Best Practice 1: KNOWLEDGE TRANSFER PROGRAMME (KTP)

Pedagogical Approach of maintaining continuity in project areas is carried over the years in the department of ECE under the banner of **"KNOWLEDGE TRANSFER PROGRAMME (KTP)".** The projects done by a group of students are extended by their juniors by utilizing the existing hardware/ software.

Following are set of projects which were carried out in continuation and the areas and guides are mentioned against them.

AREA:5G WIRELESS COMMUNICATIONS

S.No.	Name of the student	Roll Nos.	Title	Guide
1	KazaPrathyusha, SyedaHumera Fatima	1604-16-735-001, 006	Compressed Sensing Based Channel Estimation in MIMO	Ms. Nazeerunnissa
2	Md. ShajiullahSharief, Mohammed Abdul Haq	1604-16-735-030, 037	Hybrid Precoding in MIMO-OFDM	
3	ShaguftaHafeez, Syed JaberShahnawazHussaini, Mohammed Shahid Ali Khan	1604-16-735-11, 041, 047	Channel Codebook Design for mm-Wave MIMO Systems**(Published in JCR-Scopus indexed journal-2020)**	
4	MajetiSanjana, JahnviPotluri, ShilamkotiVinayswaroop	1604-17-735-003, 014, 301	DEEP LEARNING BASED BEAMFORMINGDESIGN FOR LARGE ANTENNA ARRAY **Presented in (TTCIE Web conference @ MJCET)**	
5	Mohd.Abdul Aziz, Syed Sohaib Ali, Mohammed RehanHussain Khan	1604-17-735-020,026, 053	Deep Learning Based Channel Estimation in Millimeter wave Vehicular Communication **Presented in (TTCIE Web conference @ MJCET)**	
6	Firdous Fathima, Shaik Junaid, Naser Khaled	1604-18-735-004,051,060	Super Resolution Channel Estimation for Millimeter Massive	

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			MIMO with Hybrid Precoding	
7	Mujtabauddin Ahmed, Adeel Mohammed Sultan	1604-18-735-033,059	Dimension Reduced Channel Feedback for Reconfigurable Intelligent Surface Aided Wireless Communication	
8		1604-19-744-003 (M.E)	Deep Learning Coordinated Beamforming for Highly Mobile Millimeter Wave Systems **Presented in (TTCIE Web conference @ MJCET)**	5G Wireless Communications

Channel Codebook Design for mm-Wave MIMO Systems

(Published in JCR-Scopus indexed journal-2020)

Journal of Critical Reviews: DESIGN OF CHANNEL FEED-BACK CODEBOOK AND ADDRESSING POWER LEAKAGE PROBLEM IN MM-WAVE MASSIVE MIMO SYSTEM WITH LENS ANTENNA ARRAYS

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DESIGN OF CHANNEL FEED-BACK CODEBOOK AND ADDRESSING POWER LEAKAGE PROBLEM IN MM- WAVE MASSIVE MIMO SYSTEM WITH LENS ANTENNA ARRAYS

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Abstract

Objective

The modernistic theory of beamspace MIMO, which involves millimeter wave (mm-Wave) and massive MIMO system depending on lens antenna array (LAA) can efficiently decrease the count of power consuming radio frequency (RF) chains. Hence, it is perceived as an optimistic approach for the 5G technology and its successors. Research in beamspace (BmSp) MIMO has yet to be taken into debate the issues of power leakage in channels, therefore resulting in remarkable deterioration in SNR and the sum-rate (SR). A precoding technique for beam aligning and to tackle power leakage issue has been proposed. Initially a network using phase shifters has been designed, which helps RF chains choose beams and collect leaked power in beamspace MIMO. An algorithm based on rotation for precoding, for the available phase shift networks is proposed to align the gains of the channels in the same direction to maximize SNR received by the users. In systems that employ frequency division duplexing (FDD), it is necessary that the channel is fed back to the base station (BS) via feedback based on codebook. There is no devoted codebook for the LAA dependent mm-Wave systems. The codebook design is proposed to address the gap for these systems. In this codebook, initially a large dimension vectors based on recent idea involving angle coherence time are generated. Then relying on obtained vectors in channel subspace, codebook is created by considering lens and beam selection. After that the channel is quantized and given as feedback to the BS.

Results

Simulation results conveys that the overhead in feedback is proportional to dominant paths for each user which are few and the proposed approach with uniform linear array (ULA) attains the near optimal performance in SR comparing to ideal case of zero power leakage and also obtains superior Energy efficiency (EE) than existing single beam precoding and Multiple beam via multiple RF (MBMRF) structure precoding methods.

Key words: beamspace, codebook, millimeter Wave, MIMO, path power leakage, precoding.

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INTRODUCTION

The coalition of mm-Wave communication and massive MIMO is reasoned to be prevailing technique for the forthcoming 5G-NR [1], due to their significant bandwidth potential [2]. The enormous attainable bandwidth not only enhances the throughput of wireless communications, but also increases the fine array gains given by massive MIMO to counterbalance the path loss in signals of mm-Wave frequencies [3, 4]. Precoding is one of the dominant techniques that achieves system throughput gain in mm-Wave massive MIMO technology [5, 6]. The conventional method to implement mm-Wave massive MIMO is to use fully digital precoding, which involves one RF chain dedicated to each transmitting and receiving antenna. This results in large utilization of power as RF chains used at mm-Wave frequency are power hungry and exorbitant [7]. Systems with combination of mm-Wave and massive MIMO have accepted the newly proposed BmSp MIMO theory with the objective to lessen the usage of RF chains [8]. By making a productive use of the capability of LAA to focus energy, the signals approaching from various angles can be directed on distinct points on the antenna array, so as to transform the conventional spatial channel to a BmSp channel. As there is high attenuation in mm-Wave spectrum, the number of dominant paths are restricted in mm-Wave communication systems [9]. Hence, the BmSp channel formed by the lens is sparse due to the less amount of scattering in mm-Wave systems [10]. Path division multiplexing paradigm for single users was proposed [11] to transmit distinct data streams on distinct paths and it was further generalized for the multiple user conditions. In the interest of increasing the spectral efficiency diverse beam selection methods were studied on the basis of various standards in MIMO systems using the BmSp approach [12]. Similar angle of departures (AoDs) were coincidentally shared between various multiple users which lead to the proposal of a new beam selection technique which factored for the possible inter-user interference [13]. There were many algorithms proposed for hybrid precoding in order to achieve spatial multiplexing gains. In systems that adopt FDD, the feedback has to be given to signal the channel towards BS using feedback path based on codebook [14]. However the traditional codebook design using random vector quantization is not useful for systems depending on LAA. The major issue in BmSp channels is of power leakage which is not much addressed in current studies. Since there are finite elements in LAA, it is not possible to impeccably sample the randomly distributed AoD's of path all the time, hence the power of few paths will dissipate on the extent of antennas and power leakage occurs. (Refer Fig. 1) [18].

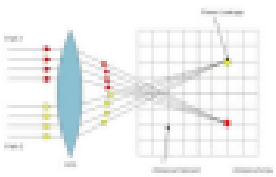


Fig 1. Lens-Path power directing functionality and problem of power leakage in beamspace channels

System Representation

Consider a standard downlink mm-Wave channel model as shown in Fig.2. To achieve higher data rate through beam selection, downlink transmit precoding is performed at the BS.

A. mm-Wave Massive MIMO downlink channel model

Let us take into consideration mm-Wave massive MIMO system using M antennas at the BS and K single antenna users (M>>K). By exploiting the ray-based mm-Wave channel model of [15], $h_k \in \square^{M\times 1}$ are channel coefficients in downlink between M and the k^{th} user can be described as in (1)

$$h_k = \sum_{l}^{P_k} g_k^l \, a(\varphi_k^l) \qquad (1)$$

where P_k is the number of dominant paths of the k^{th} user, g_k^l is the complex gain of the l^{th} path and k^{th} user, which is identically and independently distributed (IID) with zero mean and unit variance, $a(\varphi_k^l) \in \mathbb{C}^{M\times 1}$ is the directing vector of the l^{th} path and the k^{th} user. For the extensively employed ULA at the BS [15], $a(\varphi_k^l)$ can be given by equation (2)

$$a(\varphi_k^l) = \frac{1}{\sqrt{M}}\left[1, e^{-j2\pi\varphi_k^l}, \ldots, e^{-j2\pi\varphi_k^l(M-1)}\right]^T \qquad (2)$$

where $\varphi_k^l = \frac{d}{\lambda}\sin\theta_k^l$ with θ_k^l denotes the angle-of-departures (AoD) and the l^{th} path of the k^{th} user, d denotes the BS antenna spacing and λ denoting the wavelength of the carrier frequency. Then rewriting (1) in matrix form as given in (3)

$$H_k = A_k G_k \qquad (3)$$

where $G_k = [g_k^1 g_k^2 \ldots \ldots g_k, P_k]^T \in \mathbb{C}^{P_k\times 1}$ and $A_k = [a(\varphi_k^1), a(\varphi_k^2), \ldots, a(\varphi_k, P_k) \in \mathbb{C}^{M\times P_k}]$

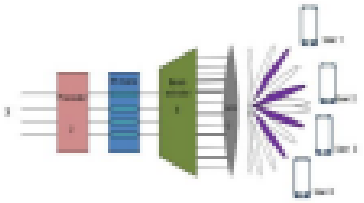


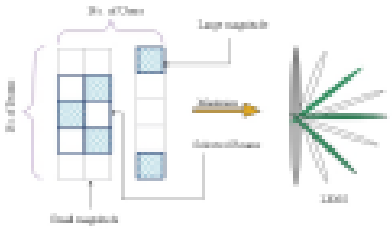
Fig.2. mm-Wave massive MIMO system based on LAA

Principle working of LAA

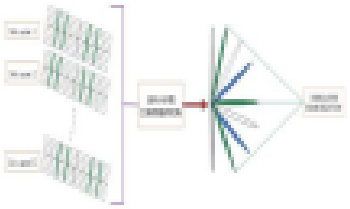
The recently proposed lens antenna array (LAA) is considered to be an effective solution to the insatiable demand of high power consumption [16]. This advanced antenna system design is composed of two parts: electromagnetic lens and a matched antenna array. It is meaningful to note that the BmSp channel gets converted from the spatial channel, due to the constitutional principle of EM lens i.e. its ability to direct signals from different beams to different antenna subsets without notable energy degradation [17]. This necessarily minimizes the required no. of RF chains and also the dimension of the MIMO system.

The implementation of LAA has been studied further with regards to channel reproduction in the hybrid A/D architecture as given in Fig.2. At the transmitting end, we have the Zero Forcing Precoder (ZF) that enables us to achieve a high data rate, leading to low complexity and latency. Secondly, due to high attenuation and less path propagation in mm-Wave signals, the BmSp channel thus formed is sparse. As a result, the no. of required RF chains are reduced. But the overall performance isn't affected because of the proposed Inter-aware (IA) beam selection technique[17],wherethebeamsareselectedoutofthetotalbeamsto maximizethepowergenerated. Lastly, by employing the lens and using its energy focusing capability, the signal is transmitted. However, such is not the case at the receiving end as the hybrid architecture and the BmSp MIMO architecture are quite different. Therefore, the channel estimation could hinder largely due to excessive need of pilot overheads.

Fig.3(a) the formation of beam-squint is eliminated by instilling an adaptive beam- selection method in the wideband mm-Wave Massive MIMO system, where the dominant beam is selected out of 'K' users defined, which in turn, decreases the complexity as it calls for less interference. Fig. 3(b) shows the ongoing beam selection method wherein the best beam is considered for every consumer in "beam- sets", which consists of the strongest beam and those beams which add up to a high attained sum-rate, eventually guaranteeing an increase in energy efficiency but also the required no. of RF chains remain certain and fixed.



(a)



(b)

Fig. 3. Wideband beam selection process: (a) initialization (b) On-going beam selection process

LAA based codebook design

In contrast to the conventional array design, the lens array is implemented by a matrix U of size MXN having M orthogonal beamsofsteeringvectorsasfollows

$$U = [a(0), a(\delta), \ldots \ldots a(\delta(M-1))]^H \text{ with } \delta = \frac{1}{M}$$

Therefore, the received signal y_k at the k^{th} user can be expressed as (4)

$$y_k = \sqrt{\frac{\rho}{K}} h_k^H U^H S Z_{P_k} + n_k = \sqrt{\frac{\rho}{K}} (h_k^b)^H S Z_{P_k} + n_k \quad (4)$$

where ρ is the transmit power (TP), $x = [x_1, x_2, \ldots, x_k]^T \in C^{Kx1}$ is the data vector with normalized power $E\{xx^H\} = I_K$, and the BmSp channel vector $h_k^b \in C^{Mx1}$ can be expressed as (5)

$$h_k^b = U h_k \quad (5)$$

Hence, the Beam selector matrix is defined by $S \in C^{MxN_{BS}}$. The reduced-dimensional equivalent channel can be written as in (6)

$$h_k^e = S^H h_k^b \quad (6)$$

the individual elements of the channel vector can be clubbed together as $H^e = [h_1^e, h_2^e, \ldots, h_K^e] \in C^{N_{BS}xK}$. By using equation (4), this is possible in (7)

$$y_k = \sqrt{\frac{\rho}{K}} (h_k^e)^H Z_{P_k} + n_k \quad (7)$$

where $Z_P = [z_{P1}, z_{P2}, \ldots, z_{PK}] \in C^{N_{BS}xK}$ is the Zero forcing precoding matrix. From equation (3), the channel subspace is defined as, $A_k \in C^{MxP_k}$ determined by (P_k<<M). Using the following relation given in (8), the large dimensional-vectors are generated.

$$c_k^i = A_k w_k^i \quad (8)$$

where $w_k^i \in C^{P_k x 1}$ is isotopically distributed with a unit norm (i=1, 2, 3……,2^B) where 'B' is the number of feed-back bits. By exploiting these large dimensional-vectors, the proposed Codebook design is given by (9)

$D_k = \{d_k^1, d_k^2, d_k^3, \ldots\ldots, d_k^{2^B}\}$ where $d_k^i \in C^{N_{BS}x1}$ and

$$d_k^i = S^H U c_k^i \quad (9)$$

Where S is the beam selector based on AoD during the angle coherence time [11]. The normalization of the code word d_k^i is given as $d_k^i = \frac{d_k^i}{\|d_k^i\|}$. Lastly, the quantization of the channel of the equivalent channel h_k^e by the k^{th} user based on the codebook design is computed as given in equation (10),

$$F_k = \underbrace{\arg\min}_{i \in \{1,2,\ldots,2^B\}} \sin^2\left(\angle(h_k^e, d_k^i)\right) \quad (10)$$

BEAM ALIGNING PRECODING FOR BEAM SPACE MIMO SYSTEMS, ROTATION BASED PRECODING ALGORITHM

The received signal can be written in agreement to equations (1) and (4) as given in (11)-(12)

$$y = H^H F_R F_B s = \bar{H}^H F_B x \quad (11)$$

Where, $\bar{H} = F_R^H H = [\bar{h}_1, \bar{h}_2, \ldots, \bar{h}_K]$ (12)

is equal to user RF domain channel, F_R , F_B are RF and Baseband Precoder's respectively.

To facilitate the design of precoding, consider that the **H** matrix has been accurately acquired at the BS. With the independent source vector $E(ss^H) = I_k$, the SR of the system R is given by (13)

$$R = \sum_{k=1}^{K} \log_2\left(1 + \frac{|h_k^H F_B^{(k)}|^2}{\sigma^2 + \sum_{i \neq k} |h_k^H F_B^{(i)}|^2}\right) \quad (13)$$

The proposed work considers a per user constraint (14) such that

$$\|F_R F_B^{(k)}\|^2 \leq \frac{P_k}{K}, \forall k. \quad (14)$$

Thus, the problem of precoding design is expressed as maximizing the SR limited by the constraints on the precoder as given in (15)

$$(F_R^{opt} F_B^{opt}) = \underset{F_R, F_B}{\arg\max} R \quad (15)$$

s.t (14)

As the nature of constraints is non-convex nature and inter user interference on F_R [16], it is challenging to give the generalized optimal solution to (14). As an option a sub- optimal solution using the following steps is proposed.

To reduce the difficulty of the problem, exploring the properties of the employed system. The primary focus is on a simple separate cluster case where there is presence of only one cluster in the mm-Wave channel for an individual user, and then extend to the multi user case. The antennas present at the BS in mm-Wave MIMO systems is very large, and is able to generate beams that give enough spatial resolution. Therefore, the AoD's of distinct users have enough separation from one another, due to which the selection of multiple beams from single user will not suffer significant inter-user interference (IUI) in the RF domain channel.

Therefore, the IUI term in BmSp MIMO system's SR is not significant [17], which helps us to maximize the effective gains of the channels and then diminish IUI. Remembering the per-user constraint in (18) is taken into consideration while ignoring the IUI in RF domain channel $\bar{H}$, decouples the optimization of the complete into a sequence of optimization of every user leading to following equation (16)

$$\left(F_R^{(k),opt}, F_B^{(k),opt}\right) = \underset{F_R{}^k, F_B{}^k}{\arg\max} |\bar{h}_k^H F_B^{(k)}|^2 \quad (16)$$

For any value of F_R, the maximizing objective function is equal to matched filter of the precoder and the normalization power factor of the k^{th} user as given in (17),

$$F_B^{(k),opt} = \underbrace{\text{argmax}}_{F_B{}^k} |\bar{a}\bar{h}_k^H \bar{h}_k|^2 \quad (17)$$

The objective function is expanded as shown in (18)

$$|a_k \bar{h}_k^H \bar{h}_k|^2 = \alpha_k^2 + \left|\left[\bar{h}_k^H F_B^{(k)}\right]^2 + \sum_{j \neq k}^{K} \left|\bar{h}_j^H F_B^{(k)}\right|^2\right|^2$$

$$\leq \alpha_k^2 \left|\left[\bar{h}_k^H F_B^{(k)}\right]^2\right|^2 \quad (18)$$

(IUI is not considered as it is not dominant). The two issues that need to be solved are beam selection and beam combining. Beam selection can be solved by examining the beam space channel in an individual user scenario.

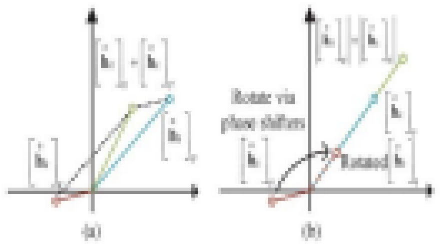


Fig.4. Representation of the beam gain rotation (a) No rotations (b) With rotations

Beam selection can be done in a greedy manner that is the strongest beam is selected and then the beams that are selected after that have a higher power leakage than the previous beam. In this manner beams are selected in a sequence. The beam combining problem can be resolved by the property of the phases of various elements of $F_B^{(k)}$ which are adjustable by rotation of the selected elements of $\tilde{h}_k$ via $F_{RF}^{(k)}$, aligning the gains given in (19).

$$\frac{[F_B^{(k)}]_p}{[F_B^{(k)}]_q} = \frac{\left(\frac{[\tilde{h}_k]_p}{|[\tilde{h}_k]_p|}\right)}{\left(\frac{[\tilde{h}_k]_q}{|[\tilde{h}_k]_q|}\right)}, \forall p \in B_k \qquad (19)$$

And $[\tilde{h}_k]_q$, $[\tilde{h}_k]_p$ are able to achieve the maximum combined value, $[F_B^{(k)}]_q$, $q \in B_k$ is a reference-element.

Therefore, the main challenge is still the beam selection process as the combination of beams is easily done by rotation. The algorithm for precoding based on rotation is given in Algorithm 1. It first searches for the beam with the dominant power from the available beams then finds the cluster in the fourth step. Later the greedy approach is adopted to select the beams corresponding to leaked power. The set $A_k \cap B_k = \emptyset$ is updated using the beams from A_k. Representation for (19) is depicted in Fig.4, where the rotated $[\tilde{h}_k]_q$, $[\tilde{h}_k]_p$ can achieve the combined maximum value.

Algorithm1: Proposed Rotation based Precoding Algorithm

Input: H, P_T and the beam selection threshold ϵ.
Output: F_B and F_{B_k}
1: Initialize U={1,2,3.........,N} and the overall selected beam set B=∅;
2: **For** $k \leq K$ **do**
3: Initialize the selected beam set $B_k = \emptyset$, the adjacent beam set $A_k=\emptyset$, and $F_B^{(k)} = 0$ for the k^{th} user;
4: $l_{max} = \arg\max_{m \in \frac{U}{B}} |[\tilde{h}_k]_m|$ and $B_k = B_k \cup \{l_{max}\}$;
5: **Repeat**
6: Update A_k according to B_k;
7: $l = \arg\max_{m \in A_k} |[\tilde{h}_k]_m|$ and $B_k = B_k \cup \{l\}$;
8: set $[F_B^{(k)}]_l$ based on (23) where $p = l, q = l_{max}$;
9: **until** $|[\tilde{h}_k]_l| \leq \epsilon |[\tilde{h}_k]|_{l_{max}}$;
10: $B = B \cup B_k$;
11: **end for**
12: $F_B = [F_B^{(1)}, \ldots\ldots, F_B^{(K)}]$;
13: $\tilde{h}_k^H = h_k^H F_B$, $\alpha = \frac{P_T}{\epsilon\|\tilde{h}_k\|}$, $F_B^{(k)} = \alpha \tilde{h}_k$;
14: $F_B = [F_B^{(1)}, \ldots\ldots, F_B^{(K)}]$.

To avoid selection of beams more than once, constraints are used. Let us take a 2-D uniform planar array case, and rewriting the $\tilde{h}_k$ as N_1 X N_2 matrix.

If $B_k = \{(l_i^{a}, l_i^{e}), (l_i^{a}, l_i^{e} + 1)\}$, where $l_i^{a}(l_i^{e})$ is an arbitrary azimuth (elevation) index and A_k is updated as in (20)

$A_k = \{(l_i^{a}, l_i^{e} - 1), (l_i^{a}, l_i^{e} + 2), (l_i^{a} + 1, l_i^{e} - 1), (l_i^{a} + 1, l_i^{e}), (l_i^{a} + 1, l_i^{e} + 1), (l_i^{a} + 1, l_i^{e} + 2), (l_i^{a} - 1, l_i^{e} - 1), (l_i^{a} - 1, l_i^{e}), (l_i^{a} - 1, l_i^{e} + 1), (l_i^{a} - 1, l_i^{e} + 2)\}$
(20)

Once A_k is updated, the beams with the highest power is being selected in B_k and this corresponds to the step 7, after that the corresponding non-zero elements in $[F_B^{(k)}]$ are computed as per step 8. The beam selection process in steps 5-7 is repeated till the newly selected beam $[\tilde{h}_k]_l$ power is lower than threshold $\epsilon|[\tilde{h}_k]|_{l_{max}}$. Now the F_B is determined and the F_B is obtained and normalized. No constraints are applied on the type of antenna used. Hence the algorithm can be used for any antenna arrays.

Simulation Results

The system parameters are set up M = 128 (BS antennas), N_RF = 24, P = 3 (number of dominant paths), K = 8 (number of users) and the angle of departures (AOD) are chosen randomly following the distribution U [-½ π, ½ π]. The feedback bits are set to $B = \frac{P-1}{3}SNR + (P-1)\log_2(K-1)$. It is found in Fig.5 that the Rate difference between the perfect CSI ideal case and the practical case with proposed Codebook design remains constant, with the increase in SNR and the proposed method outstands over the conventional based codebook design. The feed-back overhead is comparable to the number of the dominant paths of user, which is small. The improved Rate comparison per user between the perfect CSI at the BS and the practical case with the proposed and classical channel feedback codebook are presented in Fig.5 below:

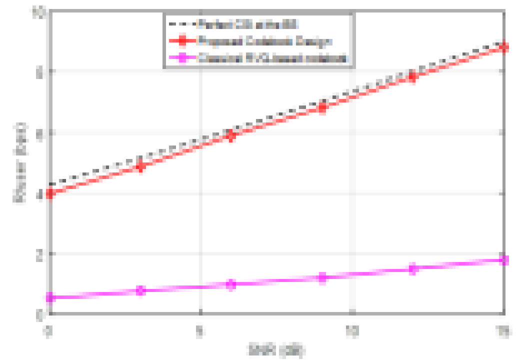


Fig. 5. Rate comparison per user between the perfect CSI at the BS and the practical case with the proposed and classical channel feedback codebook

Consider the ULA equipped at the BS, where the BS utilizes an N=512 element to serve the K=8 users together. The comparison of the SR performance is given in the Fig.6. It is analyzed that the SR performance in the proposed precoding method for beam aligning and MBMRF is much larger when compared to single beam precoding and also attains the ideal situation which has no power leakage. Illustrations depicts that the SR corresponds to the TP proportionately. It is due to the exploitation of all the BmSp channel vector of users in the same beam, therefore increasing the performance in a linear manner.

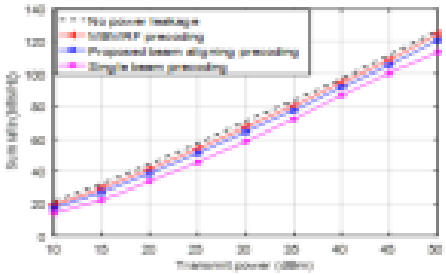


Fig. 6. ULA case: Sum- rate (SR) vs transmit power (TP)

In simple terms, the selection of multiple beams is an effective approach to tackle the power leakage issue. The use of multiple RF chains for the selection of multiple beams can give higher degrees of freedom compared to a network using phase shifters. It is anticipated that the MBMRF precoding technique marginally exceeds the proposed precoding method for beam aligning by the SR factors. Additionally, the performance of EE is also studied (refer Fig. 7). It is found that the MBMRF precoding attains a marginally higher rate in comparison to other precoding methods, this results in the severe degradation in the EE performance i,e it is the lowest among all the other methods. The justification for it is given by the fact that MBMRF uses more RF chains which consume a lot of power which leads to a low EE as in Fig.7. The proposed precoding method for beam aligning conflicts the above behavior of MBMRF and achieves a sum-rate which is near to the optimal SR and also consumes less power. An optimal EE operating point is also observed. The curve is interpreted as follows:

Case 1:-Transmit power (TP) is moderately low, increasing the TP leads to higher EE because the entire power consumption is dominated by the circuit power consumption.

Case 2:- TP is sufficiently large, it will reduce the EE rate. It is because of the fact that TP contributes to SR in logarithmic manner whereas it contributes in a linear manner to the total power.

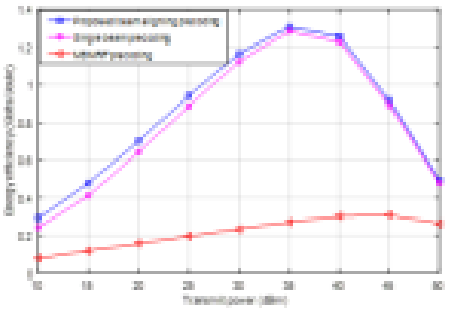


Fig. 7. ULA case: EE vs transmit power (dBm)

When the transmit power increases, it is to be noted that in Rm5p MIMO, one dedicated RF chain supports per user at the same time-frequency domain, thus failing to support multi-users. Hence, the RF chains become lesser than count of different users, throwing light on the drop in energy efficiency illustrated in the Fig.7.

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Deep Learning Based Channel Estimation in Millimeter wave Vehicular Communication

A Dissertation submitted in the partial fulfillment of the requirements

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ABSTRACT

The application of millimeter-wave (mmWave) frequencies is a potential technology for satisfying the continuously increasing need for handling data traffic in highly advanced wireless communications. A substantial challenge presented in Millimeter Wave systems communications is the high path loss. Millimeter Wave systems adopt beamforming techniques to overcome this issue. These require robust channel estimation algorithm for maintenance of an adequate quality of service.

Channel estimation is a challenging task, especially in a massive multiple-input multiple-output (MIMO) system. Traditional deep learning (DL) methods, that learn the mapping from inputs to real channels, have significant difficulties in estimating accurate channels because their loss functions are not well designed and investigated.

