style of the people and culture have also been changed. Hence farmers have also changed their attitudes towards traditional cultivation and they have gone for new method of cultivation. This is only because of globalization factors. New package program in agriculture was developed and cash crop cultivation was popularized among farmers. Giant seed companies like Monsanto, Syngenta and Cortiva Agriscience have replaced the application of traditional and farm seeds in production. Adoption of new methods of cultivation has taken place in the form of using scientific methods, chemical fertilizers and improved farm techniques. These changes have totally eroded the subsistence farming and traditional farming. Instead the new package program caused to use high quality seeds, high intensive water crops, application of chemical fertilizers to a large quantity and pesticides. The outcome of those changes are increasing cost of production and coming out from the field.

Key Words--- Globalization, Cost, Seed, Fertilizer, Yield, Fertility of the land and soil, Pesticides and Analysis

Introduction

Globalization is a process that has brought a lot of changes in all sectors including agriculture sector. It results the interdependence of world trade through which cross border business, access to high quality technologies and new culture in both business and in personal life of an individual have been developed. It is inevitable in day today life and everybody has to travel along with it. Industrialist, Educationist, Agriculturalist and the common people have rich experience in globalization and have addressed the sparkle and darkness of globalization. However farmers are largely forced by globalization factors. The traditional farming system, seed saving method, cultivation method and cost of cultivation have been totally changed. New package program in agriculture was developed and cash crop cultivation was popularized among farmers. Giant seed companies like Monsanto, Syngenta and Cortiva Agriscience have replaced the application of traditional and farm seeds in production. More than 57 percent of the total population in India depends on agriculture for their lively hood and most of them are marginal farmers holding less than 1 acre of land and engaged in subsistence farming. But globalization has totally eroded such kind of farming due to dictating farming developed by globalization. Hence an attempt has been made by the authors to bring out the impact of method of cultivation (Production). Though cost of production and cost of cultivation are interchangeable,

there is a small difference between them. Cost of production includes the factor costs and costs incurred on marketing also. But cost of cultivation covers the factor cost and cost incurred the various activities till harvesting. Both have brought changes in method of cultivation. So how farmers have changed themselves and adopted the ongoing changes in agriculture sector is presented in this paper. 1200 farmers comprising marginal, small, medium and large have been taken using stratified random sampling in Theni District for the purpose of study.

The production and productivity largely depends on the method of cultivation right from the selection of seeds, preparation of land, sowing, irrigating the plant, and pre and post harvesting operations and harvesting on time. The development process has changed the cultivation method from tradition to modern by using scientific and improved farm techniques in agriculture which has replaced human power. Analyzing the impact of globalization on cultivation would help the researchers to know the changes occurred on the selected variables in the study area. Paired sample 't' test was calculated with the help of mean score.

1.1 Fertility of the land

The opinion of the respondents' towards fertility of the land was analyzed and resulting mean score and the respective 't' value are presented in the table 1.1

Table.1.1 Change in land fertility and test of significance

Variable	Mean score of the fertility of the land		Difference	't' value
	Pre globalization period	Post globalization period		
Fertility of the land	2.4250	1.1750	1.25000	79.355**

Source : Primary Data

**Significant at 1 percent

The table 1.1 reveals that the mean value of the fertility of the land during pre globalization period was 2.4250 and it has declined to 1.1750 during post globalization period. This is due to the high consumption of fertilizer and pesticides.

It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in land fertility and the study concludes that the land fertility has decreased significantly during post globalization period in the study area.

1.2 Fertility of the soil

The opinion of the respondents' towards fertility of the soil was analyzed and resulting mean score and the respective 't' value are presented in the table 1.2

Table 1 .2.Change in fertility of the soil and test of significance

Variable	Mean score of the fertility of the soil		Difference	't' value
	Pre globalization period	Post globalization period		
Fertility of the soil	1.5550	1.4500	0.10500	3.803**

Source :Primary Data

**Significant at 1 percent

The table 1.2 indicates that the mean value of the fertility of the soil during pre and post globalization period was 1.5550 and 1.4500 respectively. The decline in the fertility of the soil is attributed to the declining micro nutrient of the soil due to the destruction of micro organisms by applying more chemical based inputs.

It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post

globalization periods in the fertility of the soil and the study concludes that globalization has statistically decreased the fertility of the soil in the study area.

1.3 Usage of self saved seed

The opinion of the respondents' towards the usage of self saved seed was analyzed and resulting mean score and the respective 't' value are presented in the table 1.3

Table1.3.Change in the usage self save seed and test of significance

Variable	Mean score of the usage of self saved seed		Difference	't' value
	Pre globalization period	Post Globalization period		
Usage of self saved seed	2.5150	1.4850	1.03000	50.484**

Source: Primary Data

**Significant at 1 percent

The table 1.3 shows that the mean score of the usage of self saved seed during pre globalization period was 2.5150 and it has been perceived low during post globalization period as 1.4850. It implies that usage of traditional seed variety has declined in the study area. Domestic and international privatization in seed sector has developed the usage of pocket seeds and reduced the traditional seed variety. It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in the usage of self saved seed and the study concludes that globalization has statistically decreased the usage of self save seed in the study area.

1.4 Usage of seed through inter farmers exchange

The opinions of the respondents' towards the usage of seed through inter farmers exchange was analyzed and resulting mean score and the respective 't' value are presented in the table 4

Table1.4.Change in the usage of seed through inter farmers exchange and test of significance

Variable	Mean score of the usage of inter farmers exchange seed		Difference	't' value
	Pre globalization period	Post Globalization period		
Usage of inter farmers exchange seed	2.0850	1.5750	0.51000	17.073**

Source : Primary Data

**Significant at 1 percent

The table 1.4 shows that the mean score of the usage of seed by farmers through inter farmers exchange during pre globalization period were 2.0850 and it has decreased during post globalization period as 1.5750. Usage of high yield variety seeds and developed market oriented agriculture have reduced the usage of seed through inter farmers' exchange.

It is also inferred from the table that since difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in the usage of seed through inter farmers exchange seed and the study concludes that globalization has significantly decreased the usage of seed through inter farmers exchange seed in the study area.

1.5 Quantity of seed used per acre

The opinion of the respondents' towards quantity of seed used per acre was analyzed and resulting mean score and the respective 't' value are presented in the table 1.5

Table 1.5.Change in the quantity of seed used per acre- Test of significance

Variable	Mean Score of the quantity of seed used per acre in kg		Difference	't' value
	Pre globalization period	Post globalization period		
Quantity of seed used per acre in kg	30.3950	22.5500	+7.84500	107.622**

Source: Primary

**Significant at 1 percent level

The table1.5 shows that the mean score of the quantity of seed used by the respondents per acre during pre globalization period was 30.3950 Kg and it has decreased during post globalization period to 22.5500Kg. Availability of high productive seeds has reduced the seed consumption per acre.

It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in quantity of seed used per acre and the study concludes that globalization has significantly decreased the seed consumption per acre in the study area.

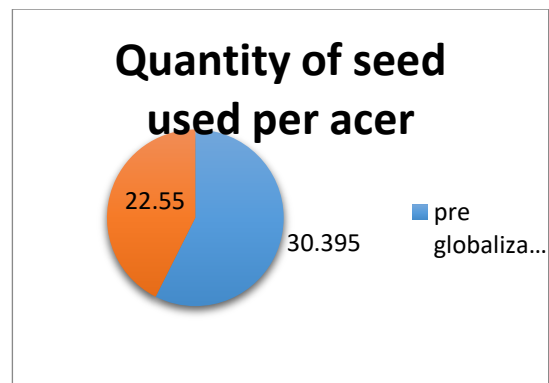


Figure-1

Quantity of seed used per acre in k.g

1.6 Yield rate

The yield rate in kg was analyzed and resulting mean score and the respective' value are presented in the table 1.6

Table1.6.Change in the yield per acre and test of significance

Variable	Mean Score of the yield per acre in kg		Difference	't' value
	Pre globalization period	Post globalization period		
Yield per acre in ke	24.6100	40.3750	-15.76500	-107.597**

Source: Primary data

**Significant at 1 percent level

The table1.6 reveals that the mean score of the yield per acre during pre globalization period was 24.6100 kg and it has increased to 40.3750 kg during post globalization period. There is an increase in yield per acre after globalization period. Adoption of improved farm techniques and availability of high productive seeds are

the reasons for increasing yield.

It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in the yield per acre and the study concludes that globalization has significantly increased the yield per acre in the study area.

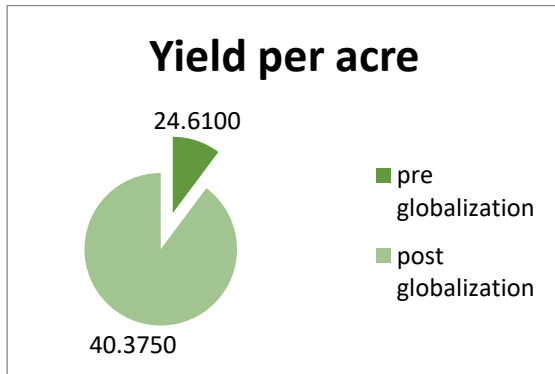


Figure-2

Yield per acre usage of chemical fertilizer

The opinion of the respondents' towards the usage of chemical fertilizer was analyzed and resulting mean score and the respective 't' value are presented in the table 1.7

Table 1.7 Change in chemical fertilizer usage by the farmers

Variable	Mean score of the usage of chemical fertilizer		Difference	't' value
	Pre globalization	Post globalization		
Usage of chemical fertilizer	1.1500	2.7200	-1.57000	-87.604*

Source: Primary Data

**Significant at 1 percent

It is evident from the table 1.7 that the mean score of the usage of chemical fertilizer per acre during pre globalization period was 1.1500 and it has increased to 2.7200 during post globalization period. Intention of the farmers towards more yield and the implications of the private sector towards fertilizer application have increased more fertilizer and developed the culture among the farmers to go for fertilizer. These are the reasons for increasing fertilizer usage.

It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in the usage of chemical fertilizer and the study concludes that globalization has significantly increased the usage of chemical fertilizer in the study area.

1.8 Usage of bio fertilizer

The opinion of the respondents' towards the usage of bio fertilizer was analyzed and the resulting mean score and the respective 't' value are presented in the table 1.8

Table 1.8. Change in Bio fertilizer usage and test of significance

Variable	Mean score of the usage of bio fertilizer		Difference	't' value
	Pre globalization period	Post globalization period		
Usage of bio fertilizer	1.0000	2.8500	-1.85000	-179.402**

Source: Primary Data

**Significant at 1 percent

It is clear from the table 1.8 that the usage of bio fertilizer during pre-globalization has perceived low mean score as 1.0000 and it has perceived high mean score as 2.8500 during post globalization period. In order to enhance the soil fertility and minimize chemical fertilizers, bio fertilizer is used.

It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in the usage of bio fertilizer and the study concludes that globalization has significantly increased the usage of bio fertilizer in the study area.

1.9 Usage of pesticides

The opinion of the respondents' towards the pesticide usage was analyzed and resulting mean score and the respective 't' value are presented in the table 1.9

Table 1.9. Change in the usage of pesticide and test of significance

Variable	Mean score of the pesticide usage		Difference	't' value
	Pre globalization	Post globalization		
Usage of pesticide	1.1600	2.7250	-1.56500	-86.139**

Source: Primary Data

**Significant at 1 percent

The table 1.9 reveals that the usage of pesticides during pre-globalization period has perceived low mean score 1.1600 and post globalization period has perceived high as 2.7250. The difference of the mean score shows that there is an increase in the usage of pesticide. Destruction of micro organisms, development of monoculture and releasing of new organisms and the lack of disease free crop production increases the usage of pesticides.

It is also inferred from the table that since the difference between the two periods is significant, there is a significant difference between the pre and post globalization periods in the usage of pesticides and the study concludes that globalization has increased the usage of pesticides in the study area.

Conclusion

The analysis has outlined that the cultivation practice has been changed according to the needs of globalization. The seed saving method, seed mobilization and seed requirement have changed. Application of chemical fertilizer, pesticide and high water consumption crop cultivation has been increased in the study area.

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AUTOMOBILES BASED BLACK-BOX SYSTEM USING IoT

S.Monika¹, S.Miruthulasri², R.Mano Priya³, D.Murugesan⁴.

¹⁻³Student, Dept. of ECE, SRM Valliammai Engineering College, Tamil Nadu, India.

⁴Professor, Dept. of ECE, SRM Valliammai Engineering College, Tamil Nadu, India.

Abstract: The black box concept is derived from the aviation industry, a flight recorder, colloquially known as black box. Although it is now orange coloured for easy search, is an electronic recording device laced in an aircraft for the purpose of the investigating aviation accidents and incidents. With the advancement in technology and cost coming down, in our project we attempt to build similar device for our cars, not only this device will help us in post crash analysis but also it helps us in post-crash analysis but also it will help us in quicker emergency rescue operation. research has been targeted towards building an integrated systems for emergency rescue services in the event of a road accident.

Keyword: IoT, ATmega328p, Black-Box, GPS.

1. INTRODUCTION:

Millions of people die due to accidents. The vehicle accident is a major public problem in many countries. This problem is still increasing due to rider's rash driving and drunk and drive. This problem can be solved by using Black Box system analysis. Automobiles and computer technologies are creating a new level of data service in vehicles. The automatic Black Box has functions similar to an airplane Black Box. It is used to analyse the cause of vehicular accident and prevent the loss of life and property arising from the vehicle accidents. This paper proposes a prototype of an automatic Black Box.

2. PROPOSED SYSTEM:

The proposed system is designed such that, the device itself sends a data to the IOT and this process is done by ESP8266 chip with sensors when an accident is met. Proposed system use Arduino board that provides an easy access to input/output and analog pins and easy burning/uploading of a program. To monitor the various sensors such as alcohol sensor, temperature sensor, light sensor, accelerometer, ultrasonic sensor, GPS are connected to Arduino board. Arduino board is connected to cloud. The output of the sensors is read from Arduino and output values are displayed in LCD. The data is stored in the cloud the given system is proposed in IoT.

3. METHODOLOGY:

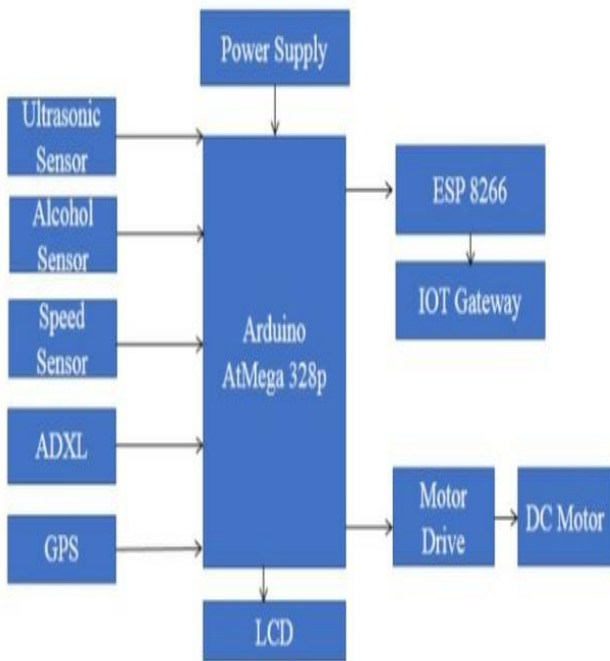
Consider a car had an accident the sensor will activated automatically and start its surveillance mode. If user is not in critical condition and can help himself then he will

For every 30 seconds GPS will receive the information from the satellite and fed to the microcontroller. Control the form of longitude and latitude. Then it records car details will read information and display it on the LCD display. A memory card is solid-state electronic flash memory data storage device capable of digital contents.

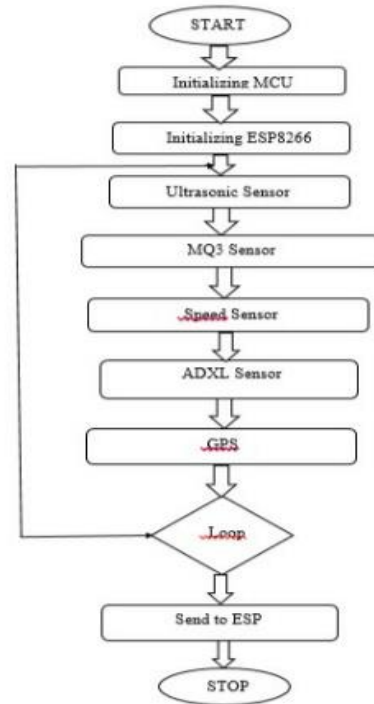
Black Box system that can be installed into vehicles. The system aims to achieve accident analysis by objectively tracking the vehicle. The system also involves enhancement of security by preventing tampering of the Black Box data. This system consists of Alcohol sensor, Speed measurement sensor, Ultrasonic sensor, MEMS sensor and Mobile GPS. Whenever an abnormal value is detected it will be created in the form of log and send to the cloud it contain location and image.

stop surveillance mode. Once the system started in assistance mode first of all system will gather the car location using GPS device Power supply is a supply of electrical power, that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The Global Positioning System (GPS) is a burgeoning technology, which provides flexibility of positioning for navigation, surveying. The GPS provides continuous three-dimensional positioning 24 hrs a day throughout the world. Once the user's position has been determined, GPS unit can calculate other information, such as speed, bearing, track, trip distance, distance to destination. One of the most common devices attached to a micro controller is an LCD display. 16x2 display is used in this project. This means 16 characters per line by 2 lines.

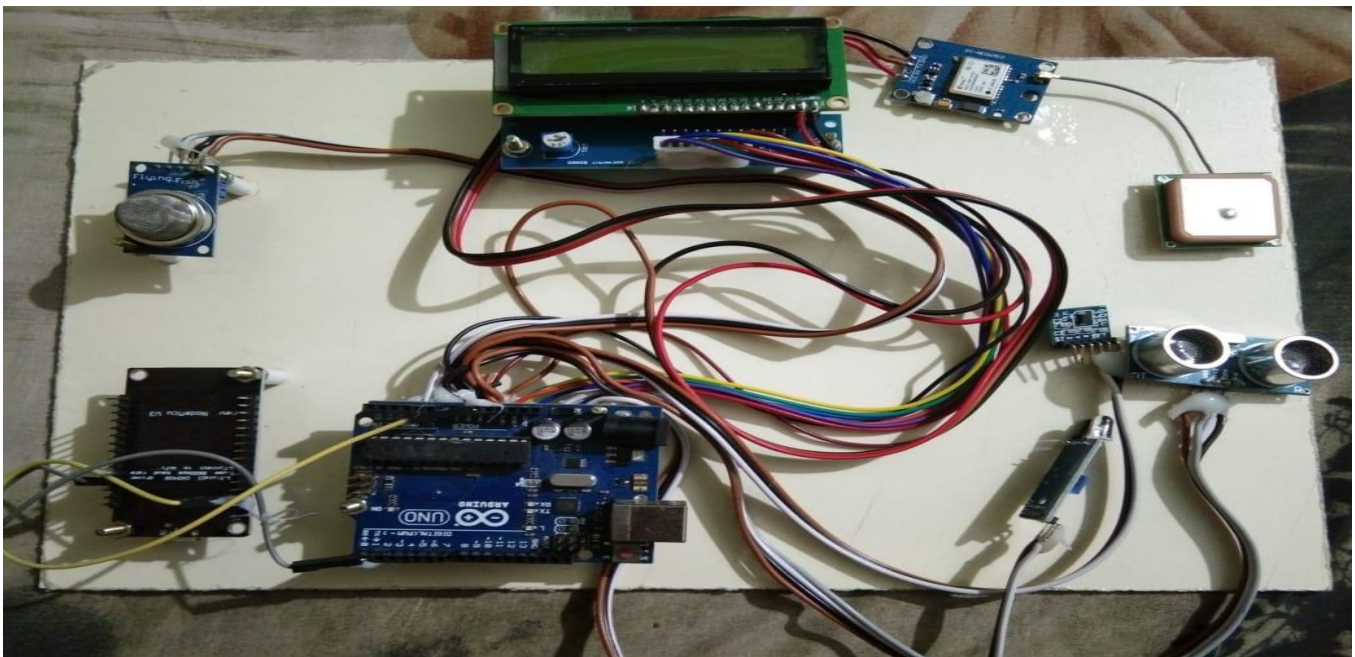
3.2 FLOW CHART:



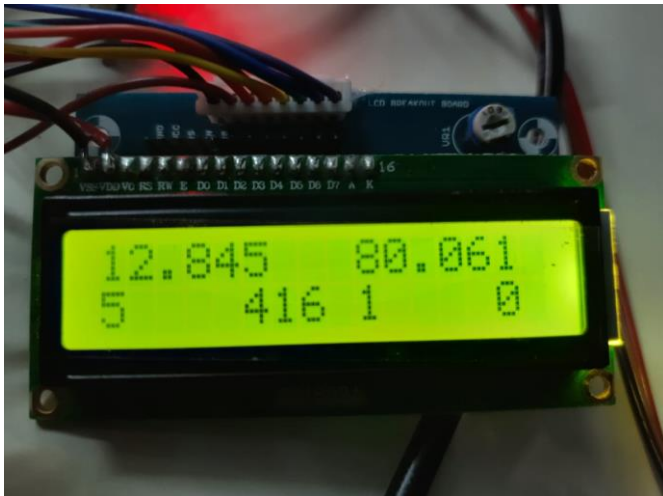
3.1 Block diagram of black box system using IoT



4. HARDWARE IMPLEMENTATION:



4.1 RESULT AND OUTPUT



SLNO	PARAMETERS	VALUES
1	Ultrasonic Sensor	5
2	Alcohol Sensor	1
3	ADXL Sensor	416
4	Speed Sensor	0
5	Latitude	12.845
6	Longitude	80.061

These are the output displayed on the LCD when the black box system works with an IoT.

5. CONCLUSION:

A working model of a Black Box with SMS alert for road vehicles has been developed for vehicle accident detection and reporting. It is a system that uses Arduino UNO, ultrasonic, alcohol, speed and AXDL sensor and also IoT developed for vehicle accident and reporting. It provides crucial information to emergency responders in the earliest possible time. The crucial time between the accident and getting victim medical attention can often be the difference between life and death. This system provides better safety rather than no safety.

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WASTE MANAGEMENT IN SMART CITIES USING IoT

Prabha Shree S

*Department of Electronics and
Communication Engineering
SRM Valliammai Engineering College
Chennai,India*

Pragathi T

*Department of Electronics and
Communication Engineering
SRM Valliammai Engineering College
Chennai,India*

Monisha S

*Department of Electronics and
Communication Engineering
SRM Valliammai Engineering College
Chennai,India*

Mr.Anbarasan A

*Department of Electronics and
Communication Engineering
SRM Valliammai Engineering College
Chennai,India*

Abstract—In this project an automated system is provided for segregating types of wastes as biodegradable, non-biodegradable and metallic wastes. A mechanical setup can be used for separating wastes into separate containers where sensors are used for separating the wastes. In this process, the color sensor detects the type of waste according to the RGB color scale. The sensing range is from 0-1024 in digital value and 0-5 volts in Analog value. If the detected value is from 0 to 500 then the particular waste is detected as bio-degradable waste and if it is from 500 to 1024 then the detected waste is termed as Non-biodegradable wastes and then that detected waste is putted into that particular container. The metal wastes are detected with the help of metal sensor these sensors create an EM field for detection of the waste. These containers are embedded with ultrasonic sensors at the top, the ultrasonic sensor is used for measure the level of waste. This makes it possible to measure the amount of waste in the containers if the containers attain a certain level, an alert message containing the location of the dustbin is sent to the garbage collector if the garbage is collected and the bin is emptied an acknowledgement is sent to the municipality corporation if not a complaint is filed against the garbage collector. This proposed system will give an enhanced waste management system for segregating and managing the wastes.

Keywords—Color sensor, Metal sensor, Waste, Garbage bin, Segregation, Garbage collector

I. INTRODUCTION

Waste management is one of the major alarming threat all over the world. Poorly managed waste leads to contamination of the oceans. Clogging drains and transmitting of new diseases. The current systems cannot cope up with the current volumes of wastes generated by the increasing urban population. The world generates about 2.01 billion tons of municipal solid waste annually, with at least 33 percent of that extremely conservatively not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages

0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. That too in the developing countries like India due to the rapid urbanization and industrialization the waste generated increases day by day. According to the recent data from MNRE Report, India is generating exponentially about 145 million tons of waste per year and further it is expected to reach approximately 260 to 300 million tons per day in the year 2047. The wastes are best at when it is recycled and treated. This waste has to be managed effectively and efficiently in order to have healthy environment to have a safer environment. The major problems affecting the solid waste management are unscientific treatment, improper collection of waste, and ethical problems. This in turn leads to hazards situations like environmental degradation, water pollution, soil pollution, and air pollution. In this project we have proposed a model for proper collection and segregation the wastes are segregated into Bio-degradable, Non-biodegradable, e-wastes with the help of color sensors and the metal wastes are detected using the metal sensor. After the detection of the type of waste the detected waste is put into the particular dustbins, these dustbins are embedded with the ultrasonic sensors which are used to measure the level of the dustbin, if the dustbin attains a certain level an alert message containing the location of the dustbin is sent to the garbage collector if the garbage is collected and the bin is emptied an acknowledgement is sent to the municipality corporation if not an complaint is filed against the garbage collector.

II. PROPOSED METHODOLOGY

As shown in the figure 1 block diagram represents how the sensors and other components are connected to the Arduino. In our model the waste is placed in the plate fitted with the color sensor and the metal sensor. When the waste is placed in the plates with the help of the color sensor the type of waste is detected, the detection is based the RGB color scale. The color sensor works on the principle of intensity of reflected light. Each object has different intensity of reflected light with these differences the waste is segregated as Bio-degradable and Non-bio degradable. For Bio-degradable waste the sensing value is

from 0-500 in digital value or 0-2.5 v in analog value as volts and for the Non-biodegradable waste the sensing value is from 500-1024 in digital value or 2.5-5.0 v in analog value as volts. The metal sensor is used to detect the metal waste like copper, silver, steel, iron, lead, aluminium and etc. The sensing range for ferrous metals like steel, iron, aluminium is 3-5 cms and for non-ferrous materials like silver, tin, lead is 1-1.5 cms. These sensed values are given into the Arduino UNO, it acts as analog to digital convertor, these converted digital values are fed into the Node MCU, the node mcu has integrated Wi-Fi module which is used for communication. The dustbins are embedded with the ultrasonic sensors at the top to calculate the level of garbage in the dustbins. After the segregation part, when the dustbin attains a certain level (75%) an alert message is sent to the respective garbage collector with the location of the dustbin to collect the waste. If he collects the waste and empties the dustbin an acknowledgement is sent to the municipality corporation. If the waste is not collected after a period of time a warning message is sent to the garbage collector even then if he didn't collect the waste a complaint is filed against the garbage collector at the municipality corporation. And then the process continues

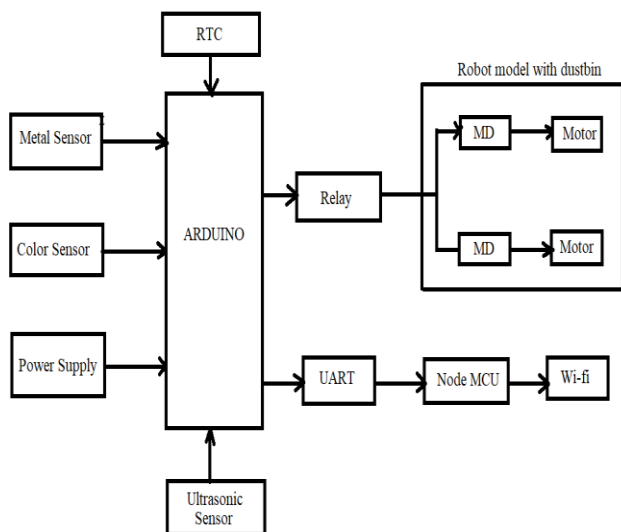


Fig.1: Block Diagram of Proposed System

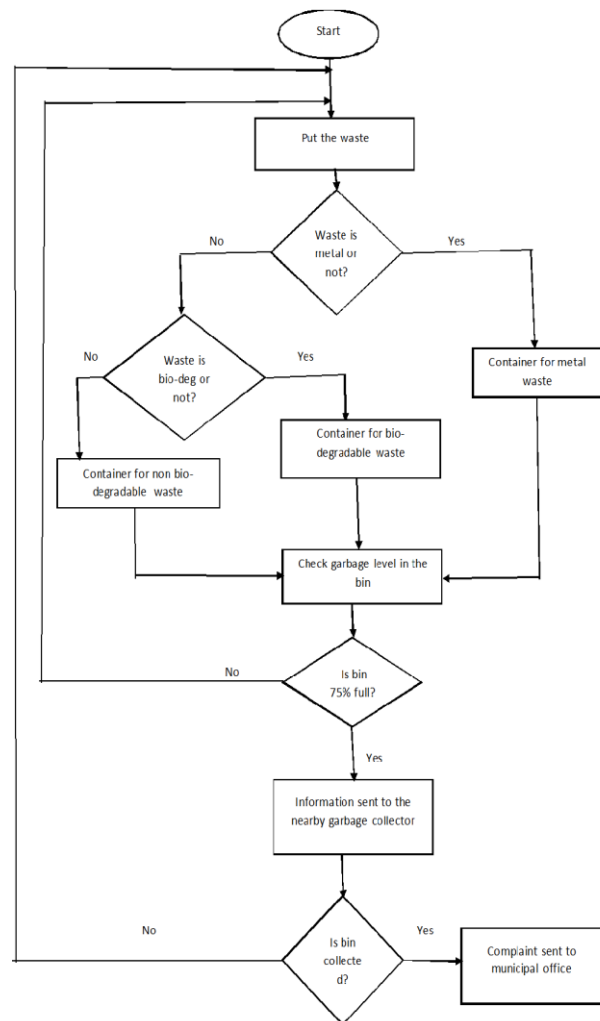
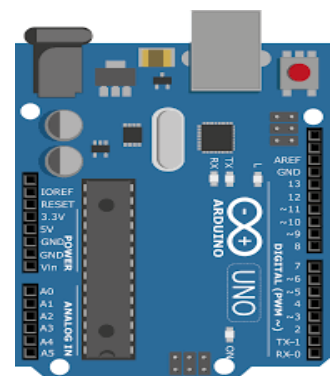


Fig.1: Flow Chart of Proposed System

III. COMPONENTS

A) Arduino UNO:

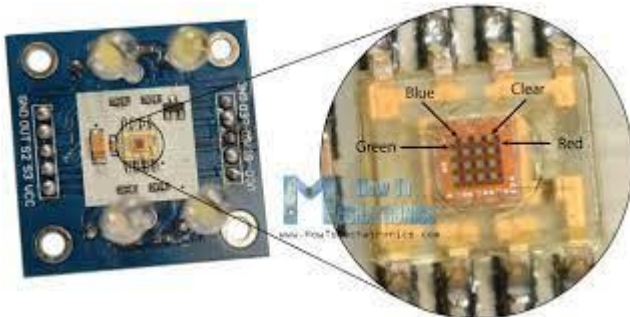
Arduino UNO is an open-source microcontroller which is easy to use with variety of applications. It has 14 digital pins and 6 Analog pins. Its operating voltage is 5volts. The advantage of the Arduino Uno over other microcontrollers is that it has a built in Analog-Digital convertor and Digital-Analog convertor.



B) Node MCU:

The Node MCU is an open-source IoT platform device consisting of ESP8266 module having a 32-bit ARM

microprocessor with integrates WI-FI network support. It consists of 10 GPIO pins but it has only one Analog pin(A0). Its operating voltage is 3.3v. Its advantages are low energy consumption and low cost.



C)Color sensor:

The color sensor is a complete color detector which detects the color and object using the reflected light intensity which differs from object to object. It consists of TAOS TCS3200 RGB sensor chip and 4 white Led's. It consists of 8 pins. The reflected light is sensed with the help of color filter filters out the primary color in the scattered rays and calculates the proportion of the primary color. With these calculated values the waste are segregated as Bio-degradable and Non-biodegradable. If the output is between 0-2.5v the detected waste is bio-degradable and if the value is from 2.5-5v the detected waste is non-biodegradable.

D)Metal sensor:

The metal sensor consists of a coil and an oscillator that generates an EM field in the surrounding of the sensing range, presence of any metallic substance in the sensing range causes dampening of oscillation amplitude with this the metal is



detected. The sensing range for ferrous metals like steel, iron is 3-5 cms and for non-ferrous metals like copper is 1-1.15 cms.

E)Ultrasonic sensor:

The ultrasonic sensor measures the distance of the targeted object by emitting ultrasonic sound waves and converts the reflected sound in to electrical signal $D=\frac{1}{2}(TC)$ where T is the time taken and C is the speed of sound (343m/s). In this proposed system ultrasonic sensor is used to measure the level of garbage in the dustbins.

F)Real time clock:

Real time clock is used to measure the passage of time. An RTC generally contains a long-life battery to allow it to keep track of the time even when there is no power applied. In our proposed system the RTC is used to keep track of the garbage collection that is to check whether the waste is collected on tie or not.



G)GSM module:

GSM is used to provide message service to enable communication. Using GSM module, the concerned person will receive message regarding the dustbin location through SMS.



IV. CONCLUSION

The proposed system will provide a better waste management system. With proper use of integrity of software and hardware, this idea can develop a better waste control in over populated cities and town. Continuous monitoring of the level of the dustbin prevents the overflow of the dustbin which in turn leads to a greener environment. Since the dustbin the cleaned with standard time intervals foul smell of the garbage is prevented. Segregating of waste at the Basic stage will make the waste management more productive and useful. Eco friendly system.

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VOICE COMMAND ROBOTICS CAR

CENTER FOR COMPUTER AND COMMUNICATION TECHNOLOGY; SOUTH SIKKIM (737121). 6TH SEMESTER TRAINEE
FROM COMPUTER SCIENCE AND TECHNOLOGY,

NAME OF THE TRAINEE: ABIKSHITTIMSINA¹, DEVCHANDRASHARMA², NIRMALASHARMA³, ALLEN ONGCHEN BHUTIA⁴
NAME OF THE GUIDE: SUJALAPRADHAN⁵.

Abstract: The main purpose of our project is to develop a car which is capable of performing certain action according to the voice command provided by the valid user through the application installed in his/her smartphone. We call this technology as voice/speech recognition technology. While our car will be integrated with this advanced technology. While developing our project our main focus area will be voice identification and voice recognition system. The proposed system will not be capable of recognizing the complete sentences while it will be capable of recognizing only those command which are implemented while preparing our system and is capable of performing certain action with regards to those commands. The system will allow user to provide voice commands through a microphone inbuilt on the smartphone for controlling the action/movement of the car. The voice command by the valid user will be delivered to the proposed system. After that with the implementation of vector Quantization(VQ) technique along with the Mel-wrapping filter bank for reducing the amplitude of the noise and also improving the signal to noise ratio, the code being inserted on the Arduino UNO (microcontroller) will start comparing the command delivered by the user with the commands being stored on the storing device on the proposed system. The result of proposed system shows that the car is capable of performing certain action according to the 5 basic commands provided by the user; those commands are forward, turn right, turn left, reverse, stop, with the help of the code being inserted in the microcontroller in MATLAB.

Key words: speech/voice recognition, speech/voice identification, Arduino UNO, vector quantization techniques (sq.).

1. Introduction

Living in twenty first century, car performs essential position for our regular visiting in addition to enhancing our day by day existence style. Most of the automobiles aren't pleasant for body disabled or handicapped person. Besides that, a few operation along with police, military, rescue operation want unmanned car to do the activity because the scenario they face day by day is risky and every so often inaccessible through human. Such activity with excessive threat should be managed with distance without putting human life at risk. Now a days with the implementation of new and superior era we are able to witness the most important improvement in our

economy, military, healthcare, entertainment, and transportation gadget. With the assist of new and superior era there exists distinct methods through which we are able to manage the proposed gadget without even going nearer or close to the management part of it along with through enforcing far off controls. With the assist of voice popularity era we are able to manage the gadgets with sure human voice command. The term "voice popularity" is used to refer as speech popularity wherein the popularity gadget is educated to a specific speaker. However, there are variations among voice popularity and speech popularity. Voice popularity is a gadget which relates on figuring out the voice command of a specific educated person. Whilst speech popularity identifies nearly everybody spoken phrases in the suitable sense. The proposed gadget will compare the command spoken the person will the command saved at the gadget reminiscence card so simplest if the command through the person suits the command saved at the gadget after then simplest it's going to carry out sure motion in any other case it's going to now no longer carry out any motion at the person command.

2. Related Work

Speech/voice is a verbal supply of interface for human to device verbal exchange in addition to human to human verbal exchange. Voice popularity era will offer the clean verbal exchange in-between human to machines. Voice popularity era continues to be in its initial growing section and plenty of scientists are running in this era to make it greater efficient even as we are able to nevertheless witness this superior era in lots of small sectors there exists especially classes of voice popularity era the ones are speaker established and speaker impartial. The machine this is being skilled with the aid of using the consumer who can be running the machine is called speaker established. This machine best responds correctly to the consumer that skilled the machine. The gain of speaker established machine is that it may reap better command remember and higher accuracy than speaker impartial machine. Meanwhile machine impartial is a machine that responds to a phrase irrespective of whos the only that speaks. Due to this reason the machine wishes to reply to exceptional type of speech patterns inflection and enunciations of the goal phrase command remember for speaker impartial machine is typically decrease than speaker established machine. However the accuracy may be maintained inside processing limits normally with inside the area of

industry speaker impartial voice machine is needed evaluate to speaker de pendent due to the fact greater peoples speech may be recognized in place of limits it right all the way down to the only who skilled the machine the maximum well-known shape of voice popularity may be performed via characteristic analysis which typically leads to speaker-impartial voice popularity this approach procedures the voice enter the use of linear predictive coding lpc or fourier transform approach after which will try and discover the feature similarities among the anticipated enter and real voice enter these similarities can be gift for a extensive variety of speakers so the machine want now no longer gain knowledge of with the aid of using every new consumer this approach will now no longer waste time on locating the fit among the real voice enter and a formerly saved voice template the maximum famous approach is the hidden markov models hmm there are others approach that used for speech popularity machine which include artificial neural network ann and dynamic time warping dtw in hmm- primarily based totally speech popularity the audio sign can be regarded as a piece-clever desk bound sign this lets in assumption that speech is about a desk bound system in a quick length of time in voice popularity hmm offer the best setup feasible with the aid of using outputting a chain of n dimensional real-valued vectors each 10 milliseconds with n cost is greater than 10 the vectors might include cepstral coefficients which can be received with the aid of using taking a fourier rework of a quick-time window of speech and de-correlating the spectrum the use of a cosine rework then taking the maximum significant first coefficients dynamic time warping dtw is an set of rules that measures similarity among sequences which can also additionally range in time or speed dynamic time warping dtw offers a temporal alignment even as evaluating pre-recorded pattern with the enter speech sign this will boom the accuracy of the popularity system as the space of those indicators has been decreased to the minimum which eased the matching of the voice sign the approach dynamic time warping dtw changed into brought to the facts mining network with the aid of using berndt and clifford in 1994 the approach thats used for mapping vectors from a big vector area to a smallfinite vectors in that vicinityarea is called vector quantizationvq even as the unmarried vector in a vicinity is called acoustic vector the series of a set of codeword changed into additionally known as a codebook the use of the lbg set of rules we are able to generate speaker-precise vq codebook for every regarded speaker the distance from a vector to the nearest codeword of a codebook is known as a vqdistortion.

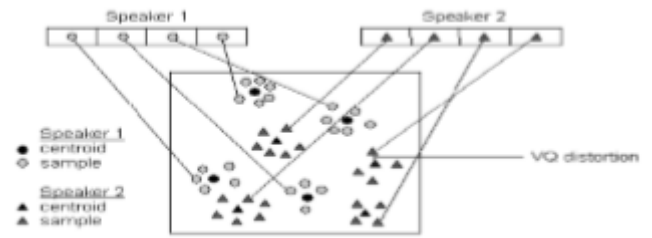


Fig. 1: Example illustration of vector quantization technique [11]

3. Methodology

The purposed gadget reveal the implementation of a voice-managed vehicle through the usage of Arduino UNO. On this purposed gadget the customers will offer the sure precise voice instructions to the gadget with the help of an Android app being set up at the consumer smartphone. While the Bluetooth module set up at the purposed gadget will capture the signal(command) and byskip it in addition to the Arduino UNO(microcontroller) being set up at the gadget/vehicle. Arduino UNO will controls the actions of the auto regular with the best acquired instructions. The vehicle will movements forwards, backwards, left and right, and prevents respectively regular with the voice instructions. The purposed gadget is includes a transmitter (Android smartphone) and a receiver (vehicle). Block diagrams of the transmitter and receiver aspects are proven in Figs 2 and three, respectively. Screenshot of the format of Voice control app is proven in Fig. 4.

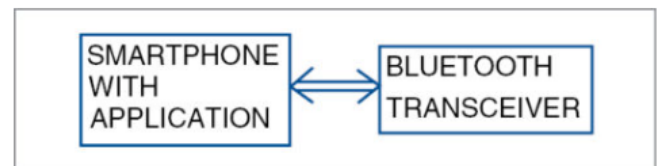


Fig. 2: Block diagram of transmitter side

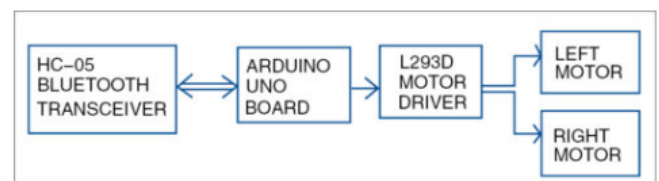


Fig. 3: Block diagram of the receiver side

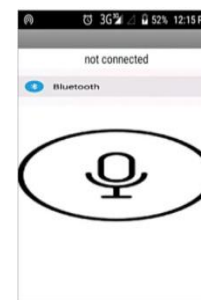


Fig. 4: Screenshot of the home screen of Voicecontrol app

3.1 Circuit and working

The circuit diagram of the receiver side of the robot is shown in Fig. 2.

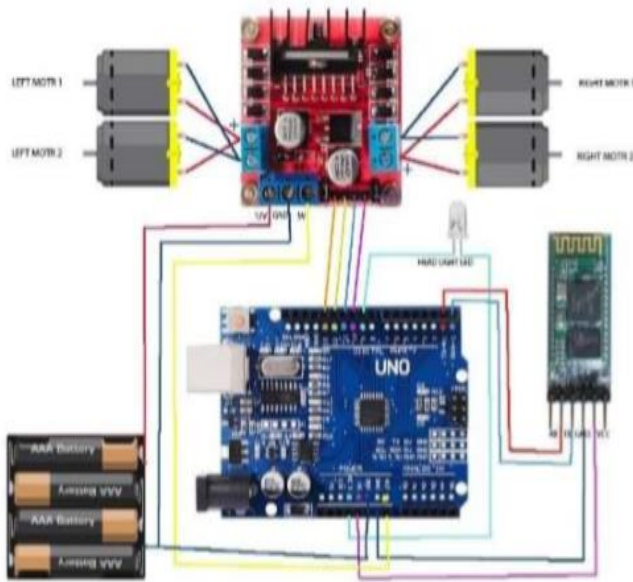


Fig.2 Circuit Diagram

3.1.1 Major components used in this project are described below.

PARTS LIST	
Semiconductors:	
BOARD1	- Arduino Uno board
IC1	- 7805, 5V voltage regulator
IC2	- L293D motor driver
Capacitors:	
C1-C2	- 0.1µF ceramic disk
Miscellaneous:	
BATT.1	- 12V battery
M1-M2	- 12V DC geared motor
CON1	- 6-pin female Berg connector for Bluetooth module
	- 8-pin female Berg connector for Board1
	- 2-pin terminal connector for battery
	- 2-pin male Berg connector for motors M1 and M2
	- HC-05 Bluetooth module
	- Android smartphone

The consumer telephone include the speech-popularity app (voicecontrol.apk) used right here turned into advanced the use of MIT App Inventor. When the app is going for walks with inside the telephone, consumer's voice instructions are detected via way of means of the microphone gift with inside the telephone. Commands are processed, and speech-to-textual content conversion is performed with inside the app the use of Google's speech-popularity technology. Text is then despatched to the receiver side thru Bluetooth.

Arduino Uno R3. Arduino Uno is an AVR ATmega328P microcontroller (MCU)-primarily based totally improvement board with six analogue enter pins and 14 virtual I/O pins. The MCU has 32kB ISP flash memory, 2kB RAM and 1kB EEPROM. The board affords the functionality of serial conversation thru UART, SPI and

I2C. The MCU can function at a clock frequency of 16MHz. In this project, virtual I/O pins 2, 3, four and five of Arduino are configured as output pins. Pins zero and 1 of Arduino are used for serial conversation with HC-05 Bluetooth module. Text acquired thru Bluetooth is forwarded to Arduino Uno board the use of UART serial conversation protocol. Arduino application voice_ctrl.ino exams the textual content acquired and, if it's miles an identical string, Arduino controls the moves of the robotic accordingly. Voice instructions used for controlling the robotic and their capabilities are proven in Table I.

TABLE I FUNCTIONS OF DIFFERENT VOICE COMMAND	
Voice command	Function
Forward	• Robotic car moves forward
Backward	• Robotic car moves backward
Right	• If previous command was forward, the car turns right and continues to move forward • If previous command was backward, the car turns right in backward direction and continues to move backward
Left	• If previous command was forward, the car turns left and continues to move forward • If previous command was backward, the car turns left in backward direction and continues to move backward
Stop	• Robotic car stops moving

hc-05 bluetooth module- the hc-05 module is a user-friendly spp module bluetooth serial port protocol the serial bluetooth module has fully passed the bluetooth v20 edr certification hardware specifications typical sensitivity -80 dbm to 4 dbm rf transmission power 33 to 5 v io programmable io control pio programmable baud rate uart interface for edge antenna connection embedded software function they are the standard baud rate of the slave is 9600 baud the standard baud rate of the slave is 9600 information bit 8 bit to be processed 1 parity check-if there is no parity check a standard power tool connection will be automatically established by default the pairing tool can be connected automatic pin coupling-standard pin 1234 indicates that the hc-05 bluetooth module has six pins see below the resolution has been reduced and the module has been disabled using this method will no longer activate the module and may no longer be able to communicate when the authorization is not used or the authorization is linked to 33v the module is in the open state this means it will continue to work and may require oral changes when using a 3 to 5 v power supply the txd and rxd pins are grounded these pins are used as uart interface for voice communication can be used as an indicator of popularity if the module is not paired or not paired with another bluetooth instrument the signal will be lost in this low state the built-in led will flash continuously to indicate that the module is not paired use other tools when this unit is connected or paired with another bluetooth instrument the signal is too large the built-in status led flashes periodically for example a few seconds this indicates that the module is paired the driving force of the l293d engine using this is a modern h-2 axis motor because the virtual pins of arduino cannot provide

enough advanced functions to separate the car from the robot car h waves can also be used to control the movement of electric motors the active pins 1 and 9 of the microcircuit are connected to 5v the four output pins of the L293d chip are connected to the vehicles m1 and m2 on the receiver table ii lists the general signals in abnormal circuits used to properly control the robot machine arduino ide 1five is used to program arduino in this project the steps of the arduino software are as follows a select the correct com port and card from the tools menu in the ide b load the delivery code voicectrlino onto the card.

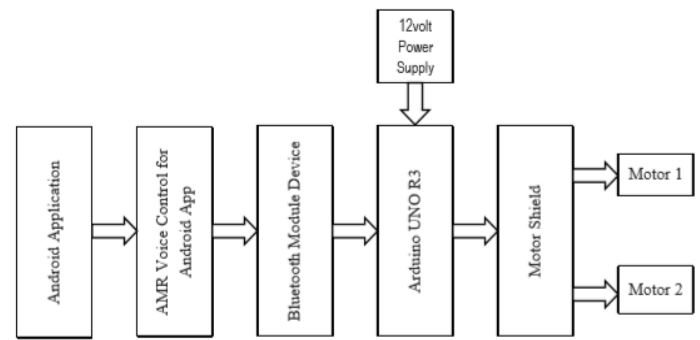


Fig.1 Block Diagram of Voice Control Robot

TABLE II
SIGNAL LOGIC LEVELS AT DIFFERENT STAGES OF RECEIVER SIDE FOR A PARTICULAR COMMAND

Command from user	Arduino output via digital pins (2, 3, 4, 5)	L293D driver inputs (2, 7, 10, 15)	L293D driver outputs (3, 6, 11, 14)
Forward	HLHL	HLHL	HLHL
Backward	LHLH	LHLH	LHLH
Right	<ul style="list-style-type: none"> • LLHL for 1s, then HLHL if previous command was forward • LLHL for 1s, then LHLH if previous command was backward 	<ul style="list-style-type: none"> • LLHL for 1s, then HLHL if previous command was forward • LLHL for 1s, then LHLH if previous command was backward 	<ul style="list-style-type: none"> • LLHL for 1s, then HLHL if previous command was forward • LLHL for 1s, then LHLH if previous command was backward
Left	<ul style="list-style-type: none"> • HLLL for 1s, then HLHL if previous command was forward • HLLL for 1s, then LHLH if previous command was backward 	<ul style="list-style-type: none"> • HLLL for 1s, then HLHL if previous command was forward • HLLL for 1s, then LHLH if previous command was backward 	<ul style="list-style-type: none"> • HLLL for 1s, then HLHL if previous command was forward • HLLL for 1s, then LHLH if previous command was backward
Stop	LLLL	LLLL	LLLL

3.2 Block Diagram of Project

The block diagram of the challenge is proven in figure 1 the following is a primary block diagram of a voice-managed robotic with arduino the robotic includes an android telecellsmartphone that could understand the command and transmit it to the bluetooth module via the bluetooth connection distinct with the aid of using the user and ship the command to the bluetooth tool consistent with the desired command arduino uno r3 gets instructions and makes use of it to carry out all approaches that require 12 volt power first this command or statistics is transformed into textual content shape in amr voice control when acquired withinside the bluetooth module the statistics or command is digitized in order that the arduino can carry out operations consistent with the acquired command or statistics .

4. HARDWARE REQUIREMENTS

1. Arduino Uno: The arduino uno is an open-supply microcontroller board depending on the microchip atmega328p microcontroller and created with the aid of using arduinocc. It's programmable with the arduino ide via a type b usb cable. It is able to be managed with the aid of using the usb hyperlink or with the aid of using an outdoor 9-volt battery but it recognizes voltages among 7 and 20 volts.

2. Motor Driver: This L298N Based Motor Driver Module is a effective engine driving force, best for using DC Motors and Stepper Motors. It makes use of the wellknownL298 engine driving force IC and has the domestically available5V controller which it is able to gracefully to an outdoor circuit. It can manipulate as much as four DC engines, or 2 DC engines with directional and pace manipulate.

3. Bluetooth Module: Hc05 module is straightforward to apply bluetooth spp serial port protocol module designed for clean wi-fi serial affiliation setup the hc-05 bluetooth module is applied in a grasp or slave configuration developing it an awesome decision for wi-fi communication.

4. Ultrasonic Sensor: A ultrasonic sensor is an device that gauges the separation to an item utilising ultrasonic sound waves an ultrasonic sensor makes use of a transducer to ship and get ultrasonic heartbeats that hand-off returned statistics approximately an objects nearness high-recurrence sound waves replicate from limits to create unmistakable reverberation designs .

5. Servo Motor: A servomotor is a rotating actuator or instantly actuator that takes into consideration actual manage of angular or linear function pace and acceleration it accommodates of an inexpensive engine coupled to a sensor for function enter it likewise calls for a fairly delicate controller often a devoted module established explicitly to be used with servomotors.

6. BO Motor with Tires: DC engine (BO) changes over electric powered power into mechanical power. DC MOTOR idea is the region gears decrease the price of the

car however increment its torque is called gadget decrease.

5. SOFTWARE REQUIREMENTS

1. Arduino IDE: the arduino integrated development atmosphere ide could be a cross-diploma application for windows macos linux thats written in capacities from c and c its dispensed to compose and transfer comes to arduino good sheets.

2. The Android App: Android phone with an software is the transmitter end. At first, there have to integrate of Bluetooth HC-05/HC-06. When matching is done, at that factor it have to be associated. When the software is jogging withinside the phone, the client's voice orders are prominent through the telecall smartphone microphone.

How to use Android application to control the Robot for that the steps are given below :

1) Install the pallication "AMR Voice Control" from Google play store 2) After installation, activate the Bluetooth of smartphone and Bluetooth module. 3) Now pair your smartphone Bluetooth with Bluetooth module HC-05 and therefore the default password for pairing is "0000" or "1234". 4) Now the appliance and robot is prepared to perform the operation. 5) Now click on the "MIC" of the appliance and provides specific command to the robot. 6) the purposed system will perform the certain action according to the command 7) the operator of the system will provide command to the system by the installed application on his/her smartphone. 8) supposed the operator provides the command forward then the command will be delivered to the Bluetooth module installed on the car after that Bluetooth module will pass that command to the microcontroller and microcontroller will guide the system with regards to code being inserted and perform the particular action as commanded. meanwhile the purposed system will perform other action following the similar procedure.

6. WORKING

the block diagram of the easy voice managed robot car is given it includes the telephone that acknowledges the voice instructions and are being wirelessly transferred to the bluetooth module hc05 the module at that factor adjustments over the order to content material and the collection of characters are despatched to the arduino for extra coping with the arduino microcontroller decodes the string were given and correspondingly plays in addition capacities the alerts are despatched to the motor that consequently powers and drives the vehicles linked to it at the transmitter place instructions are given to the cellular utility thru the mic this transportable handset is related to the transferring car by bluetooth module the transportable utility applied is changed in order that the voice orders given to the handset are

acquired by means of the mic and those easy voice orders are modified over to superior phrase successions a to d transformation those saved sequences are than transmitted to the robot car through bluetooth transceiver module and are despatched to the transceiver controller android utility transceiver is used to decode the acquired sign with the bluetooth module the controller contrasts those alerts and the positioned away application orders in it and convert them into voice strings the voice strings are then used to run the servo engines for the precise c programming language of time the microcontroller sends instructions which whilst performed facilitates in running of the engine motive force the yield of the arduino is going to the engine motive force ic and it controls the precise engine a dc energy deliver is needed to run the gadget the dc energy deliver feeds the microcontroller and the bluetooth module

7. FUTURE SCOPE

- 1) Useful for speech popularity safety gadget useful for army purpose.
- 2) Automatic goal gadget may be implemented.
- 3) This robotic is beneficial for the ones regions wherein people cant attain like hearthplace situation exceedingly poisonous regions etc.
- 4) If we use different technology like zigbee or gps we are able to enhance the variety of the robot.
- 5) The robot is beneficial for surveillance.

8. CONCLUSION/RESULT

Programmable (software program) mission. This mission operated on human voice command with android application. The implementation of this mission is straightforward, so this robotic is useful for human life. The Voice Control Robot is beneficial for disable humans and tracking purpose. It works on easy voice command the voice managed robotic is an smooth, so it is straightforward to use. It is beneficial for the ones regions wherein people can't reach. We can put in force Image processing on this robotic, in order that we are able to locate the shadeation of the item or focused system. The length of this robotic is small, so we are able to use this robotic for spying purpose. It may be used for surveillance. We can put in force net cam on this robotic for safety purpose. The voice popularity software program has an accuracy of 76% for become aware of a voice command and it's also enormously touchy to the encircling noise.

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EARLY DETECTION OF TUMOR IN BRAIN USING MONOPOLE ANTENNA

N SUNNY JOSEPH #1, V PHANI BHUSHAN #2

#1 M.Tech Scholar, Dept. of ECE, PBR Visvodaya Institute of Technology & Science Kavali, SPSR Nellore (D.T), A.P

#2 Associate Professor, Dept. of ECE, PBR Visvodaya Institute of Technology & Science Kavali, SPSR Nellore (D.T),

A.P

Abstract - In this paper, a monopole antenna is designed, analyzed at 2.45 GHz ISM band on a glass-reinforced epoxy laminate material (FR-4) substrate for early detection of brain tumor. FR-4 is used as a substrate due to its low loss tangent, flexible, and moisture resistant properties. By the implementation of slotting method, the size of this antenna is reduced to $36 \times 39 \text{ mm}^2$. The printed antenna exhibits 857 MHz bandwidth ranging from 2.14 GHz to 2.99 GHz frequency. It shows a radiation efficiency of 74.5 % with a realized gain of 1.49 at 2.45 GHz frequency. The Monostatic Radar approach is considered to detect brain tumor by analyzing the variations in received signals from the head model with and without tumor. The maximum specific absorption rate (SAR) distribution at 2.45 GHz frequency is calculated. The compact size and flexible properties make this monopole antenna suitable for early detection of brain tumor.

Key Words: Monopole Antenna, Brain Tumor, Monostatic Radar and specific absorption rate (SAR)

1. INTRODUCTION

Statistics categorizes stroke as the second most common reason for death [1] and the third most reason for disability [2]. If the treatment is ensured faster for stroke patients, the possibilities of recovery are higher. The traditional brain stroke detection techniques are Computed Tomography (CT), Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI), Electroencephalography (EEG), Magnetoencephalography (MEG), Magnetic Induction Tomography (MIT), and Electrical Impedance Tomography (EIT) [3].

An alternative screening technique which can be administered bedside or in an ambulance is necessary for point of care detection and early screening [4]. Paramedics can provide crucial information about the patient's symptoms and the test results to the hospital on the route. Brain stroke detection using Electromagnetic Impedance Tomography (EMIT, a non-invasive medical imaging technique using microwave devices) is gaining significant momentum as a surrogate technique to the state-of-the-art screening techniques.

In EMIT based brain stroke detection scheme, antenna plays a crucial role. In literature, different EMIT based stroke detection techniques can be found which use rigid and flexible antennas [3-10]. Munawar et al. utilized EMIT technique using microwave signals to detect stroke [3].

Mobashsher et al. used a 3D wideband unidirectional antenna with an overall dimension of $70 \times 60 \times 15 \text{ mm}^3$ designed on 1.52-mm-thick GIL GML 1032 substrates to detect the stroke [5].

They presented a technique based on the contrast of reflection phases for stroke detection collecting scattered signals from the antennas and investigating them to reduce the strain of the system. Mohammed et al. used variations in the reflection coefficients to detect stroke using an array of eight tapered slot antennas (TSA), each with dimensions of $24 \times 24 \times 0.62 \text{ mm}^3$ on a Rogers RT6010 substrate [6]. Wu and Pan used directional folded antennas with a dimension of $81.2 \times 80 \times 1.6 \text{ mm}^3$, each on an FR-4 substrate to detect stroke. They classified the results from the human brain model simulation by algorithms, such as PCA and LDA classification algorithms to verify the efficacy of the antenna and found accurate classification [7].

Jamlos et al. detected stroke with an ultra-wideband antenna with a dimension of $80 \times 45 \times 1.57 \text{ mm}^3$ designed on a Taconic (TLY-5) substrate [8]. The authors used the Inverse Fast Fourier Transform (IFFT) for easier analysis of S-parameters and smoothing 'mslowess' procedure to filter out the noise for accurate results. Using an array of 8 antennae with a dimension of $70 \times 30 \text{ mm}^2$, each printed on a 75- μm -thick PET substrate, Bashri et al. investigated a wearable head imaging system [9]. Alqadami et al. used a flexible and wideband 8-element array antenna with a dimension of $85 \times 60 \times 4 \text{ mm}^3$ based on a multilayer PDMS polymer substrate to detect brain stroke with a head imaging system [10].

Above discussed investigations take time for effective image reconstruction [11] and have strong multipath reflections due to array configuration [12, 13]. All these techniques used rigid substrates except Bashri et al. [9] and Alqadami et al. [10]. Though Bashri et al. and Alqadami et al. used flexible substrates, these antennas have comparatively larger dimensions due to the array configuration. Md. Ashikur Rahman, et al., a compact slotted disc monopole antenna is designed and printed on a PET substrate for early detection of brain stroke. The size of this antenna is reduced to $40 \times 38 \text{ mm}^2$. Silver nano particles (AgNPs) ink is used due to its high conductivity ($6.3 \times 10^7 \text{ S/m}$) [14] and anti-oxidation properties unlike copper nano particles (CuNPs) ink which is extremely vulnerable to oxidation in the air [15]. PET substrate is preferred to other flexible substrates such as

photo paper due to its low loss tangent and moisture resistant properties.

Current research on EMIT based stroke detection is focusing on antennas that are compact and conformal to improve the resolution and accuracy of the results.

In this paper, a compact slotted disc monopole antenna is designed and printed on a FR-4 substrate for early detection of brain stroke. The size of this antenna is reduced to $36 \times 39 \text{ mm}^2$ as compared to earlier reported antennas for stroke detection [5, 7–10]. FR-4 substrate is preferred to other flexible substrates such as photo paper due to its low loss tangent and moisture resistant properties.

The Monostatic Radar (MR) approach is considered to detect brain stroke due to its simplicity. Also, the SAR distributions of this antenna are calculated at 2.45GHz frequency for a maximum power level of 20 dBm in CST Microwave Studio.

2. ANTENNA GEOMETRY

The proposed circular microstrip patch antenna fed by a microstrip line is shown in Figure 1, which is printed on the FR4 Epoxy substrate with a size of Substrate width 36 mm and substrate length 39 mm (i.e., $W_s \times L_s = 36 \times 39 \text{ mm}^2$), the thickness of 1.6 mm and relative dielectric constant of 4.4, length of the feed line 5.58 mm, and width of the feed line 3.12 mm. The proposed antenna is connected to a connector for signal transmission.

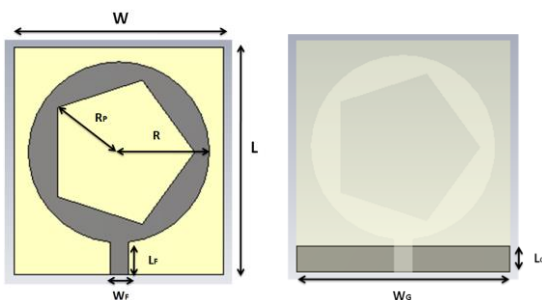


Figure 1: Design Model of the proposed antenna.

Table 1: Design parameters of the proposed antenna.

Variable Name	Symbol	Unit (mm)
Width of substrate	W	36
Length of substrate	L	39
Width of the feeding line	W_F	3.12
Thickness of FR-4 substrate	T	1.6
Length of feeding line	L_F	5.58
Radius of circular disc	R	15.5
Length of one side ground plane	L_G	4.33
Width of one side ground plane	W_G	36
Radius of pentagonal slot	R_P	13.5

The patch is connected to a microstrip feed line with a radius of 15.5 mm. A partial ground plane is printed on the bottom surface of the substrate, which is the same width as the substrate width (W_{sub}). To cover a much better frequency band pentagonal slot has been taken on the patch. All the Optimized design parameters and corresponding values for the proposed circular microstrip patch antenna are listed in Table 1.

3. MODELING OF HUMAN HEAD PHANTOM

The wearable antennas require a detailed analysis of the interaction of the antenna with the human body. A 7-layer human head model and single layer stroke model are designed and analyzed for 2.45 GHz frequency in this section. The head model including layers of skin (dry), fat, muscle, skull, dura, cerebrospinal fluid, and brain is shown in Figure 2. The proposed antenna is placed at a distance of $2D^2/\lambda$ that denotes the separation distance of the proposed antenna with the human head model. The electrical properties such as permittivity (ϵ_r) and conductivity (σ) of the 7-layer model along with the thickness of skin (dry), fat, muscle, skull, dura, cerebro-spinal fluid, and brain respectively. The single-layer stroke model (Tumor) is considered to be a spherical blood clot with an 18 mm radius shown in Figure 3. The values of the body tissue dielectric parameters are computed using a 4-Cole-Cole Model [16].

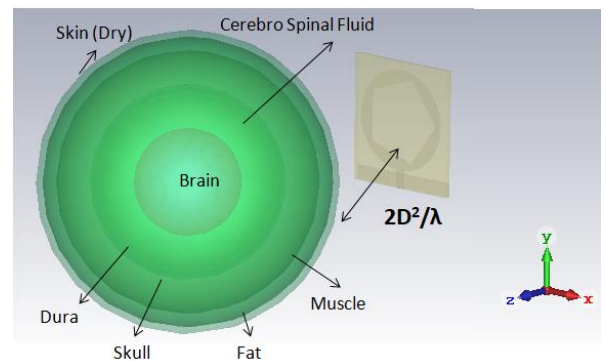


Figure 2: 7-layer human head model with the proposed antenna

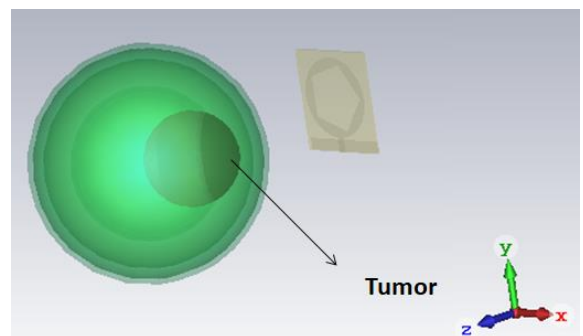


Figure 3: single-layer spherical stroke model (Tumor)

4. RESULTS AND DISCUSSION

The simulated return loss (dB) of the proposed antenna is about -38.44 dB at 2.448 GHz. It exhibits a -10 dB return loss bandwidth of around 857 MHz (2.14 to 2.99 GHz) and the simulated s-parameter graph shows in Figure 4.

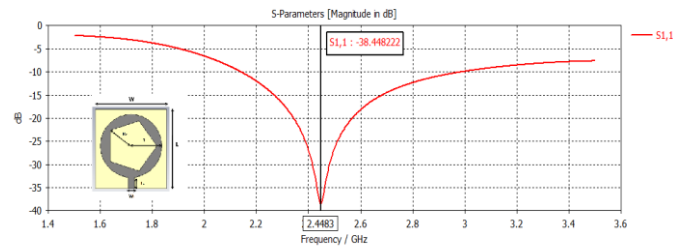


Figure 4: S-parameter plot of the proposed antenna.

The simulated return loss (dB) of the proposed antenna with head model is about -31.14 dB at 2.444 GHz. It exhibits a -10 dB return loss bandwidth of around 857 MHz (2.14 to 2.99 GHz) and the simulated s-parameter graph shows in Figure 5.

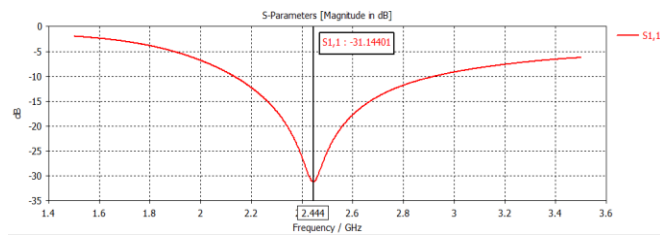


Figure 5: S-parameter plot of the proposed antenna with Phantom.

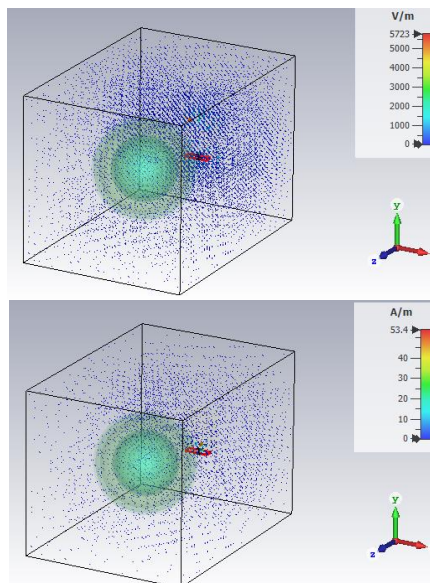


Figure 6: Electric and Magnetic Field of the proposed antenna with Phantom.

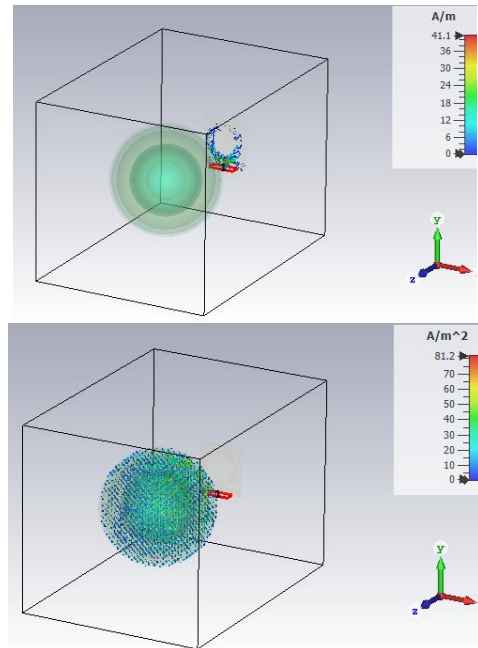


Figure 7: Surface current and current density of the proposed antenna with Phantom.

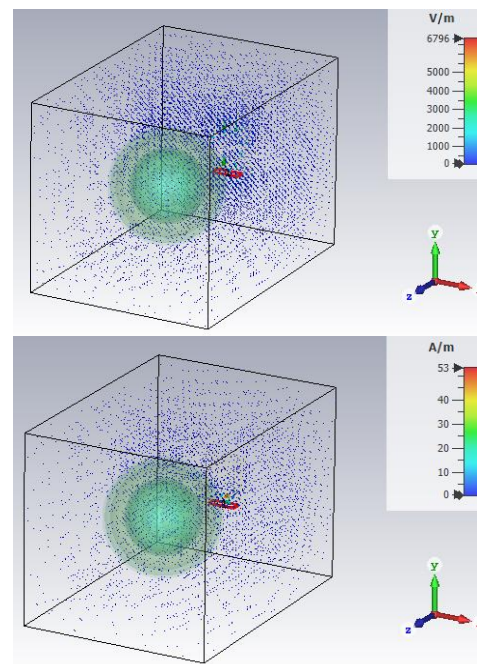


Figure 8: Electric and Magnetic Field of the proposed antenna with Phantom.

Table 2 shows the comparison among the proposed antenna without tumor and with tumor. From the above table, electric field, magnetic field, surface current and current density values for without tumor and with tumor are different, with help these threshold values and also using the variation in Reflected time signals with and without tumor model (shown in figure 8), we can able to detect tumor in

head. The proposed antenna shows an efficiency of 72.5% in a flat position when being simulated in free space. The proposed antenna has a peak gain of 1.49 dB at 2.45GHz in free space at the flat position.

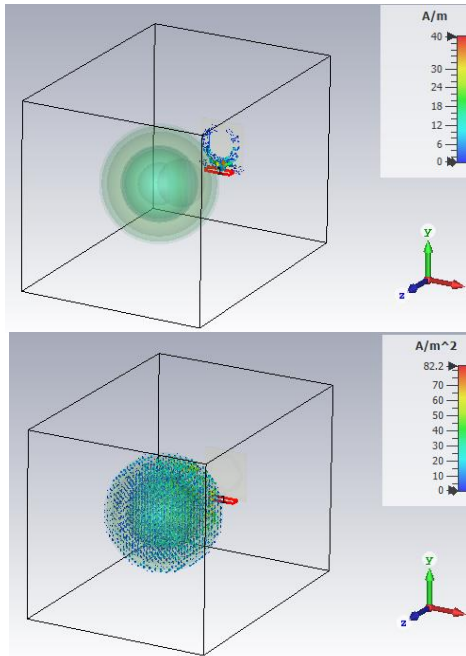


Figure 9: Surface current and current density of the proposed antenna with Phantom.

Table 2: The result comparison among the proposed antenna without tumor and with tumor

Model	Electric Field (V/m)	Magnetic Field (A/m)	Surface current (A/m)	current density (A/m ²)
For proposed antenna with Phantom without tumor	5723	53.4	41.1	81.2
For proposed antenna with Phantom with tumor	6796	53	40	82.2

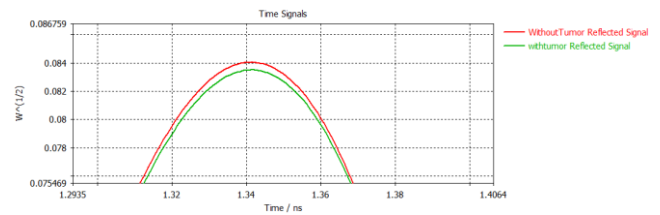


Figure 10: Variation in Reflected time signals with and without tumor model.

5. CONCLUSIONS

A Flexible Monopole Antenna on a FR-4 substrate is presented for early brain stroke detection application. This Monopole Antenna exhibits a bandwidth of 857 MHz, along with a realized gain of 1.49 dB. The performance of this antenna is adequate in flat and cylindrical head proximity conditions for ISM band applications. Also, the SAR distribution shows that the values are well within the safety limits. This study serves as a proof of concept validation of stroke detection this technique. With sufficient controls in place and in-depth study of various critical factors such as temperature and pulse of the patient, a point of care device could come into fruition. The magnitude of the variation in reflected signals can be significantly enhanced by using the antenna array.

In future, an antenna array will be placed on the head, and reflected signals will be collated and processed by digital signal processing algorithms. The signature can then be visualized as a 2D image using digital image processing algorithms. This antenna might be a basis for a futuristic diagnostic tool for point-of-care stroke detection by the first responders. The flexible and compact nature of this Flexible monopole antenna enables the feasibility of a future surrogate device for early brain stroke detection.

ACKNOWLEDGEMENT

We would like to thank all who have helped us in completing this project. We would like to thank my Guide and H.O.D of Electronics and Communication Engineering Department, PBR Visvodaya Institute of Technology and Science for providing us an opportunity to work on project "Early Detection of tumor in brain Using Monopole Antenna".

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RFID BASED ON FINGERPRINT SENSOR VOTING MACHINE

Raguvaran.N.R¹, Raghavendra.G.M², Rahul.K³, Dr J.Mohan⁴

SRM VALLIAMMAI ENGINEERING COLLEGE

¹⁻³Student, Department of ECE, Valliammai Engineering College.

⁴Associate Professor, Department of Medical Electronics, Valliammai Engineering College.

Abstract- There are around 167 Democratic countries in the world .But only around 20 countries were using Electronic Voting Machine for conducting the Election. Some of the developed countries in the world such as England,France,Germany,United states do not use the EVMS. The supreme court of Germany has stated that voting through this technology is unconstitutional. India is one among the largest democratic country in the world and there are around 911 million people .India is also one of the largest populated voting country. The maximum amount of votes polled are around just 67% which is considered to be very less taking into the account of population in India. One of the Greatest controversy is fake votes. There have been several reports that fake voters have been casted for the voters who were absent on the voting. This incase have proved to be real when celebrities like Shivaji Ganesen, Sivakarthiskeyan etc have been reported that their vote has be casted by fake person. So many citizens have complained about this issue publicity to media during Assembly election,2019.

There has been a rule that those who complain that their vote has been taken by another person still the elector must to given permission to cast vote according to section49-P.But this is not the case happened in 2019 Assembly elections .Many people who lost their vote have not provided any other chance.

In Our present work we have developed a prototype and tested successfully an Arduino Uno Based Aadhar facilitate Voting Machine processing a Two-Tier fingerprint security.

Keywords-Arduino, Voting Machine, Fingerprint sensor

Introduction-

In our system we have developed a two-tier verification system. This two-tier verification is divided in two process. The first process involes in the verification of user's identity which is provided to him by the government, which may be his aadhar identity or voter ID our idea is to make the identification card upon the RFID tag which is the basic component for one of our verification system.This RFID tag is verified through RFID reader for first step of verification.

In the second step of our verification we are going to deal with the Biometric characteristic of the human body which is nothing but the fingerprint. That is the impressions taken from the ridge of the skin of the finger. This has been used as the form of identity for the person for over centuries in human history.

By combining the previous two step of verification we provide an authentication system for allowing only the appropriate verified used to cast their vote.

A.Objective-

As we discussed earlier a major controversy in conduction elections in India is fake voter. These kind of fake voting is occurred mainly because of the less polling percentage in our country even if the percentage increases already it has shown It effect on late commerce during election day.

Hence we need a two tier security for each vote in our country. Our System exactly designed to overcome this problem by making unique ID verification and biometric verification for each voter. Our system will verify whether both data's are matching .If they do not match then our system will turn ON the buzzer to indicate that user data's does not match.

B.Literature Survey-

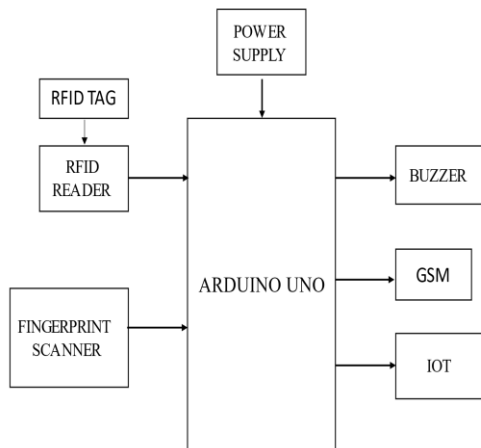
The first system Electronic smart voting system with secured data identification using cryptography introduced in the year 2018 author name Sunita patil, Amish Bansal, Utkarsh Raina.This paper describes the Function of ESVS which is used with the biometric authentication system along with the OTP based on the verification process of voting system. The ESVS utilize the aadhar number and identification of voter.

The second paper is about the Location free voting system with the help of IOT technology introduced in the year 2018.The authors Qasim Abbas, Tariq Ali,Hussnain Abbas the description of this paper is the internet of things(IOT) is becoming the faster which connect to the many things. The voters to vote in any location without any restriction all over the world which consider privacy and security.

The Third paper represented as the Application for online voting system using android device introduced in the year 2018. The author Himanshu Vinod Purandare the descriptive pattern represent that the election should decide which candidate is capable for the future of the country. This system has the high level security, but the existing system has the flaw that the vote has to wait in queue for casting their vote has lesser security in the present time.

The forth paper which is Design of Secured of E voting system introduced in the year 2013, the author are Hanady Hussien. This system is able to spread through widespread. Security is the problem in such system. The This E voting system requires the system to fulfill the security. The system employees RFID to store all condition that comply with the rule of government to check voter eligibility.

BLOCK DIAGRAM



Working Principle-

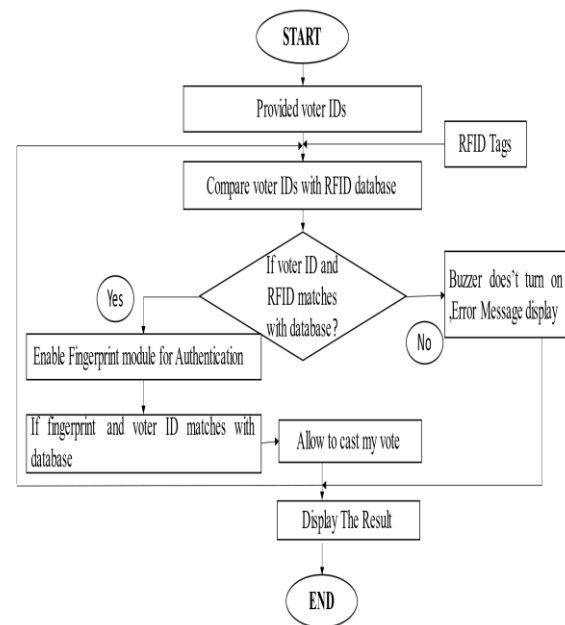
Our two tier verification system working can be explained as two process. First we are going to see about the working principle of RFID verification .The RFID tag is started with the data of the user such as Name, Aadhar ID etc. Each RFID tag will be given with a separate unique data. These stored data can be verified only by the RFID Reader. This RFID reader will read the data in RFID tag and it can be verified with the user provided data on spot direct by the officer.

In the second step of verification process each user's fingerprint Will be started either in the system or fingerprint sensor R305. These fingerprint data are simply available with the Government of India they can effortlessly access it form Aadhar data's .Now the data

for fingerprint will arrive and it will be verified by the IOT with RFID data and will allow the appropriate user if they match. If they doesn't match with each other then buzzer will turn ON to indicate that user provided data's doesn't match.

This process actually takes 2-3 minutes, which is also a quick process of two tier verification.

Flow Chart-



The flow chart explains the following process of the system which the connect to the circuit diagram. The RFID tag which stores the information of the voter. Then the RFID reader used to read the RFID tag.

The fingerprint sensor is used to verified the person as an authenticate user. If the fingerprint matches that will repeated. If the fingerprint doesn't match the person is not verified and unauthenticated user cannot be able to vote and the buzzer sound will turn ON if not.

Algorithm-

The voting machine process is shown in following step that how to vote and how it has been cast.

Step 1: Start

Step 2: Using RFID tag store the voters information

Step 3: RFID reader scans the RFID tag.

Step 4: Press the finger to the fingerprint sensor

Step 5: The LCD display shows that the person is matched or not

Step 6: Upload the program code to the Arduino.

Step 7: If the fingerprint matches the user authenticate can able to vote their cast

Step 8: If it doesn't match the buzzer will turn ON .

Step 9: Stop

The first 3 steps are using the RFID reader and tag collect the voter ID and their information. And the forth coming steps are upload the program source code and voters information.

The last 3 steps that checks that whether the following fingerprint match with the person or not .The fingerprint matches with the person is allow to continue to vote and if not matches the fingerprint LCD display shows that the person is not verified and the buzzer is turn ON thus the process of voting has the two tier verification system. IOT is also used in the system shows the wheather the user is authenticate and matches with fingerprint with time to check the count of voting also used in the following system. The unauthenticated user is also shows with the fingerprint not matches in the display.

Expected Outcome-

We have just presented an idea or concept that how our voting system can be made in the recent future for fair voting. In this method, the process of verification involves of ID and fingerprint from the database. This is faster and secured way of holding elections. The system interlinked with voter ID or Aadhar card and biometric authentication.

The security was the main concern of our project. So it is better than other traditional method. By using this system, the national voting system will be more secure, faster, easy to use and more economical. The system also consumes very low power and the device is easy to carry.

Application-

- ❖ It is mainly used in verification process of during election.
- ❖ System is easy to operate.
- ❖ Economical feasible.
- ❖ Requirements of man power is less.
- ❖ Only authenticate user can vote.

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Smart Shopping App

Prof. Debarati Ghosal¹, Abhijeet Adasul², Rajesh Thorat³, Onkar Salunke⁴

¹Professor, Dept. of Information Technology, Vidyalkar Institute of Technology, Wadala, Mumbai, India,

²⁻⁴Student, Dept. of Information Technology, Vidyalkar Institute of Technology, Wadala, Mumbai, India,

Abstract - In recent years, the way of shopping has changed from small shops to the shopping centre and E-commerce site. Every System has some disadvantages. The purpose of this application to overcome the problems of traditional shopping and provide more convenient and user-friendly shopping experience to the customer. The customer scans the product by using their NFC-supported smartphone. In the shopping centre, group of a similar product would have 1Nfc tag which contains all the information about the products. Information includes image of products, a brief description of the product, price, etc. customer can touch or wave their mobile on NFC tag and add the product to the shopping basket and they can also edit the basket any time during shopping. This application also provides a feature such as user identifier, new product notification, alternate product, and offers. At the merchant end, a customer can pay for their goods by cash, credit card, smartcard, and E-wallet.

Key words— E-commerce, NFC, Smartphone, E-wallet, Tag, Card.

1. INTRODUCTION

This project is going to represent a peculiar method of shopping in a more comfortable way using an android based M-commerce application. The purpose of this application to overcome the problems of traditional shopping and provide more convenient and user-friendly shopping experience to the customer. With the enhancement in NFC technology the application is going to give customers a more handy experience. This project will also give a brief idea on how this technology can further be used in future in our application for billing and security.

2. Problem Statement

Today's systems are traditional commerce or e-commerce systems of the retail domain which have a whole herd of disadvantages like every e-commerce system has. The prototype application's aim is to eliminate all the inconsistencies as possible from these systems and to make a system which is consumer friendly and high performing.

3. Objective

The system's ultimate aim would be consumer's convenience and time efficiency. This goal could be achieved by using M-Commerce system implemented using NFC technology. The use of NFC would benefit the system in many ways mainly with automation and security. The

consumer for a regular shopping experience goes to the mall and roams around in the outlet for the search of their desired goods. They physically pick up the desired items, place them in a trolley/cart and then carry the trolley all around. Once done with the shopping they need to stand in queues to get the billing done, which is a time-consuming process. And ultimately carry the shopping bags back home. Using M-Commerce application this entire process could be simplified and made more user-friendly.

4. Literature Survey

The main purpose of this literature overview is to investigate the topic of "Smart Shopping App". The following section explores different references that discuss various topics related to our project.

[1]. Communication between NFC device and a smartcard is done through the APDU (Application Protocol Data Unit), executed in the proximity card processor. NFC equipped device can operate in two modes: Active and passive, depending on whether it generates its own field. Active devices have a power supply; passive devices do not. In the active mode the data is sent using Amplitude Shift Keying (ASK), so that the base RF signal is being sent modulated.

[2] Automation: The entire shopping process could become a digitally immersive experience. Smart phones equipped with NFC can be paired with NFC tags which can be programmed by NFC apps to automate tasks.

Availability: The user experience with NFC tags is generally better and in the instances where the additional cost of using an NFC tag is less relevant to the overall cost.

Cheap and Effective: The strongest argument in favour of NFC, over other forms of short range wireless communication, is that tags are incredibly cheap to make and maintain, but can still be used for a wide range of applications. With very simple circuitry and very few components. NFC tags can be produced on a mass level for very low unit costs.

[3]. The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product.

- System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results.

Functional Testing

- Valid Input: identified classes of valid input must be accepted.
- Invalid Input: identified classes of invalid input must be rejected.
- Functions: identified functions must be exercised.
- Output: identified classes of application outputs must be exercised.
- Systems/Procedures: interfacing systems or procedures must be invoked.

5. SCOPE

This project aims at customers who frequently visits the store to buy products on weekly or monthly basis. The scope is to increase space and time efficiency. To make the store system more efficient and bring an ease on the customer side. Such as completely avoiding the use of trolleys which will be done by the NFC tags that is explained in the project in detail.

6. PROPOSED SYSTEM

The proposed application system will be using Android based mobile phones which are integrated with NFC technology. In general, the user will do the entire shopping process with the help of their Android mobile phones with a software application that would read and process the tap to the NFC Tag of the products, which are to be purchased. These tags assigned to the products would retrieve the information about them from a main database which is stored on the server at the merchant’s end. The products whose NFC tags were tapped (read) will be stored in a shopping list/cart. Users will be able to perform editing of existing products in the cart such as the process of addition, subtraction of quantity or deletion of the product all together from the cart. Furthermore, the user will be informed about the ongoing offers in the store and could avail them right from the application itself. The user at all times would be aware of the expenditure made by them and could verify the same. Finally, the user will checkout and confirm the same to the Merchant by performing a handshake with the merchant device. The shopping cart consisting of selected items will be processed and the same will be recorded in the merchant and user history.

Application processing time is not too long, for instance the application process features not more than 1-2 seconds for communication between mobile device and the server and 2-3 seconds for processing description of goods based on reading of NFC tags. Payments as of now could be made using cash at the point of sale or online using existing payment gateways through a credit/debit card. In future with the development and advancements in NFC based

payments, the same could be applied for the prototype application.

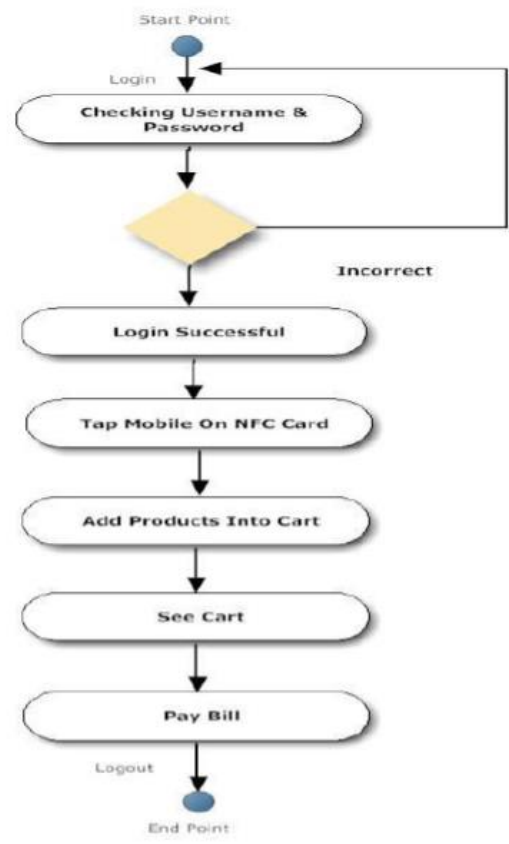
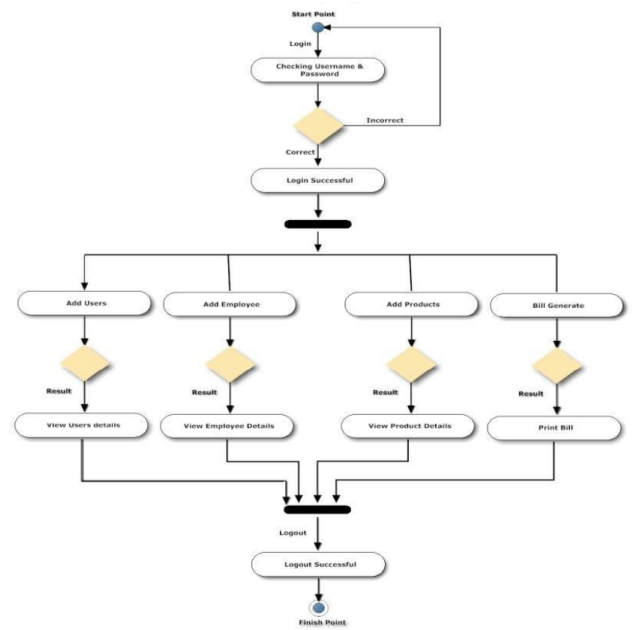


Fig : UML Diagram

6.1 FLOWCHART



Fig -2: Flow-Chart

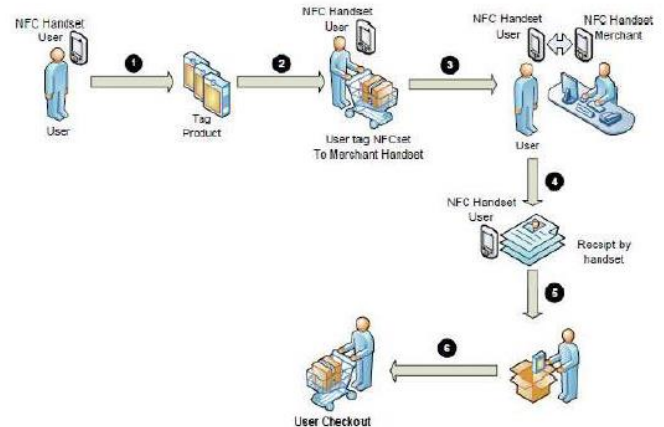


Fig -3: Work-Flow

7. HARDWARE REQUIREMENTS

- Intel processor IV and above
- 1 GB RAM
- 160 GB hard disk

7.1 SOFTWARE REQUIREMENTS

- Visual Studio 2010
- Windows Operating System
- Eclipse
- Microsoft SQL Server 2008
- Android SDK

8. FUTURE SCOPE

Our application is for mobile users who do not want to carry cash everywhere and want to do a shopping in less time. An important technology is called Near Field Communication (NFC). At the moment, the only problem with our approach is in a low number of NFC enabled mobile phones. Some of them are already available, but the price is still very high. Application created a prototype that shaped the future still remains much to do development and improvement of existing models. Shopping and NFC applications NFC Merchant shopping process is created as a model with NFC technology that allows users to do the shopping process and verification of expenditure.

9. CONCLUSION

The Project uses contact less NFC Tag technology for purchasing of products at stores. Thus, the time required to purchase and billing will be reduced as the user can purchase the products directly from his Android NFC

enabled Mobile. This project aims at user who frequently visits Mall to buy products on weekly or monthly basis.

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Leaf Analysis and Prediction

Gaurav Thorat¹, Rohit Thakur², Swapnil Tondwalkar³, Reena Deshmukh⁴

¹⁻³B.E. Student, Department of Computer Engineering, Shivajirao S. Jondhale College of Engineering, Dombivli East, Thane, Maharashtra 421201, India.

⁴Professor, Department of Computer Engineering, Shivajirao S. Jondhale College of Engineering, Dombivli East, Thane, Maharashtra 421201, India

Abstract - Although professional agricultural engineers are responsible for identifying plant diseases, clever systems can be used for their early detection. The professional programs suggested in the literature for this purpose are often based on user-defined facts or image processing of plant images in visuals, infrared, lighting, etc. Diagnosis can be based on symptoms such as sores or spots on various parts of the plant. The color, location, and the number of these areas can be very specific to a disease that has killed a plant. Expensive molecular analysis can follow if necessary. This app can be easily expanded with various plant diseases and different smartphone platforms. Graphic processing is a divisive area where research and development are taking on geometric advances in the agricultural sector. Various studies are underway on the development of plant diseases. Identification of plant diseases can not only increase productivity but also support a variety of agricultural practices. This paper proposes a process for diagnosing and diagnosing diseases with the help of machine learning techniques and imaging tools. This paper provides research into a variety of page diagnostic techniques using the image processing method and classifies them according to the type of analysis and use tool.

Keywords: Leaf Disease Detection, Graphic Processing, Intelligent System, Analyzes, Plant Diseases, Smart Phone.

I. INTRODUCTION

Agriculture has been around for years and there are many advances and changes taking place. Agriculture is a key element of the food supply, and it is an ever-growing organization. Agriculture is considered one of the key activities and on the other hand helps to improve the country's economy. The economic growth of a farmer depends on the quality of the products they grow, which depends on the growth of the crop and the yield. Plants are exposed to the external environment and are more prone to plant disease which also affects the environment of the farmer. Plants are the main victims of plant diseases.

The backbone of the agricultural economy in many developing countries, especially India. The quantity of crop production and quality depends on the growth of the plant. Usually, the grower identifies the disease by looking at the color and shape of the leaves. This approach requires a lot of experience and a lot of general effort. This is almost impossible with large fields.

Plants are attacked by many types of diseases that affect different parts of the plant body such as the leaf, stem, seeds, fruit, and so on. Diseases are specific to certain parts of the plant body. The leaves can be considered as the main part of the plant, only with the help of the leaves a course of

photosynthesis can be done. Various methods of machine learning have recently been proposed to identify and classify plant diseases in plant images. These automated methods have provided a solution to the problem, but the biggest challenge facing them is the accuracy and robustness of the results obtained. In this paper, we use imaging techniques and machine learning techniques to diagnose plant diseases. Various diseases that occur in different parts of the plant can be detected by looking at changes in signs, spots, color, etc. Spending and self-sufficiency is a major requirement for agriculture to improve crop production.

II. LITERATURE SURVEY

The rate of crop production is the same as healthy plants. Proper diagnosis and treatment of plant diseases is an important first step in the process of crop production. A farmer's misdiagnosis of plant diseases causes pesticides to be sprayed improperly. Various imaging techniques are widely used to detect plant growth and diagnostics. Plant diseases occur in different parts of the plant. In general, the leaves of diseased plants change their color, shape, size, texture, etc. Therefore, diagnosis and appropriate treatment recommendations for plant diseases can be determined using imaging techniques.

Many imaging techniques have been described in the literature to diagnose and treat epilepsy. In the process of image acquisition, unhealthy and healthy leaves are processed initially. This healthy and healthy leaf database is called a training database. Pictures of leaf trains are stored in a black box to avoid variations in light intensity or placed in a white box with a light source at 45 degrees. Reducing reflection and better lighting. Once the training data has been processed, then insert a photo of the test leaf. Continuous image analysis of the appropriate display, the image enhancement process is used.

Audio can be imported during the image capture process or electronically transmitted. Sound image converts real pixel values affect real image intensity Various sound reduction techniques are available in books to remove unwanted leaf noise. Pictures of soundless leaves are separated to make the process easier and easier. In the process of image classification, it leaves images separated into many smaller segments or pixel sets. The size of the classification depends on the picture of the problem and the classification should be stopped if the image you want is

unique. The next step is to remove the features from the split image. The feature removal process reduces image data by measuring certain features such as color, size, shape, texture, etc. These extracted elements are fed to the separator, which separates the leaf particles according to the type and severity of the disease. After that, the process of diagnosing the disease identifies the disease and provides expert recommendations to overcome the disease.

Automatic image classification of algorithms divided by processes and techniques for diagnosing plant leaf diseases with very little calculation effort. This method can identify plant diseases at an early stage. The Artificial Neural Network, the Bayes division, Fuzzy Logic, and hybrid algorithms can also be used to increase visibility in programming processes.

Various classification strategies such as K-Nearest Neighbor Classifier (KNN), Probabilistic Neural Network (PNN), Genetic Algorithm, Support Vector Machine (SVM) and Principal Component Analysis, Artificial neural network (ANN), logic Fuzzy. Appropriate management strategies can control the spread of leaf diseases using early harvest information. Compared to the performance of various machine learning methods for automatic disease analysis. A combination of discrete cosine transform (DCT), discrete wavelet transform (DWT), and Texture output extraction techniques provide excellent results in classification. The proposed method of integrating DCT + DWT features with the Support Vector Machine (SVM) provides maximum accuracy of 94.45%. Major plant disease detection strategies are the backpropagation neural network (BPNN), Support Vector Machine (SVM), the closest neighbor to K (KNN), and the Spatial Gray-level Dependence Matrices (SGDM). These methods are used to analyze healthy and diseased plant leaves.

III. PROPOSED SYSTEM

Although qualified agricultural engineers are responsible for diagnosing plant diseases, clever programs can be used for their early detection. An image processing method that can act as a smartphone program for diagnosing plant diseases.

Our aim is providing the design of this system is that with the help of a leaf image we need to identify the disease and suggest that pesticides take over the disease. Data mining is one of the most exciting concepts that can be used to predict the disease and to make training data reset. Using an Android app with a good camera and enough RAM it is used to take a picture of a leaf of a plant. Preliminary processing can be done to remove the audio data from the image found in the leaf image. After discovering all the common GLCM features associated with plant disease they are used to predict the disease. Given the results of our experiments to test a larger model for predicting plant diseases.

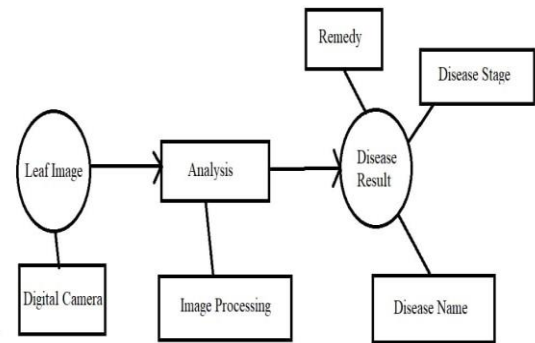


Fig. Data Flow diagram

The image feature has been removed which means to first convert this image to a gray image and then point to the pattern of points present in the leaf. Find the leaf edges that can be found using the split algorithm. Apply the Support Vector Machine algorithm to the features released to create plant disease predictions.

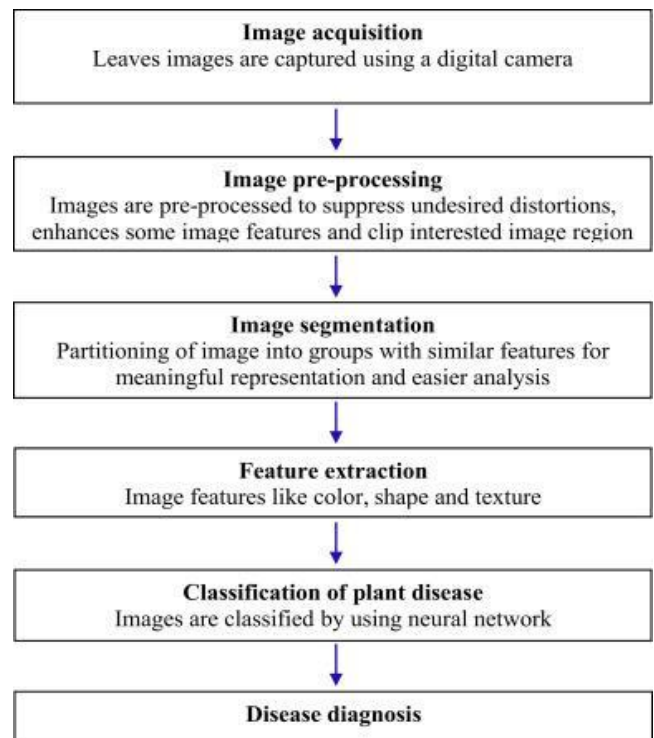


Fig. Generalized steps for diagnosing images

The training database also contains various pesticides. There are many pesticides for the same disease, these different pests have different costs so we will recommend pesticides in terms of cost. The user must select any single pesticide here and apply it to his plant.

IV. SUMMARY

In agriculture, leaf detection is a challenging task that is used to prevent major outbreaks. An inclusive review was found in the literature to detect leaf infection using the extraction factor process. The use of a variety of debugging techniques and stable, adequate data set-ups have helped to achieve satisfactory results. Scope development of hybrid algorithms such as classifiers, Support Vector Machines (SVM), genetic algorithms, cuckoo optimization, particle swarm optimization, and ant colony, etc. to increase the level of recognition of the final classification process. Photo Detection Capable camera nodes take leaf pictures and process them to separate the diseased part. The camera is triggered only when a color change in the leaf is detected thus reducing memory and energy consumption. In some cases, photographs are taken from time to time. The image is processed before the splitting process to improve image quality. Photo Detection Capable camera nodes take leaf pictures and process them to separate the diseased part. The camera is triggered only when a color change in the leaf is detected thus reducing memory and energy consumption. In some cases, photographs are taken from time to time. The image is processed before the splitting process to improve image quality.

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MALARIAL PARASITE CLASSIFICATION USING CNN TECHNIQUES

Hassan S^{1*}, Indiran P², Kaandhakumar M³, Kamalesh U⁴

^{1,2,3,4}UG Students, Department of Information Technology, SRM Valliammai Engineering College Tamilnadu, India

Abstract -Anopheles mosquito vector is the most deadliest and common human infected parasites which is known as Plasmodium Falciparum. To cure a malaria infected patient and stop further spreading, malaria diagnosis using microscopy to ascertain Giemsa-stained parasites is typically done. The microscopy diagnosis are somewhat not time friendly and requires well-trained malaria experts to interpret what they seen under the microscope. To deal with this limitation, an automatic malaria infected diagnosis is required. This work introduced a computer-aided automated diagnosis system which may perform remote field diagnosis with high accuracy while requiring low computational demands. The introduced framework consists of two main parts which are red blood corpuscle counting and parasite life-cycle stage division. The counting process were performed by computer vision techniques, called Hough transform. Various machine learning techniques, i.e., Multilayer Perceptron, Linear Discriminant Analysis, Support Vector Machine, and Weighted Similarity Extreme Learning Machine, are implemented in classification of task. The experimental results shows that the proposed methods could correctly count and divide at 97.94% and 98.12% accuracy, accordingly. The general proposal system are ready to do at 96.18% accuracy.

Key Words: S Combining features, Giemsa-stained thinfilm, malaria

1. INTRODUCTION

Global management of malaria is extremely difficult since early detection of malaria infection relies totally on diagnosis using manual microscopy of Giemsa-stained infected cells. The disease is tough to detect, even developed are lacking in technology. It's a explanation for several deaths once a year [1]. genus Plasmodium is that the explanation for disease [2]. There are four species of Plasmodium P. vivax, P. oval, and P. malaria. The disease are often transmitted by female Anopheles mosquito

1.1 OBJECTIVE

The proposed solution to the given problem is to develop a CNN based deep learning model and train it using the provided dataset so on achieve the very best accuracy possible. The input to the model are going to be a picture of the blood .The model will then use various different image processing techniques for basic filtering and segmentation and suite of pattern are recognized using machine learning (ML) algorithms and directed toward robustly recognizing infected cells during a light or whole slide microscopic image. The output in the final layer would be a number indicating the probability percentage of malaria parasite in the image.

1.2 BENEFITS

Early detection of malaria helps in reducing the death rates across the globe. Deep Learning can emerge as a highly beneficial solution in diagnosing the disease. This model gives very much faster and cheaper rate of method for detecting Plasmodium parasites

1.3 CHALLENGES

Main challenge of the IQ test is repetition of questions which affects the exact values of the result. In most of the IQ tests, the user cannot view their previous IQ test result and the other details. Other IQ scales also will not provide any variation in age groups.

2. LITERATURE SURVEY

Deepali A. Ghate, Prof. Chaya Jadhav, Automatic Detection of Malaria Parasite Fromm blood images International Journal of Computer Science and security, vol.5, issue.3, pp.310-315, May-2017

The primary concept here is, initially conversion of the input color blood image to greyscale, and then calculating the range of yth order of a greyscale. Here in this paper an Effective Algorithm, with the gamma equilization(GE) method is implemented whose main motive is to protect the fundamental structures of the acquired blood images which is infected by malaria

Mahdieh Poostchi, Kamolrat Silamut, Richard Maude, Stefan Jaegar George Thoma, Image analysis and machine learnin for detecting malaria, Translational Research(2018), TRSL 1210 S1931-5244(17)30333-X.

Poostchi wrote a survey paper on image analysis and machine learning methods used for detection and covered the basics, they mention that there is a high prospect for further development, especially using deep learning

Malaria parasite Detection using Different Machine Learning Classifier -Adedeji Oluboja, Zenghui Wang - Machine College of Science, Engineering and Technology, University of South Africa

Adedeji Oluboja, Zenghui Wang concluded that Machine Learning algorithms are a very powerful tool used in detection and classification of malaria parasites. Among the 6 algorithms used, they found out the Fine Gaussian SVM performed better in the classification tasks and the Subspace KNN had the best overall performance.

Bias, S.D., Reni S.K., Kale, I.: A Novel fuzzy logic inspired edge detection technique for analysis of malaria infected microscopic thin blood images. In: 2017 IEEE Life SciencesConference (LSC), Sydney, NSW, 2017, pp.262-265.

This paper proposes a novel, efficient, low complexity algorithm for edge detection, specifically focusing on the analysis of malaria infected microscopic thin blood smears. The algorithm proposes a simple, dynamic thresholding technique that is computed via histogram analysis, designed to capture as much information about the blood cells with minimal computational effort, which is followed by a morphological filtering process to remove noise and artifacts. A binary edge tracking system inspired by the works in fuzzy logic is introduced, defined by a semi ambiguous rule system that can be efficiently implemented in hardware

Mehanian, C., et al.: Computer-automated malaria diagnosis and quantitation using convolutional neural networks. In: 2017 IEEE International Conference on Computer Vision Workshops (ICCVW), Venice, 2017, pp. 116-125.

The optical microscope remains a widely-used tool for diagnosis and quantitation of malaria. An automated system that can match the performance of well-trained technicians is motivated by a shortage of trained microscopists. We have developed a computer vision system that leverages deep learning to identify malaria parasites in micrographs of standard, field-prepared thick blood films. The prototype application diagnoses *P. falciparum* with sufficient accuracy to achieve competency level 1 in the World Health Organization external competency assessment, and quantitates with sufficient accuracy for use in drug resistance studies. A suite of new computer vision techniques-global white balance, adaptive nonlinear grayscale, and a novel augmentation scheme-underpin the system's state-of-the-art performance. We outline a rich, global training set; describe the algorithm in detail; argue for patient-level performance metrics for the evaluation of automated diagnosis methods; and provide results for *P. falciparum*.

Malarial Parasite Detection and Recognition using Microscopic Images, Arslan Khalid;Zulqarnain Haider;Ikramullah Khosa, 2019 16th International Bhurban Conference on Applied Sciences and Technology (IBCAST)

Malaria has been a serious infectious disease since 18th century. Manual diagnosis of malaria is most widely used method but it is a time consuming process, and it involves the risk of error due to the subjective assessment of the sample. In this paper, an automatic method involving image processing techniques is presented which is capable of detecting and recognizing the infection in the microscopic images. The images are generated by using a microscope with 800× zooming capacity. Giemsa staining is used before acquiring the images. Five different categories of malarial parasites are defined and used for classification. Image processing techniques are employed to initially detect a parasite and later to classify it as one of the target categories. Images belonging to three categories were classified perfectly, while one of the category received lower recognition rate. As a result, the proposed method produced 100% classification accuracy for four classes, and 60% for the remaining class. The algorithm developed for classification in hierarchical manner showed good results overall, considering the fact that no such research is available for local data.

Malarial parasites detection in RBC using image processing, Shipra Saraswat;Utkarsh Awasthi;Neetu Faujdar, 2017 6th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)

The gold standard for the diagnosis of malaria is microscopy in which the blood slide is examined under a microscope, but the reliability, accuracy and timely diagnosis of the results are highly based on the proficiency of the technician examining the slide. False Detection can occur in the case of poorly skilled technician. In this research work we have proposed a system for automating the manual work done by a technician in order to cut down the human error and increasing the accuracy of the malaria diagnosis. The System is tested for a dataset of 80 images of a thin blood smear. The infected cells are extracted using HSV segmentation. This approach will be beneficial for the rural areas, with a

scarcity of experts.

A Novel Stacked CNN for Malarial Parasite Detection in Thin Blood Smear Images, Muhammad Umer;Saima Sadiq;Muhammad Ahmad;Saleem Ullah;Gyu Sang Choi;Arif Mehmood, IEEE Access

Malaria refers to a contagious mosquito-borne disease caused by parasite genus plasmodium transmitted by mosquito female Anopheles. As infected mosquito bites a person, the parasite multiplies in the host's liver and start destroying the red-cells. The disease is examined visually under the microscope for infected red-cells. This diagnosis depends upon the expertise and experience of pathologists and reports may vary in different laboratories doing a manual examination. Another way around, many machine learning techniques have been applied for spontaneous detection of blood smears. However, feature engineering is a challenging task that requires expertise to adjust positional and morphological features. Therefore, this study proposes a novel Stacked Convolutional Neural Network architecture that improves the automatic detection of malaria without considering the hand-crafted features. The 5-fold cross-validation process on 27,558 cell images with equal instances of parasitized and uninfected cells on a publicly available dataset from the National Institute of health, the accuracy of our proposed model is 99.98%. Furthermore, the statistical results revealed that the proposed model is superior to the state-of-the-art models with 100% precision, 99.9% recall, and 99% f1-measure.

Review of Surface Enhanced Raman Spectroscopy for Malaria Diagnosis and a New Approach for the Detection of Single Parasites in the Ring Stage, Keren Chen;Clint Perlaki;Aoli Xiong;Peter Preiser;Quan Liu, IEEE Journal of Selected Topics in Quantum Electronics

Malaria is a global disease that desires early diagnosis in the field, for which one way is to detect hemozoin (a unique biomarker of malaria infection) at low concentrations. Moreover, many anti-malarial drugs inhibit the formation of hemozoin and facilitate toxic free heme stacking to kill malaria parasites. Therefore, monitoring hemozoin within malaria parasites is important to malaria diagnosis and drug development. Here, we first review various surface enhanced Raman spectroscopy-based techniques for malaria diagnosis. Then, to enable hemozoin detection in single parasites in the ring stage for the first time, we report a method based on surface enhanced Raman spectroscopy for hemozoin detection in Plasmodium falciparum in the ring stage. In this method, silver nanoparticles are directly synthesized within parasites after the lysis of red blood cells and parasites are confirmed to be in the ring stage by Giemsa staining after a special procedure of sample postprocessing. The Raman spectra of hemozoin acquired from parasites with silver nanoparticles synthesized inside are compared with those from parasites mixed with nanoparticles synthesized separately. The results confirm the feasibility of detecting hemozoin crystals within single parasites in the ring stage. This method offers a promising strategy to investigate the mechanism of heme metabolism in malaria infection and a tool to evaluate the effectiveness of anti-malaria drugs

3. EXISTING SYSTEM

The two main phases of the system architecture that's the training and therefore the testing phases is shown Training phase starts with taking the pictures from the dataset. Multiple images are given to the training phase in order that the pictures are well processed and enhanced in order that the quantity of knowledge to be handled gets reduced. Because the number of trained images increases the performance of the system also increases. The segmentation technique removes the noise and other disturbances present within the pictures. The segmented image is enhanced by extracting only the required features and are classified by employing a classifier. In the testing phase, a test image is subjected to all or any the above mentioned stages then identifies the test image as an infected or a healthy sample.

3.1 PROPOSED SYSTEM MODULES :

3.2 PRE-PROCESSING

There are variety of re-processing techniques utilized in image processing for the enhancement of the pictures. Grey scale conversion, resizing of the image, increase the brightness of the pictures and other pre-processing techniques are applied to vary the image into desired format for subsequent segment. Pre-defined and in-built filtering techniques are applied for the higher contrast on a picture and also other techniques for multiple dimension for images are applied. The main objective of pre-processing are Resizing the image, Reduce or eliminate noise, Enhancing.

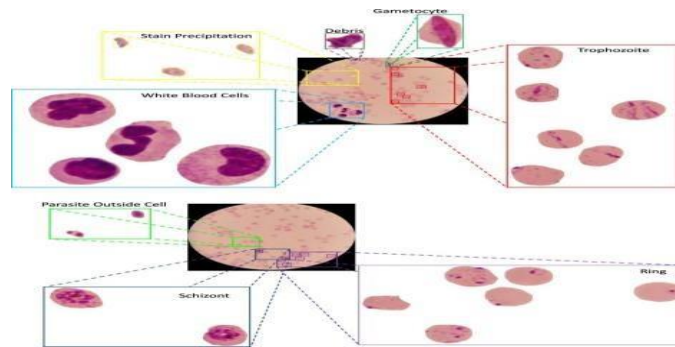


Fig 3.2.1 Separation Process of Overlapping RBCs

3.3 SEGMENTATION.

The process is employed to divide image into objects and region. Representing a picture into a way simpler and more understandable, which may be easy to analyse within the next process segmentation is employed. This helps to analyse the code simpler. It segments the image pixels supported region of homogeneity by extracting certain features which are in common. It also removes the noise present within the images. Differentiating blood cells and background is the ultimate goal. The image obtained by segmentation as shown in figure 3.3.1 are passed on to subsequent process. The cells that are identified as possibly infected are then extracted from the image and passed to subsequent stage of the algorithm for feature extraction

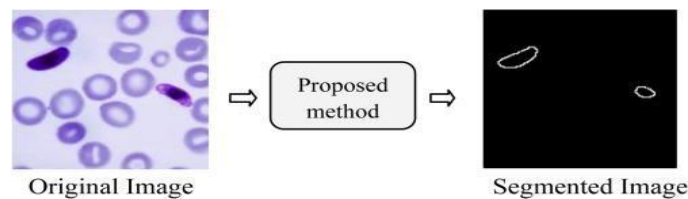


Fig 3.3.1 Transforming Region into Segmented Image

3.4 FEATURE EXTRACTION

Feature extraction is that the next step within the process where the segmented image from the previous step is provided as an input. This technique reduces the quantity of knowledge to be loaded by extracting only the features those are required. The features include contrast, correlation, homogeneity, energy, entropy, color histogram, color moments and so on. As the number of features increase the extent of accuracy also increases

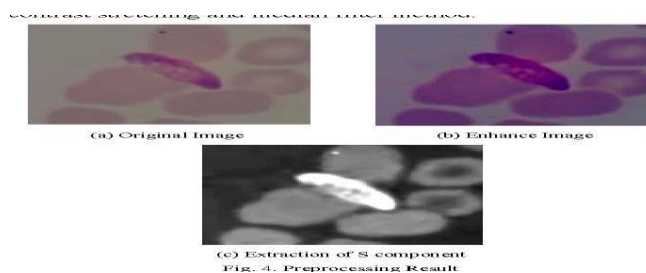


Fig. 4. Preprocessing Result

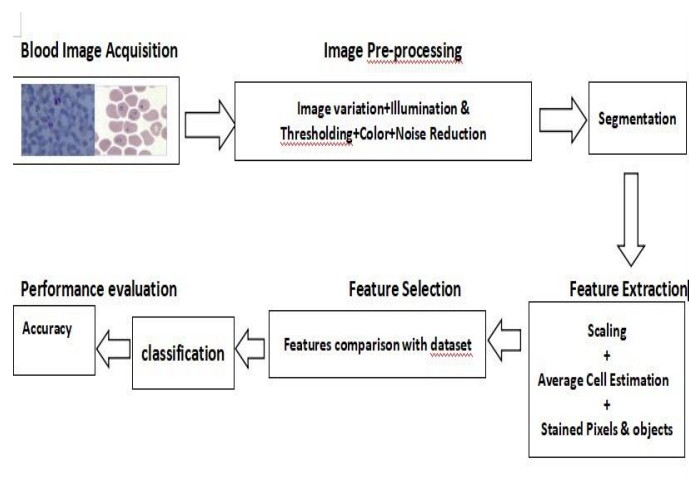
Fig 3.4.1 Processed Image of Malaria RBCs

4. SYSTEM DESIGN

The front end is designed with HTML, CSS, and Flask while the backend is built using Python (Apache server). The questions and choices of every question is stored within the database and accessed using apache server

4.1 ARCHITECTURAL DESIGN

In order to conduct a series of experiments, the available malaria dataset was used. Data collection and data preprocessing techniques are discussed in the following Diagram. In the series of experiments, we choose our best model in terms of performances and effectiveness, which is discussed in proposed model architecture. Experimental details and settings are discussed in training details ,where training of the models is discussed under three training procedure which are general Image Pre-processing, Feature Extraction, Feature Selection and Performance Evaluation, details are provided in the designated subsections.



4.2 SAMPLE OUTPUT:

UN INFECTED :

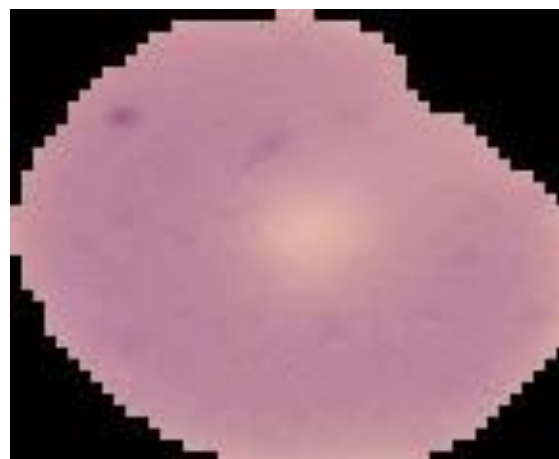


Fig 4.2.1 Images of healthy RBCs

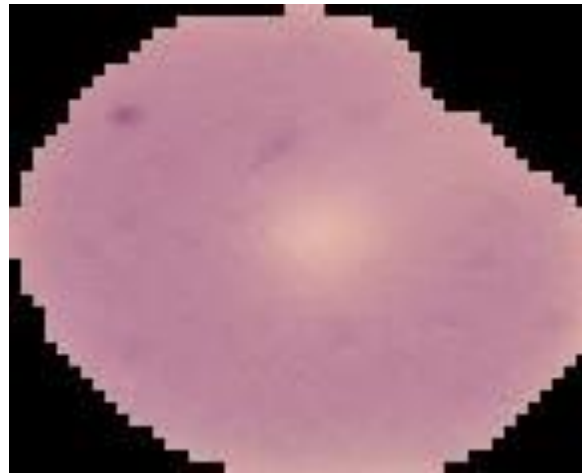


Fig 4.2.2 Images of Healthy RBCs

INFECTED :



Fig 4.2.3 Images of Unhealthy RBCs which we predicted as parasite of the ring form stage

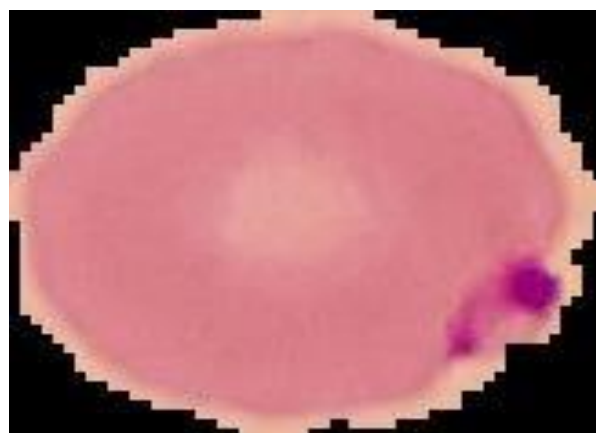


Fig 4.2.4 Images of Unhealthy RBCs which we predicted as parasite of the ring form stage

FUTURE WORK

In future, the appliance are often widened by using the adaptive method within the test. In an adaptive method if a user gives an incorrect answer then subsequent question are getting to be easier else subsequent question are getting to be harder than the previous one. This method provides more reliable results. Additionally, the generated report are often shared to the examinee's mail for more interactions. The report generated are often during a more detailed version. If the user performs well the system enhance by indicating Green, if wrong then indicates Red. IQ is one a neighborhood of testing the facility of a private. Another one is Emotional Quotient, is that the potential of individuals to acknowledge their own emotions and discern between different feelings and label them appropriately. Individuals can easily mingle with professional environment and colleagues by developing this EQ.

CONCLUSION

The introduced system has the tendency to calculate the intelligence and cognitive skills of a person. The introduced system owns the potential to improve the IQ of the person by taking the tests. It has three various age group divisions so it is feasible to analyze the specific child's IQ. The result are going to be generated immediately after the completion of the test; this reduces the time taken for evaluation. Once the IQ is improved the system will assign the report. By implementing randomization method, the level of test is increased. Because of its simple implementation it lessens the manual work of calculating the IQ position and respective IQ level. The user can view their previous history and that they can compare their growth easily through this technique.

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Optimum Design & Efficiency of One-Way Slab According to ACI

Hamdy Elgohary¹, Abdulghafour Osama², Abdulghafour Abdulrazak³

¹Professor, Dept. of Civil Engineering, College of Engineering, Umm Al-Qura University, Makkah, Saudi Arabia

²Engineer, Dept. of Civil & Environmental Engineering, The University of Tennessee, Knoxville, USA

³Associated Professor, Dept. of Civil Engineering, College of Eng., Umm Al-Qura University, Makkah, Saudi Arabia

Abstract - The paper presents a comparison review of one-way solid slab design, considering span to depth limitations given in different international building codes. Span to depth ratio limitations are mainly provided for deflection control. In ACI Code, the span to depth ratio has small values compared with the Egyptian Code ECP. Using the ACI span to depth ratio limitations in one-way slab design always give overdesign slab thickness and steel reinforcement less than the minimum values.

The parametric study was carried to apply the span to depth ratio limitations in both ACI and ECP to a one-way solid slab. Based on this study, recommendations are given to modify the span to depth limitations provided in ACI to design one-way solid slabs to optimize the design of such slabs. Also, the paper determines the effect of optimum design on the overall costs of one-way slabs considering two main variables thicknesses and deferent compressive strength of the concrete.

Key Words: one-way slabs, deflection, span-to-depth ratio, cost optimization, details of reinforcement

1. INTRODUCTION

One-way solid slabs are widely used in buildings of all types of use. Codes give provisions to preliminary determine the thickness of this kind of slabs like all other concrete elements. These provisions aim to get the thickness that will lead to safe values of deflection. The span to depth ratios for the one-way slab design recommended in the ACI Code [1] is smaller than the ECP-203 Code values [2]. In other words, the provisions of the ACI Code give a larger thickness of one-way slabs than the ECP Code. Design of one-way slabs using ACI Code span to depth ratio, in most cases, leads to the use of minimum steel ratio, i.e., the value of thickness is overestimated.

In this paper, a review of span to depth provisions in both the ACI Code and ECP-203 Code is given. According to the ACI Code procedure, a trial to design one-way slabs using ECP-203 span to depth ratio is carried out. The differences in steel ratio and the concrete amount obtained using ACI and ECP-203 Codes have been studied in detail. An alternative detailing of steel reinforcement for a one-way slab is proposed. The comparison of the concrete and steel quantities shows the effectiveness of alternative detailing of one-way slabs on the overall cost.

2. DESIGN PROVISIONS

Slabs are usually slender members (have a relatively small thickness compared to their spans). To avoid damage to the architectural finishes in contact with slab due to excessive deflection, Codes set limits on the span to depth ratio. These limits define the minimum slab thickness as a function of the span. This relation in different Codes will be reviewed in the following section:

2.1 ACI Code

ACI Code states that the minimum slab overall thickness (h) for solid non prestressed slabs shall not be less than the limits given in Table 7.3.1.1 unless the calculated deflection limits are satisfied. Accordingly, the span to depth ratio for the simply-supported one-way slab, not more than 20. This provision is used for the initial estimation of slab thickness in the design. The exact requirements are provided in SBC 304 [3].

2.2 Eurocode EC-2 [4]

According to EC-2 clause 7.4.2 [4], the primary span to depth ratio has the form:

$$\frac{L}{d} = k \left[11 + 1.5\sqrt{f_{ck}} \frac{\rho_0}{\rho} + 3.2\sqrt{f_{ck}} \left(\frac{\rho_0}{\rho} - 1 \right)^{3/2} \right] \quad \text{if } \rho \leq \rho_0$$

$$\frac{L}{d} = k \left[11 + 1.5\sqrt{f_{ck}} \frac{\rho_0}{\rho - \rho'} + \frac{1}{12} \sqrt{f_{ck}} \sqrt{\frac{\rho'}{\rho_0}} \right] \quad \text{if } \rho > \rho_0$$

k – factor taking account of the different structural systems

ρ_0 – reference reinforcement ratio = $\sqrt{f_{ck}} \times 10^{-3}$

ρ – is the required tension reinforcement ratio at mid – span

ρ' – is the required compression reinforcement ratio at mid – span

The primary span to depth ratio for simply-supported slabs ranges from 14 to 20, depending on the steel ratio.

The span to depth ratio in EC 2 is used to check for deflection and not determine the slab thickness.

According to EC 2, the initial determination of the slab thickness, the span to depth ratio can be assumed 20 (as in ACI Code), but the relationship is between span and effective depth.

2.3 Egyptian Code (ECP-203)

According to ECP-203, it is not essential to check for deflection in one-way simply-supported solid slabs if the span to depth ratio is not exceeding 25. This case is valid for the possibility of slabs under uniform loads and a live load of less than 5 KN/m² (Clause 4.3.1.3.1 and Table 4.10). This condition is always used to determine the preliminary value of the overall slab thickness.

3. PARAMETRIC STUDY

For comparison between span to depth ratio limits in ACI Code and Egyptian Code, one-way solid slabs of span 2.0, 3.0, 4.0, and 5.0 m were considered. The span to depth ratio for all slabs was taken 20 as per ACI Code and 25 as per ECP203 Code. The reinforcement ratio was assumed to be minimum as per ACI Code. Concrete strength was made 28 MPa, and steel yield strength was 420MPa. For all slab models, the load-carrying capacity and deflection were determined according to the ACI Code procedure. Chart 1 shows the relationship between the imposed load capacity (live load) and the slab span for both cases of span to depth ratio.

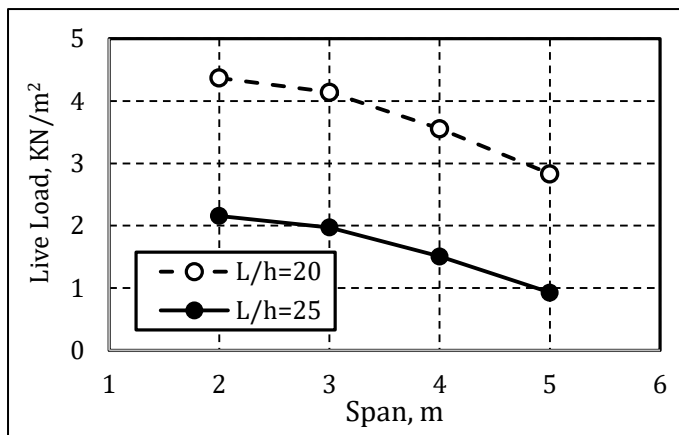


Chart -1: Live Load-carrying capacity-span relationship, case of minimum steel ratio

For the case of span to depth ratio 20, the slabs with minimum steel ratio can sustain, in addition to dead loads, live load equals or greater than 3 KN/m². This value of live load covers most practical cases. So, steel reinforcement in one-way slabs designed considering minimum slab thickness recommended by ACI Code will be minimum.

The same models were analyzed for the case of the maximum steel percentage according to ACI Code. The imposed load capacity (live load) has been determined for both cases of span to depth ratio. Chart 2 shows the relation between slab span and live load capacity.

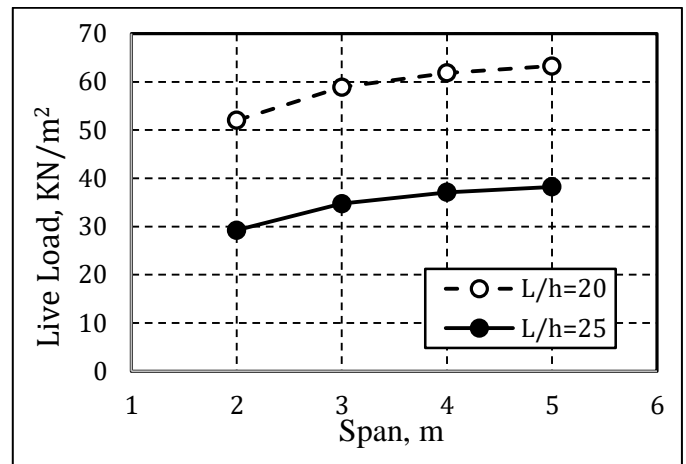


Chart -2: Live Load-carrying capacity-span relationship, case of maximum steel ratio

In ASCE [6], the superimposed live load on buildings varies between 2.0 and 7.5 KN/m². In common practice [7], one-way slabs on beams are most suitable for spans of 2.0 to 5.0 m and a live load of 2.5 to 5.0 KN/m². From Chart 2, for the case of maximum steel percentage, the slabs can sustain live loads of tremendous values. For the case of span to depth ratio 20, the live load ranges from 54 to 66 KN/m², and for ratio 25, it ranges from 29 to 38 KN/m². One-way slab with maximum steel ratio can sustain live load more than seven times the maximum practical value of the live load on buildings as per ASCE [6], in case of span to depth ratio 20, and about four times in case of depth-ratio 25. The steel percentage in the one-way slab under maximum live load in Code (7.5 KN/m²) approximately will be ranged from 0.2 to 0.14 maximum steel percentage depending on concrete compressive strength. For the case of concrete strength 28 MPa, the steel percentage under maximum live load equals 0.18 of the maximum steel ratio.

The relation between the predicted deflection and the span is presented in Chart 3 for instantaneous deflection under live load capacity of slabs with minimum and maximum steel ratio.

For all cases, predicted deflections are under the ACI Code limit, except for the case of span 2.0 m with maximum steel percentage for both span-to-depth ratios (20 and 25). This result was expected because the live load capacity of the slab in these two cases was found to be 54.6 KN/m² and 29.2 KN/m², respectively. The live load carrying capacity is 6 to 4 times the maximum practical value [7].

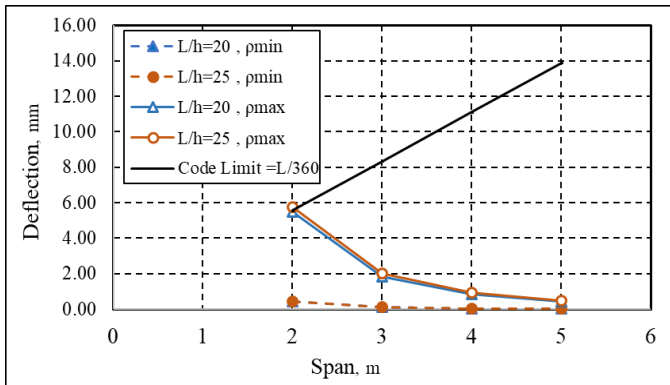


Chart -3: Instantaneous deflection due to Live Load

Chart 4 shows the predicted values of long-term deflection for the models used in the parametric study. All predicted values of long-term deflection are less than the ACI Code limit. From both Charts 3 and 4, the calculated deflection for slabs with span to depth ratio 20 and 25 is approximately the same.

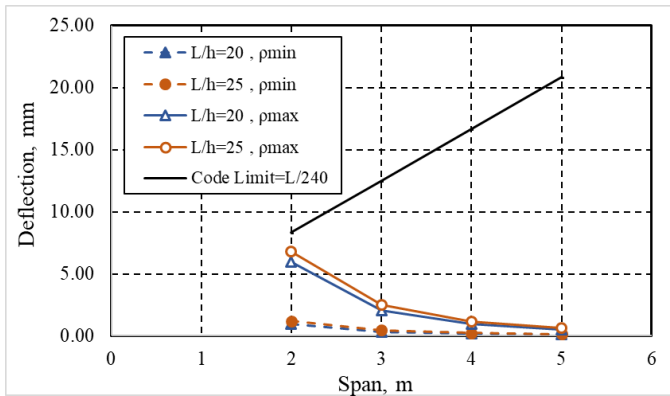


Chart -4: Long-Term deflection and slab span relationship

Simply-supported one-way slab models of span 2.0, 3.0, 4.0, and 5.0 m under live load 2.0, 4.0, 6.0, and 8.0 KN/m² have been designed according to ACI design procedure, but with a span to depth ratio of 25. The predicted deflection, instantaneous, and long-term are shown in Charts 5 and 6, respectively. All deflections are within the Code limit.

Despite using a span to depth ratio larger than the ACI Code recommended value, the instantaneous deflection due to live loads within the practical range is minimal compared with the Code limit. The ratio of the predicted values of deflection to the Code limit is 0.071; 0.141; 0.212 and 0.283 for the cases of live load equals 2.0; 4.0; 6.0 and 8.0 KN/m², respectively. Based on these results, it can be concluded that the use of span to depth ratio of 25 in the design of one-way slab will give very safe values of the instantaneous deflection due to live load

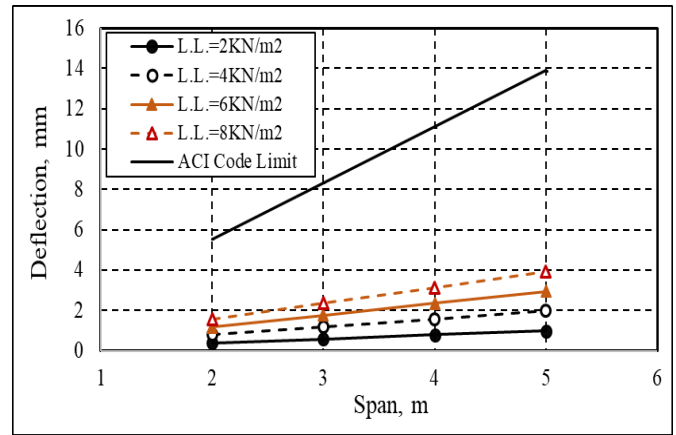


Chart -5: Deflection due to Live load for L/h=25

For the case of long-term deflection, the ratio of the predicted values of deflection to the Code limit is 0.212; 0.26; 0.306, and 0.353 for the cases of live load equals 2.0; 4.0; 6.0 and 8.0 KN/m², respectively. The shown ratios enable us to make the same conclusion for the case of long-term deflection. The predicted long-term deflection of the one-way slab using a span to depth ratio of 25 under live load in the practical range is very safe.

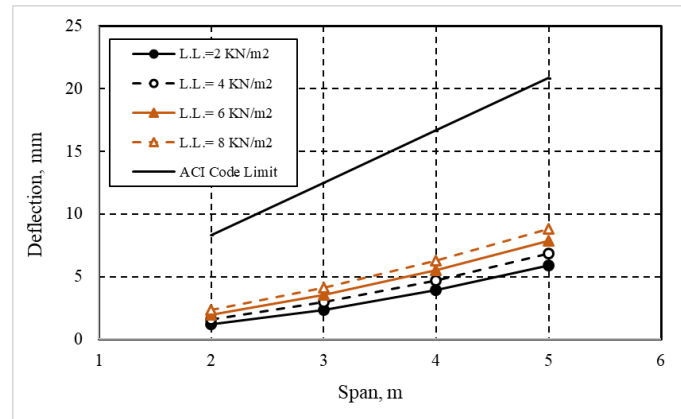


Chart -6: Long Term Deflection for L/h=25

The use of a span to depth ratio of 25 instead of 20 in the design of a one-way slab will result in a 20% reduction in the slab thickness and slab own weight. The decrease in the slab weight will result in a reduction in the loads transmitted from the slabs to the beams and consequently to a decrease in the loads on both the columns and the foundations. Practically in conventional concrete framing systems, the self-weight of slabs may represent 50% of the total self-weight of the overall skeleton (not including foundations). This means that the use of a span to depth ratio of 25 will result in a reduction of the total skeleton weight and total concrete volume, not less than 10%, with very safe values of expecting deflections.

4. RECOMMENDED ECONOMICAL DESIGN

Some selected models of one-way slabs have been analyzed using SAP2000 software [8] and manually. The chosen models have a short span of 2.0 and 3.0 meters and are subject to imposed dead load (flooring) of 2.0 KN/m² and Live Load of 3.0 KN/m² (as average practical values). Table 1 shows the properties and the design results of the chosen one-way slab models. The first three models have a span of 2.0 m, span to depth ratio of 20, and the long span was determined 4.0, 6.0, and 8.0 m (degree of rectangularity of the slab is 2.0; 3.0 and 4.0, respectively). The second three models are the same as the first three but with a span to depth ratio of 25. Models 7, 8, and 9 have a span of 3.0 m with a span to depth ratio of 20 and with a degree of rectangularity 2.0, 3.0, and 4.0. The last three models have a span to depth ratio of 25 and the same parameters as models 7, 8, and 9. The details of the selected models are shown in Table -1.

Table -1: Slabs Models for Design Analysis

Slab Model	Slab width, m	Slab length, m	Span to depth ratio	Slab Thickness, mm
1	2	4	20	100
2	2	6	20	100
3	2	8	20	100
4	2	4	25	80
5	2	6	25	80
6	2	8	25	80
7	3	6	20	150
8	3	9	20	120
9	3	12	20	150
10	3	6	25	120
11	3	9	25	120
12	3	12	25	120

For all models, the maximum bending moment at the center and the moment in the slab strip at the quarter of the longitudinal direction have been determined and shown in Table -2.

The conventional detailing of reinforcement is presented in Chart 7. The main steel reinforcement is calculated for the maximum bending moment at the center of the slab. The main steel (A_{s1}) extended over the short span and arranged along the longitudinal direction. Away from the center of the slab, the moment has values less than the maximum at the center. Consequently, the used reinforcing steel will be more than the required steel to resist the actual moment. The negative steel (A_{s2}) is determined according to the ACI Code provision to resist the negative moment of $wl^2/24$. The secondary steel (A_{s3}) is used as the minimum steel required for shrinkage and temperature. The calculated values of the required steel for all models are shown in Table -2. The values highlighted are the minimum required steel area. For all cases of span to depth ratio 20, all steel used is minimum. It can be concluded that the span to

depth ratio of 20 gives an overestimation of slab thickness and always will result in values of the designed steel area less than the minimum.

Table -2: Moments in The Models

Model of Slab	SAP2000 Results		Manual Results	
	Mu@L/2 (KN.m)	Mu@L/4 (KN.m)	Mu@L/2 (KN.m)	Mu@L/4 (KN.m)
1	3.79	2.87	4.8	2.88
2	4.482	3.37	4.8	2.88
3	4.668	3.5	4.8	2.88
4	3.54	2.68	4.5	2.7
5	4.21	3.165	4.5	2.7
6	4.399	3.3	4.5	2.7
7	9.63	5.46	12.5	7.5
8	11.244	6.27	12.5	7.5
9	11.628	6.466	12.5	7.5
10	8.99	5.1	11.5	6.9
11	10.57	5.89	11.5	6.9
12	10.97	6.13	11.5	6.9

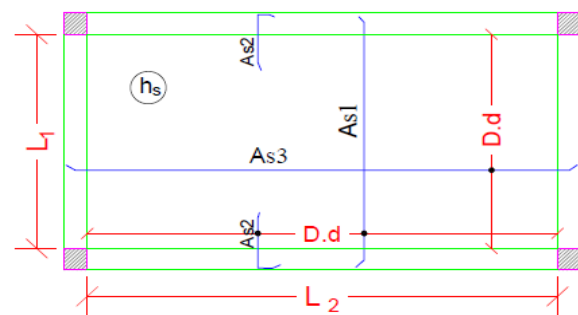


Chart -7: Conventional Details of Reinforcement of One-Way Solid Slab

An alternative reinforcing detailing is proposed to save the amount of the required steel. In the proposed detailing (Chart 8), the steel at the middle of the slab is calculated to resist the maximum moment at the center, while at the first and fourth quarter of the longitudinal side, the steel reinforcement has been obtained considering the actual moments at these locations. The moments at the quarters, in most cases, approximately equal to 0.6 of the maximum moment at the center (Table -2). In the recommended arrangement, the main steel (in a short direction) has two values, one under the maximum moment at the middle strip of width 0.5 long spans (A_{s1}). The second value (A_{s2}) will be placed at the first and fourth quarter of the slab and is determined considering the value of the design moment 0.6 of the maximum moment. As shown in Table -2, only the main steel (A_{s1}) differs from the minimum values, while the others are minimum. The total reinforcing steel area is presented in Table -3 for all models according to conventional and recommended detailing. The reinforcing steel area has been determined for the moments obtained from SAP2000 results and manual calculations.

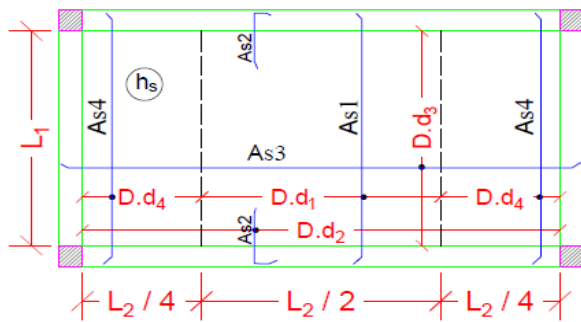


Chart -8: Recommended Details of Reinforcement of One-Way Solid Slab

Table-3: Design values of Steel reinforcement

Slab Model	Slab width, m	As1, mm ² /m.	As2, mm ² /m.	As3, mm ² /m.	As4, mm ² /m.
1	2	180	180	180	180
2	2	180	180	180	180
3	2	180	180	180	180
4	2	176	144	144	144
5	2	210	144	144	144
6	2	220	144	144	144
7	3	270	270	270	270
8	3	270	270	270	270
9	3	270	270	270	270
10	3	270	216	216	216
11	3	303	216	216	216
12	3	315	216	216	216

Table-3: Total Values of Steel reinforcement and saving percentage in steel and concrete

Slab number	Total Steel Area		Reduction in steel %	Reduction in Concrete Volume %
	Conventional	Recommended		
1	3456	3456	0.0	0
2	5184	5184	0.0	0
3	6912	6912	0.0	0
4	3020.8	2892.8	4.2	20
5	4939.2	4543.2	8.0	20
6	6745.6	6137.6	9.0	20
7	11664	11664	0.0	0
8	17496	17496	0.0	0
9	23328	23328	0.0	0
10	10303.2	9817.2	4.7	20
11	16345.8	15171.3	7.2	20
12	22226.4	20444.4	8.0	20

The recommended detailing of slab reinforcement causes a decrease of the required steel of 7% on average. For the case of manual design, this reduction will be 10%.

5. CONCLUSIONS

The span to depth ratio limit of ACI Code gives large values of slab thickness and, consequently, steel reinforcements values less than the minimum, in most practical cases of one-way slabs.

Using span to depth 25, as recommended by the Egyptian Code, for the design of one-way solid slabs by ACI Code provisions, leads to safe deflection values, and at the same time, reduction in the slab weight and concrete volume of 20%.

Considering that the slab weight represents 50% of the weight of the structure, the use of a span to depth ratio of 25 will also result in an approximately 10% total reduction of the overall weight of the skeleton.

The use of the recommended detailing of steel reinforcement allows getting a reduction in the used steel by 10%.

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GraphQL Service Layer to Enable Client-driven, Optimized and Secure Front-end Architecture

Amit Jambusaria¹

¹Amit Jambusaria; Syracuse University; 31 Caspar St, Boston, MA - 02132

Abstract - GraphQL is an open-source data query and modification language for APIs leveraged by several prominent tech shops such as Facebook (original creator), Github, Pinterest, Intuit, Coursera, Paypal, Yelp and Shopify to name a few. It has gotten a lot of positive attention from the engineering community and supporters have termed it as "Better REST", asserting a range of benefits over traditional REST. With all the buzz around GraphQL, do developers need to make an active shift towards it and deprecate REST endpoints completely? It depends on many factors, which are discussed in this article. As part of the study, we will be also be establishing performance benchmarks of GraphQL vs REST in terms of overall web page load time (TTI).

Key Words: GraphQL; Web Applications; Front-end; API; REST; Services; Client architecture; Data Query

1. INTRODUCTION

GraphQL is a data-query language created by Facebook that went open source in 2015. It provides a complete understandable description of the data in the API and enables clients to function in a declarative style to fetch exactly what they need - nothing less, nothing more. In this article, we will summarize how it works, comparative study of GraphQL vs REST, why you should use it and what are some of its drawbacks. Graph data structures are connection maps, and they have one key advantage over both relational / document stores - you can express both relational & hierarchical information as graphs.

RESTful APIs follow clear and well-structured resource-oriented approach, when the data gets more complex, the routes get longer. It is not always possible to fetch data with a single request. GraphQL structures data in the form of a graph with its powerful query syntax to request, retrieve and update data. GraphQL is a query language for APIs and not for databases.

2. GRAPHQL COMPONENTS

GraphQL enables you to fetch (or modify) all the data on a server in one go. Your client can make HTTP requests to the `/graphql` endpoint by providing query, variables and operationName. For example, the request would look something like -

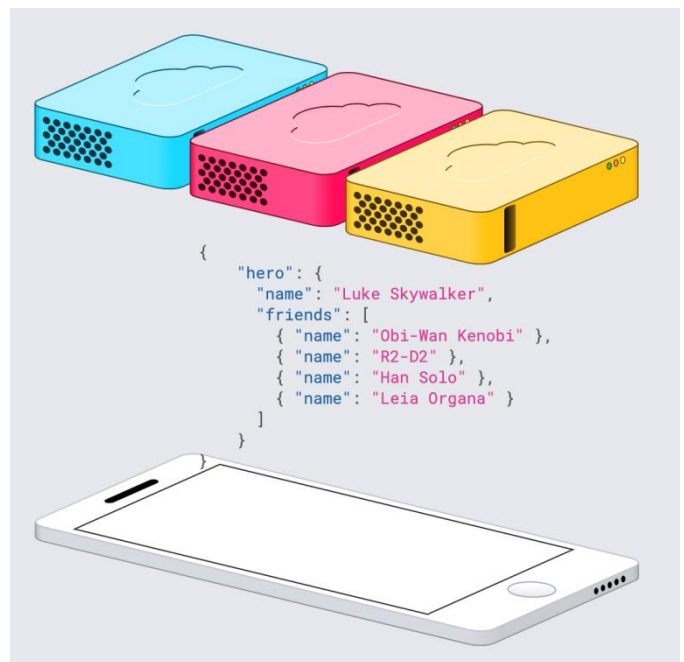
```
{
```

```
  "operationName": "operation name",  
  "query": "query string",  
  "variables": "variables"  
}
```

GraphQL allows for three kinds of operations -

1. Query
2. Mutation
3. Subscription

A GraphQL operation is either a query (read), mutation (write), or subscription (continuous read). Each of these operations is only a string that needs to be constructed according to the GraphQL specification. Once this operation reaches the backend application, it can be interpreted against the entire GraphQL schema there and resolved with data for the frontend application.



2.1 QUERY

Query enables the client to fetch data from the server. They are comparable to the GET calls in traditional REST. A GraphQL query is a string that is sent to a server to be interpreted and fulfilled, which then returns JSON back to the client. At a very basic level, each query contains fields and arguments.

The shape of the query is of the same shape as the result. This is a key feature in GraphQL, because you always get back what you expect, and the server knows exactly what fields the client is asking for. Let's take the example of the 'Ticket' resource given below. The query call is made from a web IDE called **Graphiql** that helps you to test and structure your queries against your server. We have defined a query that pulls ticket fields by passing in the ticket ID as an identifier argument.

GraphQL queries access not just the properties of one resource but also smoothly follow references between them. While typical REST APIs require loading from multiple URLs, GraphQL APIs get all the data your app needs in a single request. Apps using GraphQL can be quick even on slow mobile network connections. Existing APIs fetch more from the GET calls than what is required, leading to the emergence of technologies like GraphQL instead of traditional ones like REST [1].

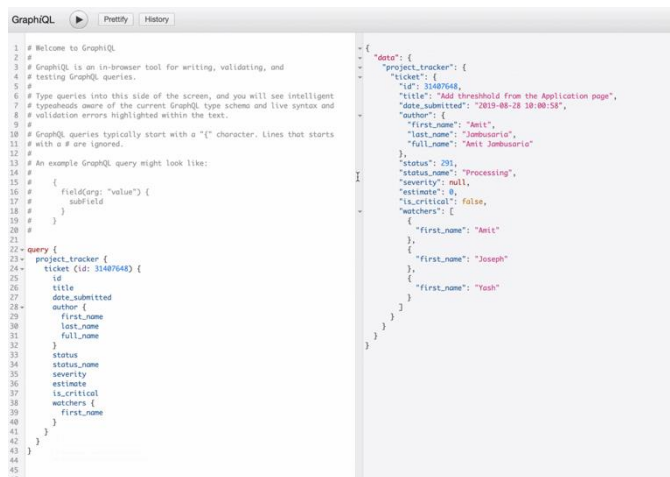


Fig - 2: Graphiql interface to test GraphQL queries

Queries can also parse through dynamic arguments which can be passed in JSON format as variables. In the example above, instead of hardcoding the ticket ID, you could pass in a variable **\$id**. Given below is the query network call as seen in the browser dev tools.

2.1 MUTATION

Just reading data from the server is not enough. We also need the ability to create, update and delete data from the server. In REST, this is accomplished by POST with a payload (usually JSON) that is passed to the server. In GraphQL this is solved through Mutation. Mutations enable the client to modify data on the server-side. In our example around "Ticket", we will replace the query with the mutation keyword. The corresponding mutation type also needs to exist on the server-side. This is an example:

```
20 #
21
22 mutation {
23   project_tracker {
24     createTicket (title: "New ticket", author_id: 11824) {
25       id
26     }
27   }
28 }
29
30
```

Fig - 3: An example of Mutation to create / update data

In our example, the **createTicket** mutation accepts two arguments for creating a ticket - **title** and **author_id**. On ticket creation, we return the **\$id** of the newly created ticket. Just like the Query, Mutation is a root object type. Mutations for the most part are very flexible and can return whatever you desire: scalars such as **int**, **string**, **bool** and core types like the **Ticket**, or even custom response objects. Similar to queries, if the mutation field returns an object type, you can ask for nested fields.

2.3 SUBSCRIPTION

Subscription enables the client to fetch real-time updates from the server. You can think of subscriptions as analogous to continuous polling mechanisms. It makes it possible for the server to stream data to all the clients that are listening or "subscribed" to it. Just like queries, subscriptions allow you to read data. *Unlike* queries, subscriptions maintain an active connection to your GraphQL server, most commonly via WebSocket. This enables your server to push updates to the client over time. Executing a subscription creates a persistent function on the server that maps an underlying Source Stream to a returned Response Stream. You can define available subscriptions in your GraphQL schema as fields of the Subscription type.

So, when should you use subscriptions? In most use cases, you should not require subscriptions. Your client can stay consistent with the backend by querying intermittently or re-execute queries on demand based on triggers / actions from the user. Subscriptions are a great for

1. **Small incremental changes to large objects** - If your backend object is continuously being updated, re-querying constantly from the client can get expensive and slow. For example, consider the stock trading apps - Robinhood, WeBull, Fidelity etc. The ticker price for a given stock is constantly fluctuating. Rather than persistently querying the server, subscriptions would provide a much more elegant solution. You can fetch the initial state of the object with a query, and your server can proactively push updates to individual fields as they occur.

2. **Low-latency, real-time updates** - A chat application is a good example where all the chat participants need to receive messages as soon as they are posted.

3. PAGE LOAD TIME OPTIMIZATION STUDY

As part of web performance measurement, following key metrics needs to be considered -

- **First contentful paint (FCP):** measures the time from when the page starts loading to when any part of the page's content is rendered on the screen. (lab, field)
- **Largest contentful paint (LCP):** measures the time from when the page starts loading to when the largest text block or image element is rendered on the screen. (lab, field)
- **First input delay (FID):** measures the time from when a user first interacts with your site (i.e. when they click a link, tap a button, or use a custom, JavaScript-powered control) to the time when the browser is actually able to respond to that interaction. (field)
- **Time to Interactive (TTI):** measures the time from when the page starts loading to when it's visually rendered, its initial scripts (if any) have loaded, and it's capable of reliably responding to user input quickly. (lab)
- **Total blocking time (TBT):** measures the total amount of time between FCP and TTI where the main thread was blocked for long enough to prevent input responsiveness. (lab)
- **Cumulative layout shift (CLS):** measures the cumulative score of all unexpected layout shifts that occur between when the page starts loading and when its lifecycle state changes to hidden. (lab, field)

We will be measuring the Time to Interactive (TTI) for web pages of different sizes using regular REST calls vs GraphQL service layer. In the research the web page content is unaltered. Fig - 4 details the GraphQL network calls to the server.

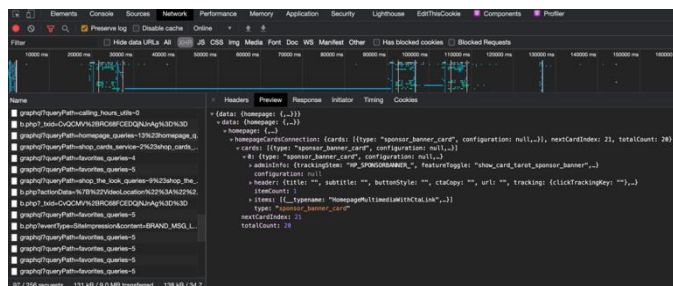


Fig - 4: GraphQL network calls to the server

In Fig - 5, we see performance profiler graphical representation of the execution time, most of the time is consumed during scripting and then for rendering.

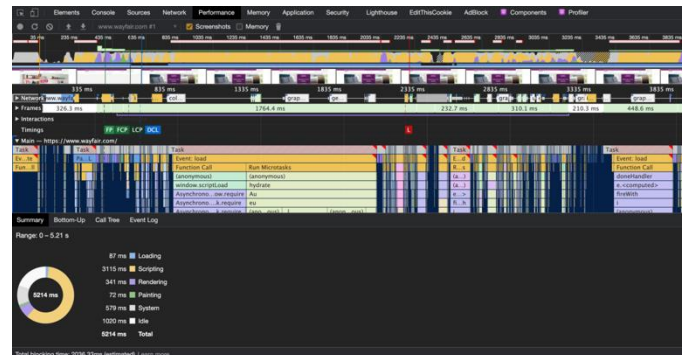


Fig - 5: Browser Performance Profiler

Measuring the GraphQL performance in terms of Page load times for web pages of different sizes.

Case 1:

Web page size - 6.6MB
 REST page load time - 2.90 sec
 GraphQL page load time - 2.17 sec
 Delta / Performance optimization - 0.73 sec

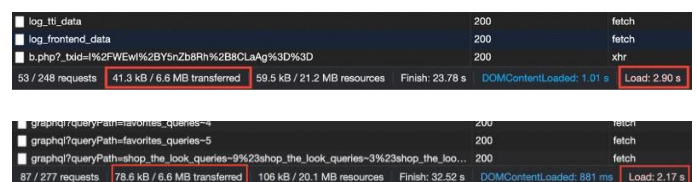


Fig - 6: Page load time - REST vs GQL (Case 1)

Case 2:

Web page size - 7MB
 REST page load time - 3.24 sec
 GraphQL page load time - 2.28 sec
 Delta / Performance optimization - 0.96 sec

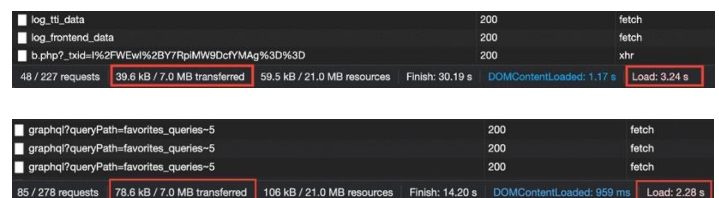


Fig - 7: Page load time - REST vs GQL (Case 2)

Case 3:

Web page size - 7.5MB
 REST page load time - 4.24 sec
 GraphQL page load time - 2.53 sec
 Delta / Performance optimization - 1.71 sec

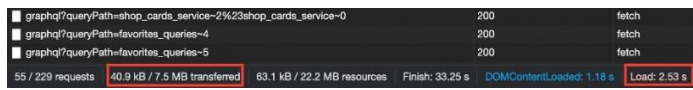
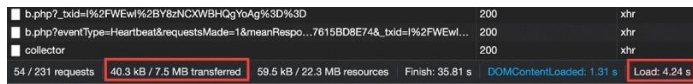


Fig - 8: Page load time - REST vs GQL (Case 3)

Case 4:

Web page size - 8.2MB

REST page load time - 5.17 sec

GraphQL page load time - 2.94 sec

Delta / Performance optimization - 2.23 sec

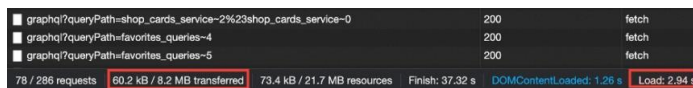
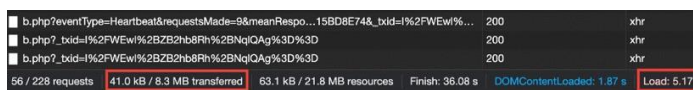


Fig - 9: Page load time - REST vs GQL (Case 4)

Case 5:

Web page size - 8.6MB

REST page load time - 5.52 sec

GraphQL page load time - 3.27 sec

Delta / Performance optimization - 2.25 sec

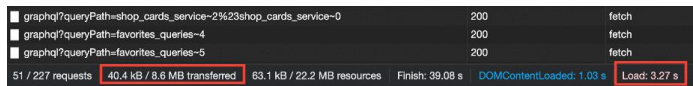


Fig - 10: Page load time - REST vs GQL (Case 6)

Case 6:

Web page size - 9.1MB

REST page load time - 6.18 sec

GraphQL page load time - 3.82 sec

Delta / Performance optimization - 2.36 sec

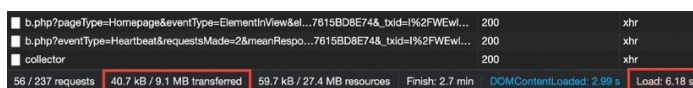


Fig - 11: Page load time - REST vs GQL (Case 6)

Final analysis (Chart 1)-

1. Comparing the page load time for REST vs GraphQL for web pages of different size, we find

GraphQL is always the winner in terms of overall performance.

2. The delta / optimization value (in sec) increases i.e., becomes better with increase in the size of web page.

Web Page Size	Normal Page Load time	GraphQL Page Load Time
6.6mb	2.90 sec	2.17 sec
7mb	3.24 sec	2.28 sec
7.5mb	4.24 sec	2.53 sec
8.2mb	5.17 sec	2.94 sec
8.6mb	5.52 sec	3.27 sec
9.1mb	6.18 sec	3.82 sec

Chart - 1: Page load time value REST vs GraphQL

The style defines a set of constraints intended to improve performance, availability, and scalability and it is based on a traditional client-server paradigm [2].

4. GRAPHQL BENEFITS

GraphQL may be a good candidate for your API layer if your application has a data domain with highly interrelated, nested, or traversable concepts. These are the types of relationships that are difficult to model with a RESTful API and usually result in repeated round trips to the backend. Other reasons to consider GraphQL are: You want to give clients control over what data (fields) are returned, you want to reduce the amount of data sent per request (related to clients asking for what they want), leveraging information about what the client requests (query) allows you to more efficiently load and serve the data.

Following are the benefits of using GraphQL -

- Exact data fetching. GraphQL minimizes the data that needs to be transferred over the network. Your client can specify exactly what resource properties need to be pulled from the server, reducing the overall payload and complexity of the call.
- For example, in order to study the gains achieved by GraphQL due to the lack of over-fetching, Brito et al. [3] implemented 14 queries used in seven recent empirical software engineering papers.
- Nearly all externally facing REST APIs we know of trend or end up in these non-ideal states, as well as nearly all *internal* REST APIs. The consequences of opaqueness and over-fetching are more severe in internal APIs since their velocity of change and level of usage is almost always higher. [4]
- Single request can fetch multiple resources. Unlike traditional REST, a single GraphQL query call can fetch data across multiple backend resources. This reduces the over sprawl of

endpoints on the server which can be a big issue with REST.

- More power to the client. One of the key benefits of GraphQL is that the client has complete control over data fetching. Rather than the server responding with static payloads, the client can dynamically request necessary data points.
- Schema stitching. Great fit for complex systems with microservices. By integrating multiple systems behind its API, GraphQL unifies them and hides their complexity.
- Highly reusable code means that everyone benefits from everyone else's work. When types (schema objects) get added, everyone gets to use them without writing a single line of new code.
- Enables parallel processing. GraphQL allows for loading fields at the same level in parallel. For example, for a given user if you want to fetch medical history and employment history, you can load those in parallel.
- Discovery of types i.e. figuring out what other people have already made - is easy when using tools like Voyager, GraphQL Playground and Graphiql. This helps in reducing duplicate code and helps achieve the DRY principle.
- First class server-side rendering support lets you get stuff done faster. See Server-side rendering with GraphQL for detailed explanation and examples.
- Amazing tooling and community. GraphQL Playground and Graphiql are just some of the many open-source things available for use. Also check out IDE integrations like JS graphql.
- Deferred Resolvers give us a real way to attack the n+1 problem, which can be hard to solve in traditional REST.
- Deprecate API's on a field level. Client receives a deprecation whenever a field is marked to be deprecated. Once all the client dependencies are updated/removed the field can be safely deprecated.
- Great ergonomics. Write all your code in the same file; queries go right next to your markup. Need more data? Add it to your query and you're done.
- Very rapid prototyping and iteration when working with types (schema objects) that already exist in the GraphQL ecosystem.

Support for serverless applications. Running the GraphQL backend (except Subscriptions) on a serverless cloud function works really well. Since GraphQL exposes a single endpoint, you can run your entire GraphQL server off a single cloud function. Recently, the authors complemented and finished this formalization by proving that evaluating the complexity of GraphQL queries is a NL-problem [5].

Vogel et al. [6] present a case study on migrating to GraphQL part of the API provided by a smart home management system. They report the runtime performance of two endpoints after migration to GraphQL. For the first endpoint, the gain was not relevant; but for the second, GraphQL required 46% of the time of the original REST API.

Wittern et al. [7] also perform a study on GraphQL schemas. The authors study the design of GraphQL interfaces by analyzing schemas of 8,399 GitHub projects and 16 commercial projects. The authors report that a majority of GraphQL APIs have complex queries, posing real security risks

Vargas et al. [8] perform a study to investigate the feasibility of using a classic technique to test generation in GraphQL schemas (deviation testing). They use an implementation of GraphQL for Pharo and run the proposed technique in two popular GraphQL APIs.

4. GRAPHQL DRAWBACKS

There are many use cases where it's quite appropriate to GraphQL, but here are some instances where it's not -

- Authentication is usually handled by headers / hashing (stateless) or by specific service endpoints that then set up authenticated sessions or provide tokens for use with the API.
- File Uploads has been a major pain point in GraphQL. You could send a base64 string with a mutation, but large files result in large (and therefore unwieldy, slow to process) strings. A dedicated endpoint for uploads is more practical. Another option can be multipart request extension GraphQL mutations as explained here.
- Dynamic Connections. This can happen with generic key/value pairs where the value amounts to a foreign key. The nature of those connections will vary from query to query.
- RPC-Style Operations. Mutations are expected to execute a query and return those results. This can be unnecessary overhead for some asynchronous RPC-style operations.
- Caching can get difficult since the requested fields with each query can change; it uses a single endpoint which can return different kinds of payloads vs REST where there are multiple endpoints, and response payload remains constant. The problem is partially solved by using persisted GraphQL queries that assist in producing a JSON file for mapping queries and identifiers.
- Potential for a single point of failure. Since the entire resource (and its fields) are defined on a single endpoint, any breaking change on the type

/ endpoint will negatively affect multiple client apps consuming it.

- Since GraphQL is *not* a versioned API the process for designing additions to the graph is more rigorous. GraphQL server implementations do support @deprecated directive OOB which helps.
- Overkill for small apps. GraphQL is a good fit for complex systems with multiple microservices, but for simple apps, it might be better to go with the tried and tested REST architecture.

One important thing to keep in mind is that by opening up the ability for clients to query across the domain space and relationships, you add the possibility of very complex data loading. GraphQL gives a client complete freedom to request whatever it needs. This can get contentious since the client can potentially request many fields across multiple resources and thus causing sluggish network calls. This is similar to how queries in SQL can get very complex and expensive. Add in the recursive relationships that can exist in the graph and some queries can tax your system.

5. KEY TAKEAWAYS

While GraphQL is an extremely powerful and flexible API strategy, it is not a *silver-bullet* for all your data CRUD needs. You should evaluate your application needs and developer skills to make the right call. GraphQL adoption (switching from REST) usually requires a major rewrite of the API and Client layer for your application. While there are material benefits to switch, depending on the size and complexity of your app, this can be a massive undertaking in terms of time and resources. There is also a learning curve with GraphQL and its best practices which should be taken into account before taking the leap.

At the same time, GraphQL can remarkably simplify/optimize your data access and modification needs for both client and server-side engineers, regardless of languages or environment you're in. If you're writing an app from scratch and/or not afraid to try something new, GraphQL presents itself as a great option with many compelling reasons to use it. If you decide to adopt GraphQL, take enough time to design your graph schema. *Measure twice and cut once*. Mapping a good GraphQL schema is a non-trivial task. So, take your time and try to get it right the first time around; it will save you from a lot of inconvenience down the line.

6. CONCLUSIONS

GraphQL shifts your focus, from thinking of data in terms of resource URLs and traditional REST endpoints, into a graph of objects and the models used in apps. You can read more about this in the Facebook blog that was published back in 2015.

GraphQL provides some significant benefits over RESTful architecture. It can substantially simplify and optimize your data retrieval and modification requirements while allowing engineers to deliver faster. Having said that, it is not a panacea for your data access needs and the *devil is in the detail*. If chosen for the wrong reasons or not implemented correctly, it can negatively affect your application and developer experience.

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BIOGRAPHIES



Amit Jambusaria - MS Computer Engineering from Syracuse University, NY, USA. Mr. Jambusaria is a seasoned technical leader and independent researcher with 11+ years of experience in the field. SME in areas such as GraphQL, Front-end web platforms and frameworks, Container technology, Cloud computing, Kubernetes (k8s) Microservices, APIs, UX/UI and Web performance.

FABRICATION OF CLOTH DRYING MACHINE USING A CONDENSATION UNIT

Prof. Irshad Shaikh, Akash Mishra and Pradeep PangamAutomobile Engineering Department, Theem College of Engineering, University of Mumbai

ABSTRACT

The following paper discusses to study the clothes dryer machine by using heat. There are many cabinet dryers which are widely used today as an alternative to natural clothes drying, especially for those who are busy working from morning until evening, having limited time and for the residents in urban areas. Nowadays cabinet dryer are already offered in the market, but they are expensive to afford. A cloth dryer has to be made with the help of available materials. Its efficiency is investigated with respect to how fast it is able to dry up the clothes. Hence a set of experiments are performed to determine the worthiness of this dryer. The main advantage of this dryer is that it can work all round the year, with a built-in auxiliary heating system. Also, with no moving parts, it consumes less power than conventional dryers in washing machines. It can easily be built with commonly available materials such as plastic moulded body, aluminium motor, timer output etc. The comparison of two different materials such as iron and aluminium are done for best results.

The cloth drying machine is designed on Solidworks and analysed on Ansys 2018.

Keywords: Design, Analysis, Cloth Dryer, Aluminium Motor, Solidworks, Ansys 2018.

INTRODUCTION

Now days drying clothes usually use natural way by using the energy from the Sunlight and the wind, but nowadays the technology is plentifully developed upward and the clothes dryers that use the electric energy or other energy come to use extensively, Especially in the urban area where limited sunlight (cloudy days) and restricted air flow of house types such as high rise condominiums and apartments, natural drying is prohibited in some housing areas for aesthetic reasons and conventional domestic electric dryers are too expensive and inefficient decreasing energy losses and heat recovery is important research topics, nowadays. Many cabinet dryers widely use, especially those who are busy working. Besides that, most of laundries today have their own dryer cabinet. It is not just because to run their operation at all the time, but they also can prevent the risk to the cloths that might lose or dirty. Cabinet dryer on the market nowadays is using electrical power as a source in generating heat.

The design available in markets are very bulky and uses lots of energy because it is not utilized properly half of energy get wasted to the surrounding. The size of the product made very compact so when it needs to be get used we can unfold it and extend it to its ultimate size where we can hang clothes and two heating sources. Because two heating sources are provided time required to dry cloths is less as compared to other expensive devices which also uses lots of energy to dry the cloths.

TYPES OF DRYERS

Spin Dryer: This machine simply spins their drums faster than a typical washer could in order to extract addition water from the load. They may remove more water in two minutes than a heated tumbler dryer can in twenty minutes, saving significant amounts of time and energy. Although spinning alone will not completely dry clothing, this additional step saves a worthwhile amount of time and energy for large laundry operations such as those of hospitals. **Condensation Dryer:** Just as in a normal dryer, condensation dryers pass heated air through the load. However, instead of exhausting this air the dryer uses a heat exchanger to cool the air and condense the water vapour into either a drain pipe or a collection tank. Afterwards, this air is run through the loop again. The heat exchanger typically uses ambient air as its coolant, therefore the heat produced by the dryer will go into the immediate surroundings instead of the outside, increasing the room temperature slightly. In some designs, cold water is used in the heat exchanger, eliminating this heating but requiring increased water usage.

Dehumidifier Dryers: By keeping a low humidity, dehumidifiers encourage fast evaporation without high heat. This type if dryer is suitable for clothes that can withstand tumbling but not high heat.

Heat Pump Dryers: A closed-cycle heat pump clothes dryer uses a heat pump to dehumidify the processing air. Such dryers typically use under half the energy per load of a condenser dryer. Whereas condensation dryers use a passive heat exchanger cooled by ambient air, these dryers use a heat pump. The hot humid air from the tumbler is passed through a heat pump where the cold side condenses the water vapour into either a drain pipe or a collection tank and the hot side reheats the air. In this way not only does the dryer avoids the need for

DESIGN AND FABRICATION OF LOOP WHEEL SUSPENSION SYSTEM FOR WHEELCHAIR

Tanmay Chonkar¹, Sourabh Raul², Gajesh Padvekar³, Rohan Mestry⁴ and MD Sami Malik⁵Student^{1,2,3,4} and Assistant Professor⁵, Department of Automobile Engineering, Theem College of Engineering, Boisar(E)

ABSTRACT

Suspension system is the main component of any vehicle whether it might be car, trucks, motorbike, bicycle or wheel chair. Suspension increases the comfort level and increases ride quality. Since suspension on wheel chair is not that comfortable We decided to not only do research on suspension system of wheel chair but also fabricate it. Loop wheel suspension system will increase the comfort level of passenger. In this project we are going to take standard foldable wheel chair and would replace the spoke wheels with our loop wheels. (In-wheel suspension).

Keywords: Wheel Chair, In-wheel Suspension, Solid Works, Ansys Workbench 19.0

I. INTRODUCTION

In today's world there is a great demand for a comfort vehicle whether it might be car, cycle or wheelchair. Suspension system plays an important role in giving the comfort and smooth ride for any vehicle. Since vehicle like wheelchair needs the good suspension system for comfort and smooth ride because they are used by patient so the concept of in-wheel suspension is used. The concept of loop wheel suspension system is for better shock absorbing performance and for greater comfort. This project presents a study of an In-wheel suspension system which is placed in a wheel chair. The loop wheel however allows isolation both in vertical and horizontal directions. The loop wheel provides durability high strength and a better shock absorber on off roads conditions. The suspension system includes the Wheel, Rim, Suspension (shock absorber) instead of spoke hub. The replacement of spokes by adaptive suspension will allow the torque to be transferred smoothly between the hub and the rim.



Fig-1: In-Wheel suspension system

TYPE OF WHEELS IN WHEEL CHAIR

Spoke Wheels - The spoked wheel is very similar to the spoked wheel on a bicycle and was the norm for all wheelchair prior to the development of composite wheels for wheelchair use. Spoked wheels are still optional on many wheelchair models but only those who expect high performance from their wheelchairs usually opt for them. In spite of their popularity, composite mag wheels will flex during use and this flexing increases the energy needed to propel the wheelchair. Spoked wheels, when in good condition, donot flex and are therefore more efficient for the user. The average user probably wouldn't notice the difference but those who are very active probably will.

Composite Mag Wheels - Composite mag wheels are by far the most common wheels in use for wheelchairs today and come standard on most wheelchairs. The composite mags are made out of is a nylon/fiberglass-like material that is strong, resilient and light weight. They can be fitted with several types of tires and hand rims to meet the needs of the user. The rims of these wheels are maintenance free and are designed to spring back to their original shape should outside pressures due to accident or rough use warp of bend them.

High performance Wheels -High performance wheels are the wheels pictured at the top of this article are not used by average wheelchair users. There are many kinds of these wheels on the market for sports and very active users.

A LITERATURE REVIEW ON DESIGN AND ANALYSIS OF ELECTRIC MOTORCYCLE

Mayuresh Kadam¹, Gaurav Bore², Aashish Maurya³, Shreyas Parab⁴ and Wasim Khan⁵
 Student^{1,2,3,4} and Assistant Professor⁵, Theem College of Engineering, Boisar (E)

ABSTRACT

In today's situations Automobile industry becoming more and more competitive. The vehicles can get the energy from petrol or diesel engine for its drive. The depletion of fossil fuels reducing the amount of petrol and diesel day by day. Now automobile industry requires new source of energy to run the vehicles, it can be done using electric energy. In this report, the design and analysis of electric motorcycle is described. Major drawback of e-bike is requiring frequent charging from EB supply. This paper shows the charging arrangement of E-bike. The electrical energy is supplied to the motor by battery and Battery can receive the electric energy by dynamo and charging system. This e-bikes running cost is very low, when compare to other sources of energy used in bike. Market available E-bike batteries are designed to spent 4-6 hours/charge by using Electric Battery supply. These batteries can be charged by dynamo, Alternator or with the help of regenerative controller. So electric supply cost also gets reduced.

Keywords: Electric motorcycle, Chassis, Brushless DC motor, Battery, Controller.

I. INTRODUCTION

Energy crisis is one of the major concerns in today's world due to fast depleting resources of petrol, diesel and natural gas. Electric vehicles is the solution which can help to save the fossils fuels for future and decrease the usage of fossil fuels. This project will deal preliminary with electric motorcycle where the internal combustion engine is replaced by a battery and electric motor drive which is used for personal transportation. The principle and working of Lithium ion battery, Lithium ion phosphate battery, Wheel hub motor, Regenerative controller and Alternator are provided to you. Mechanical Components including chassis, transmissions, wheels and brakes are presented. The design of frame of motorcycle and body is done on Solid works software and the Analysis on the frame of a motorcycle is done on Ansys software by applying appropriate Boundary conditions which will help us to show the results that how a frame will act practically when certain loads are added to it. The Electric bike which will be running on battery, the power is supplied by the motor and it will run the bike. The efforts are being made to reduce the charging time, increase the speed of a vehicle, increase the range of a vehicle and decrease the weight of a vehicle. The main purpose of using this E-bike is that it is user friendly, economical and relatively cheap. The market available e-bike use Brushless direct current motor for drive purpose.

Product Overview - Parts of An Electric Motorcycle

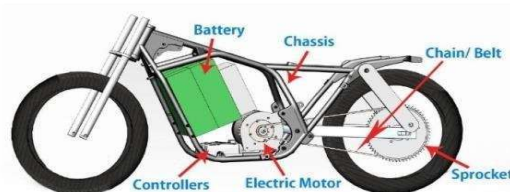


Fig-1: Major components of Electric Motorcycle

From above figure we can conclude the major components of electric motorcycle i.e. Battery, Chassis, Electric motor, Controller and drive.

II. LITRETURE VIEW

Haruo Sakamoto (1), confirmed the strength of designed motorcycle by performing a stress analysis. In prior to the analysis of designed frame, a simple calculation was conducted using a cantilever model of 100mm × 100mm cross section and 100 mm length with the force of 50N at the tip. The calculation by hand is 0.3 MPa and the result of FEM is 0.29 MPa. This result is enough to perform FEM stress analysis for motorcycle model. Saurabh Rege et. al (2), concluded that the trellis frame is the lightest frame and yet provides high rigidity due to triangulations provided by tubes and frames. The trellis frame thus has the highest strength to weight ratio among all frame types. Unlike the cradle frame, the tubes of trellis can accommodate components of larger size which also perform structural duties themselves thus providing increased strength and rigidity. Trellis frame provides better centralization and lower the overall vehicle weight. The centre of gravity of frame is below the rider seating area thus ensuring low and centralized frame weight. R.D. Belekhar et. al (3), they modelled and

INVESTIGATION OF DESIGN OF PHOTOVOLTAIC DRY CLEANER ROBOT

Niraj Gupta¹, Suraj Vishwakarma¹, Sagar Singh¹ and Mohd Raees²Student¹ and Assistant Professor², Automobile Engineering Department, Theem College of Engineering, Boisar**ABSTRACT**

Solar energy is highly suitable alternative energy source to its natural existence and can potentially replace conventional fossil. The solar panel farms are generally situated in the large area where panels can generate high amount of solar energy. These places are mostly depends on the area where most of time sunlight is available without more obstacles in day time e.g. desert and open area. In these places air contains many dirt and dust particles with it. In the solar plant solar panels can produce high amount of energy but these dirt and dust can reduce the quality of energy which solar panel produces. Therefore cleaning the solar panels is required time to time. There are different method for cleaning solar panels such as manual cleaning, pressurized water, compressed air and robotic cleaning. In this we are using microfiber setup for cleaning the solar panel. By using microfiber instead of water for cleaning the solar panel is more efficient it does not require any water and more time. The mechanism is based on control circuit, DC motor, microfiber to clean the panels. The microfibers assembled on the rotating shafts which are placed on a robot which cleans the solar panels automatically by giving just simply commands. These automatic robots clean up the dirt and dust particles on panels on time to time continuously. By cleaning the solar panels on the regular basis of time these panels can produce sufficient energy more efficiently without any problem and its increases the life of solar panels. This paper gives you the idea how the robot will work and its effect on the energy production by solar plant. It will also help you to understand the problem arise due to not cleaning of solar cells.