In this project, we use a deep learning-based channel estimation algorithm for multiuser massive MIMO vehicular communications.More specifically, a deep neural network is leveraged to learn the mapping function between the received omni-beam patterns and mmWave channel with negligible training overhead.A conditional generative adversarial network (cGAN) is developed to predict more realistic channels by adversarial training two DL networks. cGANs not only learn the mapping from quantized observations to real channels but also learn an adaptive loss function to correctly train the networks

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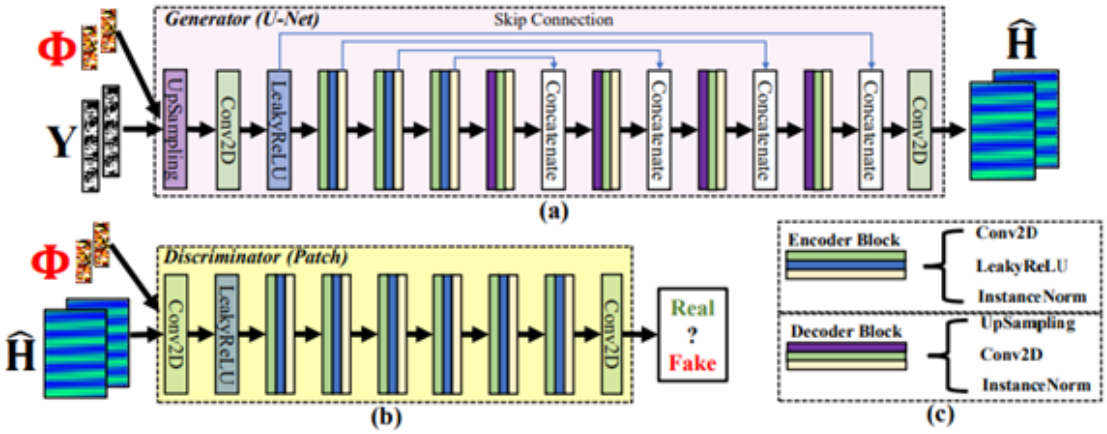

Fig 7.4: Network architectures of the proposed cGAN approach. (a) Architecture of the generator. (b) Architecture of the discriminator. (c) Composition of an encoder block and decoder block

CONCLUSION

This dissertation focused on applying conditional adversarial networks in the channel estimation for one-bit multiuser massive MIMO. These adversarial networks are able to adaptively learn a real loss from the data, which not only makes themodel more robust but also makes the generated channels more realistic.

A novel mmWave channel covariance estimation/prediction solution is developed based on deep learning techniques. The proposed solution learns the mapping between the uplink signals received simultaneously at multiple BSs using only omni-patterns and the covariance matrices. This solution, therefore, requires negligible time overhead in estimating the channel covariance matrices. In our machine learning model, we treat the covariance matrices as images and leverage conditional generative adversarial networks to learn the important features of these images. Simulations results, based on accurate ray-tracing and practical deployment scenarios, showed that the developed deep-learning based solution efficiently predicts the mmWave channel covariance matrices with small mean-squared errors.

The evaluation results suggest that deep learning with conditional adversarial network is a more effective approach for channel estimation tasks, which significantly improves the channel estimation performance.

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4	Sameena Begum, Nazia Fatima, Moghal Abdul Sameer Baig	1604-15-735-065,070, 112	Anthro-AI Based Semi Humanoid	
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7	ShahebazAhamed, Mohammed Abdul Hafi, Moin Khan	1604-17-735-086,108, 111	Implementation of Shor's Algorithm Using Quantum Computing	

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Artificially Intelligent
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A Dissertation submitted in partial fulfillment of the requirements

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ABSTRACT

Today, the world is battling the most complex pandemic and the only possible antidote at this moment is social distancing. With everyone locked indoors, the world economies are headed towards recession. Amid this pandemic, technology acts as a lifeboat, keeping us and businesses afloat. The one silver lining in these times is Artificial Intelligence (AI) and Mechanical Innovations. As we move forward, just like other technologies, robots are also playing an important role in fighting against diseases like COVID-19.

In this case, robotic technology plays a crucial role in not just assisting the patients but also keeping doctors and health-care staff safe. The robots performed a variety of essential tasks, including flagging patients at the entrance to the field hospital who displayed fever symptoms, monitoring heart rates and blood oxygen levels and delivering medication. These robots can also clean and disinfect hospital areas and lead exercise routines for sick patients. Medical workers remotely can direct and control the robot systems over a wireless network.

First, the sensible use of Robotic Nursing Assistants in health care greatly impact the sustainability and reliability of health care systems. Second, the high risk of cross-contamination among medical workers including doctors and nurses is curbed down to large extent. The high demand of medical personnel is catered by increasing the manufacturing of nursing assistants that can handle complex tasks.

In this thesis, we integrate Artificial Intelligence and Semi-Humanoid Robots in order to overcome these challenges and enable highly-mobile robot that helps the doctors and nursing staff in such trying times by providing assistance in monitoring patient's health condition and recovery updates.

Intelligent care aids, such as robotic technologies, medicine suppliers, make life easier for nursing home and hospital staff. Mobile robots that assist with transport tasks or guiding people can help patients become more independent.

Fig.1.1. Picture of AIRONA

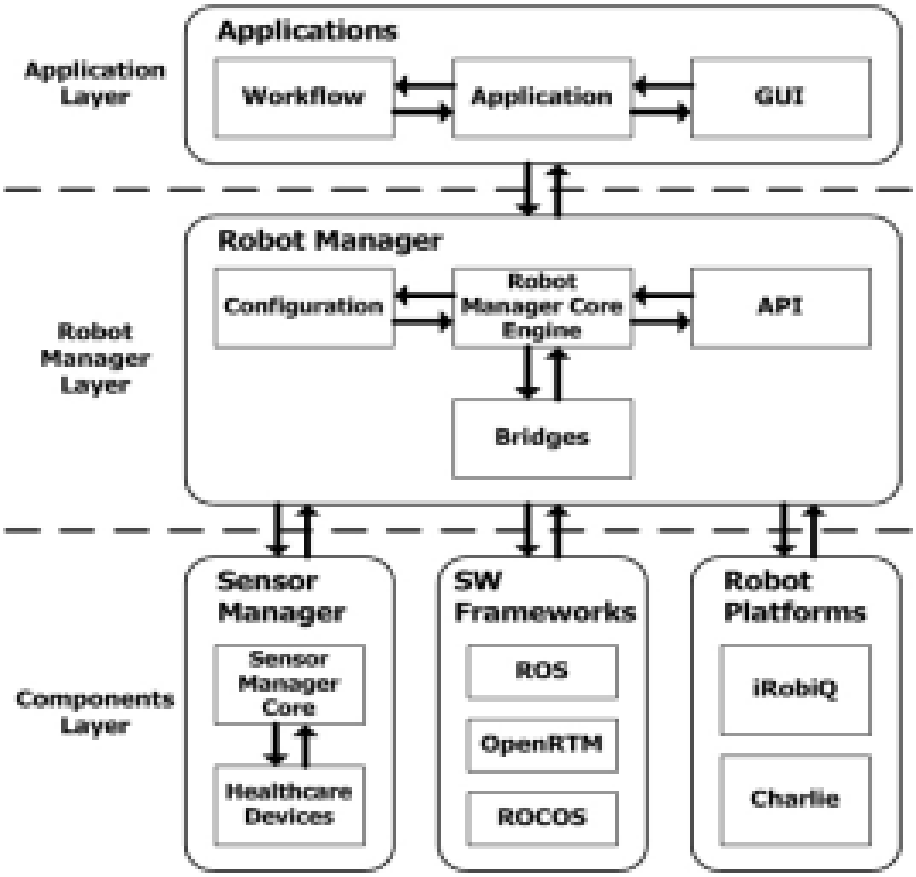

Fig. 2.2. Architecture of the UoA Robotic Software Framework. It has three layers; an application layer, a robot manager layer, and a component layer including SW frameworks, robot platforms, and external systems.

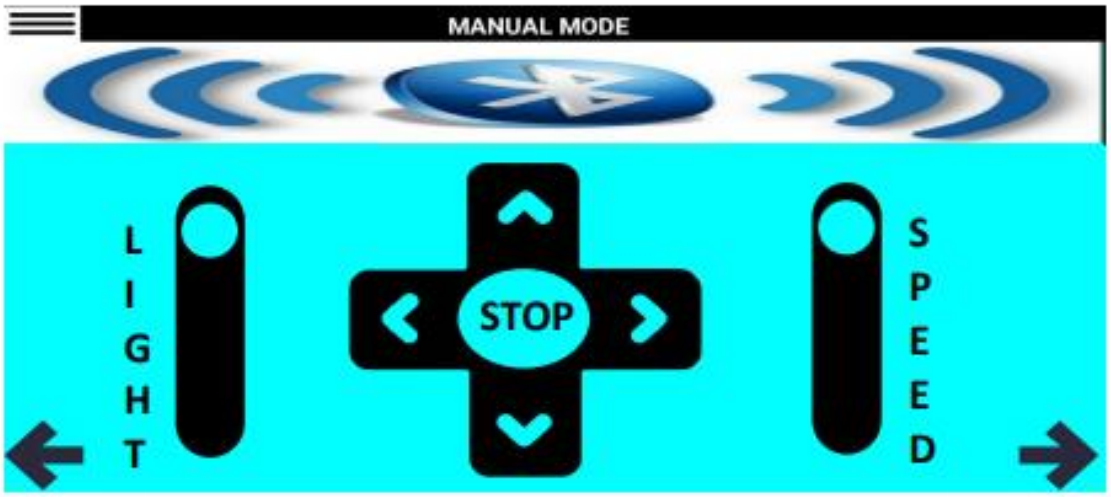

Fig.5.5. Control Screen

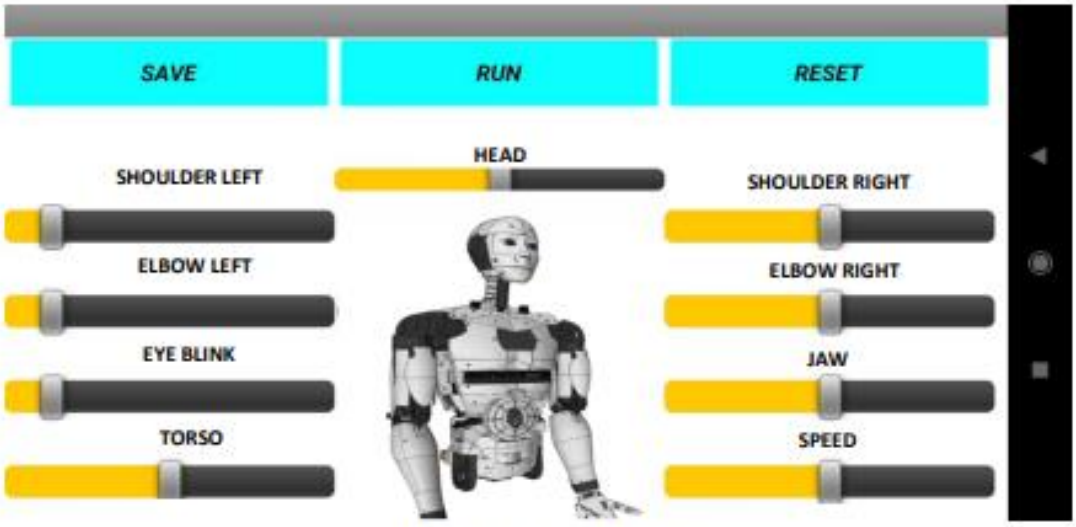

Fig.5.6. Settings Interface

8.3PRACTICAL IMPLEMENTATIONS :

Fig: 8.1. AI-RoNA carrying medicine tray

Fig: 8.2. AI-RoNA Lower Body

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OUTCOME OF THE PROJECT:

Stable semi- humanoid locomotion is still a on-going and challenging research activity for researchers from the robotics community. The primary objective and milestone of this research was to design 3D-printed design, build and develop a 3D-Printed framework for a semi- humanoid robot that can talk and recognize faces. In this chapter, we discussed some discussion on processing speed issues, challenges occurred, power issues and to what extent the future continuous research direction should be formulated is presented.

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ROS BASED SYNERGISTIC ARTICULATED ROBOTIC MANIPULATOR(R-SARM)

A Dissertation submitted in partial fulfillment of the requirements for the

award of the Degree of

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IN
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Abstract

One of the most widely used technologies in industries is robotics. The increasing demands and development require complex procedures and precise approach specially in the manufacturing. This is achieved by the introduction of Robotic arms in such workplaces. The most effective usage of the robotic arm is when it is completely autonomous and is intelligent enough to perform the required operations on different types of objects. SARM presents this usage by implementing the concepts of Object Detection and Inverse Kinematics using ROS (Robot Operating System). The objects present in the workspace are detected and their coordinates in the workspace are determined. The SARM reaches the particular object's position using inverse kinematics analysis on its own, picks the object with its end effector, and places it at the desired position within the workspace. Thus, SARM is an efficient manipulator.

The objective is to incorporate automation into the system by using a low-cost and small single- board computer i.e., Raspberry Pi with Arduino. Using Image Processing algorithms, the coordinates of the object in the workspace are determined. Once this is done, the inverse kinematics analysis is performed on the estimated coordinates in Robot Operating System (ROS). This gives the joint angles through which the links of the robotic arm are to be rotated, to reach the object. Hence the arm executes the pick and place task. One of the tasks involved over here is the communication between the two boards i.e., the processor Raspberry Pi and the driving board Arduino.

The final key point of this project is the integration of the above-mentioned tasks to form a robust and complex robotic arm system that is smart and also strong enough to detect and pick up objects for the task of sorting as would be done by a human being.

2.5 Proposed Model

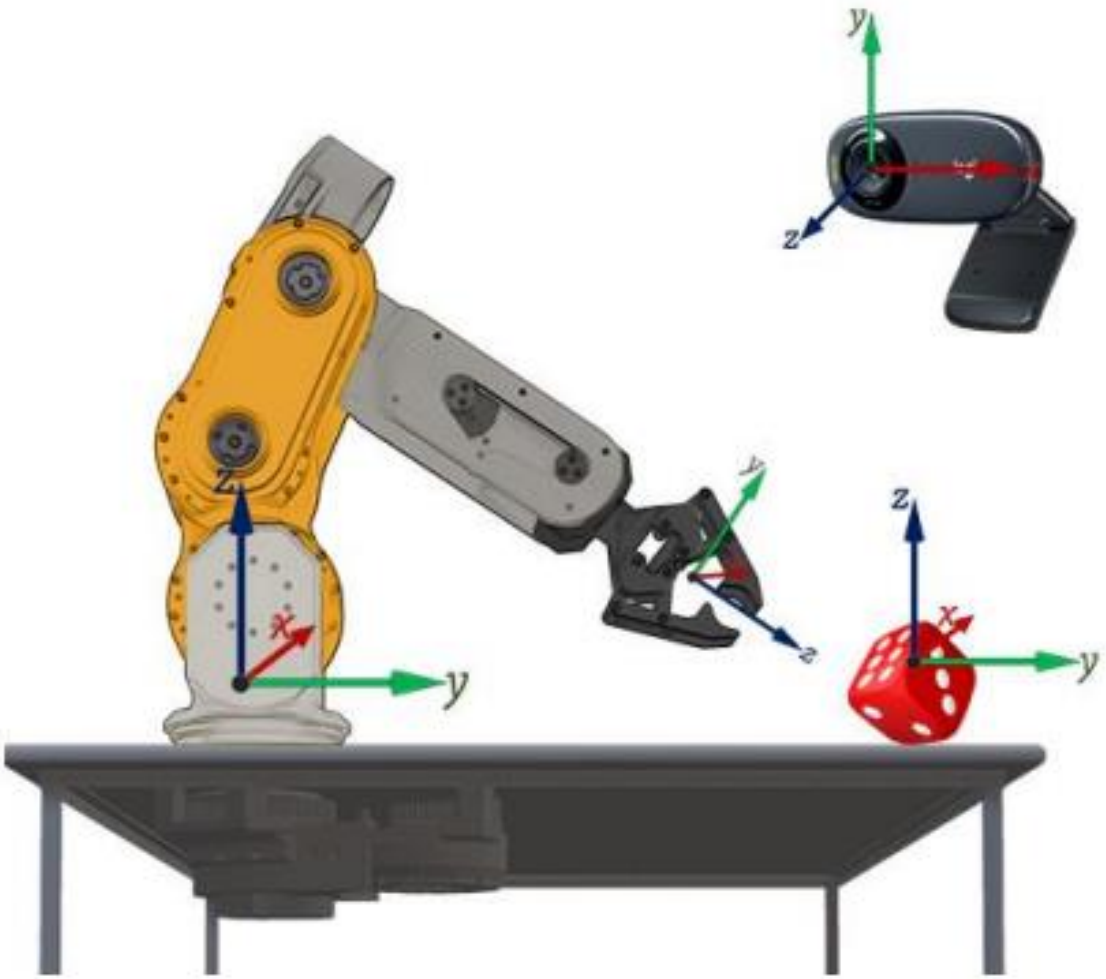

Fig 2.2 SARM and the coordinate system

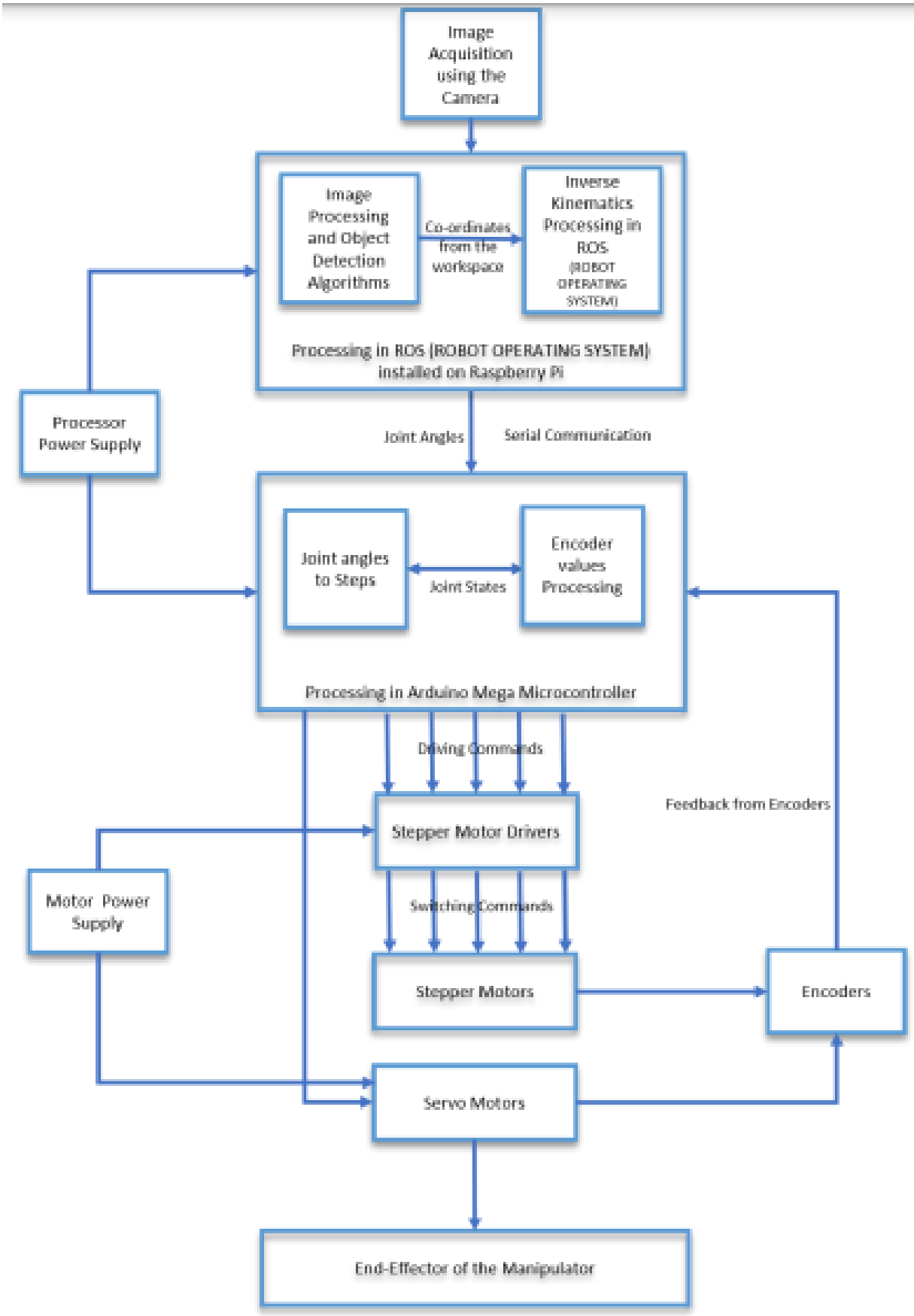

Fig 9.1 SARM Process Flowchart

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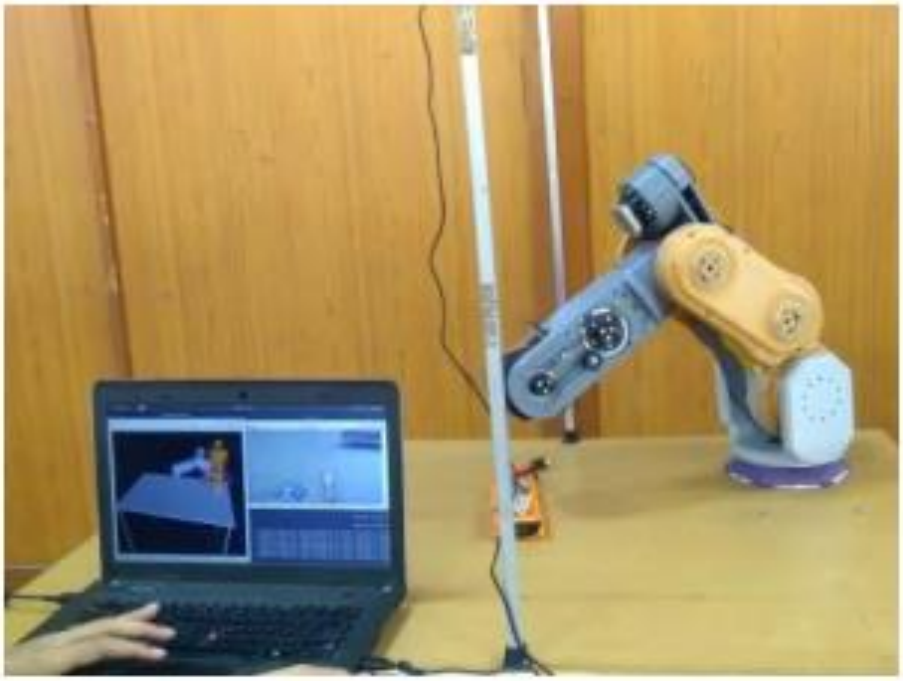
Project Photos



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3	UZMA ALIYA	1604-18-744-014	Compression of Hyperspectral Images Using Sequential truncated tucker decomposition	
4	Hiba Siddiqui	1604-18-744-016	Compression Of Hyperspectral Images Using Block Term Decomposition	
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6	Syed MudassiruddinAlvi	1604-19-744-001	Compression of Hyper spectral Image using Tucker3 decomposition method	
7	Nida Zia TahereenRizvi Syed Diraarahmed	1604-18-735-002 1604-18-735-010 1604-18-735-021	Compression and Classification of Hyper spectral Image using SVM(Current Final year Project)	

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Compression of Hyperspectral Images Using Higher Order Singular Value Decomposition (HOSVD) Tucker Decomposition

A Dissertation submitted in partial fulfillment of the requirements

For the award of the Degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

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ABSTRACT

Hyperspectral image compression had received considerable interest in recent years due to enormous data volumes. In this paper we have made a state-of-the-art investigation about hyperspectral image compression which can be used in satellites on board compression. Compression of hyperspectral images is undertaken to reduce the on-board memory requirement, communication channel capacity and the download time. Mainly this investigation is focused on lossy, lossless and near lossless compression methods and methodologies used to perform the compression.

The main aim of the project is to compress the hyper spectral image data set by calculating performance factors like compression ratio, peak signal to noise ratio and mean square error. We are using algorithms Higher Order Singular Value Decomposition (HOSVD) Tucker Decomposition and DWT transforms and adaptive arithmetic coding which exploits both the spectral and the spatial information in the images to compress the hyper spectral image and to get higher compression ratio, better PSNR (58.12 dB) as compare to that of existing algorithms. We evaluate the effect of the proposed method on real HSIs and compare the results with the well-known compression methods. The obtaining results will show a better and improved Compression ratio (393.3).

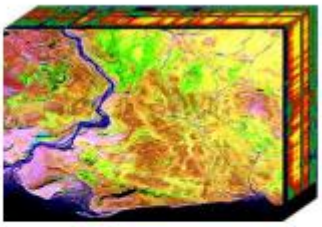


Fig 3.4 Hyper spectral Image

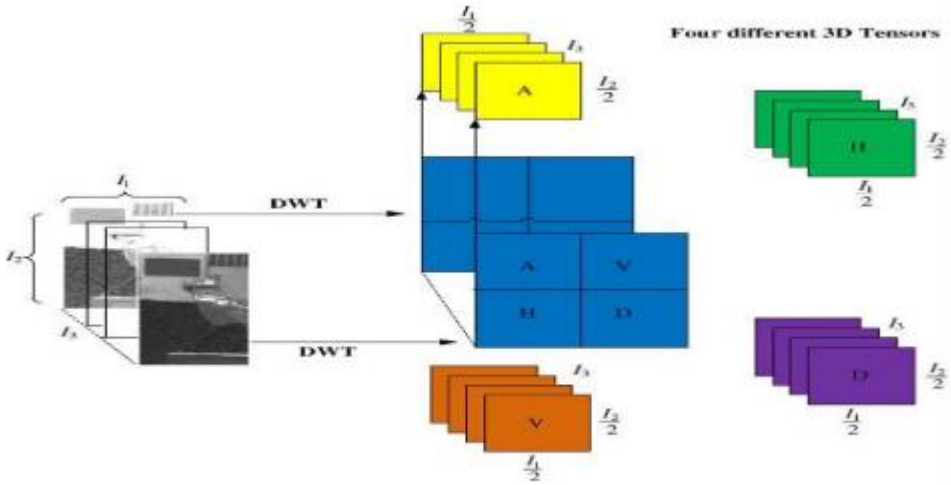
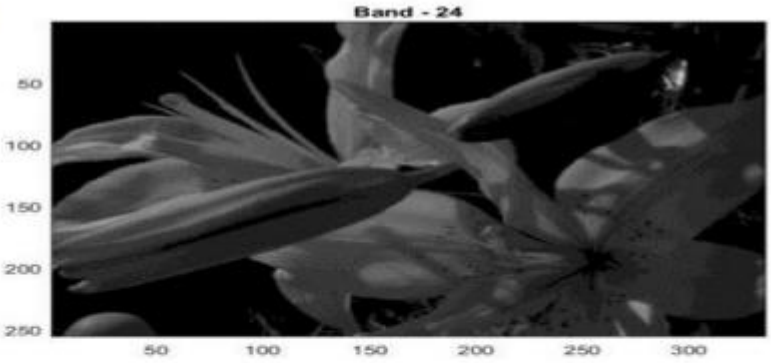


Fig 4.5 New decomposition scheme in the proposed method for HSIs.

SIMULATION RESULTS

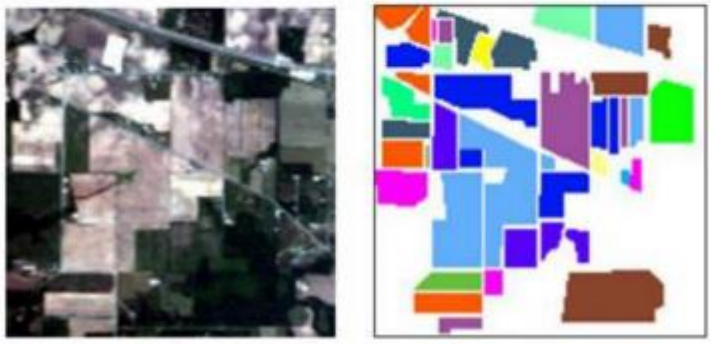
DATA SETS USED:

1).