Keywords: Solar panels, Automatic Cleaning Robot, Microfiber.

1. INTRODUCTION

The sun is responsible for nearly all renewable source of the energy available on earth. The sun emits energy at an extremely large rate hence there is abundant availability of solar energy in the nature. If all solar energy could be converted into usable forms, it would be more enough to supply the world's energy demand. However, this is not possible because of natural conditions such as effect of clouds, dust and temperature. According to research, there are many ways to use solar energy. In thermal solar system, for example, the heat from radiation is used in the form of heating, directly. On the other hand, in the case of photovoltaic systems, solar energy is converted into electricity. In photovoltaic systems, electronic devices known as photovoltaic cells are positioned on panels which is directly exposed to sunlight and transform the energy through the electron flow between two layers of semiconductors which is then stored in battery for further uses. There is unprecedented interest in renewable energy, particularly solar energy, which provides electricity without giving rise to any carbon dioxide emission or any effect in environment. The efficiency of solar panel is limited due weather, so it is very much essential to take care of parameters like dust, humidity and temperature. So it is necessary to clean the solar panel on a regular basis to increase the production rate.

There are various methods available for cleaning Photovoltaic solar panel, some of the operations and their advantages and disadvantages are listed below:

1.1 Manual Cleaning

This method is easy to use and the equipment doesn't cost much but since it need water and man power the cost of the operation is very high. This method can be used for domestic solar panels cleaning but in large plant the number of man as well as cost of cleaning increases. Sometimes it is also not possible to reach to clean the all modules of solar panels. In this process human efforts needed all the time.

1.2 Pressurized Water

As the name suggested, water is being used to clean the dust on solar panel which must be pressurized. It consists of a pipe which is connected to the pump and the pump is connected to the water tank. A nozzle is also used at the end of the pipe so that the water exist at the end of the pipe must be at high pressure to clean the dust or dirt particle.

The pressure of water must not be such that it crack or damage the solar panel and enough too to clean the solar panel for the increase in efficiency. This method needs a huge amount of water so, it is not logical to immolate water to get electricity, especially that the regions that are rich of sun power are poor in water. It is usable for large farms of solar panel. It has an advantage of less human effort. It has also disadvantage of consumption of large amount of water. The system must be maintained for maintaining the higher efficiency of the solar panel.

REVIEW ON 3D SIMULATION OF FIXED WING AIRCRAFT

Akshay Mendon, Tushar Tawte, Prathamesh Ahire and Athang Pawar

Student, Automobile, Theem College of Engineering, Boisar

ABSTRACT

An unmanned aerial vehicle (UAV) or uncrewed aerial vehicle, commonly known as a drone is an aircraft without a human pilot on board and a type of unmanned vehicle. A fixed-wing aircraft is a flying machine, such as an airplane, which is capable of flight using wings that generate lift caused by the aircraft's forward airspeed and the shape of the wings. Fixed-wing aircraft are distinct from rotary-wing aircraft in which the wings form a rotor mounted on a spinning shaft, and ornithopters in which the wings flap in a manner similar to that of a bird. The wings of a fixed-wing aircraft are not necessarily rigid; kites, hang gliders, variable-sweep wing aircraft and airplanes that use wing morphing are all examples of fixed-wing aircraft. A light weight wing which can match the requirements of work conditions is desired. The main motto of our project is to improve the efficiency of the fixed wing aircraft by changing the design of airfoil, so that it can land and takeoff in short distances. After comparing several types of wings we chose Fixed Wing design. There are number of design considerations to consider while designing a wing. They are wing mounting position, wing shape, wing span, wing area, airfoil shape, wing thickness, spar design, aileron design, dihedral angle, tip design and angle of incidence. Hence this study provides a better design to increase the use of fixed wing aircraft. This study is conducted on live and simulated experiments using modeling and simulation software. At last we develop a 3D model for realistic simulation.

INTRODUCTION

An unmanned aerial vehicle (UAV) is a type of aircraft that does not require a human pilot. The flight path of an unmanned aerial vehicle is controlled with the help of either a remote controller or autonomously by computers onboard. UAVs were used for missions that were originally deemed too dangerous for humans. Originally used for military applications, their use is expanding to various other commercial and recreational purposes like agriculture, policing, aerial photography, product deliveries and drone racing. An Aircraft is a machine that can fly, but is heavier than air.

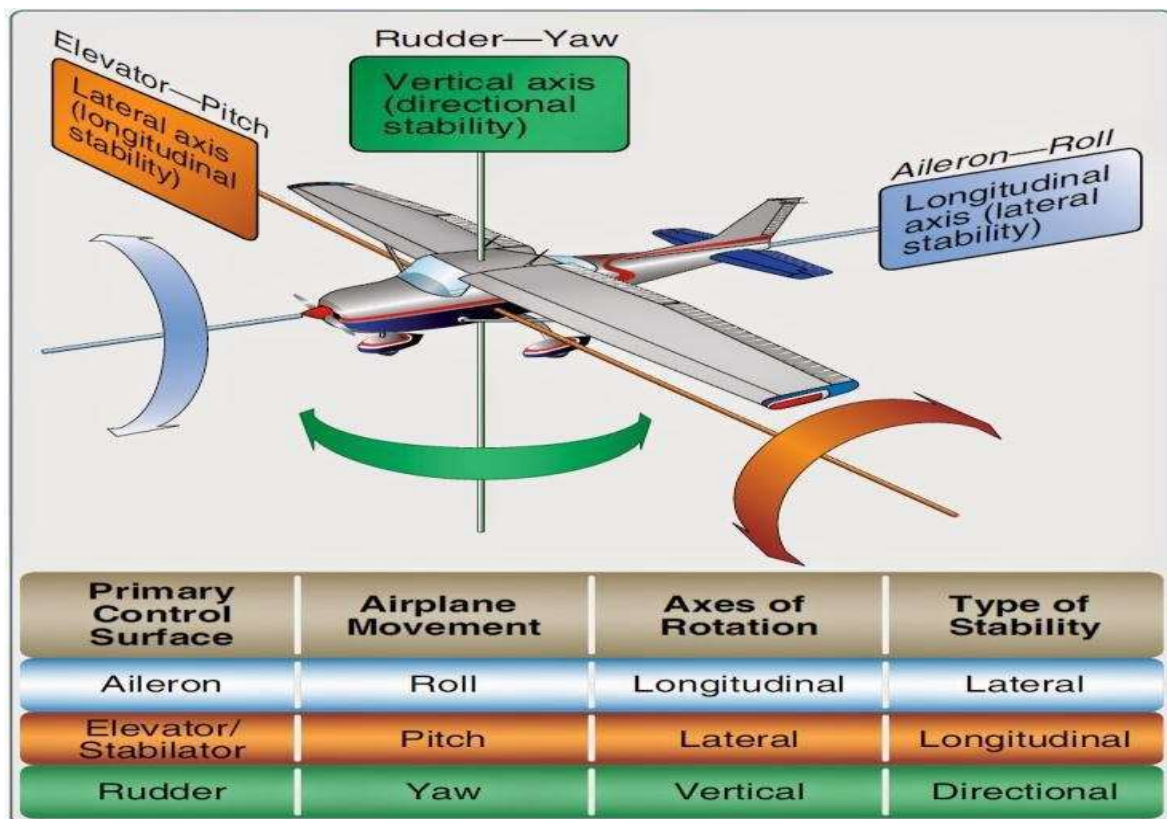


Fig-1: Stability Of Fixed Wing Aircraft

The shape of an aircraft wing is called as an airfoil. It is in a way such that it creates less pressure above the wing. The airfoil is the shape of a wing in cross section which when moved through a fluid produces an

REVIEW ON MODELLING OF QUADCOPTER BASED ON IOT

Harsh Dhamnaskar¹, Advait Kadam², Pranjal Morkhade³, Aniket Tandel⁴ and Tejas Thakur⁵B.E Student^{1,2,3,4} and Assistant Professor⁵, Automobile Engineering, Theem College of Engineering, Boisar

ABSTRACT

An unmanned aerial vehicle (UAV) (or unscrewed aerial vehicle, commonly known as a drone) is an aircraft without a human pilot on board and a type of unmanned vehicle. UAVs are a component of an unmanned aircraft system (UAS) which include a UAV, a ground-based controller, and a system of communications between the two. The flight of UAVs may operate with various degrees of autonomy: either under remote control by a human operator or autonomously by onboard computers. There are various type of UAV's which includes quadcopter. A Quadcopter also known as helicopter or quadrotor, is a multirotor helicopter that is lifted and propelled by four rotors. Quadcopters are classified as rotorcraft, as opposed to fixed-wing aircraft, because their lift is generated by a set of rotors (vertically oriented propellers). The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Quadcopter has a limited range to fly. We studied that, if Internet of things is introduced to quadcopter, many of problems would be solved. That includes increasing the range to a greater extent. Also if thermal camera is introduced to quadcopter. Night vision and many more problems would be eliminated.

Keywords: UAV, UAS, IOT, UID.

INTRODUCTION

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The definition of the Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of Things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smart phones and smart speakers.

QUADCOPTER

A quadcopter, also called a quadrotor helicopter or quadrotor is a multirotor helicopter that is lifted and propelled by four rotors. Quadcopters are classified as rotorcraft, as opposed to fixed-wing aircraft, because their lift is generated by a set of rotors (vertically oriented propellers). Quadcopters generally use two pairs of identical fixed pitched propellers; two clockwise (CW) and two counterclockwise (CCW). These use independent variation of the speed of each rotor to achieve control. By changing the speed of each rotor it is possible to specifically generate a desired total thrust. At a small size, quadcopters are cheaper and more durable than conventional helicopters due to their mechanical simplicity Their smaller blades are also advantageous because they possess less kinetic energy, reducing their ability to cause damage.

INTERNET OF THINGS

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The definition of the Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of Things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smart phones and smart speakers.

A. Abbreviations and Acronyms

IOT Internet of Things

REVIEW ON STRONG HYBRID ELECTRICAL VEHICLE

Kaustubh Pandit¹, Ashwin Khanvilkar² and Mohd Raees³Student^{1,2} and Assistant Professor³, Automobile Engineering Department, Theem College of Engineering, Boisar

ABSTRACT

In our project we are focusing on Hybrid Vehicle which is eco friendly and it is very upgrowing thing nowadays. A hybrid electric vehicle is a hybrid vehicle which combines a conventional propulsion system with a rechargeable energy storage system to achieve better fuel economy than a conventional vehicle. Modern mass-produced HEVs prolong the charge on their batteries by capturing kinetic energy via regenerative braking, and some HEVs can use the internal combustion engine to generate electricity by spinning an electrical generator to either recharge the battery or directly feed power to an electric motor that drives the vehicle. Hybrid electric vehicles are now recognized as one of the most promising avenues to materially reduce automobile contributions to petroleum dependency, air pollution, and carbon dioxide emissions. Several issues remain, however, that could become barriers to the acceptance of HEVs, thus creating uncertainty about their ultimate prospects. The present study evaluates the properties of the hybrid vehicle, its structure and performance and proposes an energy control model for its optimum operation.

Keywords: Hybrid Electric Vehicle (HEV), Rechargeable Energy Storage System (RESS), Internal Combustion Engine (ICE).

INTRODUCTION

The National Mission on Electric Mobility was unveiled in 2013 to promote electric mobility in the country. Since then, the Department of Heavy Industries has introduced the Faster Adoption and Manufacturing of Hybrid & Electric Vehicles in India (FAME-India) scheme, which has moved to Forward direction day by day. Through the mission, the government hopes to have a cumulative fuel saving of 9,500 million litres by extending support to the hybrid/electric vehicles market development [1]. As modern culture and technology continue to develop, the growing presence of global warming and irreversible climate change draws increasing amounts of concern from the world's population. Earth climate is beginning to transform, proven by the frequent severe storms, the drastic shrinking of polar ice caps and mountain glaciers, the increased amount of flooding in coastal areas, and longer droughts in arid sections of the world.

Everything from cars and industries to livestock and crops are being studied and regulated with plans of minimizing pollution levels. Amongst the most notable producers of these pollutants are automobiles, which are almost exclusively powered by internal combustion engines and spew out unhealthy emissions. Internal combustion engines account for a lot of the pollution problems, but the issue still stands as to what system will drive the next wave of automotive vehicles. One potential alternative to the world's dependence on standard combustion engine vehicles are hybrid cars. The introduction of hybrid technology in the past decade was the first step towards turning the world's population into a more fuel efficient and emissions conscious society. There are different claims, however, as to how helpful hybrids actually are in the race to save the environment, with projections ranging from significantly to marginally. The result of analyzing the full life of a car, both from technical and consumer standpoints lead us to many questions about the significance of hybrid technology.

OBJECTIVES OF STUDY

1. **Recreating Braking:-** The electric motor applies resistance to the drivetrain causing the wheels to slow down. In return, the energy from the wheels turns the motor, which functions as a generator, converting energy normally wasted during coasting and braking into electricity, which is stored in a battery until needed by the electric motor.
2. **Drive-Assist:-** The electric motor provides additional power to assist the engine in accelerating, passing, or hill climbing. This allows a smaller, more efficient engine to be used. In some vehicles, the motor alone provides power for low-speed driving conditions where internal combustion engines are least efficient.
3. **Automatic Start-Shutoff:-** Automatically shuts off the engine when the vehicle comes to a stop and restarts it when the accelerator is pressed. This prevents wasted energy from idling.

Hybrid Vehicles And Fuel Vehicles

With electric motor to power their propulsion system. Modern mass-produced Hybrid-electric vehicles prolong the charge on their batteries by capturing kinetic energy via regenerative braking, and some Hybrid-electric

SMART TRAFFIC CONTROL AND MANAGEMENT SYSTEM

Vikesh Kadam, Kashinath Lambe and Mohasin Mallick

Theem College of Engineering

ABSTRACT

The increase of population produces an increase of the number of automobiles on the road, which generates heavy traffic in the streets and that causes many problems for the Citizens and traffic policemen an additional two emergency cases therefore it's important with development technology of embedded systems to solve this problem. In this paper new traffic light controller was built to optimization using the Adriano UNO microcontroller board. The system tries to reduce traffic jams, caused by traffic lights, as possible. The system is based on microcontroller, which represent the brain of the system. The system contains ultrasonic sensors on the side of the roads. Also the system contains switches to control the traffic light manually. The ultrasonic sensor system gets activated when vehicles go along the road against it. Microcontroller controls the traffic light by driver circuit using the sensor network to determine the level of jam in the road. Different ranges of traffic light delay time intervals according to jam level are configured by microcontroller and updated regularly. In this paper the effects of temperature and humidity on the system were studied. The jam level displayer tool is another feature added to a system controlled by the microcontroller which is a traffic sign informs the drivers about the level of jam before reaching the road.

Therefore, managing of traffic flow needs to be a combination of physical infrastructure, new ways of thinking and new technologies. Smarter transport transcends infrastructure. In light of this, smart traffic control systems have gained a lot of interest.

Keywords: Smart cities, intelligent traffic systems, artificial intelligent system, WSN, FES, ANN, traffic lights, road traffic

1. INTRODUCTION

Our intelligent Traffic Expert Solution for road traffic control System offers the ability to acquire real-time traffic information, .Traffic Expert enables operators to perform real-time data analysis on the information gathered. Traffic management measures are aimed at improving the safety and flow of traffic utilizing traffic capacity more effectively. A technology for smart traffic signals has been developed and is being used in a pilot project in Pittsburgh in an effort to reduce vehicle emissions in the city. Unlike other dynamic control signals that adjust the timing and phasing of lights according to limits that are set in controller programming, this system combines existing technology with artificial intelligence.

The signals communicate with each other and adapt to changing traffic conditions to reduce the amount of time that cars spend idling. Using fiber optic video receivers similar to those already employed in dynamic control systems, the new technology monitors vehicle numbers and makes changes in real time to avoid congestion wherever possible. Swarm intelligence is the decentralized, self organized system. It may be Natural or Artificial. Swarm intelligence is used in Telecommunication network. France and British Telecommunication use this technology for the Phone network. The term Swam to represent an aggregation of the animals or insects which works collectively to accomplish their day to day tasks in an intelligent and efficient manner [1].This is helpful technology for applications in communication network routing. The swarm intelligent routing methods are providing the high reliability and less time consuming communication for the more number of system available in the network. The Swarm intelligent technology is basically based on some biological Algorithms: Ant Colony Swarm Algorithm, Honey Bees Swarm and schooling of fishes.Honey Bee Swarm Algorithm A honey bee colony reacts flexibly and adaptively to countless changes in the forage pattern outside the hive and to change inside the hive through a decentralized and communication, control system. This is multi-agent system for the preparation of food foraging is having the same purpose which is used by ants. A honey bee works with two mainly agents scouts and foragers. The scout bees searching for the food from the flower patch, when it finds the food source whose quality is better than that of predefined food source it move to dance floor and perform dance called Waggle dance, this dance is help for communication or transferring information about source to the other bees. After getting this information the Foragers bees are sent to the food source for collection of food. This algorithm uses the ad hoc networking model [3]. Adaptive System An adaptive system is used for operating in real time. The fluctuations in the traffic volumes are adjusted easily through the adaptive system. In this the system adapts itself according to the change in the traffic and the environmental conditions, and then the action will take according to it. This shows the real time operating of the method.

FABRICATION OF CLOTH DRYING MACHINE USING A CONDENSATION UNIT

Prof. Irshad Shaikh¹, Akash Mishra² and Pradeep Pangam³Assistant Professor¹ and U.G. Student^{2,3}, Automobile Engg. Department, Theem College of Engineering, Boisar, University of Mumbai**ABSTRACT**

The following paper discusses to study the clothes dryer machine by using heat. There are many cabinet dryers which are widely used today as an alternative to natural clothes drying, especially for those who are busy working from morning until evening, having limited time and for the residents in urban areas. Nowadays cabinet dryer are already offered in the market, but they are expensive to afford. A cloth dryer has to be made with the help of available materials. Its efficiency is investigated with respect to how fast it is able to dry up the clothes. Hence a set of experiments are performed to determine the worthiness of this dryer. The main advantage of this dryer is that it can work all round the year, with a built-in auxiliary heating system. Also, with no moving parts, it consumes less power than conventional dryers in washing machines. It can easily be built with commonly available materials such as plastic moulded body, aluminium motor, timer output etc. The comparison of two different materials such as iron and aluminium are done for best results. The cloth drying machine is designed on Solidworks and analysed on Ansys 2018.

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Now days drying clothes usually use natural way by using the energy from the Sunlight and the wind, but nowadays the technology is plentifully developed upward and the clothes dryers that use the electric energy or other energy come to use extensively, Especially in the urban area where limited sunlight (cloudy days) and restricted air flow of house types such as high rise condominiums and apartments, natural drying is prohibited in some housing areas for aesthetic reasons and conventional domestic electric dryers are too expensive and inefficient decreasing energy losses and heat recovery is important research topics, nowadays. Many cabinet dryers widely use, especially those who are busy working. Besides that, most of laundries today have their own dryer cabinet. It is not just because to run their operation at all the time, but they also can prevent the risk to the cloths that might lose or dirty. Cabinet dryer on the market nowadays is using electrical power as a source in generating heat.

The design available in markets are very bulky and uses lots of energy because it is not utilized properly half of energy get wasted to the surrounding. The size of the product made very compact so when it needs to be get used we can unfold it and extend it to its ultimate size where we can hang clothes and two heating sources. Because two heating sources are provided time required to dry cloths is less as compared to other expensive devices which also uses lots of energy to dry the cloths.

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LITERATURE REVIEW ON DESIGN A RECUE RAFT FOR FLOODED FLOATING CAR

Aditya Raut¹, Bhavik Sankhe¹, Unais Khan¹, Irshad Idrisi¹ and Nitin Sall²B.E Student¹, Automobile Engineering, Theem College of Engineering, BoisarAssistant Professor², Automobile Department, Theem college of Engineering, Boisar

ABSTRACT

The raft has a geometry such that it can be positioned around the driven wheels of the vehicle so that the driven wheels can be used to propel the flood rescue raft and vehicle which increases the safety. The flood floating raft can also include inflatable side panel members at the sides of the top and bottom panel members, front and rear inflatable flap members secured to the bottom panel members, and a discrete floatation ballast can be attached to the vehicle floatation raft at the engine end thereof.

The bottom panel member and top panel member hermetically joined to the bottom panel member to form a hermetically sealed air chamber and an air valve is used for filling the air chamber with air. With the help of air compressor, the air is filled in the air chamber. The raft would be multilayer flexible material, with the outer most and inner most layer being rubber plastic based, and a middle layer being a canvas type material.

There is provided an inflatable raft inflated through a single inflation valve. A pair of inflated panels held in place by at least one tie strap connecting the panels rest beneath each end of the bottom of a car to be protected. The cushion has a pair of inflatable end chambers, which when inflated protect the end and side of the car. This is facilitated by internal openings which allow the inflated panel to easily bend underneath the ends of the car and around the corners.

Keywords: Raft, Air Valve, Air Compressor.

INTRODUCTION

The rainy season is one of the worst enemies of the car owner due to flooding we don't want our car to get soaked in flooded water while its running or parked. Flood water causes a lot of car problem that down up long after the vehicle has been submerged. In order to prevent the car from being submerged in this flooded condition we are working on the designing the rescue raft for car under flood condition. Flood effect on different car body styles like, sedan, hatchback, notchback, SUV's etc. but we are making a rescue raft for prototype car.

According to the present invention, a vehicle flotation raft has an inflatable bag which is preferably provided with one or more inflatable Side and end flaps, and a flotation chamber or a ballast for securement to the engine end of the vehicle. The bag is unfolded (except for the end flaps) and slid into position under the car Stationary on the ground or in the water.

A rope attached to the frontend grommets on the bag (and possibly the rear end in moving water) is used to facilitate positioning of the bag under the car or vehicle.

EFFECTS OF FLOOD ON CAR**1. Malfunction in the Electronics and Electrical system.**

A vehicle's electronics and electrical parts always sustain most serious damage after flooding. Moisture can cause the short circuit in the electrical system, resulting in malfunction of its critical components, including the following:

- Electrical Control Unit (ECU)
- Headlight, brake lights and other Automotive lights.
- Air conditioning system.
- Power windows, power locks and power seats.
- Fuses
- Anti-lock braking system.

2. Mechanical damage to the engine.

The engine is another critical part of your car that needs atmost attention after its flooded. When flood water reaches engine part like, air intake and cylinder, the piston will try to compress it. Since water doesn't compress it can break the piston rod and lead to engine stalling.

LITERATURE REVIEW ON DESIGN AND FABRICATION OF PATH FOLLOWING CART

Deep Patel¹, Karan Shetty² and Nitin Sall³B.E Student^{1,2} and Assistant Professor³, Automobile Department, Theem college of Engineering, Boisar

ABSTRACT

In every field, industrial automation is increasing day by day. The labor cost and the processing time taken by the human is being reduced by industries. Hence, the proposed project is useful for carrying and transporting the materials efficiently with less consumption of time.

The following path following cart is a small wheeled robot which will follow the user and will have a surface on which to conventionally place heavy objects. The present condition in the industries is that they are using the crane system to carry the transportation of goods from one place to another. Sometimes the lifting of big weights may cause the breakage of lifting materials and will also cause damage to the goods too. A line follower cart is an electronic system that can trace and follow the line of the desired path. Generally, the line is specified a predefined path that can be either visible like a black line on a white surface with a high contrasted color.

This technology is focused on the delivery of safe, timely, efficient and easier transportation in the industries. However, this cart could be adapted towards other purposes, such as carrying suitcases on airports for those who have a lot of luggage and also used in malls for carrying goods and other products for the costumers.

Keywords: cart, design and fabrication, path follower, sensor.

INTRODUCTION

In the automotive production carts accomplish the more are the castoff in small, regularly self-contained, segments of the construction lines. Humans are still mandatory to draw mechanisms from granaries and, in some circumstances, shift incompletely accumulated products segments amongst the stations on the production line. Line follower carts are used in semi to fully automated plants. In this environment the cart functions as carrier to deliver products from one manufacturing point to another, where rail, conveyor and gantry systems are not a suitable option. There are many rooms such as store house or warehouse, different workshops, and also some inventories for holding o carrying the finished or partly finished goods. A lot of workers cause the high labor cost for the owner. Some workers have to work there for machining this raw material that are inevitable. The line follower is a self- operating cart that detects and follows the line that is drawn on the floor.

DESIGN AND FABRICATION

Main Components of Line Follower Cart:

1. Sensors
2. Analog to Digital convertor
3. Comparator
4. Motor Drive
5. Actuators [Motor and wheels]
6. Arduino Uno
7. Chassis and Body structure
8. Power supply

BLOCK DIAGRAM

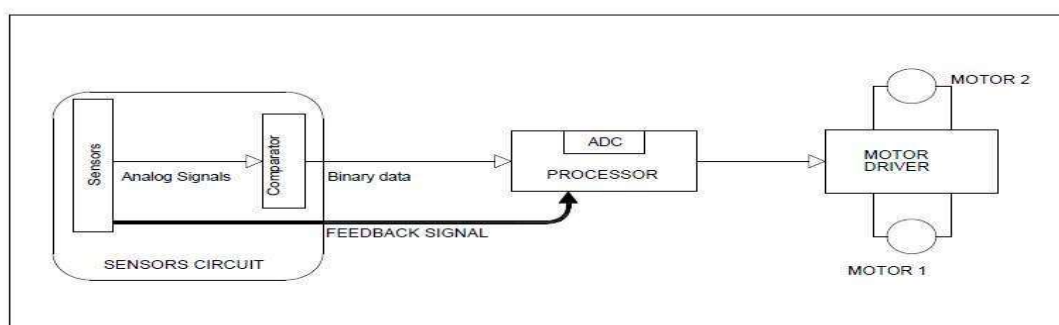


Figure-1.1: Block Diagram

RECENT TRENDS IN MILD HYBRID VEHICLES (AN OVERVIEW)**Yash Desai¹, Kedar Rane², Rohit Shelar³, Krishna Pimple⁴ and Mohd Raees⁵**B.E Student^{1,2,3,4} and Assistant Professor⁵, Automobile Department, Theem College of Engineering, Boisar

ABSTRACT

Introduction of electric vehicles (EVs) signals the beginning of the end for traditional engine vehicles. The major motivators for shifting to EVs are the need for reducing polluting engine emissions and reducing dependence on costly oil fuels. The growing acceptance of EVs is the outcome of several factors: technological advancements, rising storage capacity of traction batteries coupled with their falling costs, increased public charging facilities and Govt. incentives.

The impact of automobiles on the environment is increasing day by day such that its becoming one of the social issue day by day. In to protect the future from Air pollution, alternate Technologies like Electric Vehicles, Hybrid Vehicles, are required and introduced. Many studies have been done on hybrid vehicles in recent years. The hybrid vehicles need a large number of batteries creating up to 300V to meet the required voltage of electric motor. The size and weight of the batteries cause some problems. This research investigates the mild hybrid vehicle. A small electric motor, which can operate as engine starter, generator is located between the engines energy is generated using regenerative braking. The present study evaluates the properties of the mild hybrid vehicle, its structure and performance and proposes an energy control model for its optimum operation.

Keywords: Mild Hybrid Electric Vehicles, Air Quality, Development of MHEV, Challenges and Advantages of Mild Hybrid.

INTRODUCTION

The first hybrid vehicle reported was shown at the Paris Salon of 1899. These were built by Pieper establishments of Liege, Belgium and by the Vendovelli and Priestly Electric Carriage Company, France. In addition to being one of the two hybrid vehicle, and being the first parallel hybrid vehicle, the Pieper was undoubtedly the first electric starter.

However, the greatest problem that early designs had to cope with was the difficulty of controlling the electric machine. Power electronics did not become available until the mid-1960s and early electric motors were controlled by mechanical switches and resistors.

Toyota released the Prius sedan in Japan. Honda also released its insight and Civic Hybrid. They achieved excellent figures of fuel consumptions. Toyota Prius and Honda Insight vehicles have ahistorical value in that they are the first hybrid vehicles commercialized in the modern era to respond to the problem of personal vehicle fuel consumption.

The first electric vehicle powered by non-rechargeable batteries was built in 1834, much before the development of IC Engines. Electric vehicles were very popular during the 1890 to 1920 period despite their very high cost. In 1912, EVs have reached their prime, making up nearly 28% of the cars on the road. [22]

Compared with conventional vehicle, hybrid electric vehicle (HEV) is more complex because of their multi-power source. HEV has the advantages of low emission and fuel consumption. Mild Hybrid Vehicle is one of HEV which equips with low power traction motor.

In 2011, five German car makers announced that they will introduce 48V system into their cars. The powertrain of the next decade is being defined through 48V. The 48V system bridges the gap which allows Start/Stop performance that far outstrips existing pure 12V architecture system which enables the blending of electrical motors to be used to alleviate the transient response problems of larger turbochargers while enabling their optimization. All of these solutions and many more potential applications both improved CO2 performance and eventually reduce cost though making unnecessary the inherent complexity of today's 12V solutions. Managing the development and introduction of 48V systems is not without some significant engineering challenges, but it is the gateway to the kind of energy efficiency needed by OEMs to meet forthcoming emissions challenges and the aspirations of customers. [4]

Mild hybrid vehicle does not have major differences with full hybrid vehicles in terms of hardware but, it can be different in terms of control algorithm. In other words, mild hybrid vehicle is in fact a hybrid vehicle with a lower degree of hybridization (about 15%). In this vehicle, the scale size of the electric driving force component

A STUDY ON BAMBOO STICKS / CULM USES IN CIVIL CONSTRUCTION AS STRUCTURAL ALTERNATIVE TO STEEL RODS

Ismail Patel and Faizan KapadiaStudent, Department of Civil Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

The goal of the Bamboo Reinforced Concrete Project is to design and build a wall that uses bamboo as a structural alternative to steel rebar in order to replicate the shear strength and load bearing capacities that traditional rebar provides for concrete walls, thus minimizing cost. The inspiration for this project comes from the infrastructure flaws (lack of steel rebar reinforcement) that can result in the deaths of thousands during earthquakes. Some, if not most, of those deaths could have been avoided if the infrastructure of the buildings contained adequate reinforcement.

Steel rebar is the primary source of structural reinforcement in India, but it is too expensive to be used consistently. However, use of bamboo as a reinforcement in walls and buildings can be explored by improving its tensility & durability to manage structural stability. Furthermore, unlike steel rebar, bamboo is an abundant natural resource and is the fastest growing plant in the world.

I. INTRODUCTION

The use of small diameter whole-culm (bars) and/or split bamboo (a.k.a. splints or round strips) has often been proposed as an alternative to relatively expensive reinforcing steel in reinforced concrete. The motivation for such replacement is typically cost—bamboo is readily available in many tropical and subtropical locations, whereas steel reinforcement is relatively more expensive, but what causing its extensive use is due to readily available large amount of industry set-up sluggish to find more sustainable alternatives in the construction industry. This analysis addresses ‘bamboo-reinforced concrete’ and assesses its structural and environmental performance as an alternative to steel reinforced concrete.

II. LITERATURE REVIEW

Abhijitsinh Parmar, Jenish Patel, Vijaysinh A. Vaghela, Vijaysinh B. Vaghela, Vishal Prajapati, ‘Literature Review on Bamboo as A Reinforcement in Concrete Structure’, IJSRD - International Journal for Scientific Research & Development Vol. 4, Issue 02, 2016; this study presents: Bamboos as eco-friendly and economic material, its wrapping or covering with Binding wire can resist deflection.

Lokendra Kaushal, Mr. Madan Chandra Maurya, ‘Performance of Bamboo Reinforced Concrete Beam a Review’, International Journal for Research in Applied Science & Engineering Technology (IJRASET) Volume 5 Issue II, February 2017, research showed the test results and proved that bamboo has high ultimate tensile strength and it can be used as an alternative replacing material for steel reinforcement because of its low cost. The average ultimate tensile strength with prepared ends (with aluminium end tabs) has been found to be higher than the specimens without prepared ends.

Rajveer Singh Rathore, Nitesh Solanki, Akash Johari, ‘Review Paper on Bamboo as Reinforcement in Structural Concrete Elements’, IOSR Journal of Engineering (IOSR JEN), presents that Doubly Reinforced Beam has performed more elastically than Singly Reinforced Beam while performing flexural tests. Load carrying capacity in Doubly Reinforced Beam increased by 29.31 % as compared to Singly Reinforced Beam.

Chetan Bhatiwala, Prof. U. R. Awari, ‘A REVIEW ON BAMBOO REINFORCEMENT IN BEAM’, International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 05, May-2018, presents that Bamboo is able to resist more tension than compression. The fire resistance is very good because of the high content of silicate acid. Bamboo durability heavily depends on the preservation treatment method. This preservation method includes smoking, heating, drying, coating and another method is chemical treatment.

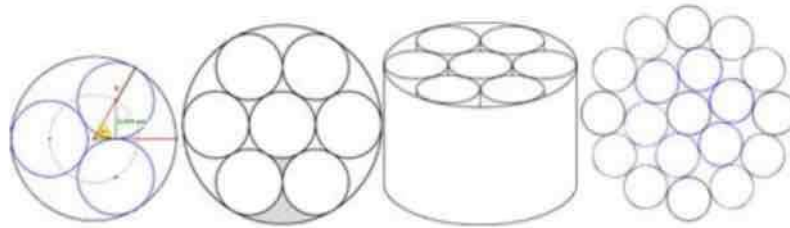
S. Srimathi, S. Dinesh, R. Preetha, R. Reshmi, ‘A Review of Bamboo As A Reinforcement Material in Modern Construction’, IJSTE - International Journal of Science Technology & Engineering Volume 3 Issue 05, November 2016, presents that Bamboos to be split & Laminated with adhesive, sand to be coated with Bitumen for Bonding. *Bambusa vulgaris* species of bamboos can attain adequate Compressive strength

III. RESEARCH ELABORATION

The bamboo strips are Coated with the help of high strength Polyvinyl Acetate Adhesive or Epoxy Resin. The bamboo is cut and split by using pressing and splitting machine.

Procedure - 1: Completely dried Bamboos are sought out with 5mm diameter, by cutting & rounding from available size of complete dried bamboos mechanically with machine

Combining to 3 culm sticks, to get 10mm sectional diameter in triangular pattern Combining to 7 culm, to get 15mm sectional



Diameter in Circular Pattern Combining to 18 Culm stick, to get 25mm sectional diameter in circular patterns And to increase as per design.

Procedure - 2: Bamboos culm Sticks are coated all-around with Epoxy Resin upto 100 micron.

For Minor construction

Procedure - 3: combined Bamboos culm sticks are wrapped with fibre glass fabric net.

Re-coating again over fibre glass net with 100 micron Epoxy Resin & Sprinkling of Quartz sand for rough surface.

For Intermediate construction

Procedure - 4: Replacing with G.I./S.S mesh 20 guage as sleeve and coating of Epoxy Resin upto 100 micron & sprinkling of Quartz Sand.

For Complex construction

Procedure - 5: Twofold layer of G.I./S.S mesh 20 guage as sleeve having in-between Carbon fibre conduit pipe including coating of Epoxy Resin up to 100 micron to each layer & sprinkling of Quartz Sand on apparent layer.

Please be noted that above Bamboo culm sticks has different schedule of tying (Truss type) compare to Steel bar bending schedule, which can be cover after strength report as per (Bureau of Indian Standard 2002).

1. Flexural Strength
2. Bending Moment
3. Tension
4. Compression
5. Modulus of elasticity
6. Shear

IV. STUDIES AND FINDINGS

AFFORDABILITY: Foundations are minimized, wall panels are non-load bearing and can be reduced in thickness. And the basic enhanced components (bamboo, wire mesh, quartz sand, fibre pipe) are all inexpensive.

EASY TO ASSEMBLE: Less labour oriented and fast job, hence low cost in terms of labour management.

SUSTAINABILITY & ENVIRONMENTAL IMPACT: Bamboo is a renewable resource with a short rotation period and can be grown on degraded land. It is treated using environment friendly preservatives. The use of high energy embodied materials (cement, steel) is minimized.

CULTURAL ACCEPTABILITY: The system offers traditional materials in a modern engineering context.

DURABILITY & SAFETY: All bamboo components are treated with safe preservatives to give extended life, easy handling, light weight and corrosion resistant.

V. CONCLUSION

The embedded bamboo structure is engineered to resist corrosion, wind and seismic forces, and other imposed loads as per bending design, its spacing arrangement.

Bonding strength can be increased by 95% compared to steel by treating the bamboos.

Bamboos due to its availability in large quantities, a certain methodology and technique can be utilised in construction materials. Over layered reinforcement of Bamboo Culm can increase the Load bearing capacity and tensile strength of a Structure. While a combination of Bamboo Culm itself layered with other material viz: epoxy/ steel wires / CPVC tubing etc. can bring the properties comparatively at par with steel rods.

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A STUDY ON CARBON, CAPTURE & STORAGE IN CEMENT INDUSTRY**Amritpal S. Rayit¹, Kartik R. Shukla², and Tasneem Azam³**Student¹, Department of Civil Engineering, Datta Meghe College of Engineering, Airoli, Navi Mumbai, MaharashtraStudent² and Assistant Professor³, Theem College of Engineering, Boisar, Maharashtra**ABSTRACT**

Concrete is the third most used substance on earth after air, water and cement is the secret to its success. Sustainable cement production today takes place in the modern dry process facilities incorporating the best available technologies. CCS is an essential technology for most the only way to decarbonize the cement industry. The cement value chain is unique in its structure and could lend itself to a lower cost of implementation for CSS than any other sectors. Furthermore, when combined with bioenergy, CCS holds the potential for producing negative emissions, which is the only well developed technology to achieve negative emissions. This exploratory study focuses on an important case study of the complexity of implementing CCS in an industrial context.

INTRODUCTION

The special ingredient or glue which makes all this possible is a rather ordinary-looking grey powder called cement. Globally, cement production accounts for around 5% of man-made CO₂ emissions. The industry recognizes this responsibility and embraces its commitment to reduce this markedly, especially by contributing to the circular economy. In the roadmap, we focused on what can be done to reduce CO₂ in cement production using today's technology, and will speculate on what could be achieved by 2050. However, the cement production process is unique due to the fact that the 60% of the carbon dioxide produced is as a result of chemical reactions when processing the raw material, not just from the combustion of fuel. Out of the total emissions CO₂ emissions generated through the production of cement, 40% comes from the use of energy whilst the remaining 60% is produced as a by-product of the thermal decomposition of limestone. This means that even if energy efficiency and renewable energy measures were technically feasible and cement production was upgraded accordingly, the maximum CO₂ abatement that could be achieved is 40%. The CCS association believes that the challenges of delivering a modern energy system that is environmentally sustainable, affordable for consumers and guarantees secure energy supply requires CCS to be widely deployed alongside other low-carbon technologies such as renewable energy, nuclear energy, and energy efficiency measures.

OBJECTIVES OF STUDY

- Ensure that CCS is recognized and accepted as an essential technology that underpins energy security objectives and cost-competitively reduces CO₂ emissions from power, energy-intensive industry and other energy uses.
- Facilitate a supportive environment for the successful delivery of early commercial-scale CCS projects and maximize the lessons learned from those projects for subsequent projects.
- Focus on the development of a political, regulatory, technical and economic landscape that underpins sustainable CCS business models and supports the deployment of CCS at scale.

TECHNOLOGY

According to the Carbon Capture & Storage Association, CCS is "a technology that can capture up to 90% of the CO₂ emissions generated from the use of fossil fuels in electricity generation and industrial processes, preventing the CO₂ from entering the atmosphere." (The Carbon Capture & Storage Association, 2017).

There are two key concepts involved in CCS: separation of carbon dioxide (CO₂) from other gases, and its storage or confinement. CCS is a way of taking the CO₂ produced from energy-intensive processes, separating it from the rest of the exhaust gases, and transporting and storing it underground so that it cannot enter the atmosphere. CCS has the potential to capture a significant proportion of the CO₂ produced in a cement kiln from both the combustion of fossil fuels and the calcination of limestone. There are several basic approaches to the separation of CO₂, but only two of them—post-combustion and oxy-fuel combustion—have been identified as potentially feasible in the cement industry.

Separation: Post-combustion technology means the separation of the CO₂ from the exhaust gas after, or at the end of, the cement kiln; it would apply to existing cement plants without significant modifications to the production process. Oxy-fuel combustion technology means operating the cement kiln with a mixture of pure

oxygen and recycled CO₂, instead of the normal ambient air, resulting in a pure CO₂ exhaust gas. This may be a long-term solution, and will be more applicable to new cement plants, since a new generation of burners, cement kiln lines, and plant configurations will be required.

Storage: CO₂ can be stored in a number of ways: in depleted gas and oil fields, in deep saline aquifer formations, in coal seams that can no longer be mined, or injected into declining oil fields to increase the amount of oil recovered (more commonly known as Enhanced Oil Recovery, EOR). These structures have stored natural gas, crude oil, brine, and CO₂ over millions of years.

ENVIRONMENTAL IMPACT

CCS technologies constrict the emission of CO₂ in the atmosphere, thereby reducing the contribution of that source of CO₂ to anthropogenically-forced global warming. However, it does not work to reduce the emissions of sulphur dioxide, nitrogen oxides and particulate matter that are associated with the combustion of fossil fuels and other traditional fuels. Moreover, the application of CCS has been found to increase the energy consumption of power plants by 10-40% to account for the energy-intensive process of post-combustion carbon capture (IPCC, 2005). CCS is the only option for the full decarbonization of the cement industry. CCS is the currently the most mature commercial technology with the potential to offer negative carbon emissions and has the ability to create negative emissions in a fully carbon-neutral society.

CONCLUSION

CCS as a potential mid-term solution to limit carbon emissions, and will continue to pursue opportunities for the advancement of this technology. Industry is the basis for prospering societies and central to economic development. As the source of almost one-quarter of CO₂ emissions, it must also be a central part of the clean energy transition. Emissions from industry can be among the hardest to abate in the energy system due to process emissions that result from chemical or physical reactions and the need for high-temperature heat. A portfolio of technologies and approaches is needed to address the decarbonization challenge while supporting sustainable and competitive industries. Carbon capture, utilization and storage (CCS) can play a critical role in this sustainable transformation. For some industrial and fuel transformation processes, CCS is one of the most cost-effective solutions available for large-scale emissions reductions. The development of CO₂ transport and storage networks for industrial CCS hubs can reduce unit costs through economies of scale and facilitate investment in CO₂ capture facilities. Establishing markets for premium lower-carbon materials through public and private procurement can also accelerate the adoption of CCS and other lower-carbon industrial processes.

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A STUDY ON CARBON, CAPTURE & STORAGE IN CEMENT INDUSTRY**Amritpal S. Rayit¹, Kartik R. Shukla², Tasneem Azam³**Student¹ Department of Civil Engineering, Datta Meghe College of Engineering, Airoli, Navi Mumbai, MaharashtraStudent² and Assistant Professor³, Theem College of Engineering, Boisar, Maharashtra**ABSTRACT**

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DISASTER MANAGEMENT IN INDIA

Zulfiqar Ahmad

Civil Engg Department, Theem College of Engineering Boisar

ABSTRACT

India is one of the most disaster prone countries in the world. disaster strike causing a devastating impact on human life, economy and environment? Various disasters like earthquake, landslides, volcanic eruptions, fires, flood and cyclones are natural hazards that kill thousands of people and destroy billions of dollars of habitat and property each year.. In India, as in the l. The GOI have a national emergency plan for disaster management, some of the state also has a disaster management plan, but there is a lack of awareness in the public. Many Indian States do not have disaster management plan due to limited resources. Considering these problems, this paper enlight more integrated disaster management system in India. This paper will provide important information in three mutually reinforcing areas viz. disaster preparedness, response and rehabilitation management. The various case studies for disaster management will be discussed.

Keywords: Disaster, Mitigation, Hazards, Risk, Safety Management, India, National Disaster Management Authority (NDMA)

1 INTRODUCTION**1.1 What is disaster?**

Disaster is an event or series of events, which gives rise to casualties and damage or loss of properties, infrastructures, environment, essential services or means of livelihood on such a scale which is beyond the normal capacity of the affected community to cope with. Disaster is also sometimes described as a "catastrophic situation in which the normal pattern of life or eco-system has been disrupted and extra-ordinary emergency interventions are required to save and preserve lives and or the environment".

The whole cycle of Disaster Management can be depicted by following figure 1.1.

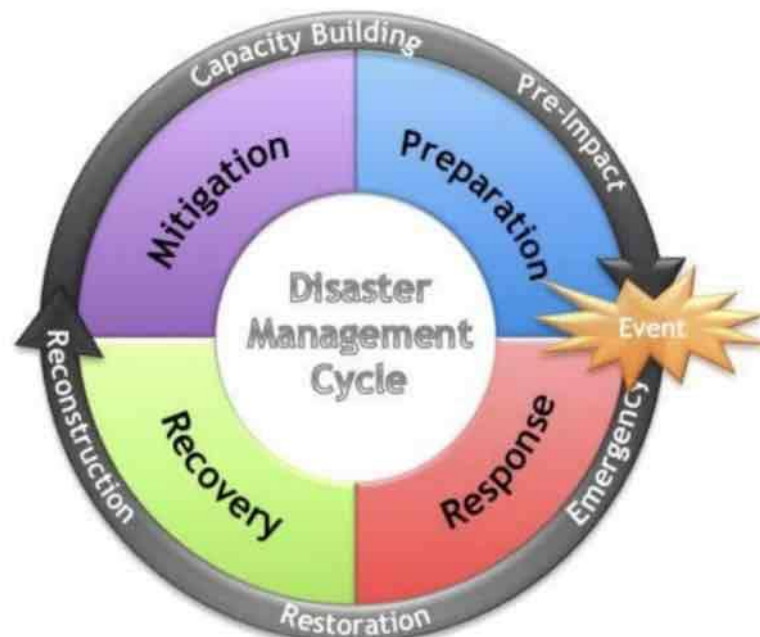


Figure-1.1: Etymology

1.2 Types of disaster

Disasters are mainly of two types –

- 1) Natural disaster
- 2) Man made disaster

These are further classified into major/minor natural disaster and major/minor manmade disasters. Some of the disasters are listed in Table 1 below.

Major natural disasters		Minor natural disasters	
<input type="checkbox"/> Flood		<input type="checkbox"/> Cold wave	
<input type="checkbox"/> Cyclone		<input type="checkbox"/> Thunderstorms	
<input type="checkbox"/> Drought		<input type="checkbox"/> Heat waves	
<input type="checkbox"/> Earthquake		<input type="checkbox"/> Mud slides	
		<input type="checkbox"/> Storm	
Major manmade disaster		Minor manmade disaster	
<input type="checkbox"/> Setting of fires		<input type="checkbox"/> Road / train accidents, riots	
<input type="checkbox"/> Epidemic		<input type="checkbox"/> Food poisoning	
<input type="checkbox"/> Deforestation		<input type="checkbox"/> Industrial disaster/ crisis	
<input type="checkbox"/> Pollution due to prawn cultivation		<input type="checkbox"/> Environmental pollution	
<input type="checkbox"/> Chemical pollution.			
<input type="checkbox"/> Wars			

1.3 Risk

Risk refers to the probability or threat of loss, liability, injury, damage, or any other negative occurrence resulting from external or internal vulnerabilities.

1.4 Vulnerability

Vulnerability describes the characteristics and circumstances of a community, that make it susceptible to the damaging effects of a hazard, on account of their nature, construction and proximity to hazardous terrain or a disaster prone area”

1.5 Hazards

A hazard is any object, situation, or behaviour that has the potential to cause injury, ill health, or damage to property or environment

The extent of damage in a disaster depends on:

- i) The impact, intensity and characteristics of the phenomenon and
- ii) How people, environment and infrastructures are affected by that phenomenon.

This relationship can be written as an equation:

$$\text{Disaster Risk} = \text{Hazard} + \text{Vulnerability}$$

1.6 The Indian Scenario for Disaster Management

India due to its geo-climatic and socio-economic condition is prone to various disasters. During the last thirty years' time span the country has been hit by 431 major disasters resulting into enormous loss to life and property. According to the Prevention Web statistics, 143039 people were killed and about 150 crore were affected by various disasters in the country during these three decades. The disasters caused huge loss to property and other infrastructures costing more than US \$ 4800 crore. In India, the cyclone which occurred on 25th November, 1839 had a death toll of three lakh people. The Bhuj earthquake of 2001 in Gujarat and the Super Cyclone of Orissa on 29th October, 1999 are still fresh in the memory of most Indians and cloud burst and mudflow in Leh and surrounding areas in the morning of 6th August, 2010.

The most recent natural disaster of a cloud burst resulting in flash floods and mudflow in Utterakhand and Kedarnath areas in the early hours of 16th June, 2013, caused severe damage in terms of human lives as well as property. There was a reported death toll of 1200 persons, about 5000 missing persons, 4200 pets (have economic value) 3,661 damaged houses in about 500 villages and 27,350 hectares of affected crop area**.[2]

2 DISASTER RISK MANAGEMENT PROGRAMME

The Government of India (GOI), Ministry of Home Affairs (MHA) and United Nations Development Programme (UNDP) signed an agreement in August 2002 for the implementation of “Disaster Risk Management” Programme to reduce the vulnerability of the communities to natural disasters, in identified multi-hazard disaster prone areas.

2.1 Disaster management in India “Government of India” [1] “Ministry of Home Affairs”: The role of emergency management in India falls to National Disaster Management Authority of India, a government agency subordinate to the Ministry of Home Affairs. In recent years there has been a shift in emphasis from

response and recovery to strategic risk management and reduction, and from a government-centered approach to decentralized community participation. The Ministry of Science and Technology, headed by Dr Karan Rawat, supports an internal agency that facilitates research by bringing the academic knowledge and expertise of earth scientists to emergency management.

A group representing a public/private has recently been formed by the Government of India. It is funded primarily by a large India-based computer company and aimed at improving the general response of communities to emergencies, in addition to those incidents which might be described as disasters. Some of the groups' early efforts

Disaster Management Plan in India includes the following:-

- Institutional and policy framework;
- Early warning system;
- Institutional and policy framework;
- Early warning system;

Disaster prevention and mitigation

- i) India has been very vulnerable to natural hazards and calamities. The Bhuj earthquake accounted for 13,805 deaths, the super cyclone in Orissa accounted for 9,885 deaths. The Government are of the view that if appropriate mitigation measures had been taken these casualties could have been reduced significantly.
- ii) Each year disasters also account for the loss of thousands of crops in terms of social and community assets. It is clear that development cannot be sustainable without building in mitigation into the planning process. Keeping the above factors in view, the Government of India have brought about a change in policy which emphasizes mitigation, prevention and preparedness. A strategic roadmap is prepared on the succeeding pages that has been drawn up for reducing the country's vulnerability to disasters. Action for reducing our vulnerabilities to disasters shall be taken in accordance with the roadmap. The roadmap will be reviewed every two years to see if any change in direction is necessary.

Disaster Management Plan in India includes the following:-

- Institutional and policy framework;
- Early warning system;
- Disaster prevention and mitigation;
- Preparedness.

2.1.1 Institutional and policy framework

The institutional and policy mechanisms for carrying out response, relief and rehabilitation have been well-established since Independence. These mechanisms have proved to be robust and effective insofar as response, relief and rehabilitation are concerned.

At the national level, the Ministry of Home Affairs is the nodal Ministry for all matters concerning disaster management.

National Crisis Management Committee (NCMC). Crisis Management Group.

2.1.2 Early Warning System

Cyclone

Indian Meteorological Department (IMD) is mandated to monitor and give warnings regarding Tropical Cyclone (TC). Monitoring process has been revolutionized by the advent of remote sensing techniques. A TC intensity analysis and forecast scheme has been worked out using satellite image interpretation techniques which facilitate forecasting of storm surges.

The meteorological satellite has made a tremendous impact on the analysis of cyclones. INSAT data has also been used to study the structures of different TCs in the Bay of Bengal.

At present there are 166 flood forecasting stations on various rivers in the country which includes 134 level forecasting and 32 inflow forecasting stations, river-wise break up. The flood forecasting involves the following four main activities:

Observation and collection of hydrological and hydro-meteorological data.

- i) Transmission of data to forecasting centres.
- ii) Analysis of data and formulation of forecast.
- iii) Dissemination of forecast.

For other natural disasters specific early warning systems are under progress.

2.1.3 Disaster prevention and mitigation

The Government of India have adopted mitigation and prevention as essential components of their development strategy. The Tenth Five Year Plan document has a detailed chapter on Disaster Management.

The Government of India have issued guidelines that where there is a shelf of projects, projects addressing mitigation will be given a priority. Measures for flood mitigation were taken from 1950 onwards. As against the total of 40 million hectares prone to floods, an area of about 15 million hectares has been protected by construction of embankments.

A National Core Group for Earthquake Mitigation has been constituted consisting of experts in earthquake engineering and administrators.

A Disaster Risk Management Programme has been taken up with the assistance from UNDP, USAID and European Union in 169 most hazard prone districts in 17 States including all the 8 North Eastern States.

Under this programme disaster management plans have been prepared for about 3500 villages, 250 Gram Panchayat, 60 blocks and 15 districts.

The Central Government is now in the process of training and equipping 96 specialist search and rescue teams, each team consisting of 45 personnel including doctors, paramedics, structural engineers, etc.

A 200 bedded mobile hospital, fully trained and equipped is being set up by the Ministry of Health and attached to a leading Government hospital in Delhi. The Geographical Information System (GIS) data base is an effective tool for emergency responders to access information in terms of crucial parameters for the disaster affected areas.

2.1.4 Preparedness

Mitigation and preparedness measures go hand-in-hand for vulnerability reduction and rapid professional response to disasters.

The Central Government is now in the process of training and equipping 96 specialist search and rescue teams, each team consisting of 45 personnel including doctors, paramedics, structural engineers, etc.

A 200 bedded mobile hospital, fully trained and equipped is being set up by the Ministry of Health and attached to a leading Government hospital in Delhi. The Geographical Information System (GIS) data base is an effective tool for emergency responders to access information in terms of crucial parameters for the disaster affected areas.

2.2 Maharashtra Disaster Management Plan

Maharashtra is the first state to prepare a comprehensive State Disaster Management Plan and also undertake risk assessment and vulnerability analysis of the state. These studies address the vulnerability of various districts, talukas within these districts, and clusters of villages in these districts to earthquakes, floods and cyclones, epidemics, road accidents and fire, and chemical and industrial disasters. A separate volume on Standard Operating Procedures, details the manuals for various departments to be activated during an emergency.

In the District Control Room, the following desks are recommended to be set up for improving the capability of the district administration to respond to disasters more effectively : Operations desk, Service desk, Infrastructure desk, Health desk, Logistics desk, Agriculture desk, Communication and Information Management desk and Resources desk. Detailed instructions have been provided to the district administration about the setting up of the District Control Room , wireless network, linking all tehsil headquarters to the District Control Room. Other Voluntary agencies, including NGOs. Public sector Private sector community helps in disaster management

2.3 Mumbai (Metro Polyton City), India Disaster Risk Management profile

Functional arrangements. Consistent with the national approach, Mumbai's Disaster Management Plan [4] refers to its goals of mitigation strategy as:

To substantially increase public awareness of disaster risk so that the public demands safer communities in which to live and work.

To significantly reduce the risks of loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from disasters.

- Inter-City Linkages.
- Land Use Management.

2.3.1 Vulnerability issues

Fire and industrial accidents have been part of the landscape of the city. Floods. Mumbai DMP identifies 10 sections along the Central Railway. Chemical (transport, handling), biological, and nuclear hazards.

Earthquakes. Mumbai lies in the Bureau of Indian Standards (BIS) in Seismic Zone III.

3 CASE STUDIES OF DISASTER OCCURRED IN INDIA

3.1 landslide

On 30 July 2014, a landslide occurred in the village of Malin in the Ambega on taluka of the Pune district in Maharashtra, India. The landslide, which hit early in the morning while residents were asleep, was believed to have been caused by a burst of heavy rainfall, and killed at least 151. Deforestation was the primary underlying anthropogenic cause of the landslide. One additional reason was changing agricultural practices – villagers had recently shifted from cultivation of rice and finger millet to wheat, which required levelling of steep areas, which contributed to instability of the hills. Also the construction of the nearby Dimbhe Dam ten years ago was considered as a possible reason. The instability of the hillsides was due to the construction activities, which are often done without careful analysis of environmental consequences. Stone quarrying, among other types of construction.

3.2 Management of earthquake

India high earthquake risk and vulnerability is evident from the fact that about 59 per cent of India's land area could face moderate to severe earthquakes. During the period 2000 to 2010, more than 25000 lives were lost due to major earthquakes in India, which also caused enormous damage to property and public infrastructure. All these earthquakes established that major casualties were caused primarily due to the collapse of buildings.[3]

These emphasise the need for strict compliance of town planning bye-laws and earthquake resistance building codes in India. These guidelines have been prepared taking into account an analysis of critical gaps responsible for specific risk.

These guidelines emphasise the need for carrying out the structural safety audit of existing lifelines structures and other critical structures in earthquake prone areas, and carrying out selective seismic strengthening and retrofitting.

The earthquake guidelines rest on the following six pillars of seismic safety for improving the effectiveness of earthquakes management in India.

The following are the 6 pillars

Earthquake resistant construction of new structures.

Selective seismic strengthening and retrofitting of existing priority structures and lifeline structures.

Regulation and enforcement. Awareness and preparedness.

Capacity development of education, training, R & D, capacity building and documentation.

Emergency response.

3.3 The Bhopal gas tragedy

The careless siting of industry and relatively poor regulatory controls leads to ill-health in the urban centers. The Bhopal gas tragedy on December 2nd, 1984, where Union Carbide's plant leaked 43 tons of methyl isocyanate and other substances, used in the manufacture of pesticides, is one of the worst industrial accidents in the recent past. Of the 520,000 people who were exposed to the gas, 8,000 died during the first week and another 8,000 later. The impact on the survivors is visible even today.

Conclusion: The government of India and respective state government through their pollution control board have laid down strict regulation and monitoring system for industries to avoid any such accident. Every industry is forced to have the safety measures and disaster management plan.

3.4 India tsunami [5]

On December 26, 2004 the tsunami caused extensive damage in 897 villages in five states/UTs in India. During the tsunami 4,259 were Injured, 5,555 people were missing and 10,749 were dead. The major sectors affected in each state: fisheries and boats, ports and jetties, roads and bridges, power and ICT, housing, water supply and sewerage and social infrastructure.

Rescue and relief operations were adjusted to be speedy, effective and timely by the external agency i.e. undertaking debris removal and disposal of bodies, dispatching relief material, providing food, water, and medical assistance. Adopting good past practices:

Earlier disaster management programs, done successfully, were revisited to carry forward the lessons learned.

Encourage ownership of solutions by potential beneficiaries to ensure sustainability.

Encourage partnerships of government, beneficiaries, community-based women's organizations and NGOs to ensure sustainable development.

Demonstrate that project implementation can be assured through a fully empowered Project Management Unit with competent leadership.

Address need for a long term approach to O&M funding.

3.5 Maharashtra Disaster Management Plan

Maharashtra is the first state to prepare a comprehensive State Disaster Management Plan and also undertake risk assessment and vulnerability analysis of the state. These studies address the vulnerability of various districts, talukas within these districts, and clusters of villages in these districts to earthquakes, floods and cyclones, epidemics, road accidents and fire, and chemical and industrial disasters. A separate volume on Standard Operating Procedures, details the manuals for various departments to be activated during an emergency.

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3.6 Role of engineers for disaster management

Engineer plays a very important role in disaster management, engineer gives information about climate conditions etc, without an engineer we can't imagine the world. Not only a particular branch is important every branch has its own importance, like how our five fingers is important to our hand like that every branch has its own importance, they can form association to help in times of disaster. Engineers can help in managing disasters in many ways, and s can help in rehabilitation and resettlement of victims

4 CONCLUSION

Thus, efficient management of disasters, will help and save the lives. rather than mere response to their occurrence has, in recent times, received increased attention within India. This is as much a result of the recognition of the increasing frequency and intensity of disasters as it is an acknowledgement that good governance, in a caring and civilized society, needs to deal effectively with the devastating impact of disasters.

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INTELLIGENT TRANSPORT SYSTEM USING GLOBAL INFORMATION SYSTEM**Tasneem Azam and Arsalan Khan**

Assistant Professor, Civil Department, Theem College of Engineering, Boisar

ABSTRACT

Intelligent transport system refers to efforts to add information and communication technology to transport infra structured vehicles in an effort to manage factors that typically are at odds with each other like vehicles, loads and routes to improve safety and reduce vehicle wear transportation times and fuel consumption. Global information system is a computer based system which is used to digitally reproduce the features, present on the surface of earth and events that take place. Advanced Traveler Information Systems (ATIS) is one of the user services provided by ITS. With ATIS information, drivers make informed decisions and are better equipped to plan their route and estimate their travel time. Route planning is an essential component of ATIS, aiding travelers in choosing the optimal path to their destinations in terms of travel distance, travel time.

Nature has gifted man and animals the ability to move. With his intelligence man has developed transportation system leading to economic well-being. However we have to pay for this in the form of its undesirable effects as environmental impacts, energy consumption, congestion, casualties and money required to build infrastructure. This has led us to a more balanced and sustainable transportation system. Here Intelligent Transportation system comes into picture – the application of computer and communication technologies to transport problems. The old adage, 'knowledge is power' is the obvious solution to this.

In this paper, how an advanced traveler information system for a developed in GIS environment can be useful is shown. This user friendly system provides complete information of a city such as road network, tourist places within the city limits, hospitals, government and private offices, stadiums, bus and railway stations. This system provides shortest path and path to closest facility based on distance and drive time. The GIS can be used in bus stands, railway stations, airports, tourist information centers, in personal computers to give information to the travelers.

INTRODUCTION

Nature has gifted man and animals the ability to move. With his intelligence man has developed transportation system leading to economic well-being. However we have to pay for this in the form of its undesirable effects as environmental impacts, energy consumption, congestion, casualties and money required to build infrastructure. This has led us to a more balanced and sustainable transportation system. Here *Intelligent Transportation system* comes into picture – the application of computer and communication technologies to transport problems. Here *Intelligent Transportation system* comes into picture – the application of computer and communication technologies to transport problems.

Japanese seems to have initiated the whole modern day notion of ITS with work carried out in the 1980s. The United States was also addressing the application of ITS at an early stage in the course of the Electronic Route Guidance project (ERGS) in the 1970's. The European Union picked up the theme, and referred to it as Road Transport Informatics. In the course of time the name of this technology subjected to many changes until USA had given a name called ITS to it.

ATIS provides both preterit and en route information to the users, both of which offer distinctive advantages. The availability of preterit information drivers enhances their self-belief to use freeways and allows commuters to make better-informed transit choices. En route information and guidance saves travel time, helps a traveler avoid congestion, can improve traffic network performance, and is more efficient than paper maps or written instructions.

The old adage, 'knowledge is power' is the obvious solution to this. Customers want real-time information to help them select the best route to take at any given time. They need to know traffic speeds, incidents (accidents or lane closures), and road conditions. With Advanced Traveler Information Systems (ATIS) information, drivers make informed decisions and are better equipped to plan their route and estimate their travel time. The ultimate solution has a big mandate. Critical features include accuracy, timeliness, and reliability. The ideal solution is an up-to-the minute traffic information system that enables drivers to make more intelligent travel decisions at any time of the day and any day of the week. There is wide scenario of problems, which are specific to India, and indigenous solutions are required to suit its requirement of a cost effective, efficient, reliable and at the same time compatible with the present level of development in the country in the related areas.

OBJECTIVES OF STUDY

1. This user friendly system provides complete information of a city such as road network, tourist places within the city limits, hospitals, government and private offices, stadiums, bus and railway stations.
2. This system provides shortest path and path to closest facility based on distance and drive time. A facility consisting of city bus routes with bus numbers, origin and destination points, and all intermediate stations have been included in the system.

PACKAGE DEVELOPMENT

1. MECHANISM

Developing *Advanced Traveler Information System (ATIS)* in *Geographic Information System (GIS)* is main objective of current project. In this system shortest path, closest facility and city bus routes were included. Besides these features location wise information and inter-city traveler information like bus, train and airways timing are also included. Mechanism involved in the development of package is described in following sections.

1.1 SHORTEST PATH

Shortest path is determined by *route planning* a fundamental issue which helps vehicle drivers to plan a route using route optimization criteria or planning criteria. The quality of a route depends on travel cost factors such as distance, travel time, travel speed and number of turns. Some drivers may prefer the shortest path based on distance and some prefer based on travel time. The route selection is done via on travel time. The route selection is done via user interface. Optimization of travel distance is done by storing distance in digital database and using route planning algorithms. While optimization of travel time is done by storing road length and speed limit in digital database, and using $Speed = \text{distance}/\text{time}$, travel time is calculated.

1.2 CLOSEST FACILITY

In the closest facility problem *route length* and *travel time* (drive time) were considered as *travel costs*. Different facilities like hospitals, bus stations, and tourist places were taken as themes in the project. Closest facility algorithm calculates all the routes from selected origin to facilities based on travel cost. It compares travel costs of these routes and gives one optimal route as output [1].

1.2 CITY BUS ROUTES

City buses with their numbers were stored in a data base in a compressed format because on one road segment there will be more than one bus. A search algorithm was used to find bus service number from selected origin and destination. According to bus number, road segments on the map were selected and highlighted with different color. The schematic flow chart of the package is shown as Fig 1.

2 SOURCE PROGRAM

The source program for this package has been written in Avenue programming language. Avenue is object-oriented and scripting language for ArcView GIS. Customization of the package was done in Avenue. The source code was divided into many numbers of scripts because in Avenue language functions or procedures are not available. Each script is used for a specified purpose.

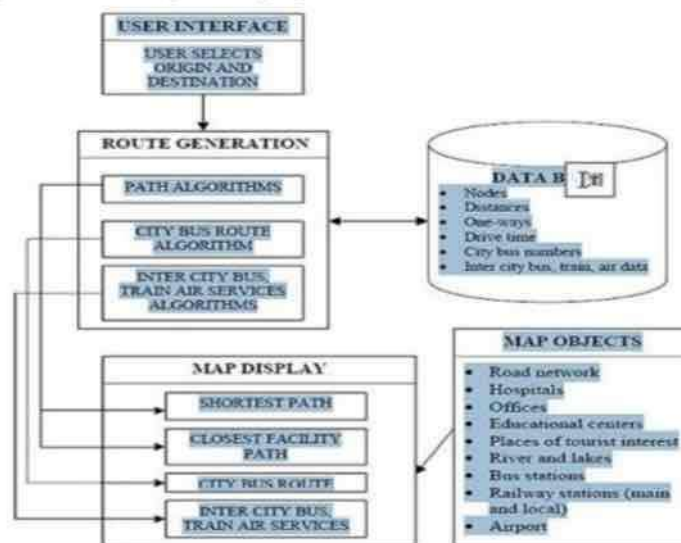


Fig-1

3 SOFTWARE DEVELOPMENT FOR A CITY

Software that can be used in the development of current project is

- Arc View GIS version 3.1
- Network Analyst version 1.1b
- Avenue programming language

3.1 ARCVIEW GIS VERSION 3.1

Arc View GIS software is a desktop GIS with an easy-to-use, point-and-click graphical user interface (GUI) that lets us easily load spatial and tabular data so we can display the data as maps, tables, and charts. Arc View provides the tools we need to query and analyze the data and present results as presentation-quality maps.

3.2 NETWORK ANALYST

The Arc View Network Analyst is an extension product designed to use networks more efficiently. It can solve common network problems on any theme containing lines that connect.

3.3 AVENUE

Arc View scripts are macros written in Avenue, Arc View's programming language and development environment. With Avenue we can customize almost every aspect of Arc View, from adding a new button to run a script we write, to creating an entire custom application that we can distribute.

CONCLUSION

1. Digital traveler information system for a city can be developed in geographic information system (GIS) using Arc View GIS software package and it was customized using Avenue programming language.
2. This package has point-and-click graphical user interface (GUI) and it is user friendly also.
3. The developed package can show the following capabilities.
 - Finding shortest path based on distance and drive time
 - Finding closest facility and its path based on distance and drive time
 - City bus routes
 - Search engine - which searches different facilities in Hyderabad city
 - Provides intercity bus, train and airways information (timings, distance and service name)
 - Site tour planning
4. The developed package can be used in the following areas to give information to the travelers
 - Bus stands
 - Railway stations
 - Airports
 - Tourist information centers.
 - In personal computers.

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COMPARISON AND PERFORMANCE OF ROOTED AND SUBMERGED PLANTS FOR MINIMIZATION OF ARSENIC BY PHYTOREMEDIATION TECHNIQUE**Pagdhare Sayyoni¹, Tandel Riddhi Naresh¹ and Prof. Faiz Muhammad Khan²**U.G. Student¹ and Assistant Professor², Civil Engineering, Theem college of Engg., Boisar**ABSTRACT**

Phytoremediation, a green plant-based technology, is a favorable technology for heavy metals pollution caused by inescapable limitations of predictable technologies. The use of some rooted plants and submerged plants in the process of Phytoremediation is more normally known as phyto filtration. The minimization of arsenic (As) by rooted plants, such as Colocasia, Cannaindica, and submerged plants such as Pistia stratiotes, Water hyacinths (Eichhorniacrassipes), etc. Thus a huge quantity of water having arsenic can be minimizing of arsenic by this technology by economically. The ornamental plants collect high concentration of arsenic in their roots, trunks and tissues. This work is intended to examine the arsenic based water and to develop the operative and economically low cost method for minimization of arsenic from water. Here the suitability of plants to minimization of arsenic and compared by two types of plants such as rooted plants and submerged plants. In which arsenic contained water is passed through the rooted plants as well as submerged aquatic weeds. The suitability of plants to minimize the arsenic depends upon holding time and velocity of water flow which passes from one end to other end of the container. In India some determinations has been focused to regulate the water pollution and to make minimization of arsenic and free from chronic disease.

INTRODUCTION

The water is a basic necessity of human and animal life. These are the main consumption of human beings well as animals. The water is one which plays important role in metabolism of living body. Water is required for the variation of functions like regulation a body temperature, solvent and vehicle for transportation of nutrients and salts required for body through the vascular system and through the inter and intracellular space and to carry away in the form removal out of body. The nontoxic and drinkable water for the public is major problem all over the world .The U.N had declared the 1980 as the year of international drinking water supply and sanitation decade (IDWSSD) during the U.N. Conference in Mar del Plata, Argentina in1977. Water indented for human consuming should safe and good for human health. W.H.O defined —health is a state of complete physical, mental and social well-being and not purely an absence of diseases or illness. The nontoxic water is one which cannot harm users when it used for long period. In this trial effort it is to find out that the minimization or eliminate concentration of arsenic by the phytoremediation technique monitoring the performance of rooted as well as submerged plants.

Phytoremediation is a technology, has expected growing helpfulness after the find of hyper accumulating plants which are able to accumulate, translocation, and concentrate high amount of certain toxic contaminants in rooted plants. Phytoremediation includes several processes namely, phytoextraction, phytodegradation, rhizofiltration, phytostabilisation and phytovolatilization. Both rooted and submerged plants have been tried to remediate arsenic based soils and waters, respectively. A number of submerged plant species have been examined for the remediation of toxic heavy metals such as As, Zn, Cd, Cu, Pb, Cr, Hg, etc. Arsenic, is the poisonous toxic element, is commonly spread in the aquatic systems which is produce from earth crushed displacement, volcanic or sedimentary rocks as well as from the dilution of geothermal waters. Some aquatic plants have been reported to accumulate high level of arsenic from contaminated water [1]. Water hyacinth (Eichhorniacrassipes), Pistiastratiotes, Colocasia esculenta Canna Indica, have been studied to examine their arsenic uptake ability and mechanisms, and to evaluate their potential in phytoremediation technology [1]. It has been suggested that the aquatic weeds would be possible for arsenic phytoremediation, and this study reviews the knowledge on arsenic phytoremediation by common aquatic weeds.

OBJECTIVES OF WORK

1. To Minimization of arsenic from water by phytoremediation technique.
2. To Comparison between rooted and submerged plants for elimination of arsenic.
3. To understanding of potential of aquatic weeds.
4. To remove the arsenic by economically.

METHODOLOGY**A. Recognizing of aquatic weeds and rooted plants**

The two rooted such as *Colocasia esculenta*, and *Canna indica* and two floating plants such as *Pistia*, *Water hyacinth* are selected for this work

B. Determination of ability for selection criteria of plant

The following criteria have been recognized for selecting a plant species.

- Flexibility to local environment.
- High high growth rates.
- Tolerance to adverse concentration of pollution
- High toxin element acceptance capability.
- Acceptance to critical climatic conditions
- Struggle to vermin and diseases and easy of management
- High oxygen conveyance expertise

EXPERIMENTAL TECHNIQUE**A. Preparation for experimental work**

The four containers are used for rooted and floating plants having a size of each reactor 0.40mX0.28 mX0.15m., two containers are placed in a such manner that water passed under gravity to maintain continuous flow. Each container with an arrangement of tap for controlling the rate of flow of water. The depth of soil media for rooted plant is 0.07m. Similarly the same depth of water in floating plant. Four number of tub container are made in one row the first and second container is plugged with seven numbers of rooted plants and third container and are plugged with fifteen numbers of floating plants. Two elevated tanks of capacity of 30 liters each placed at the top of this system for supplying of arsenic bearing water, for maintaining continuous flow four jars of 15 liters are placed at bottom of each series for recirculation of water. Materials used for experimental setup.

- Step arrangement for placing of container,
- for maintaining under gravity flow
- TwoHigher Elevated tank – Capacity 30 liters each.
- Capacity of small Jar – 15 liters
- Size of each reactor—0.4m X0.28m X 0.15m
- Area of soil media surface -0.4m X 0.28m
- Number of rooted plants-7
- Number of floating plants-15

B. Preparation of arsenic based synthetic water

- First of all for preparation of Stock arsenic solution dissolve 1.320 g arsenic trioxide, As_2O_3 , in 10 ml distilled water containing 4 g NaOH, and dilute to 1000 ml with distilled water, 1.00 ml = 1.00 mg arsenic.
- Then for preparation of intermediate solution take 500 ml of stock solution and dilute in 5liter distilled water. After that for standard arsenic solution 5000 ml of intermediate solution and dilute in 50,000 ml distilled water.
- Then get arsenic concentrated water 1ml=1 μ g As ie 1mg/liter. Equations

C. Process of horizontal continuous flow

For two month both set up from 30 liters tank plain water with nutrient is distributed to the containers for flourishing the plants, then the actual experimental work start, arsenic bearing water is supply to two series of the containers from elevated tank. The samples are collected at the outlet of container of rooted and floating plants respectively from each container, when treated water is collected in a jar of 15 liters capacity and it is recalculated to inlet of the container of each setup and hence, continuous flow system is maintain, and removal of arsenic is observed at outlet of every containers.

The rate of flow is maintained 0.60 lit/hr, from one end to other end. Due to permeable media, the rooted plants get sufficient time to extract the arsenic from water.

D. Recirculation of arsenic bearing water

The arsenic bearing water passes through containers and after 24 hrs the sample is collected from outlet of container , than the collected water in jar is recalculated for next 24 hrs at the rate of flow 0.60lit/hrs. The 3rd cycle is made after 48 hrs having a rate of flow of 0.30lit/hrs. This process is continued till the concentration of arsenic observed up to permissible limit or the exhausted due to death of plants.

Table-1: Comparison between two rooted and submerged plants for Minimization of Arsenic in mg/lit

Time in hrs	Rooted plants		Submerged Plants	
	Minimization of As by Colocasia esculenta	Minimization of As by Canna Indica	Minimization of As by PistiaStratiotes	Minimization of As by Water Hyacinths
0	1	1	1	1
24	0.872	0.901	0.984	0.92
48	0.757	0.894	0.971	0.902
72	0.715	0.871	0.905	0.887
96	0.632	0.824	0.850	0.879
144	0.568	0.781	0.843	0.833
192	0.495	0.771	0.808	0.811
240	0.453	0.709	0.761	0.746
288	0.423	0.659	0.725	0.688
Total As remove in mg/lit	0.577	0.341	0.275	0.312

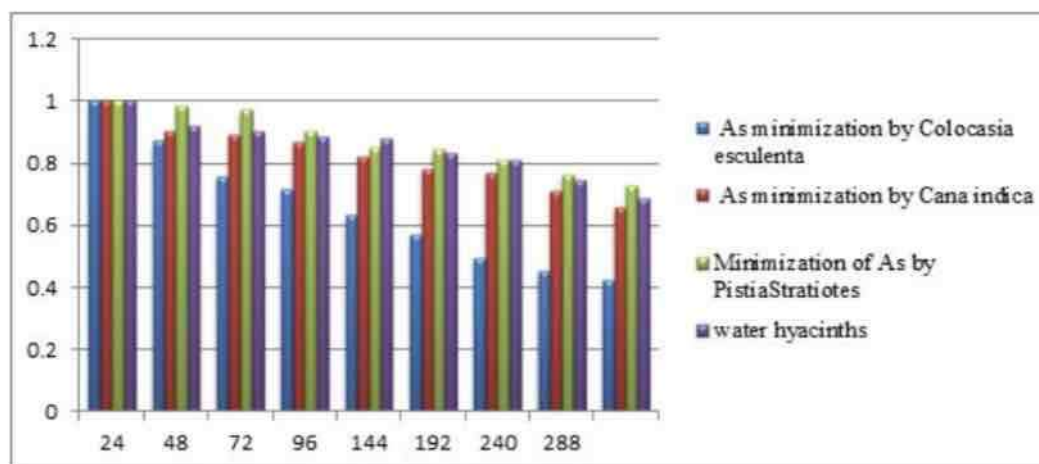


Fig-1: Shows comparatively performance of two rooted plants for minimization of arsenic concentration mg/lit

Table-2: Comparatively elimination of Arsenic by two rooted and Submerged plants

Time in hrs	Rooted plants		Submerged Plants	
	% Minimization of As by Colocasia esculenta	% Minimization of As by Canna Indica	% Minimization of As by Pistia Stratiotes	% Minimization of As Water Hyacinths
24	12.8	9.9	1.58	8
48	11.5	0.7	1.3	1.8
72	4.2	2.3	6.6	1.5
96	8.3	4.7	5.5	0.8
144	6.4	4.3	0.7	4.6
192	7.3	10	3.5	2.2
240	4.2	6.2	4.7	6.5
288	3	5	3.6	5.8
Total As remove in %	57.70%	34.10%	27.50%	31.20%

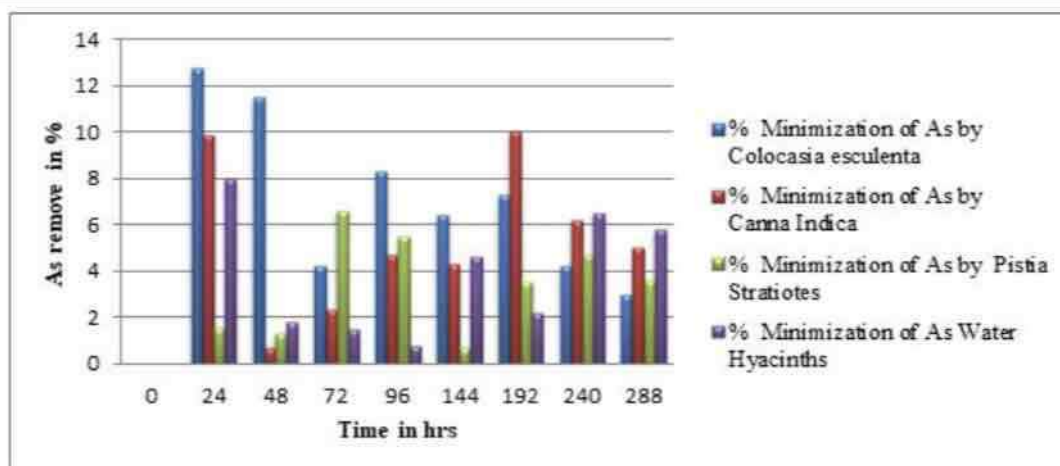


Fig-2: Shows comparatively performance of two rooted plants for minimization of arsenic concentration mg/lit



Fig-3: shows individual performance of rooted and submerged plants

OBSERVATION

A. Performance and Comparison between two rooted and submerged plants for Minimization of Arsenic

Comparatively observation among the two rooted and two submerged plants, the colocasia esculenta is removed 0.577 mg/lit arsenic as compare to canna indica which removed 0.341 mg/lit from 1 mg/lit concentration of arsenic in 24 hrs to 288 hrs . Among the both rooted plants the colocasia esculenta gives the good results. Similarly in the two submerged plants water hyacinth removed 0.312mg/lit as compare to Pistia Stratiotes which removed 0.275 mg/lit in 24 hrs to 288 hrs.respectively. as shown in Table I& Fig.1

B. elimination of arsenic by Colocasia esculenta and canna indica

In two rooted plant Colocasia esculenta and Canna indica after 288 hours in which the Colocasia esculent is the best plant tested. It minimizes arsenic from 12.80 % to 57.70% in 24hrs to 288hrs respectively. Similarly canna indica accumulates arsenic from 9.90% to 34.10%.in 24hrs to 288 hrs respectively as shown in Table 2 & Fig.2&3

CONCLUSION

- This work is concentrate on the recognize of suitable rooted and submerged plants for arsenic elimination from water. The arsenic accumulation abilities of Colocasiaesculenta, , Canna indica, Pistiastratiotes , ,Water hyacinth (EichhorniaCrassipes), are tested in this experiment had different growth rates and efficiencies for arsenic removal.

It is concluded that

- Colocasia esculenta is the good arsenic accumulation of arsenic because of it eliminate highest arsenic 57.70 %.as compare to Canna indica which removes arsenic 34.40%
- Water hyacinth is good accumulating plant which is removing highest arsenic 31.3% as compare to Pistiastratiotes which removes arsenic 27.48% respectively.

- Colocasia esculenta and Water hyacinth had the highest new mass production and the highest ability to remove arsenic when exposed to 1 mg/l arsenate for 15 days.

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REVIEW OF CHATBOT SYSTEMS WITH REFERENCE TO KNOWLEDGE AND ACCURACY

Tatwadarshi P. Nagarhalli¹ and Dr. N. K. Rana²PhD Research Scholar¹, Computer Engineering Department, Shri J. J. T. University Rajasthan
Principal², H. J. Thim Trust's Theem College of Engineering, Mumbai

ABSTRACT

With the increase in the computing power available to the normal users and the ease which it provides to the users Natural Language Processing has again gained popularity. One of the important applications of natural language processing is the dialogue systems or the conversational systems or chatbot systems. Chatbot system helps in better engagement with the humans in a language that humans, who do not have any technical background, understand. In the recent times many chatbot applications and system have been developed and launched in the market. Some are useful, but others are less so. But, all these systems target a specific audience with decent cognitive abilities. This paper conducts a detailed critical review of some of these chatbot systems/papers with specific reference to the type of knowledge given to the chatbot system and also the accuracy of these systems to understand the natural language and provide appropriate answers to the asked queries.

Keywords: Chatbot, Dialogue Systems, Conversation Systems, Natural Language Processing, Machine Learning, Chatbot Knowledge.

1. INTRODUCTION

Chatbot or conversational agents are a software program which establishes and conducts seamless conversations with humans [1]. For conducting seamless conversations with humans the chatbot system make use of Natural Language Processing (NLP), in order to understand what the humans are saying and also Machine Learning (ML) algorithms to fetching relevant information for the query asked by the users [2].

Chatbot system have become more popular in the recent times as it reduces the operational costs by as much as 30% for the corporations [3]. Apart from the cost what has attracted researchers and multinational corporations (MNC) in investing huge amount of money in developing the chatbot systems is that it is available 24 hours a day, 7 days a week and 365 days a year. Apart from the downtime for maintenance the chatbot systems are always available for the customers to get information on any product or things and buy those stuffs any time.

Also, the advancement in the field of NLP and ML have made it possible to build a chatbot system which are intelligent and can engage a user in conversations, and in small talks as well. This is the reason why it is estimated that top MNC's expected to invest more than 4.5 Billion Dollars [4]. This is also the reason why there are more than 300,000 chatbot system on the Facebook alone and more than 1.4 billion users are using these systems [3].

For fetching of relevant information for the query asked by the users the chatbot system make use of knowledge provided to it, which is the heart of the chatbot system. This knowledge can be in the form of structured database, unstructured data like text files, or knowledge bases which are written in first order predicate logic or at the basic level in prepositional logic. For retrieving relevant information from a structures database Structured Query Language (SQL) queries are generated and fired by the system. In order to retrieve required information from knowledge bases inference mechanisms like the resolution techniques are used [5].

The most challenging task in extracting the relevant information is through the unstructured data. The unstructured data contains only texts and there are no formal techniques or procedures through which query can be fired to these texts and extract the relevant information. Hence, generally only structured databases are provided to the chatbot systems. But, it is expected that further research is required in order to make the chatbot system more intuitive, and this can be done if the systems are provided with detailed and relevant knowledge. So, this paper mainly focuses on the type of knowledge given to the chatbot systems and its accuracy.

2. REVIEW OF CHATBOT SYSTEMS

In this section critical reviews of 15 papers have been carried out.

The main focus of authors Atiyah A., et. al. in paper [6] is to give and propose a solution to speed-up the process of finding an answer for a given query. To create a chatbot the paper makes use of Artificial Intelligence Markup Language.

BIG DATA ANALYTICS: A SURVEY

Awani Sankhe, Sanketi Raut and Siddiqui Mohd Ashraf

Assistant Professor, Computer Engineering, Theem College of Engineering

ABSTRACT

A very huge data is generated per day from Cloud and modern information systems. Study of these vast data needs a lot of efforts at various levels to abstract information aimed at Decision making. Developed data are complex in structure and high in dimension. The old methods were not adequate to store and analyse the enormous volumes of data. Many experts are doing their investigation for good depiction and examination report. This paper gives the understated fundamentals of big data examination, problems, issues and different enhancements.

Keywords: Big Data, Hadoop, Big data analytics

1. INTRODUCTION

Big data is defined as a large amount of complex and versatile information. Older skills are improved with the benefit of big data. It has been observed that nowadays there is a very large measurement of basic data in different associations, which can be considered valuable in different fields, for example, objects movement, sending sensors, following information and so on. It is playing an important role in revealing hidden information and gaining benefits. Researchers are doing more research than ever on building novel data analysis techniques for big data which has led to the regular development of many different algorithms and platforms. Concentrated situations arise when an institution needs to check its information from individual sites in order to investigate customer criticism, questions that have been administered toward an item. Therefore, various choice makers will go to conclusions based on the extracted information or examination of some information or information expressing weight. Point-by-point analysis is followed by an information search process which is used to separate profitable data from unstructured datasets.

2. BIG DATA

It is providing benefits to many sectors such as healthcare, finance service, educational sector, research and government sectors [1]. According to research by experts, data are becoming raw materials for business. The analysed data are large in volume, are dynamic and the data belong to groups of different data types. These data are generated from many sources such as mobile, social media, YouTube and beyond. As a result, big data has exceptional attractions such as semi-structured, un-structured, heterogeneous, excessive dimensions and flaws.

1. Characteristics of Big Data

Mainly, there are 5 characteristics of Big Data.

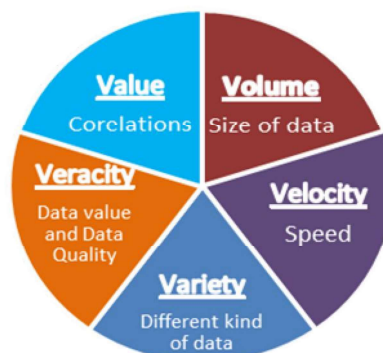


Figure-1: 5V's of Big Data

- i. *Volume*: The amount of data generated and stored. Volume is the mass of data generated in every single second.
- ii. *Velocity*: It denotes towards the speediness of development and distribution of new information.
- iii. *Variety*: Variety states to different kinds of data such as images, videos, texts, audio files, and others. It indicates the type and nature of data.
- iv. *Veracity*: Since a huge volume of information is gathered, not all content is authentic. So, veracity denotes towards the data value and the data quality, as comprehensiveness, legitimacy, accurateness, uniformity, accessibility and suitability.

BOTNET DETECTION USING ANOMALY BASED AND BEHAVIOR BASED DETECTION**Akshay Salvi¹, Shashank Patil¹, Mangesh Kawle¹ and Prof. Ashraf Siddiqui²**¹Student and ²Assistant Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, University of Mumbai**ABSTRACT**

This system introduces two-stage approach for the important cyber-security problem of detecting the presence of a botnet and identifying the compromised nodes that is nothing but bots, before the bot becomes active. The first stage detects anomalies by leveraging large deviations of an empirical distribution. This system proposes two approaches to create the empirical distribution: a flow-based approach estimating the histogram of quantized flows, and graph-based approach estimating degree distribution of node interaction graphs, encompassing both Erdős-Rényi graphs and scale-free graphs. The second stage detects the bots using ideas from social network community detection in a graph that captures correlations of interactions among nodes over time. Behavior detection is done by maximizing modularity measure in this graph. An modularity maximization problem is non-convex. This system proposes an convex relaxation, a effective randomization algorithm, and establishes sharp bounds on an sub optimality gap. This system applies the method to real-world botnet traffic and compares their performance with other methods.

INTRODUCTION

An botnet is a network full of compromised computer nodes which are controlled by a “bot master.” Botnets are mainly used for Distributed Denial-of-Service attacks, click fraud, or spamming. Distributed Denial-of-Service attacks floods an victim with packets/requests by using multiple bots.

Both, spamming and click fraud are extremely harmful to an web economy. And just because of these losses, botnet detection has mainly received considerable attention. Common intrusion detection focuses on individual hosts but is often ineffective in preventing botnet formation because not all hosts are zealously monitored and protected.

Botnets have evolved to bypass these detection methods by using more flexible C&C channels, such as HTTP and P2P protocols. In addition to this more types of C&C channels are emerging day by day, including Twitter. Some methods are been proposed to handle these botnets with more flexible C&C mechanisms by analyzing the communication patterns among hosts.

OBJECTIVE OF STUDY

1. To understand the concept of Botnets.
2. In this project we are using Bot Detection techniques to find the Anomaly and Behavior/Community Based detection in the network devices.

Botnets

The word botnet was derived from “network of robots”. It is a widespread collection of a large number of infected computer system. Each infected system runs a piece of software program known as “bot”. It can be also called as zombie network.

The Botnet attack structure is mainly divided into three layers i.e

- a) Bot Masters: A bot master system keeps the track of machines infected and the tasks they perform. For proper organization of this system Bot Managers are created.
- b) Bot mangers: This Bot managers performs the task which are allocated to them by the Bot masters, to spread out the commands to the Bots & also to report the number of infected systems. They usually send us information which can be said as security patch but those are not security patch but are infected patches send by the zombies.
- c) Zombie Army: Bot Managers create an army of zombies which are nothing but n numbers of infected computers which performs attack under a stealth mode in order to prevent themselves from getting caught up while performing an attack.

Bot Detection techniques to find the Anomaly in the network devices

- a) Anomaly Detection is used to Detect the Nodes are processed anomaly or not. In this module load the dataset and first flow based detection. This Detection is based on the splitting the node on connection. Next

COLLEGE APPLICATION FOR PARENTS**Sayed Saif Ali, Mohammad Zakir Serkhel and Mohammed Suhail Shaikh**Student, Computer Department, Theem College, Boisar

ABSTRACT

In recent years the Android Technology with web services has brought many drastic changes in mobile application development field. The creation and management of accurate, up-to-date information regarding a student's academic career is crucial for the colleges. Now a days the information to parents regarding their ward is provided through post cards, SMS or E-mail, but these techniques are very time consuming and lengthy. Hence this application provides a solution through a simple interface for maintenance of student information and also helps parents to get detailed information regarding their ward such as attendance, fees due, marks, important notice, event details, etc. It also contain query message option for parents so that parents can interact with the college faculty through this application. It also facilitate parents to gain all the notifications about the activities held in the college. Each individual parent will be provided with the details of his/her ward only. Also we have seen over the years that the process of notice boards, important notification about academics has been carried out manually almost across all educational institutions. The process is not only time consuming but also inefficient. This traditional system requires a manual work of writing notifications, taking printouts, displaying it on notice boards and also requires students to watch periodically. It uses a lot of paper work. Today, we need not to maintain paper based Notice boards. Following this thought, we have developed a system based on the concept of web services which is implemented on Android mobile application as well as on PC that communicates with the database residing on a remote server.

Keywords: College Management, Machine Learning, Chatbot, Parents Portal.

INTRODUCTION

This Android Application provides you with 24/7 access to your child's academic information. With a parent portal account, you may log on at any time to view information regarding your child's schedule, grades and attendance. Please read the information on this page. Answers to many of your questions may already be covered here. The Parent Portal is a confidential and secure online web portal where you can get current information about your child's school attendance, grades, assignments, schedule, etc. Depending on your child's grade, you may have online access to student schedules, attendance, progress reports, report cards, and teacher grade book. This module is designed for staff, which use mobile phone to take attendance, upload result and upload college notifications as well as discussion forum. The entered admin details are encrypted and sent to server for verification. Only after successful authentication the operations are performed. If username and password cannot match, he/she can enter in to next static screen. In the Faculty module they can see their research papers, placements data and Alumni of student data.

OBJECTIVES OF STUDY

1. To understand the concept of Android Application Development.
2. To understand the concept of Chatbot Interaction.

Chatbot is a piece of software that conducts a conversation via auditory or textual methods. Such programs are often designed to convincingly simulate how a human would behave as a conversational partner, although as of 2019, they are far short of being able to pass the Turing test. Chatbots are typically used in dialog systems for various practical purposes including customer service or information acquisition. Some chatbots use sophisticated natural language processing systems, but many simpler ones scan for keywords within the input, then pull a reply with the most matching keywords, or the most similar wording pattern, from a database.

A. LITERATURE SURVEY

Pallavi Mohadikar, Nasrin Mulani, Afnan Shaikh, Rachna Sable, College Parent Interaction using Android Application. They showed how concept of web services will be useful for communication between remote server and Android application. With the help of this application parents' area able to access all the details regarding their ward.

S.R.Bharamagoudar ,Geeta R.B. , S.G.Totad. Web Based Student Information Management System. Provides a simple interface for maintenance of student information. It can be used by educational institutes or colleges to maintain the records of students easily. The creation and management of accurate, up-to-date information regarding a students' academic career is critically important in the university as well as colleges.

AFFECTED AREA AND DISEASE DETECTION IN LEAF USING MACHINE LEARNING**Atik K Khan, Pratiksha S Chamute, Sahil N Sankhe and Sarita Tiwari**Student, Computer Department, Theem College, Boisar

ABSTRACT

Disease detection, in the present world has become a very common task to all. Out all the disease detection techniques, achieving the best possible result has become the main goal of most researchers around the globe. Out of all those techniques, Convolution Neural Network (CNN) is the most popular image processing technique by which the target image is retrieved based on the useful features of the give image. Agricultural productivity is something on which economy highly depends. This is the one of the reasons that disease detection in plants plays an important role in agriculture field, as having disease in plants are quite natural. If proper care is not taken in this area then it causes serious effects on plants and due to which respective product quality, quantity or productivity is affected. Proposed system works in two phases the 1st phase deals with training data sets. This include training both healthy as well as diseased data sets. The 2nd phase deals with monitoring the leaf and identifying the disease using CNN Algorithm. This system is used to detect affected part of leaf in percentage and its disease. The system thus tries to reduce the speed of disease detection which was once a crisis of older disease detection system.

Keywords: Image Processing, Machine Learning, CNN Algorithm, Leaf Disease.

INTRODUCTION

Disease detection is one of the latest trends which have become a critical part of several disease detection applications. Several approaches and techniques have been employed to make the overall disease detection stage much more close to perfection. The studies of plant can be determined by observable patterns of specific plant and it is critical to monitor health and detect disease within a plant. Due to the exponential inclination of population, the climatic conditions also cause the plant disease. Symptom of plant disease is a visible effect of disease on the plant. Symptoms can be change in colour, change in the shape or functional changes of the plant as per its response to the pathogens, insects etc. Precise, accurate and early diagnosis may reduce the usage of pesticides. The system works in two phases the 1st phase deals with training data sets. This include training both healthy as well as diseased data sets. The 2nd phase deals with monitoring the leaf and identifying the disease using CNN Algorithm. The concept of image processing with data mining technologies assists us in following purposes: 1) To recognize infected leaf 2) To measure the affected area 3) To find the shape of the infected region 4) To determine the color of infected region 5) To influence the size and shape of the leaf.

OBJECTIVES OF STUDY

1. To understand the concept of Image processing (IP).
2. To understand the concept of CNN algorithm.

With a wide range of image processing systems coming into action the main objective is to achieve the most optimum system where we implement algorithm to generate the best results. There are several techniques by which we can generate the best result, but each varies in their performance. So, the objective is to study the various available algorithms and to make use of best algorithm to generate the desired results.

TO UNDERSTAND THE CONCEPT OF CNN ALGORITHM

To achieve the best performance, in this project we apply a Convolutional neural network (CNN) algorithm, for image recognition and classification. Each image is made of numerous pixels that enclose some values. These values are applied to study each image. Moreover they can be used to compare with other such images in datasets to detect infected leaf. CNN image classifications takes an input image, process it and classify it under various categories. Moreover to help a common user to understand the entire process of image processing the system will be displaying various image processed features out of which RGB values, GLCM matrix are a few. Overall we implement a system where we are able to recognize infected leaf and measure the affected area of a leaf.

A. LITERATURE SURVEY

Several researchers have carried out their study in the field of Image Processing and have made many notable discoveries. Jiang, P., Chen, Y., Liu, B., He, D., & Liang, C. (2019). Real-Time Detection of Apple Leaf Diseases Using Deep Learning Approach Based on Improved Convolutional Neural Networks.

PEOPLE COUNTING USING COMPUTER VISION**Shaikh Khalid Alim, Prof. Abdul Sadique and Nashra Mam**

ABSTRACT

A real-time People Counting System is presented in this Paper. Using a single overhead mounted camera, the system counts the number of people going in and out of an observed area. Counting is performed by analyzing an image zone composed by a set of virtual counting lines.

The system runs on a Commercial PC, does not need a special background and is easily adjustable to different camera height requirements. We have tested the performance of the system, achieving a correct people counting rate of 95%.

INTRODUCTION

Tracking people using surveillance equipment has increasingly become a vital tool for many purposes. Among these are the improvement of security and making smarter decisions about logistics and operations of businesses. Automating this process is an ongoing thrust of research in the computer vision community.

With many different camera locations, we are very interested in finding out how many people exited, and which routes they used to exit the building. Our ultimate goal is to uniquely identify the people who exited, however that is beyond the scope of this paper.

Thus the aim of this work is to automatically count the number of people to use each exit in a particular video. To do so, it will be necessary, to first detect the people in the video, then to track the movements of each person, and finally decide if they exit.

COMPUTER VISION

The scientific discipline of computer vision is concerned with the theory behind artificial systems that extract information from images. The image data can take many forms, such as video sequences, views from multiple cameras, or multi-dimensional data from a medical scanner. The technological discipline of computer vision seeks to apply its theories and models to the construction of computer vision systems.

Sub-domains of computer vision include scene reconstruction, event detection, video tracking, object recognition, 3D pose estimation, learning, indexing, motion estimation, and image restoration.

DEFINITION OF COMPUTER VISION

Computer vision is an interdisciplinary field that deals with how computers can be made to gain high-level understanding from digital images or videos. From the perspective of engineering, it seeks to automate tasks that the human visual system can do.

Computer Vision tasks include methods for acquiring, processing, analyzing and understanding digital images, and extraction of high-dimensional data from the real-world in order to produce numerical or symbolic information, e.g. in the forms of decision

REQUIREMENTS

Python is an interpreter, high-level, general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

PyCharm is an integrated development environment (IDE) used in computer programming, specifically for the Python language. It is developed by the Czech

Company JetBrains. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems, and supports web development with Django as well as Data Science with Anaconda

OpenCV (Open source computer vision) is a library of programming functions mainly aimed at real-time computer vision. Originally developed by Intel, it was later supported by Willow Garage then Itseez (which was later acquired by Intel). The library is cross-platform and free for use under the open-source BSD license.

A Camera is an optical instrument used to capture still images or to record moving images, which are stored in a physical medium such as in a digital system or on photographic film. A camera consists of a lens which focuses light from the scene, and a camera body which holds the image capture mechanism.

APPLICATION OF IOT BASED SYSTEM FOR AGRICULTURE IN INDIA

Mohammed Raza Ansar Baig, Prof. Maya Gharat, Mohd. Aman Muneer Ahmed and Prof. Ahmed Sheikh
Computer Engineering Department Them College of Engineering, Boisar (E)

ABSTRACT

We live in 21st century, everything here is technology based. Agriculture plays vital role in development of the country. In India most of the people are having farming as prime occupation. There are some issues in traditional way that causes bad effect in farming. Hence to overcome this issue we have to make agriculture smart using automation and IOT. The highlight feature of this system is the precision farming, soil moisture, agricultural drone. This system will work automatically as per certain scenarios arises.

1. Keywords: Soil moisture, Agricultural Drones, IOT, smart greenhouses, smart farming, precision farming.

2. INTRODUCTION

We live in 21st century, everything is automated. In fact, it should because doing such things without technology is very difficult task. Agriculture is considered as the basis of life for the human species. It plays main role in the growth of country's economy. It also provides large ample employment of economic condition of the country. Unfortunately, many farmers still use the traditional methods of farming which result in low yielding of crops and fruits but wherever automation has been implemented and human beings had been replaced by automatic machineries, the yield has been improved IOT is one of those growing technology. it is a shared network of objects where these objects interact with the internet.

According to the current sex ratio of earth. The global population is set to touch 9.6 billion by 2050. So to feed this large population, the farming industry must embrace IOT against the challenges such as extreme weather conditions, rising climate change, insufficiency of water and the demand for more food has to be met.

3. What is smart farming and what its purpose?

Smart farming is a capital hi-tech system of growing food cleanly and sustainable for the masses. In IOT based smart farming a system is built for monitoring the crop field with the help of the sensors and automating the irrigation system. The farmer can monitor the field condition from anywhere and it is highly efficient as compared with the conventional approach.

4. Purpose

- automation
- efficient
- climate independency
- reducing wastage of resources
- maximizing crop yield

5. Sensors and equipment-

What is sensor? It is a device which detects or measures a physical property and records, indicates, or otherwise responds to it. Precision agriculture allows farmers to maximize yield using minimal resources such as water, chemical fertilizers and seeds by developing sensors and mapping fields, farmers can begin to understand their farms at micro scale. These sensors will sense different conditions and will work according to it. Following are the few sensors which are used in agriculture.

1. Agricultural Drones -

Many types of drones are available today, but not all are good candidates for farming. Those suitable for agricultural applications fall into two categories: Fixed-winged and multi-rotor. These fixed-winged drones have long range capacity. An advantage when a large area is to be covered. And the multi-rotor

ADVANTAGES**1. Increased production**

Optimized crop treatment such as accurate planting, watering, pesticide application and harvesting directly affect production rate.

2. Water conservation

Weather predictions and soil moisture sensors allow for water use only when and where needed.

3. Low cost

Automating process in planting, treatment and harvesting can reduce resource consumption, human error and overall cost.

4. Remote monitoring

Local and commercial farmers can monitor multiple fields in multiple locations around the globe from an Internet connection. Decision can be made in real- time and from anywhere.

DISADVANTAGES**1. Compatibility**

Currently there is no international standard of compatibility for the tagging and monitoring equipment. I believe this disadvantage is most easy to overcome. The manufacturing companies of this equipment just need to agree to a standard, such as Bluetooth, USB etc. this is nothing new and innovating needed.

2. Complexity

The IOT is a diverse and complex network. Any failure or bugs in the software or hardware will have serious consequences. Even power failure can cause a lot of inconvenience.

7.CASE STUDY**PRECISION FARMING BY DTAC**

In Thailand, local telecommunication firm DTAC, fully owned by Norwegian telecommunications group Telenor, has launched a precision farming IOT solution through a partnership with Thailand's Department of Agriculture (DOAE) and National Electronic and Computer Technology Centre (NECTEC).

The government agencies aim to equip local farmers with the technology they need to face challenges, such as climate change, plant diseases and soil moisture.

They launched a one-year pilot project that introduces this IOT based solutions to monitor, analyses and predict the factors affecting cultivation. The new solution will allow farmers to control the quality of agricultural product and reduce production Cost.

DTAC is responsible for the wireless internet connectivity and cloud computing, while NECTEC will develop and research on sensory system.

8. CONCLUSION

Implement agricultural IOT solutions in a successful manner. The proposed system will benefit for farmers while providing them a facility like analyzing health of the crop by its color, providing only required water to crops by knowing the moisture level of the soil. This will reduce the wastage of water.

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HEALTH DIRECTORIES BASED ON ANDROID APPLICATION**Aditya Jadhav¹, Shubham Mahadik¹, Asher Sayed¹ and Prof. Muhib Lambay²**U.G Student¹ and Assistant Professor², Department of Computer Engg. Theem College of Engineering, Boisar, University of Mumbai

ABSTRACT

In the last decade significant progress have been made in smart phone technology as well as wireless area network technologies. Presently, due to hectic lifestyle to cope with fast pace more and more people are facing health problems. Health Directory System thus becomes an inevitable part of every family. Getting efficient and quick healthcare becomes necessity; it is an approach which can be adopted by hospital/doctors to provide quick access to health directory services to the needed person. Such as Online Medical Prescription, Scheduling Appointment, searching about nearest Hospital and about Doctor's, Uploading of medical reports with security measures necessary while consultation. One way to solve this problem is using the Android Application. Android is open supply mobile software with huge user base and simplified mobile app development method. Enterprises are leveraging Android and creating custom mobile apps for easy adoption and increase value for their business and help them to use services on the tip of their fingers. The health directory app would be build using Java and Rich Android Libraries of open source Android SDK. It would help people to search for various health care services by specifying various set of criteria and which in turn would show them appropriate services there by helping people to get proper treatment.

INTRODUCTION

When people fall sick, they often have limited information beyond their own prior experience and the recommendations of family and friends regarding which doctor to go to. Most of them who do not know the exact location of the offices of the doctors or the way to contact their intended doctors have to go through much hassle. Physicians, when making referrals to specialists, might also find themselves equipped with inadequate data. This project aims at providing them an easy way to locate the desired doctors in the country through an android app and, if needed, contact them in an instant straight from inside the app. With more individuals turning to the net as a supply of health care information, online doctor directories and corresponding mobile applications could become very valuable assets in the near future. Unfortunately, the available sites are frequently difficult to use, not objective, or contain data that's outdated, inaccurate, or incomplete. Moreover, there is no suitable android mobile application which can connect a person to his desired doctor. Our Health Directory Application is a web based application which is available in the form of a mobile application for the android platform. The project aims at maximizing the ease of use and navigation, for example, by incorporating advanced search functions and interactive features; providing a wide range of content, including the location of the office of any doctor on the Google maps; and ensuring the credibility of data by regularly updating and monitoring for accuracy.

EXISTING SYSTEM**A. Similar Online Systems and Web Applications**

There are a few similar online systems or web applications which have such specific categorization of the doctors in India based on both their specialty and area of the city they live in, which is there in our proposed system Health Directory Application Besides, the few such websites which intent on providing the users with an online directory of the doctors in India is often found to contain inadequate, outdated and sometimes inaccurate data. Moreover, none of them are so user friendly as our proposed project Health Directory Application is. Some such local websites worth mentioning in terms of application and built-in directories are

B. Similar Mobile Applications

Though current age is being dominated by smartphone technology, if we consider the case of mobile applications, there is none in the online mobile application stores which aim at locating doctors' offices in the context of India. There are some mobile applications which tend to do so in the context of some technologically developed countries like the USA, England, Canada, etc. But when it comes to the countries which are technologically less developed in terms of health management, only a few have such facilities. Our project aims at inspiring those countries through setting an example by making such a system both popular and more accessible to people of all age groups in a technologically developing country like India. In order to do so, our project permits the users to access the system on android smartphones in a user-friendly manner with the app version of Health Directory Application.

DEXTER: A DESKTOP ASSISTANT

Anisa S. Gilani¹, Shubham Y. Dalvi², Unnati R. Patil³ and Awani P. Sankhe⁴
Student^{1,2,3}, Assistant Professor⁴, Computer Engineering, Theem College of Engineering, Boisar

ABSTRACT

The use of computers has taken a great turn up in the modern world. The less tech savvy people find it difficult to use. To overcome the problem Virtual Assistant (VA) was developed. Many companies have launched virtual assistants like Microsoft's Cortana, Apple's SIRI, google assistant and many more. However, most of the VAs are for mobile phones. The most important means of communication is language and the primary medium being the speech. The interactions between humans and computers that is their communication is called Human Machine Interaction using Human-machine Interface (HMI). In this proposal, a simple stand-alone desktop application called DEXTER is presented. Application works on Natural Language Processing (NLP). The input given to the DEXTER is by speech using a microphone. It first listens to voice, analyze it and then performs its tasks. The output is by both speech and text. The user can use the application without the microphone by using its GUI. DEXTER has simple and easily understandable Graphical User Interface (GUI). The application works on Windows Operating System (OS). DEXTER helps the user to search on Wikipedia, to send emails and various online services. It also helps to perform basic operations like open OS application, play music, to display time, date, battery and much more. By paying attention to what user likes, what user wants to share, Dexter certainly provides the users with an experience where user's individuality is celebrated and not ignored.

Keywords: Desktop Virtual Assistant, Graphical User Interface (GUI), Human Machine Interface (HMI), Natural Language Processing (NLP), Online services.

INTRODUCTION

Today, we humans rely upon machines and every machine is leaning towards automation, may it be home or car. There is a tremendous change in technology over the last few years. Believe it or not, in today's world you can interact with your machine. Since human brain is more responsive to voice rather than written text hence virtual assistant is gaining hike in the industries and it is a major innovation for various other applications. The efficient way to interact using voice commands is human-machine interaction. To achieve this, we need to use speech to text API for understanding the input. To interact with computers, an intelligent virtual assistant (IVA) or intelligent personal assistant (IPA) which is a software agent, came into existence. Many companies have developed virtual assistant applications such as Apple's SIRI, Microsoft's Cortana, Google Assistant, etc. Many of these applications are limited to mobile devices only. In this proposal, an idea for desktop based virtual assistant called DEXTER is implemented. This application uses Natural language processing for both input and output. It uses query processing by matching input with available keywords and it response back with output.

OBJECTIVES OF STUDY

1. To understand the concept of virtual assistant.
2. To understand the concept of Natural Language Processing.
3. To make a desktop based assistant with GUI.

CONCEPTS**A. Virtual Assistant**

A virtual assistant is an application that understands natural language i.e. voice commands and completes the end users' task. Historically these tasks were performed by personal assistant or secretary where there was a lot of paperwork and it was time consuming. Virtual assistant basically performs task for the end users. The tasks include searching Wikipedia, playing music, setting reminders, open applications, etc. Some of the most popular virtual assistants are Apple's SIRI, Microsoft's Cortana, Google Assistant, Amazon's Alexa. They use natural language processing (NLP) to match user voice input to executable commands.

B. Natural language processing

NLP is one of the major component of AI which processes human voice. Starting with collection of data(voice), and then analyzing it, the NLP converts this data into text. This text is actually the command. Now NLP performs the task based on the command and output is generated in the form of text and later it is converted into speech. NLP helps humans to interact with machines.

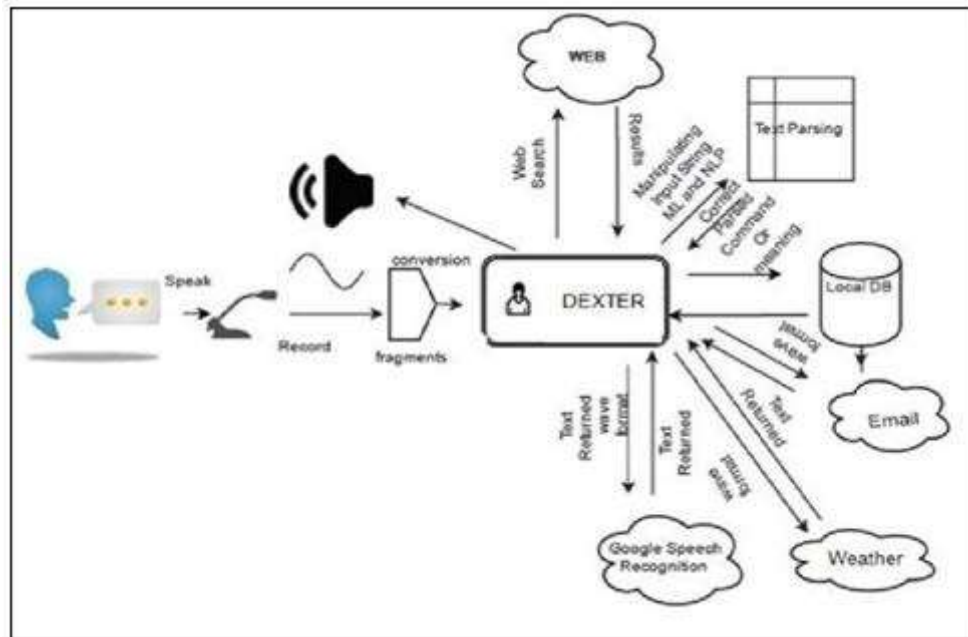


Fig. 1. Proposed System of Dexter

The another module we are using is Text-Parsing, the advantage of this module is that suppose a non-technical person gives command "Dexter Please Open Google" but we have only "Open Google" in our program, text-parsing module does the work of catching only the understandable command from the fragments and passing it to Dexter to perform the action according to the command. If user gives command to 'Send mail' then it will go through Email/SMTP module. While sending the email Dexter will ask some basic things like "what should I say, who is recipient?", etc. For fetching recipient we are using database so if you say the recipient name as Pratik, that mail is directly send over the email address of Pratik otherwise if the given name is not present in database we have to tell Dexter the full email address of that recipient. This project is based on AIML 1.0 and uses PY-AIML for using the AIML interpreter in python.

CONCLUSION

DEXTER performs various functionalities such as managing various applications on just the voice **commands**. It contains key features like Voice Pattern Detection, keyword parsing, etc. which helps the end user to use various functionalities and services of the desktop. DEXTER is language barrier independent which actively responds to user's voice commands. The application will let the user add data such as calendar entries, set an alarm, or even reminders. System is fully GUI based, easy to operate and user-friendly. Virtual Assistant reduces paperwork. Hence, we conclude that DEXTER is a desktop assistant with GUI with both speech input and output, that is, you will speak to it and it will speak back to you. All the objectives that had been charted out in the initial phases were achieved successfully.

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COMPARISON OF PI AND FUZZY CONTROLLED ACTIVE POWER FILTER UNDER NON-LINEAR LOADS

Navajyothi Abhijit Katela and Aqsa Shaikh

Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

This paper presents improvement of power quality with the PI and FUZZY logic controller for varying load conditions. Recently, a wide spread of power electronic equipments has caused an increase in power contamination (harmonic disturbances). Non-linear loads draw the harmonic currents of various types like characteristics, non-characteristics, inter-harmonic, sub-harmonics, fluctuating currents, unbalanced currents from main power supply. This type of loads called as no-linear load. The current harmonics are generated by non-linear load such as rotating machines, magnetic circuits like transformers, chokes, reactor, magnetic ballast and so on due to saturation in their magnetic circuits. Many fluctuating loads like frequency furnace, switching devices, electric hammers, switching devices behaves like a non-linear load. Optimization of the parameters of shunt active filter by fuzzy logic control is used in place of using conventional PI controller. A fuzzy logic SAPF is used to regulate DC capacitor voltage to improve APF dynamics, to ensure ac source currents produce high power quality. The main aim of APF is to reduce the harmonic contents within IEEE-519. By using fuzzy controlled APF we can achieve better performance of APF.

INTRODUCTION

Now-a-days, the dependency on the electricity is increasing day by day because of modernization and the utilization of more electronic devices. Power quality is to maintain the parameters of power at all parts of power system i.e. generation, transmission, distribution and consumer end. Since the pollution of power is much severe at consumer end, so it is important to study and maintain the power quality at consumer end. Here we are having number of reasons how the power is getting polluted including natural causes such as lighting, flashover, equipment failure and faults. Customer equipment also pollute the system and they draw the nonlinear current and act as nonlinear load. Increased non-linear equipment's and varying loads demand the compensation of the undulations caused. There is a drop in power factor and high degree of harmonics caused by these non-linear loads. APF removes difficulties related to reactive power and harmonics, simultaneously. There is a dc capacitor and a voltage source inverter together, designed to uplift the power factor and maintain the transmission system stability. APF varies the magnitude of the processed ac voltage from the inverters by using of pulse width modulation or by controlling the dc-link voltage. Thus draws lead/lag reactive power from the supply.

In control and design of APF, instantaneous reactive power theory is the basis for compensation current calculation. Here, the mains voltage is assumed to be ideal source, while, practically it is distorted. Under such scenarios, this theory may not be valid for applications. The p-q theory, since its proposal, has been applied in the control of three-phase active power filters. However, power system non-ideal voltages, in distorted voltage systems, the p-q theory control is not enough. This paper presents performance improvement of the shunt active power filter (SAPF), composed of the voltage inverter bridges having six IGBTs switches, DC-bus capacitor voltage source, and passive filter (Lf, R f) connected to the line supply voltage source fed non-linear load.

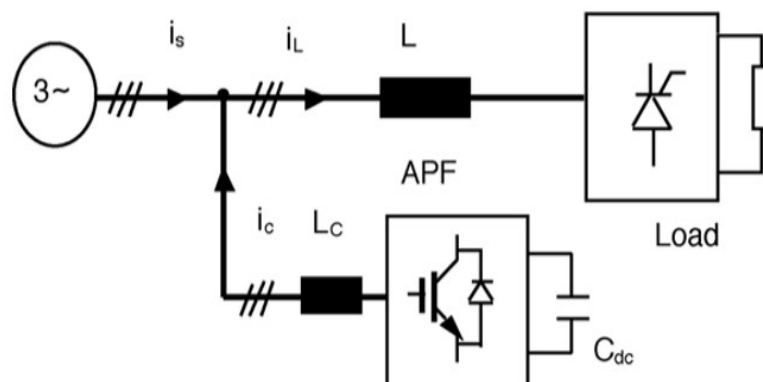


Fig-1: Block Diagram of Active Power Filter

OBJECTIVES OF STUDY

1. Comparison of PI and Fuzzy controlled APF.
2. Power quality improvement.

SUN TRACKING WITH AUTOMATED CLEANING SYSTEM FOR SOLAR PV MODULES

Arshad Sorathiya, Shruti Kambli, Akash Sharma, Yadnesh Surve and Navajyothi Katela

Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

The solar photovoltaic panel are basically worked dusty environment which is one of the case in developing countries such as India. The major factor that reduce the generation of power are the pv panel, shadows, snow, high temperature, dust and dirt, bird droppings, pollen and sea salt . It is usually the efficiency of the solar panel can be decreased by up to 50% in a dust environment as the interference with the amount of direct sunlight received the pv array. This automated system is made using 8051 microcontroller which controls the stepper motor coupled with the gear box(40:1 ratio) . The solar panel rotates in a day. By using this project we increase solar panel efficiency.

Keywords: pv solar panel, single axis sun tracking, dust position, automation cleaning, tracking system.

INTRODUCTION

Population growth is increasing day by day .electricity is also required for this purpose.But the demand for electricity in india is increased. India stand fourth place in producing electricity and stands a third place in consuming electricity. In modern day,all area of industries is going to be automated , economically and environment freely to reduce the global warming problem.

The sun emit solar energy at an extremely free price therefore there is ample availability solar power in nature.If all solar energy should be transformed into usable forms, it will be more adequate to supply the worlds strength demand ,however this is no longer possible because of existence in the atmosphere such as impact of clouds,dust and temperature. The sun travels through east to west per day .A single axis tracker increases annual output by approximately 30%. The benefits of the tracking system are to collect solar energy.

The manual cleansing has risks like danger of team of worker accident and damage of the panels, movement, difficulties, poor upkeep etc. Accumulation of dust from the outdoor environment on the panel of solar photovoltaic system is natural. There where studies to showed that the accumulated dust can decrease the performance of solar panels but the result were not clearly quantified . so it is very important to remove dust from the solar cells. With the help of wiper on the bases of object able. We can remove dust from solar panels and increase the efficiency of solar cells.

The effectivity of solar panel also calculated after cleaning the surface for one day, one week, and a one month. And subsequently evaluating each the efficiencies it is proved that photo voltaic panel efficiency increases considerably. Thus the developed model enhances the photo voltaic panel performance. Various energy generating products like coal, gas, renewable, diesel and their some of them are going to deplet in few decades.

OBJECTIVES

1. To avoid dust associated problems on solar panel.
2. To clean solar panel effectively.
3. To increase efficiency of solar panels by 30% rotation.
4. To increase efficiency of solar panels by cleaning it efficiently.

METHODOLOGY**A.Implementation of the sun tracking and self-cleaning of solar pv modules**

Sun tracking structures are designed in a way to track the photo voltaic azimuth angle on a single axis. In single axis monitoring machine the collector is circled round solely one axis, the solar panel moves tracing an angle from the sunrise to the sunset. This attitude traced by the sun is known as the azimuth attitude is defined as the angle between the lines due south and projection of everyday to the collector as proven in Figure 1. Here we have used vertical axis with motion in the east-west (E-W) direction. The automatic cleaning and tracking systems are implemented the use of a dc motor, equipment field (40:1), shaft, and sliding rod photo voltaic PV modules and round steel rings for contacts as shown in Figure 1. Then control of the stepper motor and the cleaning association is done the usage of a microcontroller. The implementation of Sun monitoring cum cleaning mechanism for Solar PV module is explained in the two steps (A and B) mentioned in subsequent paragraph.

ANTI-THEFT SYSTEM BASED ON GSM AND GPS MODULE**Jadav Ketan Subhash, Pawar Akash Vijay, Saroj Shailesh Kumar Rajendra, Maurya Aakash Awadhraj
and Prof. Rahatullah Khan**Department of Electrical Engineering, Theem College Of Engineering, Boisar

ABSTRACT

In this paper a vehicle following plan is proposed which track the vehicle and offers to imprison the vehicle in a base timeframe when it is lost. Vehicle following and bolting framework has a Global Positioning System (GPS) and a Global System for Mobile Communications (GSM). Proprietor can send a proclamation whenever to the gadget which is in the vehicle. The gadget is secret key ensured. Proprietor's message must be fused with the secret phrase to open the gadget. At the point when the gadget is opened, at that point it will give the co-ordinate of the vehicle through the message. In the event that the vehicle is filched, proprietor can direction the gadget to bolt the entryway of the vehicle and proposed framework will consequently inform closest police headquarters about taking occasion. Haversine equation is utilized to discover the closest police headquarters from GPS information and back end database. At that point the closest police headquarters may initiate vital activities to recoup the vehicle. The entire framework is fueled by a battery-powered battery and connector. This paper clarifies the foreseen outcome and gives some substance about future execution.

Keywords: Vehicle tracking system, Control unit, PIC-16 microcontroller, GPS & GSM technology, Cellphone, Google map.

INTRODUCTION

There are various GPS (global positioning system) based after structures winning today. Still in the Indian circumstance they are not in a lot of usage because of economy. Correspondingly, wherever all through the world the systems presented are fantastically for the four wheelers; yet for a country like India where a lot of the people thrives using bicycles, here is the most affordable wellspring of an adversary of theft following structure. In current days, the prosperity of private and open vehicles is a critical concern. To ensure prosperity while simultaneously traveling, GPS following system is presented in vehicle. Vehicle following system using GPS and GSM empowers customer to discover the vehicle through Short Message Administration (SMS) in cell phone. Police can seek after the sign created by the accompanying system to locate a taken vehicle. Various parameters like land encourages, speed, partition, etc can be gained and subsequently observed on a propelled guide using programming.

Watching and administering adaptable assets are a trot need of associations overseeing transportation organizations, and a part which private vehicle owners would enjoy. Extending the use of such a system to against theft use was the fundamental objective of the present structure plan. The structure made arrangements for executing a vehicle following system which can help a customer with following the vehicle and offer unfriendly to burglary organizations. It uses a mobile phone to talk with the structure, which uses GSM and GPS advancements to give the perfect organizations. The work also intended to develop a shrewd Graphical UI (GUI) for the phone application. In this paper, a steady Arduino based vehicle following system with GPS and GPRS shield is associated with the moving vehicle to enable the owner/customer to pursue the territory of that vehicle.

This proposed structure will constantly screen a moving vehicle and report the status of the vehicle. For doing so an Arduino UNO board with PIC16 microcontroller is interfaced to a GSM module and GPS authority. The GPS recipient will always give the data indicating the circumstance of the vehicle to the extent degree and longitude ceaselessly. The GSM module will send the position (Latitude and Longitude) of the vehicle to telephone from a remote spot. Comparable data is moreover appeared on LCD. Google map shows the zone and name of the spot on PDA dynamically.

OBJECTIVES OF STUDY

The main objectives of the proposed pic16 microcontroller based tracking system

1. The primary goal of the project is an acquisition geographic coordinates of vehicle in real time using GPS receiver.
2. Communication of information about location of vehicle using the GSM module.
3. Display name of the google map in real time using cell phone and position.

REVIEW & PROPOSED BRAIN CONTROLLED MOTOR VEHICLE USING ELECTROENCEPHALOGRAM (EEG)

Akshay Prajapati, Bhaskar Rai, Ramesh Prajapati, Ganesh Jaiswar and Prof. Rahatullah Khan
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

Brain controlled motor vehicle using EEG is the device that can be controlled using the user's brain signals. Brain Computer Interface (BCI) is a one of the technique to communicate with human brain through computer. The purpose of this project is to provide disable and paralyzed people to move them freely without any human assistance by brain signal. It utilizes an EEG (Electroencephalogram) headset to secure information, orders and unravel the informational collection on the equipment and accomplishes wanted directions is dependent on the motor vehicle. The technique which is used to detect electric activity in brain is Electroencephalography (EEG) brain computer interface. EEG measures the voltage fluctuations in the brain and the data which are obtained from EEG sensor is stored in controller. The brain wave measurement is delivered to the brain computer interface unit, which is analyzed and amplified and classified by attention and meditation level of brain that is Alpha, Gama, Beta, wave to headset then to arduino consist microcontroller had been program as per desire to our motor vehicle.

Keyword: Electroencephalogram (EEG), Brain Computer Interface (BCI), Bluetooth Module, Microcontroller (Arduino), Motor Vehicle.

INTRODUCTION

The human brain is made up of billions of interconnected neurons. The patterns of interaction between these neurons are represented as mind and emotional states in keeping with the human thoughts, this sample may be converting and producing different electrical waves. A muscle contraction will also generate a completely unique electrical signal. The manipulate instructions is probably transmitted to the motor wheels that is with this entire mechanism, we will move a motor wheels in keeping with the human Thoughts and it may be grew to become with the aid of blink thoughts and it could be became through way of blink muscle contraction. electroencephalography (EEG) is the measurement of electrically with in the inhabitant mind. Thoughts wave sensors are used in scientific use, however are used the brain control interface (BCI) and neuron feedback . the BCI is a right away communication pathway between the mind and an external device to provide direct verbal exchange and manipulate among the brain and physical devices by translating different styles of brain activity into commands in real time to control the motor vehicle, EEG and eye-blinking indicators are wanted. on this machine we have a tendency to use easy unipolar electrode to report EEG sign from the brow . We've got the sign interest

In addition, we moreover extract the attention-blinking indicators. Consequently, attention and eye-blinking alerts are collected as the management alerts through a Bluetooth interface and therefore they electrically interface in the motor vehicle and as a consequence the motor controlled might be controlled. on this assignment brain controlled motor vehicle the usage of EEG the are structures which can bypass traditional channels of conversation (i.e., muscle mass and mind) to provide direct conversation and control between the human brain and bodily devices by way of translating exceptional styles of mind activity into commands in actual time with those commands a cell motor vehicle may be controlled. the goal of the motor vehicle which can assist .

The disabled human beings of their each day lifestyles to do a little work impartial of others. Here, we analyze the brain wave alerts. Human brain includes thousands and thousands of interconnected neurons in line with the human mind, this pattern will be changing which in turn produce extraordinary electric waves. a muscle contraction may even generate a completely unique electrical signal these types of electric waves may be sensed by using the mind wave sensor and it's going to convert level analyzer unit (lau) will receive the mind wave raw records and it'll extract and procedure the sign the usage of arduino then the control instructions could be transmitted to the motor vehicle to process with this whole device, we are able to move a motor vehicle consistent with the human mind and it may be grew to become by using blink muscle contraction.

It's a manner of recording and monitoring mind activities with the usage of electrodes connected to someone's head. essentially, the electrodes file pastime through electric impulses that the brain neurons emit to speak with the rest of our bodies. Up till the last few years, electroencephalography has, for the most element, only been to be had in hospitals and different medical institutions in which technicians use very steeply-priced EEG gadget

REVIEW & PROPOSED CONTROL SYSTEM SCHEME FOR TRANSIENT STABILITY

Suraj Padhi, Gauresh Kumbhar, Amit Shukla, Kaushal Sudra and Prof. Raees Ahmad

Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

Power system transient stability phenomena is associated with the parallel operation of synchronized machines. It becomes important with heavy power transmissions through long distance. From the viewpoint of system theory, power system transient stability is a strongly nonlinear, high-dimensional problem. The transient stability explains swing equation while dynamic stability deals with transient period. In this paper, analysis of transient stability is done with the help of control system based study where transfer functions of the different equipments are calculated. Determination of stability using the proposed method is conservative and may be appropriate for power system operation as well as planning purposes. The analysis of fault based on transfer function modeling makes the study more accurate. The MATLAB/simulink model is designed for the analysis of transient stability during fault and a brief algorithm is also presented.

Keywords: Power System, Faults, Transient Stability, Swing Equation, Dynamic Model, Transfer Function

INTRODUCTION

An electrical power system is widely categorized into - supply of power through generators, the transmission system that transports power to the load, and also feeding the power to the consumers via distribution system. The Power System Stability Terms and Definitions as "The ability of an electric power system, for a given initial operating condition, to regain a state operating equilibrium after being subjected to a physical disturbance, with most system variables bounded so that practically the entire system remains comprehensive".

If the stability of power system is disturbed, it not only causes severe blackouts but also when exposed to various contingencies may lead to steady-state, transient or dynamic system instability. Voltage frequency and quantity of power provided to the loads is the prime concern of power system engineering. A system fault like a transmission line fault, may cause losing synchronism within machines of the system leading to transient instability. Transient stability is mainly linked with the immediate after-effects of a line fault on generator synchronism.

For interconnected power systems, the rotor angle stability is the tendency of synchronous machines to be in synchronism after been exposed to a fault. According to the type of incident, the rotor angle stability is of two types- small signal for small disturbances or transient stability for major disturbances. Further, voltage stability is the ability of a power system to have voltages which are normal and steady, everywhere in all conditions. The imbalance of reactive power between production and demand is the sole major factor which causes voltage instability in the power system network.

OBJECTIVES OF PAPER

1. To design power system and depict a line fault.
2. To analyse the transient stability occurred with the control system techniques using transfer functions.
3. Future scope to design a controller to stabilise the system after a fault.

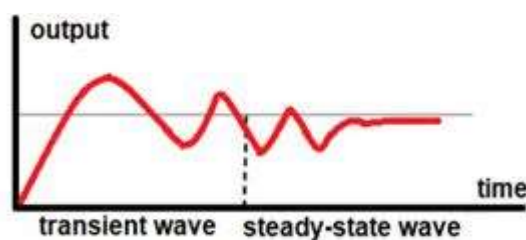
TRANSIENT STABILITY

Fig-1: Unit step response

It is defined as the ability of the power system to return to its normal conditions after a massive disturbance. The massive disturbance occurs in the system due to the sudden removal of the load, fault occurs in the system, line switching operations, sudden interruption of a line etc. The swing equation describes the behavior of the synchronous machine during change in position, which reduce the synchronism of the machine, and the system becomes unstable.

REVIEW ON ELECTRICAL AUDIT-AN IMPROVISED LIGHTING SCHEME**Khan Md Ishaque, Naseem Ahamed, Luvkush patel, Khan Md Saad and Naeem Shaikh**Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

An electrical audit is simply an audit or calculation of how much electricity you are using in industry and of where that electricity is going. A brief review of electrical audit is done in this paper and some improvising techniques are also suggested, Procedure of detailed audit is explained. The fundamental goal of every audit is to provide service with least cost least environmental effect and with better quality. This can be achieved by performing the energy audit. Energy audit is nothing but the intermediate between energy management and load side energy demand. As demand of energy increases the energy consumption is at its peak level. The unnecessary use of energy is been reduced by adapting certain improvising techniques designed after carrying the audit. That leads to energy consumption.

Keywords: Electrical audit, Energy conservation, Energy management, Simple payback period, wastage of Energy

INTRODUCTION

Energy Audit is a disciplined independent inspection of an industry or organization. Also energy audit is most important part of an energy management program which indicates the actual status of industrial facility/system with regards to energy utilization efficiencies of different activities, efficiency of different equipments, processes and suggest remedial measures to reduce areas of energy wastage with well-defined economic implications.

The technical survey for the strength audit to reveal the consumption in industry, home area, clinic and power plant has been studied. All attempts are taken to the whole energy input correlating with production for the cited fields. As a result of the find out about the areas the place the electricity is wastefully used and the upgrades are felt, are recognized and corrective measures are encouraged so that the basic field effectively should be improved. Energy auditing is a need to for the electricity sovereignty of our country.

OBJECTIVE

1. Identifying the quality and cost of various energy inputs.
2. Assessing present pattern of energy consumption in different cost centers of operations.
3. Relating energy inputs and production output.
4. Identifying potential areas of thermal and electrical energy economic.

TYPES OF ENERGY AUDIT

- Preliminary Audit
- Detailed Audit

Preliminary audit (Walk-through audit)

In a preliminary energy audit, simply available data are ordinarily used for a normal analysis of electricity and overall tactics of the plant. This type of audit no longer requires a large size of data collection. These audits take a short span of time and the results are more general, providing common possibilities for energy efficiency. The monetary evaluation is normally restrained to calculation of the easy payback period, or the time required for paying again the initial capital funding through realized power savings.

Detailed Audit

A comprehensive audit provides a detailed energy assignment implementation plan for a facility, due to the fact it evaluates all important electricity the usage of systems. This kind of audit presents the most accurate estimate of strength savings and cost. It considers the interactive results of all projects, accounts for the electricity use of all fundamental equipment, and consists of exact power value saving calculations and venture cost. In a comprehensive audit, one of the key factors is the power balance. This is primarily based on an inventory of strength the usage of systems, assumptions of present day working prerequisites and calculations of electricity use this estimated use is then compared to utility invoice charges. Detailed electrical auditing is carried out in 3 phases.

SPEED CONTROL OF SINGLE PHASE INDUCTION MOTOR USING VARIABLE FREQUENCY DRIVE

Bhavin Bhoir, Sagar Tare, Shubham Sankhe, Satish Sankhe and Jayshree Sali
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

In this project the frequency is used for controlling the speed of Induction machine. The aim of this project is that by using the variable frequency drive, we will control the frequency which is faded to the Induction motor. The multispeed activity is given by controlling the rotation of these engines. This paper exhibits the plan and investigation of single phase induction machine using MOSFET at the converter power stage with frequency control as a controller. The inverter is one of the basic requirements for induction motor speed control by variable frequency method, the inverter traditional control methods is modulated using microcontroller which control the whole operation of the proposed scheme. The good control of frequency and smooth speed control has been conducted from the scheme. The cost of modulated scheme is less.

Keywords: PWM, MOSFET, Opto-isolator, Rectifier, Inverter, Micro-controller, Speed- control, Induction motor.

INTRODUCTION

Induction motor is widely used in the domestic and industrial application about 85% of motors used is of Induction Motor. The greater part of the drives utilized in the industrial motor control are electrical. Contingent upon the application, some of them have fixed speed and some have variable speed. In past the Induction motor are used in limited purpose but due to advancement in electronic the scene completely changed today. Nowadays variable speed drive which are not only constructed smaller in size but also obtained very efficient. The induction motor can run as it were at its evaluated speed when it is associated to the most supply be that as it may they are consistent motor. The induction motor can run only at its rated speed when it is connected to the main supply. However, they are constant motor. To control the speed of these motor, a motor drive and control system with distinctive strategies can be utilized. The multiple number of Induction motor can connect to the variable frequency drive and all the induction motor can controlled simultaneously by connecting these motors to the drive.

An induction motor's speed empowers influenced by the supply frequency, alter the number of motor stators, alter the control input. The drive can vary the frequency to be higher than the normal line frequency, meaning the speed can be increased beyond what the motor. The circuit required for this method is simple to implement and cost effective.

OBJECTIVES OF STUDY

1. The desired speed of the Induction motor can be achieved using VFD's.
2. The conventional speed control method is costlier than VFD method. Hence, drives play an imperative part in different applications.

OVERVIEW

Variable frequency control could be a strategy which is utilized to control the rotation of an induction machine. The desired speed and so, the rotational speed of the motor can be varied by changing the supply frequency. The equation of synchronous speed is:

$$N_s = 120f / p$$

The EMF induced in the stator of the induction motor is given by the equation shown below:

$$E_1 = 4.44k_w f \phi T_1$$

Therefore, when change in the supply frequency occurs, then induced EMF will moreover alter to maintain the same air gap flux. The evaluated voltage v_1 is rise to to the induced emf e_1 in case the stator voltage drop is ignored. Thus, the speed control of an induction motor using variable frequency supply requires a variable voltage power source. The converter changes over a rated voltage dc to a rated or variable voltage ac with variable frequency. PWM converter converts a settled voltage and settled frequency AC to a variable AC frequency.

LITERATURE REVIEW ON MEDICAL IMAGING USING MACHINE AND DEEP LEARNING ALGORITHMS

Raees Ahmad Noor MohammadAssistant Professor, Department of Electrical Engineering, Theem COE, BOISAR

ABSTRACT

Machine and deep learning algorithms are apace growing in dynamic research of medical imaging. Recently, substantial measures are developed for the enrichment of medical imaging applications to diagnose the errors in disease diagnostic systems which can lead to extraordinarily ambiguous medical treatments. Machine and deep learning algorithms are vital ways in medical imaging for detection of the symptoms in early stages. Deep learning techniques, in specific convolutional networks, have promptly developed a methodology of special for investigating medical images. The supervised or unsupervised algorithms using optimal standard dataset being used to indicate the predictions. We review object detection, image classification, pattern recognition, reasoning etc. concepts in medical imaging. These are used to improve the accuracy through extracting the important features or patterns for the specific disease in medical imaging. These ways also indorse the decision- making procedure. The main aim of this paper is to spotlight the machine learning and deep learning techniques used in medical images. My intention is to provide an outline for researchers to know the existing techniques carried out for medical imaging, spotlight the advantages and disadvantages of these algorithms, and to discuss the future scope. Machine and deep learning are commendable technique for creation of classification and automatic decision making in the study of multi-dimensional medical data. This paper present review of medical imaging in the machine and deep learning methods to analyze distinctive diseases. It carries concern over the suite of these algorithms which can be used for the investigation of diseases and automatic decision- making.

Keywords: Medical imaging; Machine learning; Deep learning; Image enhancement; Information retrieval;

I. INTRODUCTION

Machine and deep learning algorithms play a very important role to train the computer system as a skilled which might be used further for prediction and higher cognitive process. Machine learning is the field of study that provides computers the ability to learn without being explicitly programmed [1]. Deep learning is a kind of machine learning that empowers systems to realize for a fact and comprehend the globe concerning of ideas [2]. These fields bring intelligence into a computer that may extract the patterns according to the particular data and process it for automatic reasoning [3]. Medical imaging is the emerging research area that is used to diagnose any disease for early treatment. The task of image processing in the health domain is relative to the growing position of medical imaging. The digital image processing presents significant effect on decision-making procedure depending on some predictions. It provides better features extraction and accuracy. The procedure of functioning assessment is complex and contains numerous diverse properties [4]. The digital image processing techniques are associated in many different computer systems. The authentication of image processing approaches is very important that gives an implementation of particular procedures which provides influence on the performance of these systems. Therefore, it brings actions and decision based on approaches in medical imaging. It delivers a numerous rudimentary, refined image analysis and visualization tools [5]. The machine learning and deep learning are the integral part of Artificial Intelligence (AI) as shown in Fig. 1. The AI is the major field to showcase human intelligence in a machine, machine learning being used to achieve artificial intelligence, while deep learning is a tool used to implement machine learning [6].

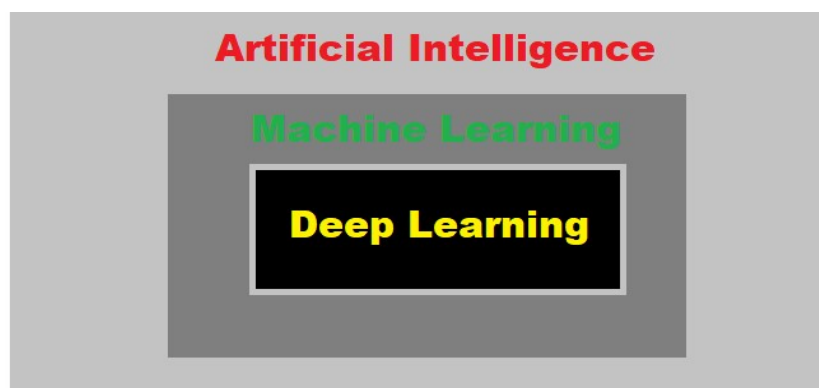


Figure-21: Artificial Intelligence, Machine learning and Deep Learning Domain

HIGH VOLTAGE MARX GENERATOR USING MOSFET**Dhanashree Chaudhari, Sudhali Gawade, Rajeshwar Jagatap, Mayur Gujar and Elahi Shaikh**Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

The main aim of the project proposes high voltage DC generation using Marx generator precept that uses MOSFET alongside capacitor stacks. The Marx precept turned into brought with the aid of Erwin Otto Marx. The system includes 10 stages such that everyone is made up from resistors, MOSFET in conjunction with capacitor. Resistor are used in capacitor charging at every stage and MOSFET is used as switches between capacitor. It is used to generate a high voltage pulse at the output with the smaller DC voltage. It uses cascading of charged capacitors in series to generate the output voltage ideally equal to the sum of voltages of all the capacitors connected in series. To charge the capacitors a DC voltage is applied with a series charging resistor and a diode to prevent discharge.

Keywords: Capacitor, MOSFET, Resistor.

INTRODUCTION

Marx Generator is an outlandish voltage generator. The imperative rule of Marx Generator is that the capacitors are charged in parallel as much as its data DC voltage compose. Those capacitors are then associated nonparallel the utilization of changes to give AN over the top voltage beat all through the weight innovation. With the development of solid state natural philosophy, solid-state devices became more and additional acceptable for periodical power application. they could supply the periodical energy systems with compactness, responsibility, excessive repetition fee, and extended existence time. The rising of periodical electricity generators the usage of solid-state gadgets gets eliminate barriers of ancient additives, and guarantees periodical strength to be extensively used in business packages. However, strong-state switch devices inclusive of MOSFET to be had now are best rated up to three kg volts. most of periodical power systems demand of a lot of higher voltage rating. switch devices are important additives in periodical power systems. typical Marx Generator use spark gas switches. These switches possess barriers like short lifestyles time in terms of range of operation cycles, low switching frequency, immense length, additional maintenance and lots of others. In current strong country switches like MOSFET or IGBT is used in situ of spark gaps. The benefits of solid country switches are compact, reliable, bendy, more efficient, long lifestyles time, low charges and reduced losses. The output pulse breadth and amplitude every could also be varied by dominant the gate management pulses to the switches. Rapid discharge of keep energy in brief interval as electrical pulses into a load produces huge amount of instant power. The traits of pulse as rise time, fall time, pulsewidth, repetition charge, a voltage and strength tier varies with distinctive applications. High voltage periodical electricity have intensive kind of programs in exclusive fields like industrial, environment.

OBJECTIVE OF STUDY

1. The principle goals of Marx generator will be to create high motivation voltage with great productivity in high voltage research facility.
2. To provide an environment friendly power source.
3. Producing a big amount of energy and storing it to use later when the electricity shut down.
4. To make cheap and easy maintainable power source.
5. To produce low Cost high voltage DC generator.

Concept

Problem Definition:- In this mode of operation of the capacitor discharges from the impulse generator. The shape of the pulse is controlled by external impedances at the output of the pulse generator. When the voltage gets higher it's difficult to get practical resistors with low parasitic inductance that will also stand the full impulse voltage. The usual remedy for this is to include the wave shaping resistors in the Marx generator. Physical size of the circuit components are huge. The six of the circle is bigger. This requires a high DC charging voltage.

Block Diagram :-

EFFICIENT SPEED CONTROL OF THREE PHASE INDUCTION MOTOR USING VECTOR CONTROL METHOD

Prof. Elahi shaikh

HOD, Department of Electrical & Electronics Engg, Theem College of Engg, Boisar

ABSTRACT

This paper deals with design and analysis of a 3-phase induction motor drive using Vector control Method on an integrated DSC (digital signal controller) system manufactured by Microchip. The system integrates into a single board the computational power of dsPIC30f2010 DSC with extra peripherals needed in vector control application, and therefore require minimal hardware development. The vector control system consists of a power circuit having a three-phase IGBT based bridge inverter feeding a three phase squirrel cage induction motor and the control circuits, which comprise of sensors (for sensing speed and current signals), interfacing circuits and control software (processed in DSC). The sensed speed and the sensed winding currents of the three phase are used as feedback signals for the closed loop control structure. Test results are presented for different load, various speeds with stator winding currents. On the developed vector control drive system.

Keywords: Digital Signal Controller, vector control, Induction Motor


I. INTRODUCTION

The motor control industry is a aggressive sector. Each industry to remain competitive must reduce costs but also has to answer to power consumption reduction and EMI radiation reduction issues imposed by governments and power lobbies. To preserve the environment and to reduce green house effect gas emission, governments around worldwide are introducing regulation requiring white good manufactures and industrial factories to produce more energy efficient appliances. This is reason why appliances designers and semiconductor suppliers are now interested by the design of low cost and energy efficient variable speed drives. DC motors are simple in control and offer fast dynamic response, High initial and maintenance costs of dc motors needs a substitute having all these advantage as well as capable of eliminating these problems. Three-phase squirrel cage induction motor is a good option due to its brushless robust structure and free from regular maintenance. Vector control mode of operation is defined as a control technique in which two equivalent control signals are produced to control torque and flux in decoupled manner. When three-phase squirrel cage induction motor is operated in vector control mode, its response improves considerably and it acts as a better substitute for the separately excited dc motor. In addition it can improve the motor's dynamic and steady state characteristics.[4]

In this investigation, an indirect vector control method is implemented. Three-phase squirrel cage induction motor is fed from a current controlled voltage source inverter. The current and speed signals are fed back to the closed loop control structure. The control algorithm is processed in real time using digital signal controller (DSC), namely dsPIC30f2010, This DSC has built in features like 16/32 bit timers, 6 channels of 10 bit analog to digital converters, digital input and output units, 4 input capture, 1 UART, 1 SPI, 1 I2C, 6 PWM outputs along with central processing unit. Therefore, using such signal processors the hardware required for realizing a real time controller is reduced leading to improvement in reliability, yields enhanced operations, fewer system components, lower system cost and increased efficiency. The various graphs/waveforms are analyzed and studied on storage oscilloscope. The closed loop hardware control of the motor is developed and the results are studied and analyzed.

II. ANALYSIS OF CONTROL SCHEME

The purpose of the vector control scheme is to maintain the air-gap flux of AC Induction motor constant in order to achieve higher run-time efficiency.[10] The magnitude of stator flux is proportional to stator currents and finally controls the rotor currents. If stator current is kept constant the stator flux remains constant & motor torque will only depends upon slip frequency. However, when fast dynamic response and greater speed accuracy are needed, Thus closed-loop speed control methods are essential, but a precise feedback system must be used to sense the rotor speed and adjust the inverter frequency accordingly.[6][8]

The vector control method controls the frequency, amplitude and phase of motor drive voltage. The Key to Vector control is to generate a 3-phase stator voltage to control 3-phase stator currents. These 3-phase stator currents control the rotor flux linkage vector and finally control the rotor currents. The rotor current cannot be measured directly because the rotor is a steel cage and there are no direct electrical connections. Hence The measured parameters are Instantaneous stator phase currents,  Rotor mechanical velocity and rotor

PROTECTION, MONITORING, CONTROLLING AND LOAD SHARING OF 3-PHASE INDUCTION MOTOR USING IOT

Praveen Prajapat, Parag Bhosale, Nilesh Chauhan, Prajyot Arekar, Naeem Shaikh
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

This paper presents a review of protection, monitoring, controlling and load sharing of 3-phase induction motor comparing different methods of implementation of this technique. Power is of main concern which needs to be monitored and controlled. The design contains Arduino connected to different sensors such as current and voltage measurement sensor, Wi-Fi module or monitoring and controlling a 3-phase induction motor problems. The design gives protection of induction motor from faults i.e. overcurrent, overvoltage, under-voltage and single phasing, monitoring for voltage and current, manual and automatic ways to control induction motor and load sharing also. Protection of these motors is very important because of inclusion in most of the industrial applications use induction from due to their high robustness, reliability, low cost, maintenance and high efficiency.

Keywords: Internet of things (IoT), voltage and current sensor, Wi-Fi module, contactor, relay, Arduino

INTRODUCTION

Within the advancement of electrical technology, the dc motors are broadly used in different industrial applications. After the innovation of ac motors particularly ac induction motors, the view of industries has changed due to the wide advantage of induction motors. An induction motor has two main parts- stationary part and rotating part. An induction machine is known as a rotating transformer since it works on the principle of transformer. The main advantages of the 3-phase induction motors are self-starting, rugged construction, good pf and low cost but without compromising the efficiency the speed cannot be controlled.

Different electrical faults may occur due to unbalanced 3-phase supply, over-voltage, under-voltage, over-current, single –phasing, mechanical faults: The mechanical faults occur due to broken rotor bar, air gap eccentricity, damage in bearing, rotor and stator winding failures.

To ensure the reliable operation of induction motors recent advancement techniques are used which include monitoring and controlling, automatically. Internet of Things (IoT) is the recent development to control and monitor the motor from remote location. This method provides easy control and reliability. The reliability of 3phase induction motor is obtained by continuous monitoring of electrical parameters. If any abnormal value of electrical factors is detected, the 3- phase induction motor is controlled automatically i.e. suddenly turns-off to reduce the various type of faults.

The aim of this paper is to make the control easy, fault detection, monitoring and load sharing. The technique is designed to allow easy use of a mobile phones to control industrial appliances like induction motor from any location. By using a mobile phone, the development of the control system will be carried out using android application. This will be communicating with Wi-Fi module, which in turn will control the device attached to microcontroller modules. When the action has been carried out, a response will be sent to the user by using application or site.

OBJECTIVES OF STUDY

1. To monitor and control an induction motor based on IoT for safer and economic data communication in industrial fields.
2. To start or stop the induction machine to avoid system failures by automatic and manual control methods.
3. To monitor and control the motors used in electric vehicles.

MOTOR PARAMETERS AND REFERENCES

The Parameters that are taken for protection of three phase Induction Motor are over-current protection, protection from unbalanced load, single-phasing fault protection, under-voltage protection and overvoltage protection. Motor reference values are taken as

Voltage=415V, Frequency=50Hz, Rated Current(I_s)=1.5A, RPM=1449, Power Factor=0.83, Rated Power=0.75KW.

SIMULATION OF DIRECT TORQUE CONTROL OF INDUCTION MOTOR BASED ON SPACE VECTOR MODULATION

Nikhil Keni, Shivam Golatkar, Nishchal Dawane, Sawan Verma and Aqsa Shaikh
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

Induction motor (IM) speed control is comparatively difficult, since the torque produced and flux are inter-dependent. Through the conventional PI regulation, torque error can lead to undesirable change in angle between rotor and stator flux vectors. In this paper, space vector modulation (SVM) based direct torque control (DTC) is applied on induction motor. DTC is a closed-loop speed control technique to control a motor with the help of flux and torque vectors. It constitutes of hysteresis-band flux and torque controllers. The undulations in current and torque occur in the traditional DTC technique. Reason for unwanted torque and current undulation is less voltage vectors applied to the machine, which means less accuracy. Ripples are reduced using the SVM-DTC technique. SVM techniques have a number of superiority features that offer finer DC bus utilization, minimum torque undulations, lesser total harmonic distortions (THD) in the AC motor current, minimal switching losses, and simpler to adapt in the digital systems. Simulations for the SVM based DTC are performed in MATLAB/Simulink and the results are studied thoroughly.

Keywords — Motor, SVM, DTC, Torque error, Flux error

INTRODUCTION

Motors are one of the electric machines most widely used in industrial, commercial and domestic applications as they are simple, rugged, low cost and easy to maintain. The drive control system is necessary for IMs, since they demand good performance control: accurate and quick flux and torque response, higher torques at low speed, wide range of speed.

Direct torque control (DTC) method came in spotlight because instead of controlling the torque indirectly through flux or current, it directly controlled the torque. To obtain precision, DTC uses the difference between reference values and calculated values of flux and torque to control the machine. Although a well-accepted method, but DTC has some disadvantages like – at low speeds, control becomes difficult; high undulations in torque and current; more noise and variable switching frequency issues.

Space Vector Pulse Width Modulation (SV-PWM) is a technique introduced to improvise DTC in order to overcome the drawbacks of conventional DTC.

The usual three phase PWM generation technique involves a high frequency carrier wave intersecting with three sinusoidal waves as reference. The major drawback of this intersection method is that it includes automatic redundant computational efforts, since the intersection points of each of the three phases is computed independently [5].

On the other hand, the SVM strategy generates the waveforms simultaneously for all the three phases in a two-dimensional frame of reference, excluding the chances of considering each waveform intersection as an independent variable.

In this paper, MATLAB simulation of SVM based DTC of IM is performed and results are analysed. An attempt is made to minimise the general limitations of conventional control schemes and conventional DTC as well.

OBJECTIVES

1. To control the torque of induction motor using space vector modulation.
2. Space vector modulation (SVM) based direct torque control is applied on induction motor

OVERVIEW- Direct Torque Control (DTC)

Direct Torque Control (DTC) makes use of an induction motor model to acquire preferred output torque. By using solely cutting-edge and voltage measurements, it is viable to estimate the immediate stator flux and output torque. The simple configuration of DTC scheme is as shown in Fig. 1. It consists of a two torque and flux controller alternatively of PI controllers in DTC scheme and flux and torque estimator.

In DTC, it is possible to immediately manage stator flux linkage and electromagnetic torque by means of resolution of finest inverter switching modes. The selection is such that flux and torque blunders are restrained within respective flux and torque hysteresis bands to obtain fast torque response.

SIMULATION OF REVERSE POWER RELAY FOR GENERATOR PROTECTION

Aqsa Shaikh and Navajyothi Katela

Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

Generators are hearts of the power system. Any faults at the generator side may lead to severe failures and fatal accidents. Thus, a major concern is protection of these generators from number of faults like- varying voltage, varying current, short circuits, varying frequency, over-fluxing, reverse power flow, etc. In this project, we have designed a protective scheme for power flow in opposite direction that is flow of power from grid to the generator, due to which the generator starts consuming and acts as a load. Modelling tools are important to have a basic idea of power system. These tools aid an engineer to modify the system under normal and faulty scenarios. This paper contains the simulation and modelling of digital reverse power relay in MATLAB/Simulink. MATLAB libraries offer Power System Analysis Toolbox which are simulation based, for power system engineers.

INTRODUCTION

In power systems, for detection of synchronous generator's motoring action, reverse power relays (RPR) are used. When the field winding is electrically connected with the excitation system but the prime mover fails, this condition occurs. Thus, the machine acts like a synchronous motor connected with huge power system. In such conditions, the rotors behave like the active load on that machine. Motoring action eats power to rotate the prime mover and severe damage is caused to the prime mover. This condition is dangerous since there is an objectionable rise in temperature, especially in case of steam turbine. Therefore, these must be detected quickly and the GCB should be tripped.

Electromechanical relays are replaced with digital relays which are highly accurate and have high-speed operations. Immediate operation of relay is a must, especially for faults which may result in system blackout. Some additional perks of digital relays are - multiple variable settings, highly sensitive, control for a wide range and compact size.

OBJECTIVES OF STUDY

1. To detect a reverse power flow in the power system.
2. To trip the circuit breaker within threshold.
3. To design a relay logic to prevent motoring action of the synchronous alternator.

PRIME MOVER FAILURE FAULT OR REVERSE POWER FAULT

A generator is incorporated with prime mover and is connected with the grid, supplying power. When the failure of the synchronized prime mover occurs, the condition is known as motoring. Here, the generator pulls power from the bus, operates as a motor and drives the prime mover. In a synchronized condition, frequency of all the generators is same. Any dip in frequency of one alternator causes the other power sources to feed power into the alternator. This power flow in the reverse direction is known as the reverse power flow or motoring action of alternator. Another cause of reverse power occurs during synchronization. If the frequency of the bus bar to which the machine is to be synchronized is slightly higher than frequency of the machine and the breaker is OFF, reverse power flows. Hence, during synchronization, the machine frequency is kept little more than that of the bus bar. This enables the machine to take load the moment the breaker is closed. A reverse power relay can be used but it must have a time delay setting to ensure correct trip in case of short time fluctuations, phase swings and disturbed synchronization. Hence, when a power reversal issue occurs, the first thing is to decouple the corresponding alternator from live line with the help of the breaker. If it is stuck, then whole bus needs to be shut down.

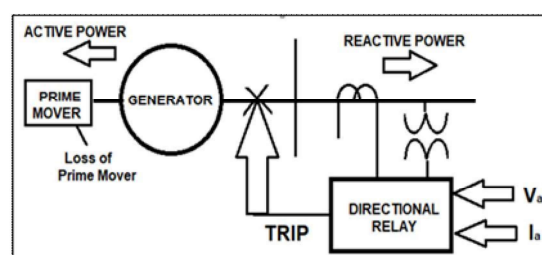


Fig. 1. Reverse Power Flow

IMPLEMENTATION OF SPEED CONTROL OF DC MOTOR IN MATLAB USING FUZZY LOGIC CONTROLLER TECHNIQUES

Govind Patil, Anisahmad Khalifa, Chinmay Machhi, Nitesh Dhodi and Aqsa Shaikh
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

A direct current (DC) motor should be operated at a precise and steady frequency for a varying load. In a DC motor, speed can be controlled by means of manual control or by automatic control apparatus. But speed regulation is an altogether different thing – where the natural variation of speed due to changing load is not considered while trying to maintain the speed. This paper attempts to control the speed of DC motor based on the fuzzy logic controller (FLC) and simulate the fuzzy rules in MATLAB/Simulink environment. FLCs are designed to attain the control of a DC motor speed using both field current and armature voltage by changing these in the constant power region and constant torque region, respectively. The fuzzy controllers are proposed to be based on each other such that the one set of rules are fired at a time for two controllers, having similar predecessors but different outcomes. Simulations show the efficacy of the proposed fuzzy logic control method.

Keywords—DC motor, speed controller, fuzzy logic, torque, power, field, armature

INTRODUCTION

A machine that generates mechanical energy by generating current flow through the coils inside it is called a DC motor. It is capable of providing high starting torque and the chances to control speed across a wide range. Some applications of DC motor include domestic appliances, automotive and industrial uses. It is mainly preferred for its wide range speed operations, versatility and cheapness. It is also known as adjustable speed machine. To settle the speed of a DC motor to desired value, controllers are designed based on the application. Non-linearity of a DC motor results in some problems while applying a general speed control like proportional, integral or derivative algorithms in a speed controller. The non-linear properties of the motor like friction and saturation result in degradation of the performance of these control methods. PID is a conventional control method, usually used in industries for speed control system DC motor. It is an all-inclusive control loop feedback technique and has simplified form.

However, the controller has to be reset for varying ranges of operation. An effectively efficient system for speed control is being design to overcome the complications of conventional methods of control. A separately excited DC motor, shown in Fig. 1, is the most appropriate configuration used for applications of varying speed for longer durations because of its precise speed control, good reliability, controllable torque and lucidity. Fig. 2 indicates its performance characteristics when armature resistance is gradually increased.

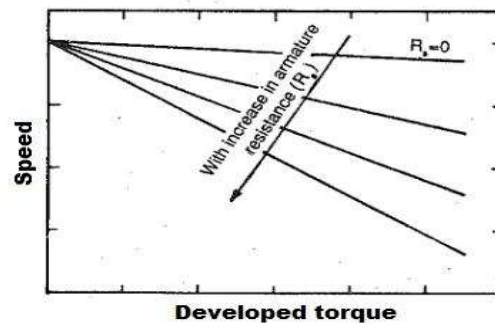
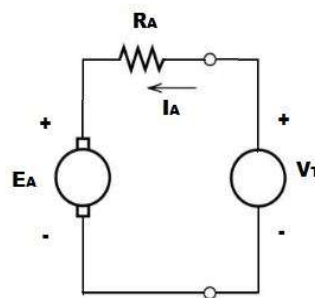
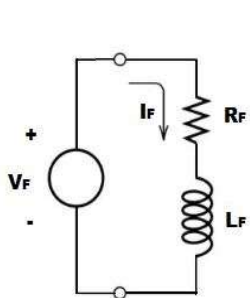


Fig. 1. Separately excited DC motor

Fig. 2. Performance Characteristics

OBJECTIVES

1. To control the speed of dc motor using independence of armature voltage and field control method
2. To design and build an effective fuzzy logic controller for the dc motor speed control over a broad range (0-2000rpm)

OVERVIEW

• DC Motor

A DC Motor is an electromechanical energy converting device. There are two types of DC machines. A DC motor converts DC electrical potential into mechanical potential. Although the fact that the battery is a

EFFECT OF UPFC ON DISTANCE RELAY

Afjal Salauddin Shaikh

Lecturer, Electrical Engg. Department, Theem College of Engineering Boisar

ABSTRACT

Among the FACTS controllers, the Unified Power Flow Controller (UPFC) is a device that control all three parameters of line power flow (i.e. line impedance, voltage and phase angle) at the same time. It is the most versatile FACTS controller for the regulation of voltage and power flow in a power system. But when fault occurs, due to presence of UPFC in fault loop, the apparent impedance of line is affected which results in mal-operation of distance relay. This paper discusses the effect of UPFC in different modes on apparent impedance and thus on distance relay tripping characteristics.

I INTRODUCTION

Power transfer in most integrated transmission systems is affected by transient stability, voltage stability, and power stability. These parameter limit the total utilization of accessible power flow. FACTS may be a technology that creates complete use of existing transmission systems and, therefore, improve stability and thermal limit. Among the FACTS controllers, UPFC is a device which may manage all three parameters of line power flow at same time (i.e. line electrical phenomenon, voltage and phase angle) [1]. The impact of UPFC in minimizing the disturbances in voltages, currents and power flows at intervals the fault affected parallel line ought to be assessed, attribute to the presence of UPFC in associate extremely fault loop, the voltage and current signals at the relay point are going to be affected in each the steady state and thus the transient state. This in turn can have an impact on the performance of existing protection schemes, like the distance relay which is one among the really wide used ways in transmission line protection. that works on principle, impedance between the relay and fault points; the apparent impedance is then compared with the relay trip characteristic to ascertain to determine whether it is an enclosed or external fault. A typical methodology of conniving this impedance is to use symmetrical component transformation using power frequency elements of voltage and current signals measured at the relay purpose [2]

II APPARENT IMPEDANCE OF LINE

Distance relay operation is based on the apparent impedance

(measured impedance at the relaying point) of the line. When the fault resistance is equal to zero, the measured impedance by a distance relay is the actual impedance of the line section between the fault and the relaying points. Consider a single phase to earth fault as shown in Fig.1, according to figure this impedance is equal to pZ_{1L} , where p is the per-unit length of the line section located between the fault and the relaying points, and Z_{1L} is the line positive sequence impedance in ohms.

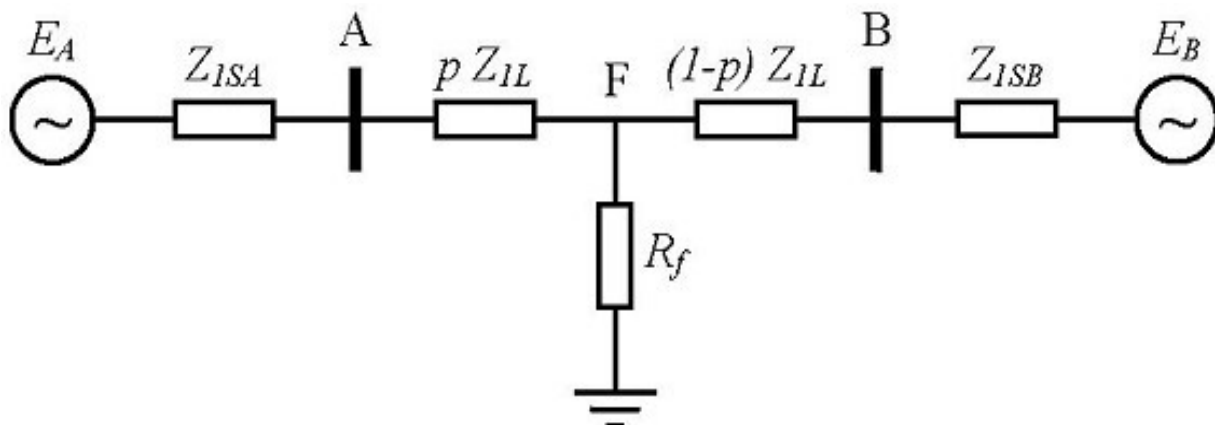


Fig.1. Equivalent circuit for single phase to earth fault

In the case of a non-zero fault resistance, the measured impedance by a distance relay is not equal to the mentioned magnitude. In this case, the structural and operational conditions of the power system affect the measured impedance at the relaying point. The operational conditions prior to the fault instance can be represented by the load angle of the line, i.e. δ , and the ratio of the magnitude of the line end voltages, i.e. h , or in general $EB/EA = he^{-j\delta}$. The structural conditions are evaluated by the short circuit levels at the line ends, i.e. S_{SA} and S_{SB} . With respect to Figs. 1 and 2, the measured impedance at the relaying point can be expressed by the following equations.

SAR MEASUREMENT TECHNIQUES OF MICROSTRIP PATCH ANTENNA- A SURVEY

Kajal Gopal Patil¹ and Uday Pandit Khot²PG Student¹ and Professor², Electronics and Telecomm. Engg. Department, St. Francis Institute of Technology**ABSTRACT-**

SAR is a value describing how much power absorbed in biological tissue when the Body is exposed to electromagnetic radiation. The use of microstrip patch antenna for measuring SAR in human tissues leads to various effects such as thermal effect, cancer, cognitive effects, MRI biological effects, etc. Because of these biological effects, there is a need of measuring the SAR. To measure SAR, very costly hardware equipments/software are required. Literature gives various SAR measurement techniques which are simple and cheap. This paper discusses these various SAR measurement techniques such as SAR measurement using RMS value of induced electric field, electric conductivity, and density of human tissues. In hyperthermia, SAR can be measured by using specific heat capacity and change in temperature when exposed in electromagnetic field per unit time. SAR can also be measured using power absorbed by the tissue. SAR can also be measured by electric and magnetic field distribution using FDTD method.

Keywords- Biological Effects, Human Tissues, Microstrip Patch, Power Absorbed, Sar.

I. INTRODUCTION

Specific absorption rate (SAR) measures how much radiation is absorbed by the human body under the worst possible circumstances. Technically speaking, SAR is a measure of the rate at which radio frequency (RF) energy is absorbed by our body from a cell phone. SAR provides a straightforward method for evaluating the radiation exposure to our bodies from cell phones in order to ensure that they are within the safety guidelines set by regulatory bodies, such as the FCC in the US. In mobile telephony, the SAR value indicates the energy absorbed by a particular mass of human tissue in a certain amount of time. SAR is measured in units of power per mass (W/kg).

There are various SAR measurement techniques. Different techniques use different formulas for SAR measurements. Value of SAR can be varies with different parts of body. As mentioned earlier, SAR evaluation is done under the worst-case scenarios. Thus, the SAR value that you find should not go beyond its safety guidelines. As can be seen from Table 1 [1] and Table 2 [1], in the United States, phones need to have a SAR value below or at 1.6 W/kg, taken over the volume containing 1 gram of tissue mass. In Europe, the SAR limit is 2 W/kg, but it takes into consideration a sample size of 10 grams of tissue.

II. DIFFERENT SAR MEASUREMENT TECHNIQUES

There are various methods available in literature for measuring SAR. The SAR can be measured using electric field induced, power absorbed, temperature variation, etc.

Table 1. IEEE Standards of SAR [1]

SAR Limits recommended by IEEE (W/kg in 1 g of tissue) (Frequency Range: 100 kHz – 6 GHz)			
Exposure characteristics	Hands, Wrists, Feet, ankles	Partial Body	Whole Body
General public exposure	4	1.6	0.08
Occupational exposure	20	8	0.4

Table 2. ICNIRP Standards of SAR [1]

SAR limits recommended by ICNIRP (W/kg in 1 g of tissue) (Frequency Range: 100 kHz – 10 GHz)			
Exposure characteristics	Whole body average SAR	Local head/trunk SAR	Local limb SAR
Occupational	0.4	10	20
General public	0.08	2	4

1. SAR Measurement using RMS Value of Induced Electric Field [2]

SAR is usually averaged either over the whole body, or over a small sample volume (typically 1 g or 10 g of tissue). SAR can be calculated from the electric field within the tissue as: SAR can be related to the electric field at any point by,

ANALYSIS OF EEG SIGNALS FOR AUTOMATED DETECTION OF EPILEPSY

Kaushal Ajugia¹ and Kevin Noronha²Student¹ and Professor², Department of Electronics and Telecommunication Engineering, St. Francis Institute of Technology**1. ABSTRACT**

Epilepsy is a common neurological disorder that shows symptoms of recurrent seizures. World Health Organization statistics indicate that every year between 40 and 70 per 100,000 people are diagnosed with epilepsy and in developed countries this figure increases 2 times. Electroencephalogram (EEG) signals are used to detect seizures. Electroencephalogram (EEG) signals are used to detect and study the characteristics of epileptic activities. Owing to the non-linear and dynamic nature of EEG signals, visual inspection and interpretation of these signals are tedious, time-consuming, error-prone, and subjected to inter-observer variability. Therefore, several Computer Aided Diagnostic (CAD) based studies have adopted non-linear techniques to study the normal, pre-ictal, and ictal activities in EEGs. In this paper, we present an automatic technique based on data mining for epileptic activity classification. In order to compare our study with the results of relative studies in the literature, we used the widely used benchmark dataset from Bonn University for evaluation of our proposed technique. Hundred samples each in normal, pre-ictal, and ictal categories were used. We have been successful in attaining an Accuracy of 89.15% for Normal EEG signals, 83.63% for Pre-ictal EEG signals and 98.17% for Ictal EEG Signals.

Keyword: CAD, EEG, Epileptic, Pre-ictal, ictal

2. INTRODUCTION

Epilepsy is a chronic neurological disorder characterized by recurrent unprovoked seizures [1] resulted from abnormal, excessive and hyper synchronous neuronal activity in brain. Meta-analysis of 33 articles showed that the median incidence of epilepsy was 50.4 per 100,000 per year [2], [3]. The incidence rate of epilepsy was 45.0 per 100,000 per year for high income countries and 81.7 per 100,000 per year for low income and middle income countries. Moreover, the population-based studies have provided higher incidence than hospital-based studies [4]. Epilepsy can be noninvasively diagnosed using EEG signals which are recordings on scalp of electrical activity of the brain. Seizures can be focal or generalized. If seizures are focal in nature, only part of the brain is affected, whereas in generalized epilepsy the entire brain is affected. Since in brain there are millions of neurons interconnected in a very complex manner, the resultant EEG signal is complex, nonlinear, non-stationary and non-Gaussian in nature. Over the past 20 years, much research has been carried out using time and frequency domain measures [5-6]. In a study with EEG sampled at high frequency was shown to be effective in localizing epileptic foci [7]. It was shown that linear prediction method can effectively be used in signal generation, storage and transmission of EEG [6]. Using independent component analysis (ICA), the artefacts in EEG signal were removed and the individual sources were separated.

The flow of the paper is as follows: Section 3 provides the Dataset description. Section 4 describes the methodology and feature extraction. Section 5 discusses the results of the paper. Finally, the paper concludes in Section 6.

3. DATA DESCRIPTION

The EEG data used in this study was obtained from Bonn University open source database [8]. Three classes of data, namely normal, pre-ictal and ictal were considered for analysis. From each data class 100 data files were used. Each data file consists of 23.6s duration signal sampled at 173.61Hz. The normal EEG was acquired using standard electrode placement scheme from five healthy volunteers in relaxed awake state while the eyes remained open.

The ictal EEG signals were acquired from five epilepsy patients during the epileptic seizures. These signals were collected from patients using intracranial electrodes that were placed on the correct epileptogenic zone [9-10]. The pre-ictal EEG signals were acquired from the same five epilepsy patients when there were no seizures. The typical EEG signals of normal, pre-ictal and ictal cases were shown depicted in Fig. 1.1, Fig. 1.2 and Fig. 1.3 respectively.

SMART ENERGY METERING SYSTEM¹Prof. K.N.Attarde, ²Aakash Pawar, ²Shubham Patil, ²Dipesh Patil, and ²Rohit Kushwaha¹Head of Department and ²U.G. Student, Department of Electronics and Telecommunication Engineering, Theem College of Engineering, Boisar University of Mumbai**ABSTRACT**

An automatic remote meter-reading system based on GSM is presented in this paper. The paper is useful to obtain meter reading when desired so meter readers don't need to visit each customer for the consumed energy data collection and to distribute the bill slips. Microcontroller can be used to monitor and record the meter readings. In case of a customer defaulter, no need to end a person of utility to cut-off the customer connection. Utility can cut off and reconnect the customer connection by short message service (SMS). Furthermore, the customer can check the status of electricity (load) from anywhere. In this system energy meter readings are being transferred by making use of GSM.

INTRODUCTION

In the present billing system the distribution companies are unable to keep track of the changing maximum demand of consumers. The consumer is facing problems like receiving due bills for bills that have already been paid as well as poor reliability of electricity supply and quality even if bills are paid regularly. The remedy for all these problems is to keep track of the consumers load on timely basis, which will help to assure accurate billing, track maximum demand and to detect threshold value. These are all the features to be taken into account for designing an efficient energy billing system.

The present project "IoT Based Smart Energy Meter" addresses the problems faced by both the consumers and the distribution companies. The paper mainly deals with smart energy meter, which utilizes the features of embedded systems i.e. combination of hardware and software in order to implement desired functionality. The paper discusses comparison of Arduino and other controllers, and the application of GSM and Wi-Fi modems to introduce 'Smart' concept. With the use of GSM modem the consumer as well as service provider will get the used energy reading with the respective amount, Consumers will even get notification in the form text through GSM when they are about to reach their threshold value, that they have set. Also with the help of Wi-Fi modem the consumer can monitor his consumed reading and can set the threshold value through webpage.

This system enables the electricity department to read the meter readings monthly without a person visiting each house. This can be achieved by the use of Arduino unit that continuously monitor and records the energy meter reading in its permanent (non-volatile) memory location. This system continuously records the reading and the live meter reading can be displayed on webpage to the consumer on request. This system also can be used to disconnect the power supply of the house when needed.

1.1 MOTIVATION

Utility billing is yet unavoidable in the World as for concern post-paid energy meter. In Pakistan, utilities are using a conventional way of billing. A meter reader goes Home to home takes the meter reading and note down it, manually. These readings are brought to utility administration office. The criterion of utility billing is applied according to the utility service rules and regulations. The employee of the utility goes door to door again and gave the bill slips of the utility to the respective consumer.

Smart energy meter are used for Automatic Meter Reading (AMR) to increase the accuracy of meter reading. For instance, a utility person might not read the correct value of the total energy consumed that is displayed on energy meter or may intentionally give lower value than the exactly read one.

1.2 PROBLEM STATEMENT

Energy meter reading is a tedious and an expensive affair. The meter reader has to go and take the reading manually to issue the bill, which will later be entered in the software to automate the billing and payment system. It would have reduced the laborious task and financial wastage if can automate the manual meter reading process and bill data entry process.

1.3 OBJECTIVE

Smart meters provide data that enable customers to make choices about how much energy they use by allowing them to access accurate real-time information about their electricity consumption.

Unlike the old meters they replace, smart meters are up to date two-way, digital communication systems that record electricity usage every 30 minutes and automatically send this data to a customer's electricity distributor, virtually bringing an end to estimated bills and manual meter readings.

CHABOT USING PYTHON

Chetan Prajapati¹, Unnati Patil¹, Saloni Pimple¹, Ranjana Yadav¹ and Rajesh Patil²
Student¹ and Assistant Professor², Department of Electronics and Telecommunication Engineering, Theem
College of Engineering College, Boisar, Palghar

ABSTRACT

In today's world computers play an important role in our society. Computers gives us lots of information also helps us in many manner. Chatbots, or conversational interfaces as they are also known, present a new way for individuals to interact with computer system. A chatbot allows a user to simply ask questions in the same manner that they would address a human. The most well-known chatbots are voice chatbots: Alexa and Siri. However, chatbots are currently being adopted at a high rate on computer chat platforms. Chatbot recognize the user input as well as by using pattern matching, access information to provide a predefine acknowledgment.

1. INTRODUCTION**1.1 Motivation**

Before the invention of the computers if any person want's the information they refer the books or ask any other person for that information. Later on when computer were invented the person try to fetch the information from the web pages. But the disadvantage of the web pages is that if any person asks the question then it does not get the satisfactory answer. So there is the new technology called as a Chabot.

1.2 Problem Definition

There are many websites which takes time to provide information related college. Any college websites if we want some information regarding college the college website will provide the information but user needs to navigate many links. This navigation process is time consuming there is no guarantee that user name find the information he/she is looking for.

If user has queries regarding college activity e/she needs to personally visit corresponding staff to clear his/her doubt. Staff f has to take some time from their busy schedule to clear the doubts of students. In this process both students (question) and corresponding college staff has to sacrifice some of their time from their busy schedule.

1.3 Objective of Project

The main objective of this project is that, to fetch the exact information from the chatbot. By using the chatbot, the user can get the exact required information or satisfactory answer without getting unwanted information.