NAME: SALINES DATA SET

2).



(a) (b)

NAME: INDIA PINES DATA SET

AREA: Microwave Engineering

S.No.	Name of the student	Roll Nos.	Title	Guide
1	KatluruSpoorthi, VardhineediSivani, Sadia Simran	1604-16-735-061,064, 070	Microstrip Antenna Design	Dr. Ayesha Naaz/ Ms.GPrashanthi
2	MohdAsaduddin, ShaikSeif Shah, Mohammed AsimSiddiqui	1604-18-735-073,095, 097	Design of Microstrip Patch Antenna Using AnSys - HFSS	

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DESIGN OF 2X2 MICROSTRIP PATCH ANTENNA ARRAY

A Dissertation submitted in partial fulfillment of the requirements For the award of the Degree of

BACHELOR OF ENGINEERING
IN
ELECTRONICS AND COMMUNICATION ENGINEERING

BY

KATLURI SPOORTHI	**1604-16-735-061**
VARDHINEEDI SIVANI	**1604-16-735-064**
SADIA SIMRAN	**1604-16-735-070**

Department of Electronics and Communication Engineering

Muffakham Jah College of Engineering and Technology

Banjara Hills, Hyderabad-500 034

(Affiliated to Osmania University)

2020

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COLLEGE OF ENGINEERING &TECHNOLOGY
(Est. by Sultan-Ul-Uloom Education Society in 1980)
(Affiliated to Osmania University, Hyderabad)
Approved by the AICTE & Accredited by NBA

CERTIFICATE

This is to certify that the dissertation titled **'Design of 2x2 microstrip patch antenna array'** submitted by **Katluru Spoorthi (Roll No: 1604-16-735-061), Vardhineedi Sivani (Roll No: 1604-16-735-064), Sadia simran (Roll No: 1604-16-735-070)** in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering,** is a bonafide record of work carried out by them under our guidance and supervision during the year 2019-2020. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Mrs. Prashanthi
Project Guide
Associate professor, Dept of ECE
MJCET, Hyderabad

Dr. Mohammed ArifuddinSohel
Professor and Head,
Dept of ECE
Hyderabad

Head of Department
Electronics & Communication Engineering
Muffakham Jah College of Engg. & Tech.
Road No: 3, Banjara Hills Hyderabad-34

INTERNAL EXAMINER

EXTERNAL EXAMINER

8-2-249, Mount Pleasant, Road No.3, Banjara Hills,
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Fax: 040-2335 3428,Website: www.mjcollege.ac.in,

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ABSTRACT

Micro strip patch antennas (MPAs) are rapidly gaining more attention due to the proliferation of communication devices and systems with frequencies becoming more suitable for the size and performance of this type of antenna. However, MPAs suffer from problems associated with narrow bandwidth and low gain. The aim of the project is to design a rectangular Micro strip Patch Antenna array with enhanced gain and bandwidth. In this project we are using MPA array over single radiating patch because it helps in improving gain, directivity, power, signal to noise ratio, signal strength which results in better performance. This micro strip patch antenna array is designed for resonating at X-band frequency range (8-12Ghz). This frequency band is mainly used in civil and military application. Design and simulate a Micro strip array antenna in CST with a main beam in the broad side direction with specified beam width. They operate at 8.2GHz (Resonant Frequency) with FR4 glass Epoxy as a substrate. The array antenna will consist of four rectangular patches in a linear fashion, having length of patch 7.7189mm and width of patch 10.7144mm each. The height of each of the patch is 1.6mm. Two transmission lines are used to connect these patches to quarter-wave transmission lines. The impedance of each transmission line is required to be 200Ω. The length of each transmission line is 24mm and the width of each transmission line is 1mm. The electrical length of each line is 180°. A quarter-wave transmission line is used to match the impedance of the system. The impedance of the line is 50Ω. The length calculated to get 50 Ω impedance is 1.7698mm and the width is 24mm. II The electrical length of the quarter-wave transmission line is 90°. This corporate feed network is excited by coaxial probe feed. A 50Ω coaxial probe is connected to the quarter-wave transmission line. Also we have return loss of -45.756 db and -21.741 db respectively

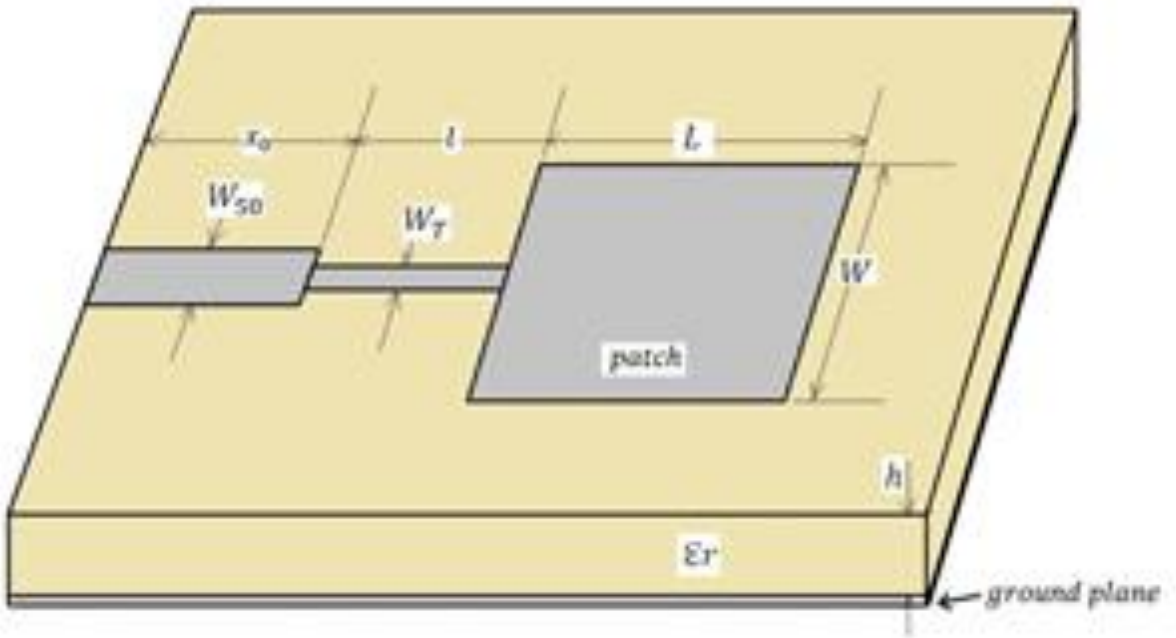
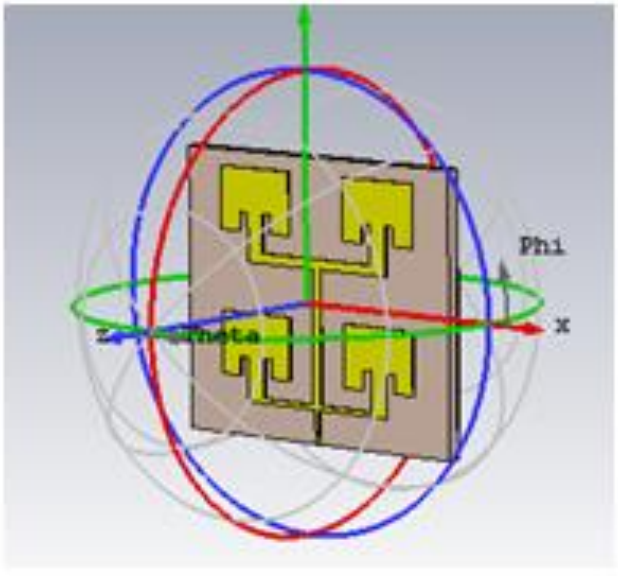


Figure (4.3.2a) Rectangular micro strip patch antenna

6.9.5 Far Field Cuts:



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7.1 CONCLUSION

With the ever-increasing need for mobile communication and the emergence of many systems, it is important to design broadband antennas to cover a wide frequency range. The design of an efficient wide band small size antenna, for recent wireless applications, is a major challenge. Microstrip patch antennas have found extensive application in wireless communication system owing to their advantages such as low profile, conformability, low-cost fabrication and ease of integration with feed networks. However, conventional Microstrip patch antenna suffers from very narrow Broadband.

Usually gain of single element is low. The radiation is relatively wide. This may not be suitable for long distance communication. Hence there is a need of antenna array. Beam width is quite broad. High gain and directional pattern.

In this paper, 4 elements Micro strip patch antenna array by Micro strip feed line are presented. Simulation results have shown that the single patch micro strip antenna with their several limitations such as low gain and bandwidth can be improved by using micro strip patch antenna array.

AREA: Image Processing

S.No.	Name of the student	Roll Nos.	Title	Guide
1	Mohammed Omairullah, Shaik Mohd. SulemanShohaib, Md. Waseem Akhtar	1604-16-735-029,050, 060	Detection of Brain Tumors Using U-Net Architecture for Segmentation and Neural Networks	Mr. Hakeem Aejazaslam
2	NameeraMohsin, Maleeha S Hasan, SaneelaGauhar	1604-17-735-061,063, 066	Brain Tumor Detection from MRI Dataset Using CNN and Python	

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Brain Tumor Detection from MRI dataset using CNN with Python

A Dissertation submitted in partial fulfillment of the requirements

for the award of the Degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

NAMEERA MOHSIN(1604-17-735-061)

MALEEHA HASAN(1604-17-735-063)

SANEELA GAUHAR(1604-17-735-066)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHNOLOGY
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(AFFILIATED TO OSMANIA UNIVERSITY)

June, 2021

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CERTIFICATE

This is to certify that the dissertation titled **'Brain tumor Detection from MRI Dataset using CNN with Python'** submitted by **Nameera Moshin, Maleeha hasan, Saneela Gauhar bearing roll No: 1604-17-735-061,1604-17-735-063,1604-17-735-066** in partial fulfillment of the requirements for the award of the Degree of Bachelor of Engineering, is a bona fide record of work carried out by her under my guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Mr. Hakeem Aejaz Aslam
Project Supervisor
Assistant Professor, ECED
MJCET, Hyderabad

Dr. Mohammed Arifuddin Sohel
Prof & H.O.D
Dept. of ECE
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Brain Tumor Detection from MRI dataset using CNN with Python

A Dissertation submitted in partial fulfillment of the requirements

for the award of the Degree of

BACHELOR OF ENGINEERING
IN
ELECTRONICS AND COMMUNICATION ENGINEERING

By

NAMEERA MOHSIN(1604-17-735-061)

MALEEHA HASAN(1604-17-735-063)

SANEELA GAUHAR(1604-17-735-066)

Under the guidance of

Mr. HAKEEM AEJAZ ASLAM

Assistant Professor

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June, 2021

ABSTRACT

Brain tumor is the most commonly occurring malignancy among humans,hence studying of brain tumor is important. In this project, we have used a biomedical image segmentation method to identify or detect tumors from the brain magnetic resonance imaging (MRI). Biomedical image processing consists of biomedical signal gathering, image forming, picture processing, and image display to medical diagnosis based on features extracted from images. The primary goal of medical imaging is to extract meaningful and accurate information from these images with the least error possible. It comprises various types of imaging methods such as MRI,PET ,CT scan etc.

The whole process of detecting brain tumors using MRI can be classified into three different categories: Pre-Processing, analyzing and manipulating the image which includes data compression ,and image enhancement and spotting patterns and Feature extraction. This detection of brain tumor can be studied using Convolutional Neural Networks(CNN) .

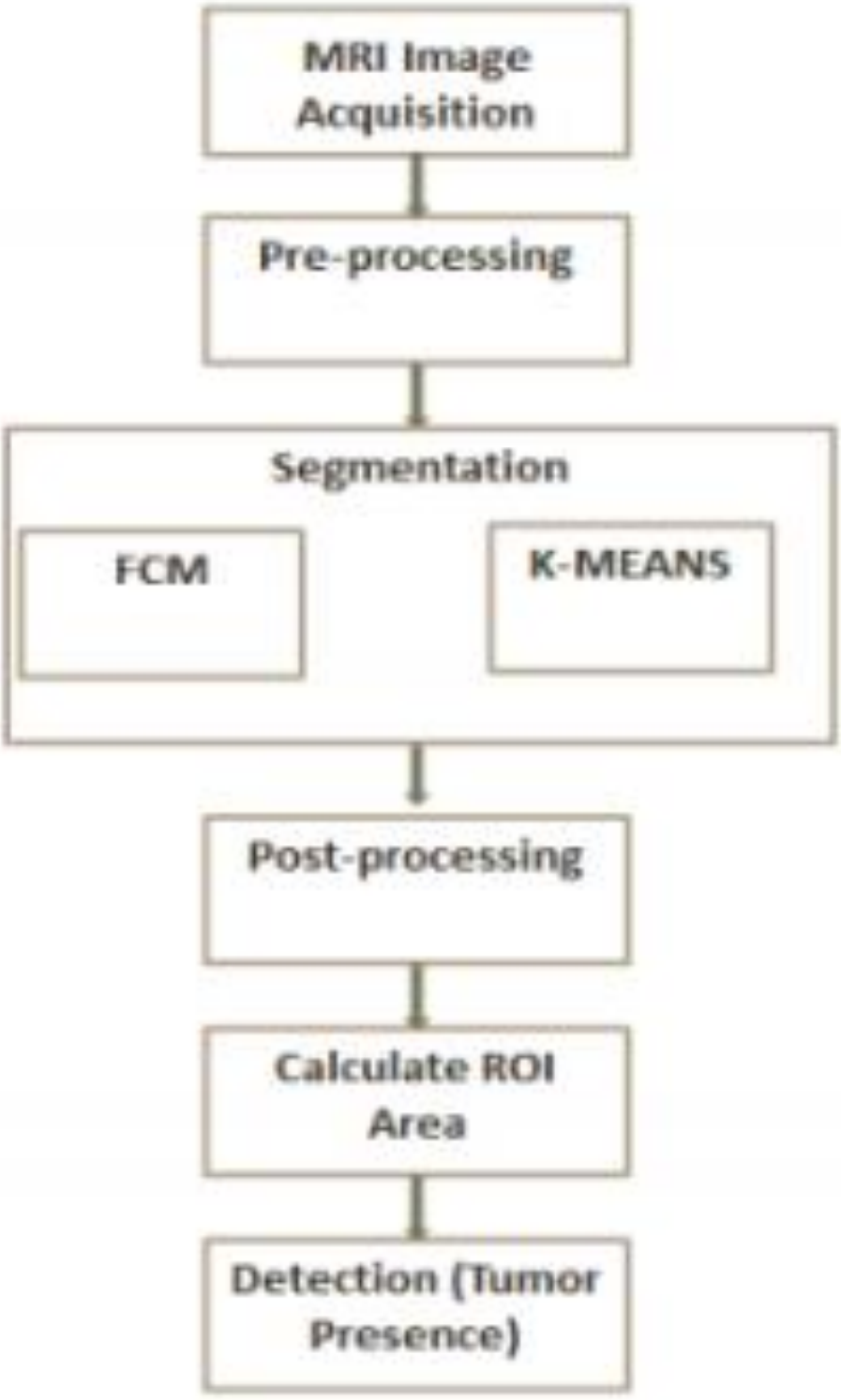

fig 1.4.1- proposed FCM model

5.3.1 HOME PAGE:

The home page is the first page of the website. This page gives us a brief introduction and provides a reference link to the upload section where the prediction takes place.

Figure 5.3.1 Home page

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5.3.2 UPLOAD PAGE:

On the page the uploading of image takes place. The validation of the results is done on the fact that the image to be uploaded must be that of MRI and the image format should be of the form .png, .jpg ,jpeg.only.

The prediction of the model is given to the app.py which in turn returns the prediction value which is linked to the upload page. The .h5 file of the model is given to the back end which is then linked to the front end to display the output.

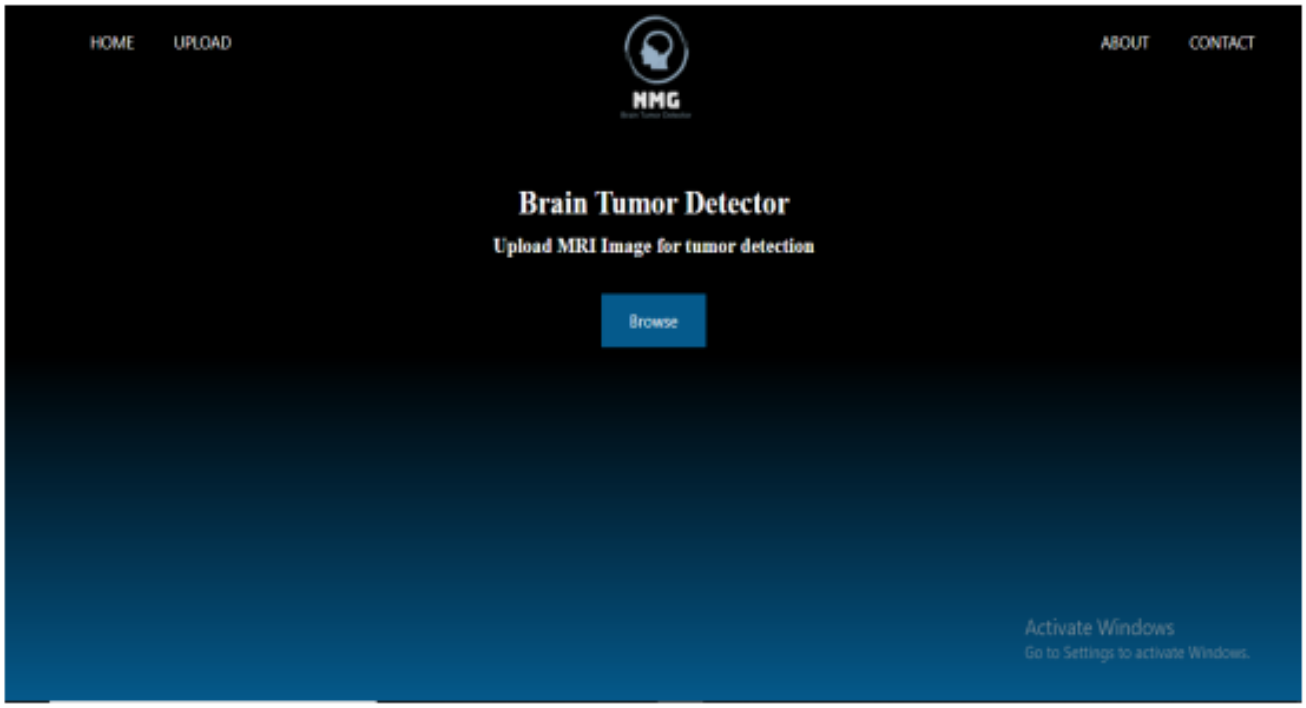

Figure 5.3.2 Upload Page Before Prediction

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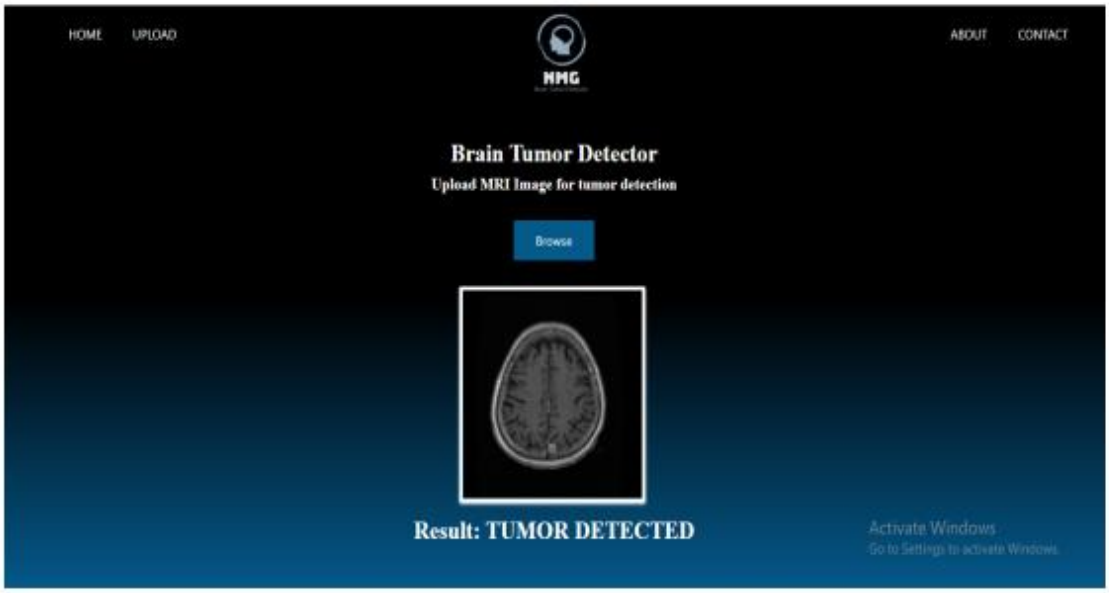

Figure 5.3.2 Upload page after prediction

5.3.3 ABOUT PAGE:

The about page gives a brief introduction to the program and the features of its model. It consists of a basic paragraph about the project and the model.

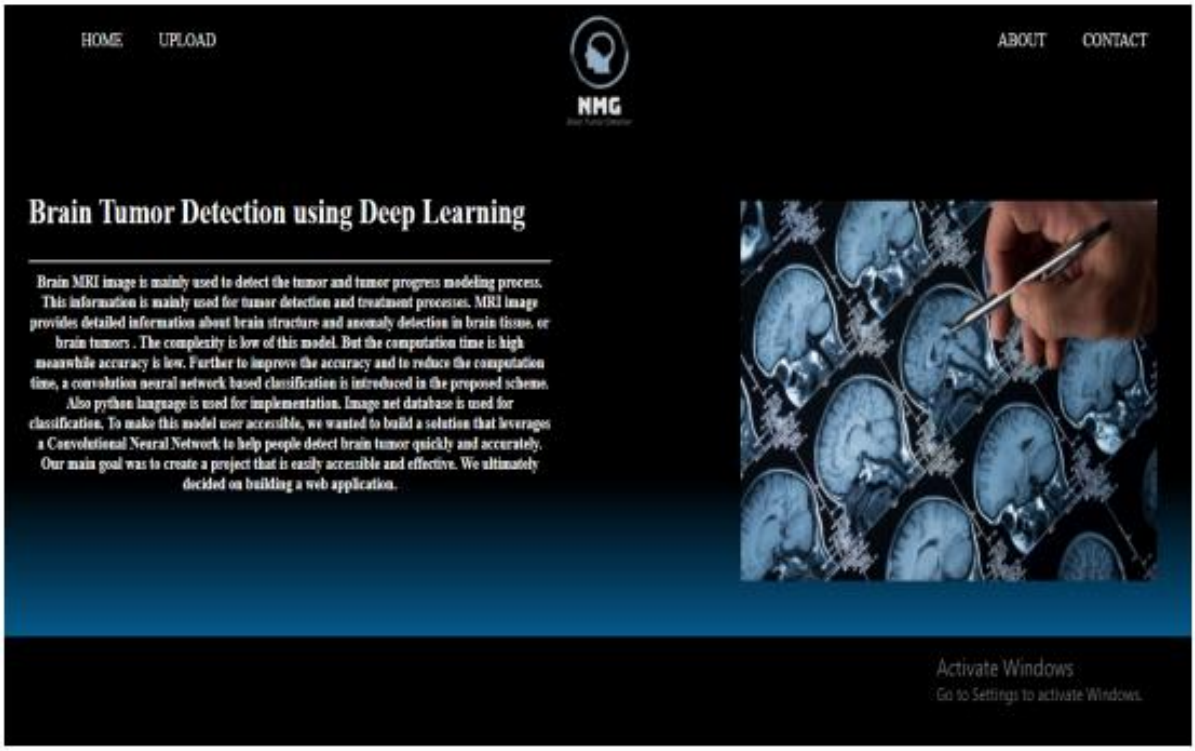

figure 5.3.3 About Page

5.3.4 CONTACT PAGE:

This page consists of the contact information of the developers of the project with a social media link to each along with their email addresses.

Figure 5.3.4 Contact page

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OUTCOME OF THE PROJECT

It is a web based project where one can display a graphic interface of a project by simply uploading MRI images. In this web based project we have used front-end and back-end programming languages to implement a user access project using https. The programming languages used as front-end programming languages in this project are html(HyperTextMarkup Language), CSS(Cascading Style Sheets), bootstrap and javascript programming language. The programming languages used as back-end programming languages are python and flask. We used an Atom editor for a virtual environment. Later, we are going to deploy our project so that it can be accessible by everyone and from everywhere. There is a lot of scope in biomedical image processing. Biomedical Image Processing is a growing and demanding field. It comprises many different types of imaging methods like CT scans, X-Ray and MRI. These techniques allow us to identify 95 even the smallest abnormalities in the human body. The primary goal of medical imaging is to extract meaningful and accurate information from these images with the least error possible. Out of the various types of medical imaging processes available to us, MRI is the most reliable and safe. It does not involve exposing the body to any sorts of harmful radiation. This MRI can then be processed, and the tumor can be segmented.

The current study developed a comparative analysis of brain tumor detection using machine learning methods. For more than one layer we have used CNN and the layers of CNN we used are also three (3). By comparing all the other models we conclude that a model using CNN with augmented dataset gives more accurate results. With a few training samples, the model gave 86% accuracy.If we increase the training data by more MRI images of patients or perform data augmentation techniques we can achieve higher classification accuracy. We used pre-trained architectures like Vgg19 for improving the model performance. Finally, the brain tumours can be detected with the help of deep learning and neural networks. The method is more suitable for detecting brain tumours in high glioma images than low glioma images

Best Practice 1: THINK – PAIR SHARE

1. Objectives of the Practice

The Chemistry Department has advance infrastructural ambience for teaching and learning with the special focus on practical's where student performance is evaluated with well-defined procedures. The curriculum is made more interesting by extending it to the applied aspects wherever possible like, Ground water analysis using Instrumental Analytical Techniques. The practical's are also taken as a means to bring about changes in the attitude of the students by inculcating values in them.

3. The context

Faculty has to prepare a series of questions for students to answer at the viva voce/ discussion sessions

Encourage students to participate and also efforts to overcome fear in students while presenting their topic.

0. Evidence of the Success

https://drive.google.com/file/d/1Sdq81wYNrxp6mKHybMHnnO4vFelZlZa/view?usp=sharing

0. Problems encountered and resources required

Time management, motivating students as these sessions were planned during covid-19 pandemic Wearing mask has been inevitable, though not bad, it too has established a mask culture over the world. Along with it arose some major problems, likewise, identity issues, healthy issues and bargaining. Production of mask has taken the shape of big profit making Industries. There is a lack of knowledge regarding proper wearing of mask. There is no check on production firms. Assessment and award of marks mainly based on

- Key arguments and findings
- Methodology and scholarship used
- Strengths
- Weaknesses

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Best Practice 1: CAREER VISION APPROACH

CAREER VISION APPROACH - National Science Day Celebrations

1. **Objective of the practice**

Science brings about solutions for everyday problems and provides answers to the greatest mysteries of the universe. Science is thus one of the most important channels of knowledge. It has a specific role, yet has various functions, for our society's benefit, i.e. improving knowledge and education, and enhancing the quality of life. A country can evolve thanks to scientists who find new approaches to problems and prove new scientific laws. In this regard, National Science Day is observed on 28th February each year in India, to honour the revered physicist Dr Chandrasekhara Venkata Raman's contributions.

Every year, National Science Day is celebrated with a concept or theme that focuses on the importance of science, and the Department of Science and Technology selects the theme.

National Science Day's primary objective is to ignite an interest in science, inspire people, especially students, to perform new experiments, and make them aware of the latest developments in science and technology. Several scientific activities and programs are organized on this day.