2. LITERATURE SURVEY

In today's world computers play an important role in our society? Computers give us information; they entertain us and help us in lots of manners. A chatbot is a program designed to counterfeit a smart communication on a text or spoken ground. But this paper is based on the text only chatbot. Chatbot recognize the user input as well as by using pattern matching, access information to provide a predefined acknowledgment. For example, if the user is providing the bot a sentence like "What is your name?" The chatbot is most likely to reply something like "My name is Chatbot." Or the chatbot replies as "You can call me Chatbot." based on the sentence given by the user. When the input is bringing into being in the database, a response from a predefined pattern is given to the user. A Chatbot is implemented using pattern comparing, in which the order of the sentence is recognized and a saved response pattern is acclimatize to the exclusive variables of the sentence. They cannot register and respond to complex questions, and are unable to perform compound activities. Chatbot is relatively a new technology. The application of a Chatbot can be seen in various fields in the future. This paper covers the techniques used to design and implement a Chatbot. Comparisons are made, findings are discussed and conclusion is drawn at the end.

3. METHODOLOGY

College Enquiry Chat Bot project will be built using artificial intelligence algorithms that will analyse user's queries and understand user's message. This system will be a web application which will provide answers to the queries of the students. Students will just have to register and then login to the system and then ask the query to the bot that will be used for chatting. Artificial intelligence is used to answer the student's queries. The student will get the appropriate answers to their queries. The answers will be give using the built in artificial intelligence algorithms. Students won't have to go to the college to make the enquiry. The system replies using an effective Graphical user interface which implies that as if a real person is talking to the user. The user just has to register himself to the system and has to login to the system.

AUTOMATION OF STREET LIGHT GLOW ON DETECTING ENVIRONMENTAL DARKNESS

Nidhi Chauhan, Soni Yadav and Prof. Sneha SankheDepartment of Information Technology, University of Mumbai, Mumbai, Maharashtra

ABSTRACT

This paper illustrates the 'STREET LIGHT GLOW ON DETECTING ENVIRONMENTAL DARKNESS USING LDR (Light detective register)'. Automation of street light is very and controlling it will help a country like India develop faster since India is a populated country and with population comes heavy traffic which should be maintained and to do this clear vision of roads is necessary at night. This paper presents a street light control system that combines various technologies: a timer, photodiodes, Light Emitting Diodes (LED), power transistors. LDR used on either side of the road sends logic commands for the LEDs at the output to get glowing for a patch ahead Intensity control is also possible by pulse width modulation based on movement sensing when a vehicle moves. Thus, in this way of dynamically changing intensity or on to on helps in saving a lot of energy. A programmable microcontroller is engaged to provide different duty cycle for different intensities at different density conditions of a person or a vehicle's movement.

Keywords: LDR Sensor, Street light, Movement of Vehicle.

INTRODUCTION

Street lighting is one of the important parts of a city's infrastructure where its main function is to illuminate the city's streets during dark hours of the day. Previously, the number of streets in the town and city was very small and people didn't travel that much at night time. But with the increase in population and much more developing country, it is necessary to help people travel from one place to another in less time this caused the number of streets to increase rapidly with high traffic density which highlighted in [1]. There are several factors need to be considered to design a good street lighting system such positioning of street lamps from another, cost-cutting to get the excess results but not in the reduction of quality so that it can be possible to provide high-end but cheap programmed microcontroller of street lamps in rural areas too. At the very beginning, street lamps were controlled manually by the set of the control switch. It is called the REST generation of the original street light. After that, another method that has been underused was the optical control method where the science behind is using high-pressure sodium lamps in their system. It can be seen that this method is widely used in many countries nowadays. In this paper, we will be using a method which operates by setting up an optical control circuit, change the resistance by using of the light-sensitive device which will increase in major brightness and decrease as darkness approaches to control street lamps light up automatically at dusk and turn off automatically after dawn in the morning. Due to technological development nowadays, road lighting can be categorized according to the installation area, performance and they are used, for example, lighting for subsidiary roads, traceroutes, urban centers and public amenity areas. While the wireless sensor network (WSN) helps in improving the network sensing for street lighting.

Street lighting can be classified according to the type of lamps used in making such as incandescent light, mercury vapor light where mercury vapor is ionized and emits light in the ultraviolet region as the current is passed through the tube to make it visible the glass is coated with fluorescent. metal halide light, high-pressure sodium light, low-pressure sodium light, fluorescent light, compact fluorescent light, induction light and LED light, LDR lights. LED is considered a promising solution to the modern street lighting system due to its behavior and advantages as emphasized in. Apart from that, the advantages of LDR are likely to replace the traditional street lamps such as the incandescent lamp, fluorescent lamp and high-pressure Sodium Lamp in future, LED technology is an extremely difficult process that requires a combination of advanced So we will be discussing about the easy use of LDR with an Arduino to automate street lights.

RELATED WORK

In[1] system uses IR to sense the density of pedestrians and traffic by which intensity of light varies. The system becomes less efficient because of the IR sensor. There may be an unwanted appearance of the animal that can be detected by an IR sensor while crossing the street. Microcontrollers can increase the developing hours of the system.

In[2] system uses IR, GPS, and PIR which is used to detect the human's walking movement. Anyone can mislead the PIR sensor for their entertainment. IR sensors can detect unwanted movement of animals while crossing the street as it detects movement of vehicles moving on the street.

DESIGN AND DEVELOPMENT OF CLASSIFICATION MODEL FOR RECYCLABILITY STATUS OF TRASH USING SVM

Ajay Yadav¹, Saurabh Banerjee¹, Prof. Krunal J. Pimple²

Student¹ and Assistant Professor², Department of Information Technology, Theem College of Engineering, Boisar, University of Mumbai

ABSTRACT

SVM is a relatively new supervised classification technique for the cartographic community of land cover. They have their roots in statistical learning. SVMs are inherently essentially binary classifiers. Our classification problem involves receiving images of a single object algorithm and classifying it into a recycling material type. The input to our pipeline are images in which a single object is present on a clean white background.

Keywords: SVM; hyperplane; machine learning.

INTRODUCTION

Recycling is important for a sustainable society. The current recycling process requires recycling facilities to sort garbage by hand and uses an arrangement of huge channels to separate out more distinct objects. Consumers can also be confused about how to determine the correct way to dispose of a wide variety of materials used in packaging.

This input to this project are images of a single piece of recycling or garbage, process them and classify it into six classes consisting of glass, paper, metal, plastic, cardboard, and trash. In order to mimic a stream of materials at a recycling plant or a consumer taking an image of a material to identify it, our classification problem involves receiving images of a single object and classifying it into a recycling material domain. The input to our pipelines is imaging in which a single object is present on a clean white background. We then use an SVM to classify the image into six categories of garbage classes. By using a machine learning algorithm, we can predict the category of garbage that an object belongs to base on just an image. This will have beneficial economic effects and also positive environmental effects.

WHAT IS SVM?

SVM is a supervised learning model which is used for classification and regression analysis. For image classification, it uses the linear separable. Linear separable algorithm is used to determine a pair set of sets is linearly separable and finding a separating huperplane if they are arising in several different areas. If they arise in the same area it means they are the same object.

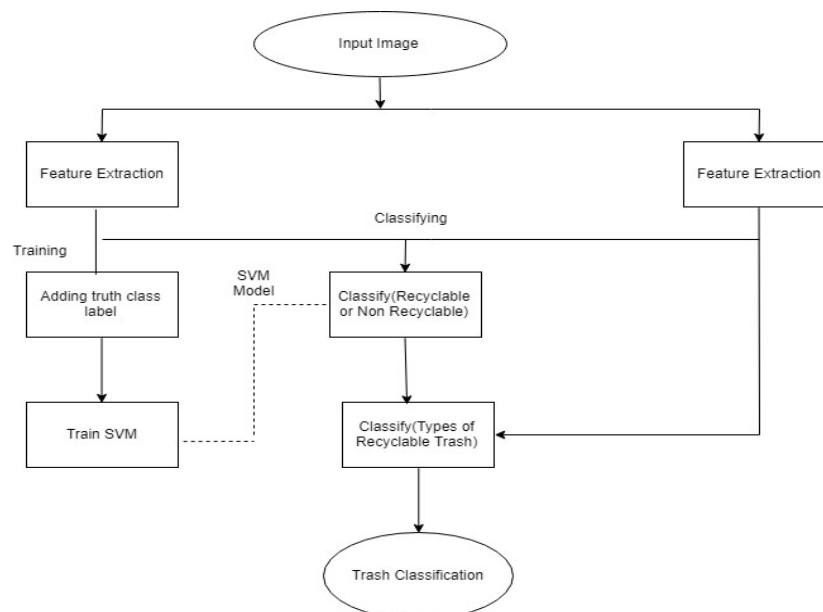


Fig: Block diagram of SVM

PROPOSED WORK

An SVM was used for the first analysis to classify waste into recycling categories. The SVM was chosen because it is considered one of the best initial classification algorithms and is not so complicated compared to a CNN.

A CRITICAL REVIEW ON: MALWARE DETECTION FOR ANDROID USING MACHINE LEARNING**Saaima Siddiqui¹, Dhruv Pujari¹, Sameer Raval¹ and Prof. Harshal Patil²**Student¹ and HOD², Department of Information Technology, Theem College of Engineering, University of Mumbai

ABSTRACT

Malware is always been a issue regarding the operating system or in the software world. In the same way the android system is also going through the same problems. To analyze such malware, we are using machine learning algorithms. We have to use dataset which have both type of application malicious and viruses which will be installed on android device to analyze the behaviour patterns. The Android Application will be using SVM-Based Approach which will validate the performance of the proposed system which then show that the proposed malware detection scheme is able to identify malicious Android applications effectively and efficiently. We generate system feature vector from each app by executing the algorithms. The metrics (feature vector) support gives the most effective form of malware detection.

Keywords: Machine learning, Android, Applications, App classification.

I. INTRODUCTION

Malware is nothing but the short name for malicious software, in general referred to many forms of hostile or intrusion creating software, spyware, Trojan horses, backdoors, and rootkits. Main aim of malware is to damage, steal, disrupt or do some bad actions. Malware is powerful enough to infect any kind of computing machine running application, and the prevention of malware is being well studied for personal computers (PC). Smartphone devices the detection techniques used are lagging far behind as compared to fast growth of mobile population is being increased.

Some recent survey has shown that there are about 2.1 million android applications are there in market. Due to popularity of android system has led to more spreading of android malware. This malware are spreading in market by the third parties developing application. The Google android market also doesn't promise to guarantee that all its listed applications are threat free. There are also such reports about download Trojans applications that download their malicious code after installation such applications can not be easily detected by Google's technologies during publication in Google android market. The android threats include banking Trojans, spyware, bots, root exploits, SMS fraud, phishing, premium dialer & fake installer.

Penetration techniques commonly used for malware applications for installation activation & running on the android system are repackaging, updating and downloading.

REPACKAGING

It is among the common techniques for malware developers to install malicious applications on a android platform. Repackaging approach for popular applications and misuse them as a malware. The developer downloads such types of application and recode them and add their own malicious code and upload that application to the official android app store or on the different markets.

UPDATING

This technique is much more difficult for detecting the malware. The malware developer may still use repackaging but instead of encoding the infect code to the application, the developer may include a update component that will able to download malicious code at the runtime.

DOWNLOADING

This is the most traditional attacking technique. The malware developer need to attract the user to download the interesting and attractive applications.

II. RELATED WORK

Mariam Al Ali et al. [1] - In this paper, a practical and effective anomaly based malware detection framework is proposed with an emphasis on Android mobile computing platform.

Naser Peiravian, Xingquan Zhu [2] - In this paper a propose to combine permission and API (Application Program Interface) calls and use machine learning methods to detect malicious Android Apps.

Chenglin Li, Rui Zhu, Di Niu [3]- In this paper a propose highly reliable machine learning Algorithms for android Malware detection based on the use of Factorization Machine and the extensive study of Android App features.

SMART SURVEILLANCE SYSTEM USING MACHINE LEARNING

Ankit Yadav¹, Rajkumar Sharma¹, Alka Yadav¹ and Dr. Najmuddin Aamer²U.G Student¹ and Professor², Department of Information Technology, Theem College of Engineering, University of Mumbai**ABSTRACT**

This work suggests an intelligent surveillance system for anomalous human activity in a hypothetical environment. The wide range of advanced surveillance techniques was proposed by surveillance system: object detection in Real-time, tracking object from web camera, acknowledgment of generic object class and abnormal behavior of human, and situation of happening an alarm. The surveillance system was conducted in three phases: Preprocessing phase, abnormal activity detection phase, and content-based image retrieval phase. An anomalous activity can be any action that can provided at secured area, moving with speed more than a limit in a secure place, any typical pose that is not normal (i.e., falling and jumping) and many other actions which can trigger an alarm. Alarm triggering varies from customer to customer. It may include actually ringing any alarm, sending a notification to any department through e-mail or SMS, making an entry in the database, etc., it assist human operators to make the right decisions

Keywords: Human motion object detection, Real time security system detection, background subtraction, intelligent surveillance system.

INTRODUCTION

The last decade of progress on various visual acknowledgment tasks has been based considerably on the use of SIFT [9] and HOG [7]. But if we look at performance on the conforming a well-established pattern visual recognition task, PASCAL VOC object detection [15], it is generally acknowledged that progress has been slow during 2010-2012, successful method was proposed with small gains obtained by building ensemble systems and employing minor variants. Image classification, the domain of computer area is used widely for researched area and domain of computer vision has achieved remarkable results in world-wide competitions such as ILSVRC, PASCAL VOC, and Microsoft COCO with the help of deep learning[2]. The results of image classification was to motivate object detection have been developed by deep learning models and deep learning based object detection has also achieved state-of-the-results[3]. The intelligent resident surveillance is the most important smart community services [7].This application enables a broad spectrum, including areas of interest in access control , human identity or behavior recognition, detection of anomalous behaviors, interactive surveillance using multiple cameras and crowd flux statistics and jamming analysis and so -on [20] for complete image understanding, classifying different images not only concentrated on it, but also try to specifically approximation of the concepts and locations of objects contained in each image. This object detection task is referred [1], which usually consists of different sub tasks such as face detection [2], perambulator detection [3] and skeleton detection [4]. As one of the fundamental computer vision problems, The valuable information of object detection is able to provide for semantic understanding of images and videos, and is related to many applications, including image classification [5], [6], human behavior analysis [7], face recognition [8] and autonomous driving [9], [10]. Meanwhile, related learning systems and neural networks by inheriting, the progress in these fields will develop neural network algorithms, and object has a great impact.

Learning systems is considered as detection techniques. [11]–[14]. However, due to large variations in viewpoints, poses, occlusions and lighting conditions, for accomplish object detection is difficult with an additional object localization task . So much attention attracted of attentions to this field in recent years. detection of object in advance are driven by the success of region proposal method and region-based convolutional neural networks (R-CNNs) [6]. Although region-based CNNs were developed originally as computationally expensive [6], drastically reduced there cost have been thanks to sharing across proposals across convolutions [7, 5]. The advance in carnation, Fast R-CNN [5], achieves very deep networks was used by real time when the time spent has been ignored on region proposals In state-of-the-art of detection systems proposals are available as computational bottleneck

PLANT DISEASE DETECTION USING DEEP LEARNING (KRUSHIMITRA)

Anas Dhang¹, Shreyas P. Bhafalekar², Sakshi R. Dubey² and Kajal S. Sankhe⁴Assistant Professor¹, Masters of Engineering Computer Engineering Theem College of Engineering Maharashtra Student^{2,3,4}, Bachelors of Engineering Information Technology, Theem College of Engineering Maharashtra

ABSTRACT

Crop cultivation plays an essential role in the agricultural field. So, if plant leaf are affected by the diseases, it may affect the production as well as the economy of the country. To identify the plant leaf diseases at an ultimate phase is not yet explored. In order to find out which disease affect the leaf, the farmer need to contact the expert for the detection of disease. The expert provides the suggestions which is based on its knowledge and information whereas sometimes searching the expert suggestion is time consuming, expensive and may be not precise. Therefore, to resolve this problem, Image processing techniques can be used which provides the accurate and fast solution. In this project we have made a mobile application which uses MobileNet and Inception Model, enhanced convolutional neural network algorithms to predict the infected area of the leaves. A colour based segmentation model is defined to segment the infected region and placing it to its relevant classes. Our project is used to detect the leaf diseases of Potato and strawberry.

Keywords: plant disease, deep learning, neural networks

I. INTRODUCTION

In early days, the monitoring and analysis of plant diseases were done manually by the expertise person in that field. This requires tremendous amount of work and also requires excessive processing time. Also identifying plant disease incorrectly leads to huge loss of yield, time, money and quality of product.

Plant disease diagnosis through optical observation of the symptoms on plant leaves, incorporates a significantly high degree of complexity. Due to this complexity and to the large number of cultivated plants and their existing phytopathological problems, even experienced agronomists and plant pathologists often fail to successfully diagnose specific diseases, and are consequently led to mistaken conclusions and treatments.

To overcome this, we have proposed an mobile application ‘Farmitra’ through which we can detect the plant leaf diseases and offer a corresponding treatment measures as well as the farmers can post a comment or issues in the forum. The Plant leaf disease detection is done by using image processing. Image recognition of plant diseases is to extract the characteristic feature information from the diseased regions in the obtained images by using image processing techniques, and then to achieve disease recognition by using pattern recognition methods such as neural networks.

Deep learning can be thought as a learning method on neural networks. Due to image recognition, the Farmitra app is able to identify the plant type-as well as the appearance of a possible disease. The Deep Learning Model we have proposed is the MobileNet and Inception Model, which are widely used Image Recognition models and with a greater accuracy rate of around 99.7% as compared with the other Deep Learning Models such as Vgg(95%) and Resnet(97%).

React native, an upcoming cross platform app development which provides optimal performance, simple user interface and support third party plugins makes a very efficient front-end. In our product we have built our front-end on react native so that the farmers find it easy to use.

India is an agricultural country and about 70% of the population depends on agriculture. Farmers have large range of diversity for selecting various suitable crops and finding the suitable pesticides for plant. Diseases on plant leads to the significant reduction in both the quality and quantity of agricultural products. Monitoring of health and disease on plant plays an important role in successful cultivation of crops and plant growth in the farm.

The image processing techniques can be used in the plant disease detection. A neural network learns how to extract features while training. CNN being a multi-layer feed-forward neural network, is the popular deep learning model. Image recognition of plant diseases is to extract the characteristic feature information from the diseased regions in the obtained images by using image processing techniques, and then to achieve disease recognition by using pattern recognition methods. Generally, the extracted features from the images of plant diseases include color features, shape features, texture features, and so on. It is very important to extract the effective characteristic features for the image recognition of plant diseases

AUTOMOBILE SUSPENSION SYSTEM WITH MR DAMPER**Shaikh Irfan, Ravi Jaiswal and Bhiton Gosh**Student, Mechanical Engineering, TCOE, Boisar

ABSTRACT

The automobile suspension system mostly influence vehicle ride quality and safety. Suspension system is responsible for smoothing out the ride and keeping the car in control. Specifically, the suspension system maximizes the friction between the tires and the road to provide steering stability and good handling. Conventional dampers such as hydraulic dampers and spring dampers and air suspension have constant settings and same characteristics through out there life .There damping properties also remain same, but in reality different damping required for different types of road. There was a need of real time performance adjustment based on road situation and vehicle operation state. Semi active suspension system is required for the solution of this problems. Semi-active control systems are becoming more popular because they offer both the reliability of passive systems and the versatility of active control systems without imposing heavy power demands. It has been found that magneto-rheological (MR) fluids can be designed to be very effective vibration control actuators. MR fluid damper is a semi-active control device that uses MR fluids to produce controllable damping force.

The present paper aims to understand Semi-active suspension system and its use in Automobile design. The study will also focus on detail information on Semi-active system and its application on Mountain Bicycle .

Keywords: Active Suspension, Active Vibration, MR dampers: Magneto Rheological Damper, Magneto rheological Fluid, Passive Vibration Control, Semi-active Suspension.

INTRODUCTION

Vibration suppression is considered as a key research field in engineering to ensure the safety and comfort of their occupants and users of mechanical structures. To reduce the system vibration, an effective vibration control with isolation is necessary. Vibration control techniques have classically been categorized into two areas, namely passive and active controls. For a long time, efforts were made to improve the effectiveness of the suspension system by optimizing its parameters, but due to the intrinsic limitations of a passive suspension system, improvements were effective only in a certain frequency range. Compared with passive suspensions, active suspensions can improve the performance of the suspension system over a wide range of frequencies. Semi-active suspensions were proposed in the early 1970s and can be nearly as effective as active suspensions. When the control system fails, the semi-active suspension can still work under passive conditions. Compared with active and passive suspension systems, the semi-active suspension system combines the advantages of both active and passive suspensions because it provides better performance when compared with passive suspensions and is economical, safe and does not require either higher-power actuators or a large power supply as active suspensions do.

OBJECTIVE OF STUDY

1. To understand the concept of Semi-active suspension system.
2. To understand detail information of Magneto-rheological fluid damper.
3. To study the benefits of MR damper compare to conventional damper.
4. Its application on Mountain Bicycle.

BRIEF DESCRIPTION

Today, a large number of automobiles manufacturers rely on many different types of the control systems when it comes to the performance optimization. Out of them some are independent, adaptive and some that can fulfill a particular function from the automobile point of view while some of the others are designed with a high level authentic logic. The examples of the type of logical control system used in the automobile are traction control, adaptive cruise control, ABS systems, electronic stability program and many more. These types of systems assist to enhance the ride and handling, safety, driving comfort and most importantly it gives the best driving pleasure. The ride quality, driving pleasure and the driving comfort are directly related with the comfort of the passenger and the driver of what he (driver or the passenger) perceives while the vehicle is in motion. The main issue that hampers the performance of an automobile is due to the most unanticipated cause and that is vibration. The vibrations that originate in an automobile are due to a number of causes some of which are the road unevenness, the aerodynamic forces and the vibrations that are induced due to the engine and the powertrain.

DESIGN, ANALYSIS AND FABRICATION OF ATV ROLL CAGE

Dhruv Vartak¹, Akash Ranpise², Amit Wagharalkar³, Kaustubh Mhatre⁴ and Guruprasad Y. S.⁵
 Student^{1,2,3,4} and Assistant Professor⁵, Department of Mechanical Engineering, Theem COE, Boisar, Maharashtra

ABSTRACT

In this research paper we have done design and analysis for constructing a roll cage for an ATV. Roll cage is a very important component for a vehicle where its primary function is to protect the driver and the vehicle components from the surrounding. Roll cage must be designed and build in such a way that it will withstand all the forces exerted on it during normal or working conditions. Along with this a roll cage must be light in weight as it affects the overall weight of the vehicle. It should also be cost effective, i.e. the cost of designing, analysis and fabrication should be minimum as possible.

I. INTRODUCTION

Roll cage is an integral part of a vehicle. Its primary function is to create a protective cover around the driver. It must have adequate strength to withstand the stresses induced in the members during impact. Roll cage must also provide mounting points for suspension system and wheel hub assembly. Appropriate material should be selected in order to ensure the proper working of roll cage, also such a material should be selected that is light in weight and also cost effective. Design of roll cage was done on Solidworks 2016 and analysis was done on Ansys 2019.

II. LITUREATURE REVIEW

- Khelan Chaudhari, Amogh Joshi** – This paper considered factors like strength, bending stress, machinability, cost, availability, etc. while selecting material. After surveying they choose AISI 1026 as it is low in cost and also have good strength. A model is developed on Pro-engineer and tested in Autodesk Multiphysics. Newton's 2nd law of motion is used for Force calculation.
- Bharat Kumar, Prashi Upreti, Anirudh Tripathi, Shankar Batra** – In this paper they have chosen ERW2 steel pipes for fabrication of Roll Cage. They adopted it because of its high yield strength. Also considering the fact that it is easily available and low in cost compared to other materials. They designed the model in CATIA V5 and analysis in ANSYS 14.5. The main purpose of designing is to optimize to maximum strength and minimum weight. Work done method is used for force calculation.
- Denish Mevawala, Mahesh Sharma, Devendra Patel, Darshan Kapadia** – in this paper they have selected the material ST-52 and used ANSYS for designing and analysing. They have used the model to withstand the impact, torsion, roll-over conditions and provide a great amount of safety to the driver without subjected to deformation. G-Force method is used for Force calculation.

III. OBJECTIVE OF STUDY

- To select proper material that will be light in weight, cost effective and strong enough to resist stresses.
- To design a roll cage that will house all the important components and prevent them from any damage.
- To analyse the design for different impacts occurring during operation.
- To construct the roll cage using the final design that passed all the analytical tests.

IV. DESIGN METHODOLOGY

The important steps for designing of an ATV roll cage in systematic order are as follows:

1. Material Selection

Material selection is a very important factor while designing a roll cage. The material selected should be strong enough to withstand the forces exerted during impacts. Cost and weight should be also taken into consideration while selection as it will directly affect the efficiency and economy of the ATV. After careful consideration we have selected AISI 4130 as this material meets all our requirements.

Properties	AISI 4130
Density (gm/cc)	7.85
Young's modulus (GPa)	205
Tensile strength (MPa)	670
Yield Strength (MPa)	460
Elongation (%)	25.5

DESIGN AND ANALYSIS OF MAGNETIC SUSPENSION

Raut Parag¹, Sankhe Omkar², Patil Mitesh³ and Prof. Iqbal Mansuri⁴Student^{1,2,3} and Assistant Professor⁴, Department of Mechanical Engineering, Theem COE, Boisar (E)**ABSTRACT**

Magnetic suspension is technology for absorption of shock by means of a magnetic force. Magnetic suspension system have many advantages like It provides more stable effect, very less friction etc. So far, many kinds of magnetic levitation systems have been proposed and developed. These magnetic levitation system use various methods to control the suspension force. Two types of systems are electromagnetic suspension systems (which control the coil current so as to vary the suspension force in order to achieve stable suspension), and permanent magnet suspension system. A magnetic shock absorber- (for automobiles and two-wheelers) which makes use of the magnetic repulsion between dipoles to achieve shock absorption. This shock absorber will eradicate the problems faced in the spring shock absorbers due to friction and other factors.

The present paper aims to study how Magnetic suspension will allow us to get variable stiffness and much higher comfort just by playing with magnetic field. It will also allow us to reduce wear and tear along with less maintenance. The study will also focus on developing suspension system with simplicity in construction and ease of application.

Keywords: Magnet, Shock Absorber, Development in Suspension

INTRODUCTION

Magnetic Suspension is a shock absorbing device. Magnetic suspension is a method by which an object is suspended with no supports other than magnetic fields. Generally the suspensions are used as of spring type. The direct shock on spring is reduced in magnetic suspension. The magnets are arranged in a manner that gives more repulsion. Magnets are of required quality with required magnetic field strength. Magnetic suspension systems have been extensively studied and have found numerous applications. Most magnetic suspension systems are electromagnetic suspension systems (EMS systems) that utilize electromagnets, but here permanent magnets are used instead of that. Various mechanisms are used for various suspensions like wishbone, dual link, multi links, etc. When a lever (Bell crank) used in suspension it consist of lever and two links for horizontal arrangement of suspension.

Then, based on the principle that the magnetic force is inversely proportional to the square of the gap between the magnet and the ferromagnetic body, the mechanism controls the air gap between the magnet as per load and the object so as to adjust the attractive force. Magnetic suspension is described as the fastest reacting suspension in the world as sensors monitor the road surface up to 1000 times per second and an ECU can make variations within a few milliseconds resulting in the possibility of multiple damping variations being made in a second.

Magnetic ride control uses a system known as magneto rheological technology for suspension damping. Each absorber is filled with a polymer liquid containing many small magnetic particles. An electrical charge is sent to the liquid in the absorber which immediately changes the position of the particles in the liquid and its viscosity. The viscosity of the polymer liquid can be changed to an almost solid state similar to plastic or rubber in composition. As the viscosity of the liquid changes, it offers a difference in the damping. Each of the four dampers are adjusted individually and independently even when it seems that all of them are doing the same thing. This ensures a comfortable ride along various road surfaces. Magnetic suspension reduces vibrations, bouncing, noise and body roll very effectively on all road surfaces and at any speed that the vehicle could travel. The reduction of body roll may reduce the need for antiroll bars. Another benefit is that these dampers easily offers the best of both worlds in the ride comfort/handling compromise that many other suspension systems are subjected to. Although this type of suspension offers a very comfortable ride, sport settings can be applied or tuned into the system to cater for performance vehicles.

The Cadillac CTS-V uses magnetic suspension/magnetic ride control and has earned the respect of many for its ride comfort/handling compromise as much as its powerful engine. Magnetic dampers are designed with similar dimensions and connection points to other types of dampers so they are usually attached to the chassis of the vehicle similar to how a coil spring suspension would. Magnetic suspension or magnetic ride control is used by a range of Cadillac vehicles and several other high end vehicles from General Motors (GM) like the Chevrolet Corvette. Other companies, such as Ferrari and Audi are also known to use magnetic suspension in their vehicles. Ferrari uses them in most of their vehicles and Audi uses them in the TT and their supercar, the R8.

DESIGN AND ANALYSIS OF PARKING ELEVATOR PLATFORM SYSTEM

Giri Akash¹, Mendon Jitesh², Lokhande Kunal³, Nair Abijith⁴ and Wasim Khan⁵Student^{1,2,3,4} and Assistant Professor⁵, Theem College of Engineering Boisar (E)**ABSTRACT**

Vehicles have always been heavy and requiring regular repairs. That was the necessity behind car lifts invention. These days, car lifts are an integral part of many garages and repair shops but it's applications are not limited to that, they're also used to raise vehicles for storage in places where ramps are inconvenient or if there are space restrictions. The car lift we are working on is used for raising Light Motor Vehicles (LMV). The scissors elevator is an elevator with a system of links and hydraulic cylinders on which the metal platform is capable of moving in the vertical plane. This is achieved by using of links, folding supports in a crisscross pattern, called scissor mechanism. Also, scissor lift is an integral part of most of the workshops and building objects. The important advantage of lifts is that they even offer the best way to organize a technological and industrial process. Also, almost all lifts give the possibility to change the place of its installation without much effort, which is more important in the regularly changing circumstances in the production process these days. The main objective of our project is to design and analyze car lift to fit the given parameters and for doing that, the history and types of car lifts are studied, several research papers are referred to. In case of our lift, it had to be more stable and have a higher capacity so as to lift LMV. Literature & the task of material selection have been performed by considering hydraulic scissor lift as a LMV parking elevator system. The scissor lift can be used in different types of combination with any of applications such as pneumatic, hydraulic, mechanical, etc. Material selection plays a key role in designing a machine and also influence on several factors such as durability, reliability, strength, resistance which finally leads to increase the life of scissor lift. The computational values of two different materials such as aluminum and mild steel are compared for best results. A hydraulic scissor lift is used to lift LMV upwards with its crisscrossing foundation supporting beneath the platform. As the hydraulic fluid is forced in or out of the hydraulic cylinder it pushes the scissor arms outwards lifting the platform to the desired height. The project uses Solid works for design and ANSYS for analysis of the CAD model of the lift. After the design is analyzed, the parts are ordered and the lift is assembled.

Keywords: Car Lift, Hydraulic Lift, Hydraulic Cylinder, Scissor Arms, Top Platform, Base Support Frame, Design, Analysis Weight Optimization, Mild Steel, Aluminum Alloy, SOLIDWORKS, ANSYS.

INTRODUCTION

The most common industrial lift used for lifting purpose is the hydraulic scissor lift. This may seem like a complicated piece of equipment, but in actuality hydraulic lift tables are simple in design. Hydraulic scissor lift tables comprises of four major components:

1. **Platform:** This is the top of the lift table where lifted product sits. It can be supplied in a variety of sizes.
2. **Base:** This is the bottom of the structure that rests on the floor. It contains the track the scissor legs travel in and have a support.
3. **Scissor legs:** These are the vertical members that allow the platform to change elevation.
4. **Hydraulic cylinder:** The most common industrial scissors lifts are actuated by one, two, or three single-acting hydraulic cylinders. These allow the lift table to move in horizontal and vertical directions. A scissor lift is easily extended and compressed, safe operating machine used for transportation of light motor vehicle to its expected position.

TYPES OF SCISSOR LIFT

The scissor lifts can be classified as follows:

1. **Hydraulic lifts:** The hydraulic scissors lift is operate using the fluid pressure that raises the platform via power through the use of pressurized hydraulic oil.
2. **Pneumatic lifts:** The pneumatic lifts are operated using air pressure and they are very efficient because the power supply is carried out by compressing the atmospheric air.
3. **Mechanical lifts:** The mechanical lifts are extended through a rack and pinion system or power screw, both of which can convert rotational motion.

Hydraulic scissor lifts are very powerful tool for applying a ton of force on the platform plate of component which is equally distributed on scissor arms.

DESIGN AND DEVELOPMENT OF AERO AMPHIBIOUS VEHICLE

Sakir Shaikh¹, Adesh Maral², Nikhil Shahu³, Sohel Shaikh⁴ and Guruprasad Y S⁵Student^{1,2,3} and Assistant Professor⁵, Department of Mechanical Engineering, Theem College of Engineering, Boisar, Mumbai University, Maharashtra**1. ABSTRACT**

A widely used definition of AAV is AERO AMPHIBIOUS VEHICLE (which is based on a drone having multiple domains) which can maintain its flight along a path controlled by the flight controller without an on-board pilot. This Mechanization has proven its utilizations in many areas such as environmental survey, surveillance and weather research, monitoring and protection, agriculture, exploration and aerial target system, it can provide better applications for airborne surveillance for military operations, and reconnaissance missions. This project consists of designing process of Aero Amphibious Vehicle. It is recognized as "Multi domain Multi-copter" which can fly in air and move on the ground and float on water, applicable for any exigencies like medical assistance, rescue operations disaster affected people, spying for enemy countries etc. The project provides high degree of information about the new concept of quad-copter and design procedure. The design is developed in Solid Works and nick name of this drone is Aero Amphibious Vehicle.

Keywords: Multi-Domain Copter, UAV, Amphibious Vehicle, Tank Copter

2. I. INTRODUCTION

The Aero Amphibious Vehicle is a drone with various multiple capabilities. Aero Amphibious Vehicle can be remote controlled aircraft (e.g. controlled by a pilot at ground control station) or can fly autonomously based on pre-programmed flight plans. The Aero Amphibious Vehicle have been most often been relatable with the military but they are also used for search, research and rescue, surveillance, traffic monitoring, weather monitoring and firefighting operations.

The Aero Amphibious Vehicle is a concept of having multiple domains on single UAV such that as an aerial vehicle primarily it is able to hover above the ground but with the help of extended domain, it is also able to move on ground. This project gives detailed explanations and study to introduce multi-domain feature on UAV's and quad-copters. The project also provides the advantages of multi-domain feature and future scope.

A Quadcopter mechanism with four rotors is used in the design. Due to its distinctive design comparing to traditional Quadcopter, it allows a more stable platform, making quadcopter ideal for various tasks such as surveillance and aerial photography. And it is gathering limelight and becoming popular in UAV research in recent years. A quad copter has four rotors all work together to produce upward thrust and each rotor lifts only 1/4 of the weight, so we can use less powerful and therefore cheaper motors. The quadcopter movement is controlled by substantially varying the relative thrusts of each motor.

Various robotic machines are actively being developed for both civilian and military use to perform dull, dirty, and dangerous activities. An AAV can be defined as a "powered, amphibious vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted by the control stations and it can be recoverable, and can carry a lethal or non-lethal payload. Therefore, the goal of this paper is to present a brief overview about the available open-source control system to describe the building of an AAV, based on one of these systems and the first result of a field test, which was carried out with this low-cost system.

II. LITERATURE SURVEY

- **Agus Budiyo** Advances in Unmanned Aerial Vehicles Technologies - The paper explains a recent progress in the Mechatronics for unmanned aerial vehicles from the modelling, control and guidance perspectives. The Dynamics of the rotorcraft-based unmanned aerial vehicle is been presented to explain the principle of modelling for the control application. A number of major trends in aerial robotics are discussed state estimation algorithm, SLAM, vision for guidance, integrated modelling, manoeuvre automation and safety verification
- **Hashem Izadi Moud, Alireza Shojaei, and Ian Flood**, -This paper has briefly reviewed current applications of USVs, UUVs and UGVs across all industries, and elaborates on the current construction-related applications of these devices. By reviewing the non-construction related applications of USVs, UUVs and UGVs, the paper has identified the potential areas for UVs future application in the construction industry. It is worth noting that very few of the reviewed papers were conducted by

DESIGN AND DEVELOPMENT OF DELTA 3D PRINTER

Siddhant Belvalkar¹, Santosh Pandey², Sagar Pawar³, Omkar Shingte⁴ and Md. Sami Malik⁵
 Student^{1,2,3,4} and Assistant Professor⁵, Theem College of Engineering, Boisar(E)

ABSTRACT

3D printing is a very used process in industry, it allows the designers to produce a prototype in a very short time, which is tested and quickly remodeled. The Delta printer is based on the functional principle of a Delta robot, which is a parallel robot with 3 interconnected arms fixed to a motherboard. Compared to the Cartesian coordinate's printer, the Delta 3D printer has a bigger flexibility used to get the nozzle in the working position, higher working space, higher speed and temperature conditions, the possibility of using other types of printing material compared to the existing ones, futuristic design, usage of high quality pieces, higher stability.

Keywords: Compact, Cost efficient, Delta 3D printer, Delta Robot, Universal.

I. INTRODUCTION

The most fascinating three-dimensional printer design to watch print is the delta 3D printer. The delta design is quite different from most 3D printers and is best known for its vertical orientation and relatively small footprint although larger units can be quite tall. This paper will help you learn what you need to buy or build your own delta printer, as well as how to get the most out of your delta printer. A Delta 3D printer is a type of parallel robot that uses geometric algorithms to position each of three vertical axes simultaneously to move the nozzle to any position in a cylindrical build area. Thus, when the printer is printing, all three axes move in a mesmerizing ballet of mathematical equation. Before we jump into how the hardware mechanisms work, let's take a short tour on what 3D printing is all about. A firm understanding of the concepts of 3D printing is essential to getting the most out of your 3D printer investment. Even if you are already a 3D printing enthusiast and especially if you have never used a Delta 3D printer, you may want to read the following sections because we present the material with delta printers in mind.

The initial 3D printers were used in the 1980s where a pattern submerged in a liquid polymer would be traced by a computer. The traced pattern hardened into a layer, thanks to the laser, and that was how you built an object out of plastic. Since then tremendous progress has been made in additive manufacturing such that material extrusion is now used. By this method, an object is built out of matter that is pushed from a mechanical head like the way an inkjet printers extrudes ink onto paper. Interestingly, the cost of acquiring 3D printers has been decreasing with the advancement of technology.

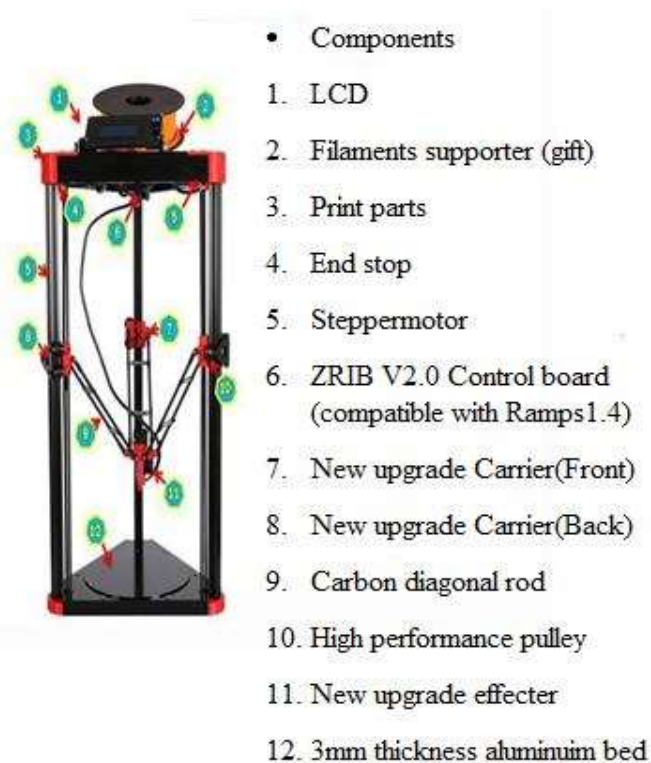


Fig-1: Major components of delta 3D printer

DESIGN AND FABRICATION OF LOOP WHEEL SUSPENSION SYSTEM FOR WHEELCHAIR

Tanmay Chonkar¹, Sourabh Raul², Gajesh Padvekar³, Rohan Mestry⁴ and MD Sami Malik⁵Student^{1,2,3,4} and Assistant Professor⁵, Department of Automobile Engineering, Theem College of Engineering, Boisar(E)

ABSTRACT

Suspension system is the main component of any vehicle whether it might be car, trucks, motorbike, bicycle or wheel chair. Suspension increases the comfort level and increases ride quality. Since suspension on wheel chair is not that comfortable We decided to not only do research on suspension system of wheel chair but also fabricate it. Loop wheel suspension system will increase the comfort level of passenger. In this project we are going to take standard foldable wheel chair and would replace the spoke wheels with our loop wheels. (In-wheel suspension).

Keywords: Wheel Chair, In-wheel Suspension, Solid Works, Ansys Workbench 19.0

I. INTRODUCTION

In today's world there is a great demand for a comfort vehicle whether it might be car, cycle or wheelchair. Suspension system plays an important role in giving the comfort and smooth ride for any vehicle. Since vehicle like wheelchair needs the good suspension system for comfort and smooth ride because they are used by patient so the concept of in-wheel suspension is used. The concept of loop wheel suspension system is for better shock absorbing performance and for greater comfort. This project presents a study of an In-wheel suspension system which is placed in a wheel chair. The loop wheel however allows isolation both in vertical and horizontal directions. The loop wheel provides durability high strength and a better shock absorber on off roads conditions. The suspension system includes the Wheel, Rim, Suspension (shock absorber) instead of spoke hub. The replacement of spokes by adaptive suspension will allow the torque to be transferred smoothly between the hub and the rim.



Fig-1: In-Wheel suspension system

TYPE OF WHEELS IN WHEEL CHAIR

Spoke Wheels - The spoked wheel is very similar to the spoked wheel on a bicycle and was the norm for all wheelchair prior to the development of composite wheels for wheelchair use. Spoked wheels are still optional on many wheelchair models but only those who expect high performance from their wheelchairs usually opt for them. In spite of their popularity, composite mag wheels will flex during use and this flexing increases the energy needed to propel the wheelchair. Spoked wheels, when in good condition, donot flex and are therefore more efficient for the user. The average user probably wouldn't notice the difference but those who are very active probably will.

Composite Mag Wheels - Composite mag wheels are by far the most common wheels in use for wheelchairs today and come standard on most wheelchairs. The composite mags are made out of is a nylon/fiberglass-like material that is strong, resilient and light weight. They can be fitted with several types of tires and hand rims to meet the needs of the user. The rims of these wheels are maintenance free and are designed to spring back to their original shape should outside pressures due to accident or rough use warp of bend them.

High performance Wheels -High performance wheels are the wheels pictured at the top of this article are not used by average wheelchair users. There are many kinds of these wheels on the market for sports and very active users.

ROOM COOLING ANALYSIS WITH VORTEX TUBE

Anirudh Narendra¹, Pawankumar Pandey² and Prof. Manoj K Gowda³

Student^{1,2} and Assistant Professor³, Department of Mechanical Engineering, Theem COE, Boisar (E)

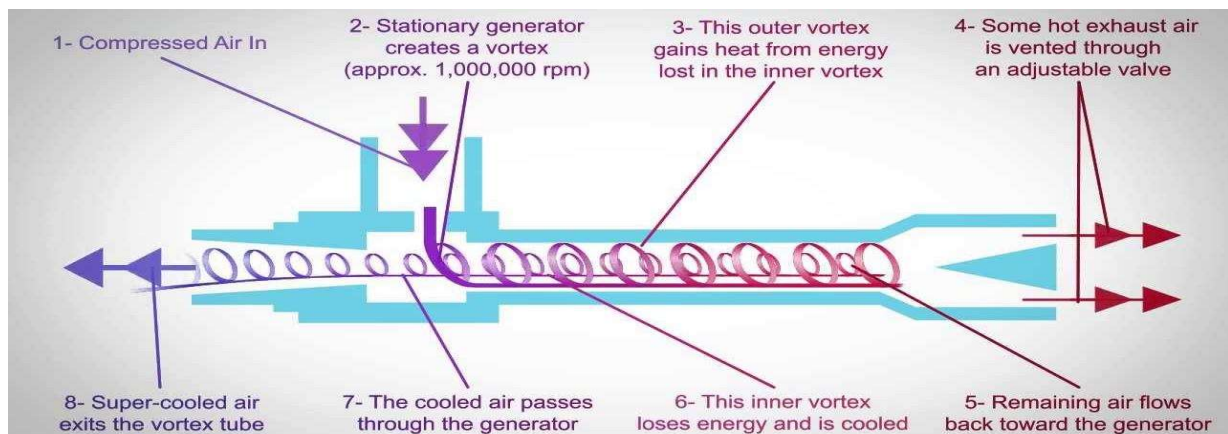
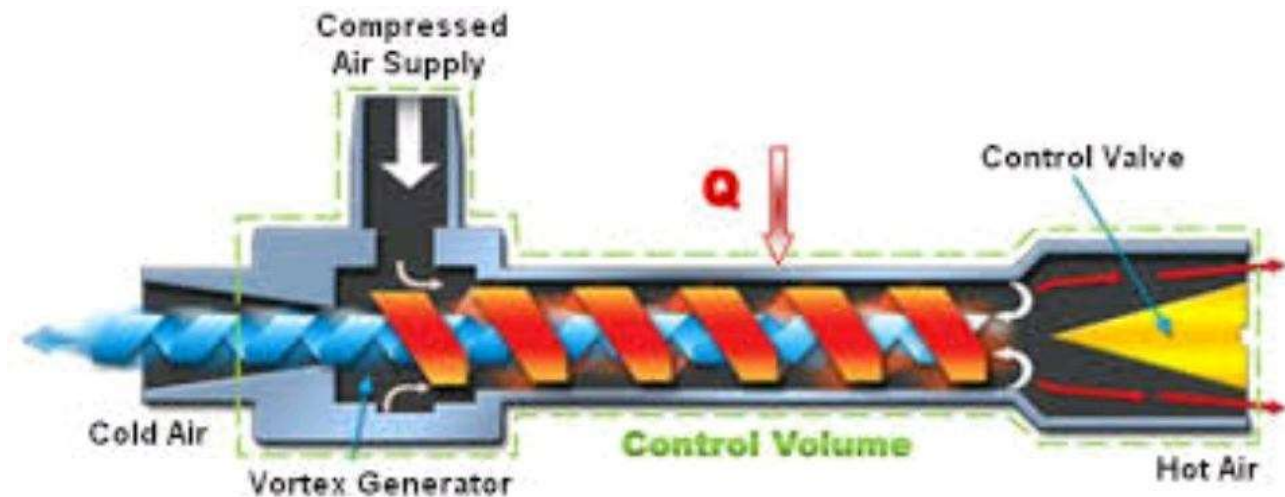
ABSTRACT

In first and foremost quality of a research or development is to develop eco-friendly product or system, which fulfill our needs without affecting environment. Today environmental safety is become prior needs in world and common people. This paper is generally carried out to increase efficiency, cooling effect of such an eco-friendly device called vortex tube. In recent years, Air Conditioner has evolved drastically and uses of it are increasing day by day, it is widely used in home, offices as well as industrial sector. But due to its cost and large holding space for its equipment like condenser, etc. requires more space. So due to this it is not feasible and acceptable to all people to use it. Because of this it has resulted in extensive research into novel technologies of generating some alternative for it. Experiment and calculation are going on to produce such a device or a system which can provide same cooling effect, at same room condition. A background on the basic concepts of cooling with vortex tube at spot is presented and recent patents of this with their important and relevant applications of free eco-friendly energy are reviewed and discussed.

Keywords: Vortex tube, Eco-friendly, Cooling, Efficiency.

INTRODUCTION

The vortex tube was invented by French physicist Georges J. Ranque in 1933. He found that when compressed gas was injected tangentially into the tube, flow streams at lower and higher temperature were generated and exhausted from different ends of the tube. The cold stream was exhausted from the central exit near the inlet and the hot stream was exhausted from the peripheral exit at the other end of the tube. Ranque explained the separating effect in the vortex tube as one, which depended on expansion and compression. A vortex tube is a Thermo-fluidic device, which generates cold and hot streams from a single injection of pressurized gas. The gas emerging from the "hot end" can reach temperatures of 200 °C (392 °F), and the gas emerging from the "cold end" can reach -50 °C (-58 °F). Without any moving parts or chemical reaction within the tube.



A LITERATURE REVIEW ON DESIGN AND ANALYSIS OF ELECTRIC MOTORCYCLE

Mayuresh Kadam¹, Gaurav Bore², Aashish Maurya³, Shreyas Parab⁴ and Wasim Khan⁵
 Student^{1,2,3,4} and Assistant Professor⁵, Theem College of Engineering, Boisar (E)

ABSTRACT

In today's situations Automobile industry becoming more and more competitive. The vehicles can get the energy from petrol or diesel engine for its drive. The depletion of fossil fuels reducing the amount of petrol and diesel day by day. Now automobile industry requires new source of energy to run the vehicles, it can be done using electric energy. In this report, the design and analysis of electric motorcycle is described. Major drawback of e-bike is requiring frequent charging from EB supply. This paper shows the charging arrangement of E-bike. The electrical energy is supplied to the motor by battery and Battery can receive the electric energy by dynamo and charging system. This e-bikes running cost is very low, when compare to other sources of energy used in bike. Market available E-bike batteries are designed to spent 4-6 hours/charge by using Electric Battery supply. These batteries can be charged by dynamo, Alternator or with the help of regenerative controller. So electric supply cost also gets reduced.

Keywords: Electric motorcycle, Chassis, Brushless DC motor, Battery, Controller.

I. INTRODUCTION

Energy crisis is one of the major concerns in today's world due to fast depleting resources of petrol, diesel and natural gas. Electric vehicles is the solution which can help to save the fossils fuels for future and decrease the usage of fossil fuels. This project will deal preliminary with electric motorcycle where the internal combustion engine is replaced by a battery and electric motor drive which is used for personal transportation. The principle and working of Lithium ion battery, Lithium ion phosphate battery, Wheel hub motor, Regenerative controller and Alternator are provided to you. Mechanical Components including chassis, transmissions, wheels and brakes are presented. The design of frame of motorcycle and body is done on Solid works software and the Analysis on the frame of a motorcycle is done on Ansys software by applying appropriate Boundary conditions which will help us to show the results that how a frame will act practically when certain loads are added to it. The Electric bike which will be running on battery, the power is supplied by the motor and it will run the bike. The efforts are being made to reduce the charging time, increase the speed of a vehicle, increase the range of a vehicle and decrease the weight of a vehicle. The main purpose of using this E-bike is that it is user friendly, economical and relatively cheap. The market available e-bike use Brushless direct current motor for drive purpose.

Product Overview - Parts of An Electric Motorcycle

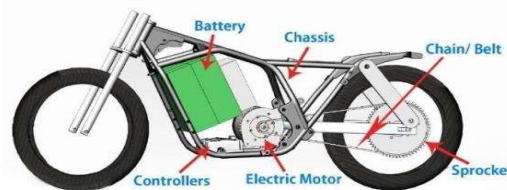


Fig-1: Major components of Electric Motorcycle

From above figure we can conclude the major components of electric motorcycle i.e. Battery, Chassis, Electric motor, Controller and drive.

II. LITRETURE VIEW

Haruo Sakamoto (1), confirmed the strength of designed motorcycle by performing a stress analysis. In prior to the analysis of designed frame, a simple calculation was conducted using a cantilever model of 100mm × 100mm cross section and 100 mm length with the force of 50N at the tip. The calculation by hand is 0.3 MPa and the result of FEM is 0.29 MPa. This result is enough to perform FEM stress analysis for motorcycle model. Saurabh Rege et. al (2), concluded that the trellis frame is the lightest frame and yet provides high rigidity due to triangulations provided by tubes and frames. The trellis frame thus has the highest strength to weight ratio among all frame types. Unlike the cradle frame, the tubes of trellis can accommodate components of larger size which also perform structural duties themselves thus providing increased strength and rigidity. Trellis frame provides better centralization and lower the overall vehicle weight. The centre of gravity of frame is below the rider seating area thus ensuring low and centralized frame weight. R.D. Belekar et. al (3), they modelled and

A LITERATURE REVIEW ON WIRELESS CHARGING SYSTEM FOR VEHICLES BY USING FLEMINGS METHOD TO CHARGE THE VEHICLE BATTERY

Prathamesh Mane¹ Sumit Katkar² Vivek Dharsandiya³ and Mustaque Ahmed Mohd⁴
Student^{1,2,3} and Assistant Professor⁴, Theem College of Engineering, Boisar (E)

ABSTRACT

In today's situations Automobile industry becoming more and more competitive. the vehicles can get the energy from petrol or diesel engine for its drive. The depletion of fossil fuels reducing the amount of petrol and diesel day by day. Now automobile industry requires new source of energy to run the vehicles, it can be done using electric energy. In this report, the design and analysis of electric motorcycle is described. Major drawback of e-bike is requiring frequent charging from EB supply. This paper shows the charging arrangement of e-bike. The electrical energy is supplied to the motor by battery and Battery can receive the electric energy by dynamo and charging system. This e-bikes running cost is very low, when compare to other sources of energy used in bike. Market available e-bike batteries are designed to spent 4-6 hours/charge by using EB supply. These batteries are charged by dynamo. So electric supply cost also reduced. Many electric bikes have been developed before, but the drawbacks of those bikes are their cost, efficiency, charging time, etc.

Therefore, in this project we are going to design and analyse electric motorcycle which will have a low manufacturing cost than other electric motorcycle, as well as we will try to increase its efficiency and increase the running rate as well as good speed. In this project we will compare the batteries which have been previously used in electric motorcycle as well as we study about the battery which we will use in electric motorcycle in this project. Efforts are been made to increase the running rate of a vehicle with help of suitable battery and decrease the charging time of a battery with help of selecting suitable battery and a charger.

To design an electric motorcycle, the program used in this project for designing are SolidWorks 2016 and ANSYS 18.0 (for analysis). Consequently, of using these programs, this project allows us to apply, learn and link technical knowledge of automobile, Electrical and computer knowledge.

INTRODUCTION

Inductive charging (wireless or cordless charging) is a kind of charging that uses an electromagnetic field to transfer energy between binary objects using electromagnetic induction, generating electricity across a magnetic field. Example- Induction chargers practice an induction coil to produce an alternating electromagnetic field from in a charging base, and a second induction coil in the portable device takes power from the electromagnetic field and transforms it back into electric current to charge the battery.

Example- Induction chargers use an induction coil to generate an alternating electromagnetic field as of within a charging base, and a second induction coil in the convenient device takes power from the electromagnetic field and changes it back into electric current to charge the battery.

Fleming's Right-hand Rule (for generators) displays the direction induced current when a conductor attached to a circuit travels in a magnetic field. It can be used to govern the direction of current in a generator's windings.

When a conductor for example a wire attached to a circuit travels through a magnetic field, an electric current is induced in the wire due to Faraday's law of induction. The current in the wire can have two likely directions. Fleming's right-hand rule index finger and middle finger mutually perpendicular to each other (at right angles), as revealed in the diagram.

The direction of the motion of the conductor is determined relative to the magnetic field.

The direction of the magnetic field is indicated by first finger. (north to south)

Then the second finger signifies the direction of the induced or generated current inside the conductor (from the terminal with lower electric potential to the terminal with higher electric potential, as in a voltage source)

A RESEARCH PAPER ON FLUID MIXING M/C USING LEAD SCREW MECHANISM**Milind Kshirsagar, Dhruv Panchal, Faiz Patel, Harshal Vaidya and Prof. Harshal Ahire**Student and Assistant Professor, Mechanical Engineering Department, Theem College of Engineering, Boisar

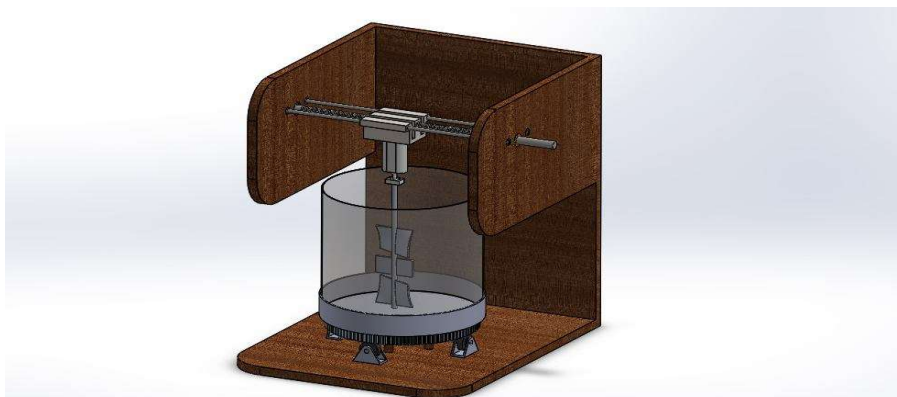
ABSTRACT

The stirrer of conventional machine rotates in one direction only which creates a particular flow pattern in the fluids hence the particles tend to stick to the walls of container owing to the centrifugal force rather than mixing thoroughly in mixture of paint, ultimately results into poor quality mixture of paints there by poor quality output of paint. In order to have a through mixing of metal oxide powder it would be appropriate to have a stirrer that rotates such that rotates about own axis as well revolves about another fixed axis which helps it reach all parts of the container. This ensures that turbulence required for thorough mixing is provided all over the container. It would be advantageous to change pattern of flow, which avoids vortex formation, ie motion of particles in a spiral path. Also if an wiper is added that brings the particles adhering to walls of container back into main flow or mixing area, good quality mixture will be ensured. The planetary mixer with strainer is an ideal solution that has all the above mentioned features. This machine involves a rotating stirrer that revolves about the fixed container axis as well as incorporates a strainer that changes the flow pattern and also acts as a wiper. Machine has variable mixing speed feature at the same time delivers heavy torque to the stirrer for proper mixing.

INTRODUCTION

In industrial process engineering, mixing is a unit operation that involves manipulation of a heterogeneous physical system with the intent to make it more homogeneous. Familiar examples include pumping of the water in a swimming pool to homogenize the water temperature, and the stirring of pancake batter to eliminate lumps. Mixing is performed to allow heat and/or mass transfer to occur between one or more streams, components or phases. Modern industrial processing almost always involves some form of mixing. Some classes of chemical reactors are also mixers. With the right equipment, it is possible to mix a solid, liquid or gas into another solid, liquid or gas. A bio-fuel fermenter may require the mixing of microbes, gases and liquid medium for optimal yield; organic nitration requires concentrated (liquid) nitric and sulphuric acids to be mixed with a hydrophobic organic phase; production of pharmaceutical tablets requires blending of solid powders.

Mixing of liquids occurs frequently in process engineering. The nature of liquids to blend determines the equipment used. Single-phase blending tends to involve low-shear, high-flow mixers to cause liquid engulfment, while multi-phase mixing generally requires the use of high-shear, low-flow mixers to create droplets of one liquid in laminar, turbulent or transitional flow regimes, depending on the Reynolds number of the flow. Turbulent or transitional mixing is frequently conducted with turbines or impellers; laminar mixing is conducted with helical ribbon or anchor mixers.

CONSTRUCTION AND WORKING**SYSTEM DESIGN****ADVANTAGES**

- Proper mixing of viscous fluids.
- Decrease in mixing of time.

DESIGN ANALYSIS AND TESTING OF CENTRIFUGAL PUMP IMPELLER

Shrihari B. Kale¹ and Suraj S. Wankhade²

Assistant Professor¹, Mechanical Engineering Department, ZES's Zeal Polytechnic, Pune
Assistant Professor², Mechanical Engg. Department, Theem College of Engineering, Boisar, University of
Mumbai

ABSTRACT

Impeller is a rotating components of a centrifugal pump. In that the excessive vibration is a good indicator that indicates some damaging phenomenon occurring within a impeller. Mostly machinery problems result from the interaction between an exciting force, associated structural and hydraulic resonance frequencies. When exciting force is stronger at natural frequency the amplitude of vibration becomes maximum. Hence the main objective of this is to carryout vibration analysis and experimentation on various materials to find out alternate suitable material and to minimize the vibration and to improve the performance of pump impeller. To find out the natural frequency of a impeller modal analysis was carried out. Cad model generation was done in CATIA V5, meshing in HYPER MESH and ANSYS is for post processing. Re-analysis and experimentation was done using different material to check the vibration response on the impeller.

I INTRODUCTION

AN impeller is a rotating component of a centrifugal pump, which transfer energy from motor to the fluid being pumped by accelerating the fluid centrifugally from the center of rotation. It usually made of iron, steel, bronze, brass, aluminum or plastic. The fluid which flow outward from the center of rotation due to centrifugal phenomenon increases pressure by converting the velocity achieved from the impeller. Usually impellers are short cylinders with an open inlet for accepting fluid from suction pipe, vanes provided to push the fluid radially and keyed or threaded bore provided for a drive-shaft. The impeller may be called rotor also. A centrifugal pump contains the rotating and the stationary part. The rotating part includes a shaft and a pump impeller while the stationary part is composed of the casing, bearing, electric motor and an associated cooling fan. Mechanical vibration sources are carried out by vibration of unbalanced rotating masses and friction in bearing and seals. Vibration in any machine component is undesirable. Vibration may be dangerous in many ways i.e. it causes damage to the structure, loosening of bearing may occur etc.

A. Mechanical Vibrations Sources

- 1) Motor and shaft: When the motor in the hydraulic system is rotating at a high speed, the rotating part imbalance can result in periodic unbalanced force. The vibration occur due to the displacement of its shaft from its neutral position due to some external forces generated when the shaft rotates. The shaft vibration frequency is equal to motor rotation frequency.
- 2) Coupling: Alignment of motor shaft and prime mover driven shaft is very important to minimize the vibration.
- 3) Pipeline and Tank: Pipeline and tank are not the source of vibration. The vibration is influenced by other components, such as pressure and flow pulsation, mechanical vibration and so on. When natural frequencies and vibration frequency of pipeline and tank is same, then resonance occurs, resulting in strong vibration. Especially when the pipeline is too slender or meticulous and direction changes to a great extent, more easily to cause vibration.

II PROBLEM STATEMENT

Always some vibration produce in the operation of any mechanical system but when it crosses the desire limit, vibration is unavoidable. Vibration is an indicator of some problem with a mechanism, or it may be a cause of other problems. Vibration of impeller in centrifugal pump is responsible to reduce performance of pump. So most important is to find out and minimize the vibration by doing proper vibration analysis and experimental analysis of components.

III METHOD OF VIBRATION REDUCTION

Mainly two main group of vibration reduction methods, i) passive method and ii) active method.

Passive method uses materials and mechanical linkages that absorb and damp these mechanical waves. Active method involves sensors and actuators that produce destructive interference that cancels out incoming vibration.

IV VIBRATION ANALYSIS

A centrifugal pump impeller model designed by using CatiaV5R19 and then imported a solid model to Hype

DESIGN AND ANALYSIS OF ELECTROMAGNETIC DAMPER FOR VIBRATION SUPPRESSION OF STRUCTURES

Roshan C Vani, Nitin Galwade, T. Santosh Dubey

Assistant Professor, Mechanical Engg. Department, Theem College of Engineering, Boisar, University of Mumbai

ABSTRACT

This Paper presents the use of eddy current due to electromagnet is sufficient to suppress the structure vibration. Electromagnetic principle is used normally in brake systems, transmission or for damping phenomena. For damping phenomena the advantage as compared to some other devices is no mechanical contact, no wear and is simple technique. In this article finite element analysis (FEA) software was used to develop the model. Start is done by plotting different mode shapes of structure and then by eddy current due to electromagnetic damping the vibration of structure. We can reduce the damping of varying mass by this damper and also reduce damping coefficient. Damper consists of neodymium iron grade N 50 magnet. By utilizing the damper it is observed that there is more difference in damping when experimental result is compared with analytical result.

INTRODUCTION

Damping due to eddy current is more efficient form of damping. Important parts of damping are permanent magnet, conducting disc of copper. When conductor moves through stationary magnetic field or vice versa electromagnetic forces are produced and these electromagnetic forces can be used to suppress the vibrations of a flexible structure. Drag force or damping force is generated which dissipates kinetic energy into ohmic heat. These dampers have found huge applications, as compared to viscous, viscoelastic or piezoelectric damper. Advantages of electromagnetic based eddy current damper are mechanical contact is eliminated, more reliable, high thermal stability and vacuum compatibility. Certain disadvantages are due to large mass and more packing size.

Normally in the design of transformers or electromagnetic motors laminated steel is used to reduce to reduce eddy current losses. By splitting the conductor, electrical resistance can be increased in the current loops. For electromagnetic damper we should reduce the loop resistance, hence the area of conductors is usually more than the area of magnetic field. By utilizing this approach of “split the magnets to increase eddy current via alternating the magnetic poles.

To illustrate this idea, consider two extreme cases as follows. Figure 1a) shows a moving conductor in a uniform magnetic field of the same width. In Fig. 1b) the magnetic field is split into two with alternative pole directions. When the conductor is moving at position as shown in the figure, instantaneous electric charges are induced in both cases, as indicated in Figs. 1a) and 1b). However eddy current loop and damping exist only in case b) but not in case a) .Case a) is similar to two identical batteries connected in parallel. If the conductor plate is wider than the magnetic field, or the B flux density is not uniform, eddy current and damping force exist in both cases in Fig. 1, but the damping force in case b) will be much larger than that in case a)

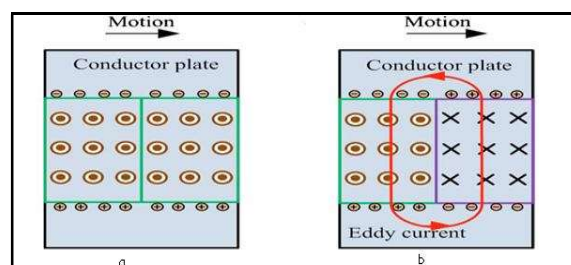


Fig-1: Illustration of Two Types of Arrangements of Magnetic Field for Eddy Current Dampers: (a) Uniform Magnetic Field & (b) Alternating Magnetic Field

A. Analysis of a Conducting plate in a Uniform Magnetic Field.

According to our intuitive illustration based on electrical current loops, we see that the damping Coefficient of a moving conductor plate in an Alternating magnetic field is larger than the plate in a Uniform magnetic field. In the following, we will describe the analytical model of the eddy current Damper in a uniform magnetic field, and then present the modeling of the eddy current damper in the alternating magnetic field. Fig. 2a) shows the eddy current damper composed of a conductor moving with a relative velocity v (m/s) in a rectangular magnetic field

**EFFICIENCY IMPROVEMENT OF VORTEX TUBE, BY VARYING INSIDE SURFACE
ROUGHNESS OF CYLINDRICAL HOT TUBES****Nitin Vijay Galwade, Roshan Vani and Santosh Dubey**Assistant Professor Mechanical Engineering Department, Theem College of engineering Boisar

ABSTRACT

Refrigeration plays an important role in developing countries, mainly for the preservation of food, medicine and air conditioning. Conventional refrigeration systems use Freon as a refrigerant. As they are the main cause of ozone depletion, extensive research work is underway on alternative refrigeration systems. The Vortex tube is an unconventional cooling device, without moving parts that can produce cold air and hot air from the compressed air source without affecting the environment. When a high pressure air is injected tangentially into the vortex chamber, a strong vortex flow will be created which will be split into two air flows. It can be used for any type of spot cooling or heating application. In this document, the counter-flow vortex tube is compared with different performances of hot surface roughness tubes. It was found that the vortex tube with surface roughness of $Ra = 6.264 \mu\text{m}$ exceeded the hot tubes with surface roughness of $Ra = 4.510 \mu\text{m}$ and $Ra = 3.133 \mu\text{m}$ respectively from 6% to 26% and from 16% to 52% in COP. The COP of the vortex tube increases as the roughness of the inner surface of the hot tube increases

A vortex tube contains the different main parts vortex chamber inlet and cold terminal orifice, hot control valve and orifice. It works in such a way that the fluid enters the tube circles around an axis that is called a vortex. And that rotation creates a vortex from the compressed air and separates that flow into two hot and cold air flows. From its center, the super-cooled air that is delivered through the cold end door is exceeded. The surface finish of the nozzle and tube, ie the hot end, plays an important role in the performance of the vortex tube. In this document it is observed that the vortex tube with main surface roughness values of cylindrical hot tubes is used to increase the efficiency of the tube vortex. It results in COP of the vortex tube.

Keywords: Vortex chamber, Roughness value of cylindrical hot tubes, COP of the system, Efficiency of tube.

INTRODUCTION

The vortex tube is a static thermal tube that separates the flow of compressed gas into two flows; a cooler flow than the inlet flow while the other flow is warmer than the inlet flow. The vortex tube has no moving parts and separation occurs due to vortex flow generation without requiring any external mechanical work or heat transfer. The vortex tube was first discovered by Ranque [1, 2] who was granted a French patent for the device in 1932 and a US patent in 1934. Ranque encountered the vortex tube phenomenon while he was working experimentally with the vortex tube pump in 1928. In 1945 Rudolf Hilsch [3] conducted a vortex tube experiment focused on thermal performance with different inlet pressure and geometric parameters. In recent years it has been known that the vortex tube is a low cost and an effective solution to many spot cooling problems. The separation mechanism inside the vortex tube remains until now not completely understood [4]. The ability to obtain hot or cold flow streams using compressed gas has allowed the use of the vortex tube in many engineering applications such as electronic cooling, food cooling, cooling of the fire suit and machinery cooling during operation. Despite its reduced capacity, the Ranque-Hilsch swirl tube (RHVT) is very useful for some thermal management applications due to its simplicity, high durability, compactness, lightness, sturdiness, reliability, low maintenance and safety costs [5]. RHVT can be classified into two types [6]: (1) counter-flow RHVT and (2) uni-flow RHVT. In the counter-current type RHVT the cold flow moves in the opposite direction to the hot flow, while in the uni-flow type, the hot and cold flows flow in the same direction. In general, counter-current RHVT is recommended over RHVT uni-flow due to its efficient energy separation [6]. The Vortex tube is widely treated in literature through experimental and numerical analyzes. The experimental work of Nimbalkar and Muller [7] indicated that there is an optimal diameter of the cold end orifice to obtain maximum energy separation. Furthermore, the results [7] showed that the maximum value of the energy separation was always reachable with a cold fraction of 60% regardless of the diameter of the orifice and the inlet pressure. The optimal ratio between diameter and length of the hot side was studied by Dincer et al. [8, 9]. The performance of the vortex tube was studied for three different working gases: air, oxygen and nitrogen and the results were reported using strip views in a vortex tube in Perspex [10]. Aydın and Baki [10] and Hamdan et al. [11] indicated that the inlet pressure and the cold mass fraction were the most important operating parameters. Hamdan et al. [11] in their experimental work investigated the effect of numerous operating and geometric parameters on the thermal performance of the vortex tube, in which the effect of position of the vortex plug, the pressure of the inlet gas, the number were covered. of vortex generator inlet nozzles and

RECOVERY OF WASTE HEAT USING HEAT EXCHANGER

Sagar Yadav¹, Amit Mahto¹, Neeraj Yadav¹, Rohit Ramchandra¹ and Prof. Iqbal Mansuri²
Student¹ and Guide², Department of Mechanical Engg, Theem COE Boisar

ABSTRACT

The paper considered a review for the design of a shell and tube heat exchanger. Therein, popular analytical techniques such as log mean temperature difference (LMTD) and effectiveness-number of transfer units (ϵ -NTU) were considered in the analysis. In the design, analysis, performance charts and tables describing the performance of the shell and tube heat exchanger in terms of crucial dimensionless parameters were developed. These fundamental dimensionless parameters account for the thermal & the physical properties of the fluids and the heat exchanger (HX) material. Using the information from the performance charts and tables, a basic design for the shell and tube heat exchanger can be readily formulated. The basic design involves choosing an appropriate number of transfer units (NTU) and capacity rate ratio for a given application. The NTU and capacity rate ratio can then be extrapolated to develop a detailed design for the shell and tube heat exchanger. Since NTU and capacity rate ratio accounts for all the significant physical and thermal properties of the heat exchanger, performance tables and charts would certainly help in maximizing the performance and minimizing the cost of the shell and tube heat exchanger. In the case considered here in, both LMTD and ϵ -NTU techniques yield the same exact results.

I. INTRODUCTION

Heat exchangers are widely used in manufacturing and process industries for several applications. The choice of heat exchanger for a given application is dependent on several factors such as the application, available floor area, available resources, connections in the field, cost, and many more. In a highly competitive environment, it is essential that the heat exchanger must deliver the required heat transfer, occupy less space, weigh less, and yet be priced competitively. In this project, a shell and tube heat exchanger is designed for and steam is the heating medium. The heat exchanger shall be designed such that the hot oil flows through the tubes and steam through the shell side of the heat exchanger. It is assumed that large steam flow rate is available to provide the required heating for the hot oil in the shell and tube heat exchanger. A conventional ϵ -NTU approach and LMTD approach shall be used to design the shell and tube heat exchanger. Performance tables and charts describing the variation of shell heating hot oil. Hot oil is used for a certain process heating application and tube heat exchanger's performance with respect to capacity rate ratio and NTU were developed. Dimensionless parameters such as capacity rate ratio and NTU provide concise information on the heat exchanger as they account for material characteristics, flow characteristics, physical and thermal properties, construction and fouling. Likewise, the developed tables and charts can also be employed during the regular working phase of the shell and tube heat exchanger to understand its performance and There are numerous references available in the literature pertaining to heat exchanger performance modelling, and only the most pertinent studies are discussed. There are numerous references available in the literature pertaining to heat exchanger performance modelling, and only the most pertinent studies are discussed in this manuscript.

II. LITERATURE SURVEY

Dawit Bogale-2014 [1] : Dawit Bogale conducted a experiment on shell and tube heat exchangers showing optimization and redesign of the machine is done for both mechanical and thermal designs and the simulation for the heat transfer between the two fluid is analyzed using the concept of CFD (Computational Fluid Dynamics) using Gambit and Fluent software's. The final result of the STHEX in HBSC which is the redesigned STHEX can achieve or efficiently work to achieve the required outlet temperature 340°C the temp at which the beer is ready for customer for use.

Vindhya Vasiny Prasad Dubey, Raj Rajat Verma-2014 [2]: Dubey and Verma conducted a Performance Analysis of Shell & Tube Type Heat Exchanger under the Effect of Varied Operating Conditions and concluded that It may be said that the insulation is a good tool to increase the rate of heat transfer if used properly well below the level of critical thickness. Amongst the used materials the cotton wool and the tape have given the best values of effectiveness. Moreover the effectiveness of the heat exchanger also depends upon the value of turbulence provided. However it is also seen that there does not exists direct relation between the turbulence and effectiveness and effectiveness attains its peak at some intermediate value. The ambient conditions for which the heat exchanger was tested do not show any significant effect over the heat exchanger's performance.

JAY J. BHAVSAR, V K. MATAWALA-2013 [3]: The previous works carried out by different authors were limited to helical coil heat exchanger and spiral plate heat exchanger. The spiral tube heat exchanger is compact

EXPERIMENTAL INVESTIGATION OF RADIATOR SYSTEM FOR A STATIONARY C. I. ENGINE

Prof. Iqbal MansuriAssistant Professor, Department of Mechanical Engg., Theem C.O.E. Boisar, Mumbai

ABSTRACT

The radiator is an essential adornment of vehicle motor. Typically, it is utilized as a cooling arrangement of the motor and by and large water is the warmth exchange medium. For this fluid cooled framework, the waste warmth is evacuated by means of the circling coolant encompassing the gadgets or entering the cooling diverts in gadgets. In this paper different techniques for radiator execution assessment and testing of the radiator are considered in light of the fact that all inner ignition motors produce heat as a by result of burning and rubbing. This warmth can achieve temperatures up to 1925°C (3500°F) and can have disastrous effects on motor parts. Inner burning motors are fitted with a cooling framework which is in charge of expelling certain warmth from the motor and keeps the motor from overheating. This cooling framework requires an extensive space to address cooling issue furthermore have constrained warmth dispersal. Car radiator is key segment of motor cooling framework. Radiator warm investigation comprise measuring and rating of warmth exchanger. Radiator estimate for the most part relies on upon warmth dismissal prerequisite. Heat exchange estimations are imperative essentials to enhance radiator size. In this study, Ethylene glycol (EG) and Ethanediol with aliphatic added substances blended with refined water in different proportions as traditional coolant have been utilized as a part of car auto radiator. These warmth exchange liquid have low warm conductivity. In this Experimental study introduced the blend Ethylene glycol + water utilized as a part of auto radiator. General warmth exchange rate have been spoken to in the present work.

Keywords: Car radiator, Engine Cooling, Efficiency, Coolants etc.

I. INTRODUCTION

Today, the interest of car vehicles is on top. There is a considerable measure of rivalry existing between car commercial ventures. In this way, it is an incredible test for car commercial enterprises to give a proficient and prudent motor. There are different elements influencing the productivity of motor specifically, fuel supply frameworks, Lubrication framework, Transmission framework, Cooling framework, Climatic conditions, Size of chamber head, Ignition timing. Here cooling parameter is taken into thought and investigates are finished. The warmth produced amid burning in IC motor ought to be kept up at more elevated amount to expand warm effectiveness, however to keep the warm harm some warmth ought to expel from the motor. In air-cooled motor, augmented surfaces called balances are given at the fringe of motor chamber to build heat exchange rate. However, these days because of different enhancements in car field, enhanced cooling frameworks are utilized as a part of vehicles to expand the warmth exchange rate. They are examine bellows.

II. LITERATURE SURVEY

Yiding Cao and KhokiatKengskool [1], had gave utilization of the warmth channel in a car motor was presented. In this application, heat funnels were fused into the radiator of the car motor for more productive warmth exchange. The cooling heap of the radiator can be expanded for overwhelming obligation motors, while the force utilization of the cooling fan can be diminished for higher vitality productivity. Heat channels including two-stage shut thermo siphon were two-stage heat exchange gadgets with a viable warm conductance many times higher than that of copper. For the physical applications, gravity was regularly used to right hand the arrival of the fluid condensate and no wick structure was required inside the warmth channel. A little measure of working fluid was filled in a tube.

Hwa-Ming Nieh, Tun-Ping Teng, Chao-Chieh Yu [2], This study receives an alumina (Al₂O₃) and titanium (TiO₂) Nano-coolant to upgrade the warmth scattering execution of an air-cooled radiator. The two-stage combination strategy is utilized to deliver diverse convergences of Al₂O₃ and TiO₂/water (W) Nano liquid by utilizing a 0.2 wt. % chitosan dispersant, and the Nano liquid is blended with ethylene glycol (EG) at a 1:1 volume proportion to frame NC1 to NC6(Nano Coolant). The investigations were led to gauge the warm conductivity, thickness, and particular warmth of the NC with various convergences of nanoparticles and test temperatures, and after that the NC was utilized as a part of an air-cooled radiator to assess its warmth scattering limit, weight drop, and pumping power under various volumetric stream rates and warming temperatures. The test results demonstrate that the warmth dissemination limit and the EF of NC are higher than EG/W, and that the TiO₂ NC are higher than Al₂O₃ NC in the vast majority of the trial information. The upgraded rate of the normal EF increments as the fixation and volumetric stream rate of the TiO₂ NC increments. sort of compartment. Air was emptied from the compartment and the holder was fixed. Warmth was connected to the

SELF-CHARGING CAR**Abubakr Thim Spandan Samal and ShahFaisal Shaikh**Student, Mechanical Engineering Department, Theem College of Engineering, Boisar, University of Mumbai

ABSTRACT

The natural resource (crude oil) is getting vanished slowly and also in future it is possible that it will be completely finished. We know that crude oil is the main source of petrol and as crude oil is being vanished, petrol will not be produced in future. So, the alternate solution for this problem is the E-Vehicle. But E-Vehicle needs batteries to run the vehicle. Due to that reason, everybody is not able to afford this type of vehicle. So we have overcome from a problem of battery discharging. But E-Vehicle contains more weight other than the self-charging system and the passenger's weight. The concept of self-charging car is that it will charge your car's battery with the help of dynamo. As the dynamo will start rotating, it will produce electric charge. Due to direct connection of dynamo with the car battery, it will start charging the battery.

Keywords: Crude Oil, Vanished, Petrol, E-Vehicle

I. INTRODUCTION

The natural resource to generate the petrol which is the fuel used in vehicle is crude oil and we all know that crude oil is being running out slowly. Due to running out of crude oil, it is not possible to generate petrol for vehicle. So, we have an alternate solution for this problem which is E-Vehicle. But the negative point of this E-Vehicle is that it requires charging for the vehicle and it takes hours-and-hours to charge the vehicle from empty-to-full. So, for that problem we came here with an alternate solution which is self-charging car. The reason to use this system is that we can cover more distance we want.

We can travel as much distance we want and there will be no problem for battery drainage. This was the main reason that everybody was not able to afford the E-Vehicle. After using this self-charging system the cost of the E-Vehicle will reduce to some extent. The car will also help to reduce the pollution and also will help to reduce and control the pollution.

With the help of E-Vehicle we are able to reduce the noise pollution generated from the petrol fuelled vehicles.

Fig-1: Prototype of Self-charging Car.



According to our concept the wind energy will be converted into electrical energy and then electrical energy will be converted into mechanical energy. The component required to convert wind energy into electrical energy is the dynamo. The dynamo will be placed or kept at the front side of the car. The dynamo will rotate with the help of air which will be generated when the car will start moving.

II. WORKING OF COMPONENTS

We are going to use the dynamo or the alternator to charge the battery. The alternator is the device that is used to convert wind energy into electrical energy. Due to this quality of alternator it becomes the second main component of the car because the first main component is the motor. The alternator can generate upto 24V which is more than enough to keep the battery fully charged. We are also using a battery for movement of the vehicle. A battery is the component which will provide the required power to the motor. A battery is a device which will produce electrons and will also supply them to the motor and the motor will start rotating. The battery of an electric car runs out within 100,000 miles but after installing the self-charging system the battery will last more than 100,000 miles which will help to reduce the electricity cost.

AUTOMATED TROLLEY MACHINE**Valmik Sonavane**Shivajirao S. Jondhale College of Engineering Dombivali East

ABSTRACT

*A shopping mall or complex is a place where people buy product/s for their regular use. The customers have to wait in long queues to get their products scanned using barcode scanner and get it billed. To get rid of this, we have proposed a new 'Smart Shopping Trolley using RFID (Radio Frequency Identification)'. This implementation is used to assist a person while shopping and also to avoid standing in long queues and thus saving time. The smart shopping trolley would consist of a microcontroller, Android Device, RFID Reader and an 16*2 LCD Display. The products in the shopping centers will have RFID tags to retrieve/access information about it. When a customer places a product in the smart trolley, the RFID Reader will read the Product ID and the information related to it will be stored in controller. The total amount of the products in the trolley will be calculated on 16*2 LCD display and will be updated on server and the Central billing System.*

Keywords: RFID, Billing process.

INTRODUCTION

People tend to overshoot their budget when they are shopping at a big shopping center. Moreover they end up in long queues at the end of their shopping waiting for the products to be scanned and billed. The "Automated Trolley Machine" addresses the above problems with ease. It helps the customer in ensuring that he does not overshoot his pre decided budget and only buys the essential commodities actually needed by him, also the system aids in eliminating the long queues at the billing counter as the products are already read by RFID and the customer just has to pay the bill and bag the items purchased. The system is profitable for the shopping centers as it can help in reducing the number of billing counters and in turn will help in reducing employee costs significantly. The aim is to design a "Automated Trolley Machine" in cart aiding the customers in their shopping and reducing the queue at the billing counter. The device must be user friendly and have an interface via which the customer can read the products he/she intends to buy, also the system must have a LCD display so that the customer can know the total cost of the commodities purchased. The system must also have a feature to delete a purchased product in case the customer changes his/her mind. There is also a need of a centralized database which contains the cost of all the products in the shopping market. It is very common that people tend to overshoot their expenditure at large shopping centers due to a simple fact that they are not able to anticipate the cost of the products they have placed in their shopping cart.

Also on weekends and during festive seasons the customers have to wait in long queues just to get their products scanned at the counter and get them billed. This project helps in eliminating or reducing the above mentioned problems substantially. The "Automated Trolley Machine" not only displays the total cost of the commodities in the cart it also has a feature to remove any product if the customer wishes to do so. The "Automated Trolley Machine" also eliminates the tedious process of scanning the products at the counter as this process is already done by the customer during the shopping itself. After the Product reading by RFID we can our bill Amount By ownself with the help of automated billing system..

PROBLEM DEFINATION

An imperative product with social acceptance is the one that aids the comfort conveniences and efficiency in everyday life. Purchasing and shopping at big malls is becoming daily activity in metro cities. There will be rush at these malls on holidays and weekends. People purchase different items and put them in trolley . After completion of purchases, one needs to go billing counter for payment. At billing counter the cashier prepare the bill using barcode reader which is very time consuming process and results in long queue at billing counter.

In this project we are implementing a system "Automated Trolley Machine" being developed to assist a person in everyday shopping in terms of reduced time spent while purchasing. The main objectives of proposed system is to provide a technology oriented , low-cost, easily scalable and rugged system for assisting shopping in person.

III. LITERATURE SURVEY

1] Manikandan, Mohammed aejaz, Nithin Krishna, Mohan Kumar, "RFID based advanced trolley for Super Market", Journal of Chemical and Pharmaceutical Sciences 8th june 2017. As per our survey money and average time spent to each customer is high especially in over- crowded supermarkets.

DEVELOPING COOLING SYSTEM FOR INJECTION MOULDING DIES

Prajal Bore¹, Amit Chauhan², Shreyas Gawade³, Kaustubh Vinde⁴ and Majid Shaikh⁵^{1,2,3,4} B.E. Students and ⁵ Assistant Professor, Theem College of Engineering, Boisar (E)**ABSTRACT**

This paper focus on determining the appropriate method to designed and fabricated the cooling system using the wire drawing method in which the wire tube is placed from inside the die, the gap should be maintained of 3mm between the die hole and the tube inserted or else it will get wore out. Cooling tower is used for cooling the water.

Keywords: Cooling Systems, Wire Drawing, Injection Moulding, Pkastic Products, Warpage and Heating

INTRODUCTION

Riya enterprises located in vicinity of Palghar is manufacturer of precision plastic components and engineering components. They have equipped injection moulding machines with various types of dies giving a wide range in variety of products. Injection moulding is a technology that has been used since the late 1800's. Injection moulding machines incorporate a huge screw to force molten plastic into the mould at high pressure. This screw drive method was invented in 1946 and is still the method used today. Injection moulding machines definitely do not have the modern, high-tech feel of 3D printing technology. There is really nothing cool about injection moulding but nonetheless it is a requirement for most hardware products. An injection mould consists of two halves that are forced together to form a cavity in the shape of the part to be produced. Hot, liquid plastic is then injected at high pressure into this cavity. The high pressure is needed to ensure that the plastic resin fills in every crook and cranny of the mould cavity. Once the plastic has had time to cool, the two halves of the mould are pulled apart, and the part is ejected. Although designing for injection moulding can be quite complicated, and the cost of the moulds themselves are incredibly expensive, there is one huge reason why injection moulding is still used today. No technology can beat injection moulding when it comes to producing millions of identical copies of a part at an incredibly low price.

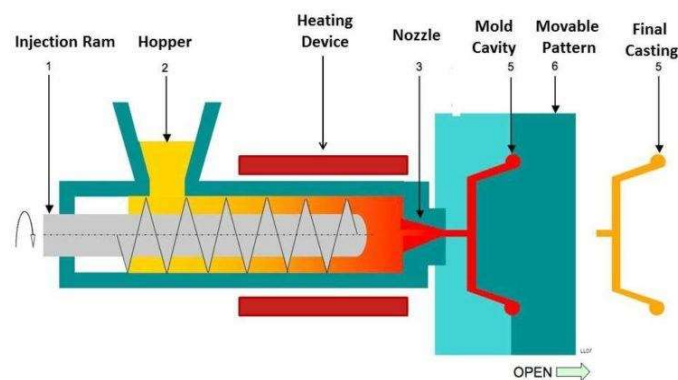


Fig-1: Injection Moulding Construction

OBJECTIVES OF STUDY**1. Problem Definition****2. Proposed Methodology****3. Process Parameters****LITERATURE REVIEW**

[1] Shaileshbhai P Patel, et.al [2017], presents a simulation study of different types of cooling channels in an injection moulded plastic part and compares the performance in terms of cooling time, temperature profile and part warpage to determine which configuration is more appropriate to provide uniform cooling with minimum cycle time. [2] Parag Chinchkhede, et.al [2016], compared various cooling systems namely; parallel cooling system, series cooling system, robust cooling system and conformal cooling system and presented results in terms of cooling time, average mould cavity and part temperature, and average cycle time to decide suitable cooling channel system. [3] Ekadewi A Handoyo, et.al [2018], designed and fabricated the cooling system using the wire drawing method in which the wire tube is placed from inside the die, the gap should be maintained of 3mm between the die hole and the tube inserted or else it will get wore out. Cooling tower is used for cooling the water. [4] Hong S Park, et.al [2017], presented the conformal cooling system with the help of the spiral form

DEVELOPMENT OF QC TOOLS TO IMPROVE THE QUALITY OF MANUFACTURING PROCESS**Tejal D. Raut and Guruprasad Y S**Assistant Professor, Department of Mechanical Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT

The purpose of this paper is to apply quality tools to ascertain the root causes of quality complexities related to manufacturing. Methods of faults on the production line are investigated through direct observation on the production line and enhance the process by continuous monitoring through the inspection of samples using statistical tools such as check sheets, histograms, Pareto analysis, cause and effect diagrams, etc. Is done in the effort demonstrates the utility of quality tools to discover and eradicate the root causes of problems. Seven outdated quality control tools are a set of QC tools that can be used to enhance the performance of production processes from the first phase of production or the final stage of production of a product.