0. The context

On this day, various efforts and achievements in science are celebrated, and dialogues are held on the implementation of new technologies

Invite guest speaker , poster making , to encourage students in participating such events .

0. The practice

National Science Day: History And Significance

National Science Day is celebrated in India on February 28 each year to ark the discovery of the Raman effect by Indian physicist Sir ChandrashekharaVenkata Raman on February 28, 1928. It is one of the main science festivals in India. Every year students of the schools and colleges demonstrate various science projects and national and state science institutions demonstrate their latest researches on this day.

PM Modi extends greetings on National Science Day

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On the occasion of Science Day, 2021, the Department of chemistry conducted an informative Webinar on the topic “evolution of scientific methods”. The talk delivered by Dr. Rajeevan P.P Associate professor Department of Avionics IISC Bangalore ,highlighted the need to recognize and foster the essential values and professional ethics to become an asset to an organization. The session was a grand success and drew an attention of a large gathering comprising faculty and students.

The enthusiastic participation of the students was greatly appreciated.

Evidence for success

https://drive.google.com/file/d/1Ubzckz6awCXzs0_UrJPDWtMRz50GFS1R/view?usp=sharing

https://drive.google.com/file/d/1B6Pt_ozKwMrzKhdpEnhAKkNDk5Y3eGg2/view?usp=sharing

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https://docs.google.com/document/d/18FCTWL_zdpBeyWOe0VDEwmKcMdMNwaCo/edit?usp=sharing&ouid=106974383897430107421&rtpof=true&sd=true

https://drive.google.com/file/d/1ohusNnqh1upjIW9gAB14b28aFg2DJWki/view?usp=sharing

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Best Practice 1: BLENDED LEARNING

- **OBJECTIVES OF THE PRACTICE**

Blended learning combines modern learning technologies with traditional learning methods. Like any learning method, blended learning comes with unique benefits and draw backs that are important to consider when adopting blended and learning approach

Advantage 1: Well-suited for large groups

The first advantage is that blended learning helps you reach a larger audience in a shorter time.

Traditional classroom settings are constrained to a limited number of people at the same time.

Advantage 2: Better preparation and feedback

There is more time for useful discussions

Another important benefit is that blended learning makes traditional training more valuable. When people can complete assignments independently, they can come to class with the same knowledge level. There is more time for useful discussions and to practice what they have learned.

While they complete the online materials and assignments on their own, you can do less work and relax. Yet, it's also possible to assist learners who require more information, which is one of the main benefits of blended learning. You can complete the feedback loop when you adjust your training based on the first training sessions' results

0. The context

It's hard to disagree that there's a significant amount of work involved in the early stage of blended learning where you set everything up. It's not easy to switch to a new method if you are already accustomed to a traditional approach. You might wonder how to balance face-to-face training with online training. It can take a while to reap the benefits of this learning approach

Another disadvantage is that, depending on how you set up blended learning, it might diminish the motivation of your participants. Not every blended learning model is suited to every person, task, subject, or organization

0. The practice

Some people in the education sector are not big fans of technology, even though they recognize its benefits. Also, some employees and customers might not like it either, mostly when they are already used to face-to-face training.

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Blue-collar workers and more traditional learners, for example, might appreciate hands-on training much more than learning from their smartphone screen. Given that no one can deny technology's benefits, taking up a blended approach can solve this problem.

Keeping people engaged and interested in what you are saying while teaching a mandatory training course can be daunting, even if you are the trainer! Imagine having to repeat yourself over and over and not being able to measure if your trainees have paid attention to what you said!?
Blended learning eliminates this problem. Move the theoretic part of your training online, and follow it up with tests that measure your employees' knowledge.

0. Evidence of success

https://docs.google.com/spreadsheets/d/1OkG2buSWjt8h_O8EnncW0fXKjOaOyFlNvz_a-fXf17k/edit#gid=1993622257
https://drive.google.com/file/d/1HXD46VC__IMzxGrljfzohF_GyLGixVek/view?usp=sharing
https://drive.google.com/file/d/1a3VkWJbnTPRN2-ojwYke48Vfp2cIzePk/view?usp=sharing
https://drive.google.com/file/d/15FWuRJ6ZTQlnc8qjvgtQttA8OoZ0CXYr/view?usp=sharing

Best Practice 1: BLENDED LEARNING

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Date: 28-02-2021

From
Dr.Basheer Ahmed
Advisor cum Director
MJCET,Hyderabad.

To
Prof. Anantha Lakshmi
Professor of Physics
University of Hyderabad

Dear Madam

Physics Department of MJCET is organizing the Guest lectures on National Science Day every year. This year also we are celebrating the National Science Day. So we request you to deliver a lecture on 24th **Feb**2021 on topic of **"Role of Women in Science"**. Hope you will accept our invitation and spare your valuable time from **2.00pm to 5.00pm** on the National Science Day. Hope you will oblige to our request.

Thanking you

Prof. Basheer Ahmed
Advisor-cum-Director

8-2-249 to 267, "Mount Pleasant" Road, No. 3, Banjara Hills, Post Box No. 14, Hyderabad - 500 034.
Phone : 040 - 23280301, 23280305, Fax : 040 - 2335 3428. Website : www.mjcollege.ac.in
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Best Practice 1: CAREER VISION APPROACH

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24-02-2021

To
Dr.Rajeevan.P.P
Associate Professor
Department of Avionics
Indian Institute of Space Science and Technology (IIST)
Thiruvananthapuram
Sir,

Sub: Invitation to be esteemed speaker in the webinar to be conducted on 4th March -2021 on accounts of National Science day celebrations -2021

Let me proudly introduce our institution **Muffakham Jah College of Engineering and Technology,** a premier institution, located in the heart of the city, Banjara Hills, having courses of eight Engineering fields in under graduation as well as five courses in post-graduation level and three branches offering doctoral research.

With this backdrop, let me take pleasure in inviting you to be the **Guest speaker** for the webinar on **4-03-2021** (Thursday) at 2:30 PM on account of National Science day celebrations - 2021
Sir, all preparations are at its peak, faculty and students are taking part with much enthusiasm and with your enlightening talk the celebrations will become more graceful.
We acknowledge your hectic routine but without your motivational speech our science day celebrations will be incomplete.

I hope you will very kindly give your consent to be our Guest speaker

With regards,

Dr.Shanthi Vunguturi
Associate Professor & Coordinator - Chemistry
Department of BS&H

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25/02/2021
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National Science Day Celebrations

MUFFAKHAM JAH COLLEGE OF ENGINEERING & TECHNOLOGY

February-28, 2020

Minute to Minute Programme

Venue-Seminar Hall

2.30 – 2.32 PM Qirat by Mr.Mohd.Azharuddin

2.32 – 2.35 PM Welcome the Guests on the dias and bouquet presentation by Dr.V.Shanti.

2.35 – 2.40 PM Address by Prof.AbdulMajeed, Head, Basic Sciences & Humanities

2.40 – 2.45 PM Address by Dr. Basheer Ahmed, Advisor cum Director

2.45 – 2.47 PM Guest of Honour introduction by Dr.ShabanaTahniath

2.47 - 2.52 PM Address by Guest of Honour, Mr.NageshMarupaka, Project Director, TSCOST, Govt of Telangana

2.52 – 2.55 PM Chief Guest Introduction by Dr.ShabanaTahniath

2.55 – 3.00 PM Address by Chief Guest, Prof.P.Anantha Lakshmi, Professor of Physics, University of Hyderabad.

3.00 – 3.05 PM Memento Presentation to Guest of Honour and Chief Guest by Advisor-cum-Director

3.05 – 4.15 PM Lecture on "Role of Women in Science & Technology" by Chief Guest

4.15 – 4.20 PM Prize distribution for science day event by Chief guest

4.20 PM Vote of Thanks by Dr.Shaik Kareem Ahmed

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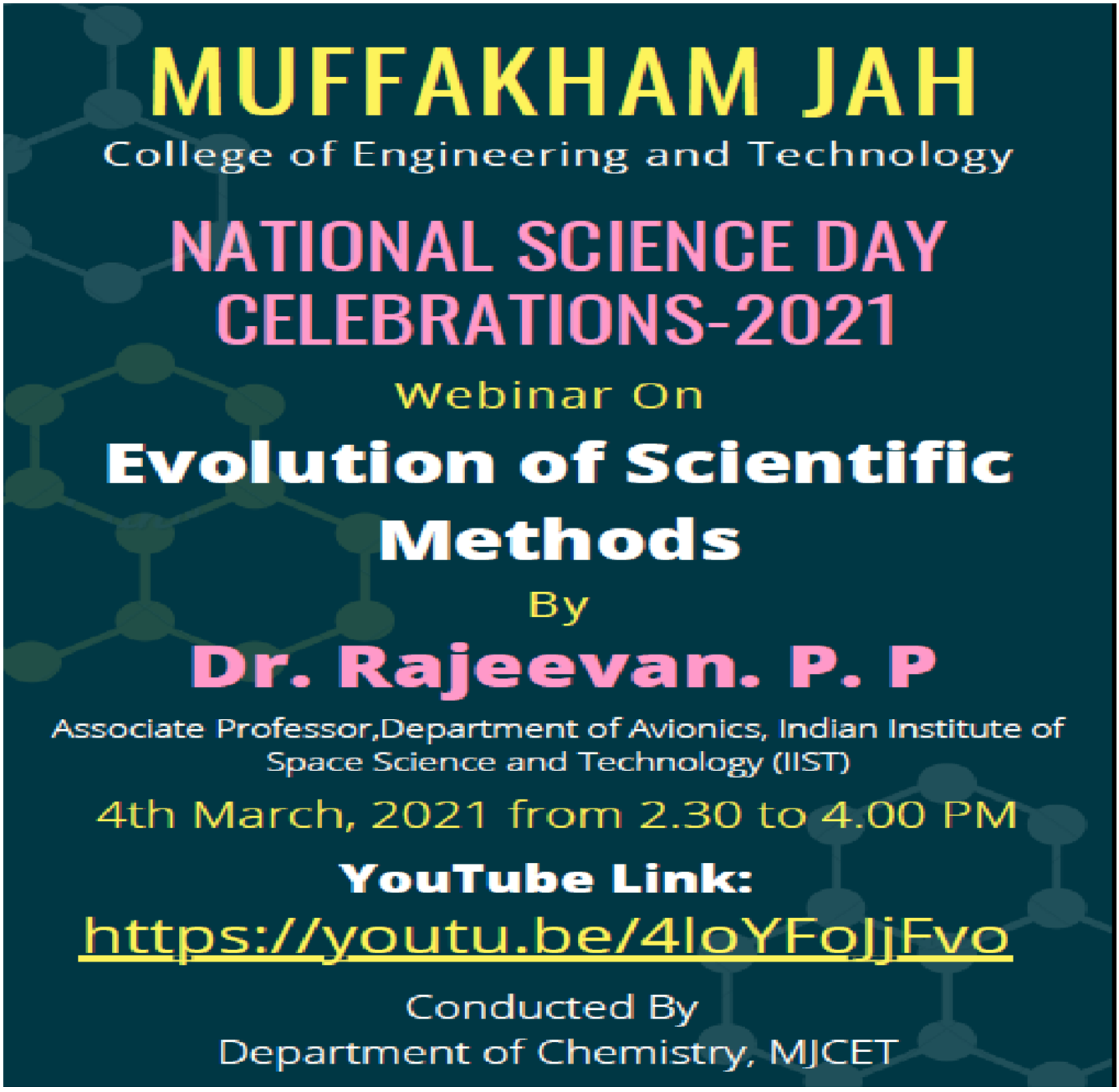

Best Practice 1: CAREER VISION APPROACH

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Best Practice 1: PROJECT BASED LEARNING

1. OBJECTIVES OF THE PRACTICE

The goals of High Quality Project Based Learning are to: Teach academic content knowledge and skills, and develop deeper understanding. Build success skills such as critical thinking, problem solving, communication, collaboration and creativity/innovation

2. Advantages:

- Deeper engagement and interaction with learning content.
- Encouragement of higher order thinking and problem-solving skills.

3. The context

Within his theory, project-based learning is considered a method that engages students to invent and to view learning as a process with a future instead of acquiring knowledge base as a matter of fact. The practice

4. Evidence of success

- Students of the fourth year production have Non Conventional Energy Sources as an Open elective in their curriculum. To enhance their skills in their subject, students approached to the concerned faculty and requested to provide some addition source which may help to understand the concept easily.
- In this connection faculty has provided a technical paper published and requested them to follow the same for understanding the concept related to associated topic.

Subject: Non Conventional Energy Sources

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Students:**Name**	**Roll No**
TAUSEEF UNNISA	1604-17-738-001
ZAID FARUQI	1604-17-738-011
MOHD JUNAID ULLAH KHAN	1604-17-738-015
MOHAMMED RIZWAN AHMED	1604-17-738-032

Title of the paper: Design of a Solar Distillation Plant

- **Abstract:** Parabolic collectors are used to collect the energy from the sun. And water purification is one of the fore most issues now a day a human is facing in rural areas, urban areas and also chemical industries. In the present work a case study has been carried out at SUES campus pharmacy laboratory to supply the distilled water and to carry out the experiments. The design for the Solar distillation plant works under the principle of concentrating the Sun's energy on a thermally conducting water tube to heat up the flowing water to vapour, there after it gets condensed and is later collected it in a pure form of water used for laboratories. The distillation is the requirements for this specific design are a target for distilling 80 litres of water per day regularly with low maintenance.

Design of a Solar Distillation Plant

[1]S. Irfan Sadaq, [2]Ajaz Fatima, [3]Faisal Mohammed Akbar, [4]Sadia Alvi

[1]Mechanical Engineering Dept., Muffakham Jah College of Engineering & Technology, Hyderabad, Telangana, India
[2]Electrical Engineering Dept., Muffakham Jah College of Engineering & Technology, Hyderabad, Telangana, India
[3,4] Mechanical Engineering Dept., Muffakham Jah College of Engineering & Technology, Hyderabad, Telangana, India

Abstract— Parabolic collectors are used to collect the energy from the sun. And water purification is one of the fore most issue now a day a human is facing in rural areas, urban areas and also chemical industries. In the present work a case study has been carried out at SUES campus pharmacy laboratory to supply the distilled water and to carry out the experiments. The design for the Solar distillation plant works under the principle of concentrating the Sun's energy on a thermally conducting water tube to heat up the flowing water to vapour, there after it gets condensed and is later collected it in a pure form of water used for laboratories. The distillation is the requirements for this specific design are a target for distilling 80 litres of water per day regularly with low maintenance.

Keywords— Water Distillation, Solar collector, Concentrator, Design tube.

I. INTRODUCTION

Renewable energy is a form of energy which is not depleted till the world is alive. There are many energy sources out of which commonly use is solar energy and wind energy. Parabolic collector is one of the solar collectors used to trap energy from the sun. The principle behind this collector is evaporation and condensation process. Solar distillation technique is of the most useful method of extraction of distilled water from the source of sun.

This water is used to produce potable drinking water and also to produce water for lead acid batteries or in chemical laboratories. The level of dissolved solids in solar distilled water is approximately close to 3 ppm and bacteria free. The distillation is the requirements for this specific design are a target for distilling 80 litres of water per day regularly with low maintenance.

The process starts from the Sun that acts as the prime source of energy. An array of metal sheets act as a reflecting surfaces that reflects the energy carrying sunrays to their focus. These sheets are shaped parabolic and hence called parabolic concentrators. On the focal point of each of the concentrator is a metal tube that is designed to carry the feed water to be heated. The tube gets its required heat from the reflected solar energy and heats up the water to its vapour form. The heated vapour develops a pressure that is driven out from a vapour exit knob. As the process has a complete entry and exit scheme, it runs as a complete cycle until the source water is completely distilled and collected by a condenser mechanism.

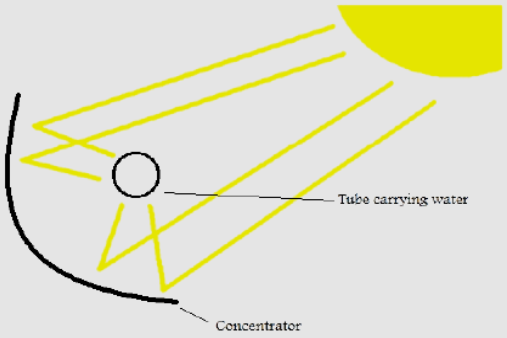


Fig. 1: Concentrator focusing the suns energy on the tube system.

II. BLOCK DAIGRAM

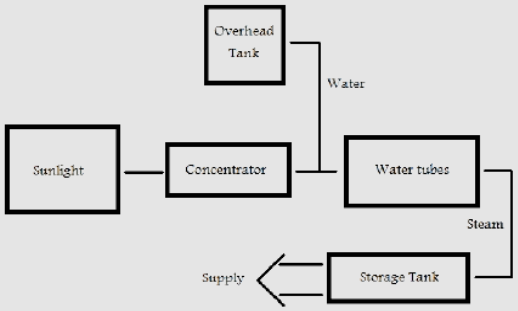
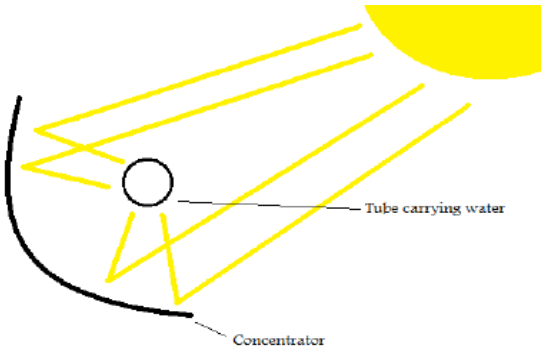
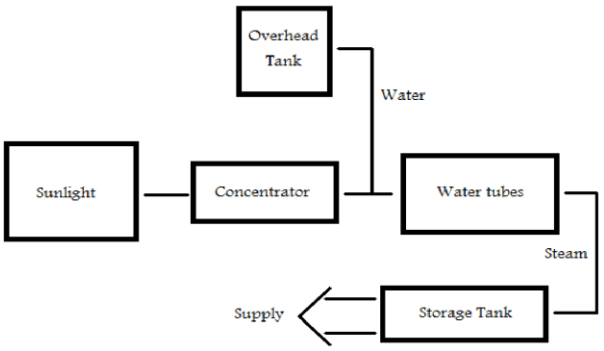


Fig. 2: shows the block diagram of the system

The design comprises of the following parts:

1. The Overhead tank
2. The parabolic concentrator
3. The central tubes
4. The water feed tubes
5. The vapour collector tubes
6. The condenser





V. DESIGN CALCULATIONS:-

Water requirement 80lt. /day=20 lt. /hr

(assume for 4hrs working)

= (20*1000)/3600=5.55 cc/s =6 cc/s

=0.006 kg/s

Initial transfer 30°c,

Heat required to raise the temperature up to 100°c

= m Cp Δt

={0.006*4180*(100-30)}/1000 KW

=1.75 KW

Latent heat of steam (atm. Pressure) = 2256.7KJ/kg

Heat required=0.006*2256.7=13.54 KW

Total power requirement= 1.75+13.54=15.29KW=15.3KW

Solar radiation available for Hyderabad=300 w/m2

(Note: changes from winter to summer. This value for summer)

Area required for solar energy collection= (15.3*1000)/200

=25.5 m^2

An arrangement as in the design is suggested for the collector and water.

Inner diameter= 60mm

Outer diameter=75mm

All 75mm tubes are half tubes

Area available per meter=π (0.0751)

= 0.2355 m2/ m length

Length required =51/0.2355=216.56 m

≅ 220 m length

According to the data 220m length tubes in 4 panel, 55m /panel. Assuming 2m length tubes, we need 28 tubes /panel.

Width of the panel= 28* 75=2100mm

≅ 2.1 m (only for tubes)

2m*2.1m panels, 4 numbers accommodate this area.

Consider 6mm diameter tubes for water flow. We have 28*6mm diameter copper tubes for each panel.

Average velocity of water= (0.006 m3 /s)/ [(π/4)*0.006 *28*4 m2]

= 1.895 * 10-3 m /s = 2m/s

Results & Discussions:

The following results were obtained after designing the solar collector the velocity to maintain for achieving the 81 liters of water in a day is 2m/s. The inner diameter of tube is 60mm, outer diameter 75mm. Total insulation required is 2.5 MJ/m2/hr. Total radiation at declination 18.79o, hour angle 96.156o, day lenght 12.8hrs is 306 W/m2. These data has been taken in to account in considerations for effective heat management for systems that are placed in mixed, temperate environmental conditions.

With the help of faculty's support the students were able to learn the concept regarding the parabolic collectors and their basic design calculations, which is a topic in non-convention energy sources. They got hands on experience on design of a Solar Distillation Plant.

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Best Practice 1: EXPERIENTIAL LEARNING

1. OBJECTIVES OF THE PRACTICE

While project-based learning has been criticized in the past for not being rigorous enough, the following features will greatly improve the chances of a project's success.

- A realistic problem or project that aligns with students' skills and interests, and requires learning clearly defined content and skills (e.g., using rubrics, or exemplars from local professionals and students).
- Structured group work with groups of three to four students, with diverse skill levels and interdependent roles; team rewards; and individual accountability, based on student growth.

2. ADVANTAGES:

- Development of peer and professional networks.
- Engagement with potential employers and career mentors.

3. THE CONTEXT

- Drone Technology learning

- **Evidence of success**

Students of EED once again participated in Drone Dance Competition Organized by Board of International Aviation Games, Delhi, India in the year of 2021. The video is on YouTube for competing with other college teams. One of the criteria for the winning is number of likes to the video.

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Road No 3, Banjara Hills, Hyderabad-500034

ELECTRICAL ENGINEERING DEPARTMENT

Date:-08/12/2021

- **Year of collaboration with Binford:2020**

Event-1: Two Days Awareness Program on Drone Technology held on 30th and 31 Dec 2020.

Student Participants

- GhulamMutakabbir(EED)
- BuddhavaramChaitanya Roy(EED)
- Mohammed Sohel(EED)
- Syed Aziz Ahmed(EED)
- Syed Nabeel Ahmed(EED)
- Irshad (EED)
- Mirza AtaAbbas(EED)

Committ Members:

1. Dr. Mohammed Haseeb Khan	Professor & HEAD, EED
2. Dr. IshratMirzana	Associate Professor, MED
3. Dr. Mohammed Sajid	Associate Professor, EED
4. Mr. Arshad Mohammed	Assistant Professor, EED
5. Mr. G. Ravikiran	Assistant Professor, EED
6. P. Bharathi	Assistant Professor, EED

Event-2: Drone dance competition in the year of 2021

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Student Participants

1. B. Sidhant(EEE)
2. BuddhavaramChaitanya Roy(EIE)
3. Mohammed Sohel(EEE)
4. Syed Aziz Ahmed (EEE)
5.

Mentor of the Team: Dr. Mohammed Sajid, Associate Professor, EED

Head of the Department: Dr. Mohammad Haseeb Khan

Activity-3: Ongoing R & D Project: - Object Detection And Surveillance using Quad Copter

Project Guide:- Mrs P.Bharathi Assistant professor , EED

Students:

B. Chaitanya Roy, 1604-18-739-010

Syed Nabeel Ahmed, 1604-18-739-017

- **Students Competitions:** In coordination with Binford research labs private LTD, students of EED participated in Drone Dance Competition Organized by Board of International Aviation Games, Delhi, India in the year of 2021.

Team MJCET has Secured 2nd rank in Central India zone and 4th rank in national level.

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Student Participants

1. B. Sidhant (EEE)
2. Mohammed Sohel (EEE)
3. BuddhavaramChaitanya Roy (EIE)
4. Syed Aziz Ahmed (EEE)

Mentor of the Team Dr. Mohammed Sajid, Associate Professor, EED

Head of the Department: <u>Dr. Mohammad Haseeb Khan</u>

Technical workshop with hands on session in collaboration with Binford research labs private LTD

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Two Days Hands on session held on 30th and 31 Dec 2020

- Students of MJCET attended the program
- An expert talk from **Binford research labs private LTD** was organized for better understanding of niche aspects of drone technology.

Fig. Hands on session held on 30 and 31 December 2020

Drone dance series-2

Students of EED once again participated in Drone Dance Competition Organized by Board of International Aviation Games, Delhi, India in the year of 2021. The video is on YouTube for competing with other college teams. One of the criteria for the winning is number of likes to the video.

Drone dance link:https://youtu.be/-Iyi_M4wZvw

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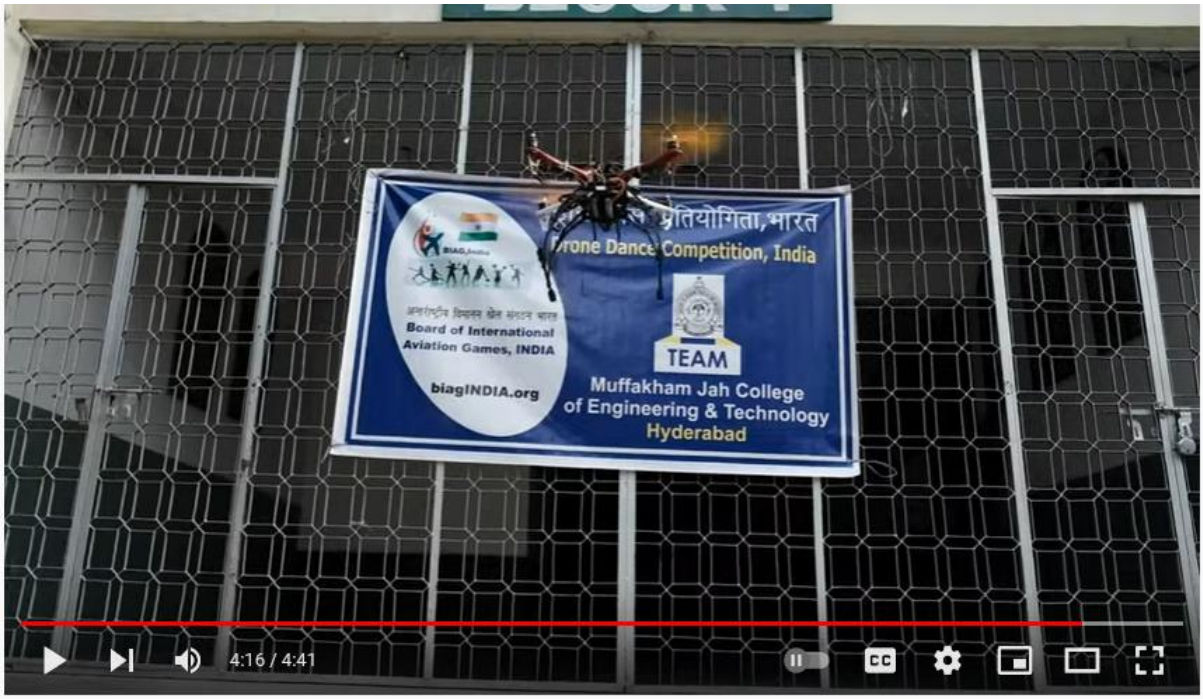
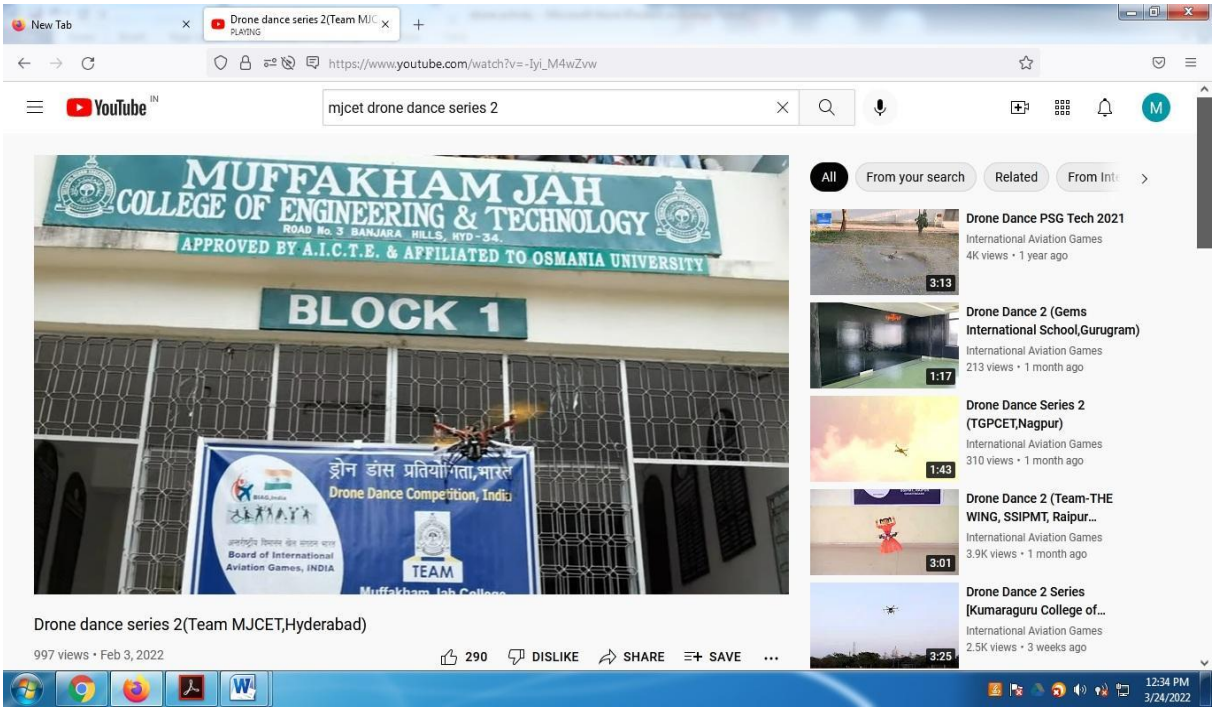


Drone dance series 2(Team MJCET,Hyderabad)



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Best Practice 1: TECHNOLOGY FOR ENGLISH LANGUAGE LEARNING

ENGLISH LANGUAGE LEARNNG

By
Dr. Sher Mohammed Khan,Asst. Professor, and
Dr. Shabana Tahniyath Asso. Professor, Dept. of English MJCET

OBJECTIVE :

Enable Learners to use Online Resources and Technology for Developing English Language Proficiency

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Technology and English Language Learning

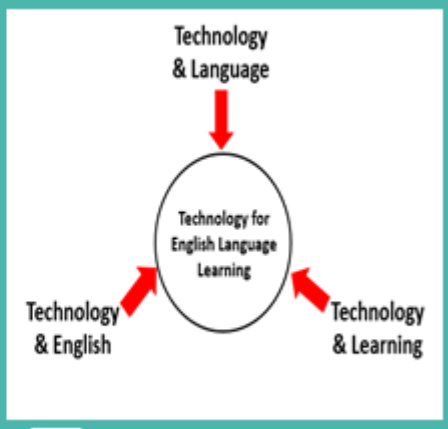
- Technologies today are widely used for communication and for learning.
- Computer technology - Course materials, teaching, evaluation etc.
- Students use interactive technology to do their course assignments.
- Course management systems to submit their assignments to their teachers and to communicate with each other and with the teacher.