Keywords: flow chart, pareto chart, scatter diagram, histogram, cause and effect diagram, control chart, check list PDCA List.

INTRODUCTION TO QUALITY CONTROL

Quality improvement is a primary requirement in any production system that sends products or service as its output. Thus, it is a major target in any manufacturing industry. The manufacturing industry puts a lot of effort into maintaining and improving the quality of its products using a variety of control devices and techniques. Quality concerns affect the entire organization in every competitive environment. This is necessary not only to reduce wastage, but also to meet customer expectations, continuous cost reduction and continuous improvements to survive in a highly competitive environment.

Seven Quality Control Tools Various tools are used to check product quality to define the weather whether the product is a quality or not and to take further necessary action to bring the process under control.

- 1) Flow Chart
- 2) Check Sheets
- 3) Pareto Chart
- 4) Histogram
- 5) Cause and effect diagram
- 6) Scatter diagram
- 7) Control Chart

FLOW CHART

The flow chart is one of the basic tools used to study the entire process. It shows the entire process in a phased manner. Flow charts of the entire process from material to product are studied. The graphical representation of data makes it simple and easy to understand.

CHECK SHEETS

Since measurement and collection of data form the basis for any analysis, this activity needs to be planned in such a way that the information collected is both relevant and comprehensive. Check sheets are tools for collecting data. They are designed specific to the type of data to be collected. The check sheet helps in the systematic collection of data. Some examples of check sheets are daily maintenance check sheets, attendance records, production log books etc. There is a need to meaningfully classify the data collected using check sheets. Such classification helps to gain an early-feminine understanding of the relevance and dispersion of data so that further analysis can be planned to obtain a meaningful output. The meaningful classification of data is called stratification. Stratification can occur by group, location, type, origin, characteristics, etc.

PARETO CHART

A Pareto diagram, named Wilfredo Pareto, an Italian economist, is a special type of bar graph used to describe the relative frequency of another entity in various events such as faults, repairs, claims, failures, or any other entity, in the descending order. This helps to focus on the major defect rather than many small defects to improve quality.

DESIGN AND FABRICATION OF FARMBOT

Sachin Pathak¹, Krupesh Shinde², Dhanraj Naik³ and Mohd Mustaque Ahmed⁴
B.E Student^{1,2,3} and Assistant Professor⁴, Theem College of Engineering Boisar (E) India

ABSTRACT

Agriculture plays an important role in the life of an economy. It is the backbone of our Nation. For survival, humans need food which mainly depends upon farming, so farming plays an important role. The farmers have to Implement new techniques which will not affect the soil texture but will increase the overall crop production. The aim of this project is to design and develop a set of few mechanisms with some additional attachments which would ease the effort of the farmer and help them in increasing their crop production. Most of the conventional and traditional ways of farming can fasten up with a minimum amount of modification and by introducing smart mechanism techniques which are most importantly affordable to the farmers. Fertilizer, natural or artificial substances are used in farming so productiveness of plants can be improved. By using more amount of fertilizers in crops, crops reduce its natural fertility by which it gives proteins and nutrients given to the plant while growing. Without crop protection, including pesticides, more than half of the world's crops would be lost to insects, diseases, and weeds. Pesticides are important. By spraying more amount of pesticides it helps reducing pests and diseases growing in plants which would destroy the crops, so spraying would result in more growth of plants with proper nutrients and an increase in production per hectare.

INTRODUCTION

About 40 per cent (approximate) of the agricultural area in India is irrigated, accounting for 69 per cent (approximate) of total fertilizer consumption. Six crops (rice, wheat, cotton, sugar cane, rapeseed, and mustard) are estimated to consume more amount of fertilizer in the country.

Fertilizers are compounds that are added to plants for increasing growth. The two types of fertilizers used in India are - organic and inorganic. Organic fertilizers are carbon-based and are mixtures of organic matter like leaves, cow dung and parts of plants. Inorganic fertilizers contain simple inorganic chemicals. Some of the common nutrients present in fertilizers are nitrogen, phosphorus, and potassium (NKP). They also contain plant nutrients such as calcium, sulphur, and magnesium. Some special fertilizers contain elements or micronutrients for the nutrition of plants like boron, chlorine, manganese, iron, zinc, copper and molybdenum. Farmers know the exact combination of fertilizers to be used for a specified crop and amount of each chemical elements to be mixed to avoid damage through excessive or improper use.

While fertilizers help in plant growth, pesticides save the crops against pests. A pesticide is a substance or mixture of substances designed for preventing the crops been destroyed by pests, insects, etc.

Pesticides mostly include chemical substances such as phosphamidon, lindane, chlorpyrifos, heptachlor and malathion. Many pesticides are known to be poisonous to humans.

Pesticides are substances that are meant to control pests, including weeds. The term pesticide includes all of the following herbicides, insecticides (which may include insect growth regulator, termiticides, etc.) nematicide, molluscicide, piscicide, avicide, rodenticide, bactericide, insect repellent, animal repellent, antimicrobial and fungicide. The most commonly used pesticide among all the pesticides is herbicides which are almost 80%. Most pesticides are intended to serve as crop protection product, which in general, protect plants from weeds, fungi, or insects.

In general, a pesticide is a chemical or biological agent which contains such as a virus, and bacterium that destroys, or kills, pests. Target pests can include insects, plant pathogens, weeds, molluscs, birds, mammals, fish, nematodes (roundworms), and microbes that destroy property, cause nuisance, or spread disease, or are disease vectors. Along with these benefits, pesticides also have drawbacks, such as potential toxicity to humans and other sections.

LITERATURE REVIEW

[1].HUGH SAVOY,et.al,(1914), discussed about the different elements which is been required in crop production and the main amendments lime and fertilizer materials. Also the tools required for measuring the chemical proportion of fertilizer and for measuring soil fertility.[2].OENE OENEMA,et.al,(2002)proposed an information regarding the pros and cons of balanced fertilization as a policy tool and suggests operational measures. Essential steps are book keeping of nutrients of farm and fields levels, and evaluation of soil fertility level and nitrogen and phosphate surpluses relative to vulnerability of the environment.[3]. Hillel MAGEN

LITERATURE REVIEW ON: THE ELECTRIC BIKE

Piyush Patel¹, Pranay Pitale², Makarand Mudholkar³, Abhijeet Shinde⁴ and Wasim Khan⁵
 B.E students^{1,2,3,4} and Assistant Professor⁵, Theem College of Engineering Boisar(E)

ABSTRACT

An electric bicycle also known as an e-bike is a bicycle which use an electric motor for propulsion. there are various kinds of e-bikes are available through the world, from e-bikes that only having a small motor to assist the rider's pedal-power (i.e. pedelecs) to more powerful e-bikes which are as same as a moped-type functionality. All retain the ability to be pedaled by the rider and are therefore not electric motorcycles. E-bikes uses a lighter weight battery which can be recharged easily and help to travel up to 25 to 32 km/h (16 to 20 mph), which is to be depended on local laws, while the more high-powered varieties can often touch the speed limit of 45 km/h (28 mph). In some markets, such as in Germany as of 2013, they are gaining in popularity and taking some market share away from conventional bicycles, while in others, such as China as of 2010, they are replacing fossil fuel-powered mopeds and small motorcycles. Depending on local laws, many e-bikes such as pedelecs are legally classified as bicycles rather than mopeds or motorcycles. This frees them from the more stringent laws regarding the operation of more powerful two-wheelers which are often classified as electric motorcycles. E-bikes can also be defined separately and treated under distinct electric bikes laws. E-bikes are the electric motor -powered versions of motorized bicycles, which have been in use since the late 19th century.

Keywords: BLDC motor, controller, batteries.

I.) INTRODUCTION

An e-bicycle is one with an electric motor (attached to the bottom bracket or front wheel) that assists the rider with their pedalling. This means that while you're still getting a workout – and enjoying the scenery – you don't need to pedal nearly as hard, especially up hills. The electric vehicles industry is continuously evolving. One type of such electric vehicle is the electric bicycle (e-bike). E-bikes typically incorporate a battery, which can be charged at an ordinary domestic power socket, linked to an electric motor in the bicycle transmission system. The rider have the power to controls the output power from motor i.e speed using a handlebar mounted computer display panel and controller. The term 'e-bike' is generic and includes a combination of different electrically powered two-wheelers some of which function by simply turning a throttle. Electric bicycles, like other electric vehicles, use a BLDC motor. Main reason to identify the need of finding and modifying E-Bike is to overcome the issue of the pollution because of vehicles in metro towns & urban zones is swelling uninterruptedly. Considering the all class of society it is not reasonable for all to purchase (scooters, mopeds or motorcycles). So, combining both issues, environmental progress supporting and economical affordable alternative would be the best solution. In the modern days, the primary concern of government is to find out a way by which we can minimize consumption of fossil fuel and promote the use of electric vehicle our daily life. However, there are certain barriers while adopting these latest technology in our daily life.

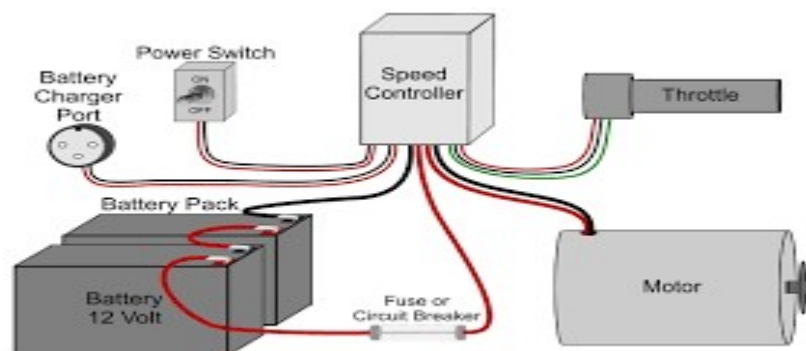


FIG.1 Major components of e-bicycle

INSTRUMENT SPECS

Some important parts required for propulsion of e-bikes are: a.)Motor, b) Battery, c) PIC Controller

a.)Motor

In e-bicycles brush less DC (BLDC) motors are to be used which consists of armature windings on the stator permanent and magnets on the rotor. The stator of this BLDC motor consists of stacked steel laminations with

DESIGN ANALYSIS AND FABRICATION OF ATV KNUCKLE-HUB

Pratik Khandkar, Rohit Katkar, Sanket Jadhav and Harshalahire

Department of Mechanical Engineering, Theem College of Engineering, Boisar

ABSTRACT

The Paper presented over here deals with the Design and Analysis of Rear Knuckle-Hub required for the construction of All Terrain Vehicle (ATV). Knuckle-Hub is a critical and load sustaining component of a rear wheel assembly. It is a part which contains knuckle and wheel hub connected to suspension and braking components. The primary function of the Knuckle-Hub is to keep the wheels attached to the vehicle while carrying the vehicle load and sustaining various loading conditions as well as to allow the wheels to freely rotate enabling the safe driving conditions. Knuckle-Hub must be designed and build in such a way that it will withstand all the forces exerted on it during normal or working conditions. Knuckle-Hub must be produced in order to reduce the weight of All Terrain Vehicle (ATV) while retaining a satisfactory safety factor for better performance of the vehicle. A two step process has been used for the successful design and analysis of Knuckle-Hub. First step is modeling the Knuckle and Hub as per the structural, dimensional and design considerations set by type of suspension system used and brake assemblies as well as determination of loads acting on the knuckle and Hub. The second step is deformation and stress analysis using ANSYS software and design adjustments for reducing weight without compromising on the structural strength.

I. INTRODUCTION

Knuckle-Hub is a part which contains knuckle and wheel hub attached to chassis, suspension and braking components. The wheel and tyre assembly is attached to the hub of knuckle where the tyre/wheel rotates while being held in stable plane of motion by knuckle-hub assembly. It can be designed according to the requirement of vehicle. The proper mountings to hold braking components, Tie rod, Trailing rod and bearing should be provided at exact places. Proper material selection is of great significance in order to increase strength and reduce weight and cost of Knuckle-Hub, eventually increasing efficiency of an ATV. Design and Analysis of the Knuckle-Hub is be done using SOLIDWORKS, 2016 and ANSYS, 2019 considering and applying all the Design Topologies for optimum Design.

II. OBJECTIVE OF STUDY

1. Design and fabrication of a Knuckle-Hub that would sustain various loading effects during normal and working condition.
2. Selection of proper materials for both Knuckle and Hub which would be light in weight, cost effective and strong enough to withstand various forces exerted.
3. Development of an optimum design with less material requirement.
4. Design Knuckle and Hub with all the necessary mountings placed on the exact positions.
5. Analyze the Design for the forced exerted on it during working conditions.
6. To fabricate the Knuckle-Hub by using the final Design that have passed the analytical tests.

III. DESIGN METHODOLOGY

1. Material Selection While designing Knuckle and Hub, material selection is a crucial topic. The selected material must be light in weight and also withstand all the stresses applied on it during working conditions without failure. So to optimize these conditions, different materials for both Knuckle and Hub are used as per the magnitude and types of forces exerted on it so that it can withstand with overall light weight Knuckle-Hub assembly and without affecting the strength of assembly. The material considered for Knuckle is ALUMINIUM 7075 T6 and for the Hub is ALUMINIUM 6061 T6 as these materials fulfill all our requirements.

Material selected for Knuckle :

ALUMINIUM 7075 T6

Material selected for Hub :

ALUMINIUM 6061 T6

Properties	Values
Density (g/cm ³)	2.7
Brinell hardness Number (BHN)	95
Ultimate Tensile Strength (MPa)	310

DESIGN AND FABRICATION OF ELECTROCOIL SOLAR DRYER

Jiggesh GuptaTheem College of Engineering, University of Mumbai

ABSTRACT

Drying of food is necessary in order to maintain its colour, taste, and also help to prevent from insect dust and rain which may damage and spoil the food product. So the drying is an excellent way to prevent the agriculture products and as well as the house hold food product in large as well as in small scale to prevent it from contamination and damage of it. Drying from the sun directly is the earliest method of drying farm produce ever known to man and it involves simply laying the agricultural products in the sun on mats, roofs or drying floors. This has several disadvantage since the farm produce are laid in the open sky and there is greater risk of spoilage due to adverse climatic situation like wind, rain, moist and dust, loss of product to insects, birds and rodents; totally dependent on good weather and very slow drying rate with danger of mould growth thereby causing deterioration and decomposition of the product. The process also requires large area of land, takes time and highly labour intensive.

In solar drying, solar dryers are specialized devices that control the drying process and protect agricultural product from damage by insect, dust and rain. In addition, it takes up less space, takes less time and relatively inexpensive compared to artificial mechanical drying. The solar dryer can be seen as one of the solutions to the world's food and energy crises. With drying, most agricultural product can be preserved and this can be achieved more efficiently through the use of solar dryer.

The present paper aim to design and fabricate the solar dryer from the reference of previous concept and design in order to overcome with the new innovative idea about the drying of agriculture products as well as other by using the convection drying method.

INTRODUCTION

The drying of agriculture products by using open air and uncontrolled sun is still existing now a day. But the main problem arising in this type of solar dryer is the uncontrollable heat and temperature and also the humidity which cause the agriculture products to damage. Solar dryers are specialized devices that control the drying process and protect agricultural product from damage by insect, dust and rain.

In addition, it takes up less space, takes less time and relatively inexpensive compared to artificial mechanical drying. The solar dryer can be seen as one of the solutions to the world's food and energy crises.

With drying, most agricultural product can be preserved and this can be achieved more efficiently through the use of solar dryer. One of the modern type of solar dryer has a black absorbing surface which collects the light and converts it to heat; the substance to be dried is placed directly on this surface. These driers may have enclosures, glass covers and/or vents to in order to increase efficiency.

AIMS AND OBJECTIVE

- The objective of a solar dryer is to provide ample amount of heat i.e. more than ambient heat under given humidity.
- It increases the vapor pressure of the moisture confined within the product and decreases the relative humidity of the drying air so that the moisture carrying capacity of the air can be increased.
- The moisture absorption capacity of air is affected by its initial humidity and by the temperature to which it is subsequently heated.
- Studying the efficiency of solar dryer for drying fruits and grains and discovering ways to improve it.

MATERIAL REQUIRED

- Balsa wood.
- Epoxy paint.
- ARC coated glass.
- Solar panels.
- 12-24 V Battery.
- 4 mini computer fans.

EFFICIENCY IMPROVEMENT OF VORTEX TUBE, BY VARYING INSIDE SURFACE ROUGHNESS OF CYLINDRICAL HOT TUBES**Nitin Vijay Galwade, Roshan Vani and Santosh Dubey**Assistant Professor, Mechanical Engineering Department, Theem College of Engineering Boisar

ABSTRACT

Refrigeration plays an important role in developing countries, mainly for the preservation of food, medicine and air conditioning. Conventional refrigeration systems use Freon as a refrigerant. As they are the main cause of ozone depletion, extensive research work is underway on alternative refrigeration systems. The Vortex tube is an unconventional cooling device, without moving parts that can produce cold air and hot air from the compressed air source without affecting the environment. When a high pressure air is injected tangentially into the vortex chamber, a strong vortex flow will be created which will be split into two air flows. It can be used for any type of spot cooling or heating application. In this document, the counter-flow vortex tube is compared with different performances of hot surface roughness tubes. It was found that the vortex tube with surface roughness of $Ra = 6.264 \mu\text{m}$ exceeded the hot tubes with surface roughness of $Ra = 4.510 \mu\text{m}$ and $Ra = 3.133 \mu\text{m}$ respectively from 6% to 26% and from 16% to 52% in COP. The COP of the vortex tube increases as the roughness of the inner surface of the hot tube increases

A vortex tube contains the different main parts vortex chamber inlet and cold terminal orifice, hot control valve and orifice. It works in such a way that the fluid enters the tube circles around an axis that is called a vortex. And that rotation creates a vortex from the compressed air and separates that flow into two hot and cold air flows. From its center, the super-cooled air that is delivered through the cold end door is exceeded. The surface finish of the nozzle and tube, ie the hot end, plays an important role in the performance of the vortex tube. In this document it is observed that the vortex tube with main surface roughness values of cylindrical hot tubes is used to increase the efficiency of the tube vortex. It results in COP of the vortex tube.

Keywords: Vortex chamber, Roughness value of cylindrical hot tubes, COP of the system, Efficiency of tube.

INTRODUCTION

The vortex tube is a static thermal tube that separates the flow of compressed gas into two flows; a cooler flow than the inlet flow while the other flow is warmer than the inlet flow. The vortex tube has no moving parts and separation occurs due to vortex flow generation without requiring any external mechanical work or heat transfer. The vortex tube was first discovered by Ranque [1, 2] who was granted a French patent for the device in 1932 and a US patent in 1934. Ranque encountered the vortex tube phenomenon while he was working experimentally with the vortex tube pump in 1928. In 1945 Rudolf Hilsch [3] conducted a vortex tube experiment focused on thermal performance with different inlet pressure and geometric parameters. In recent years it has been known that the vortex tube is a low cost and an effective solution to many spot cooling problems. The separation mechanism inside the vortex tube remains until now not completely understood [4]. The ability to obtain hot or cold flow streams using compressed gas has allowed the use of the vortex tube in many engineering applications such as electronic cooling, food cooling, cooling of the fire suit and machinery cooling during operation. Despite its reduced capacity, the Ranque-Hilsch swirl tube (RHVT) is very useful for some thermal management applications due to its simplicity, high durability, compactness, lightness, sturdiness, reliability, low maintenance and safety costs [5]. RHVT can be classified into two types [6]: (1) counter-flow RHVT and (2) uni-flow RHVT. In the counter-current type RHVT the cold flow moves in the opposite direction to the hot flow, while in the uni-flow type, the hot and cold flows flow in the same direction. In general, counter-current RHVT is recommended over RHVT uni-flow due to its efficient energy separation [6]. The Vortex tube is widely treated in literature through experimental and numerical analyzes. The experimental work of Nimbalkar and Muller [7] indicated that there is an optimal diameter of the cold end orifice to obtain maximum energy separation. Furthermore, the results [7] showed that the maximum value of the energy separation was always reachable with a cold fraction of 60% regardless of the diameter of the orifice and the inlet pressure. The optimal ratio between diameter and length of the hot side was studied by Dincer et al. [8, 9]. The performance of the vortex tube was studied for three different working gases: air, oxygen and nitrogen and the results were reported using strip views in a vortex tube in Perspex [10]. Aydın and Baki [10] and Hamdan et al. [11] indicated that the inlet pressure and the cold mass fraction were the most important operating parameters. Hamdan et al. [11] in their experimental work investigated the effect of numerous operating and geometric parameters on the thermal performance of the vortex tube, in which the effect of position of the vortex plug, the pressure of the inlet gas, the number were covered. of vortex generator inlet nozzles and insulation during the study. Eiamsa-ard [12] studied the effect of multiple inlet nozzles, the ratios of the

EXPERIMENTAL STUDY ON BETA STIRLING ENGINE**Khan Gulzar Ahmed, Dhruv Sukla, Juned Shaikh, Rahul Kushwaha and Prof Iqbal Mansuri**

Department of Mechanical Engg, Theem COE, Boisar Mumbai, Maharashtra

ABSTRACT

This essay mainly makes an exposition of the Stirling Engine. Firstly, the history of Stirling Engine is showed to make a guide of first comprehension. Then the Stirling Engine's thermodynamic cycle is explained and the configuration is analyzed, which we do to make sure a further insight into the Stirling Engine. After that, the reasons to use a Stirling Engine are discussed, especially from an economic point of view. This is to describe why the Stirling Engine is widely used in nowadays' world. And the last part is to show out how the Stirling Engine is applied in each field. But with a special focus on sterling engines in applications with renewable energies. This whole essay displayed a broad overall presentation to the Stirling Engine, and analyzed its intrinsic value for the future.

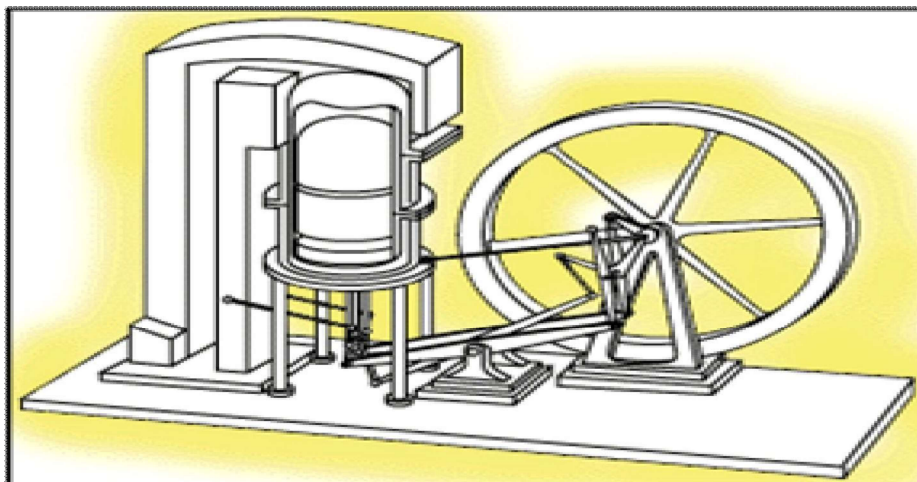
I. INTRODUCTION

The Stirling Engine was invented by Robert Stirling. This device was born as a competence to the vapor machine, since a Stirling Engine works with smaller pressures than the device created by Watt and it did not require a qualified train engineer. With the development of the internal combustion engine and the appearance of electric engines, the machine of this study was forgotten.

Nowadays the technology that involves the invention of Robert Stirling is in completely development because of the fact that now very useful applications are available.

This document travels in the history of this curious device looking for reasons of this incredible development in this called high technology with its different applications and doing an analysis from the point of view of the economy. This project explains the principle function of the engine with a deep investigation. And we show how the Sterling Engine in combination with renewable energy sources can be part of a sustainable energy supply.

The Stirling Engine is one of the hot air engines. It was invented by Robert Stirling (1790-1878) and his brother James. His father was interesting in engine and he inherited it. He became a minister of the church at Scotland in 1816. At this period, he found the steam engines are dangerous for the workers. He decided to improve the design of an existing air engine. He hope it would be safer alternative. After one year, he invented a regenerator. He called the "Economiser" and the engine improves the efficiency. This is the earliest Stirling Engine. It is put out 100 W to 4 kW. But the internal combustion engine substituted for it quickly. The Ericsson invented the solar energy in 1864 and did some improvements for after several years. Robert's brother, James Stirling, also played an important role in the development of Stirling engines.

**Figure: Earliest Stirling engine**

Robert Stirling gets a patent for the economizer with an air engine incorporating it in 1817. Since the Stirling engine worked at a lower pressure, and could not cause steam burns, the danger to explode is impossible. In 1818 he built the first practical exponent of his engine, used to pump water from a quarry. The inventors sought to create a safer engine instead of steam engines at that time, whose boilers often exploded as a result of high pressure of the steam and the inadequate materials.

LITERATURE REVIEW ON: THE ELECTRIC BIKE

Piyush Patel¹, Pranay Pitale¹, Makarand Mudholkar¹, Abhijeet Shinde¹ and Wasim Khan²
 B.E students¹ and Assistant Professor², Theem College of Engineering Boisar (E)

ABSTRACT

An electric bicycle also known as an e-bike is a bicycle which use an electric motor for propulsion. there are various kinds of e-bikes are available through the world, from e-bikes that only having a small motor to assist the rider's pedal-power (i.e. pedelecs) to more powerful e-bikes which are as same as a moped-type functionality. All retain the ability to be pedaled by the rider and are therefore not electric motorcycles. E-bikes uses a lighter weight battery which can be recharged easily and help to travel up to 25 to 32 km/h (16 to 20 mph), which is to be depended on local laws, while the more high-powered varieties can often touch the speed limit of 45 km/h (28 mph). In some markets, such as in Germany as of 2013, they are gaining in popularity and taking some market share away from conventional bicycles, while in others, such as China as of 2010, they are replacing fossil fuel-powered mopeds and small motorcycles. Depending on local laws, many e-bikes such as pedelecs are legally classified as bicycles rather than mopeds or motorcycles. This frees them from the more stringent laws regarding the operation of more powerful two-wheelers which are often classified as electric motorcycles. E-bikes can also be defined separately and treated under distinct electric bikes laws. E-bikes are the electric motor -powered versions of motorized bicycles, which have been in use since the late 19th century.

Keywords- BLDC motor, controller, batteries.

I.) INTRODUCTION

An e-bicycle is one with an electric motor (attached to the bottom bracket or front wheel) that assists the rider with their pedalling. This means that while you're still getting a workout – and enjoying the scenery – you don't need to pedal nearly as hard, especially up hills. The electric vehicles industry is continuously evolving. One type of such electric vehicle is the electric bicycle (e-bike). E-bikes typically incorporate a battery, which can be charged at an ordinary domestic power socket, linked to an electric motor in the bicycle transmission system. The rider have the power to controls the output power from motor i.e speed using a handlebar mounted computer display panel and controller. The term 'e-bike' is generic and includes a combination of different electrically powered two-wheelers some of which function by simply turning a throttle. Electric bicycles, like other electric vehicles, use a BLDC motor. Main reason to identify the need of finding and modifying E-Bike is to overcome the issue of the pollution because of vehicles in metro towns & urban zones is swelling uninterruptedly. Considering the all class of society it is not reasonable for all to purchase (scooters, mopeds or motorcycles). So, combining both issues, environmental progress supporting and economical affordable alternative would be the best solution. In the modern days, the primary concern of government is to find out a way by which we can minimize consumption of fossil fuel and promote the use of electric vehicle ourdaily life.

However, there are certain barriers while adopting these latest technology in our daily life.

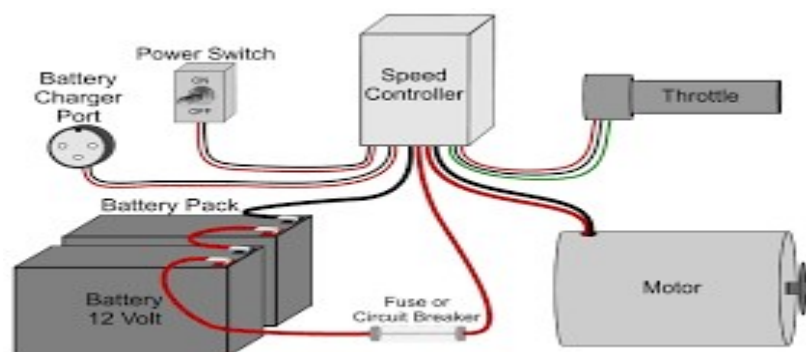


FIG.1 Major components of e-bicycle

INSTRUMENT SPECS

Some important parts required for propulsion of e-bikes are: a.)Motor, b) Battery, c) PIC Controller

a.)Motor

In e-bicycles brush less DC (BLDC) motors are to be used which consists of armature windings on the stator permanent and magnets on the rotor. The stator of this BLDC motor consists of stacked steel laminations with windings placed in the slots and these stator winding can be arranged in two patterns i.e. a star pattern or claw

LITERATURE REVIEW ON TOTAL PRODUCTIVE MAINTENANCE

Varad Deshpande¹ and Jitendra Chavan²

Assistant Professor¹, TCET, Mumbai

Assistant Professor², THEEM COE

ABSTRACT

Total productive maintenance (TPM) is an approach to improve and enhance productivity. TPM improves the overall effectiveness of equipment with the active involvement of operators. The objectives of this paper are to review the literature on TPM and based on this summarize the findings in the form definitions of TPM as given by various researchers, benefits achieved as a result of TPM implementation, targets of TPM, and implementation aspects of TPM. In the end, some concluding observations and directions for future research.

Keywords: Total productive maintenance, attributes, benefits, implementation

INTRODUCTION

With the development of faster means of communication, better quality computers and rapid transportation systems, manufacturing is no longer restricted at local level, but has become global in character. A manufacturing company has to become competitive for its survival. Confronting these challenges, companies world-wide are forced to find ways to reduce costs, improve quality, and meet the ever-changing needs of their customers. One successful solution has been the adoption innovative techniques like TPM.

The basic idea of TPM was originally developed and formalized into a sophisticated management system by Japan. It made progressive strides in countries like USA, Europe and other south Asian countries after its successful implementation in Japan. Total productive maintenance (T P M) is a method of maximizing equipment performance, availability, and quality with the total involvement of the production operators, technicians, engineers, supervisors and managers. For staying in competitive market an organization must have continuous improvement throughout the organization with innovative plan .TPM is the right approach for continuous improvement with innovative tools like kaizan, quality circles, employee involvement, waste minimization, planned maintenance etc. This paper attempts to summarize the main findings from literature survey on TPM and then suggest some research directions.

SUMMARIZED FINDINGS FROM LITERATURE SURVEY

TPM definitions

The definitions of TPM as given by various researchers are tabulated in table 1.

Table-1: Definitions of TPM by different authors.

Name of Author	Definitions
Nakajima (1984)	TPM is a manufacturing program designed primarily to maximize equipment effectiveness throughout its entire life through the participation and motivation of the entire work force.
Christian (1994)	Total productivity maintenance (TPM) is a maintenance productivity improvement practice analogous to the use of total quality management.
Eugene (1996)	Total productive maintenance (TPM) provides a comprehensive, life cycle approach, to equipment management that minimizes equipment failures, production defects, and accidents.
Jorge (1997)	Total productive maintenance (TPM) is the process of maximizing equipment performance, availability, and quality with the total involvement of the production operators, technicians, engineers, supervisors and managers.
Venketesh (2007)	TPM is considered as a medical science of total productive maintenance.

Benefits of TPM

Various benefits as stated by various researchers are shown in table 2.

Implementation Aspects of TPM

The following steps are used in implementation of TPM in an organization are as follows;

(i) Preparatory stage

(a) Announcement by management to all about TPM introduction in the organization

HEAT GENERATION IN SUPER-FINISHING LATHE ATTACHMENT AND IN SLIDING AND ROTATING COMPONENTS**Sayyad Layak¹ and Ch. Sanjay²**Research Scholar¹ and Professor², GITAM Deemed to be University, Hyderabad

ABSTRACT

Friction and friction factors are very important factors specially in machine components. In superfinishing lathe attachment heat generated due to piston oscillates in to sleeve and sleeve gets deformed due to heat and friction in the contacting surfaces of piston and sleeve

But it can be reduced with the help of some lower thermal conductivity material coat. in rotary components like axle-shaft arrangements, friction and slip are important factors. In the case of a heat exchanger, the friction factor is important because the heat transfer depends on it. Research has also been reported on the effect of stop the machine attachment because of expansion. of the sleeve. researchers also suggested various models for predicting the coefficient of friction based on their research related to the factors affecting the coefficient of friction and the nature and severity of their effect on friction

Keywords: friction, energy, heat, coefficients lathe attachment

1.1 INTRODUCTION

During grinding, extreme heat and aggressive stock removal often alters micro structure and base metal hardness. This creates slight dimensional and surface imperfections such as smeared peaks, waviness and chatter. Super finishing, a low temperature, low stock removal process, improves part geometry and surface finish by removing the amorphous layer formed during the grinding process. This dramatically improves these imperfections, which can compromise part quality and performance turbulence by roughening the surface and introducing the inserts for increasing heat transfer coefficient. The friction becomes important in the rotating devices. The study on reducing friction by using appropriate lubricant or coating is also important aspect. The current review is aimed at emphasizing the importance of friction and friction factors in various fields and summarizing the research carried out to study factors affecting the friction in various applications and to improve friction characteristics according to the requirement. Also, some study related to modeling and analytical computations of friction factor and related parameters is reported.

1.2 Friction Factor and related Parameters

Increase in load may effects on the local hardness of the mating metals in two main ways. It may induce a hardness increase by strain hardening (with a decrease in μ), or it may induce a hardness decrease by thermal softening (with an increase in μ). These two effects may cancel out, or one may be prevailing. Friction coefficient is seen to increase with load and this may be attributed to the softening effect due to the heat generated at the contacting asperities. This is further confirmed by the observation that friction increases also with sliding speed that also contributes to local heating.

They freedom mathematical model of a friction-induced vibration system) by PID controller. friction coefficient in hot compression of cylindrical sample [2].

They carried out compression tests in order to analyze the evolution behavior of friction coefficients during large strain hot forging processes. Also they compared the simulated results for friction factors with experimental results. The simulation results also indicated that the friction coefficient is not a factor for shape of deformed sample. Instantaneous friction coefficient and the strain had exponential relationship. An investigation was carried out on development of low-friction factor sliding isolation device by Hamaguchi and Higashino by using Poly Tetra Fluoro Ethylene (PTFE) [3].

They developed some new additives and coating materials with heat-stiffened resin. The friction coefficient of new material was 0.03, less than pure PTFE. Newly developed epoxy resin adhesive between PTFE and steel plates was weather resistant and durable. Hargreaves and Tang carried out investigation on friction factor characteristics of liquid lubricants [4].

Reducing friction is very important from energy point of view. It also essential to measure friction characteristics of lubricating oils. During their investigation it was observed that the lubricants exhibit reducing friction coefficient with increase in the temperature. They observed that the mineral oil exhibited lowest friction coefficient. An investigation on friction coefficient of rough in-house materials was carried out by Ezzat et.al [5].

VIBRATION ANALYSIS AND EXPERIMENTATION OF CENTRIFUGAL PUMP IMPELLER

Suraj Sudamji Wankhade and Prof. S. S. Jarikote

Department of Mechanical Engg., MGM College of Engineering, Nanded, Maharashtra

ABSTRACT

The impeller is a rotating component of a Centrifugal Pump. In the Pump application, excessive vibrations encountered would pose a damaging effect on the impeller. Most of the dynamic machinery problems result from the interaction between the exciting forces and associated structural frequencies. When frequency generated by exciting force becomes equal to natural frequency, the amplitude of vibration becomes maximum causing resonance. Hence the main objective is to carry out static vibration analysis and conduct experimentation performance on the Impeller of two material- MS and Nylon and record the running pump parameters – Pressure head (H) and flow rate (Q) and observe when the pump is running smoothly without any noise. The smooth run, without noise, indicates that the vibration level is normal. To find out the natural frequency of an impeller modal analysis was carried out. Cad model generation was done in CATIA V5, meshing in HYPER MESH and ANSYS is for post-processing. The experimentation carried out using different material (MS and Nylon) should not only smooth run of the Pump but also improves the Pump efficiency resulting in sufficient power saving of the pump.

Keywords: Efficiency, Impeller, Duty point, Nylon

1. INTRODUCTION

An impeller is a rotating component of a centrifugal pump, usually made of iron, steel, bronze, brass, aluminum or plastic, which transfers energy from the motor that drives the pump to the fluid being pumped by accelerating the fluid outwards from the center of rotation. The velocity achieved by the impeller transfers into pressure when the outward movement of the fluid is confined by the pump casing. Impellers are usually short cylinders with an open inlet (called an eye) to accept incoming fluid, vanes to push the fluid radially, and a splined, keyed or threaded bore to accept a drive-shaft. The impeller made out of cast material in many cases may be called rotor. Also, it is cheaper to cast the radial impeller right in the support it is fitted on, which is put in motion by an electric motor, combustion engine or by steam driven turbine.

Table 1: Specification of the Pump (Duty Point)

Discharge Capacity	2.1 l/s
Number of revolution	2900 rpm
Number of blades	06
Head	11 m
Motor	1 HP
Flow type	Radial flow

Table 2: Existing Radial Flow Impeller Dimension

Parameter	Size
Impeller outer diameter	99 mm
Eye diameter	20 mm
Blade number	6 nos
Blade width at the inlet	5 mm
Blade width at outlet	2.5 mm
Inlet angle	19.25°
Outlet angle	23.76°

2. OBJECTIVES OF THE WORK

1. To study the **effect of vibrations** on impeller.
2. To analyze the **performance of pump** due to vibrations and Noise.
3. Comparison of **Efficiency** of existing impeller with Nylon.
4. A CAD model analysis of impeller to find out the **changes in Natural frequency of vibrations**.

NUMERICAL ANALYSIS OF TITANIUM AND STAINLESS STEEL INTRAMEDULLARY ROD**Shreyash P. Bagwe, Gangasagar Chauhan, Kunal Agre, Daiwat Bari and Prof. Ubaid Ansari**Student, Department of Mechanical Engineering, Theem College of Engineering

ABSTRACT

The solid metal rod which is forced into the bone when it is broken due to accidents or high impact is called Intramedullary rod or Intramedullary nail. It is similar in case of humans as well as animals (pets) in both the cases this solid rod is forced into the bone. In this paper we will specifically work on the Tibia bone which is also known as Shinbone or Shankbone in Human body. This bone is used to connect the knee with the ankle bones. Two materials are found to be suitable for design of tibia rod i.e. Titanium and Stainless Steel. Both the materials are easily available in the market and are extensively used for manufacturing of Tibia rod. Primary goal of this study is to compare the different mechanical properties and parameters of both the materials regarding Tibia Rod. In this study the rod dimensions are fixed and by using Titanium and Stainless Steel the performance of the rod will be compared with each other.

Keywords: Intramedullary nail, Stainless Steel, Tibia rod, Tibial Fracture, Titanium

1. INTRODUCTION

The skeletal system comprises of bones and joints in the body. Each bone is made up of many cells, protein fibers and minerals. Hard parts of the human body are the components of skeletal system. The skeleton provides support and protection for the soft tissues which makes the complete body. Joint is the connection made between bones which help skeletal system to move at different locations. 6 major functions are provided by skeletal system to human body.

1. **Support:** The skeleton in the human body act as a frame which helps to support the body and maintain its shape. The musculoskeletal system in the body provides support, stability and movement to the body. This system comprises of bones of skeleton, muscles, cartilage, tendons, ligaments, joints and other connective tissues that supports and binds tissues and organs together.
2. **Movement:** The joints between the bones is responsible for the movement of skeletal system, movement is powered by skeletal muscles attached to the skeleton at various sites on bones. Nervous system coordinates the mechanics provided by muscles, bones and joints for the movement.
3. **Protection:** Many vital internal organs are protected by the skeleton from being damaged (For example: Skull protects brain and eyes, ribcage protects the lungs and heart, vertebrae protects the spinal cord).
4. **Blood cell production:** Blood cells are made inside bone marrow, which is in the bones of the skeleton, it is the site of hematopoiesis.
5. **Storage:** Calcium is stored by the Bone matrix and is involved in calcium metabolism, iron is stored in bone marrow and is involved in Iron metabolism. Bone is not completely made up of calcium but it is a mixture of chondroitin sulfate and hydroxyapatite, the latter making up 70% of a bone.
6. **Endocrine regulation:** Osteocalcin is the hormone released by the bone cells, which is responsible for blood sugar (glucose) regulation and fat deposition and it also increases both insulin secretion and sensitivity, in addition to boosting the number of insulin producing cells and reducing fat storage.

1.1 Human Skeleton Components

Human Skeleton consists of three main components, namely bones, cartilages and joints. **Bone:** A bone is a rigid organ i.e. rigid or dense form of connective tissues. It has honeycomb like matrix internally, which helps to provide rigidity to the bone. Bone is the responsible for bearing a load therefore it is also known as load or weight bearing organ which provides strength to the human skeleton. **Cartilages:** It is a smooth and resilient elastic tissue, a rubber-like padding that protects and covers the end of the long bones at the joints. It is not as hard and rigid as bone, but it is much stiffer and less flexible than muscles. **Joints:** A joint is the connection made between bones in the body which link the skeletal system into the functional the whole. They are constructed to allow for different degrees and types of movement. Human body contains six types of synovial joints. Synovial joints are the most movable type of joints in human body. Six types of synovial joints are pivot, hinge, saddle, plane, condyloid and ball and socket joints.

IOT BASED SMART PARKING SYSTEM**Pritesh Patel and Aditya Patel**Theem College of Engineering

Problem in Today's Farming**1. ABSTRACT**

In the recent years, a large number of new registered vehicles were reported compared to the previous years, which makes it a rough estimate of 54.5% increase in a span of 7 years (Indian Ministry of Transportation, 2007). Referring to the aforesaid statistics provided by the Malaysian Ministry of Transportation, the current transportation infrastructure and car park facilities are deemed insufficient in sustaining the influx of vehicles on the road.

Therefore, problems such as traffic congestion and insufficient parking space inevitably crops up. In Asia, the situation are made worse by the fact that the roads are significantly narrower compared to the West (Inaba et al., 2001). Various measures have been taken in the attempt to overcome the traffic problems. Although, the problem can be addressed via many methods, the paper focuses on the car park management system introduced, which is the smart parking system.

This study will review the evolution of vehicle detection technologies as well as the detection systems developed over the years.

2. INTRODUCTION

The smart parking system implemented mainly in the Europe, United States and Japan (Shaheen et al., 2005) is developed with the incorporation of advanced technologies and researches from various academic disciplines. With its deployment in the car park, it is hoped that it would solve the aforementioned problems faced by the patrons within the car park.

3. ADVANTAGES OF SMART PARKING SYSTEM IMPLEMENTATION

The smart parking system is considered beneficial for the car park operators, car park patrons as well as in environment conservation (Shaheen et al., 2005; Chinrungrueng et al., 2007). For the car park operators, the information gathered via the implementation of the Smart Parking System can be exploited to predict future parking patterns.

Pricing strategies can also be manipulated according to the information obtained to increase the company's profit. In terms of environment conservation, the level of pollution can be reduced by decreasing vehicle emission (air pollutant) in the air (Shaheen et al., 2005). This can be attributed to the fact that vehicle travel is reduced. As fuel consumption is directly related to vehicle miles travelled, it will be reduces as well.

Patrons are also able to benefit from smart parking system as parking space are able to be fully utilized (Kurogo et al., 1995; Sakai et al., 1995) with a safer (Shaheen et al., 2005; Chinrungrueng et al., 2007), optimized and more efficient system implemented (Sakai et al., 1995; Shaheen et al., 2005). The system is made more efficient as vehicle travel time and search time are significantly reduced due to the information provided by the smart parking system.

With the information provided, drivers are able to avoid car park that are fully occupied and locate vacant parking spaces with ease elsewhere. The number of vehicles parked illegally by the roadside which leads to traffic congestion is also reduced as it is absorbed into the car parks (Kurogo et al., 1995). Most importantly, traffic congestion can be reduced. All this would eventually lead to convenience for the patrons.

4. METHODOLOGY

The project works through a set of instructions and commands placed by the programmed engineer within the Arduino through the software.

Arduino was feed through DC 12V source and have several blocks as per use, including a 5-volt, We put the Node MCU for connectivity with database.

The project needs some components to work properly. Here, all the components will introduced with details.

FABRICATION OF CLOTH DRYING MACHINE USING A CONDENSATION UNIT

Prof. Irshad Shaikh, Akash Mishra and Pradeep PangamAutomobile Engineering Department, Theem College of Engineering, University of Mumbai

ABSTRACT

The following paper discusses to study the clothes dryer machine by using heat. There are many cabinet dryers which are widely used today as an alternative to natural clothes drying, especially for those who are busy working from morning until evening, having limited time and for the residents in urban areas. Nowadays cabinet dryer are already offered in the market, but they are expensive to afford. A cloth dryer has to be made with the help of available materials. Its efficiency is investigated with respect to how fast it is able to dry up the clothes. Hence a set of experiments are performed to determine the worthiness of this dryer. The main advantage of this dryer is that it can work all round the year, with a built-in auxiliary heating system. Also, with no moving parts, it consumes less power than conventional dryers in washing machines. It can easily be built with commonly available materials such as plastic moulded body, aluminium motor, timer output etc. The comparison of two different materials such as iron and aluminium are done for best results.

The cloth drying machine is designed on Solidworks and analysed on Ansys 2018.

Keywords: Design, Analysis, Cloth Dryer, Aluminium Motor, Solidworks, Ansys 2018.

INTRODUCTION

Now days drying clothes usually use natural way by using the energy from the Sunlight and the wind, but nowadays the technology is plentifully developed upward and the clothes dryers that use the electric energy or other energy come to use extensively, Especially in the urban area where limited sunlight (cloudy days) and restricted air flow of house types such as high rise condominiums and apartments, natural drying is prohibited in some housing areas for aesthetic reasons and conventional domestic electric dryers are too expensive and inefficient decreasing energy losses and heat recovery is important research topics, nowadays. Many cabinet dryers widely use, especially those who are busy working. Besides that, most of laundries today have their own dryer cabinet. It is not just because to run their operation at all the time, but they also can prevent the risk to the cloths that might lose or dirty. Cabinet dryer on the market nowadays is using electrical power as a source in generating heat.

The design available in markets are very bulky and uses lots of energy because it is not utilized properly half of energy get wasted to the surrounding. The size of the product made very compact so when it needs to be get used we can unfold it and extend it to its ultimate size where we can hang clothes and two heating sources. Because two heating sources are provided time required to dry cloths is less as compared to other expensive devices which also uses lots of energy to dry the cloths.

TYPES OF DRYERS

Spin Dryer: This machine simply spins their drums faster than a typical washer could in order to extract addition water from the load. They may remove more water in two minutes than a heated tumbler dryer can in twenty minutes, saving significant amounts of time and energy. Although spinning alone will not completely dry clothing, this additional step saves a worthwhile amount of time and energy for large laundry operations such as those of hospitals. **Condensation Dryer:** Just as in a normal dryer, condensation dryers pass heated air through the load. However, instead of exhausting this air the dryer uses a heat exchanger to cool the air and condense the water vapour into either a drain pipe or a collection tank. Afterwards, this air is run through the loop again. The heat exchanger typically uses ambient air as its coolant, therefore the heat produced by the dryer will go into the immediate surroundings instead of the outside, increasing the room temperature slightly. In some designs, cold water is used in the heat exchanger, eliminating this heating but requiring increased water usage.

Dehumidifier Dryers: By keeping a low humidity, dehumidifiers encourage fast evaporation without high heat. This type if dryer is suitable for clothes that can withstand tumbling but not high heat.

Heat Pump Dryers: A closed-cycle heat pump clothes dryer uses a heat pump to dehumidify the processing air. Such dryers typically use under half the energy per load of a condenser dryer. Whereas condensation dryers use a passive heat exchanger cooled by ambient air, these dryers use a heat pump. The hot humid air from the tumbler is passed through a heat pump where the cold side condenses the water vapour into either a drain pipe or a collection tank and the hot side reheats the air. In this way not only does the dryer avoids the need for

AGROCHEMICAL SPRAYER

Swapnil Bhosale¹, Smitesh Vangalvar², Ajay Poojary³ and Geetanjali Thakur⁴^{1,3}Mechanical Department, Saraswati Institute of Technaology, Mumbai^{2,4}Lecturer, Mechanical Department, Saraswati Institute of Technaology, Mumbai**ABSTRACT**

India is a highly populated country and about 60% to 70% of its population depends on agriculture. In this majority is the small scale producers. One of the most important part of farming includes pesticides spraying. In today's market many types of agricultural sprayers are available which works on different kinds of power source. This sprayer have higher cost which is difficult for the medium scale farmers to afford. To over this problem the project comes with the mechanism which is easy to use and affordable.

Keywords—Pesticide sprayer, nozzle, chain shaft mechanism.

I. INTRODUCTION

India is the agriculture based country. Majority of its population depends on agriculture, where more than 60%-70% of population is depend on agriculture. This structures the main income. Agriculture is the main source of Indian economy so, it is known as backbone of Indian economy. The total national output is between 48% and 60% is contributed by the agriculture in initial two decades.

Instead farmers in India does not produces the crop which has to be produce. Reason behind this is the insects which damages the crops and the lack of use of technology in Indian farmers. Many types of pesticides sprayers are available in market but due to its complication in use and high cost it becomes difficult to farmers to use this machine. So we have to make such machineries which is easy to handle and with low capital cost. India is the developing country and it will take some time for farmers to overcome with the problems of use of high quality machines and its techniques. Now in present time the farmers are using the sprayers which are helpful for them for killing insects damaging the crops. The invention of a sprayer, pesticides, fertilizers, etc. bring revolution in the agriculture sector. Maximum agriculture output was enable to the farmers after invention of the sprayers.

In present time farmers are using motorized sprayers which requires different types of fuels, batteries or solar panels. Accordingly we have decided to make a project on sprayer which works without any fuel. The sprayer works on a simple pressure generated in the drum when the wheel of the sprayer rotates. This will reduce the cost of fuel to the farmer and can cover the large area than the backpack hand sprayer.



Figure 1: Agrochemical Sprayer

COMBINE ACCELERATOR AND BRAKE PEDAL**Rushikesh Kelgandre¹, Dhruvin Patel² and Prof. Irshad Shaikh³**U.G. Student^{1,2} and Assistant Professor³, Automobile Engg. Department, Theem College of Engineering, University of Mumbai**ABSTRACT**

In Automobiles, have different pedals for the function of acceleration and brake, in order to operate any one of them it is necessary to leave the one pedal free and press the other pedal for operation. The death rate is about 25% , due to automobile accident and is going on increasing every year. One of the main reason is pressing the wrong pedal at the time of emergency. To solve the following problem, a mechanism is developed “Combine Accelerator and Brake Pedal”, which can reduce the death rates by some instant. This mechanism reduces the operation time of pedals by approximate 5-6 seconds. This pedal is designed in such a way that it can be used universally in any automobiles. Its manufacturing and production is very easy. The pedal is hinged over a lever which can oscillate, retracting springs have been attached to the lever which can bring them to its original position. Pressing the pedal from the lower end it will cause the action of acceleration, when pedal is pressed at the center, lever moves and brakes are applied.

INTRODUCTION

In present time the death ratio in India is about 25% caused due to road accident, this mechanism will reduce this by 7-8% of total, as it can be used in any automobile. This innovation improves the mechanical movement of the brake and accelerator pedal, it is arranged in such a way that it can perform any one function without possibility of errors and not interfering the other operation. Typically the cars have the foot pedal arrangements such that, left pedal is for clutch, right pedal is for accelerator and middle is for braking. Here right foot has to be used for the operation of accelerator and for braking. This ensures that the throttle is released as the brakes are applied. But however foot is always at some distance from the brake pedal while it is placed on the accelerator pedal. This movement of foot will take some time and also it will increase in the total braking time of any automobile. Due to combine brake and accelerator pedal, misapplication of pressing the pedal will be very less in manual transmission, as the driver will disengage the clutch so it will be easy to discover his mistake of pressing the pedal.

LITERATURE REVIEW

[1]**Vaibhav V. Sawant et.al,(2019):-** This study by Vaibhav Sawant concludes that this new mechanism results in avoiding interference in braking during acceleration and vice versa. This combine pedal mechanism thus provides a driving control which permits the quick and smooth transition from acceleration to braking without transferring the foot from one pedal to another.[2]**V. B. Vishal et.al,(2018):-** The subject of the power descriptive memorandum is a combine pedal mechanism which involves the both operations such as acceleration and braking. There is advantages over the conventional pedals. This combine pedal mechanism allows to operate both the function of acceleration and braking on the same pedal without moving the foot over the pedal.[3]**Jay Krishna et.al,(2018):-** This study helps us to analyze and incorporate combine pedals which helps in decrease in the possibilities of accident and improved transition time between accelerator and brake pedals. [4]**Karthik Rao et.al,(2018):-** This paper helped us to get through the design, construction, working, and use of the pedal in an actual automobile vehicles. They also got the problems of the drivers which gets confused to press the pedals in case of acceleration and braking. [5]**Ajinkya Bhonge et.al,(2016):-** Their study is about a pedal which is adjustable, ergonomical for driver, light weight, serviceable, secure and better braking effect which are expected by driver. So they have made an pedal considering the following content. [6]**Sahil Arora (Jan, 2016) :** This study by Sahil Arora is based on avoiding interference of braking during acceleration and vice versa. This combined pedal mechanism thus provides a smooth and quick transition over pedals which minimizes the time taken for shifting the foot from acceleration pedal to brake pedal. [7]**H. Nijmeijer et.al,(2015):-** The study by him is based on one pedal operated acceleration and brake. In his study acceleration is done by the pedal but the braking action is taken place by the kinetic energy generated by the acceleration pedal is used to decelerate the vehicle. It works efficiently in the electric vehicles and similar mechanism is being used by the well known companies like BMW and TESLA. [8]**Sangdong Lee et.al,(2010):-** The study of Sandong Lee has analysis the time required to press the pedal and the time for switching foot between the pedal and has implemented a new system to reduce the total time and more efficient braking. [9]**Rickard Nilsson et.al,(2002) :** This study by Rickard Nilsson is focussing on the adaptability of new inventions by drivers because drivers actually face lot of problems in adapting new method of accelerating and braking using combined brake and accelerator pedal instead of separate pedal. [10]**Henri Bonnard et.al,(1999):-** He

COMMUNICATION SKILLS AND ETHICS**Sahil Kamruddin Mallick, Himanshu Jitendra Singh Bisht and Amit Jitender Gupta**Student, Department of Mechanical Engineering, Theem College of Engineering, Boisar

ABSTRACT

This paper deals with “Communication Skills and Ethics” and its importance in everyone’s personal and professional life to communicate to the world. In the modern era, people hardly take this into consideration. The first thing to influence communication all over the world is to know English language very well because it has tremendous effects on the communication skills and ethics as well as used as an international business language and overall it help us to build rapport among people. This research witnesses some reviews and exhibits the outcome of the professional training and the disciples’ effective communication skills and their success.

Keywords: Communication Skills, Ethics, English language, professionals, training, disciple.

I. INTRODUCTION

This is the era of information exchange and we all send and receive messages everyday but we cannot completely call it as an effective communication. Many people lack this ability because they are not getting opportunities to learn and understand the emotions of the words and use of correct language and skills i.e. both verbal and non-verbal communication. They just back off on account of many factors that create problems in their future. This paper prominences that taking care of this situation by putting more effort into learning the terms seriously to achieve their goals.

The goal of the paper is to describe a successful model for professional skills both verbal and non-verbal communication proficiency and to encourage a convenient method on how to inculcate the people with communication skills and ethics for professional as well as personal practice.

II. EFFECTIVE COMMUNICATION

Communication is a two-way process sharing the meaning of information to attain mutual understanding of participants through a medium encoding and decoding. For effective communication, Francis J. Bergin advocated “**Seven Principles of Effective Communication**” and it is also called as “Seven C’s” because all the seven words start with alphabet ‘C’ such as “Clarity, Conciseness, Concreteness, Correctness, Consideration, Completeness, and Courtesy.

The seven principles define its meaning as – While making information, choose short and familiar conversational words including illustration and other visuals, next construct effective sentences in brief with fewest possible words to save the time and expenses of both participants. Then compose concrete and convincing points with specific and clear message rather than general and vague. After that, confirm it as error-free communication by using proper format, grammar, spelling and punctuation to enhance appropriate readability to understand the information and then consider ‘You Attitude’ for the deal as per the recipient’s point of view and make sure that you have completed with all the required information to avoid misunderstanding and delaying action. Finally, to build rapport - be friendly, open and honest while answering and apologizing because “**Courtesy Begets Courtesy**”.

III. REVIEW

Studying and writing about this topic gave us opportunities to refer some other research papers and books that helped us to gain more knowledge to make this task successfully. The reviews of the papers are presented over here - “The factors for poor performances of students in communication skills were determined and solutions for the same were suggested with the necessary needs to develop the sense of students and their communication skills with the facts of the teaching-learning process of communication skills. [Abena Abokoma Asemanyi, Department of Communication and Media Studies, University of Education, Winneba, P.O. Box 25, Winneba, Central Region, Ghana]. Reference[4]

Essentially, ours is a society that moves on the wheels of communication. Particularly in the professional world, it is communication and its related skills that decide a person’s career curve. The better one’s communication skills, the higher are the chances for him/her to touch the zenith of success. The poorer one’s communication skills, the greater is the possibility of not achieving one’s goals Reference [5].

“Understanding your audience is fundamental to the success of any message. You need to adapt your message to fit the audience’s goals, interests, and needs.” Reference[6]

AUTOMATION BY CAM IN PUNCHING PRESS MACHINE**Premshanker R. Tripathi**Lecturer, Mechanical Maintenance Department, Shri T. P. Bhatia College of Science, Kandivli

ABSTRACT

From time immemorial, man has striven to achieve perfection. This thought has led him to make significant development in any stream that has come across him.

One such stream is engineering. Many researches have been done to improve quality at faster production rate. The casual observer seldom takes any interest in it's development.

The result of the development in Engg field has led to production and fabrication of press. These press forms a backbone in stamping industries. This technology of efficient dies to produce work piece at faster rate, at lower cost has emerged to such a degree that we can raise our present standard of living, to these dies.

In any thing used by us, in various field of life has been a product of these dies. This product has merged so much with our life, that it is literally impossible to eradicate or stop usage of these products.

The following report is sincere effort to study the basic dies in details. The casual observer seldom takes a second look at the press department when he visits a modern production plant. He views this section of the plant as an assemblage of noisy mechanical monsters calmly chomping out parts from a roll of rubber and is much more concerned with latest machining and manufacturing process.

This chapter is intended to acquaint the student or beginner with cutting operation. The design of cutting dies will be discuss in details.

INTRODUCTION

Today world required speed in each and every field. Hence rapidness and quick working is most important. Now days for achieving rapidness, various machines and the equipments are being manufactured. In such a modern era of liberization, small-scale industries are contributing in a big way to the growth of our country.

The engineer is constantly conformed to the challenges of bringing ideas and design into reality. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality.

Taking into account the above contribution we have tried to help the small scale industry by introducing a machine which will be very much helpful for them intending to make a light weight and multipurpose machine. Hence we tried our hands on "AUTOMATION BY CAM"

Introduction about Press working

Press working is the probably the earliest occupation known to mankind. Native metals have been formed technological and shaped 7000 years ago. Press working industry utilize million on man, production tool, forming processes, building and other related facilities, in order to form and produce the material to meet the increased demand of mankind. The high productivity of forming process, the simplicity of press operation, all leads to greater extension of this method manufacturing. Of course, the many alternative processes require the complementary tooling, while in the forming dies or press tools the trouble has often been traced to an adequate grasp of the basis of design construction.

Press tools processes in which they are used in an inadequate grasp on the basis of design and construction are greatly improved of lathe both in design and in regards to capacity.

Press working may be defined as the chinless mfg. process by which various components are made from sheet. These processes are also termed as cold stamping. The machine used for press working is called press.

OBJECTIVES OF STUDY

- 1) We are able to have market survey of raw material and finished product.
 - 2) We can actually implement practical procedure for manufacturing different components.
 - 3) We are known with the concept of alignments which is part of metrology.
 - 4) We are able to specify the machine.
 - 5) We are able to calculate the quantity of the material required.
-
-

PyBot- A chatbot for answering python queries

¹Prof. Syed Tanzeem, ²Pakala Chandra Sekhar, ³Raj Vishwakarma, ⁴Monis Khot, Abhishek Ezhava, Mayur Kadam,

¹Professor, Department of IT, Theem College of Engineering, Maharashtra, India

²School of Engineering, Central University of Karnataka, Karnataka, India

³Bachelor of IT, Department of IT, Theem College of Engineering, Maharashtra, India

Abstract: Pybot can change the way learners try to learn python programming language in a more interactive way. This chatbot will try to solve or provide answer to almost every python related issues or queries that the user is asking for. We are implementing NLP using NLTK module for improving the efficiency of the chatbot. We will include voice feature for more interactivity to the user. Sequence to Sequence model introduced in Learning Phrase Representations using RNN Encoder-Decoder for Statistical Machine Translation has since then, become the Go-To model for Dialogue Systems and Machine Translation. It consists of two RNNs (Recurrent Neural Network): An Encoder and a Decoder. The encoder takes a sequence (sentence) as input and processes one symbol (word) at each time step. Its objective is to convert a sequence of symbols into a fixed size feature vector that encodes only the important information in the sequence while losing the unnecessary information. You can visualize data flow in the encoder along the time axis, as the flow of local information from one end of the sequence to another.

Index Terms— Natural Language Processing, Machine Learning, Recurrent Neural Network, Chatterbot.

I. INTRODUCTION

Fast transportation systems and rapid transit systems are nerves of economic developments for any nation. Mismanagement and traffic congestion results in long waiting times, loss of fuel and money. It is therefore utmost necessary to have a fast, economical and efficient traffic control system for national development. The monitoring and control of city traffic is becoming a major problem in many countries. With the ever-increasing number of vehicles on the road, the Traffic Monitoring Authority has to find new methods of overcoming such a problem. One way to improve traffic flow and Safety of the current transportation system is to apply automation and Intelligent control methods. As the Number of road users constantly increases, and resources provided by current infrastructures are limited, intelligent control of traffic will become a very important issue in the future.

In our project we are using Quantitative approach. It is a process of deciding on the quality of the results obtained from the input of different process occurring in the system. The decision-making quality of the system depends on the maximum number of inputs giving the same amount of results. Similarly, the decision making of our project will depend on the change in the user review time by time. If the decision is based on neutral reviews (i.e. both positive + negative) then results might be average. The administrator OR admin that is monitoring the flow of data will make sure to encode the software to handle neutral reviews as well. For example, if a customer posts a review saying, “The product was good, but battery life is poor”. Now this is a neutral review, so the application will be encoded to manage it.

The main objectives of the project were to develop a NLTK model that will be used to identify answers related to user submitted questions. To develop a trained model were all the related data will be stored in vector/checkpoints and can be used by integrating it with the Chatbot for answering the questions. The user interface developed is simple and easy for every user who is new to the interactive environment and can grab the intuitive-ness of the bot [1]-[3].

II. PROPOSED SYSTEM ARCHITECTURE

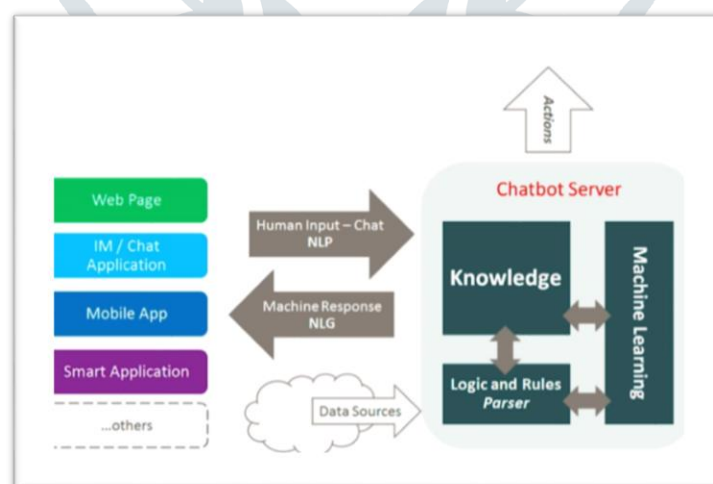


Fig.1. Block diagram of proposed system architecture

2.1 Hardware Module:

- Intel i5 (Pentium P4) Processor
- Motherboard (Genuine Intel)
- RAM (4 GB)

- 350GB HDD

2.2 Software Module:

- Tkinter
- Python
- Anaconda
- Jupiter IDEA

III. PROPOSED TECHNIQUES

3.1 Query by User

Here we are using the qualitative approach. The approach used for system development in the project implementation. This System is a web application which provides answer to the query of the student. Students can chat using any format there is no specific format the user has to follow. The System uses built in artificial intelligence to answer the query. The answers are appropriate what the user queried.

Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. System design is the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and well-running system.

3.2 System Working

Initial stage the system where project is setup so in that system environment python must be install in order to run the software we need to install python as well as the basic module of python which is required for software running. After the installation user just need to run that application then the our PyBot user interface will open base on that user interface user has to provide the input user has provided the voice as well as input option in order to interact with the software. Base of the user input it will give the matching or relevant output.

IV. PROPOSED SYSTEM DESIGN

The following features are implemented in our proposed system

1. Textbox and window view.
2. White/Black UI for night mode.
3. Easy response with proper grammatical response.
4. Definition and explanation present.

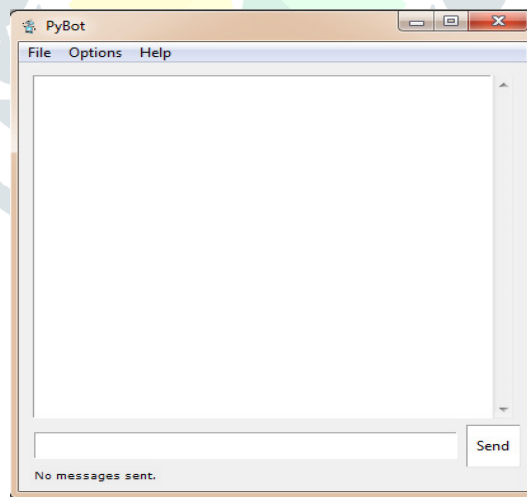


Fig. 1. Preview window

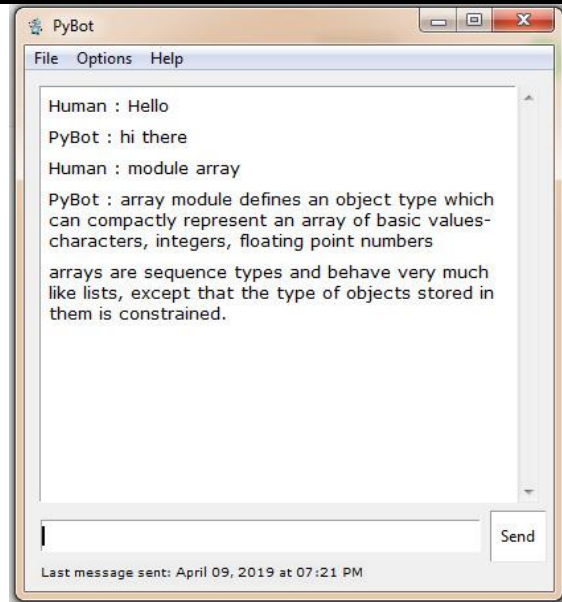


Fig.2. Query & Response

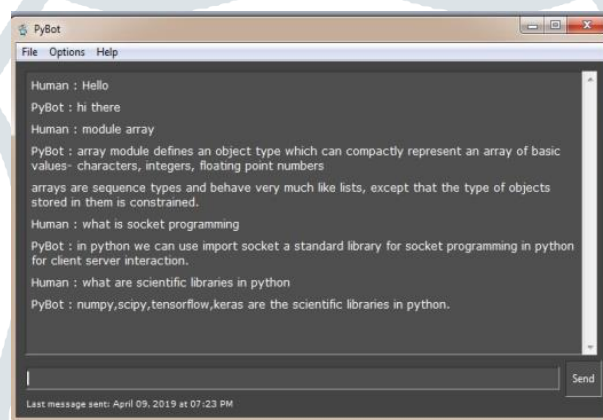


Fig.3. Last Seen feature

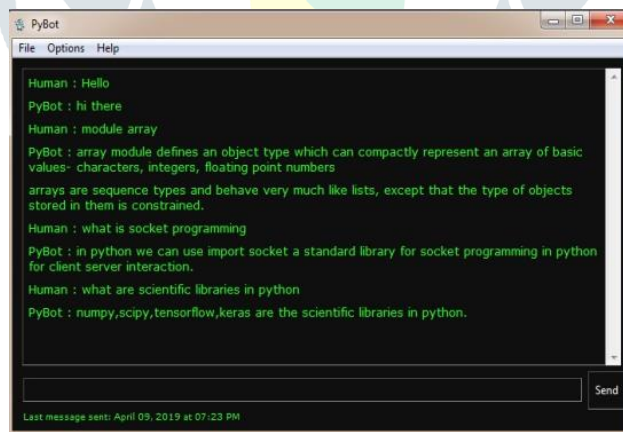


Fig.4. Dark Screen feature

V. CONCLUSION

Proposed system gives efficient way of utilizing the resources implemented during the making of Chatbot (Pybot) model this provides a structured and well-defined execution of the bot for which it was build. Bots should be used to improve the end user experience. It is highly optimized for answering python question with adequate amount of accuracy based of the trained model checkpoints. Improving and doing changes in the hyper-parameters of the training model could increase the accuracy rate of the Chabot.

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Voice and Gesture Based Smart Home Automation using Raspberry PI

¹Rajendra Patil, ¹Aakash Yadav, ¹Sujeet Prajapati, ¹Sagir Khan, ²Prof. Khalil Pinjari

¹ UG Student, Theem College of Engg, (Mumbai University) India,

²Assistant Professor, Theem College of Engg, (Mumbai University) India.

Abstract: This paper proposes the design of Voice and Gesture Based Smart Home Automation using Raspberry PI. In recent years, the home environment has seen a rapid introduction of network-enabled digital technology. This technology offers new and exciting opportunities to increase the connectivity of devices within the home for the purpose of smart home automation. Moreover, with the rapid expansion of the Internet, there is the added potential for the remote control and monitoring of such network-enabled devices.

Speech control is an emerging innovative method to accomplish control tasks. In this work, a system is created to control two of the most human interactive activities; switching on and off of lights and fans using voice and gestures given input given by humans. This system improves the living standard by making life easier and increasing productivity.

Keywords: Firebase Server, Smart Home automation, Internet of Things, Raspberry Pi, Personal Assistant

I. INTRODUCTION

The Internet of things (IoT) is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data.” (IoT). The development of the prototype will be made within a low budget in hopes to attract people. This work presents the design, specification, and prototype implementation of a composite smart home automation system using Wi-Fi module in raspberry pi. The research work provides multiple yet simple design approaches for developing flexible and robust smart home automation system to cater for the deficiency in overall control of user appliances. It also tackles the problems with complex, multiple, incompatible standards and the resulting expenses in the existing systems. Overall, the system extends the capabilities of smart home automation beyond the basic appliances switching and monitoring by giving broad control over the appliances’ functionalities in addition to switching their power.

Smart Home automation system consists of switches and sensors connected to a central hub from which the systems are controlled with a user-interface that is interacted via a wall mounted terminal, mobile phone software or via a web interface. The smart home automation system is increasingly used due to the wide manufacturer brands and various available technologies. From a social point of view, residents are admitted to smart homes for comfort, luxury, improving quality of life, and for providing security against intrusion and burglars. Secondly, smart home automation is achieved using a single controller, monitoring and the controlling many interconnected appliances such as lights, power plugs, HVAC system, humidity and temperature sensors, gas, smoke and fire detectors, audio, video and home theatre as well as security and emergency systems.



Figure 1: Smart home Automation

Smart homes are cheap, low-power, cost-effective, efficient, and realize the automation of a variety of domestic appliances using user-friendly interface as the remote control or any other handheld devices. Elderly, handicapped patients and people with disabilities who have problems with locomotion difficulty can benefit from this smart home to totally operate, with high performance, all appliances, and devices from anywhere in the house. Smart Home automation plays a very important role in the modern era because of its flexibility in using it at different places with high precision which will save money and time by decreasing human hard work.

IoT is having the potential to change the lifestyle of peoples. In today's life, people prefer more of automatic systems rather than any manual systems. The major elements of the IoT based Smart home automation systems are Arduino Uno and Raspberry PI 3 for a personal assistant. Smart Home automation can be defined as an Automatically controlling Home Appliances through voices and gesture given as Humans. Ultimately it is a system that aims to heighten the quality of life with the automation of household appliances that may be controlled over the Internet. IPv6 allows us to assign a communications address to billions of devices. Electronics companies are building Wi-Fi and cellular wireless connectivity into a wide range of devices. ABI Research estimates over five billion wireless chips will ship in 2013.

II. LITERATURE SURVEY

This paper provides a simple introduction to the IoT, its application and potential benefits to the society. In day-to-day life, every people want to be smart by using home automation. This project is intended to construct a Smart home automation system controlled by Voice and Gestures This system is designed to assist and provide support in order to fulfil the needs of elderly and disabled beings in our society. The gesture mode and voice mode are used to control home appliances. The main control system implements wireless technology to provide remote access from a smartphone. The design remains the existing electrical switches and provides more safety control on the switches with low voltage activating method. The switches status is synchronized in all the control system whereby every user interface indicates the real-time existing switches status. The system intended to control electrical appliances and devices in the house with relatively low-cost design, user-friendly interface, and ease of installation. Implementation of a low cost, flexible home automation system is presented. It enhances the use of wireless communication which provides the user with remote control of various electronic and electrical appliances.

III. HOME AUTOMATION & HISTORY

The Internet Of Things, as a concept, wasn't officially named until 1999. One of the first examples of an internet of things is from the early 1980s and was a coca cola machine, located at the carnegie melon university. Local programmers

would connect by the internet to the refrigerated appliance, and check to see if there was a drink available and if it was cold, before making the trip. By the year 2013, the internet of things had evolved into a system using multiple technologies, ranging from the internet to wireless communication and from micro-electromechanical systems (mems) to embedded systems. The traditional fields of automation (including the automation of buildings and homes), wireless sensor networks, gps, control systems, and others, all support the IOT.

IV. SYSTEM DESIGN

A. Raspberry Pi

The Raspberry Pi is a series of a credit card-sized single board computers developed in the United Kingdom by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science. They develop free resources to help people learn about computing and how to make things with computers. The Raspberry Pi 3 Model B is the earliest model of the third-generation Raspberry Pi. It replaced by Raspberry Pi 2 Model B in February 2016.

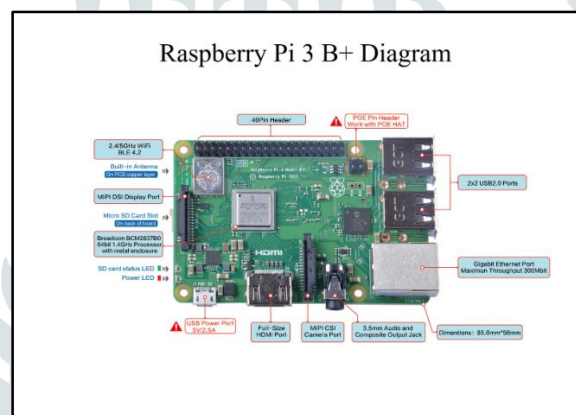


Figure 2: Raspberry Pi Board

Components:

1. Quad-Core 1.2GHz Broadcom BCM2837 64bit CPU
2. 1GB RAM
3. BCM43438 wireless LAN and Bluetooth Low Energy (BLE) on board
4. 100 Base Ethernet
5. 40-pin extended GPIO
6. 4 USB 2 ports
7. 4 Pole stereo output and composite video port
8. Full-size HDMI
9. CSI camera port for connecting a Raspberry Pi camera
10. DSI display port for connecting a Raspberry Pi touchscreen display
11. Micro SD port for loading your operating system and storing data
12. Upgraded switched Micro USB power source up to 2.5A

B. NodeMCU ESP8266

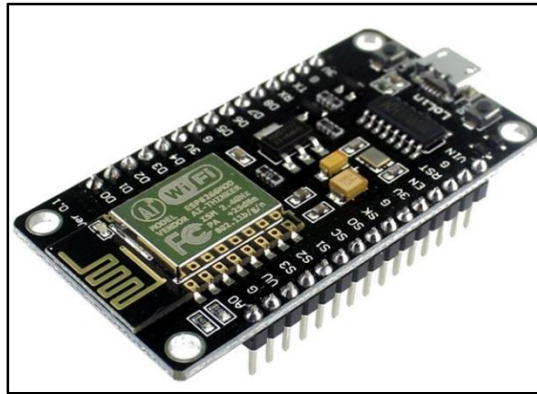


Figure 3: Block diagram of NodeMCU

With its USB-TTL, the NodeMCU Dev board supports directly flashing from a USB port. It combines features of a WIFI access point and station + microcontroller. These features make the NodeMCU extremely powerful tool for WIFI networking. It can be used as an access point and/or station, host a web server or connect to the internet to fetch or upload data.

Components:

1. programmable WIFI module.
2. Arduino-like (software defined) hardware IO.
3. Can be programmed with the simple and powerful Lua programming language or Arduino IDE.
4. USB-TTL included plug & play.
5. 10 GPIOs D0-D10, PWM functionality, IIC, and SPI communication, 1-Wire and ADC A0, etc. all in one board.
6. WIFI networking (can be used as an access point and/or station, host a web server), connect to the internet to fetch or upload data.
7. Event-driven API for network applications.

C. 4-Relay Module:

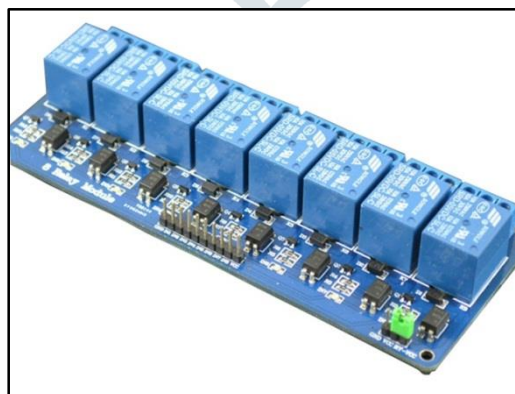


Figure 4: 4-relay Module

This is a 5V 4-channel relay interface board, and each channel needs a 15-20mA driver current. It can be used to control various appliances and equipment with large current. It is equipped with high-current relays that work under AC250V 10A or DC30V 10A. It has a standard interface that can be controlled directly by a microcontroller.

Components:

1. Size: 75mm (Length) * 55mm (Width) * 19.3mm (Height)
2. Weight: 61g
3. CB Colour: Blue
4. There are four fixed screw holes at each corner of the board, easy for install and fix. The diameter of the hole is 3.1mm.
5. High-quality Single relay is used with single pole double throw, a common terminal, a normally open terminal, and a normally closed terminal.
6. Optical coupling isolation, good anti-interference. Closed at a low level with an indicator on, released at the high level with indicator off
7. VCC is a system power source, and JD_VCC is a relay power source. Ship 5V relay by default. Plug jumper cap to use. The maximum output of the relay: DC 30V/10A, AC 250V/10A

D. Camera Module

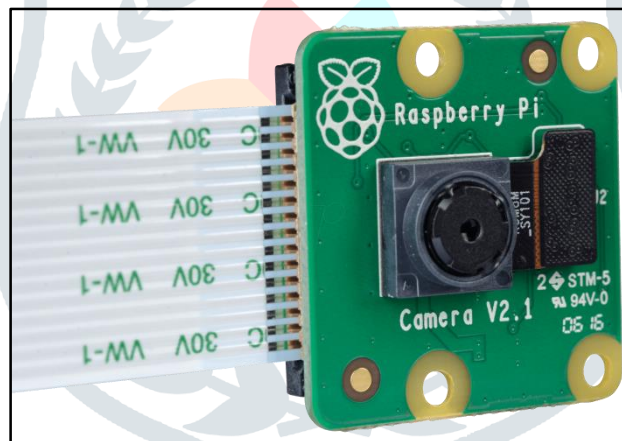


Figure 5: Camera Module

Components:

1. megapixel camera capable of taking photographs of 3280 x 2464 pixels
2. Capture video at 1080p30, 720p60 and 640x480p90 resolutions
3. All software is supported within the latest version of Raspbian Operating System

E. Microphone

This is a tiny USB Microphone that plugs into your laptop or desktop computer. No need to install any extra software; Microsoft Windows will detect the device and automatically install it. There is no need to configure the USB mini microphone, it can be used directly. You can also use it in Raspberry Pi which has been burned with Raspbian



Figure 6: Microphone

Components:

1. A TF card burned with the Raspbian
2. 5V DC power adapter, 2A or above with micro USB interface
3. HDMI interface display (or VGA interface display with a VGA to HDMI adaptor)
4. USB mouse and keyboard
5. Speakers or headphones in the standard of 3.5mm
6. USB mini microphone

V. METHODOLOGY

1. Hardware implementation:

Initially, the user will say something like switch on ‘home appliance name’ then personal assistant will start recognizing user's voice through a microphone that is connected to Raspberry Pi then that voice input gets converted to text first. It will compare with the dataset if match is found then control goes to the NodeMCU.

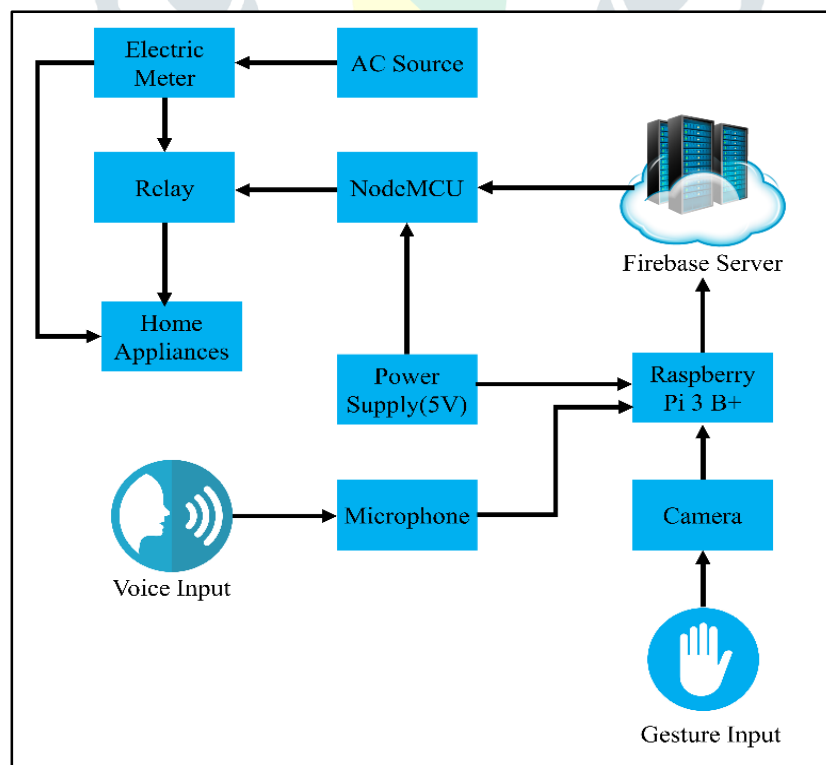


Figure 7: Block diagram of system

In this project thing-speak server is used. Similarly, in gesture mode camera will capture gesture in image format. This image is compared with picture data if a match is found then raspberry pi will send input to NodeMCU. Then it will check whether the input is high or low. Then control goes to the relay module and then power is supplied to respected pins.

2. Software implementation:

Programming is done using python programming and embedded C. The package used are speech recognizer and OpenCV. The speech recognizer is used for converting speech to text. whenever the user gives voice instruction it is converted to text and that text is compared with multiple functions. If a match is found then the device is turned ON or OFF. Similarly, in gesture mode hand gestures are compared with the dataset, if a match is found than for that gesture device is turned on or off accordingly. Devices can be operated using android application.

VI. SIMULATION AND RESULT

1. Working of Voice and Gesture based Smart Home Automation:



Figure 8: Working of Smart Home Automation System

Fig 8 shows the working model of this system. we have tested this system using a fan, led bulb and tube light. The fan, led bulb, tube light is connected to relay switch. For hand gesture input we have used picamera and for voice input, we have used a microphone to test the system. We have used firebase server for connectivity between android application and NodeMCU. Whenever the user says to turn on or off home appliances than data is sent to firebase server. NodeMCU will retrieve data from firebase server and will give 1 or 0 output to relay switch. Thus, the device will be turned on.

2. Layout of Android Application:

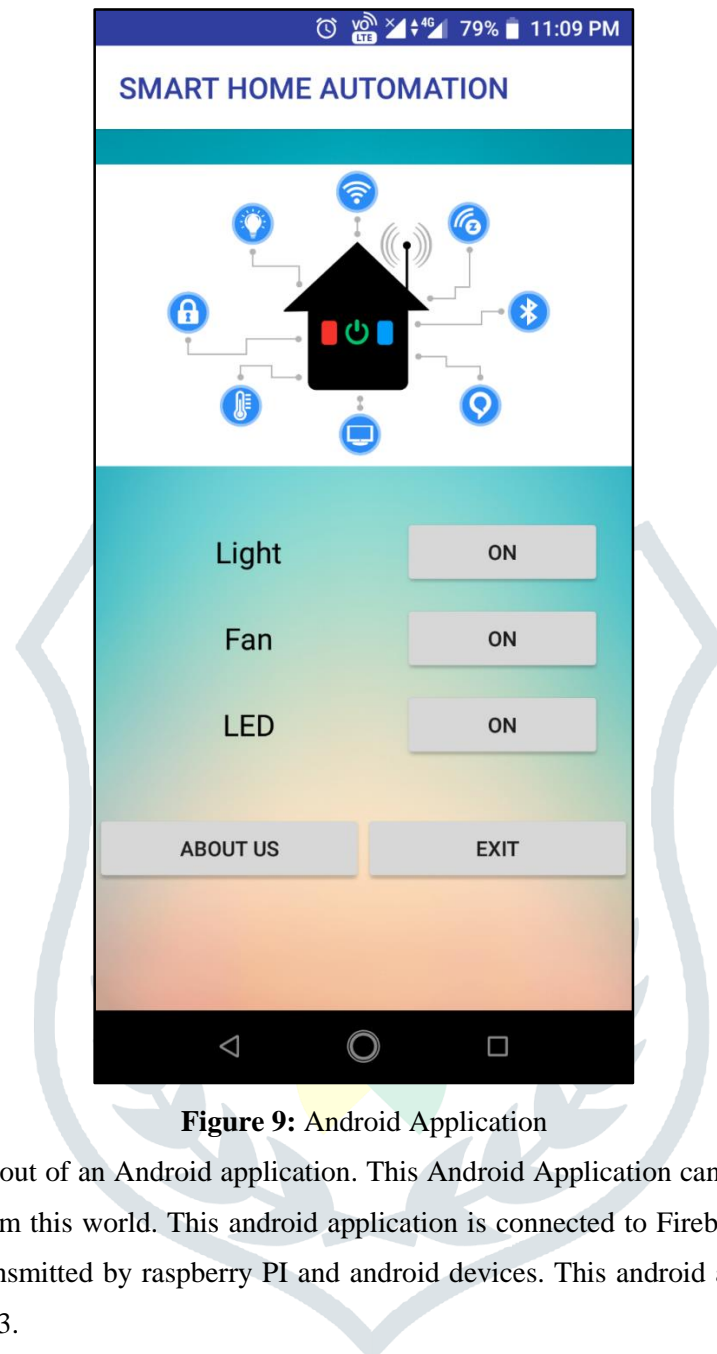


Figure 9: Android Application

Fig 9 shows the layout of an Android application. This Android Application can be used to operate the home appliance anywhere from this world. This android application is connected to Firebase server. Firebase server is used to collect data transmitted by raspberry PI and android devices. This android application supports Android version higher than 4.0.3.