Course Management System or LMS

The Connection between Technology and Language

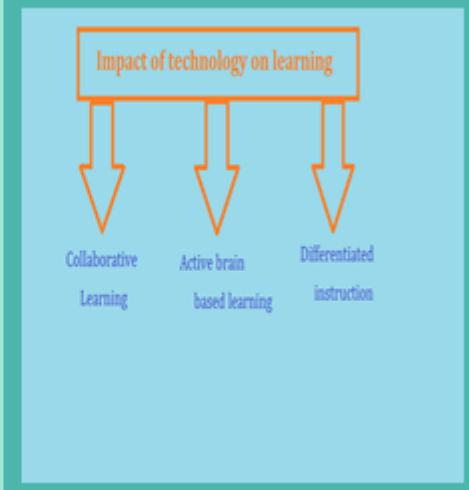
Our topic is affected by these larger trends in society:

1. The connection between technology and language,
2. The connection between technology and learning,
3. The connection between technology and the English language.



Connections... cntd.

- Operate outside of our classrooms
- They all impact what happens with how we use technology for English language learning.
- All of these larger societal trends provide new opportunities - use technology for English language teaching and learning.



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How can learners/teachers use communication and learning technologies for English language learning?

As a result of these trends and and impact of technologies for English language learning, students and teachers need to learn where they fit in this dynamic world of technology.

- Learners must be able use the resources that technology provides in a variety of ways that changes what they do in the classroom.
- Teachers need to learn about the resources and how to use them to develop pedagogy. (the method & practice of teaching/learning)

6 Areas of English Language Learning: Listening, Vocabulary, Grammar, Speaking, Reading and Writing

- Each of these areas is something that we tackle in the English language classroom, even though students use all of these skills and abilities and knowledge together when they create new meanings.
- For each of these areas we'll look at how students learn and how technology can help.

Develop me HERE

Importance of Listening

- **Listening** is key to all effective communication. The ability to actively listen demonstrates sincerity, and that nothing is being assumed or taken for granted.
- Active listening is most often used to improve personal relationships, reduce misunderstanding and conflicts, strengthen cooperation, and foster understanding.
- Listening forms the basis for speaking. We tend to speak the way we listen.
- In conversations there is a whole lot of listening. And without listening, one cannot do a whole lot of speaking.
- So, in an important sense listening is part of speaking.

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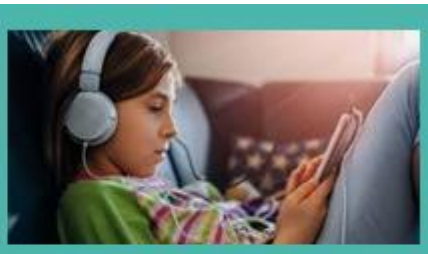
Technology

Technology today provides access to many different ways for students to listen..

- Students have access to technology to listen on what's going on in the English-speaking world and can take advantage of all the resources that are available on the Internet in English.
- Many resources to help learn listening on the Internet, too. Now we listen to a lot of this information online.
- So listening has become very important, especially in the last ten to twenty years, as the Internet has become more and more common



What learners need to lea

- Not only audio cues, but visual ones as well—so anything in the listening context or environment that will help the student to understand better. They need to learn how to use these things.
- Top-down listening is what is needed to get the main idea, Bottom-up listening focuses on the phonology, words and phrases. Students need to learn both top-down and bottom-up strategies.
- Understanding details matter both in listening and in speaking.
- Emphasizing listening in conversation classes helps the students to learn better.
- have a lot of listening, listen to each other, listen to teachers and audio materials with a variety of speakers and listen to a lot of media.

Resources for Listening

https://learningenglish.voanews.com/a/3686764.html

https://learningenglish.voanews.com/

Voice of America: http://www.voanews.com

American English: Sing Out Loud

Children's songs: https://americanenglish.state.gov/resources/sing-out-loud-childrens-songs

Traditional songs: https://americanenglish.state.gov/resources/sing-out-loud-traditional-songs

Resources for Listening

EFL listening websites:

ESL Lab: http://www.esl-lab.com

ESL Lounge: http://www.esl-lounge.com

Many Things: http://www.manythings.org

TED Ed: https://www.ted.com/watch/ted-ed

YouTube: https://www.youtube.com

https://www.engvid.com/

Additional Websites:

NBC: http://www.nbcnews.com/nightly-news

ABC: http://abcnews.go.com/Video

CBS: http://www.cbsnews.com

PBS Kids: http://pbskids.org/video

National Geographic: http://www.nationalgeographic.com

Academic Earth: http://academicearth.org/electives (Links to an external site.)

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Websites for Listening

First let's take a look at the many different websites that are available for listening for English as a foreign language students.

URL for the following segment:
https://youtu.be/deyFTOfLoM0

Ted.Ed resource

URL for the following segment:
https://youtu.be/JCz4bV3mWeY

URL to the following segment:
https://youtu.be/O2F5EYxtF9Q

And as a result, you feel like your speaking improved, just from listening.

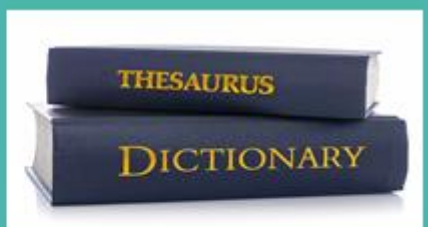
Importance of Vocabulary

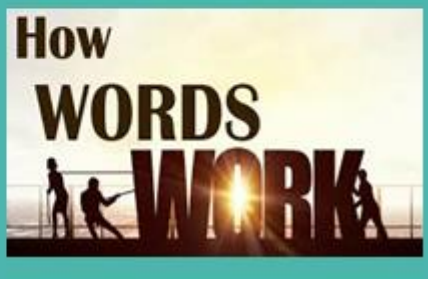
"Without grammar, little can be conveyed. Without vocabulary, nothing can be conveyed."
David Wilkins

Grammar helps us structure and refine and clarify what we mean, but vocabulary really does the heavy lifting in terms of conveying meaning.

ntd.

- You can't say much without grammar but without vocabulary, nothing can be conveyed. You can't say anything without vocabulary.
- Vocabulary holds the meaning. It is the stuff we talk about, so it's really important.
- Typically, vocabulary is learning the meanings of words, but there's a lot of other information about words that we need in order to use them well.





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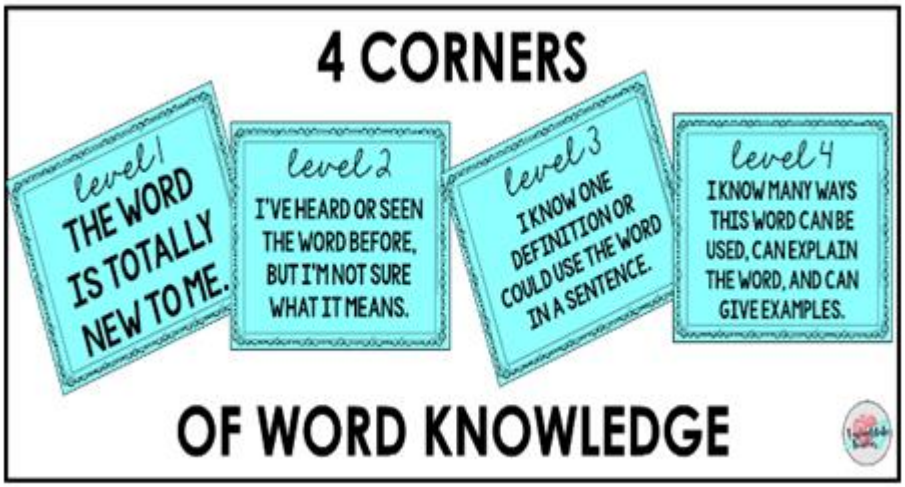


Intentional and Incidental Vocabulary

- One really useful distinction to keep in mind is that between incidental vocabulary learning and intentional vocabulary learning. Incidental would be where we pick up new words without meaning through reading or listening

- Great deal of second language vocabulary can be learned this way.
- Should do a lot of reading outside of class—reading for pleasure, extensive reading--and also listening to English language radio programs or English pop songs or English language movies or TV shows that provide some form of comprehension support or input in terms of captions or subtitles or something like that.
- These aids help make connections between form and meaning and acquire new words incidentally.
- Learning words intentionally - making a deliberate effort to identify words-useful to us and also doing things that'll help those words stick in our memories so that they're available to be used later.

Technology-vocabulary Tools

There are many important connections between technology and vocabulary today. Technology provides access to many different ways for students to study vocabulary

- **Voice of America (VOA)** -News Words: Obliterated: http://learningenglish.voanews.com/a/3522697.html
  - Additional News Words stories: http://learningenglish.voanews.com/z/3620.html
  - The VOA news reports lesson plans: http://learningenglish.voanews.com/
  - New Details on Asteroid Strike That Killed Off the Dinosaurs is available at https://learningenglish.voanews.com/a/new-details-on-asteroid-strike-that-killed-off-the-dinosaurs/5082360.html
- **Lingro.com** - Please click on the link to the website www.lingro.com

Internet search - to search the internet for vocabulary items.

- **Corpus of Contemporary American English (COCA)** http://corpus.byu.edu/coca/
- **Spell Checker** (e.g., Microsoft Word, GoogleDocs, SMS autocorrect, etc)

COCA Tutorials

A **corpus** is a collection of texts, written or spoken, usually stored in a computer database.

COCA - The List function

COCA - The KWIC function

COCA - The Collocates function

COCA - The Collocates function

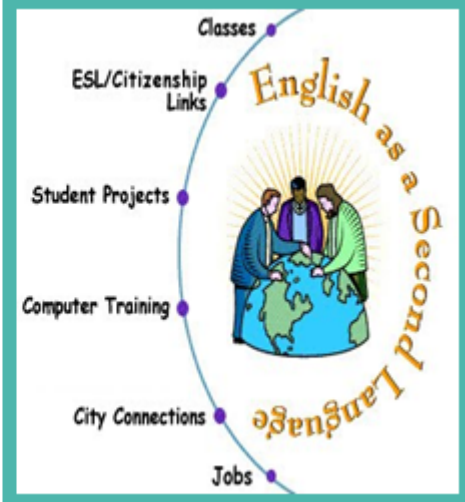
COCA - The Compare function

COCA - The Chart function

Importance of Speaking

- Speaking is such an important skill for English learners to develop.
- People need to be able to talk to get things done, and to maintain social relationships.
- These uses of oral language can be accomplished through speaking face-to-face or at a distance over the Internet.
- Speaking is the basis of oral language. If you learn a foreign language and you can't speak, it feels like a failure.
- If you ever travel and you want to use the language.

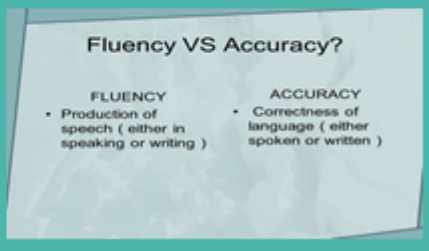
- Understanding what other people are saying to you and also being able to communicate with them.



Accuracy

Two dimensions of speaking: fluency and accuracy. Learners need to master each one of these dimensions.

- Tension between being fluent and being accurate. Sometimes, you can be very fluent, like in greetings, and you don't have to worry very much. There are other times that accuracy gets in there, and you wonder, "Am I saying this wrong? Am I using the wrong word? Am I using the right word? Am I getting my message across?" In a second language, that's always the issue.
- Fluency and accuracy--work together to make good, clear, comprehensible speech. But while learning how to speak, those two dimensions of speaking really work against each other.
- While trying to speak accurately, they are often very slow and hesitant. They are stopping to think. Their speech isn't automatic and fluent. So when accuracy is up, fluency can go down.
- When talking casually and the words are just flowing, the accuracy isn't always possible. So these two dimensions need to be developed simultaneously.



Pronunciation

The other part of oral communication is pronunciation. It is really the face of language.

- Pronunciation is the thing people first notice. Even if someone speaks well, you notice whether or not they are speaking like you.
- We make all kinds of judgments about people because of that, and so, pronunciation is essential for interpersonal communication
- We know the spelling, but in order to actually use a word or an expression in their own speech, they need some help. We need tools to provide us with an example of how to pronounce the expression. Examples for students, are abundant.
- Phonology and morphology can help master speaking. Phonology is the study of the sound system of a language and how the sounds work together.

Technology-Speaking Connection

- The Technology-Talk Connection. New technologies have provided new ways for people to connect with each other, and part of the connection is maintained through oral language.
- These technologies also give teachers new opportunities for engaging students in oral conversation as well as pronunciation practice.
- We'll start by looking at two examples of the new opportunities for speaking practice that we find on the Internet: Pronunciation tools and opportunities to connect.

Resources for Learning Speaking:

1. YouGlish: http://youglish.com
The website claims to give "fast, unbiased answers about how English is spoken by real people and in context." While not all words yield results, many do and show words pronounced and used in context.
2. Merriam-Webster: https://www.merriam-webster.com
3. Skype https://www.skype.com/en
offers free audio/video calls among its users.
4. Google Hangouts https://hangouts.google.com
allows for free audio/video conference calls.
5. WhatsApp (https://www.whatsapp.com) is a popular tool in many parts of the world
6. Microsoft PowerPoint is a market leader when it comes to putting together presentations. Language learners can use it to create presentations and narrate them.
7. Screen capturing applications are particularly useful for the creation of tutorials.
8. Prezi https://prezi.com is an online option for the creation of presentations.

Tools

there are tools for listening to the pronunciation of words and connected speech. There are audio chat tools for collaborative work. For example, discussion of a topic before presenting as a group.

There are tools for creating presentations. There are sites with good pronunciation help and conversation partners.

There are conversation groups that can be formed on a common interest and that's within the class, within language learner sites on the web, or within fanfiction sites.

Please visit resource corner For more resources

What learners need to know

- To learn speaking, you have to always learn both elements: for fluencyand for accuracy. Learners of a language need to just feel comfortable producing language and not worrying so much about whether it's right or wrong.
- But at some point, they also need to work on places where accuracymatters. These two things should be separated.
- Understand the nature of progress: that often, automaticity(how automatically we can produce things) don't follow. This is normal, and it will come to a point where it becomes more automatic.
- Learners of any age can improve in speaking or in pronunciation. It's not a hopeless thing. Adult learners think that they're just never going to be able to do it. It is not so,anybody can improve. It's like any other skill. You just need to do it.

Advice for teachers

Linguists emphasize that accented speech is not a problem for students. So, teaching should really focus on comprehensibility: can the student be understood? When teachers correct errors, there are lots of errors to choose from and so teachers should focus on those that are actually a problem for comprehensibility without trying to reach a goal of native-like pronunciation.

The goal for speaking instruction should be comprehensibility rather than native-like pronunciation.

Grammar and technology

Below are the links to the resources for exploration:

- Voice of America Every Day Grammar TV at http://learningenglish.voanews.com/z/4716.html
- Activate: Games for Learning American English https://americanenglish.state.gov/resources/activate-games-learning-american-english-word-bricks
- Longest Sentence Activity: https://americanenglish.state.gov/files/ae/resource_files/word_bricks-longest_sentence_instructions.pdf
- American English Facebook Page: https://www.facebook.com/AmericanEnglishatState/
- ; Measure Words

THANK YOU

All the resources, Glossary and the Quiz will be made available to you in the next session (20th Jan.2021)

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Objective

- To enable students to use Online Resources and Technology for developing English Language Proficiency.
- To enable students to improve their communication skills, collaboration, and efficiency by participating in online discussions and presentations,
- To help students acquire and maintain basic knowledge and skills in technology for professional purposes through hands-on learning.
- To help teachers integrate pedagogical knowledge and skills with technology to enhance their language teaching and learning through their reading, discussion, and creation of new learning activities.

The context

Smartphones have become so handy today that it's almost impossible to catch anyone without them. Using smartphones to learn English Language Skills (LSRW) will be easier and more effective. This webinar intends to provide direction to learners (engineering students) and introduce them to specific free resources available on the Internet.

People worldwide now communicate via the Internet, and most of the communication is conducted in English as a result of technological advancements. Because so many people speak English, it has become the global language; it is the language that many people use for communication. As a result, English has a unique connection with technology because, in many situations, the growth of technology has been accompanied by the spread of English, the spread of opportunities to learn English, and the spread of possibilities to engage with a wide range of people across the world.

Technologies for Learning.

Today's technologies are widely used not only for communication but also for education. Course materials are given through computers at many schools and institutions. In addition, books are no longer used in several classes. Computer technology is instead used to teach a course. Students complete their course tasks using interactive technologies. They use course management systems to submit assignments to teachers and interact with one another and with the teacher.

These three technological connections are relevant to the webinar's content. In other words, the relationship between technology and language, the connection between technology and learning, and the connection between technology and the English language are all influenced by larger societal trends. All of these connections exist outside of our classrooms, yet they all have an influence on how we utilize technology to learn English. These broader cultural trends open up new possibilities for using technology in English language teaching and learning.

The Practice

How can learners/teachers use communication and learning technologies for English language learning?

Technology for English Language Learning:

The use of technology in the study of English is becoming more common. Students and instructors must discover where they fit in this dynamic world of technology as a result of these trends and the development of tools for English language learning. Teachers must get familiar with the resources and how to utilize them to improve teaching. Learners must also be able to use

the resources provided by technology in a number of ways that alter their behavior in the classroom.

The following six areas of English language learning: Vocabulary, Grammar, Reading, Speaking, Listening, and Writing, exist in the English language classroom, even though students use all of these skills and abilities, and knowledge together when they create new meanings.

Listening

Technology today provides access to many different ways for students to listen. they still have access to technology to listen in on what's going on in the English-speaking world and to take advantage of all the resources that are available on the Internet in English.

Two examples of listening activities are found on the websites of the US government:

- Voice of America
- American English website of resources called Sing Out Loud.

Voice of America: Learning English. One great resource is found on the Voice of America website in the Learning English section. It contains a number of news stories that appear in video format with audio and subtitles. The videos allow the students to listen to current news stories than bring them news from around the world. The example shown is about the Women's March that took place on January 21st in 2017. The march was a big protest that occurred in lots of different cities around the world. It provides great listening material for LEARNERS because there are a lot of visual cues that the students can use to see what's going on. They can get meaning from both watching and from listening. In the picture shown you can see that this particular march happened in Washington, D.C. You can see the Capitol Building in the back. There are also signs that the students can look at. Even very beginner level students probably know the meaning of "stand up." The videos also include the subtitles that provide text that goes along with audio. The audio is spoken in very slow and clear English. So these resources are really ideal for bringing current and interesting materials into the classroom using English that is accessible for learners.

It is important that students learn to use as many cues as possible when trying to understand. These include not only audio cues, but visual ones as well—so anything in the listening context or environment that will help the student to understand better. It is so important that students get a lot of practice listening to English outside of the classroom.

Vocabulary

What are good strategies for learning vocabulary?
Should students try to memorize words?
Should they read texts with words to learn?
Do vocabulary drills help?
Should they be learning more about words?

- One really useful distinction to keep in mind is that between incidental vocabulary learning and intentional vocabulary learning. Incidental would be where we pick up new words without meaning through reading or listening
- Great deal of second language vocabulary can be learned this way.
- Should do a lot of reading outside of class—reading for pleasure, extensive reading--and also listening to English language radio programs or English pop songs or English language movies

or TV shows that provide some form of comprehension support or input in terms of captions or subtitles or something like that.

- These aids help make connections between form and meaning and acquire new words incidentally.
- Learning words intentionally - making a deliberate effort to identify words-useful to us and also doing things that'll help those words stick in our memories so that they're available to be used later.

Speaking

Technologies give teachers new opportunities for engaging students in oral conversation as well as pronunciation practice. Examples of technologies with new opportunities for speaking practice we find on the Internet is Pronunciation tools and opportunities to connect.

- Speaking is such an important skill for English learners to develop.
- People need to be able to talk to get things done, and to maintain social relationships.
- These uses of oral language can be accomplished through speaking face-to-face or at a distance over the Internet.
- Speaking is the basis of oral language. If you learn a foreign language and you can't speak, it feels like a failure.
- If you ever travel and you want to use the language.
- Understanding what other people are saying to you and also being able to communicate with them.

Fluency and Accuracy.

- There's always a kind of tension between being fluent and being accurate. Sometimes, you can be very fluent, like in greetings, and you don't have to worry very much. There are other times that accuracy gets in there, and you wonder, "Am I saying this wrong? Am I using the wrong word? Am I using the right word? Am I getting my message across?" In a second language, that's always the issue—this kind of tension between fluency and accuracy.
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- Learners of any age can improve in speaking or in pronunciation. It's not a hopeless thing. Adult learners think that they're just never going to be able to do it. It is not so, anybody can improve. It's like any other skill. You just need to do it.

Problems Encountered

- Lack of adequate ICT support, infrastructure, or time
- Not all teachers 'believe' in using technology
- Not everyone has technology at home
- Teachers need more professional development
- Introduced technology is not always preferred
- Differing device capabilities and instructions
- It's easy for students to be distracted

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Best Practice 1: IN-CLASS / FAUX FLIPPED CLASSROOM

1.**Title of the practice:**

DEPLOYING LSRW AND LIFE SKILLS IN LEARNERS THROUGH QUOTES

2. **Objectives of the practice:**

To promote all the four language skills(LSRW) of the students To upgrade the student's capacities to collect, analyze and interpret the information

To encourage overall development of students and instil ability to understand the world

3**. The Context:**

The course structure assigns 5 marks to classroom assignments that reveal much stronger sense of ownership. In this task, it is important that students express with clarity while relating quotes to their own personal life and

4. **The Practice:**

Classroom language learning using ITC motivates students, improves their speaking, reading, writing and listening skills, instils expertise and transforms the learning into a project-based experience.

5. **Evidence of Success:**

Students after sharing the quotes with one another orally and expressing their relation to life, commented towards the end of the session that the collected quotes changed their entire thought process. Many were also of the view that they learnt to convey ideas pithily using appropriate words.

6. **Problems Encountered and Resources Required**

Although there was classroom noise, it promoted creativity among the students which is considered an important skill in learning . The task also promoted life skills and language learning on a continuous basis beyond the academic sphere

This individual task required one computer system for three students apart from a paper and a pen

7. Link to view Document

thttps://drive.google.com/drive/u/0/folders/1_dNI6f1TVYdKnqn9yyaYaIr8-umaeTrt

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Best Practice 1: Career Vision Approach

Muffakham Jah college of Engineering & Technology

Department of English

A Report on the Guest lecture titled "Serving the Nation"

Date: 25th Jan 2022 **Plat form: Google Classroom**

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The Department of English - Orators' Club organized a webinar titled **'Serving the nation'** to give young aspirants a better understanding of the UPSC examinations and instill confidence in their minds to overcome the challenges along the way. The session scheduled on 25th January 2022 at 2.00 pm. The event was conducted in Google Classroom and the guest speaker was Mr. Vishal Mani Tripathi, an IES Officer and Director at the Ministry of Defence. The session was attended by Principal Mahipal Singh Rawat, Prof Majeed, HOD Basic Sciences, faculty, and students.

Cracking the UPSC Exams is a very difficult task as it requires constant effort and determination. Many students aspire to become UPSC civil servants but not all of them have clarity on how to prepare for the exams. Due to the structure and enormity of this exam, the young aspirants especially students are sometimes left with a plethora of doubts. Keeping that in mind, the webinar primarily focused on the challenges posed as well as the different strategies to crack the exam.

The webinar commenced with the objective of the webinar by Ms. Noor ul Huda, faculty EITK and with a welcome note and introduction of the speaker by Ms. RushdaBabukhan from the orators' club. The speaker set the floor for the session by giving a well-structured presentation that gave a brief overview of the UPSC Civil Services Examination. The presentation focused on enlightening the students regarding the structure and pattern of the exam. It also gave an understanding of how to get into these services by giving the students an idea of the various exams offered by the Government. The presentation also gave an elaborate insight into the Engineering Services Examination including the subjects being offered as well as its recruitment process.

The speaker motivated the students to join the UPSC services as it gives a very good opportunity to understand our country from all aspects. He even highlighted the latest developments in our country to understand the contribution of the civil servants in the progress of the nation.

The speaker gave suggestions, tips, and guidance to the students to crack the UPSC exams and also spoke of his journey and experiences. He suggested the students constantly update their knowledge on current affairs and emphasized that students should be dedicated and continuous in their efforts and preparation.

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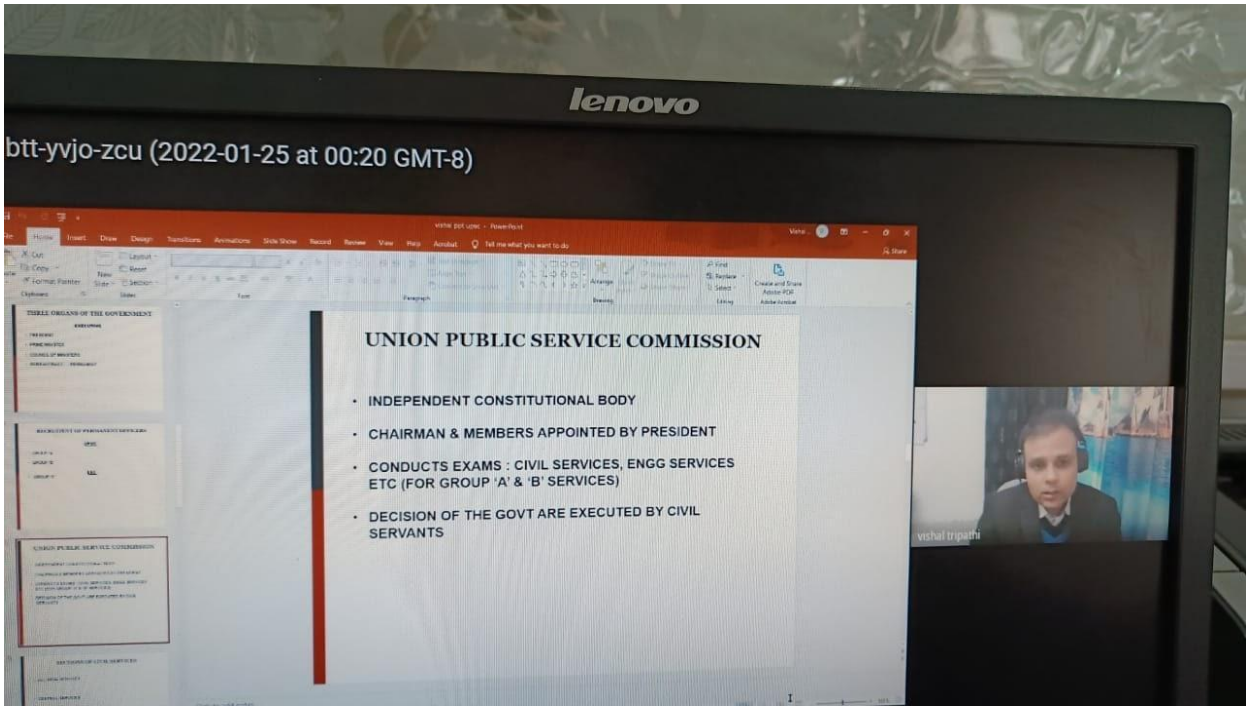
Towards the end, there was a very interactive question and answer session where the questions asked covered the recent updates concerning the services as well as other technical and procedural related topics.

The session concluded with an appreciation message by Dr. ShabanaThayniath and a vote of thanks by Adnan from the Orators club to the speaker and the students gave their feedback. The session was attended by 130 students. Overall the session was very informative and comprehensive as it focused on all important aspects and the students were able to take back a lot of valuable inputs that would certainly motivate them to achieve their goals.

It closed with a National Anthem.



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Best Practice 1: ENCOURAGEMENT FOR RESEARCH AND DEVELOPMENT ACTIVITIES FOR STUDENTS AND FACULTY MEMBERS.

Goal

- The institution has a strong vision of promoting R & D activities in diverse areas aiming to practical oriented studies in Science, Engineering and Technology.
- The goal of this practice is to empower the faculty and students in the area of Research & Development by providing seed funds for implementing their innovative research and product development ideas.
- The goal is to provide appropriate infrastructure, resources, funding ,guidance and motivation to nurture the research competencies among the students and faculty members.

The Context

- The college offers UG PG degree Programmes and Ph.D in various engineering discipline.
- It is the accountability of faculty members to instill effective learning methodology for students to understand different engineering concepts.
- To accomplish this, faculty need to be innovative and pioneering in their approach of teaching / learning activities and have to possess holistic idea about the subjects what they teach, which requires certain level of research competencies.

The Practice

- The college encourages the faculty members to visit the industry/ academia during non-teaching time to acquire the modern technology obtainable which can be used to develop the research skill and augment the potential of faculty members.
- The college also encourages the faculty members to publish the research papers, attending conference ,workshops national/ International conferences, webinars ,patents and to carry out consultancy work.
- The faculty members are encouraged by giving financial support to publish and present the research articles in national/ International journals and conferences book proceedings and allocates funds for in-house R & D projects of the faculty, research scholars and students
- For collaborative research. the departments are encouraged to invite distinguished academicians and industry experts for special lectures and interaction on the campus
- The R &D cell of MJCET recognizes the importance of R & D in the vertical growth of the institution and established the R & D cell to focus on the scientific and industrial research in the various disciplines of Engineering.

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- Evidence of Success There is a remarkable progress in teaching learning process as the faculty is exposed to latest areas of their topic of research and development of latest technology.
- Further they guide the students and faculty who are filing IPRs like patents and copy right, signing MOU with industries and R & D Organizations for research and product development
- There are 63 faculty members who completed Ph.D and 61 faculty members are registered at various universities. A number of research journals are subscribed by the central library and department libraries.
- The faculty is also given financial assistance in the incentive scheme by the management to join technical chapters.
- R & D Funding is provided to the different departments for in-house R & D projects of the faculty, research scholars and students.
- Faculties have good h index and publication of technical papers in National / International refereed Journals and Conferences .
- These achievements evidently show that the struggles taken by the institution to promote R&D activities has given the desired results.
- This has led to more faculties being motivated to take up research oriented projects that would not only help them in acquiring higher qualifications but also will benefit the society at large.

Problems Encountered

• Student learning is mostly memory based

• Lack of creative thinking

• Motivating the students to develop logical thinking to solve technical problems

Resources Required

• High definition computer system to store the ongoing project work.

Inability to see beyond examinations and grades.

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An Artificial Intelligence based Smart Parking System using Haar-Cascade Method

By

Mohammed Abdul Nayeem

Penna Abdul Ajmal Abdullah

Mohammad Jawad Ahmed

Roll No: 1604-17-735-044

Roll No: 1604-17-735-050

Roll No: 1604-17-735-055

Project Guide

Mr. Hakeem Aejaz Aslam

Project Supervisor

Assistant Professor, ECED

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Muffakham Jah college of Engineering and Technology

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(Affiliated to Osmania University)

2017-2021

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COLLEGE OF ENGINEERING & TECHNOLOGY
(Est. by Sultan-Ul-Uloom Education Society in 1980)
(Affiliated to Osmania University, Hyderabad)
Approved by the AICTE & Accredited by NBA

CERTIFICATE

This is to certify that the dissertation titled '**An Artificial Intelligence based Smart Parking System using Haar-Cascade Method**' submitted by **Mohammed Abdul Nayeem, Penna Abdul Ajmal Abdullah and Mohammed Jawad Ahmed** bearing Roll No: 1604-17-735-044, 1604-17-735-050 and 1604-17-735-055 in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering,** is a bonafide record of work carried out by him under my guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Mr. Hakeem Aejaz Aslam
Project Supervisor
Assistant Professor, ECED
MJCET, Hyderabad

Dr. Mohammed Arifuddin Sohel
Prof & Head of the department
Dept. of ECE
MJCET, Hyderabad

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25/07/2021
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Abstract

High population is the biggest problem in today's modern world cities, due to increase of number of vehicles parking is has become time consuming and very tough to find. So there is need for smart parking system , which helps in minimize time , efforts and also avoids unnecessary congestion , making parking and lives easier. Current parking system uses sensors at the entry and exit points which unfortunately when the vehicle takes up more than one parking spot. Also fails when there is different types of parking spots .

So, we have taken up the system that use computer vision algorithms for detection of parking areas. The algorithm uses car feature point detection and color histogram classification to detect parking spaces in static overhead images.

This thesis presents image processing based smart parking system using Haar-Cascade method. The aim of this project is to develop a smart car parking system using a camera for computer vision and a single board computer for processing.

The image processing for detection of car is performed on Raspberry Pi interfaced with the Firebase cloud platform through an Application Interfaced. The system posts the data to the cloud , enabling an Internet of Things (IoT). A mobile application developed for visualization and hence the data is accessible through the driver's phone.

However, the thesis presents and describes the simulation of the project. The experimental results with different condition of parking areas and different camera view angles are discussed in the thesis.

25/07/2021

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Architecture of the implemented smart parking system

Fig 17: Architecture of the to be implemented Smart Parking System

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OUTCOME OF THE PROJECT

The system proposes an effective methodology to manage parking system using a camera placed for a lamp-post view. The accuracy of the system is dependent on the laplacian threshold, motion tracking algorithm based on background subtraction and most importantly, the strength of the classifier. The challenge card was to determine motion in a small region of interest when there's a high possibility of noise. For example, the camera was placed near the stairs and the reflection of people walking down the stairs was being reflected in the input video provided by camera. It becomes challenging to reduce the impact of such noises and detect the small amount of motion. Besides, HAAR classifier does a decent job but implementing a classifier based on Convolution Neural Networks will greatly increase the overall accuracy of the system.

25/07/202

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Brain Tumor Detection from MRI dataset using CNN with Python

A Dissertation submitted in partial fulfillment of the requirements for the award of the Degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

NAMEERA MOHSIN(1604-17-735-061)

MALEEHA HASAN(1604-17-735-063)

SANEELA GAUHAR(1604-17-735-066)

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June, 2021

25/07/2021
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CERTIFICATE

This is to certify that the dissertation titled **'Brain tumor Detection from MRI Dataset using CNN with Python'** submitted by **Nameera Moshin, Maleeha hasan, Saneela Gauhar bearing roll No: 1604-17-735-061,1604-17-735-063,1604-17-735-066** in partial fulfillment of the requirements for the award of the Degree of Bachelor of Engineering, is a bona fide record of work carried out by her under my guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Mr. Hakeem Aejaz Aslam
Project Supervisor
Assistant Professor, ECED
MJCET, Hyderabad

Dr. Mohammed Arifuddin Sohel
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Brain Tumor Detection from MRI dataset using CNN with Python

A Dissertation submitted in partial fulfillment of the requirements

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IN
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By

NAMEERA MOHSIN(1604-17-735-061)

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SANEELA GAUHAR(1604-17-735-066)

Under the guidance of

Mr. HAKEEM AEJAZ ASLAM

Assistant Professor

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June, 2021

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ABSTRACT

Brain tumor is the most commonly occurring malignancy among humans,hence studying of brain tumor is important. In this project, we have used a biomedical image segmentation method to identify or detect tumors from the brain magnetic resonance imaging (MRI). Biomedical image processing consists of biomedical signal gathering, image forming, picture processing, and image display to medical diagnosis based on features extracted from images. The primary goal of medical imaging is to extract meaningful and accurate information from these images with the least error possible. It comprises various types of imaging methods such as MRI,PET ,CT scan etc.

The whole process of detecting brain tumors using MRI can be classified into three different categories: Pre-Processing, analyzing and manipulating the image which includes data compression ,and image enhancement and spotting patterns and Feature extraction. This detection of brain tumor can be studied using Convolutional Neural Networks(CNN) .

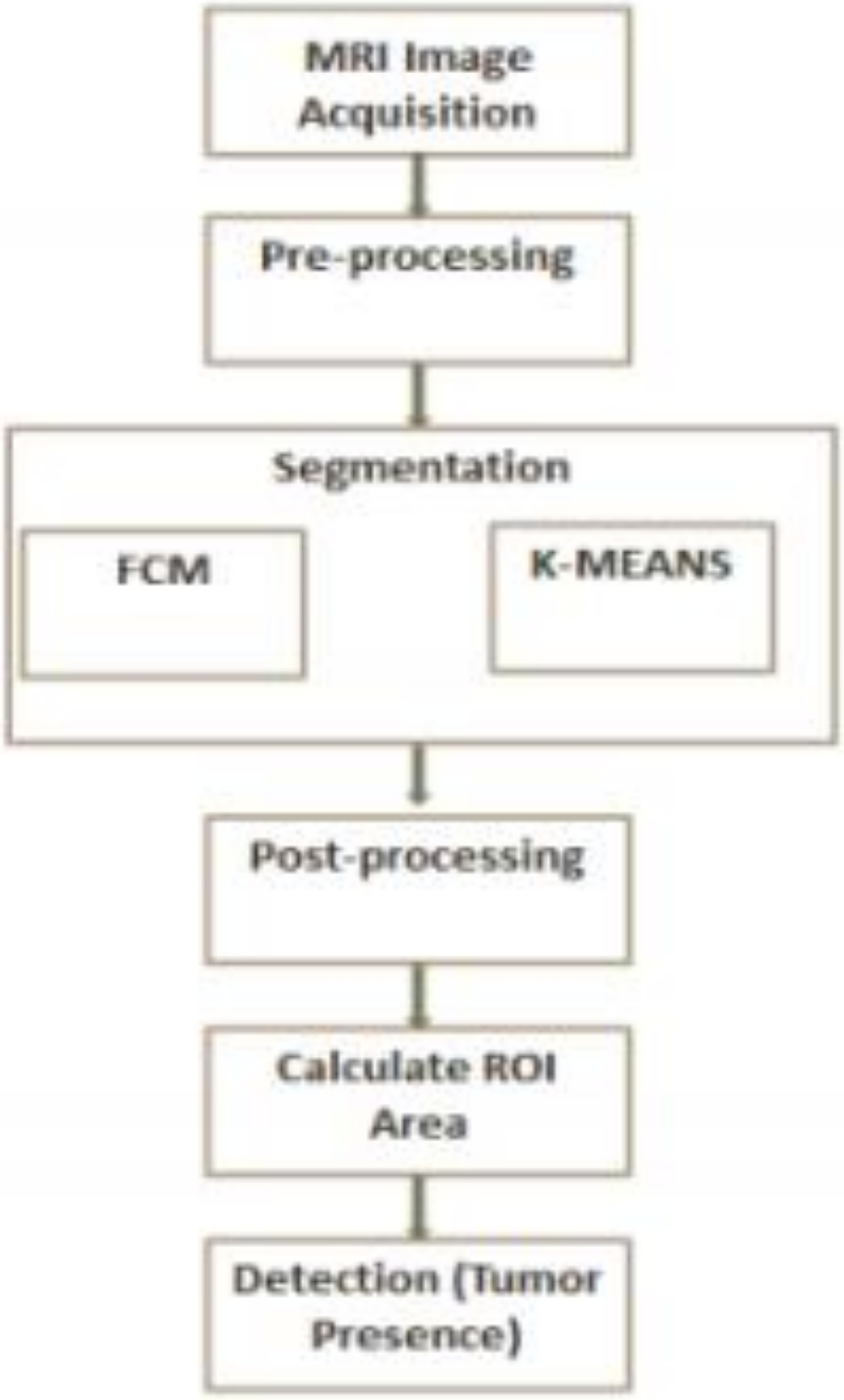

fig 1.4.1- proposed FCM model

5.3.1 HOME PAGE:

The home page is the first page of the website. This page gives us a brief introduction and provides a reference link to the upload section where the prediction takes place.

Figure 5.3.1 Home page

5.3.2 UPLOAD PAGE:

On the page the uploading of image takes place. The validation of the results is done on the fact that the image to be uploaded must be that of MRI and the image format should be of the form .png, .jpg ,jpeg.only.

The prediction of the model is given to the app.py which in turn returns the prediction value which is linked to the upload page. The .h5 file of the model is given to the back end which is then linked to the front end to display the output.

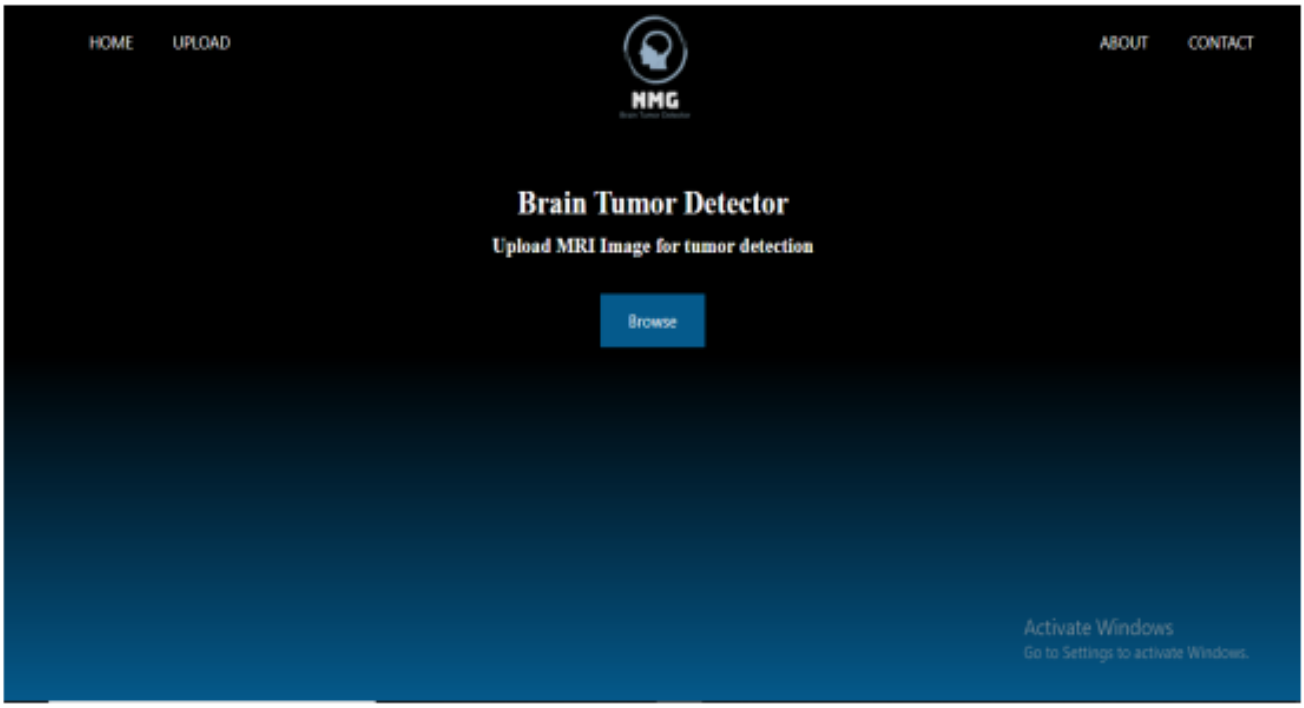

Figure 5.3.2 Upload Page Before Prediction

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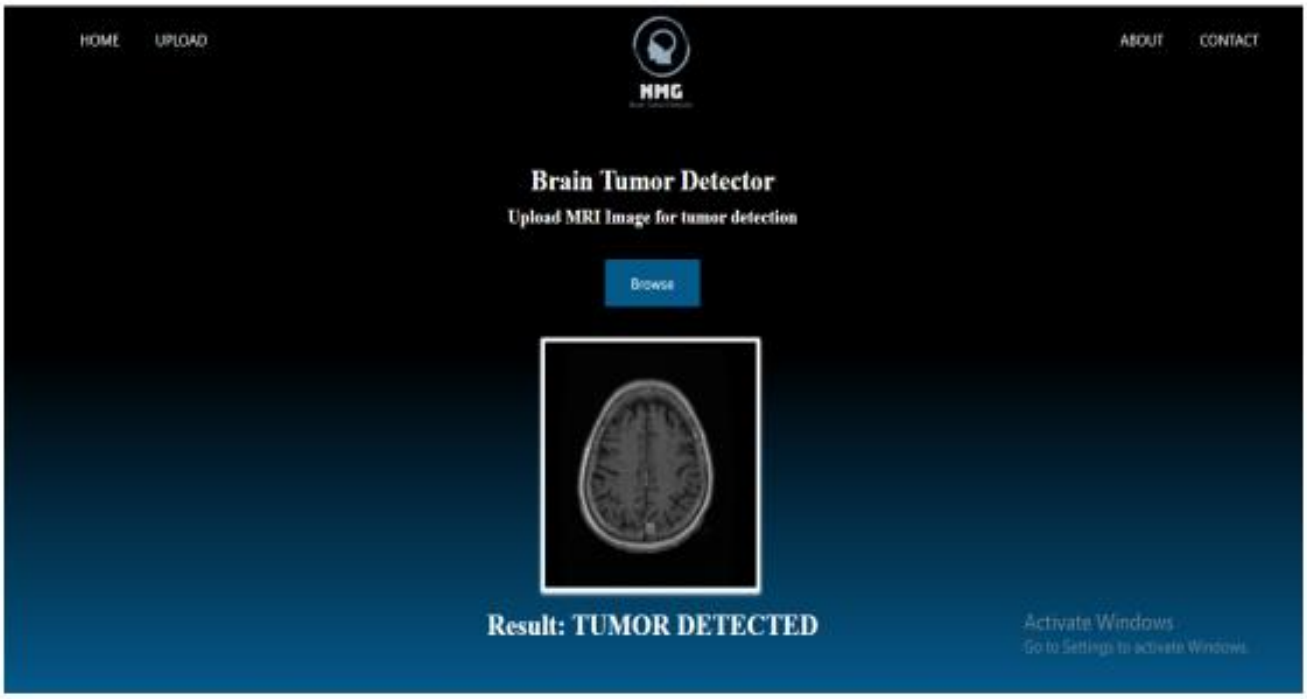

Figure 5.3.2 Upload page after prediction

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5.3.3 ABOUT PAGE:

The about page gives a brief introduction to the program and the features of its model. It consists of a basic paragraph about the project and the model.

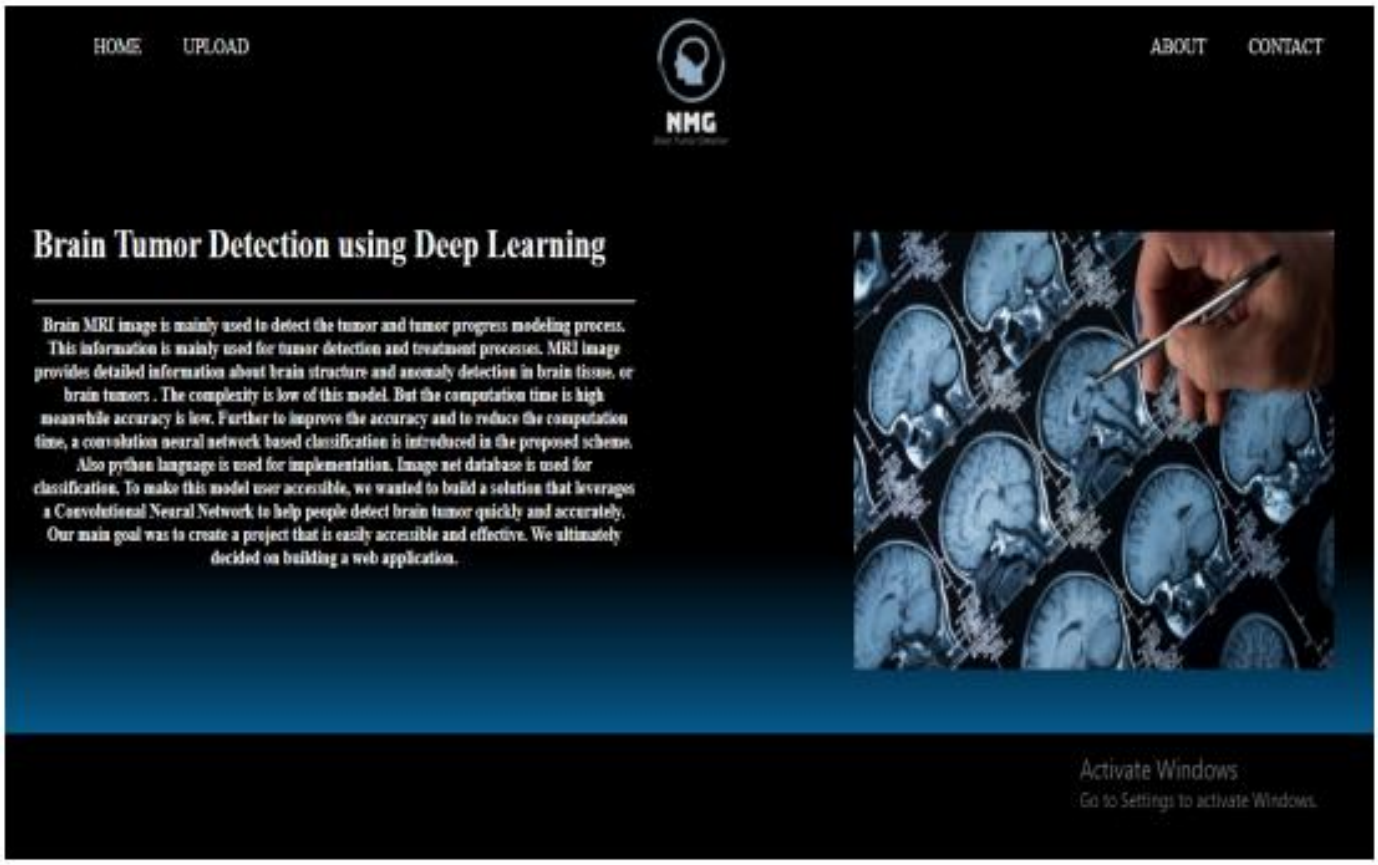

figure 5.3.3 About Page

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5.3.4 CONTACT PAGE:

This page consists of the contact information of the developers of the project with a social media link to each along with their email addresses.

Figure 5.3.4 Contact page

OUTCOME OF THE PROJECT

It is a web based project where one can display a graphic interface of a project by simply uploading MRI images. In this web based project we have used front-end and back-end programming languages to implement a user access project using https. The programming languages used as front-end programming languages in this project are html(HyperTextMarkup Language), CSS(Cascading Style Sheets), bootstrap and javascript programming language. The programming languages used as back-end programming languages are python and flask. We used an Atom editor for a virtual environment. Later, we are going to deploy our project so that it can be accessible by everyone and from everywhere. There is a lot of scope in biomedical image processing. Biomedical Image Processing is a

growing and demanding field. It comprises many different types of imaging methods like CT scans, X-Ray and MRI. These techniques allow us to identify 95 even the smallest abnormalities in the human body. The primary goal of medical imaging is to extract meaningful and accurate information from these images with the least error possible. Out of the various types of medical imaging processes available to us, MRI is the most reliable and safe. It does not involve exposing the body to any sorts of harmful radiation. This MRI can then be processed, and the tumor can be segmented. The current study developed a comparative analysis of brain tumor detection using machine learning methods. For more than one layer we have used CNN and the layers of CNN we used are also three (3). By comparing all the other models we conclude that a model using CNN with augmented dataset gives more accurate results. With a few training samples, the model gave 86% accuracy.If we increase the training data by more MRI images of patients or perform data augmentation techniques we can achieve higher classification accuracy. We used pre-trained architectures like Vgg19 for improving the model performance. Finally, the brain tumours can be detected with the help of deep learning and neural networks. The method is more suitable for detecting brain tumours in high glioma images than low glioma images

BREAST CANCER PREDICTION USING MACHINE LEARNING FOR HISTOPATHOLOGICAL IMAGES

A Dissertation submitted in partial fulfillment of the requirements

For the award of the Degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

SYEDA KULSOOM NAHID **Roll No: 1604-17-735-062**

S. TABASSUM **Roll No: 1604-17-735-065**

SYEDA AREEJ ANZER **Roll No: 1604-17-735-320**

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Muffakham Jah college of Engineering and Technology

Banjara Hills, Hyderabad-500 034

(Affiliated to Osmania University)

2021

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(AFFILIATED TO OSMANIA UNIVERSITY)

April, 2021

25/07/2021

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

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(Est. by Sultan-Ul-Uloom Education Society in 1980)
(Affiliated to OsmaniaUniversity, Hyderabad)
Approved by the AICTE & Accredited by NBA

CERTIFICATE

This is to certify that the dissertation titled **'Breast Cancer Prediction using Machine Learning for Histopathological Images'** submitted by **Syeda Kulsoom Nahid(1604-17-735-062) , S.Tabassum(1604-17-735-065) , Syeda Areej Anzer(1604-17-735-320)** in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering,** is a bona fide record of work carried out by them under my guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

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Abstract

Since time immemorial, women are victims of breast cancer which is a predominant disease worldwide with high dreariness and mortality. The absence of careful visualization models brings about trouble for specialists to set up a treatment plan that may lengthen outpatient endurance time. Early diagnosis of breast cancer is the most reliable and practical approach to managing cancer. Computer-aided detection or computer aided diagnosis is one of the software technologies designed to assist doctors in detecting or diagnosing cancer and reduce mortality via using the medical image analysis with less time. Recently, medical image analysis used Convolution Neural Networks to evaluate a vast amount of data to detect cancer cells or image classification. In this thesis, we implemented transfer learning from pre-trained deep neural networks ResNet50, VGG16, and Xception+NASNet(Xception concatenated with NASNet) in terms of binary classification for breast cancer from histopathological images. Our proposed workflow combines the effectiveness of a pre-trained CNN model to extract high-level features from an image input data.