3. Activity Diagram:

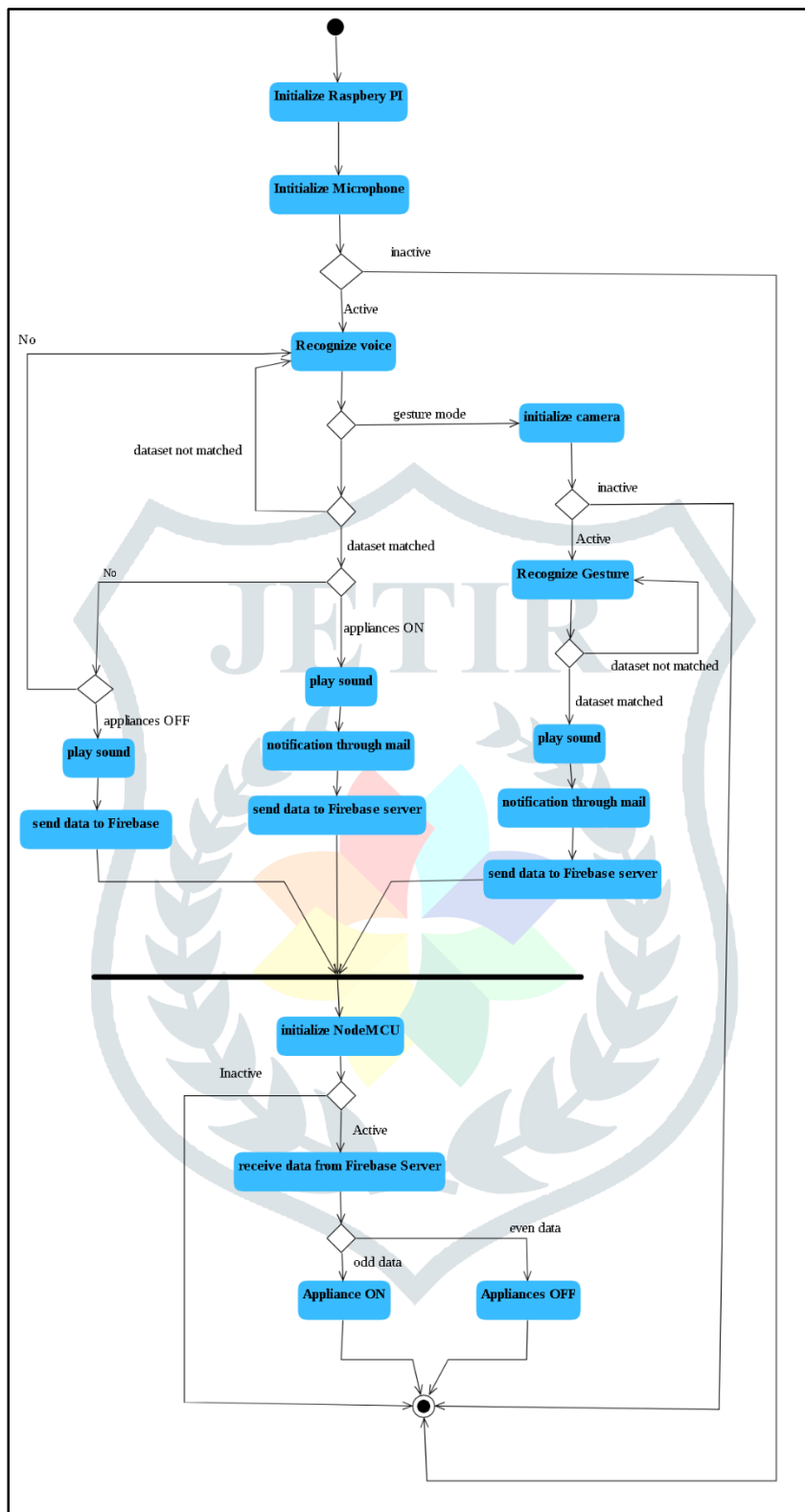


Figure 10: Activity Diagram of Smart Home Automation.

CONCLUSION

The work for IoT based smart home automation is completed successfully using internet source and Raspberry Pi. It is reliable and scalable home automation system with low cost and easy to implement. It makes human life easy and comfortable. It is possible to operate home appliances from any part of the globe.

ACKNOWLEDGEMENTS

Our Project is “**VOICE AND GESTURE BASED SMART HOME AUTOMATION USING RASPBERRY PI**”. First and foremost, we would like to thank to our Project Guide of this project, **Prof. Khalil Pinjari** for the valuable guidance and advice. He inspired us greatly to work on this project. His willingness to motivate us contributed tremendously to our project. We also would like to thank our Project Coordinator **Prof. Sneha Sankhe** for showing us some example that related to the topic of our project.

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Real Time Bus Status Monitoring System

¹Vividh Tare, ¹Prathamesh Chaudhari, ¹Aditya Kini, ²Prof. Azhar Nabi

¹UG Student, Theem College of Engg, (Mumbai University) India,

²Assistant Professor, Theem College of Engg, (Mumbai University) India

Abstract: In this project, we have proposed a Real-Time Bus Tracking Application which runs on Android smart-phones. This enables the user to find out the location of the bus so that they won't get late or won't arrive at the stop too early. The application also estimates the time required to reach a particular stop on its route. This device is a standalone system designed to display the real-time location(s) of the buses in Mumbai city. The system will consist of an application installed on the user's mobile, with information on the bus stops. The bus transportation routes at the centralized controller. Assembly of these hardware component modules consisting Arduino mega controller, GSM and GPS module, Battery, etc will enable the tracking device to obtain GPS data of the bus locations, which will then transfer it to centralized database of system i.e a server using 000Webhost in the approximate geographic positions of the buses on the route map. It will also transmit its bus numbers and route names continuously as soon as the bus comes to its Destination. In addition, the device will be portable and sustainable.

Keywords: 000Webhost Server, Arduino mega controller, Real-Time Bus Tracking, GSM, GPS

I. INTRODUCTION

Nowadays, due to the growing world & the importance of the time in day to day life, there is a need for effortless transport. So, we are also providing an Android application which will provide the all system information of Bus tracking and monitoring. It also provides the feature of density measure for the user convenience and nearest bus available on the route and will make the user up to date as bus moves. This application can be widely used by college students, office worker's, etc. since Android smart-phones have become common and affordable for all. The application also estimates the time required to reach a particular stop on its route. The application uses client-server technology. The Real-Time Bus Status monitoring system is a bus tracking device that will serve as a viable notification system that will effectively assist pedestrians in making the decision of whether to wait for the bus or walk.

II. LITERATURE REVIEW

In Real Time Bus Status Monitoring System, we have hardware module inbouded in the bus, which are made available for users via the bus tracking application. It came into existence due the server interaction with system application and hardware with the complete information about these buses. Complete information namely the number of buses that go to the required destination, bus numbers, bus timings, the routes through which the bus would pass, time taken for the bus to reach, maps that would guide the passenger with his/her route and most importantly, track the current location of the bus and give the correct time for the bus to reach its bus stop. Secondly it describes comparative Study of Similarity measures and its integration technique



Fig 1: Real Time Bus Status Monitoring

We have proposed a Real-Time Bus Tracking Application which runs on Android smart-phones. The hardware display showcases the name as follows. This enables the user to find out the location of the bus so that they won't get late or won't arrive at the stop too early. The main purpose of this application is to provide an exact location of the user's respective buses in Google Maps when a particular bus is selected besides providing information like bus details, driver details, stops, contact number, routes, etc. This application can be widely used by college students, office worker's, etc since Android smart-phones have become common and affordable for all. It is a real-time system as the current location of the bus is updated every moment in the form of latitude and longitude which is received by the user through their application on Google maps.

III. SYSTEM DESIGN

Basically, in our project we are using different types of hardware modules which will track the location of the bus. The following will showcase the different hardware components used in our project

1. Arduino Mega controller 2560:

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

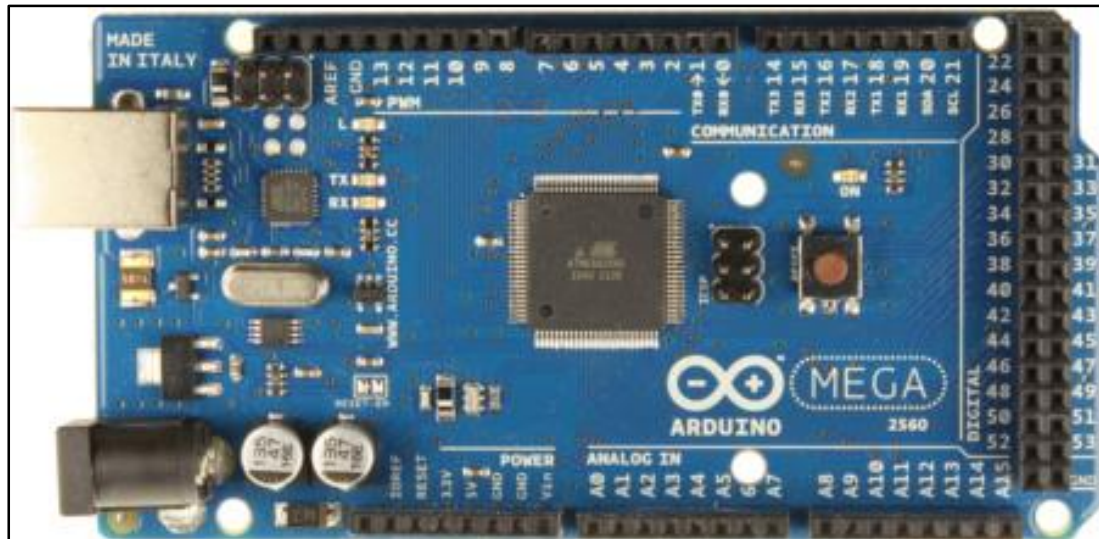


Fig 2: Arduino Mega controller 2560

2. SIM808 GSM GPRS GPS Modem:

A GPS navigation device, GPS receiver, or simply GPS is a device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position. Using suitable software, the device may display the position on a map, and it may offer directions.

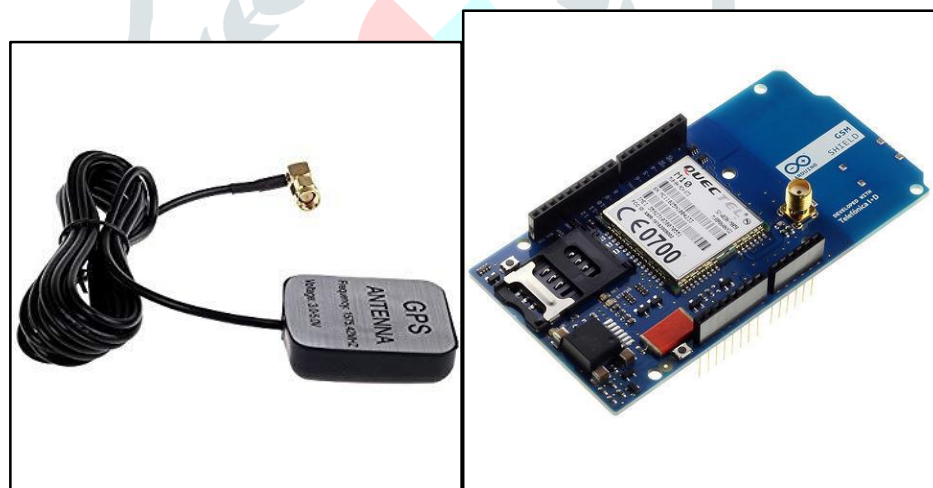


Fig 3: SIM808 GSM GPRS GPS Modem.

The GPS satellites only transmit 27 W (14.3 dBW) from a distance of 20,200 km in orbit above the Earth. By the time the signals arrive at the user's receiver, they are typically as weak as -160 dBW, equivalent to one-tenth of a million-billionth of a watt (100 attowatts). This is well below the thermal noise level in its bandwidth. Outdoors, GPS signals are typically around the -155 dBW level (-125 dBm). Based on Latest SIMCOM sim808 GSM/GPS engine, which offers GSM and GPRS data along with GPS technology for satellite navigation. The compact design which integrated GPRS and GPS in an SMT package will significantly save both time and costs for customers to develop GPS enabled applications.

3. Lead Acid Batteries 14v:



Fig 4: Lead Acid Batteries 14v

Lead–acid batteries designed for starting automotive engines are not designed for deep discharge. They have a large number of thin plates designed for maximum surface area, and therefore maximum current output, which can easily be damaged by deep discharge. Repeated deep discharges will result in capacity loss and ultimately in premature failure, as the electrodes disintegrate due to mechanical stresses that arise from cycling. Starting batteries kept on a continuous float charge will suffer corrosion of the electrodes which will also result in premature failure. Starting batteries should, therefore, be kept open circuit but charged regularly (at least once every two weeks) to prevent sulfation.

4. Resistors:

In this circuit of resistors, we have components attached to it so that to prevent short circuiting in the whole circuit of our hardware module. In this section of hardware, we have voltage regulators that controls the voltage flow in the circuit. Secondly, we have three different types of capacitors that maintains current integrity during working of the module.

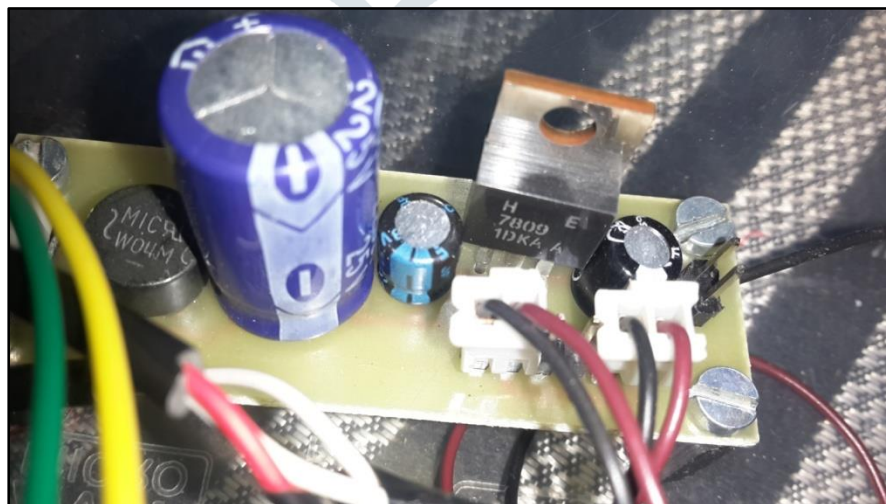


Fig 5: Resistors

5. Key switches:

The most important aspect of the project is select the key buttons attached with 3 colored wires. The grey button is the reach button that will send the data about latt-long meanwhile the remaining red and the white button is the showcase for selecting route of the bus.

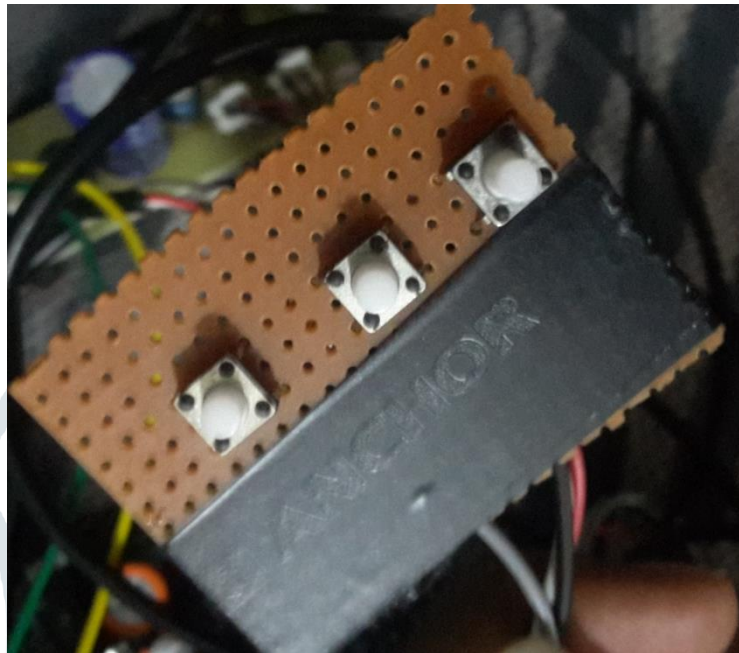


Fig 6: Key switches

6. LCD Display(16X2)

LCD (Liquid Crystal Display) screen is an electronic display module and finds a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi-segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in the 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display, etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.



Fig 7: LCD Display

7. Real time Application

The android application consists of the whole bus time table and the bus route that will enlist bus timings. For different stops at different period of time

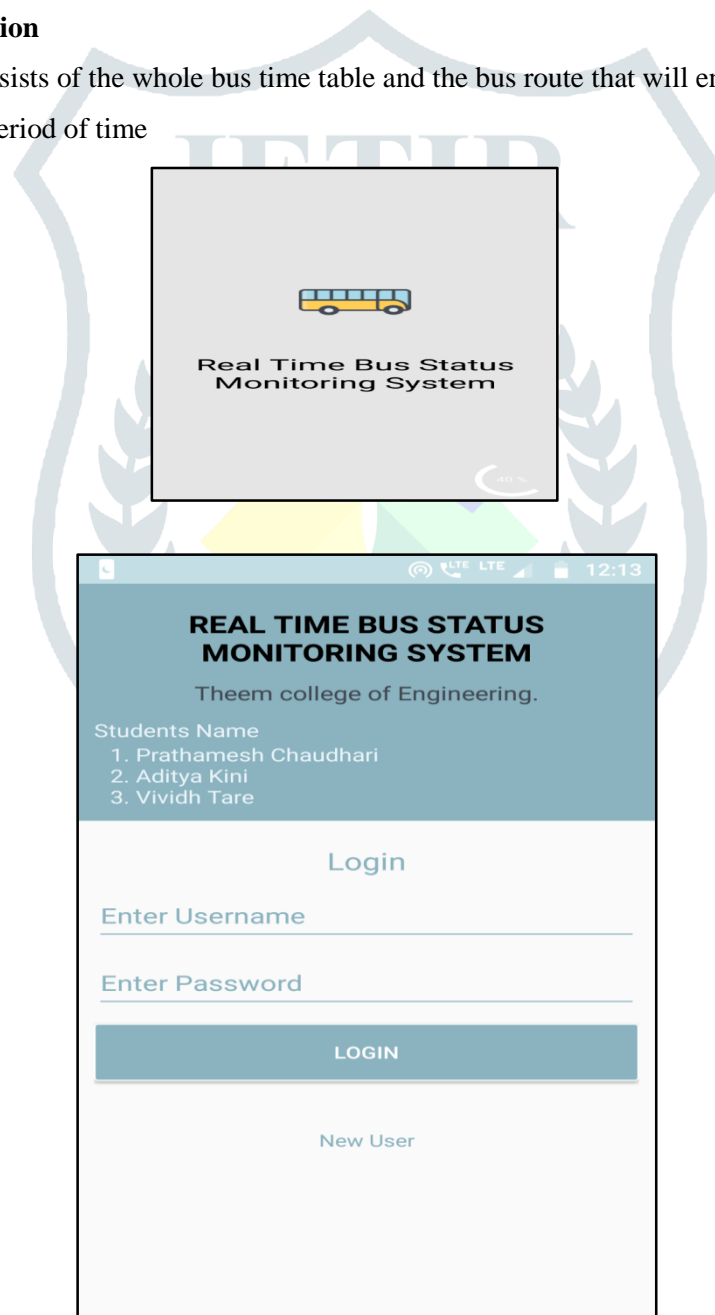


Fig 8: Layout of Android Application

It consists of login Credentials and the bus details as shown in the png snapshot of the Android application. An Android is a mobile operating system (OS) currently developed by Google, based on the Linux kernel and designed primarily for touchscreen mobile devices such as smartphones and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touchscreen devices, Google has further developed Android TV for televisions, Android Auto for cars, and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on notebooks, game consoles, digital cameras, and other electronics. Now we have phones which can even access GPS, GPRS, Wi-Fi, NFC and a lot of other cool and advanced features which you cannot even imagine. So in this Mobile world of this complication. Android is one of those operating system platforms which made it easy for manufacturers to design top class phones

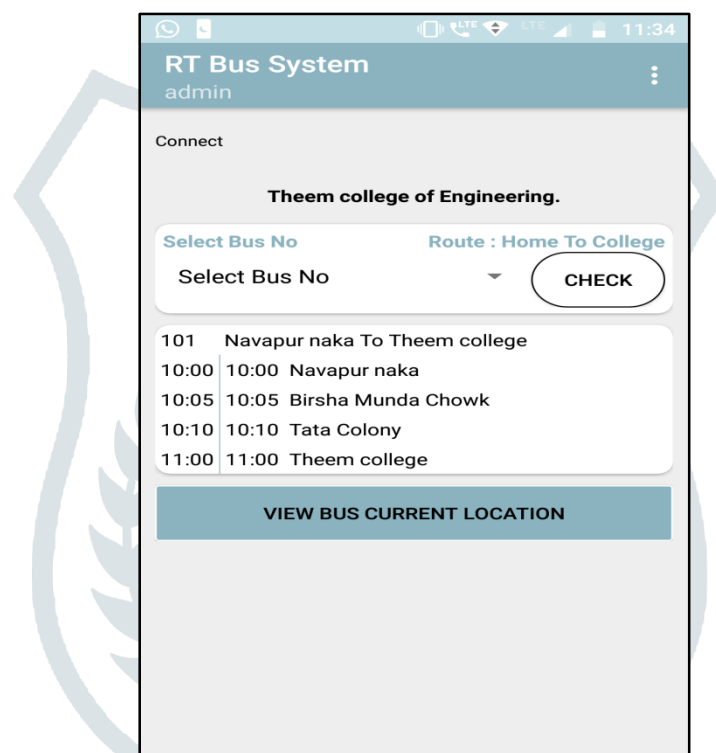
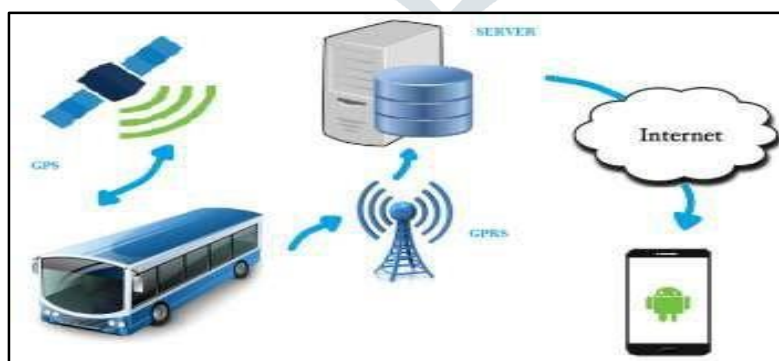


Fig 9: Bus Tracking.

IV. METHODOLOGY



V. Fig 10: Working Diagram

1. There is login page on the application
2. Then once the application is login it tracks the location using the hardware components.

3. The hardware components consist of Arduino mega controller which fill with details and connected to the GPRS module and then it signified to GSM module using latitude and longitude positionThe following diagram will showcase that how the bus tracking is executed
4. Once this location is ensured by hardware components the application is notified with the stop and the real time position is assigned
5. User can track the location the bus and if he/she is done with it can logout.

VI. FUTURE SCOPE

Our system is based on smartphone and server. Our System we are add admin, where admin can track driver location and view bus details. As this system uses a combination of processing elements: PCs, Mobile Phones etc., there is a possibility of the overall system malfunction due to a particular type of attack, it is termed as Denial of Service (DoS) attack by malicious agents who might try to disrupt the function of the system.

VII. CONCLUSION

In this paper we discussed the problems arising from the immense use of web-based applications in mobile phones and other mediums, which leads us to the need of higher level of authentication. The proposed system uses a RSA to implement ZKP using random number generator for every login instance and the hash (stored in crc32) is added to it and the server counter checks the values for access granting.

VIII. ACKNOWLEDGEMENT

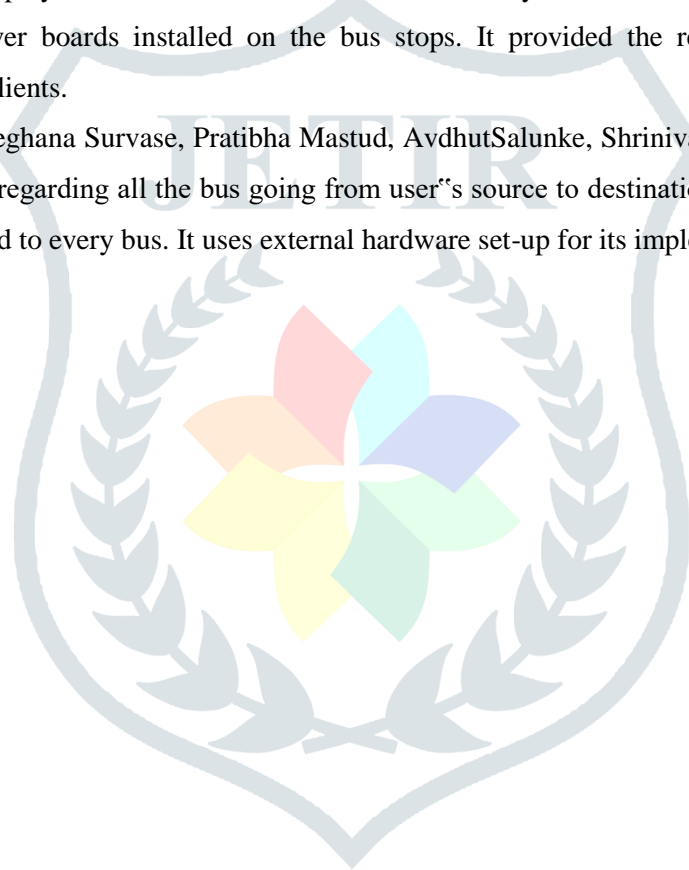
In this paper Our project is “**REAL TIME BUS STATUS MONITORING SYSTEM**” we are thankful to **Prof. Azhar Nabi** who is our project guide. He provided most of the material for study and was readily accessible every time. We would also like to thank all the employees of our college who helped in our project directly or indirectly and it is because of them. Lastly, we would like to thank our parents, friends and teachers of our college who encouraged us morally and guided us to put in our best.

Any successful Endeavour requires an opportunity, an opening, and proper direction. Such An opportunity was provided to us by **THEEM COLLEGE OF ENGINEERING**. We are really grateful to our principal **Dr. Aqueel Ahmed Shah** that he accepted our project. The environment and resources made available enable us to put in the best efforts and to complete our project in time. We would like to thank our Head of Department **Prof. Harshal Patil** and project in charge **Prof. Sneha Sankhe** for giving us time in his busy schedule. She also provided us with most congenial and conducive environment and her unrelenting support.

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- [2]. G. Jemilda, R. Bala Krishnan, B. Johnson, G. LingaSangeeth have used two Android applications designed are: One for the Driver to start uploading the bus's location to the server and the other for the user to retrieve the location of the bus and check how much time the bus takes to reach a particular stop and also to see the location of the bus on the Google Map.
- [3]. Karan Punjabi, PoojaBolaj, PratibhaMantur, SnehaWali uploads the current location of the bus to the server. The server then sends an SMS to all the registered students those are about to board at the bus stop. Here the driver's mobile phone is used as a GPS receiver. It is a tiresome process where the details of all the students are to be kept and updated from time to time. The server is overloaded every now and then to get details of a student at every stop.
- [4]. Dr. (Mrs.) Saylee Gharge, Manal Chhaya, GauravChheda, Jitesh Deshpande, Niket Gajra have developed a system using GPS displays the current locations of the bus. The system consisted of a transmitter installed on the buses and receiver boards installed on the bus stops. It provided the relevant bus routes and other information to their clients.
- [5]. Manini Kumbhar, Meghana Survase, Pratibha Mastud, AvdhutSalunke, Shrinivas Sir deshpande provided the relevant information regarding all the bus going from user's source to destination. The system is operated by GPS which is attached to every bus. It uses external hardware set-up for its implementation.



Prediction of Customer Review using Opinion Mining

¹Fauzan Padvekar, ¹Faisal Sothe, ¹Priya Yadav, ²Najmuddin Aamer

¹UG Student, Theem College of Engg, (Mumbai University) India.

²Professor, IT Dept, Theem College of Engg, (Mumbai University) India.

Abstract: Merchants selling products on the Web often ask their customers to share their opinions and hands-on experiences on products they have purchased. Unfortunately, reading through all customer reviews is difficult, especially for popular items, the number of reviews can be up to hundreds or even thousands. This makes it difficult for a potential customer to read them to make an informed decision. The Opinion Miner system designed in this work aims to mine customer reviews of a product and extract high detailed product entities on which reviewers express their opinions. Opinion expressions are identified and opinion orientations for each recognized product entity are classified as positive or negative.

Keywords: Opinion Mining, Naïve Bayes, Preprocessing, Feature Extraction.

I. INTRODUCTION

Opinions are central to almost all human activities and are key influencers of our behaviours. Our beliefs and perceptions of reality, and the choices we make, are, to a considerable degree, conditioned upon how others see and evaluate the world. For this reason, when we need to make a decision, we often seek out the opinions of others. This is not only true for individuals but also true for organizations.

Opinions and its related concepts such as sentiments, evaluations, attitudes, and emotions are the subjects of study of sentiment analysis and opinion mining. The inception and rapid growth of the field coincide with those of the social media on the Web, e.g., reviews, forum discussions, blogs, micro blogs, Twitter, and social networks, because for the first time in human history, we have a huge volume of opinionated data recorded in digital forms. Since early 2000, sentiment analysis has grown to be one of the most active research areas in natural language processing. It is also widely studied in data mining, Web mining, and text mining. In fact, it has spread from computer science to management sciences and social sciences due to its importance to business and society as a whole. In recent years, industrial activities surrounding sentiment analysis have also thrived. Numerous start-ups have emerged. Many large corporations have built their own in-house capabilities. Sentiment analysis systems have found their applications in almost every business and social domain.

Opinions are central to almost all human activities because they are key influencers of our behaviours. Whenever we need to make a decision, we want to know others' opinions. In the real world, businesses and organizations always want to find consumer or public opinions about their products and services. Individual consumers also want to know the opinions of existing users of a product before purchasing it, and others' opinions about political candidates before making a voting decision in a political election. In the past, when an individual needed opinion, he/she asked friends and family. When an organization or a business needed public or consumer opinions, it conducted surveys, opinion polls, and focus groups. Acquiring public and consumer opinions has long been a huge business itself for marketing, public relations, and political campaign companies.

With the explosive growth of social media (e.g., reviews, forum discussions, blogs, micro-blogs, Twitter, comments, and postings in social network sites) on the Web, individuals and organizations are increasingly using the content in these media for decision making. Nowadays, if one wants to buy a consumer product, one is no longer limited to asking one's friends and family for opinions because there are many user reviews and discussions in public forums on the Web about the product. For an organization, it may no longer be necessary to conduct surveys, opinion polls, and focus groups in order to gather public opinions because there is an abundance of such information publicly available. However, finding and monitoring opinion sites on the Web and distilling the information contained in them remains a formidable task because of the proliferation of diverse sites. Each site typically contains a huge volume of opinion text that is not always easily deciphered in long blogs and forum postings. The average human reader will have difficulty identifying relevant sites and extracting and summarizing the opinions in them. Automated sentiment analysis systems are thus needed.

In recent years, we have witnessed that opinionated postings in social media have helped reshape businesses, and sway public sentiments and emotions, which have profoundly impacted on our social and political systems. Such postings have also mobilized masses for political changes such as those happened in some Arab countries in 2011. It has thus become a necessity to collect and study opinions on the Web. Of course, opinionated documents not only exist on the Web (called external data), many organizations also have their internal data, e.g., customer feedback collected from emails and call centres or results from surveys conducted by the organizations.

Due to these applications, industrial activities have flourished in recent years. Sentiment analysis applications have spread to almost every possible domain, from consumer products, services, healthcare, and financial services to social events and political elections. Many big corporations have also built their own in-house capabilities, e.g., Microsoft, Google, Hewlett-Packard, SAP, and SAS. These practical applications and industrial interests have provided strong motivations for research in sentiment analysis.

II. LITERATURE SURVEY

Studies on feature-based opinion mining have exploited various methods for feature extraction and refinement, including NLP and rule-based methods [6], [2], statistical methods [4], [9], and ontology-based methods [15]. R. Nitish [2] proposed a system to extract features from review data using association rule mining. The system selects frequent terms and then extracts features by measuring the similarities between selected terms. The main problem of this method is that the system only considers the information from the term itself, for example, term frequency, which does not reflect the relationship between a feature and its related opinion information.

Zulva Eachrina [6] proposed a feature extraction method using a rule-based approach. This method extracts a relatively large number of features compared with the amount of review data. For example, it generates 263 features from 45 reviews for digital cameras. The main reason for the extraction of so many features is that terms that have the same or similar meanings are not considered as the same features. For example, 'photo,' 'picture,' and 'image' all have the same meaning; however, they are considered as different features simply because they are different words. Consequently, this system could not provide proper summary information for the product. In FEROM, we solve this problem by reducing the number of features by merging words that have similar meanings using the semantic similarity between features and then providing reliable summary information for the product based on the merged features.

Neelam Duhan [5] proposed a feature extraction method for opinion mining that uses ontology. Although this method worked well semantically, the main problem is the maintenance of the ontology to address the constant expansion of the review data. In this system, the ontology is manually constructed and must be updated when new features are added. In addition, a concept that is not defined in the ontology is not able to be classified. Thus, it is necessary to construct an automatic system to avoid continued intervention.

In summary, previous studies on feature-based opinion mining do not consider the relationship between a term and its related opinion information and also do not merge words with the same or similar meanings. We propose FEROM to solve these problems.

III. SYSTEM DESIGN

1. System Working:

The system architecture of FEROM is shown in Fig. 1. The review crawler collects customer review data from online stores, and the review cleaner removes unnecessary content such as HTML tags and then stores the review data to the review database.

The pre-processor conducts morphological analysis of the review data including POS tagging, splits a compound sentence into multiple sentences, and performs stop word removal and stemming.

The feature extractor extracts product features from pre-processed review data. Feature extraction proceeds in three phases: feature selection selects a candidate feature in a sentence by looking for a noun phrase, opinion information extraction finds an opinion phrase that is associated with the candidate feature, and opinion phrase conversion replaces an opinion phrase expressed using a negative term with its antonym.

The feature refiner reduces the number of features by merging candidate features with the same or similar meanings, defined as homogeneous features. The feature refiner recognizes homogeneous features by exploiting the feature ordering process that synchronizes the word orders of the features to detect synonymous feature candidates and the feature containment checking process that examines the subset-superset relationship between the features to check for similarity between them. Finally, the feature merging process merges homogeneous features into a representative feature and also prunes the feature candidates that have significantly low frequencies and very small amounts of related opinion information.

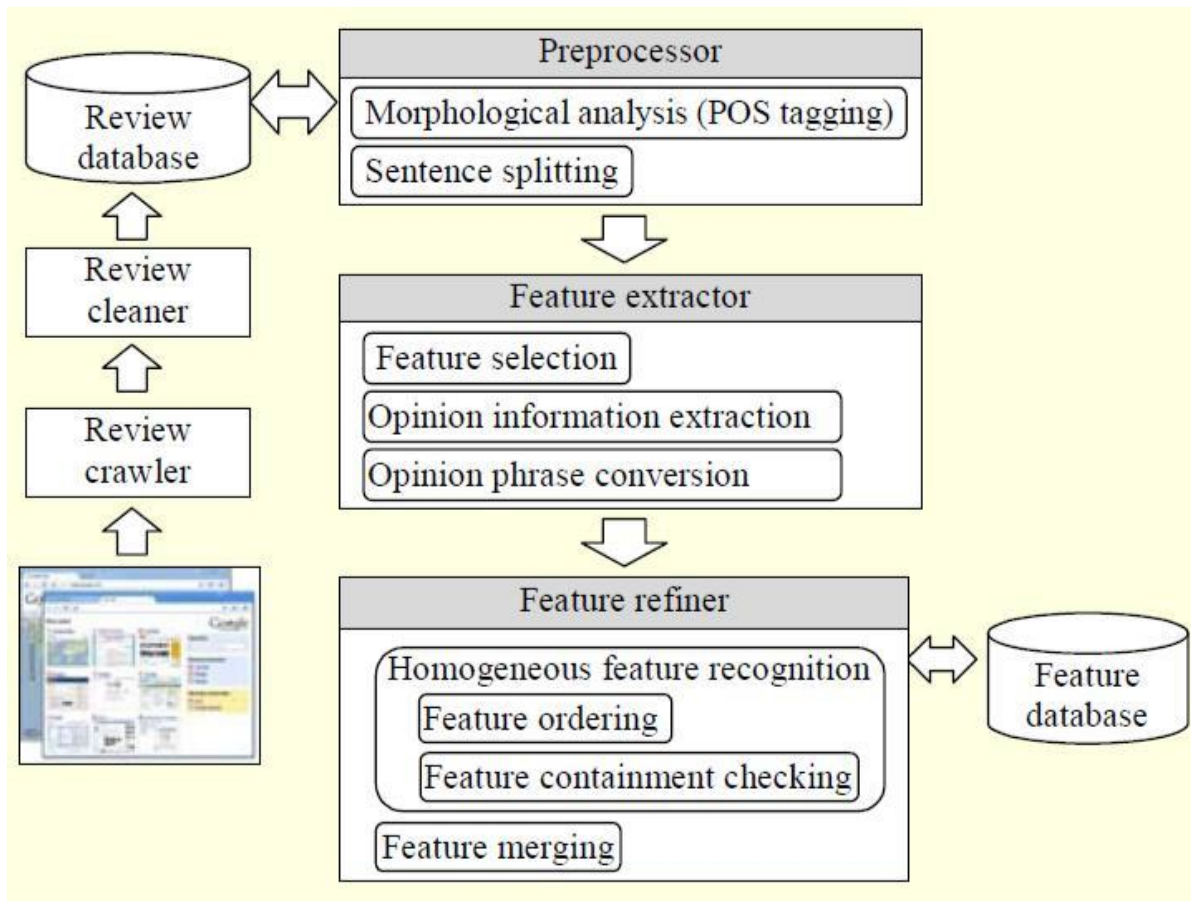


Fig 1: System Architecture of FEROM

IV. METHODOLOGY

After analysing the requirements of the task to be performed, the next step is to analyse the problem and understand its context. The first activity in the phase is studying the existing system and other is to understand the requirements and domain of the new system. Both the activities are equally important, but the first activity serves as a basis of giving the functional specifications and then successful design of the proposed system. Understanding the properties and requirements of a new system is more difficult and requires creative thinking and understanding

of the existing running system is also difficult, improper understanding of present system can lead diversion from solution.

1. Waterfall Model:

1.1 Overview:

The model that is basically being followed is the WATERFALL MODEL, which states that the phases are organised in a linear order.

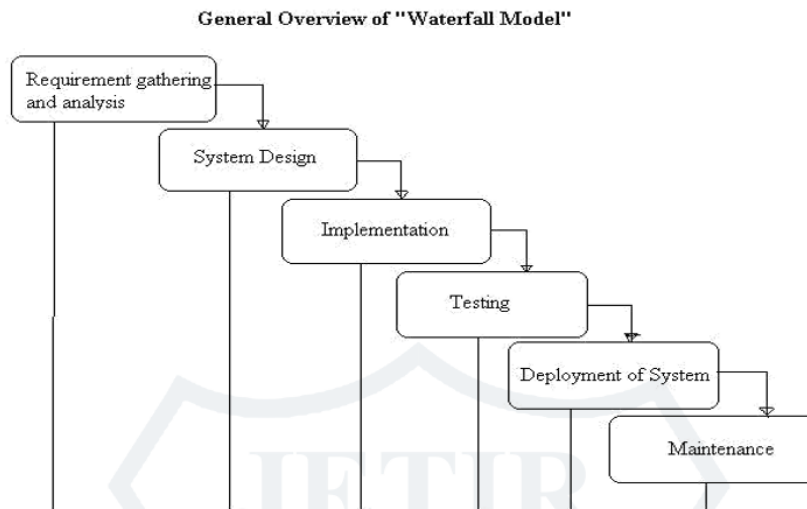


Fig 2: Waterfall Model

WATERFALL MODEL: Waterfall approach was first Process Model to be introduced and followed widely in Software Engineering to ensure success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate process phases. The phases in Waterfall model are: Requirement Specifications phase, Software Design, Implementation and Testing & Maintenance. All these phases are cascaded to each other so that second phase is started as and when defined set of goals are achieved for first phase and it is signed off, so the name "Waterfall Model". All the methods and processes undertaken in Waterfall Model are more visible.

The stages of "The Waterfall Model" are:

- **Requirement Analysis & Definition:** All possible requirements of the system to be developed are captured in this phase. Requirements are set of functionalities and constraints that the end-user (who will be using the system) expects from the system. The requirements are gathered from the end-user by consultation, these requirements are analyzed for their validity and the possibility of incorporating the requirements in

the system to be development is also studied. Finally, a Requirement Specification document is created which serves the purpose of guideline for the next phase of the model.

- **System & Software Design:** Before a starting for actual coding, it is highly important to understand what we are going to create and what it should look like? The requirement specifications from first phase are studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture. The system design specifications serve as input for the next phase of the model.
- **Implementation & Unit Testing:** On receiving system design documents, the work is divided in modules/units and actual coding is started. The system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality; this is referred to as Unit Testing. Unit testing mainly verifies if the modules/units meet their specifications.
- **Integration & System Testing:** As specified above, the system is first divided in units which are developed and tested for their functionalities. These units are integrated into a complete system during Integration phase and tested to check if all modules/units coordinate between each other and the system as a whole behaves as per the specifications. After successfully testing the software, it is delivered to the customer.
- **Operations & Maintenance:** This phase of "The Waterfall Model" is virtually never ending phase (Very long). Generally, problems with the system developed (which are not found during the development life cycle) come up after its practical use starts, so the issues related to the system are solved after deployment of the system. Not all the problems come in picture directly but they arise time to time and needs to be solved; hence this process is referred as Maintenance.

1.2 Advantages of Waterfall Model:

Waterfall model is the oldest and most widely used model in the field of software development. There are certain advantages of the waterfall model, which causes it to be the most widely used model as yet. Some of them can be listed as under.

- a. Needless to mention, it is a linear model and of course, linear models are the most simple to be implemented.
- b. The amount of resources required to implement this model is very minimal.
- c. One great advantage of the waterfall model is that documentation is produced at every stage of the waterfall model development. This makes the understanding of the product designing procedure simpler.
- d. After every major stage of software coding, testing is done to check the correct running of the code.

1.3 Drawbacks of Waterfall Model:

The question that must be bothering you now is that with so many advantages at hand, what could be the possible disadvantages of the waterfall model. Well, there are some disadvantages of this widely accepted model too. Let us look at a few of them.

- a. Ironically, the biggest disadvantage of the waterfall model is one of its greatest advantages. You cannot go back, if the design phase has gone wrong, things can get very complicated in the implementation phase.
- b. Many a times, it happens that the client is not very clear of what he exactly wants from the software. Any changes that he mentions in between may cause a lot of confusion.
- c. Small changes or errors that arise in the completed software may cause a lot of problem.
- d. The greatest disadvantage of the waterfall model is that until the final stage of the development cycle is complete, a working model of the software does not lie in the hands of the client. Thus, he is hardly in a position to mention if what has been designed is exactly what he had asked for.

2. Software implementation:

This software is been implemented in Java Language. IDE used is 'NetBeans 8.2.0'. Framework used here is 'Java Swing'. Instead of database, we are using datasets in unstructured form. Product reviews are been taken from website 'https://www.tesfreaks.co.in'. Here, we have used inbuilt libraries as well as added certain external libraries for Pre-processing as well as Tagging (Grammatical Classification). After tagging, this software creates a 'Feature Table' which displays Product, Its Feature and Opinion Sequence Wise. We had added certain files of Formal, Informal Text and using those files, this application classifies what are the total number of positive, negative and neutral words in dataset. This process is done through Frames. Finally, its summary is displayed and result is in form of 'Graph'.

V. SIMULATION AND RESULT

1. Prediction of total positive, negative and neutral reviews in Graphical Form:

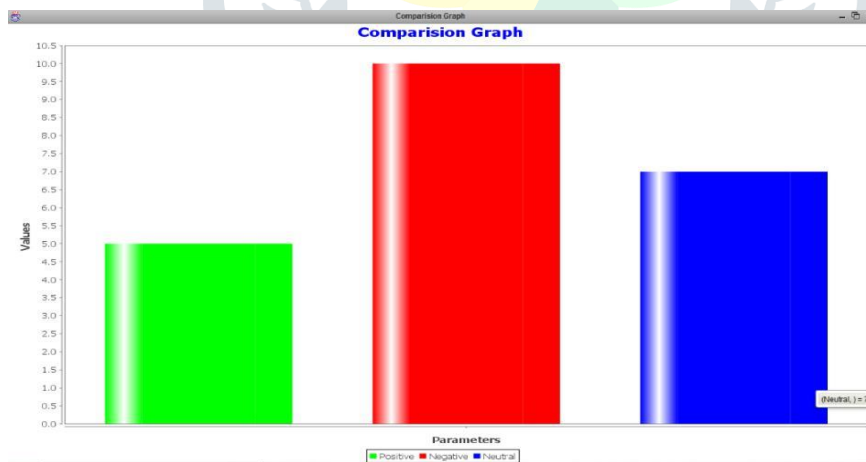


Fig 3: Graphical Analysis

Result is the 'Graph Analysis' that displays total Positive, Negative and Neutral comments. Through this graph, most of the organizations will be able to understand the statistics of their product at market (whether their product is in profit or loss.) If there are more negative opinions regarding specific product, This will also help the companies to find and fix the issue in their product and will eventually lead to best selling of their product.

2. Layout of Desktop Application:

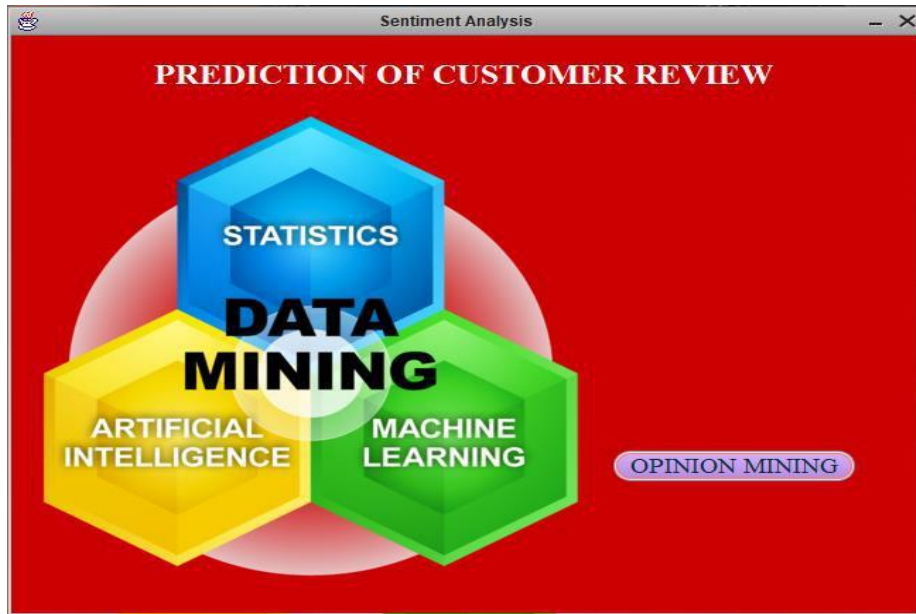


Fig 4 : Desktop Application

Desktop application can be installed in your system This application can be used both online as well as offline. For online usage, you just have to click on given product in application and it will fetch reviews from website and load it into scroll box automatically, then you can find it's review type through application processing.

For offline usage, you must have a dataset (.csv) file that contains reviews regarding specific product. File can be in both structured and untrusted format. Once you load that file in application, then software will do its job.

3. Sequence Diagram:

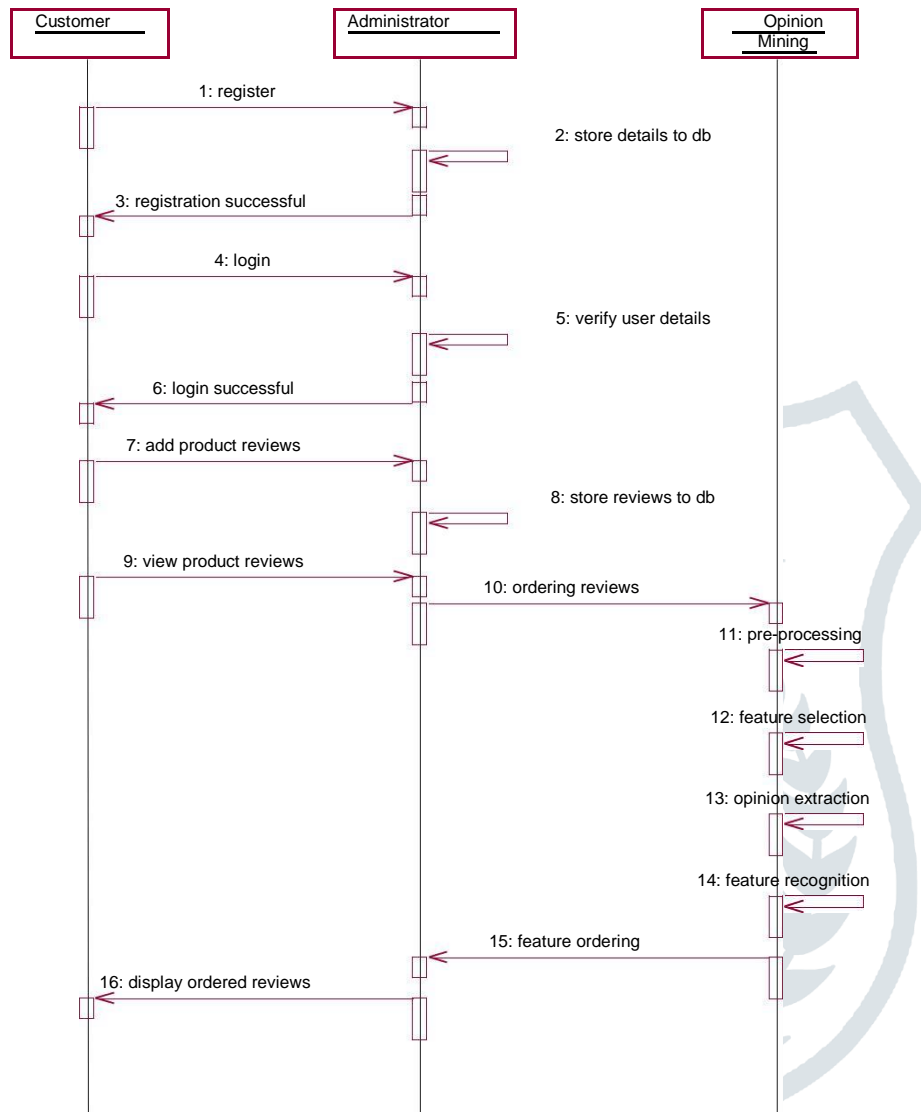


Figure 5: Sequence Diagram for FEROM

VI. CONCLUSION

We proposed an enhanced method of feature extraction and refinement for opinion mining, to analyse product review data. It extracts candidate features considering the syntactic and semantic similarities between them and reduces the number of features by merging words with similar meanings. This showed satisfactory performance results through a series of experiments conducted on real product review data. Furthermore, this system showed good performance in a virtual opinion mining framework. Based on these observations, we claim that this system is a proper method for opinion mining by employing an enhanced scheme of feature extraction and refinement to analyse customer review data.

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Advance Traffic Control Safety and Security in Vehicle Using IOT

¹Kawal Raut , ¹Tanmay Sarkar , ¹ Akshay Sankhe ² Prof. Ansar Ahmed Shaikh

¹ U.G Student, Theem College of Engg. ²Asst. Professor, IT Dept. Theem College of Engg. (Mumbai University), Boisar, India

Abstract: In last decade, we observe the drivers fatigue driving and vehicle theft activity which causes social real time problem like accidents and many more hazards conditions. We daily see or read such type of activities which are raising the question of our safety and security in both public and private sectors. Even security and safety, that should be given to the people on roads as well as on off-roads is can't be managed by an individual at a time. To focus on creating safe environment on roads. To focus on some part of the safety that can't be managed by an individual. To create safety in the areas like-Silence zone like- Residential areas at night, Hospitals, Schools, Colleges, Court, etc. No Speeding zone (like-Residential Areas, schools, Danger Path (Sharp turns), etc.

Keywords: RFID tag, RFID Reader, Raspberry Pi3 B model, Arduino, Piezoelectric Sensor, GSM Module 900A, GPS Receiver ,(SIM28ML) ,ADXL345 Accelerometer Sensor.

INTRODUCTION

I. INTRODUCTION

The project uses a number of hardware components for its working. Each component has their individual importance. The architecture and the design of the system is very simple as compared to the other system and the implementation of this system is also very efficient and the installation cost is also low. From the present issue area, it can be seen that, current advancements are inadequate to deal with the issues of over speeding, high intensity Horn, and to prevent the accidents which are taking place on the roads. To take care of these issues, we propose to execute our Advanced Traffic Control Safety and Security in vehicles.



Figure 1: Traffic Control System

II. LITERATURE SURVEY

To give safety and to give secure environment to other people, that there is no problem to others due to our driving of car across urban and rural areas of India, is not possible as the traffic police is not there everywhere to monitor the speed and to monitor the intensity of the horn at strict areas like schools, Courts, Hospitals, etc. Also, after the accident if someone is not present near to the area where accident has already occurred, then the driver and the people which were

there inside the car, will die on the spot as there were no people to help the casualties. Many people in India do not follow traffic rules, due to this many victim and nonvictim people face the problems.

The advantage of the system is that it can control the speed of the car and the intensity of the horn while passing through the strict areas like School, Courts, Hospitals, etc. Also, it will send the message to Police Station and to Hospital automatically after accident and the Buzzer will get activated after the accident as to aware the people that accident has occurred near to your location. These are the features of our system.

Shubham Swaraj el.at [1] Designed system for “RFID Based Automatic Vehicle Identification for Access Control. RFID (Radio Frequency Identification)” is one of the solid and fast strategy for perceive the material article. In the long-earlier the institutionalized labels are best when diverged from RFID because of their cost however now a day's RFID are easily open and are more useful to use. Paper is based upon security get to and Control structure using RFID and with GSM module.

R.Aishvarya el.at [2] proposed “Automatic and Effective Tracking of Hit & Run Misbehavior Driver with Emergency Ambulance Support”. The Instantaneous development of innovation has made our lives simpler. On the off chance that a mishap has happened at a specific area and it is expected that two vehicles are included, then the vibration sensor set before these vehicles detects the vibration furthermore, gives the caution to the activity police control.

Sumit S. Dukare el.at [3] Explained about “Vehicle Tracking, Monitoring and Alerting System”. There are different difficulties experience in vehicle following, checking and cautioning because of insufficiency in appropriate ongoing vehicle area and issue of alarming framework. GPS (Global Positioning System) is most broadly utilized innovation for vehicle following and keep standard checking of vehicle. The goal of following framework is to oversee and control the vehicle utilizing GPS trans receiver to know the present area of vehicle.

Murtadak T.A. el.at [4] Designed about “RFID based vehicle identification during collision”. It is helpful to be used track down rash drivers in hit and run cases. It also useful in traffic control. The use of RFID for vehicle identification has already been implemented worldwide. Moreover, at the time of manufacturing of vehicles by insertion of RFID tag and readers it helps in exchanging the information between two vehicles which get in collision. With the help of exchanged information police can track the criminals who lead to collision and also hospital, family of injured person get informed through the message and through this treatment served to the injured person as early as possible. When the accident occurs at any time any place between two vehicles. The information of RFID tag exchange between two vehicles. And message containing the location will be send to their relatives & care units.

Vengadesh, K. Sekar, el.at [5] Designed about “Automatic Speed Control Of Vehicle In Restricted Areas Using RF And GSM”. It is a new design to control the speed of the automobiles. In normal driving mode, we can expect other vehicles interfering nearby and possibly blocking or attenuating RF signals. In this aspect, we are going to use GPS location for restricted areas. In this, there are two case: First, the current speed is less than the transmitted speed the vehicle goes normally no action is required. Second, the information from the speed meter is greater than the transmitted speed by the transmitter module the controller waits for few second whether the driver reduce the speed to the below value if the driver does not reduce the speed means it automatically takes the control and reduce the speed according to it. At the same time the information is transmitted to the nearest police station. The information contains the vehicle number and the time. The time denotes that at which time the vehicle crosses that area, then the fine or penalty amount is collected by the nearest tollgate or the check post. After that at the end of the speed limit area there is another transmitter that contains a stop information means the control releases by the controller to driver.

III. HISTORY

The Internet of Things, as a concept, wasn't officially named until 1999. One of the first examples of an Internet of Things is from the early 1980s, and was a Coca Cola machine, located at the Carnegie Mellon University. Local programmers would connect by Internet to the refrigerated appliance, and check to see if there was a drink available, and if it was cold, before making the trip. By the year 2013, the Internet of Things had evolved into to a system using multiple technologies, ranging from the Internet to wireless communication and from micro-electromechanical systems (MEMS) to embedded systems. The traditional fields of automation (including the automation of buildings and homes), wireless sensor networks, GPS, control systems, and others, all support the IoT.

IV. SYSTEM DESIGN

A. Raspberry Pi3 B model:



Fig2: Raspberry pi 3 B Model

The Raspberry Pi 3 Model B is the earliest model of the third-generation Raspberry Pi. It replaced the Raspberry Pi 2 Model B in February 2016. Its features are-

Features:

- Quad Core 1.2GHz Broadcom BCM2837 64bit CPU
- 1GB RAM
- BCM43438 wireless LAN and Bluetooth Low Energy (BLE) on board
- 100 Base Ethernet
- 40-pin extended GPIO
- 4 USB 2 ports
- 4 Pole stereo output and composite video port
- Full size HDMI
- DSI display port for connecting a Raspberry Pi touchscreen display
- Micro SD port for loading your operating system and storing data
- Upgraded switched Micro USB power source up to 2.5A

B. RFID tag:

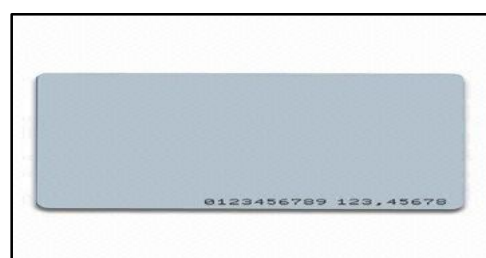


Figure 3: RFID tag

A radio-frequency identification system uses tags, or labels attached to the objects to be identified. Two-way radio transmitter-receivers called interrogators or readers send a signal to the tag and read its response.

RFID tags can be either passive, active or battery-assisted passive. An active tag has an on-board battery and periodically transmits its ID signal. A battery-assisted passive (BAP) has a small battery on board and is activated when in the presence of an RFID reader. A passive tag is cheaper and smaller because it has no battery; instead, the tag uses the radio energy transmitted by the reader. However, to operate a passive tag, it must be illuminated with a power level roughly a thousand times stronger than for signal transmission. That makes a difference in interference and in exposure to radiation.

Tags may either be read-only, having a factory-assigned serial number that is used as a key into a database, or may be read/write, where object-specific data can be written into the tag by the system user. Field programmable tags may be write-once, read-multiple; "blank" tags may be written with an electronic product code by the user.

RFID tags contain at least three parts: an integrated circuit that stores and processes information and that modulates and demodulates radio-frequency (RF) signals; a means of collecting DC power from the incident reader signal; and an antenna for receiving and transmitting the signal. The tag information is stored in a non-volatile memory. The RFID tag includes either fixed or programmable logic for processing the transmission and sensor data, respectively.

An RFID reader transmits an encoded radio signal to interrogate the tag. The RFID tag receives the message and then responds with its identification and other information. This may be only a unique tag serial number, or may be product-related information such as a stock number, lot or batch number, production date, or other specific information. Since tags have individual serial numbers, the RFID system design can discriminate among several tags that might be within the range of the RFID reader and read them simultaneously.

C. RFID Reader:

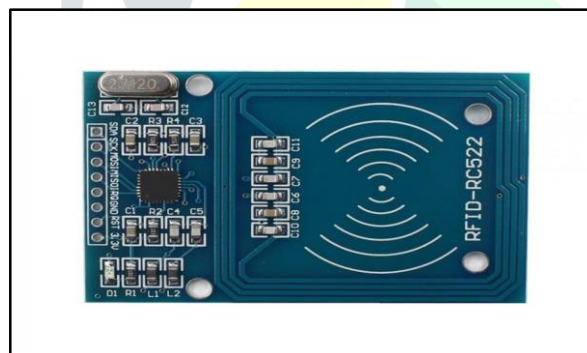


Figure 4: RFID Reader

RFID systems can be classified by the type of tag and reader. A **Passive Reader Active Tag (PRAT)** system has a passive reader which only receives radio signals from active tags (battery operated, transmit only). The reception range of a PRAT system reader can be adjusted from 1–2,000 feet (0–600 m), allowing flexibility in applications such as asset protection and supervision.

1. An **Active Reader Passive Tag (ARPT)** system has an active reader, which transmits interrogator signals and also receives authentication replies from passive tags.
2. . An **Active Reader Active Tag (ARAT)** system uses active tags awoken with an interrogator signal from the active reader. A variation of this system could also use a Battery Assisted Passive (BAP) tag which acts like a passive tag but has a small battery to power the tag's return reporting signal.

3. Fixed readers are set up to create a specific interrogation zone which can be tightly controlled. This allows a highly defined reading area for when tags go in and out of the interrogation zone. Mobile readers may be hand-held or mounted on carts or vehicles.

E. GSM Module (Sim900A):



Figure 7: GSM Module.

GSM is a mobile communication modem; it stands for global system for mobile communication (GSM).

It is widely used mobile communication system in the world. SM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose. For our project GSM module is used to alert consumers via SMS on mobile phone.

F. Piezoelectric Sensor:

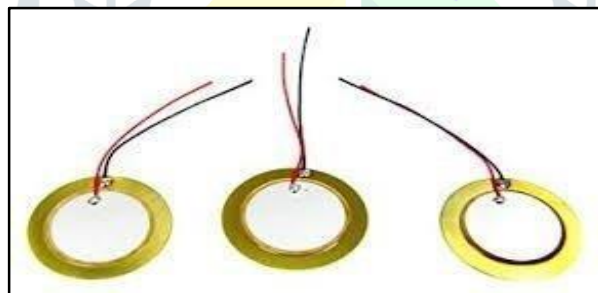


Figure 8: Piezoelectric sensor

A **piezoelectric sensor** is a device that uses the piezoelectric effect, to measure changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge.

G. GPS Receiver:



Figure 9 : GPS Receiver

A **GPS navigation device**, **GPS receiver**, or simply **GPS** is a device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position. Using suitable software, the device may display the position on a map, and it may offer directions. The Global Positioning System (GPS) is a global navigation satellite system (GNSS) made up of a network of a minimum of 24, but currently 30, satellites placed into orbit by the U.S. Department of Defence.

The GPS was originally developed for use by the United States military, but in the 1980s, the United States government allowed the system to be used for civilian purposes. Though the GPS satellite data is free and works anywhere in the world, the GPS device and the associated software must be bought or rented.

H . ADXL345 Accelerometer sensor:

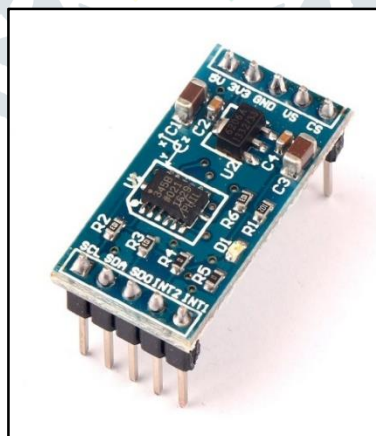


Fig 10. ADXL345 Accelerometer sensor

Accelerometer is a sensor that can measure velocity, detect and measure vibration, and measure acceleration due to gravity. One of its uses is to detect motion, such as feet when people are walking. It is also used to detect hand motion for game consoles, as accelerometer sensors can be attached to a hand and detect the velocity of that hand motion. Distance and direction of a movement can be measured from the velocity detected by an accelerometer. This

measured acceleration is the result of recorded object movement related to changes in mass the accelerometer sensor detects.

I. L293D Microcontroller Driver:

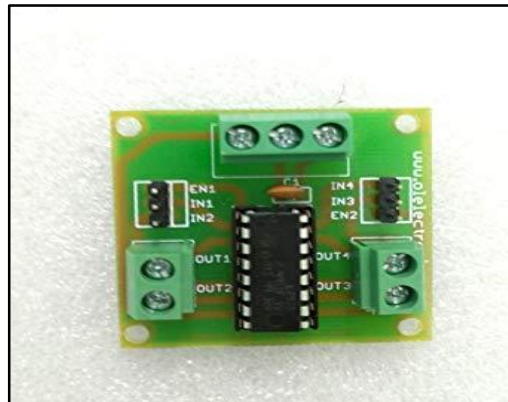


Fig. 11 . L293D Microcontroller Driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC.

V. METHODOLOGY

1. 1. HARDWARE IMPLEMENTATION :

To make the system hardware we gone through below block diagram.

The approach used for system development is that we are using Raspberry pi3 and Arduino is used to read the RFID tag using Reader .and hall sensor is used to Hall effect sensors are used for proximity switching, positioning, speed detection, and current sensing applications.

A **piezoelectric sensor** is a device that uses the piezoelectric effect, to measure changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge.

A **GPS navigation device, GPS receiver**, or simply **GPS** is a device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position.

ADXL345 Accelerometer sensor (sometimes known as **speed control** or **autocruise**, or **tempo mat** in some countries) it helps system automatically controls the speed of a motor vehicle.

2. Software implementation:

Programming is done using Embedded C and micro python. Micro Python is a lean and efficient implementation of the Python3 programming language that includes a small subset of the Python standard library and is optimised to run on microcontrollers and in constrained environments.

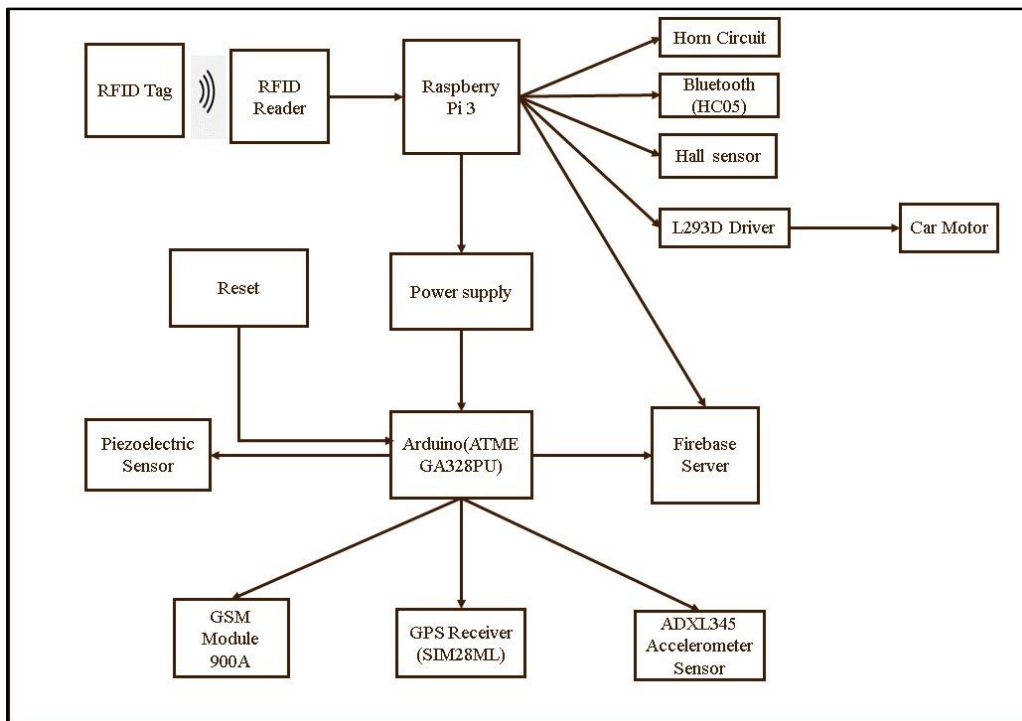


Figure 12 : Block diagram of system

VI. SIMULATION AND RESULT

1. WORKING OF TRAFFIC CONTROL SAFETY AND SECURITY IN VEHICLE:



Figure 13: Working of Safety And Security In Vehicle System

Working:

Initially every vehicle has RFID reader and every Sign board has RFID tag. In these the RFID reader of the vehicle hits the first RFID tag. Due to which the L293D Microcontroller will get activated and it will

bring the speed of car in required speed and also the Microcontroller will send the messages to the horn circuit to reduce the intensity of the horn.

Also, when the vehicle hits the obstacles then the piezoelectric sensor will get activated and the threshold voltage will be sent to the microcontroller . it will send the message through the GSM SIM900A to the Police Station and Hospital and Buzzer will get activated. If no accidents have taken place then user can deactivate the buzzer by clicking the button on the system or through using the application so that the buzzer will get deactivated and message will get aborted as the message should be disabled within 5 minutes.

2. Layout of Android Application:

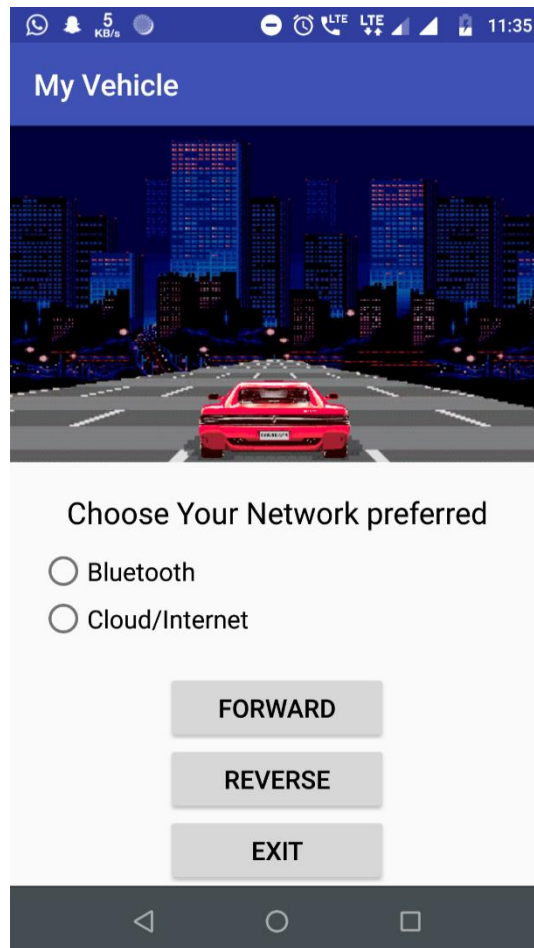
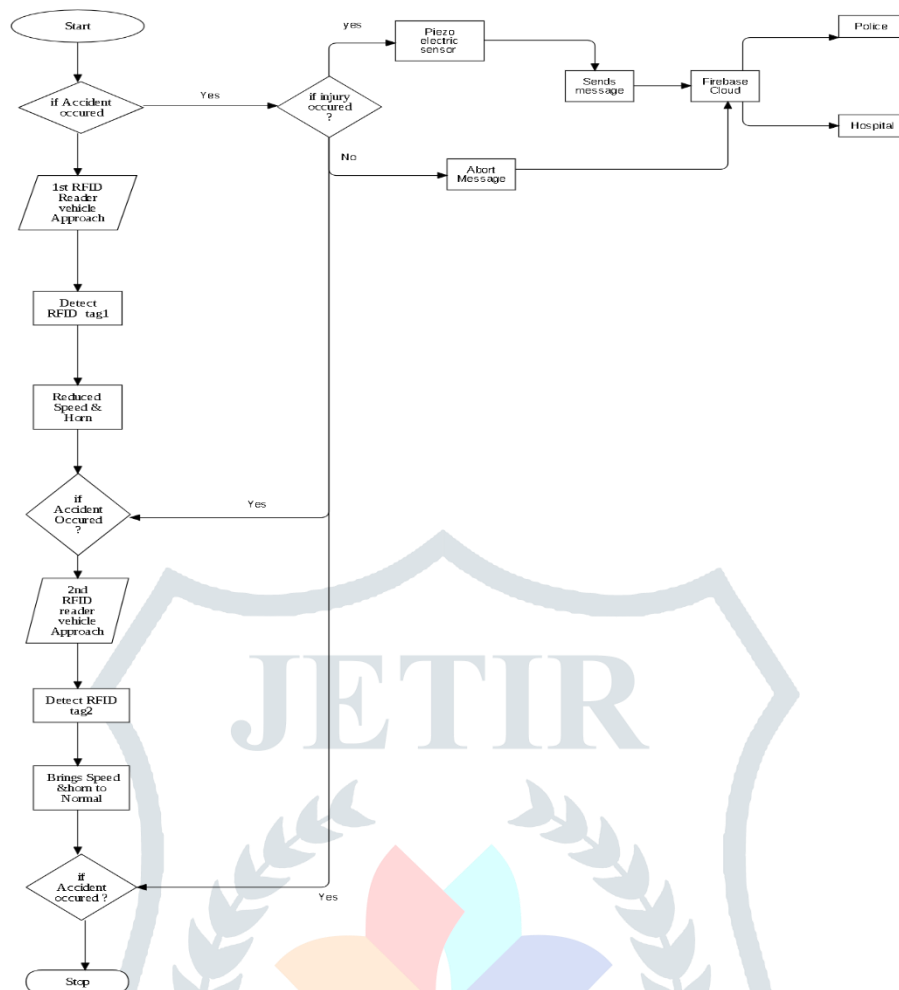


Fig14. Android Application

3.FLOW DIAGRAM:



VII. CONCLUSION:

From this system we will be able to control the speed of car as well as to reduce the intensity of the horn in the car. System will get activated during first RFID tag hitting and after the second RFID tag hitting, the system will get deactivated. Also, it will send the message to the police station and hospital after accident and also it will activate the buzzer in order to give the information of accident occurred to the near surrounding.

ACKNOWLEDGMENTS:

Our Project is- “Advanced Traffic control security and safety in the vehicle using IOT”. First and foremost, we would Firstly like to thank all our **Professor** and our project guide, Professor Ansar Ahmed Shaikh for the valuable guidance and advice. He inspired us greatly to work in this project. His willingness to motivate us contributed tremendously to our project.

We also would like to thank our Project Coordinator Professor Sneha Sankhe for showing us some example that related to the topic of our project. We would like to thank our **Head of Department Prof. Harshal Patil** for giving us time in his busy schedule. We are really grateful to our **Principal Dr. N. K. Rana** that he accepted our project. Besides, we would like to thank H. J. THEEM COLLEGE OF ENGINEERING

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Design and Investigation Of Suspension System Of Ambulance

¹Govinda Sakpal, ²Shabaz Ansari, ³Aniket Kadam, ⁴Murtuza Haidary, ⁵Mohd Raees

¹BE Student, ²BE Student, ³BE Student, ⁴BE Student, ⁵Assistant Professor

¹Department of Automobile,

¹Theem College Of Engineering, Boisar, India

Abstract : Discussion on converting the old suspension system into advance one in ambulance resulted us to design a new suspension system in ambulance to provide maximum comfort ride with better stability to the patient and the passengers. In this paper, we discuss hydro-pneumatic suspension system which helps to provide improved safety in running condition of ambulance vehicles from road bump and various disturbances.

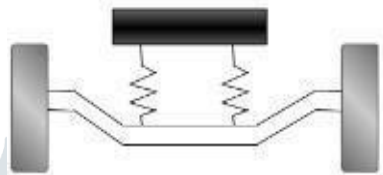
Index Terms - Converted, Suspensions System, Comfort Ride, Hydro-pneumatic, Improved safety.

I. INTRODUCTION

In automobile industry, there are many suspension systems. The main objective of a suspension system is to maintain the stability of a running vehicle when sudden disturbances and irregularities occur and to keep the tires on road all the time without transmitting shock directly to the passengers. Ideally, the suspension should allow the wheels to move up and down according to the road bump. The main element of the suspension system is spring used in different shapes as per the requirement. The spring absorbs road impacts by oscillating and maintains wheel moves vertically and keep tires on road contact related to the body. The spring is resilient member that acts as reservoir of energy. This energy is released subsequently with the action of damper and it is converted into heat to avoid bounce and return to original position slowly.

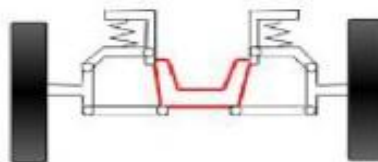
Suspension control is highly difficult control problem due to complicated relationship between its component and parameter [1], modern vehicle suspension system, shock absorber is crucial component in vehicle suspension system which reduces the effect of traveling over rough ground thus achieving good ride quality [2], Suspension system is designed as per the general design procedure that is first need definition as importance of hydro-pneumatic suspension system [3].

II. TYPES OF SUSPENSION SYSTEM



DEPENDENT SUSPENSION SYSTEM:

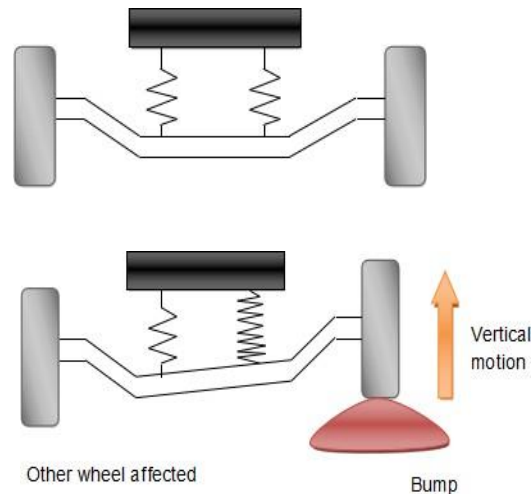
A suspension system, in which both right and left wheels of front and rear pair of wheels are connected with the solid axle, results in such a way that if one wheel of the front or the rear wheels lifts upward then it causes the other wheel to slightly lift. This type of suspension system is used in many old trucks in which the solid axle is used to connect the front and rear pairs of the wheels.



INDEPENDENT SUSPENSION SYSTEM:

A suspension system in which all four wheels of a vehicle are free. It means there is no relative motion between the front and the rear pairs of the wheels and all are connected independently with frame. When wheels either right or left side of the vehicle comes over any bump, the wheel in contact with the bump moves upward without lifting any other wheel.

III. NEED OF SUSPENSION SYSTEM



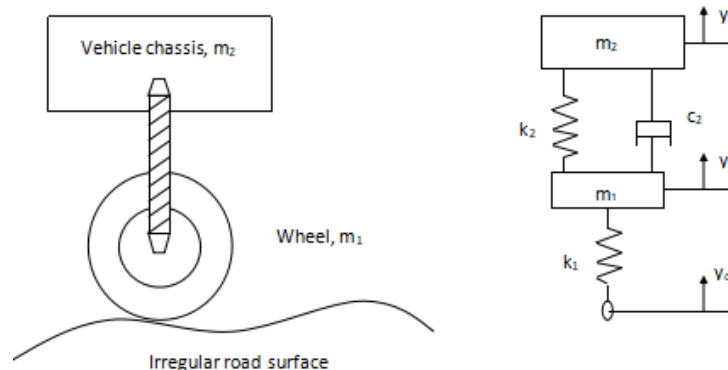
There is a need of flexible connection between the main frame and the wheels of the vehicle in dynamic condition that enables the relative motion between them without causing deformation to the main structure or any other components of the vehicle. To support the overall weight of the main frame that includes weight of all mounted components along with the passenger's weight. To maintain a firm contact between tires and road in turn provides stability to vehicle. When a vehicle is taking a sharp turn, there is a chance of rollover of the vehicle along its lateral axis which should be prevented. The suspension system prevents the vehicle from excess rolling. It provides isolation to vehicle body from vibrations and irregularities of the road surfaces.

IV. COMPONENTS OF THE SUSPENSION SYSTEM

1. **Wheel and Tires:** Tires are not always considered as the part of suspension system but they are arguably the most important component of it. Tires provide traction for acceleration, braking, and cornering, and they absorb small bumps.
2. **Springs:** Spring is a mechanical element which is used to support for the tensile and compressive nature in the system. Spring supports the weight of a vehicle and permits the wheel to move up and down.
3. **Shock Absorbers or Dampers:** Shock absorbers or dampers are used to damping the motion of the spring after bump and keeping the vehicle from bouncing excessively.
4. **Linkages:** Every suspension consists various rods and other connecting pieces that collectively keep wheels where they are supposed to be related to the rest of the vehicle.
5. **Bushings and Bearings:** The most of the parts of suspension system are movable and various linkages are connected by flexible connections. These include bushing and bearings which allow small amount of twisting and sliding.

V. CONVENTIONAL SUSPENSION SYSTEM:

Normally, the conventional suspension system is known as spring, damper suspension system. This arrangement consists of a coil spring connected to hub of wheel with knuckle and damper supporting the springs. The springs take up the load of the vehicle including weight of passengers and luggage. The spring is important if we do not provide spring in suspension system then the axle of vehicle gets hurt and may be get destroyed and also, we cannot control the vehicle properly. The damper on the other side is used to support and guide the spring motion. The dampers control the excess bounce of the spring. The damper has a type of fluid in it which gets compressed with the help of piston arrangement connected with wheel struts. When damper compresses the fluid some heat energy is generated, this energy then dissipated in the atmosphere.



Where:

m_1 = mass of the wheel

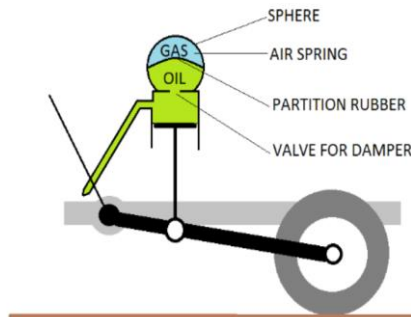
m_2 = mass of the vehicle body

k_1 = stiffness of the tire material

k_2 = stiffness of the springs

c_2 = damping coefficient of the damper

VI. PROPOSED IDEA



We decided to use “Hydro-pneumatic Suspension System” that can compress gas instead of fluid which results to achieve a smooth ride. A typical hydro-pneumatic system consists of system of spheres with pipes to give good ride quality. The sphere can either be mounted on suspension system or as per the space demands. The spheres of hydro-pneumatic system have two parts - the first part is filled with some gas such as Nitrogen and the other part is filled with hydraulic fluid as shown in the figure. The two parts of the sphere is separated with help of rubber diaphragm. Hence, with the help of this design we get a sphere that is half gas and half liquid. The tube has a piston inside which is connected to the suspension strut from where the piston take up the movement. In uncompressed state, both the parts gas and fluid have equal space in the sphere. When the vehicle experiences any bump, hollow or any irregularities from road surface then the piston moves up and as we know the fluids cannot be compressed hence here in our arrangement the gas gets compressed as we can see in the figure.

TYPE OF FLUID USED:

We use oil as hydraulic fluid because we cannot compress the oil. The oil consists of mainly carbon (83-87%), hydrogen (12-14%) and complex hydrocarbon mixture like paraffin, naphthene, aromatic hydrocarbon, gaseous hydrocarbon (from CH₄ to C₄H₁₀). Besides oil, it also contains small amount of non-hydrocarbons (Sulphur compounds, nitrogen compounds, oxygen compounds) and minerals heavier crudes contains higher Sulphur.

TYPE OF GAS USED:

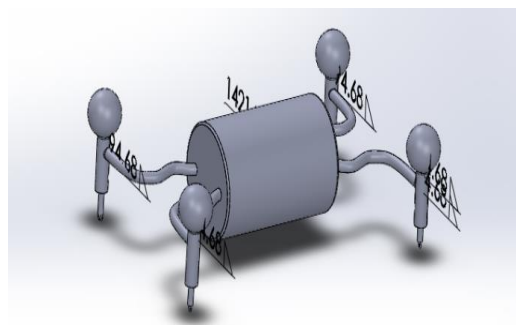
As per the reference of papers, we use nitrogen gas which has nearly negligible effect of temperature on its volume. The Nitrogen gas does not exert an aggressive impact on the accumulator.

DIAPHRAGM MATERIAL:

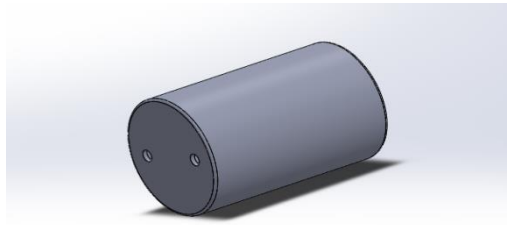
Diaphragm is a type of rubber which cannot exceed or brake by force. The role of diaphragm is a very important in suspension system.

VII. Full Suspension Model

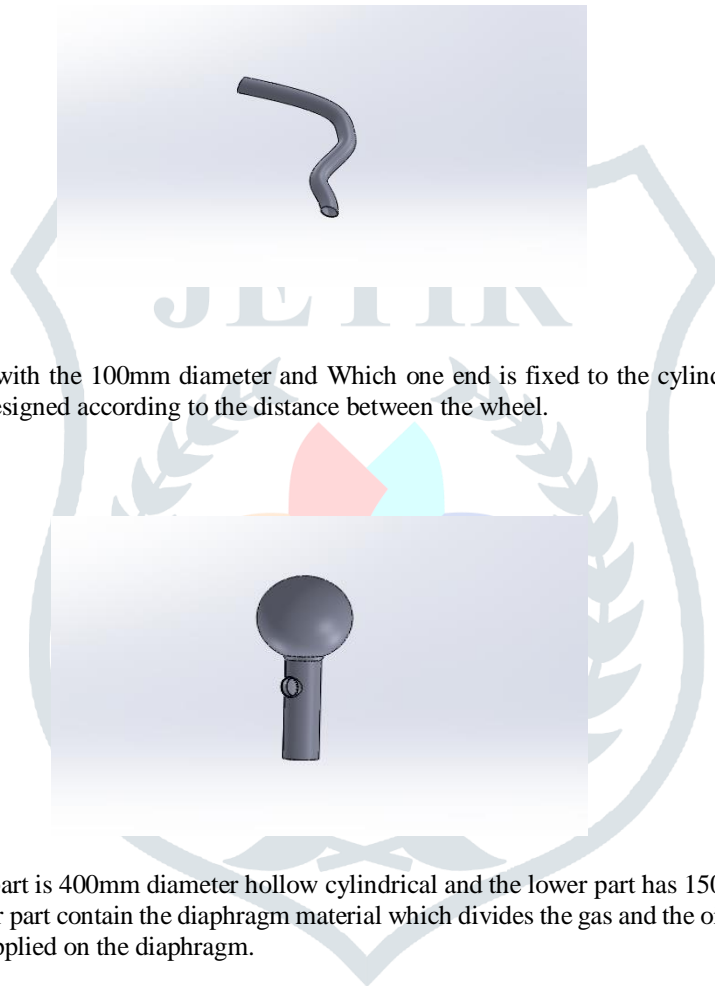
We designed suspension model according to the standard dimension of the force ambulance model.



Component and Dimension of Hydro pneumatic suspension model

Cylinder:

The cylinder we build have length 1500mm and diameter 987.5mm hollow cylinder. The cylinder have two hole on both sides which is required for the pipe. Cylinder is completely filled with the fluid which is oil.

Pipe:

Pipe is hollow cylindrical with the 100mm diameter and Which one end is fixed to the cylinder and other end is fixed to the accumulator. The pipe is designed according to the distance between the wheel.

Accumulator:

Accumulator which upper part is 400mm diameter hollow cylindrical and the lower part has 150mm diameter. Hole is provided to attach the pipe. The upper part contain the diaphragm material which divides the gas and the oil. The stability of the suspension is depend on the pressure applied on the diaphragm.

Piston:

Piston which is adjusted according to the road bump which has 140mm diameter. When road bump is created during the running position of vehicle piston moves upward which force the flow of oil towards diaphragm.

VIII. CAPABILITIES OF HYDRO-PNEUMATIC SUSPENSION SYSTEM

Progressive characteristics of elasticity provides great driving comfort as well as possibility of placing a considerable load on the vehicle. Compressed nitrogen gas, sealed in the sphere using an elastic diaphragm, which provide more driving comfort. Hydro-pneumatic suspension is self levelling which is adjusted according to road surface. It is a low cost for mass production. This suspension gives possibility to increase the road clearance that provides higher cross-country driving capability. Suspension serves the possible safety to passengers of the vehicle. In various cases, there is lower unsprung mass of vehicle. - Suspension serves the possible safety to the passengers in the vehicle. Due to all above capabilities of suspension it perform a very important role in the comfortableness of the ambulance vehicle. Also this suspension model is compact casing of Accumulator and it gives better stability in the minimum cost.

IX. Drawbacks of the Hydro-pneumatic Suspension System

Hydro-pneumatic suspension system required proper maintenance. Repair of the suspension model is costly and damage Of this suspension system may not give better stability.

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DEVELOPING A METHOD FOR PRODUCING HOLE OVER CIRCULAR PROFILE OF DOOR CLOSER HOUSING BODY

¹Mayuresh Mestry, ²Nikhil Mantry, ³Vinay Sawant, ⁴Himesh Kale, ⁵Majid Shaikh

¹B.E.Student, ²B.E.Student, ³B.E.Student, ⁴B.E.Student, ⁵Professor

¹Department of Automobile Engineering,

¹Theem College of Engineering, Boisar, India

Abstract: Since the invention of electric drill in 1889, the drilling mechanism has undergoing tremendous modifications over the past few decades. With the increasing complexity in design of various industrial components, the drilling processes has to be upgraded to meet the new requirements. A simple technique for achieving this without much investment was to develop drill attachments. But for more precise control and close tolerances, a specialized drill jig has to be developed based on the component to be machined. An example of such a complex component is the Hydraulic Door Closer. The holes provided in the door closer housing body needs to be drilled internally and cannot protrude out of the external surface of the housing body. Such a restriction makes it necessary for a specialized tool or jig to serve for this purpose. Thus we have used the door closer housing body and developed a jig that can provide internal holes of minute diameter in the walls of the compact circular bore of the door closer housing body. This improved jig has been designed to provide holes with much more accuracy, closer tolerances and better surface finish to eliminate any further machining done onto the bore to clear the damages caused by the drilling tool currently being used to carry out this operation. The application of this jig is not just restricted to door closer but can be incorporated in various other industrial applications, with a few minor modifications.

Index Terms - Punch, Press, Drilling, Jig, Door closer, Circular profile, Compact space.