We used transfer learning with the fine-tuned network which resulted in a much faster and less complicated training than training a network with randomly initialized weights from scratch. In order to do the analysis proposed in this study, the PCam dataset has been employed to pre-train the CNN architectures on a heterogeneous dataset composed of thousands of histopathological image samples. To make our work and ideology beneficial to every individual, we have created a web application that is being built and deployed using the Streamlit library, wherein we have incorporated the model with highest accuracy for classifying the histopathology images. To encourage better diagnosis, the programmed examination of histopathology images can assist pathologists and medical practitioners for early prediction with recognizing harmful tumours and malignancy subtypes.

In conclusion, this thesis demonstrates an efficient deep learning approach which may potentially hamper the usefulness of computer assisted analysis of histopathological images, and early prediction of breast cancer by applying the proposed algorithm.

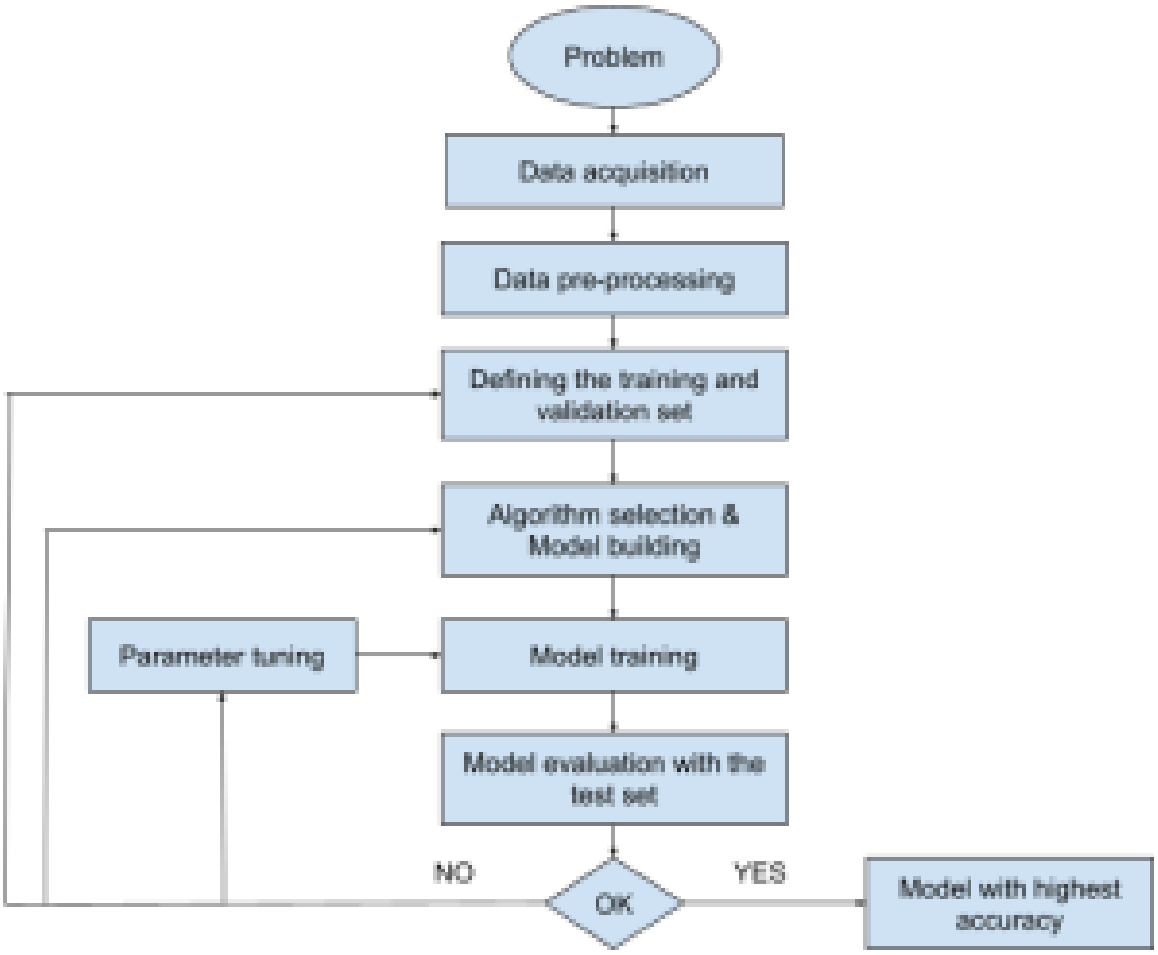

Fig. 4.1 Supervised machine learning pipeline that is used to create a successful classifier that gives highest accuracy

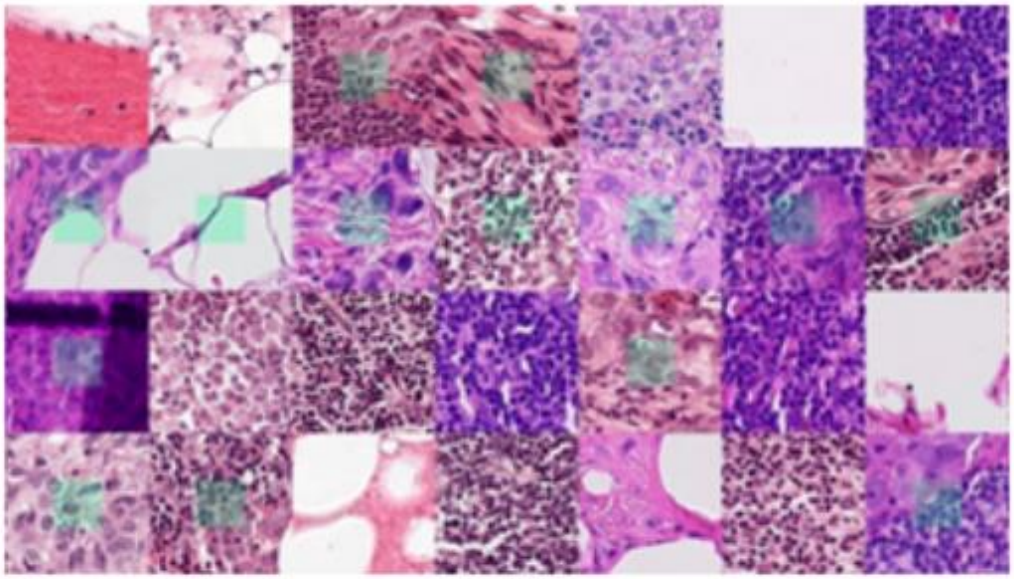

Fig. 4.2 Image patches from the PCam dataset

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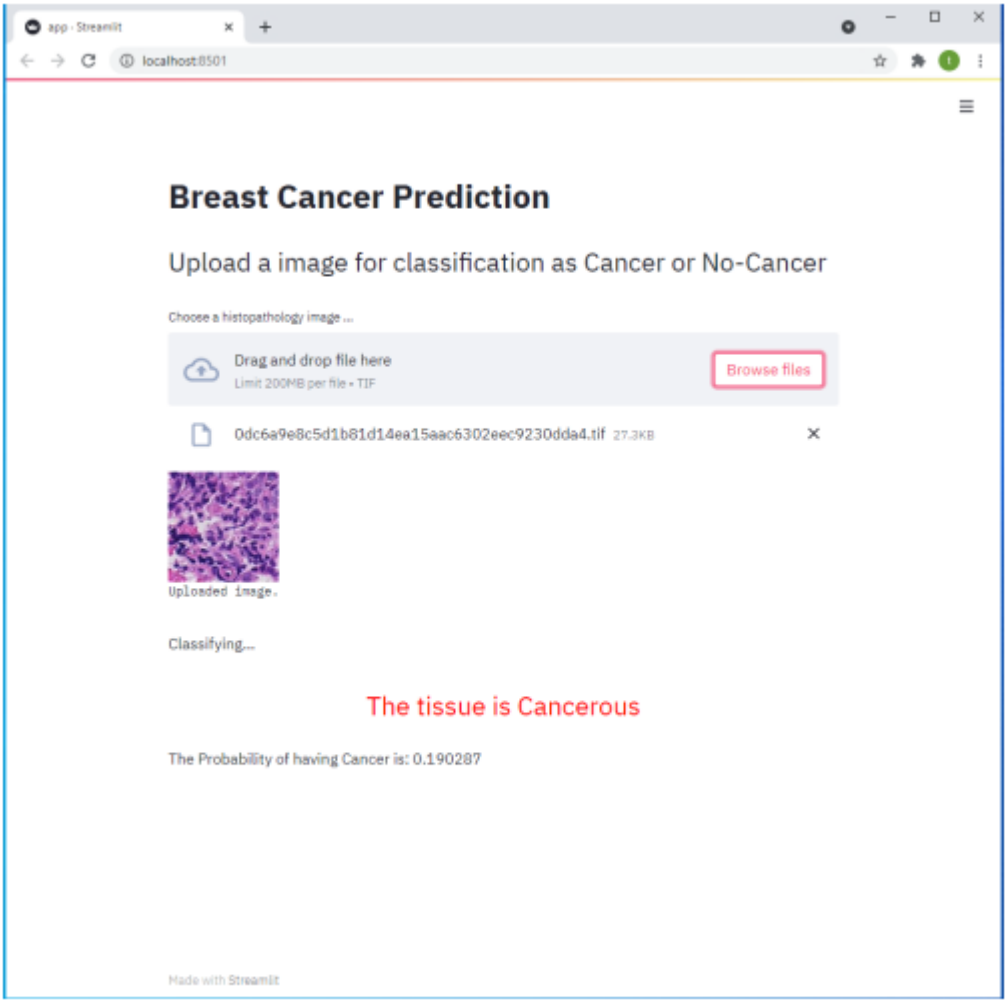

Fig. 6.1 App running on localhost:8501

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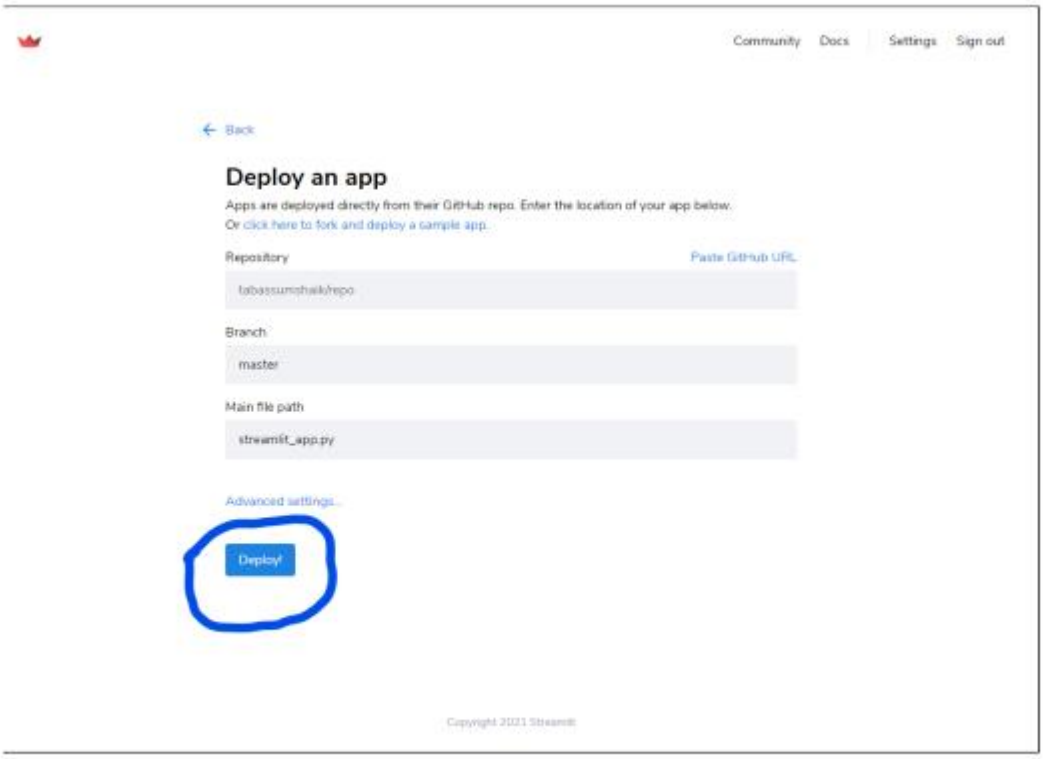

Fig. 6.3 The process of deploying an application

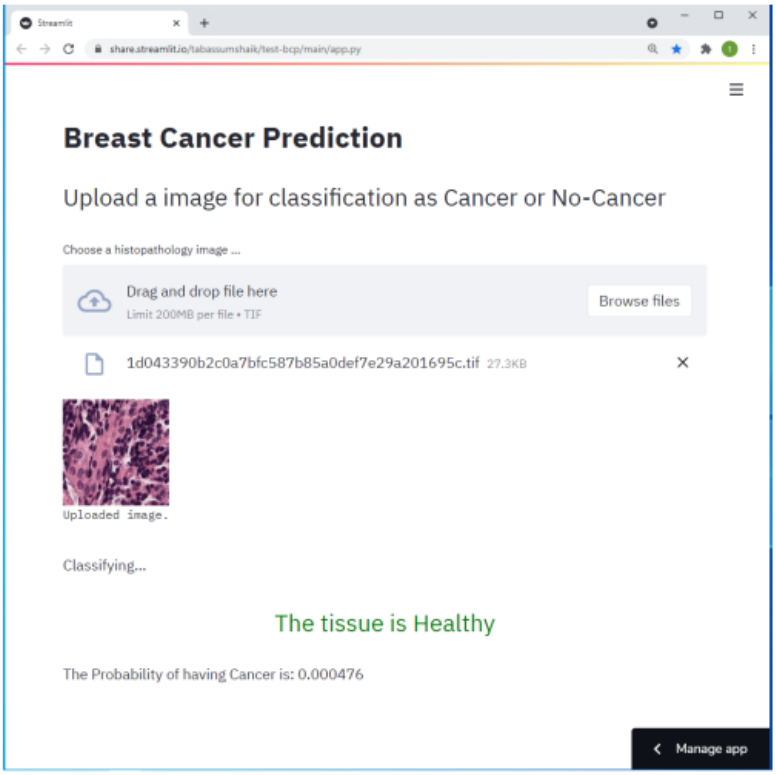

Fig. 6.4 The image showing the webapp successfully deployed as public accessible URL

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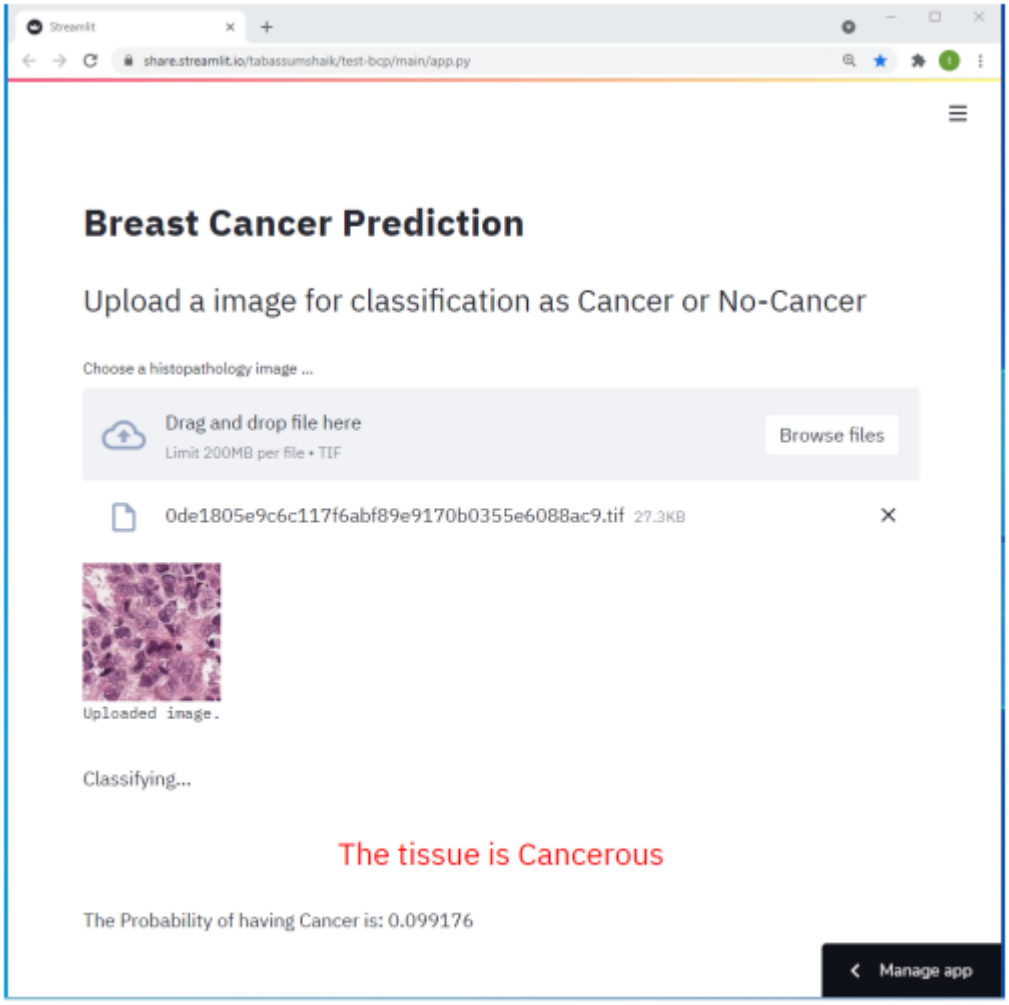

Fig. 6.5 The image showing the webapp successfully making the predictions on an uploaded image

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OUTCOME OF THE PROJECT:

Considering everything to conclude our work, Convolutional neural Networks (CNNs) are the present state-of-the-art design for automatic classification of histopathological images. In our proposed methodology, we have analyzed the performance of different combinations of pre-trained CNN models namely ResNet50 ,VGG16 ,Xception+NASNet (Xception concatenated with NASNet) . The accuracy values obtained for ResNet50 ,VGG16 ,Xception+NASNet are 76.18% ,93.82% and 95.65% respectively. From the results,we observed that the Xception+NASNet model has achieved maximum accuracy i.e., 95.65% . In addition ,we used this concatenated model i.e. Xception+NASNet which has yielded highest accuracy, to build a web application that is able to classify histopathological images into Malignant(Cancer) and Benign(Non- cancerous).And deployed this application into a public accessible web URL. As we have carried out our work on the Google colab platform which offered 12GB Tesla T4 GPU for training the model, one can use higher configuration GPUs or even TPUs for training the model with increased number of epochs which will ultimately increase the performance of the model.

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APPLICATIONS OF GENOMIC SIGNAL PROCESSING TO DETECT CANCER CELLS

A Dissertation submitted in partial fulfillment of the requirement for the award of the degree of

BACHELOR OF ENGINEERING

in

Electronics & Communication Engineering

By

SYEDA MARYAM FATIMA (1604-17-735-013)

AMREEN SULTANA (1604-17-735-016)

NUZATH SULTANA (1604-17-735-307)

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2021

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

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(Affiliated to Osmania University, Hyderabad)
Approved by the AICTE & Accredited by NBA

CERTIFICATE

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Dr. Arifuddin Sohel
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ABSTRACT

In the field of signal processing, a new area of research has been introduced namely genomic signal processing (GSP). GSP basically processes genes, proteins, and DNA sequences using various signal processing methodologies to extract the information hidden in it. As some genetic abnormalities turn into cancer diseases, proper understanding and analysis of genes and proteins may lead to a new horizon in cancer genomic study. In genomic signal processing, the exact identification and classification of the diseased gene is a great challenge to the researchers.

Hence in the present paper, the crucial job of gene identification and classification is attempted for detection of cancer. Cancer arises as a result of changes that occur in the DNA sequence. DNA (Deoxyribonucleic acid) is a nucleic acid that contains the hereditary information in all the living organisms. DNA is a polymer with monomeric units called as nucleotides. There are 4 types of nucleotides namely Adenine (A), Thymine(T), Guanine(G), and Cytosine(C) which are coded in the genes. A gene is divided into coding regions(exons) and non-coding regions(introns). For early detection of cancer, identification of exon region plays crucial role.

Our project is implemented in MATLAB R2019a using the bioinformatics toolbox. Where the DNA sequences obtained from the NCBI are processed and numerically mapped before extracting the exons using period-3 property which is done using anti-notch filter and STFT. Digital filters are used for noise reduction and increased accuracy. Once the cancer genes are identified, mutual information estimator based on their minimum entropy is used as a classifier to detect different types of cancer genes in the future scope.

The main challenge is the identification of cancer genes accurately without involving biological experiments so that early treatment is possible in oncology. The requirement is a need to design an efficient and effective method for the identification of coding and non-coding regions and also finding out abnormalities present in coding regions with increased accuracy and reduced complexity.

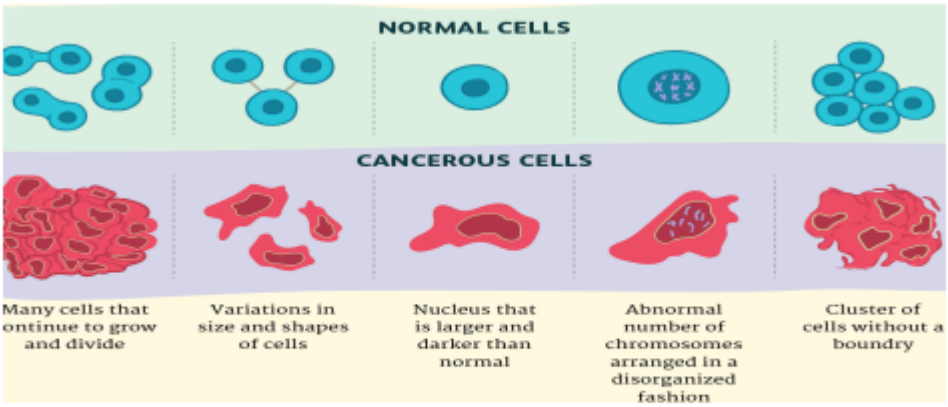

Figure 3.12 Differences between normal cells and cancer cells

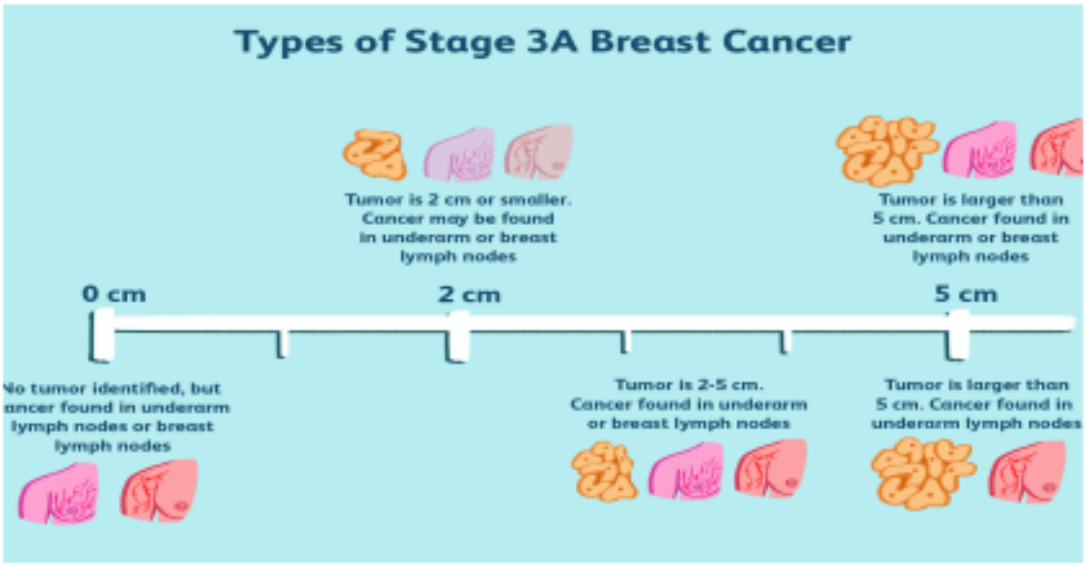

Figure 3.13 Breast Cancer

OUTCOME OF THE PROJECT

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The discrimination between the normal and the cancer cells is identified by the spikes in the power spectrum plot. The spikes occur only in the cancer cell whereas absent in the normal cell. The prediction is done by computing the parameters such as mean amplitude, standard deviation, and the coefficient of variation. It has been observed that the ratio of mean amplitude to mean frequency is less than 1.0 for cancer cells and more than 1.0 for normal cells. The algorithm is successfully tested for several DNA sequences for both normal and cancer cells with various accession numbers collected from NCBI website.

Instead of biological experiments, this project can easily recognize the cancer cells with the help of signal processing concepts. In addition, it consumes less time and cost effective compared to the biological concepts in cancer prediction.

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Artificially Intelligent
Robotic Nursing Assistant AI-RoNA

A Dissertation submitted in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF ENGINEERING IN
ELECTRONICS AND COMMUNICATION ENGINEERING BY

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MOHD SAFWAN HUSSAIN	**1604-17-735-023**
SHAIK FAZIL AHMED	**1604-17-735-057**

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(Affiliated to Osmania University)

2021

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CERTIFICATE

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Dr. Mohammed Arifuddin Sohel
Project Guide,
Professor and Head
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Dr. Mohammed Arifuddin Sohel
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ABSTRACT

Today, the world is battling the most complex pandemic and the only possible antidote at this moment is social distancing. With everyone locked indoors, the world economies are headed towards recession. Amid this pandemic, technology acts as a lifeboat, keeping us and businesses afloat. The one silver lining in these times is Artificial Intelligence (AI) and Mechanical Innovations. As we move forward, just like other technologies, robots are also playing an important role in fighting against diseases like COVID-19.

In this case, robotic technology plays a crucial role in not just assisting the patients but also keeping doctors and health-care staff safe. The robots performed a variety of essential tasks, including flagging patients at the entrance to the field hospital who displayed fever symptoms, monitoring heart rates and blood oxygen levels and delivering medication. These robots can also clean and disinfect hospital areas and lead exercise routines for sick patients. Medical workers remotely can direct and control the robot systems over a wireless network.

First, the sensible use of Robotic Nursing Assistants in health care greatly impact the sustainability and reliability of health care systems. Second, the high risk of cross-contamination among medical workers including doctors and nurses is curbed down to large extent. The high demand of medical personnel is catered by increasing the manufacturing of nursing assistants that can handle complex tasks.

In this thesis, we integrate Artificial Intelligence and Semi-Humanoid Robots in order to overcome these challenges and enable highly-mobile robot that helps the doctors and nursing staff in such trying times by providing assistance in monitoring patient's health condition and recovery updates.

Intelligent care aids, such as robotic technologies, medicine suppliers, make life easier for nursing home and hospital staff. Mobile robots that assist with transport tasks or guiding people can help patients become more independent.