I. INTRODUCTION

The consumer's demand for manufactured goods has been increasing rapidly over the years. Thus, to meet this requirement, manufacturers have introduced new and innovative methods of manufacturing high quality products at a faster rate. Since last few decade industries and engineers are focusing on multiple use and compact products. To overcome or fulfill these requirements there is a need of robust design and reliable tools which can perform in such compact space and on different profiles. Different operation or processes like Micro-Drilling, Boring, Welding etc. on a compact profile can only be performed by a skilled worker and require expensive machineries there by increasing machining and production cost. Compact products may have fragile nature and only skilled worker can perform different operation. These modern concepts have necessitated the need for more cheaper and reliable work-holding devices and tools. An example of such a compact product is the Hydraulic Door Closer housing body.

II. DESCRIPTION OF HYDRAULIC DOOR CLOSER

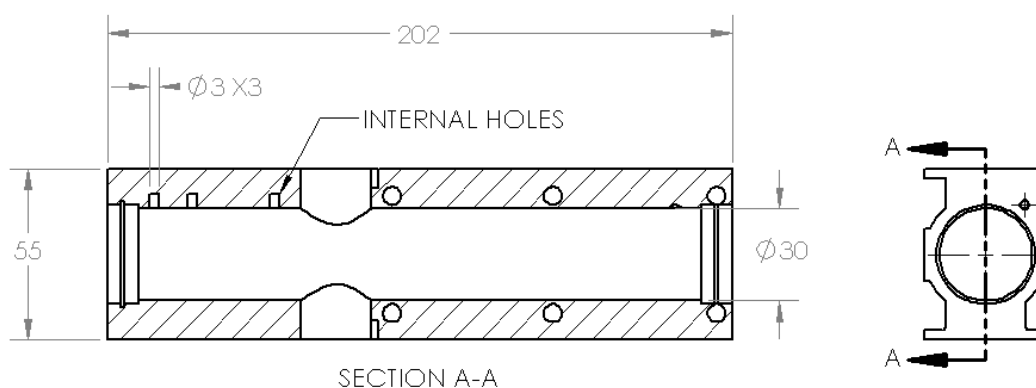


Fig.1 Door Closer Housing Body

The Door closer opted for the Jig development process is the DC-2000 Series Door Closer manufactured by MM Efficient Gadgets LLP, India as shown in Fig 1. The hydraulic door closer is simple and easy to work with. One end of the hydraulic door is attached to the door, and the other end is attached to the door frame. When the door is opened, the hydraulic door closer pulls the door and closes it rather than slamming the door. This happens because the closer has a sealed tube which contains a spring, so that the closer can work properly like how it is supposed to work. It includes a fluid-filled chamber which releases the pressure to close the door in a slow manner rather than banging it. Inside the cylinder is a spring. If the spring was the only thing inside the cylinder you would get a door that slams shut and is annoying. So there is also an oil cylinder. When you open the door, the cylinder fills with oil. When

the door is closing, the spring pushes a piston, which forces the oil out of the cylinder through a small hole. Door closing velocity is adjusted with the help of valves, through which flows the oil.

The housing body of the door closer comprises of 3 holes on the internal cylindrical wall of the bore, the roles of these holes is to transfer the fluid from one chamber to another through the valves while the door closer is in operation. The major obstacles in producing these holes are:

- The diameter of the holes is quite small (3mm).
- The holes should not protrude out from the external surface of the housing body. Thus, the holes cannot be drilled from the external surface of the housing body.
- Presently, no standard drill tool or drill attachment is available that can easily fit through the bore of such small diameter and produce a hole perpendicular to its axis of rotation, without damaging the bore's internal surface.

III. BRIEF DESCRIPTION OF THE JIG AND FIXTURE

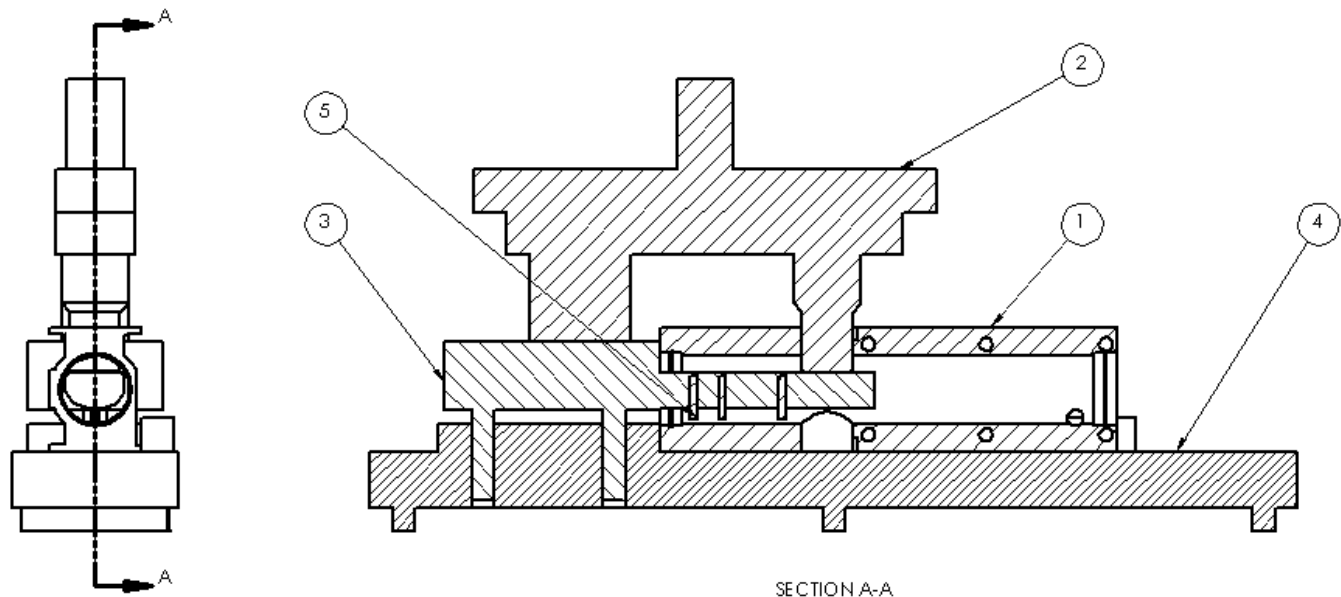


Fig.2 Assembly of Jig with Housing Body

1. Housing Body, 2. Press Plate, 3. Punch Plate, 4. Work Holder, 5. Punch Pin/Bit

A jig is a device in which a component is held and located for a specific operation in such a way that it will guide one or more cutting tools to the same zone of machining. The usual machining operation for jigs are drilling and reaming. Jigs are usually fitted with hardened steel bushings for guiding drills or cutting tools. The most common jigs are drilling jigs, reaming jigs, assembly jigs etc. when these are used they are usually not fastened to machine tools or table but are free to be moved so as to permit the proper registering of the work and the tool. A jig's primary purpose is to provide repeatability, accuracy, and interchangeability in the manufacturing of products. A jig is often confused with a fixture; a fixture holds the work in a fixed location. A device that does both functions (holding the work and guiding a tool) is called a jig. The most ideal method for achieving the required results was to develop an entirely new set-up to produce the holes in such compact space and complexity.

The Jig assembly in Figure 2 is an open type Jig in which machining operation is carried out on only one side of the workpiece. The material of the jig assembly can be changed as per load requirement. The design of the Jig assembly is simple and robust it can resist deflection based on different working loads. Loading and unloading of workpiece from the jig is quite easy as no external clamps are required in the assembly, the work holder and press plate itself acts as a fixture. The three part jig is designed while keeping in mind all the restrictions and can perform the intended task quite effectively. The jig primarily consist of three major components:

3.1 Work Holder

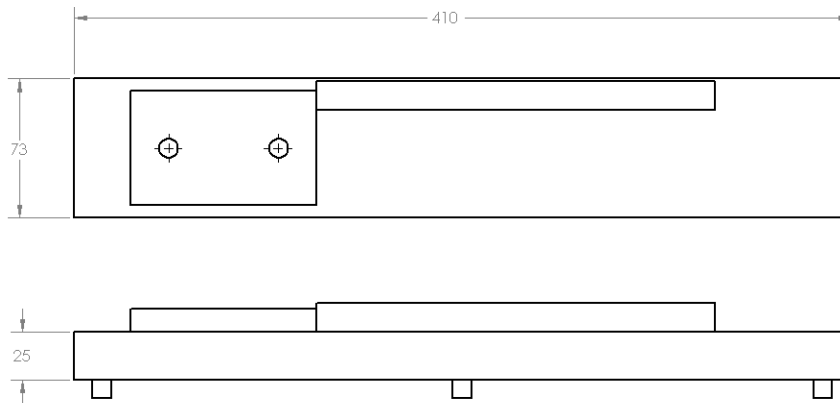


Fig.3 Work Holder

As the name suggests, the function of the work holder is to firmly grip the housing body into position as well as to provide a base support to the entire jig assembly. The function of the work holder is based on the 3-2-1 Principle. Any free body has a total of twelve degrees of freedom;

6 translational degrees of freedom: +X, -X, +Y, -Y, +Z, -Z.

And 6 rotational degrees of freedom:

- Clockwise around X axis (C-X)
- Anticlockwise around X axis (AC-X)
- Clockwise around Y axis (C-Y)
- Anticlockwise around Y axis (AC-Y)
- Clockwise around Z axis (C-Z)
- Anticlockwise around Z axis (AC-Z)

All the 12 degrees of freedom need to be fixed except the three translational degrees of freedom (-X, -Y and -Z) in order to locate the work piece in the fixture. So, 9 degrees of freedom of the work piece need to be fixed. Rest the work piece on the bottom surface (XY), and fixed the +Z, C-X, AC-X, C-Y and AC-Y degrees of freedom. Rest the work piece at the side surface (XZ), and fixed the +Y and AC-Z degrees of freedom. Rest the work piece the adjacent surface (YZ), and fixed the +X and C-Z degrees of freedom. Thus, successfully fixating 9 required degrees of freedom by using the 3-2-1 principle of fixture design.

3.2 Punch Assembly

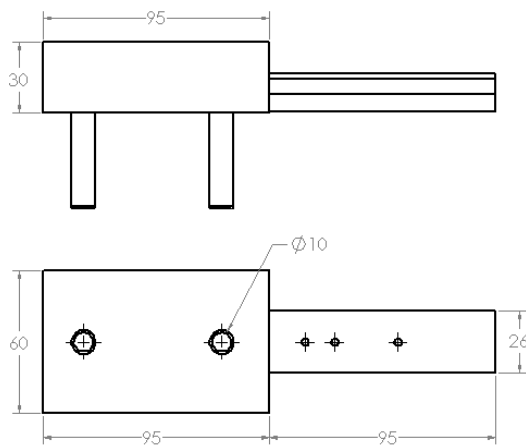


Fig.4 Punch Plate

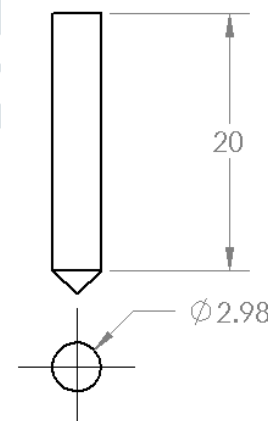


Fig.5 Punch Pin

3.2.1 Punch Plate

The punch plate is designed in such a manner that it firmly fits into the bore of the housing body. It also consists of clamping screws that hold the punch pin into their slots during the operation. The force is exerted by the press machine on the punch plate through the press plate which causes the pins to penetrate into the workpiece i.e. housing body.

3.2.2 Punch Pin

There are three punch pins, one for each hole, held into the plate by the clamping screws. These pins penetrates into the housing body on the application of force by the press.

3.3 Press Plate

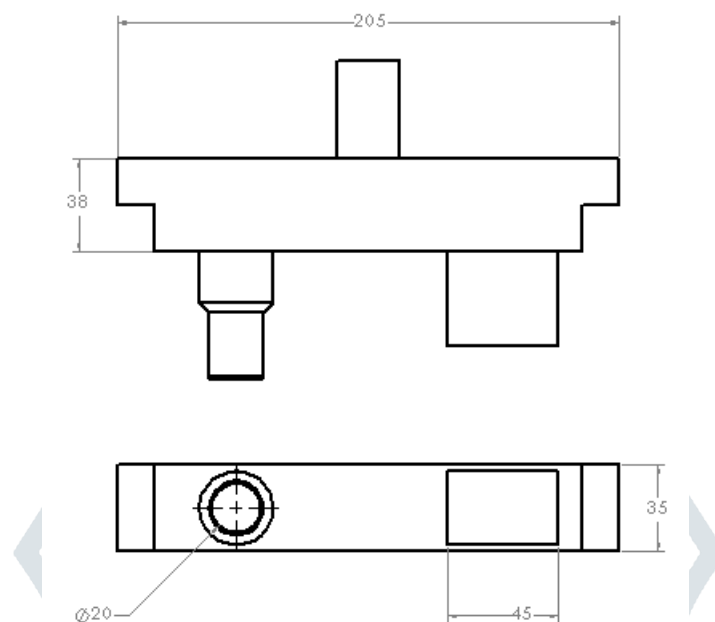


Fig.6 Press Plate

The press plate is located at the top and is in direct contact with the press machine. It is so designed that it transmits the force exerted by the press machine to the punch inside the housing body. The design of the press plate enables it to transfer the force directly onto the punch through the top hole without transmitting any load onto the top surface of the housing body. Thus prevents any deformation or damage to the housing body.

IV. SELECTION OF MATERIALS

There is a wide range of materials available for producing high quality robust tools that can withstand wear and tear. But the objective here is to opt for the material that is cost effective as the operation being performed is not much robust and can be carried out by simpler materials. The materials selected are listed below:

4.1 Aluminium 6063- T6

The housing body of the Hydraulic Door Closer is made up of Aluminium 6063- T6. Aluminium alloy 6063 is a medium strength alloy commonly referred to as an architectural alloy. It is normally used in complex extrusion processes. It has a good surface finish, high corrosion resistance, is easily suited to welding and can be easily anodized. It has good formability.

Table 1. Mechanical properties for aluminium alloy 6063- T6

BS EN 755-2 Tube Up To 25mm Wall Thickness	
Proof Stress	170 MPa
Tensile Strength	215 MPa
Elongation A50 mm	8 %
Hardness Brinell	75 HB
Shear Strength	152 MPa

4.2 EN8 Steel

The EN8 Steel is being used for making the three part jig assembly. All the three major parts of the jig are entirely made up of En8 Steel except the Punch Pins. EN8 steel grade belongs to the standard of BS 970-1955, which is a standard for wrought steel for mechanical and allied engineering purpose.

Table 2. EN8 Medium Carbon Steel Mechanical Properties and Hardness

Heat Treatment	Tensile Strength	Yield Strength	Hardness
	MPa	MPa	HB
Normalized	550	280	152/207
	510	245	146/197
Quenched	625/775	385	179/229
Tempered	700/850	465	201/255

4.3 High Speed Steel

The punch pins/bits used for producing the holes onto the housing body are made out of High Speed Steel. It has high toughness, retains its hardness at high temperatures, and good wear, tear and impact resistance. Also, it is possible to achieve specific properties by balancing the amount of alloying elements.

V. CALCULATIONS

The standard formulae for calculating the punching force required to produce the holes is explained below:

$$\text{Punching force} = \text{Perimeter (mm)} * \text{Thickness (mm)} * \text{Shear Strength (KN/mm}^2\text{)} \quad (1)$$

5.1 Perimeter

Assuming that the face of the punch pin/bit is flat circular instead of conical,

$$\begin{aligned} \text{Perimeter} &= \pi * d \quad (2) \\ &= \pi * 3 \\ &= 9.42 \text{ mm} \end{aligned}$$

5.2 Thickness

It is the thickness that will be piercing through by the punching pin/bit and it is required to be 3mm.

$$\text{Thickness} = 3\text{mm}$$

5.3 Shear Strength

The shear strength of the plate or material to be punched is considered while calculating punching force. Here the component to be punched is housing body which is made up of Aluminum Alloy 6063- T6. Thus,

$$\begin{aligned} \text{Shear Strength} &= 152 \text{ MPa} \\ &= 0.152 \text{ KN/mm}^2 \end{aligned}$$

From Equation (1)

$$\begin{aligned} \text{Punching force} &= 9.42 * 3 * 0.152 \\ &= 4.295 \text{ KN} \end{aligned}$$

The above value of punching force is for single punching pin/bit. Since there are three punch pins/bits used in the design. Thus,

$$\begin{aligned} \text{Punching Force} &= 4.295 * 3 \\ &= 12.886 \text{ KN} \end{aligned}$$

Converting it into tonnage,

$$\text{Punching Force} = 1.31 \text{ tones}$$

However, this force value is an approximate value as we considered the pin/bit as flat circular shaped. The value obtained above is slightly higher than required value.

VI. SUMMARY AND CONCLUSION

The outcomes of the new jig design are:

- Ease to introduce a hole or a punch within a compact profile
- Avoiding wear and tear of both workpiece and tools
- Elimination of complex machines
- Elimination of need of skilled worker
- Environment friendly operation
- Easy adaptive method
- Elimination of human fatigue since operation is safe

From the new design adopted for the jig and the materials opted for various components it can be concluded that by the use of High Speed Steel and EN8 Steel for developing the punch pin/bit and jig assembly respectively, the jig can be developed with minimum effort and minimum cost as these materials are standard and readily available. Also it can be made without compromising with strength and durability of the components. In addition, this will help to achieve our primary goal i.e. to produce these holes in the compact space of housing body bore without damaging the workpiece and eliminating the need for any additional finishing operation. Based on the material selection and calculation, the punching force required for producing the holes is 1.31 tones. This amount of force can be achieved easily by the use of a simple 2 ton Hand Press. This has resulted in the reduction of set up cost as well as manual fatigue. Thus, collectively it can be said that the Jig has simplified the process and reduced the use of power tools in the production process of the Door Closer and improved the productivity.

VII. ACKNOWLEDGMENT

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VOICE CONTROL ROBOTIC ARM AS A PHYSICAL ASSISTANT FOR PARALYZED PERSON

¹Adarsh Singh, ²Omkar Naik, ³Amit Ghadi, ⁴Ahmed Khalil,

¹Student, ²Student, ³Student, ⁴Professor

¹Department of Automobile Engineering,

¹Theem College of Engineering, Boisar, India

Abstract: This project present a system whereby the human voice may use to command the robotic arm for specific need. Individual with motor impairments such as those with quadriplegia, hemiplegia, spinal cord injuries, war time injuries or amputations rely on other to assist them in their daily activities. The affected patients would have a voice controlled robotic arm which would assist them in their daily feeding activities. This will partially fill their some of the basic needs like eating foods, Drinking water, controlling electric switches etc. Patient can play indoor games such as chess, carom, snake & ladder. This arm can be fixed on either wheelchair or on a bed as per individual needs.

Index Terms – Quadriplegia, Hemiplegia, Arduino, Matlab.

1.INTRODUCTION

Robotic Arm is a first invented in 1954 by American inventor **George Devol**, which is used in operation on general motors assembly line at the Inland Fisher Guide Plant. Basically, a robotic arm resembles a human arm, usually programmable with similar functions to a human arm. Robotic Arm are very useful in many industry for pick and place the component. Nowadays, the arm is also used in home appliance for performing the different tasks.

Kinematics has play important role while modeling a robotic arm. Kinematics concern with the robotics motion. Kinematics of robotic arm deals with geometric and time based property of the motion and gives the relation between links, how one link rotate with respect to another link.

This project presents the robotic arm using voice control. The main aim of this robotic arm is to provide a care to disable person. He can fulfill his need by this voice control robotic arm

.Robotic arm has basically five types, they are as follows:

- Cartesian
- Cylindrical
- Spherical
- Articulated
- SCARA

1.1 Cartesian:-These robot are made of three linear joints that position the end effector, which are usually followed by additional revolute joints that orientate the end effector.



Fig.1 Cartesian robot

1.2 Cylindrical:-Cylindrical coordinate robots have two prismatic joints and one revolute joints for positioning parts, plus revolute joint for orientating the part.



Fig.2 Cylindrical robot

1.3 Spherical:- Spherical coordinate robots follow a spherical coordinate system, which has one prismatic and two revolute joints for positioning the part, plus additional revolute joints for orientation.

Spherical Arm Geometry
Polar Coordinates / 2RP Geometry

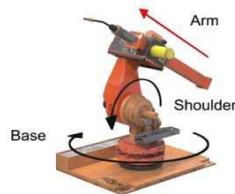


Fig.3 Spherical robot

1.4 Articulated:- An articulated robot's joints are all revolute, similar to a human's arm. They are most common configuration for industrial robots.



Fig.4 Articulated Robot

1.5 SCARA:- SCARA robots have two revolute joints which are parallel and allow the robot to move in horizontal plane, plus an additional prismatic joint that moves vertically. SCARA robot are very common in assembly operations.



Fig.5 SCARA robot

2. PROBLEM DEFINITION

Nowadays most of the person are getting paralyze due to harmful environment, and also at the time of war, so he is not able to move his upper limb/entire body. Hence, a paralyzed person faces difficulty in fulfilling his basic need like eating a food, drinking water, etc. This problem is very much common today for person suffering from upper limb/entire body paralyzed but having his voice control. Thus they has to depend on other to fulfill their basic needs. Thus an artificially voice assistant Robotic Arm can be used to fulfill their some of the basic need like helping in eating food, drinking water, opening and closing doors, switch off on the lights and fans playing games like chess etc.

3. THEORY

In this project, we have used many component for making a robotic arm like Arduino Mega micro-controller, Servo Motor, Vision Sensor, Voice Control module, Ultrasonic distance sensor etc.

3.1 Arduino mega controller (2560)

Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It is used for the controlling the motions of the actuator. It has 54 digital input and output pins. It is a brain of the robotic arm.



Fig.6 Arduino Mega 2560

3.2 Servo Motor

Servo motor is an electrical device which can push or rotate an object with great precision. It works on the servo mechanism. Due to its high torque in small weight make this motor reliable in robotic arm.



Fig. 7 Servo Motor

3.3 Web Cam:

A Web Cam is a video camera that feeds or streams its image in real time to or through a computer to a computer networks. When 'captured' by the computer the video stream will be saved.



Fig. 8 Web cam

3.4 Voice Control Module

Voice control module use voice of user to make it go forward, back, left and right also it can move up and down. By this, height of the arm can be altered.



Fig. 9 Voice control module

3.5 Ultrasonic Distance Sensor

An ultrasonic distance sensor is an instrument that measure the distance to an object using ultrasonic sound waves. It uses transducer to send and receive ultrasonic pulses that relay back information about the object proximity.



Fig. 10 Ultrasonic distance sensor

4.METHODOLOGY

- Forward kinematic
- Inverse kinematic

Forward kinematic: Forward kinematics refers to the use of the kinematic equations of robot to compute the position of the end effector from specified values for the joint parameters. The kinematics equation of robot are use in robotics, computer games, and animation.

Inverse kinematic: Inverse kinematic is the mathematical process of recovering the movements of an object in the real world from some other data, this is useful in robotics and in film animation. It makes the use of kinematic equation to determine the joint parameters that provide a desire position for each of the robot's end effector.

Equation:

$$\theta_1 = \tan^{-1} \left(\frac{P_y}{P_x} \right)$$

$$\theta_{234} = \tan^{-1} \left(\frac{a_z}{C_1 a_x + S_1 a_y} \right)$$

$$C_3 = \frac{(P_x C_1 + P_y S_1 - C_{234} a_4)^2 + (P_z - S_{234} a_4)^2 - a_2^2 - a_3^2}{2 a_2 a_3}$$

$$S_3 = \pm \sqrt{1 - C_3^2}$$

$$\theta_3 = \tan^{-1} \left(\frac{S_3}{C_3} \right)$$

$$\theta_2 = \tan^{-1} \frac{(C_3 a_3 + a_2)(P_z - S_{234} a_4) - S_3 a_3 (p_x C_1 + p_y S_1 - C_{234} a_4)}{(C_3 a_3 + a_2)(p_x C_1 + p_y S_1 - C_{234} a_4) - S_3 a_3 (P_z - S_{234} a_4)}$$

$$\theta_4 = \theta_{234} - \theta_2 - \theta_3$$

$$\theta_5 = \tan^{-1} \frac{C_{234}(C_1a_x + S_1a_y) + C_{234}a_z}{S_1a_x - C_1a_y}$$

$$\theta_6 = \tan^{-1} \frac{-S_{234}(C_1n_x + S_1n_y) + C_{234}n_z}{-S_{234}(C_1o_x + S_1o_y) + C_{234}o_z}$$

5.MODEL

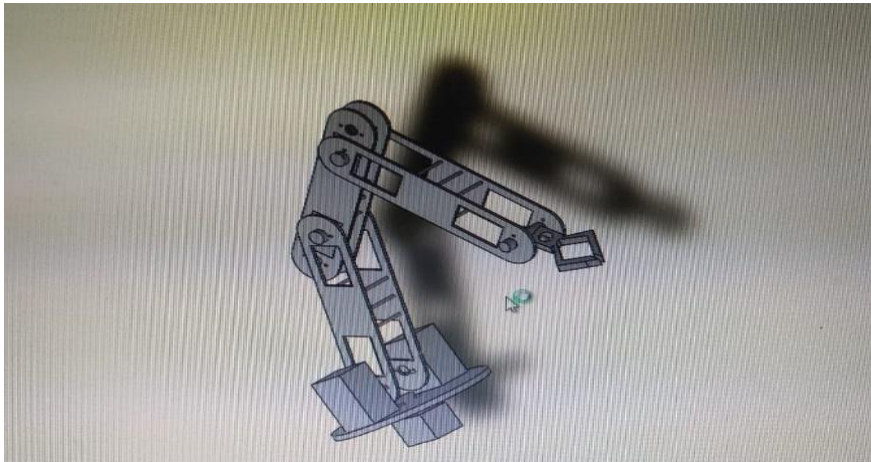
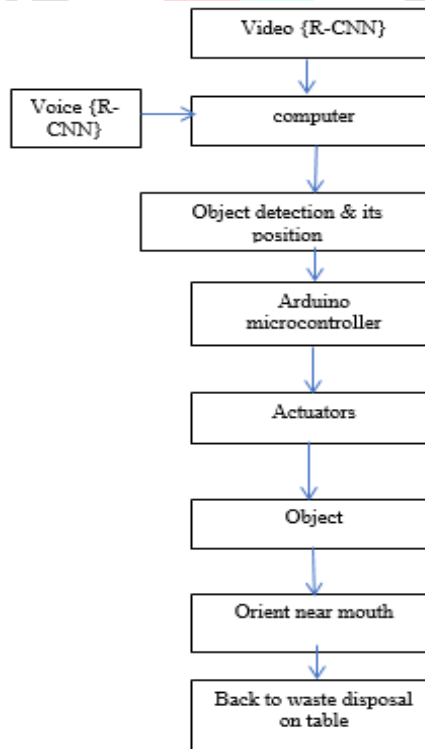
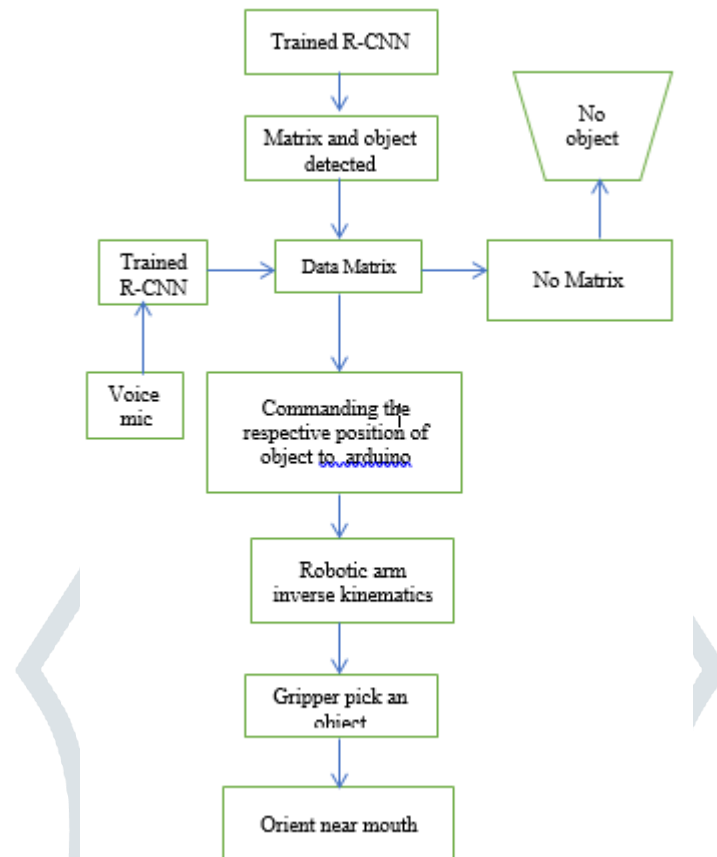


Fig.11 Robotic arm model

6.SYSTEM BLOCK DIAGRAM



7.Object And Its Position Detection flow diagram:

Using camera the object co-ordinate can be determine, the working algorithm and object and it's position detection is shown in flow diagram

8.Software use:

we have used a two software for making model and to give the motion to robotic arm:

8.1.Matlab:

Matlab is high performance language for technical computing. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. It is use for math and computation, algorithm development, modelling, simulation, data analysis, visualization etc.,

8.2. Solidworks :

Solidworks is very productive 3D CAD software tool, with its integrated analytical tools and design automation to help simulated physical behaviour such as kinematics, dynamics, stress, deflection, vibration, temperature or fluid flow to suit all types of design.

9.CONCLUSION:

We have design the robotic arm for paralyze person to fulfil his basic needs by giving voice command. It is very similar to the human arm, and this robotic arm have a 6 D.O.F. The prepared mechanism has been successfully constrained and executed to carry out the required work of picking up and the weight of object like apple, glass etc.

10.FUTURE SCOPE:

Robotic arm has a wide scope of development. In the near future the arms will be able to perform every task as humans and in much better way. Imagination is the limit for its future application. It can be real boon for handicapped people who are paralyze or lost their hands in some accident.

11.ACKNOWLEDGEMENT:

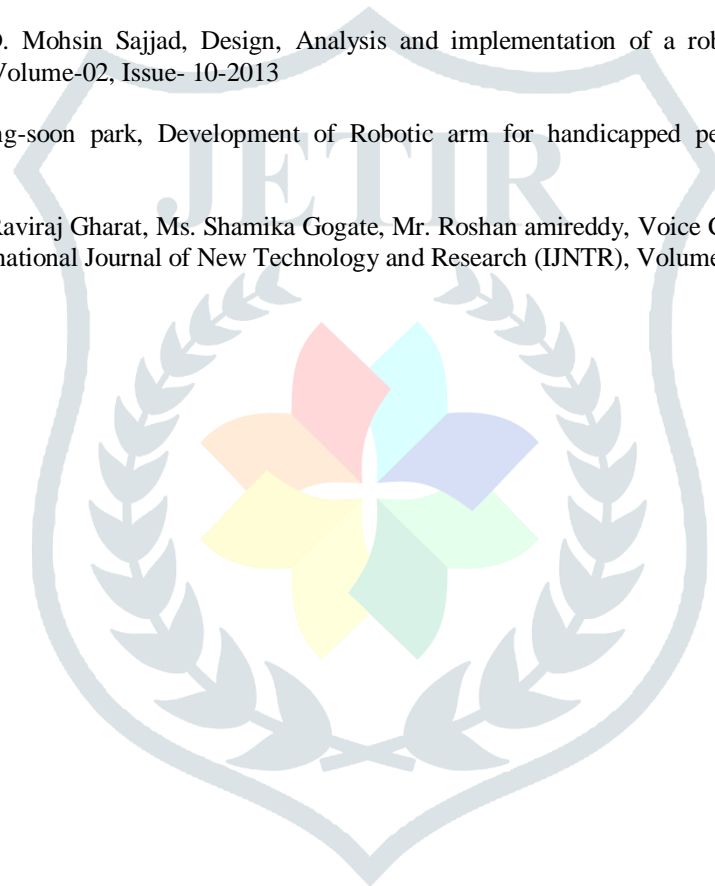
Presentation inspiration and motivation have always played a key role in to success of any venture. I express my sincere thanks to principal DR. N. K. RANA, Theem college of engineering. I pay my deep sense of gratitude to Prof. Wasim Khan (HOD) of automobile engineering department, and prof. Khalil sir to encouraging us to the highest peak and to provide us to opportunity to prepare a project.Last, but not the least, our parents are also an important inspiration for us. So with due regards, I express my gratitude to them.

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Material Selection of Knuckle using Static Analysis Method Under Statically Applied Gross Weight of GO-KART

¹Prathamesh Gawad, ²Subodh Chate, ³Pratik Patil, ⁴Sayed Mubasshir, ⁵Nadeem Ansari

¹ Student, ² Student, ³Student, ⁴ Student, ⁵Professor

¹Department of Automobile Engineering,

¹Theem College OF Engineering, Boisar, India

Abstract : Steering knuckle is one of the most important component of vehicle which is connected to the stub axle and chassis of the vehicle. It continuously undergoes the static and dynamic loading condition. The report explains about the objectives and assumptions made in designing of a GO-Kart knuckle with best suitable material. The design is chosen such that the knuckle is easy to fabricate in every possible way. SolidWorks has been used for the CAD modeling of above said GO-KART knuckle and static analysis is completed in ANSYS workbench by fixing the knuckle and applying normal reaction in upward direction due to gross weight of the kart. This report documents the process and methodology of selecting the strong and suitable material for knuckle out of three available materials we have i.e. Mild Steel, Stainless Steel & Heat treated Steel. One after another three possible cases of all the available materials of knuckle will be analyzed under the statically applied gross weight of the car and finally strong and safe material for the knuckle shall be selected.

Keywords— Knuckle, GO-KART, Stub axle, Mild Steel, Stainless Steel, Heat treated Steel.

I. INTRODUCTION

A. Background

This report contains project work dependent on analyzing and selecting a material for steering knuckle of Go-kart. As we are probably aware, Go-kart is not a commercial vehicle. Therefore, its knuckle does not have constrained dimension and material for it. There are various material in market, but we will be focusing on Mild Steel, Stainless Steel, Heat treated Steel. This issues can be unraveled by analyzing the candidate material. In this project we are selecting a material for knuckle by comparing the result from candidate material.

B. Problem Identification

- The shape, size and material of the knuckle depend upon the weight of the kart due to vertical loading directly act on it and the lateral force from the stub-axel.
- There are various material available in the market which have their own distinct physical as well chemical properties.
- If proper shape, size and material is not selected it may affect the performance of the kart as well as increase the inventory cost.

C. Title Justification and Purpose

As all the load of vehicle whether the load is static or dynamic is transferred from the tire to the axel connected to knuckle and finally on the chassis making the steering knuckle an important part to be analyzed. There are numerous materials available in the market having different properties and use for different purpose. Due to which it really becomes difficult to choose the best material suitable for the knuckle. Wrong selection of material can lead to bad performance of the knuckle and it can fail increasing the maintenance cost and inventory cost.

To fabricate a knuckle which is strong and flexible enough to take the load of the kart with the passenger. As the title implies "Material Selection of Knuckle using Static Analysis Method Under Statically Applied Gross Weight of GO-KART". It becomes optimal to compare knuckle made of different materials. It can be done applying the gross weight of the kart on the knuckle under static condition.

D. Objective

- Material selection out of three available materials i.e. Mild Steel, Stainless Steel, Heat treated Steel.
- To maximize the knuckle performance under loading condition
- To minimize the maintenance cost and inventory cost.

II. THEORY

Go-kart is a simple four-wheeled vehicle which does not have any suspension, differential [1] and power steering. It has two type of engine category, a light engine which may be of 125cc and a heavy engine which can be up to 250cc. The engine used can be a two stroke or a four stroke single cylinder engine. Go-kart which is used for sport is a single seated kart and has a bucket seat and for amusement purpose may have a single or a double seat.

Steering knuckle usually used in Go-kart has C-cross-section and is connected with the chassis of the kart and the other end to the stub-axel as shown in “Fig 1”. The stub-axel is connected to knuckle by the help of king pin. The use of the knuckle is to give support to the stub-axel so that the stub-axel can convert the liner motion from the tie rod into angular motion of the stub-axel [1]. As all the load of vehicle whether the load is static or dynamic is transferred from the tire to the axel connected to knuckle and finally on the chassis making the steering knuckle an important part to be analyzed.

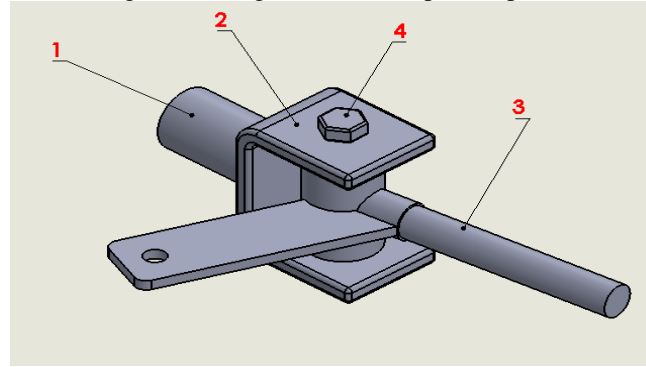


Fig 1: Knuckle Stub-axel assembly

1. Chassis member
2. Steering knuckle
3. Stub-axel
4. King pin

A. Knuckle Material

- Mild Steel
Mild steel is very strong due to the low amount of carbon it contains. In material science, strength is a complicated term. Mild steel has a high resistance to breakage. Mild steel, as opposed to higher carbon steel, is quite malleable, even when cold.
- Stainless Steel
Stainless Steel is a metal alloy, made up of steel mixed with elements such as chromium, nickel, molybdenum, silicon, aluminium and carbon. Iron mixed with carbon to produce steel is the main component of stainless steel.
- Heat treated Steel
Heat treated steel is a type of low, medium to hard plain carbon steel that has undergone heat treatment, quenching and further reheating. Components made of hardened steel have a hard exterior casing and a robust core.

B. Proposed Methodology

The study is divided into three parts. First part will be pre-processing, the knuckle will be designed in Solid Works2014 according to requirement of size of stub-axel and keeping its dimension constant for all the three material which will be tested for. The second part will be processing, by keeping the modal dimension constant one after another material will be selected and appropriate mesh type, element sizing and load will be applied in ANSYS WORKBENCH 19.1. Third part is post processing part, in which result obtain for all the three material will be compared and appropriate material will be selected.

Several methodologies are used to design by certain define process. As discussed in introduction, different material will be used for the given desing. To resolve the problem which are observerd with the help, a new method is proposed to resolve all the discussed problems. The following chart shows the step which are followed. As shown in figure 2.

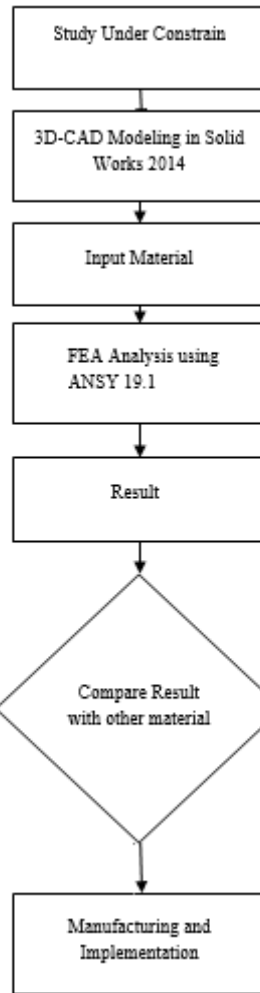


Fig 2:Flow chart

C. Measurement

Table 1

Thickness	8mm
Width	48mm
Height	70mm

Table1: Dimension of knuckle

D. Standard

Table 2

Properties				
Quantity	Value			
Material	Mild steel	Stainless Steel	Heat Treated Steel	Units
Density	7850	7900	7850	Kg/m ³
Ultimate Tensile Strength	460	546	440	MPa
Yield Strength	250	243	329	MPa
Young's Modulus	210	198	210	GPa
Poisson ratio	0.3	0.27	0.29	-

Table 2: Properties of material

III. RESEARCH

A. Modeling

3D-CAD model of knuckle was made in Solid Works 2014. It consists of Stub-axel mounting and chassis mounting. Knuckle design depends upon Stub-axel geometry.

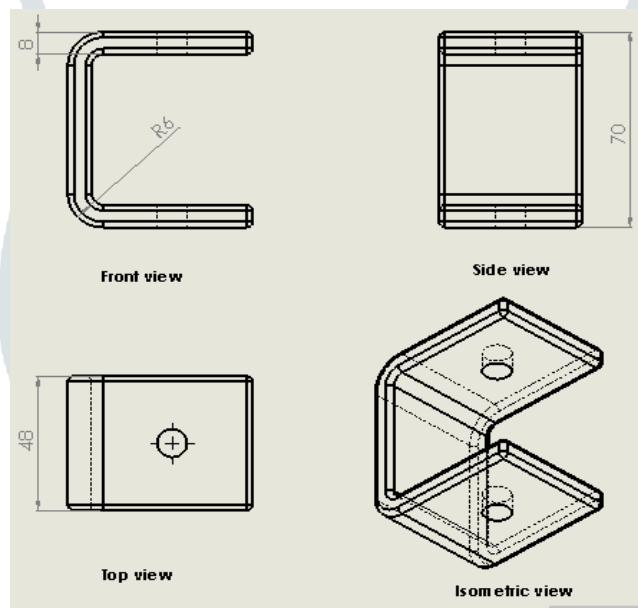


Fig 3: 3D-CAD model of knuckle

B. Calculation

- Static condition

This type of load is acted on the vehicle when the vehicle is not in motion. When the vehicle sits statically on level ground, the load equations simplify considerably. The sine is zero and the cosine is one, and the variables R_{hx} , R_{hz} , a_x , and D_A are zero. Thus. It is given by following equation [6]

$$W_{fs} = W \left(\frac{c}{L} \right) \tag{1}$$

$$W_{rs} = W \left(\frac{b}{L} \right) \tag{2}$$

Where,

W_{fs} = Weight acting on front wheel

W_{rs} = Weight acting on rear wheel

c = Distance from C.G of vehicle to rear wheel

b = Distance from C.G of vehicle to front wheel

L = Wheel base

- Assumption

Wheel base =1040mm [7]

Gross weight of kart=160kg

Weight distribution=43 percent at front and 57 percent at rear wheel of 160 kg

By theoretical calculation C.G location was calculated to be 447.2mm from rear wheel

Weight on front wheel

From equation 1

$$W_{fs} = 160 \left(\frac{447.2}{1040} \right)$$

$$W_{fs} = 68.8 \text{ kg}$$

$$\text{Force} = 68.8 * 9.81$$

$$\text{Force} = 674.928/2$$

$$\text{Force} = 337.464 \text{ N}$$

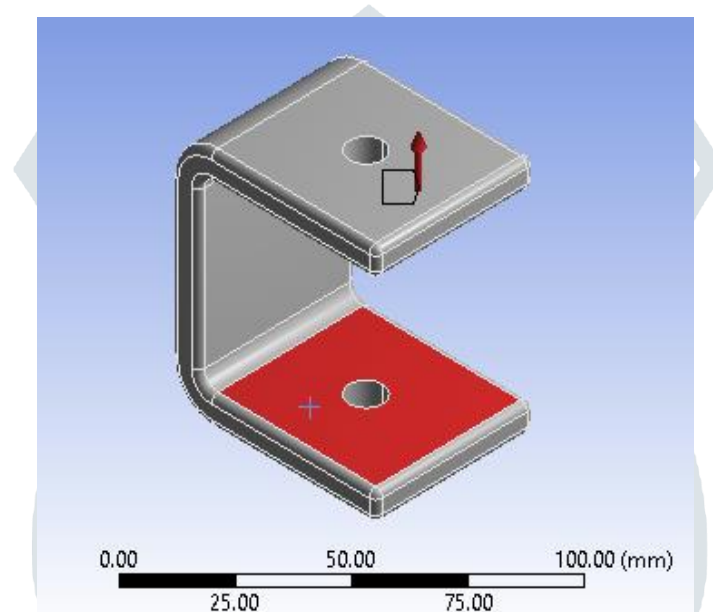


Fig 4: Direction and place where load is acting

C. Mesh Setup and Analysis

Candidate material is selected one after another then the geometry is imported. Knuckle is constrained and load of 337.464 N is applied in positive Y direction after selecting suitable mesh which is hex dominant type and element size. ANSYS WORKBENCH 19.1 is used to analysis the component. Mesh model is shown in “Fig 5”.

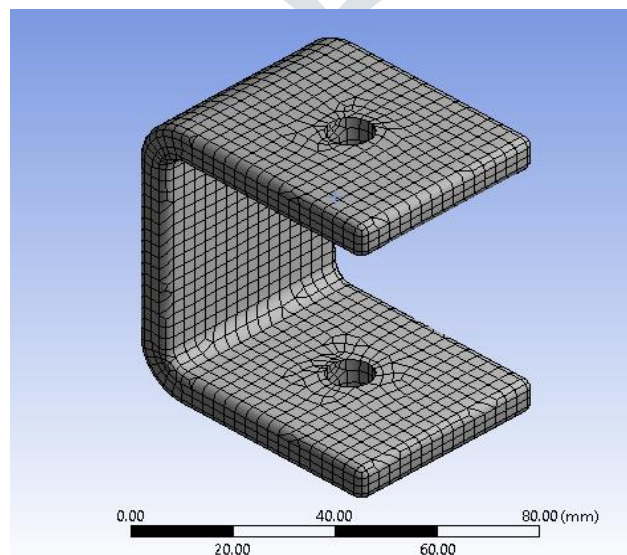


Fig 5: Mesh quality

Table 3

No of Nodes	21991
No of element	5496
Element size	3mm

Table 3: Quality of mesh

The analysis result for different material candidate are shown in figures which are given below.

• Mild Steel

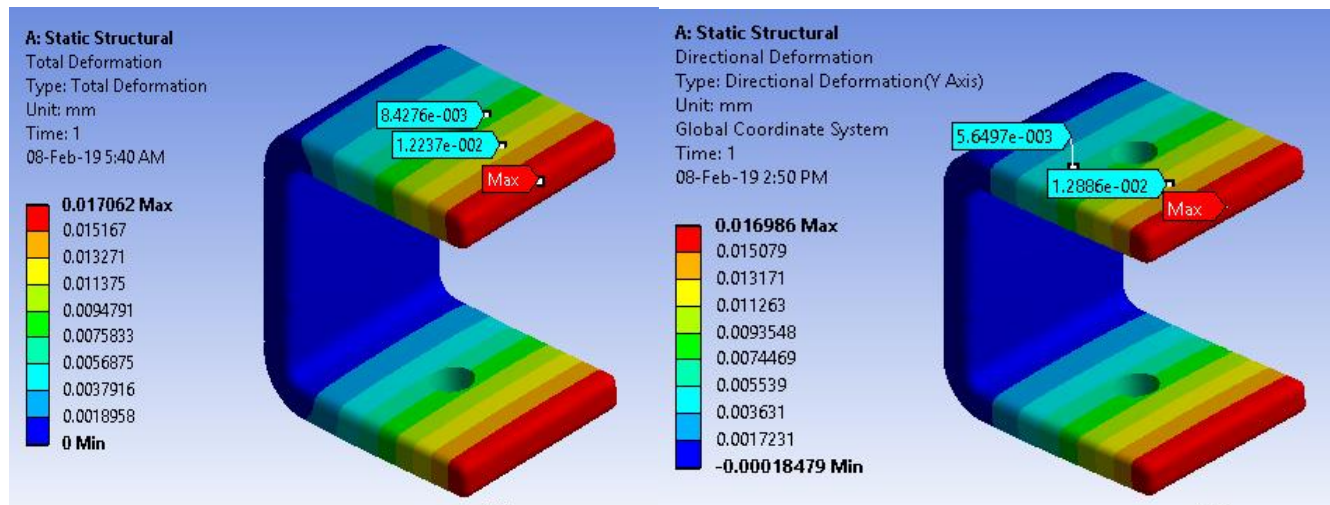


Fig 6: Total deformation

Fig 7: Directional deformation

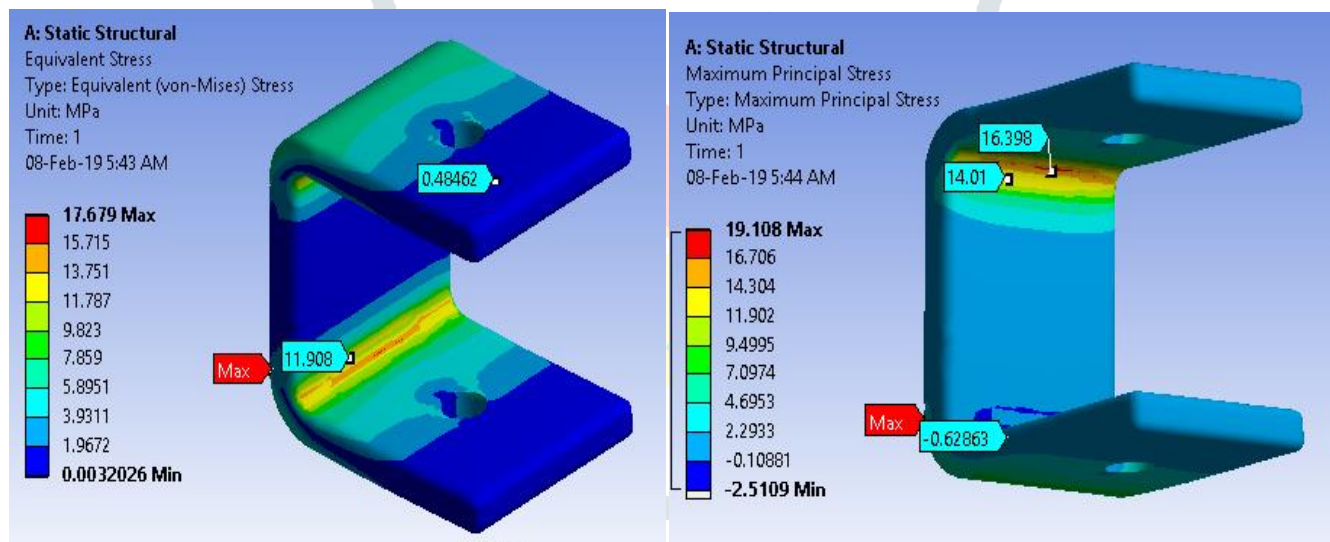


Fig 8: Equivalent (von-Mises) stress

Fig 9: Maximum principal stress

• Stainless Steel

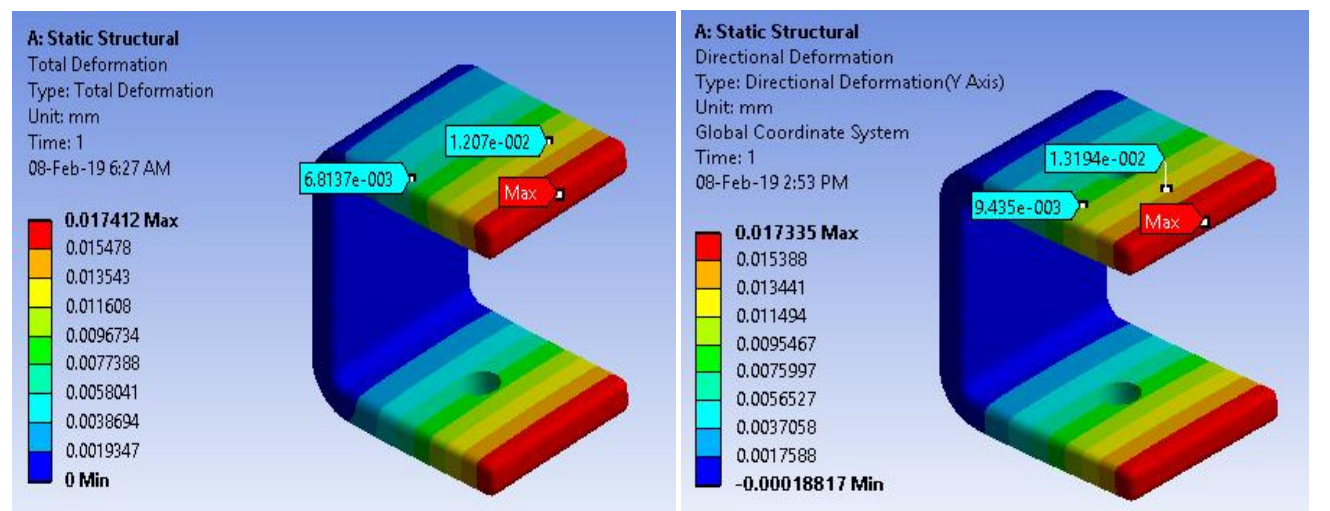


Fig 10: Total deformation

Fig 11: Directional deformation

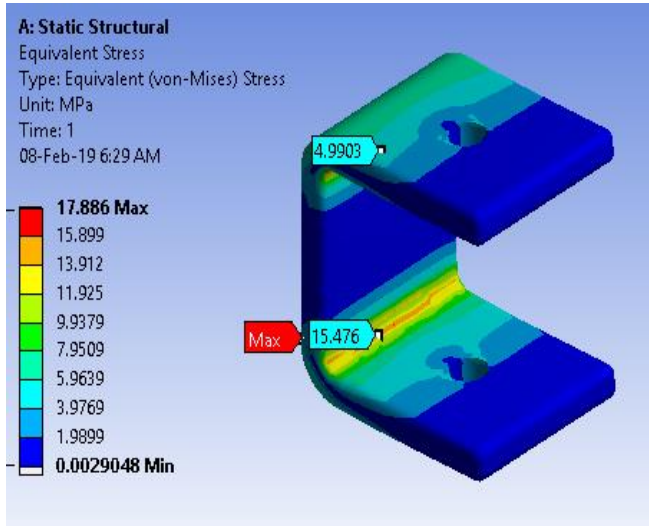


Fig 12: Equivalent (von-mises) stress

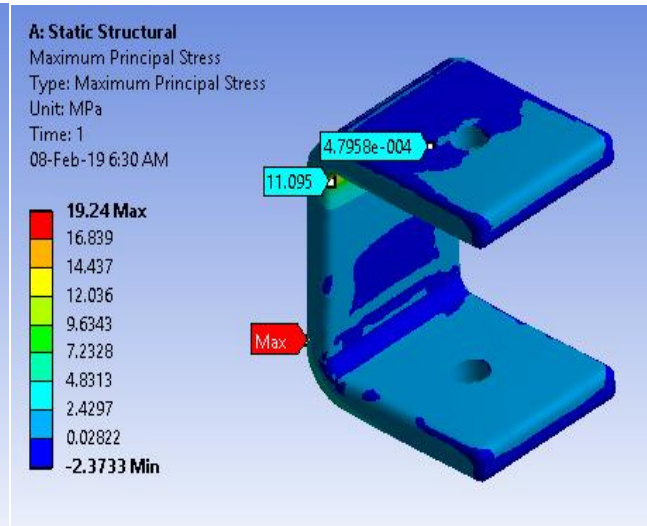


Fig 13: Maximum principal stress

• Heat treated steel

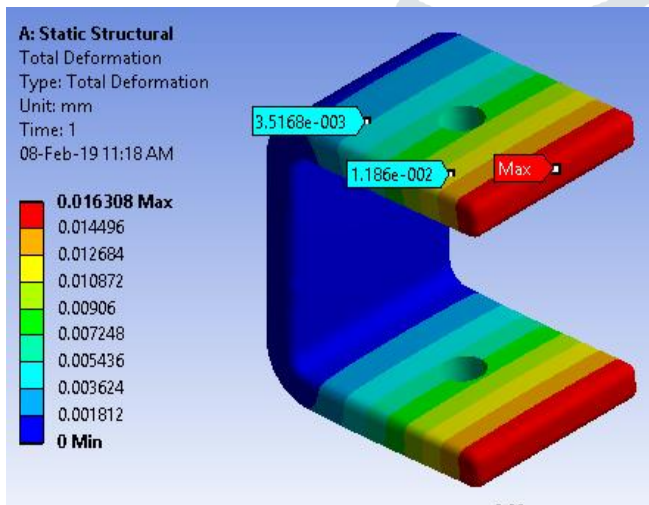


Fig 14: Total deformation

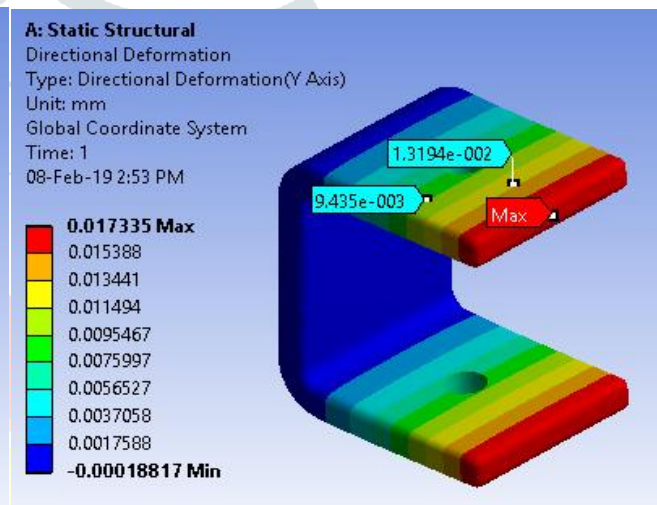


Fig 15: Directional deformation

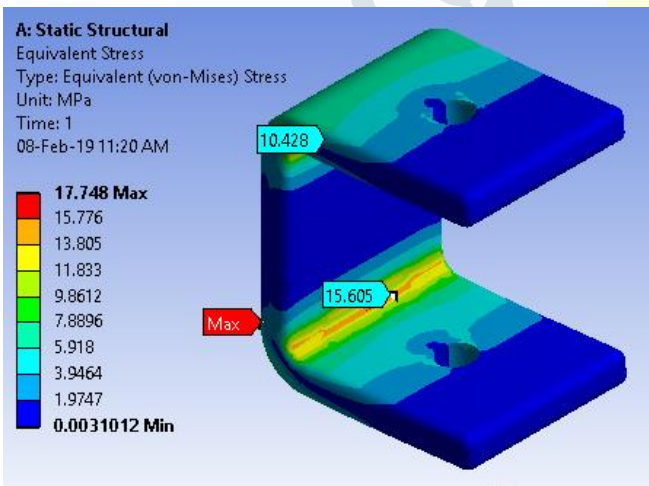


Fig 16: Equivalent (von-mises) stress

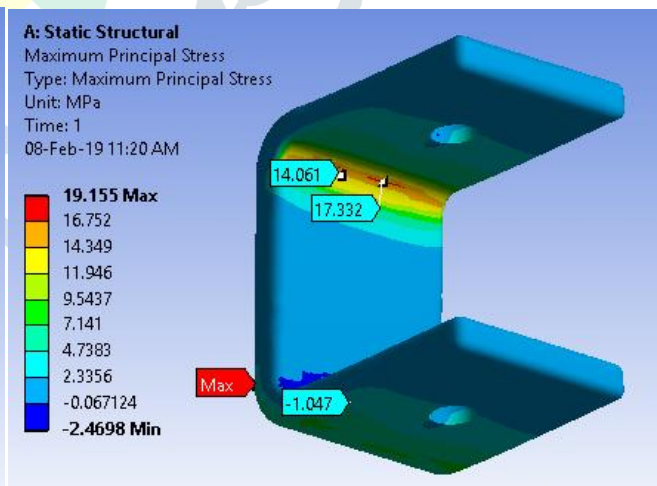


Fig 17: Maximum principal stress

IV.RESULT

A. Observation Table

Material	Total deformation	Directional deformation	Maximum von-mesis stress	Maximum principle stress
Mild steel	0.017062 mm	0.016986 mm	17.679 MPa	19.108 MPa
Stainless Steel	0.017412 mm	0.017335 mm	17.886 MPa	19.24 MPa
Heat treated Steel	0.016308 mm	0.017335 mm	17.748 MPa	19.155 MPa

Table 4: Result of all the three material

B. Findings and new learning

Steering knuckle model with three candidate material i.e. Mild Steel, Stainless Steel, Heat treated Steel were analyzed. Result are shown in table 4.

All the three material were compared with each other and we found that Mild Steel and Heat treated steel had approximately equal reading under same loading condition.

Thus we decide to go with Mild Steel, as it is easily available, easy to work with and cheap in cost compared to Stainless Steel and Heated treated steel.

V.CONCLUSION

The steering knuckle was modeled using Solid Works2014 and was analyzed in ANSYS WORKBENCH 19.1. By studying under constrain and following the methodology we were successfully able to analysis and compare all the three material taken into consideration i.e. Mild Steel, Stainless Steel and Heat treated steel and select the optimum material for knuckle which is mild steel.

This report also shows the area where Stress concentration is maximum due to static loading condition.

VI.FUTURE SCOPE

- Optimization of knuckle dimension can reduce the weight and material resource and even can improve performance of kart.
- New and better methodology can be developed for the analysis and refinement of mesh can be done.
- Analysis considering dynamic condition can be done to check for failure in dynamic loading condition.

ACKNOWLEDGMENT

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COMPARING THEORETICAL CALCULATION AND FE ANALYSIS OF RIGID FLANGE COUPLING

¹Prof. Pramod Ramprakash Maurya, ²Anand Santosh Dongare, ³Narshingsatyam Ajay Sharma,

⁴Pawan Dinanath Yadav, ⁵Vaibhav Laxmikant Sharma

¹Assistant professor, ²Student, ³Student, ⁴Student, ⁵Student

¹Department of Mechanical Engineering,

¹Theem College of Engineering, Boisar, India

Abstract : The purpose of this paper is to compare the result obtained from theoretical calculation and FE analysis of rigid flange coupling. The coupling is used in chemical industry where it is installed in screw conveyer having high torque and slow speed. The material from which coupling is manufacture is EN8 as it has better properties than most of the material from which coupling is manufactured like mild steel, cast iron. The theoretical calculation is done using input data parameters and used to prepare CAD (Computer Aided Design) model using SolidWorks15. Finite element analysis is done using sophisticated FE analysis software workbench 18.1. The result obtained from both the theoretical calculation and finite element analysis is compared to check design is safe against shear failure or not.

Keywords – EN8, Ansys 18.1, Rigid Flange Coupling, Solidworks FEM Analysis.

I. INTRODUCTION

Coupling is device used to transmit motion, particularly rotary motion from one shaft to other. The coupling is fixed at each end of the shaft and mate together by means of nut and bolt. The coupling are strong and made such that they won't disconnect from each other but some time torque limiting coupling are used in industries in which can slip occur when a particular limit of torque is exceeded. The primary function of this device is to connect rotating equipment with some degree of misalignment. They are used to connect driving and driven part and helps in reducing shock loads from one shaft to another. Rigid flange coupling is used were high torque is required at low speed, heavy transmissions of load can be transfer.

Shaft coupling are of two type:-

- A. *Rigid type* = in this type of coupling two shafts are perfectly align to each other and it does not permit any misalignment between shaft axis. Following are some types of rigid coupling
 - Flange coupling
 - Sleeve or muff coupling
 - Split muff coupling
- B. *Flexible type* = in this type of coupling two shafts are not perfectly align to each other and it permits certain degree of misalignment between shaft axis. Following are some types of flexible coupling
 - Oldham coupling
 - Bushed pin type coupling
 - Universal coupling

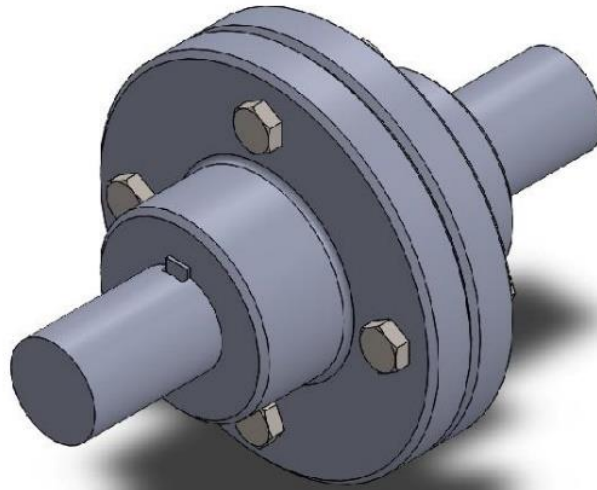


Fig. 1. SolidWorks model of rigid flange coupling

Rigid flange coupling is used where high torque is required at low speed, heavy transmissions of load can be transfer.

II. OBJECTIVES

- A. Analytical calculation of rigid flange coupling.
- B. Design of CAD model using SolidWorks.
- C. Analysis of rigid flange coupling using Ansys workbench 18.1.

III. LITERATURE REVIEW

- A. *Chandra Sekhar Katta, Kamana Srinivasa Rao* – in this paper Chandra sekhar kata shows the structure analysis of rigid flange coupling subjected to load. In this paper it also shows that composite material is not better than cast iron. The cast iron is used for flange in any load condition is way better than other composite material (aluminum, silicon, carbide). SolidWorks and Ansys workbench is used for modelling and analyzing of rigid flange coupling.
- B. *Praveen Kumar Sonwane, Prof. K.K. Jain, Asst. Prof. Prateek Yadav* – The main topic of this id paper is to compare the result obtain through analysis to theoretical and analytical result for proving that design is safe the structural analysis of coupling and flange has been carried out in this paper. Catia software is used to design flange coupling. Structural steel and grey cast iron is used for shaft, key, bolt and flange material respectively. The value obtained through stress induced in different part is less than theoretical solution. Hence design is in safe mode.
- C. *Chandrakant M Patil* – In this paper external load is applied on flange bolted joint to study its behavior.in this paper the material used the both cast iron and mild steel used for flange and shaft respectively. The allowable shear stress is already given with the diameter of shaft and it is used to design hub, key and bolts circle. Analysis is done using Ansys workbench. As a boundary condition fixed support is used to fix a flange at one end of the shaft and torque is applied at another end of the second shaft. Result is obtained in the post processing phase.

IV. MATERIAL AND METHODOLOGY

Material used is EN8 for flange and shaft for bolt and key C40 material is used.

Table 1. Properties of Material Used

Properties	Material	
	EN8	C40
Density	7800 (kg/m ³)	7850 (kg/m ³)
Young Modulus	1.9E+11 (Pa)	1.9E+11 (Pa)
Poisson Ratio	0.3	0.29
Tensile Yield Strength	465 (MPa)	330 (MPa)
Ultimate Tensile Strength	775 (MPa)	630 (MPa)

- A. Selection of material-EN8 material for flange and shaft, and material C40 for bolts and key.
- B. Analytical design-formulation of rigid flange coupling for finding dimensions and stresses.
- C. Cad model-the model is prepared by using SolidWorks software with the help of analytical design.
- D. Stress analysis and FEA- by using the design and the material from which the parts of rigid flange coupling is design for stress calculation using FEA software.
- E. Comparing analytical design with Ansys model-comparing the stresses of the analytical design with FEA workbench.
- F. Result-the result has taken below by above comparison of stresses between analytical and software.
- G. Conclusion-overall conclusion will be taken from above result.

V. CALCULATION

Design parameters:-

1. Power (P) = 3.1125 kW
2. Speed of input shaft (N) = 36 rpm
3. Diameter of shaft (d) =50mm
4. Allowable Shear Stress for key and bolt
 $\tau_{as} = \tau_{ys} / \text{FOS} = 0.5\sigma_{yt} / \text{FOS}$
 $= 0.5 \times 330 / 3$
 $= 55.0 \text{ MPa}$
5. Allowable Shear Stress for flange and shaft
 $\tau_{ac} = \tau_{uc} / \text{FOS} = 0.5\sigma_{ut} / \text{FOS}$
 $= 0.5 \times 465 / 3$
 $= 77.5 \text{ MPa}$

Torque,

$$T_{max} = \frac{P * 60}{2\pi N}$$

$$= 825.616 * 10^3 \text{ N-mm}$$

1) Design of shaft

Shear stress of shaft

$$\tau_{max} = \frac{16T_{max}}{\pi d^3}$$

=33.6386 N/mm² (shear stress induced in shaft)

Since, the shear stress induced in the shaft is less than 77.5 MPa therefore the design is safe against shear failure.

2) Design of key

Width of the key (w) =12.5mm

Height of the key (h) =8.5mm

Length of the key (L) =77mm

Shear stress of key,

$$\tau_{max} = \frac{2T_{max}}{dwl}$$

=35.226 N/mm² (shear stress induced in key)

Since, the shear stress induced in the key is less than 55 MPa therefore the design is safe against shear failure.

3) Design of hub

Length of hub (l) =75mm

Outer diameter of shaft (D) =100mm

Shear stress induced in hub,

$$\tau_{max} = \frac{16T_{max}}{\pi D^3(1-K^4)}$$

=4.4851 N/mm² (shear stress induced in hub)

Since, the shear stress induced in the hub is less than 77.5 MPa therefore the design is safe against shear failure.

Where..... (K=d/D)

4) Design of flange

Thickness of flange (t) =0.5d=0.25mm

Diameter of bolt circle (D₁) =3d=150mmOuter diameter of flange (D₂) =4d=200mm

Shear stress induced in flange,

$$\tau_{max} = \frac{2T_{max}}{\pi D^2 t}$$

=2.1024N/mm² (shear stress induced in flange)

Since, the shear stress induced in the flange is less than 77.5 MPa therefore the design is safe against shear failure.

5) Design of bolt

Number of bolts (N) =4

Take, Bolt diameter (d_b) =12mm

Shear stress induced in bolt,

$$\tau_{max} = \frac{8T_{max}}{\pi N D_1 (d_b^2)}$$

=24.333N/mm² (shear stress induced in bolt)

Since, the shear stress induced in the bolt is less than 55 MPa therefore the design is safe against shear failure.

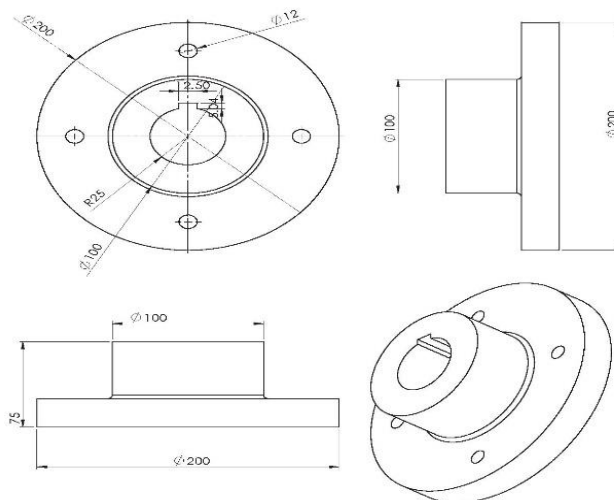


Fig. 2. Dimensions of rigid flange coupling

VI. ANALYSIS OF COUPLING

Ansys workbench18.1 software is used for analysis of complete model.

Below fig 3 which contain following information about meshing are as follows:-

Table 2. No. Of Nodes, Elements Relevance Center Element Size

Nodes	75916
Elements	40858
Relevance Center	Fine
Element Size	Default

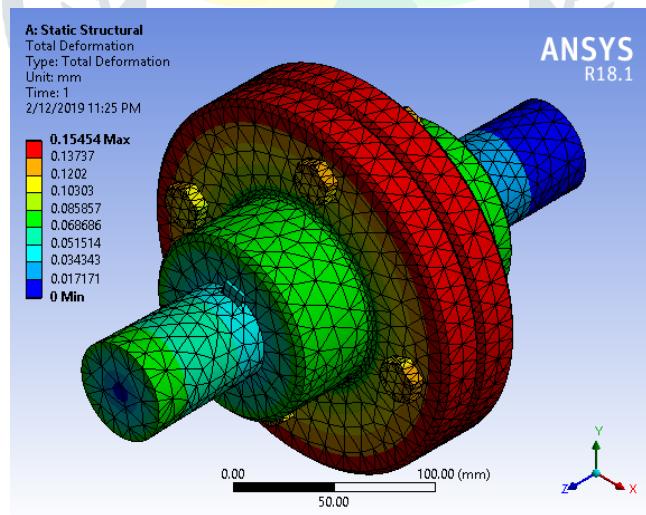


Fig. 3. Total Deformation

Maximum deformation obtain is about 0.15454 mm.

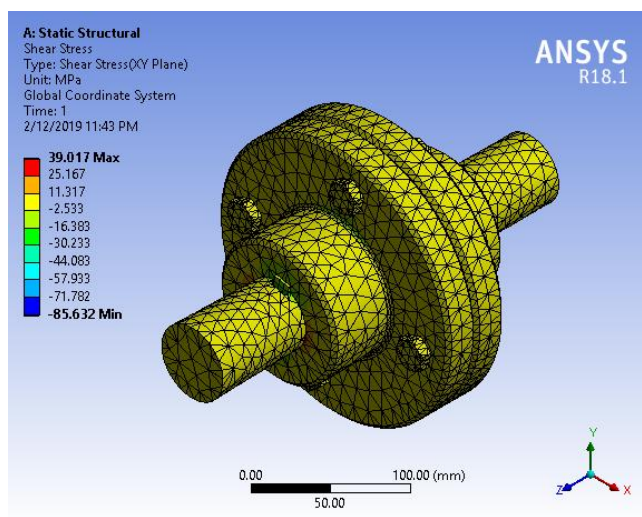


Fig. 4. Shear Stress in Rigid Flange Coupling

Maximum shear stress obtained is 39.017 N/mm².

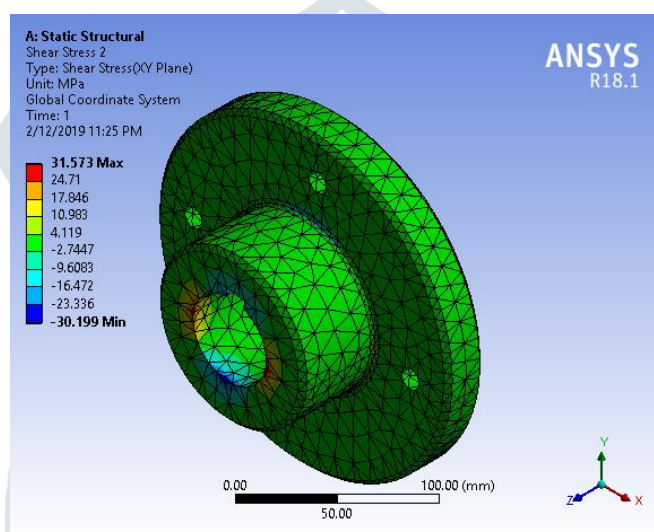


Fig. 5. Shear Stress in Flange

Maximum shear stress obtained is 31.573 N/mm².

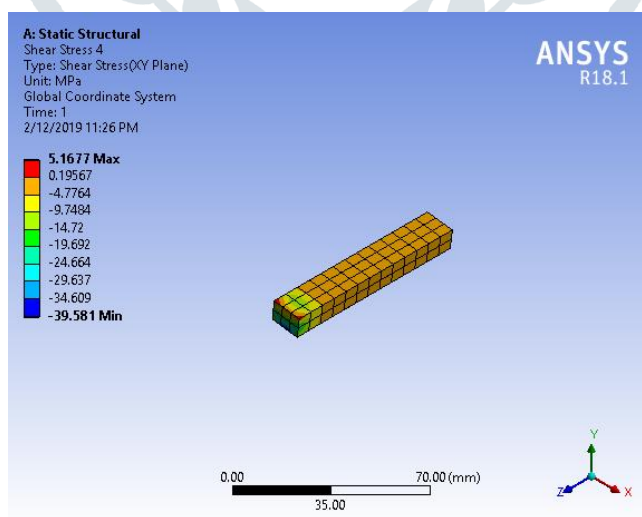


Fig. 6. Shear Stress in Key

Maximum shear stress obtained is 5.1677 N/mm².

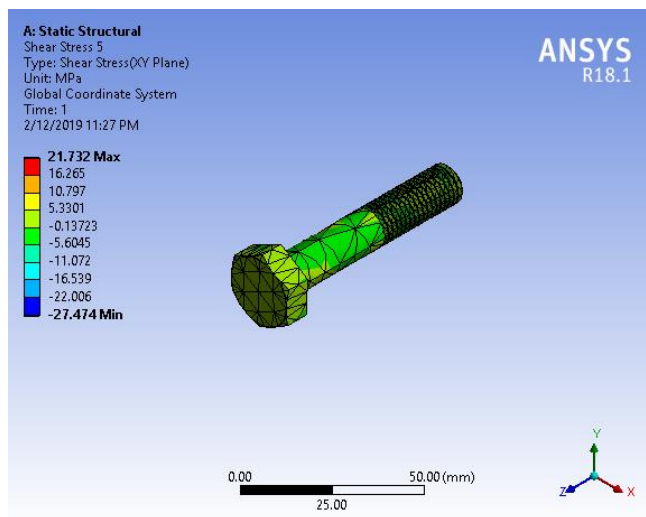


Fig. 7. Shear Stress in Bolt

Maximum shear stress obtained is 21.732 N/mm².

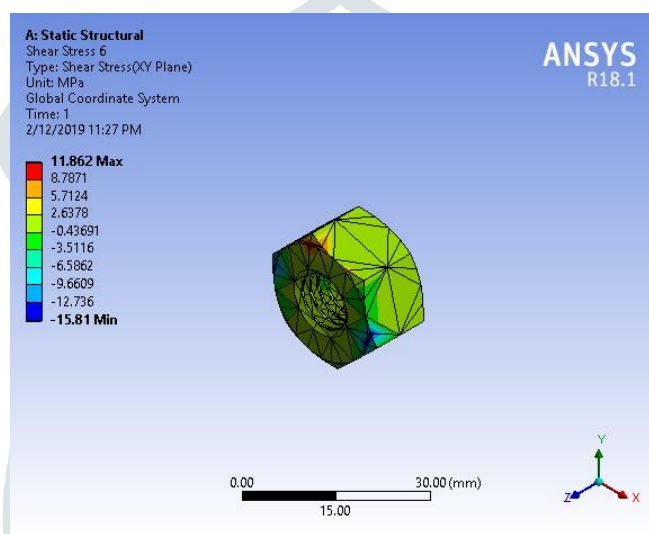


Fig. 8. Shear Stress in Nut

Maximum shear stress obtained is 11.862 N/mm².

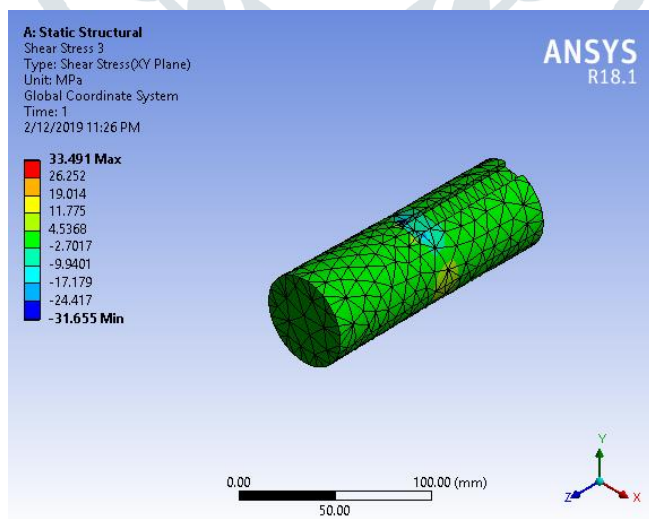


Fig. 9. Shear Stress in Shaft

Maximum shear stress obtained is 33.491 N/mm².

VII. RESULT

Table 3. Result

Component	Theoretical result (Shear stress)	FEA Analytical result (Shear stress)
Flange	77.50N/mm ²	31.573 N/mm ²
Bolt	55 N/mm ²	21.732 N/mm ²
Shaft	77.50N/mm ²	33.491 N/mm ²
key	55 N/mm ²	5.1677 N/mm ²

VIII. CONCLUSION

Comparison of results between theoretical calculation and solution from finite element analysis for different parts of rigid flange coupling is shown in above table. From above table it is seen that shear stress induced in different parts of rigid flange coupling are within limit so it's safe against failure. The requirement for safe design is that the result of FE analysis for shear stress is should be under theoretical result of shear stress which is considered as safe from shear.

We can also do FE analysis of coupling with same design but from different materials such as mild steel, aluminum, cast iron to compare their result with result obtain from FE analysis of coupling made from material EN8. We can also manufacture the coupling by using design obtained from theoretical calculation and further we can practically perform the lab test to find the stress induced in on coupling.

Above design is safe as the EN8 material helps to increases the life of coupling and also help from shear failure at maximum possible load induces in coupling. Therefore it is safe design.

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Design and Development of Remote Controlled Agriculture Pesticide Sprayer Vehicle

¹Sagar Gaikwad, ²Jignesh Patil, ³Mohsin Patel, ⁴Aditya Devrukhkar, ⁵Md. Sami Malik

¹Student, ²Student, ³Student, ⁴Student, ⁵ Assistant Professor

¹Department of Automobile Engineering,

¹Theem College of Engineering, Boisar, India

Abstract: — Spraying is traditionally done by labor carrying backpack type sprayer which requires more human effort. The farmer who is spraying pesticide is affected by it which is harmful to human health. Also the lumber pain and shoulder disorder due to the weight of the equipment and the pesticide in it. Mechanization for spraying operation is costlier for specialized operations like High Pressure Sprayer, Engine Operated Sprayer. We have designed an Agricultural Pesticide Sprayer Vehicle which does not need fossil fuel for required operation, which is easy to move and sprays the pesticide without the farmer being in direct contact with the pesticide. In this project we have used Wiper Motor which drives the sprayer vehicle. The rotation of the wheel rotates the chain sprocket which is connected to give motion to pesticide drum lever, the lever operates the piston of the drum and hence it sprays the pesticide. The sprayer motion is given by linkage through motor that is powered by battery and it is operated by a remote control.

Index Terms - Wiper Motor, Battery, Pesticide Sprayer, Remote Control.

I. INTRODUCTION

India is an agriculture based country. In India 73% of population indirectly depends on farming. Farmers have been using the same methods for seed sowing, spraying, weeding etc. There is need of improving method of farming. India is facing the problem of low agricultural productivity. This is because of low level farming, insufficient power supply to farms and poor level machinery are the main reason for agricultural productivity of India being low as compared to other countries that have been agricultural rich countries for a very long time. Spraying is an important method in farming. Most common type of sprayer used in India are backpack (hand operated sprayer) its main component are hand operated lever, pesticides tank nozzle. In backpack sprayer hand lever is continuously operated to maintain pressure in pesticide tank. Nozzle converts the water and pesticide mixture in small droplets. This type of sprayer can generate pressures up to 100 pounds per square inch.

II. LITERATURE SURVEY

Nitin Das (Agricultural fertilizers and Pesticides Sprayers) April 2015

The development of an attachment for a motorbike for getting a multi-purpose tool bar was given by Mansukhbhai Jagani. From this development they tried to solve the twin problems of farmers, the paucity of laborers and shortage of bullocks. This motorbike can be used to carry out various farming operations like inter-culturing, sowing, spraying operation and furrow opening. This technology is proved efficient. And the cost is low for small size farm

Siddharth Kshirsagar (Design and Development of Agriculture Sprayer Vehicle) March 2016

The engine operated sprayers produce more consistent sprays; the sprays cover the area more uniformly when operated at constant speed. Results are more uniform coverage than the hand spraying. Motorized sprayers are also capable of higher pressure spray that is required to provide a better coverage. There is many other type of hand operated sprayer that are not widely used throughout the agriculture. Used wide extensively for the productions of specific commodities.

Pavan B. Wayzode (Design and Fabrication of Agricultural Sprayer, Weeder with Cutter) April 2016

Experiments with rotary blades were performed in the early years; Power Specialties Ltd. introduced a gasoline powered rotary mover. One of the experiments in the design of rotary moving equipment was made by C Stacy, a farmer in the Midwest region of the United States. The concept was the use of a toothed circular saw blade mounted horizontally on a vertical shaft, which would be suspended at a height of approximately 2 inches. The movement was across a lawn to cut grass and other lawn vegetation at a uniform height. The power for his experimental mover was an electric motor. The common disadvantage was that the engine runs down easily. The cost of production was high for an average individual to purchase. Rotary movers were not developed until engines were small enough and powerful enough to run the blades at a high speed

III. PROBLEM DEFINATION

Vehicle should be able to work with the help of appropriate controls in order to spray effectively along the path as required to perform the required functions. Based on this factor, the basic mechanical designs of agricultural sprayers vehicle will be designed and implemented for 15 liters of payloads by combining the entire factor that are stated above with goal of achieving a better functionality. Mechanization for spraying operation is costlier for specialized operations such as high pressure sprayer, engine operated sprayer. Skills of labor required depend upon the complexity of the equipment or machinery used. All the pre-

existing methods have concentrated on providing less feasible and uneasy solutions. Now here we require a machine that is cost efficient for the farmers and also machine which would keep the farmer away from the spray so that the harmful pesticide may not enter his body by any means. A machine that does not require any means of fossil fuel will be an ideal solution that we are going to provide.

IV. PROPOSED METHODOLOGY

The vehicle is design to perform the operation namely spraying with the help of remote control. It is used for spraying pesticides. The reserve tank contains pesticides, which is attached to the reciprocating pump. The reciprocating pump is connected to the spraying nozzle through flexible pipe. Following are the component used:

1. Supporting wheels
2. Nozzles.
3. Pump System.
4. Base Frame.
5. Pesticide Storage (Tank).
6. Remote Control system.
7. Flexible Pipe.
8. Connecting Rod.
9. Wiper Motor
10. Battery

1. Supporting wheels:

Supporting wheels are used to give motion to the vehicle and also these wheels have the ability to take the whole weight of the assembly.

2. Nozzles:

The nozzle is a critical part of any sprayer Nozzles performs three functions:

- Regulate flow
- Atomize the mixture into droplets
- Disperse the spray in a desirable pattern

3. Pump System:

The pump system comprises of sprayer mechanism of 15 liter capacity integrated with inbuilt pump and sprayer.

4. Base frame:

The base frame is a steel fabricated structure that holds the entire assembly of the sprayer and supports the weight of whole structure.

5. Pesticide storage Tank:

Pesticide storage tank is used to store the pesticide. It has 15 liter capacity and is lighter in weight.



Fig.1. Pesticide storage tank

6. Remote access:

It is used for performing to and fro motion of sprayer and adjustment of nozzle

7. Flexible pipe:

It can be mounted in any orientation

8. Connecting Rod:

Connecting rod connects sprocket to storage tank



Fig.2. Connecting Rod

9. Wiper Motor:

Wiper motor is used to drive the wheels of the Agriculture pesticide sprayer vehicle.

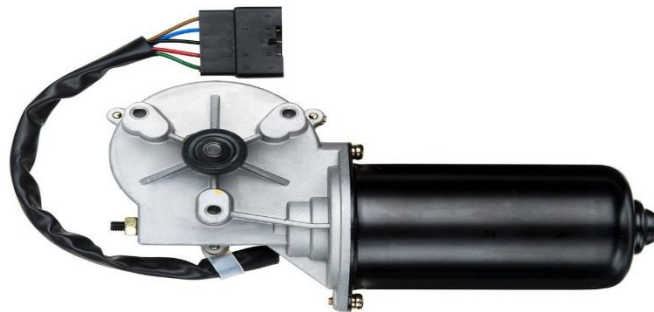


Fig.3. Wiper Motor

V. CALCULATIONS

- Discharge of pesticides through the nozzle = 8.9 ml/stroke
- Discharge in minute = 1.8 lit/min
- Amount of pesticide required = 9.5 lit/acre
- For Swept length

Angle of dispersion from nozzle = 110 degree

So now,

Consider that the plant is at a distance of 1.5 feet that is 0.47 m therefore, the radius required to be covered by the spray will be

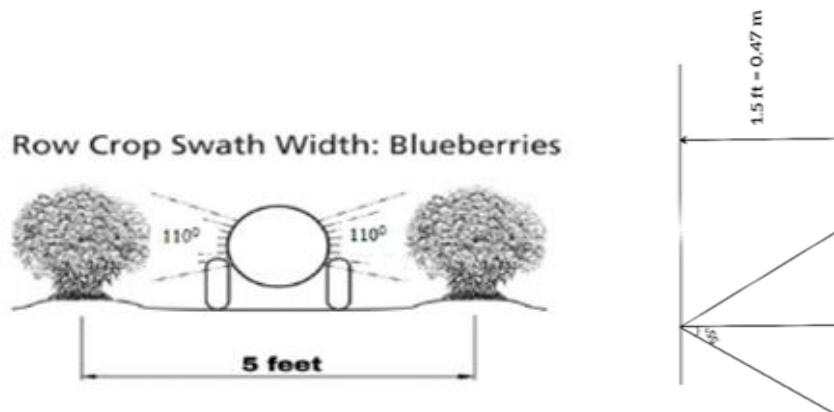


Fig.4. Spraying angle and the distance covered by the spray

$$\tan 55 = r/0.47$$

$$r = 0.47 * \tan 55$$

$$= 0.671$$

$$\text{Diameter} = 0.671 * 2 = 1.34$$

Therefore, 1.34 m would be covered in a stroke of the pump.

VI. RESULT

The machine we are making is a real model of a cost effective machine .This machine would surely reduce the effort of farmer. Also the machine will not have any kind of maintenance. The farmer is saved from the ill effects of the pesticide. Fatigue of the farmer will also be reduced to very low level. A green and eco-friendly environment product is provided for the future. The flexible hose helps the farmer to reach the heightened plants as well.

VII. FUTURE SCOPE

Technology is ever growing and there is always scope for improvement and advancement in every field of work. In future we can accommodate the charging of the battery by use of a solar panel so that the farmer would not need to worry about the charging of battery. By use of more powerful motor this type of instrument can be used for very rough terrains like hilly slopes etc. Further this type of technology can be modified and used for spraying in very narrow areas.

VIII. Acknowledgment

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