25/07/2021

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Fig.1.1. Picture of AIRONA

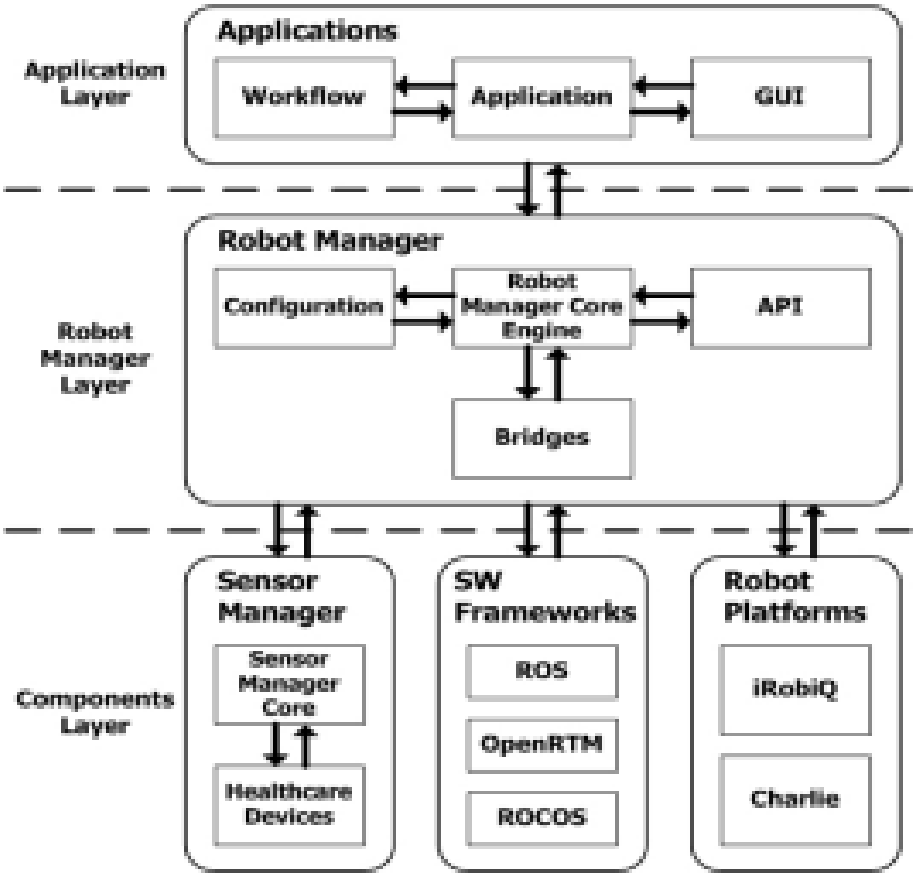

Fig. 2.2. Architecture of the UoA Robotic Software Framework. It has three layers; an application layer, a robot manager layer, and a component layer including SW frameworks, robot platforms, and external systems.

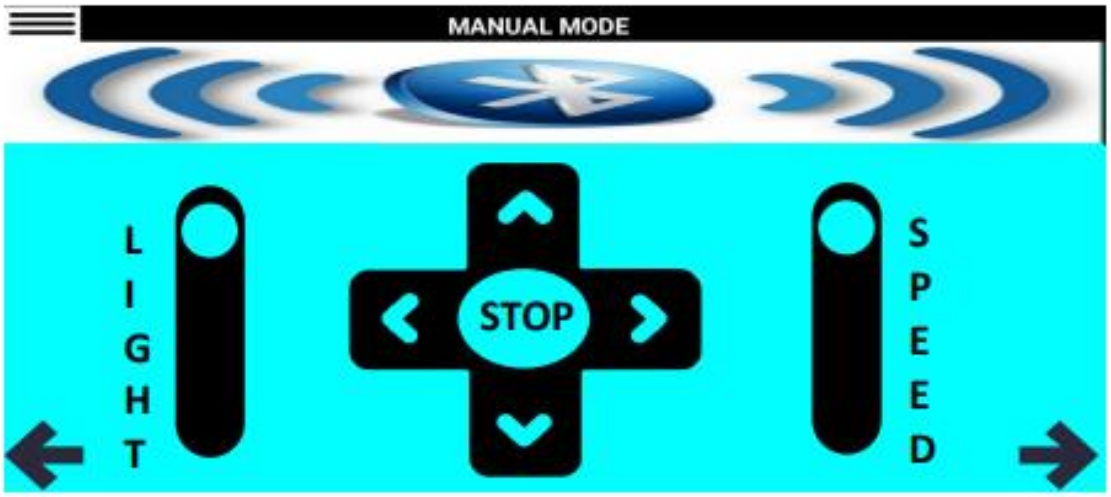

Fig.5.5. Control Screen

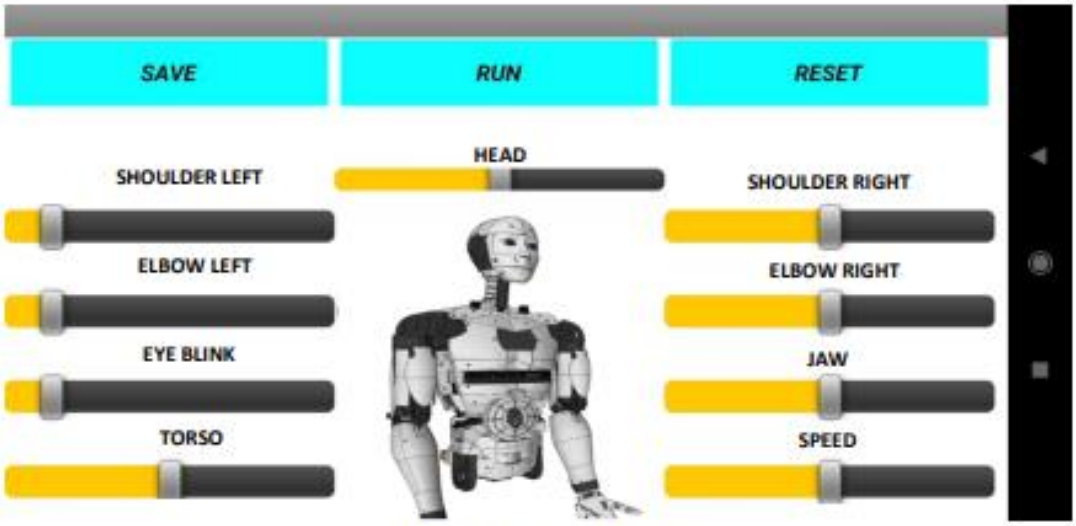

Fig.5.6. Settings Interface

8.3PRACTICAL IMPLEMENTATIONS :

Fig: 8.1. AI-RoNA carrying medicine tray

Fig: 8.2. AI-RoNA Lower Body

OUTCOME OF THE PROJECT:

Stable semi- humanoid locomotion is still a on-going and challenging research activity for researchers from the robotics community. The primary objective and milestone of this research was to design 3D-printed design, build and develop a 3D-Printed framework for a semi- humanoid robot that can talk and recognize faces. In this chapter, we discussed some discussion on processing speed issues, challenges occurred, power issues and to what extent the future continuous research direction should be formulated is presented.

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OXYGEN CONCENTRATOR CONTROLLED BY IOT

A Dissertation submitted in partial fulfillment of the requirements

For the award of the Degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

MOHD. HABIB HUSSAIN	**1604-15-735-078**
RIZWAN AFSAR BAIG	**1604-15-735-091**
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Department of Electronics and Communication Engineering

Muffakham Jah College of Engineering and Technology

Banjara Hills, Hyderabad-500 034

(Affiliated to Osmania University)

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

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COLLEGE OF ENGINEERING &TECHNOLOGY

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(Affiliated to Osmania University, Hyderabad)
Approved by the AICTE & Accredited by NBA

CERTIFICATE

This is to certify that the dissertation titled **'OXYGEN CONCENTRATOR CONTROLLED BY IOT'** submitted by **Mohammed Habib Hussain (R.No.:1604-15-735-078), Rizwan Afsar Baig (R.No.:1604-15-735-091), Mohammed Abdul Baseer (R.No.:1604-16-735-092),** in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering,** is a bonafide record of work carried out by them under our guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Dr. Mohammad Arifuddin Sohel
Head of Department and
Professor of ECE
MJCET Hyderabad

Dr. Mohd.Abdul Raheem
Project Guide,
Professor ECED
MJCET Hyderabad

INTERNAL EXAMINER **EXTERNAL EXAMINER**

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25/07/2021
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Muffakham Jah College Of
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HYDERABAD-500 034.(T.S.)

ABSTRACT

With an improvement in technology and miniaturization of sensors, there have been attempts to utilize the new technology in various areas to improve the quality of human life. One main area of research that has seen an adoption of the technology is the healthcare sector. The people in need of healthcare services find it very expensive this is particularly true in developing countries.

As a result, this project is an attempt to solve a healthcare problem currently society is facing. The main objective of the project was to design a remote healthcare system. It's comprised of three main parts. The first part being, detection of patient's vitals using sensors, second for sending data to cloud storage and the last part was providing the detected data for remote viewing. Remote viewing of the data enables a doctor or guardian to monitor a patient's health progress away from hospital premises.

The Internet of Things (IoT) concepts have been widely used to interconnect the available medical resources and offer smart, reliable, and effective healthcare service to the patients. Health monitoring for active and assisted living is one of the paradigms that can use the IoT advantages to improve the patient's lifestyle. In this project, I have presented an IoT architecture customized for healthcare applications.

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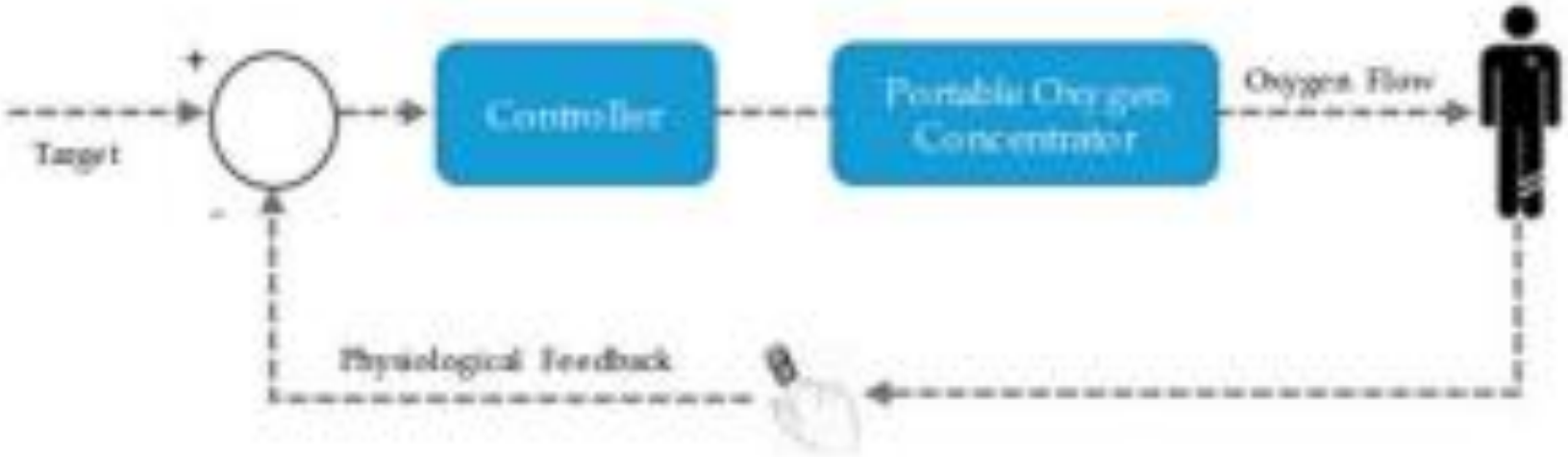

Fig1.1 Structure of POC

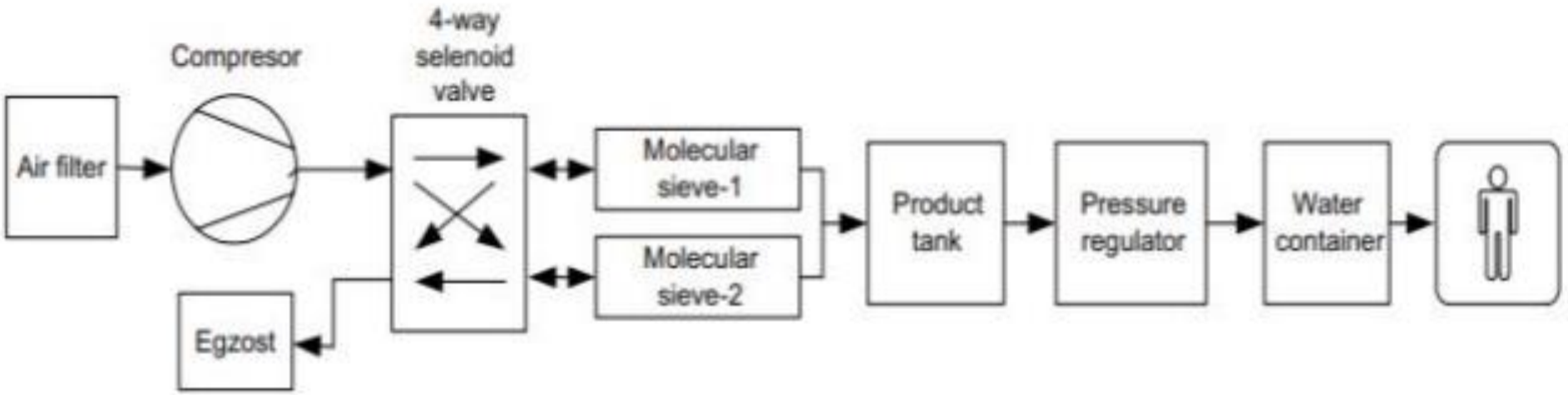

Fig 1.2: Parts and organization O2C.

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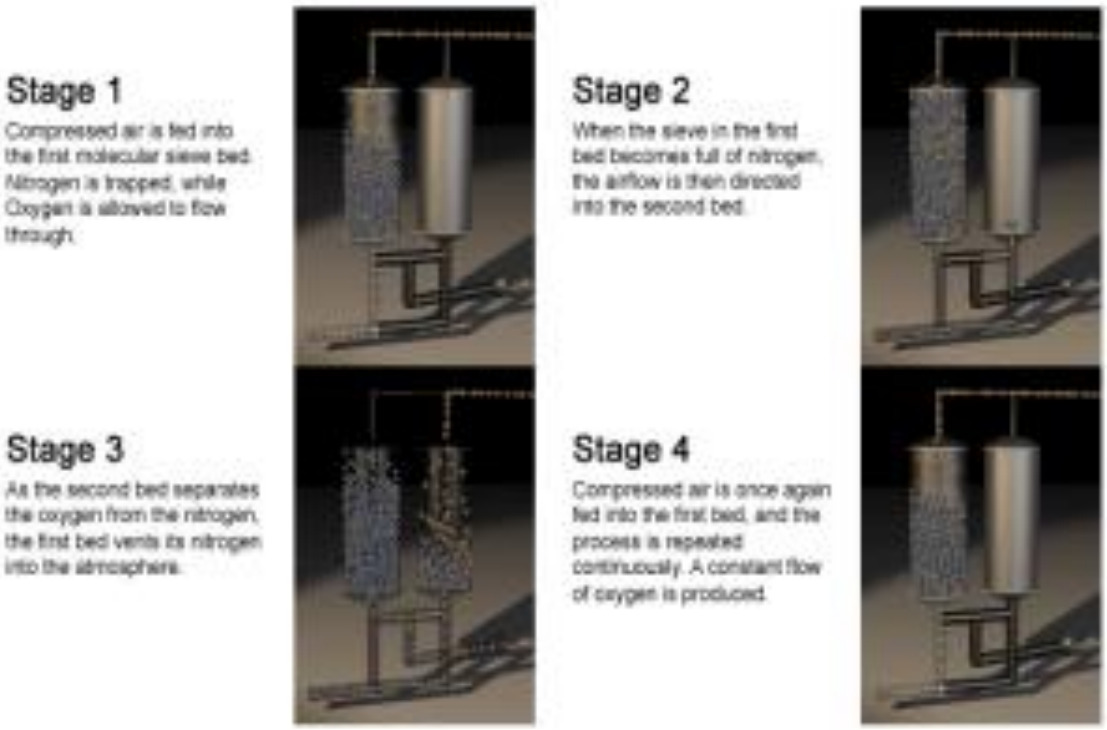

Fig 3.2: PSA Process.

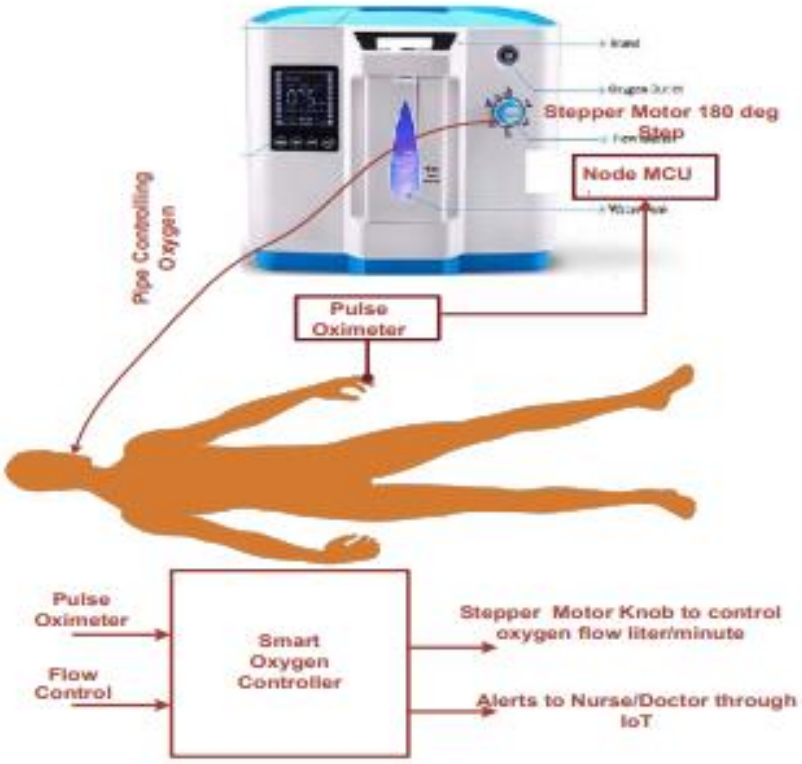

Fig 6.1: Final Setup

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OUTCOME OF THE PROJECT:

The designed system modules can further be optimized and produced to a final single circuit. More important fact that came up during project design is that all 75 the circuit components used in the remote health detection system are available easily. With the development in the integrated circuit industry, Micro Electro Mechanical Systems (MEMs) and microcontrollers have become affordable, have increased processing speeds, miniaturized and power efficient. This has led to increased development of embedded systems that the healthcare specialists are adopting. These embedded systems have also been adopted in the Smartphone technology.

And with increased internet penetration in most developing countries through mobile phones, and with use of Internet of things (IoT) will become adopted at a faster rate. The Remote Health Care system utilizes these concepts to come up with a system for better quality of life for people in society. From an engineering perspective, the project has seen concepts acquired through the computer science and embedded study period being practically applied. The Electric circuit analysis knowledge was used during design and fabrication of the individual modules. Electromagnetic fields analysis used in the wireless transmission between microcontrollers and Software programming used during programming of the microcontrollers to come up with a final finished circuit system.

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Precision Agriculture using Wireless Sensor Network

A Dissertation submitted in partial fulfillment of the requirements for the award of the Degree of

Bachelor of Engineering

In

Electronics and Communication Engineering

By

Mohd Ismail Khan	**1604-17-735-031**
Mohd Khaja Moinuddin	**1604-17-735-038**
Mohammad Abrar Baqtiyar	**1604-17-735-039**

Department of Electronics and Communication Engineering

Muffakham Jah College of Engineering and Technology

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(Affiliated to Osmania University)

2017-2021

Precision Agriculture using Wireless Sensor Network

A Dissertation submitted in partial fulfillment of the requirements for the award of the Degree of

Bachelor of Engineering

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By

Mohd Ismail Khan	**1604-17-735-031**
Mohd Khaja Moinuddin	**1604-17-735-038**
Mohammad Abrar Baqtiyar	**1604-17-735-039**

Under the guidance of

Dr. Salma Fauzia

Asst. Professor, ECE Department, MJCET

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2017-2021

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(Affiliated to Osmania University, Hyderabad)
Approved by the AICTE & Accredited by NBA

CERTIFICATE

This is to certify that the dissertation titled '**Precision Agriculture Using Wireless Sensor Network**' has been submitted by **Mohd Ismail Khan** bearing Roll No: 1604-17-735-031, **Mohd Khaja Moinuddin** bearing Roll No: 1604-17-735-038 and **Mohammad Abrar Baqtiyar** bearing Roll No: 1604-17-735-039, in partial fulfilment of the requirements for the award of the Degree of **Bachelor of Engineering**, is a bonafide record of work carried out by them under my supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Dr. Salma Fauzia
Project Supervisor
Asst. Prof, ECED
MJCET, Hyderabad

Dr. Mohammed Arifuddin Sohel
Head of Department
Prof, ECED
MJCET, Hyderabad

Dr. Kaleem Fatima
Project Coordinator
Prof, ECED
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External Examiner

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ABSTRACT

Precision Agriculture is a Technique that uses Information Technology to Provide Quality yield and avoids wastage of various resources. One of the main part of Precision Agriculture which makes its implementation successful is the use of Wireless Sensor Networks. The WSN is useful in collecting the different kinds of information from the environment, this information is then used to precisely allocate the resources in the field to get Maximum yield without using Extra resources.

In a Country like India in which several States has Scarcity of Fresh water, nearly 70% of the fresh Water is used in the Agriculture Sector alone, Crops like Rice, Wheat, Sugarcane use most of the Water, therefore avoiding the excessive use of Water in Agriculture Sector can help immensely in solving the Water Scarcity Problems but this has to be done such that there is no Negative affect on the Quality and Quantity of the yield, this can be achieved through Precision Agriculture.

In this Project Precision Agriculture is implemented by implementing WSN through RF Transceivers and for the Precise Allocation of Water Resources AWD technique is used, the Data collected by the various Nodes in the WSN is sent to the main Base Station and the Data is Processed according to the Algorithm of the AWD and decision for the usage of Water is obtained without any manual labour.

During the course of the Project, it was observed that the Quality of the Crops, growth was not compromised and we were successfully able to Save 34% of the Water consumption when compared with Normal Agriculture Practice.

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The results are obtained by deploying the three sensor nodes in three different tubs of radius 27cm each as shown in the figure 6-1. These three tubs were placed distance apart from the base station in an open area.

Figure 6-1 Sensor nodes in tubs

The crops were grown in these tubs normally and then using precision agriculture technique, the total water consumption was lesser than the normal practice and around 34% lesser water was consumed compared to the normal growing practice as shown in comparison table 6.1.

OUTCOME OF THE PROJECT

Precision Agriculture has been successfully implemented by integrating different technologies like Wireless Network using RF transceivers, Arduino Micro controllers and different Sensors and Satisfactory results have been observed upon the completion of the Project, it was observed that with the help of this Project up to 34% of the water consumption used in the Irrigation of Paddy crop can be saved, which can create a huge impact in solving the water crisis faced by many States in a Country like India.

There is further room in developing this project by adding other functionalities for example this Project can be integrated with IOT to automatically irrigate the field control the amount of water used in Irrigation through water pumps, there are different kinds of Sensors available to calculate different Environmental factors, certain Environmental factors play an important role in certain kinds of crops ,therefore particular types of Sensors can be integrated in this Project depending upon the type of crop grown.

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CERTIFICATE

OF PARTICIPATION

CERTNO: IEEE_IOT_208

Pantech e Learning
DIGITAL LEARNING SIMPLIFIED

IEEE

This is to certify that

Ismail Khan

from **Muffakham jah college of Engineering and technology**, has participated in the Three DaysNational Level IEEE Workshop on **Internet of Thingsfor Agricultural Applications** organized by P.R.Pote Patil College of Engineering & Management , Amaravathi in Association with IEEE (MumbaiSection) & PantecheLearning held on 22nd-24th October2020

N.SRINIVASAN
DIRECTOR-PANTECHELEARNING

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SELF-DRIVING CAR USING MINIMAL CNN MODEL ON UDACITY's SIMULATOR

A Dissertation submitted in partial fulfillment of the requirements

For the award of the Degree of

BACHELOR OF ENGINEERING IN
ELECTRONICS AND COMMUNICATION ENGINEERING BY

MOHD AKEF ALI	**1604-17-735-036**
MOHAMMED MAZHER YOUSUF	**1604-17-735-033**
SHAIK SOHAIL	**1604-17-735-040**

Department of Electronics and Communication Engineering

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CERTIFICATE

This is to certify that the dissertation titled **'Self-Driving Car using minimal CNN model on Udacity's Simulator'** submitted by **Mohd Akef Ali (Roll No: 1604-17-735-036), Mohammed Mazher Yousuf (Roll No: 1604-17-735-033), Shaik Sohail (Roll No: 1604-17-735-040)** in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering,** is a bonafide record of work carried out by them under our guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Mr. Muneer Uddin
Project Guide,
Sr. Assistant Professor, ECED,
MJCET, Hyderabad

Dr. Mohammed Arifuddin Sohel
Professor and Head
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ABSTRACT

The autonomous car or the driverless car can be referred to as a robotic car in simple language. This car is capable of sensing the environment, navigating and fulfilling the human transportation capabilities without any human input. The advantages of autonomous cars, such as fewer traffic collisions, increased reliability, increased roadway capacity, reduced traffic congestion as well as reduction of traffic police and care insurance, are compulsive for the development of autonomous car even though we have to overcome the issues of cyber security, software reliability, liability of damage and loss of driver related jobs.

The project purpose is to train a neural network to drive an autonomous car agent on the tracks of Udacity's Car Simulator environment. Udacity has released the simulator as an open source software and enthusiasts have hosted a competition (challenge) to teach a car how to drive using only camera images and deep learning. Driving a car in an autonomous manner requires learning to control steering angle, throttle and brakes. Behavioral cloning technique is used to mimic human driving behavior in the training mode on the track. That means a dataset is generated in the simulator by user driven car in training mode, and the deep neural network model then drives the car in autonomous mode.

To tackle this problem, image processing and different augmentation techniques were used, which allowed extracting as much information and features in the data as possible. The project aims at reaching the same accuracy on real time data in the future.

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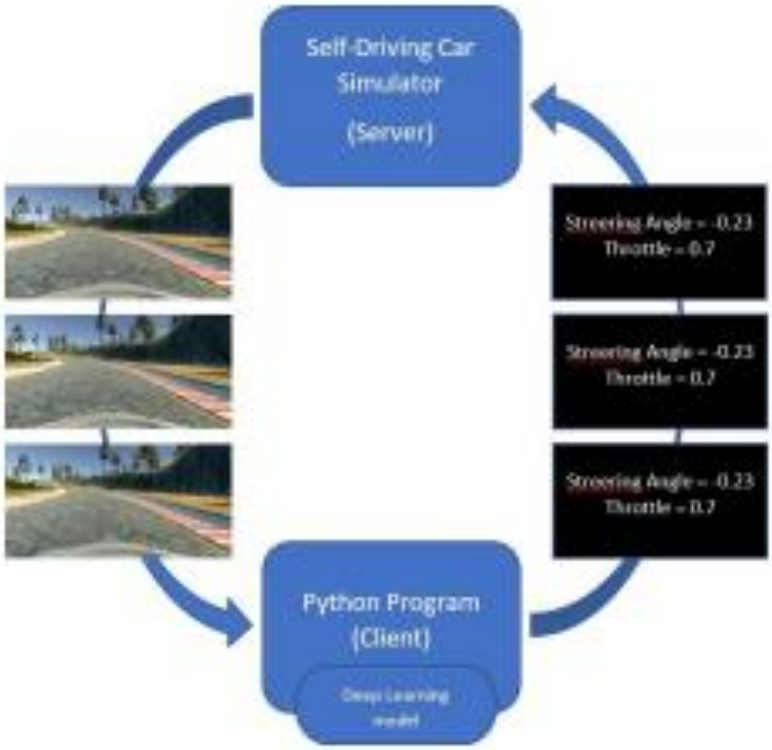

Fig 1. Implementation Architecture

Fig 11. Autonomous mode

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A few images from the dataset are shown in Figure 12.

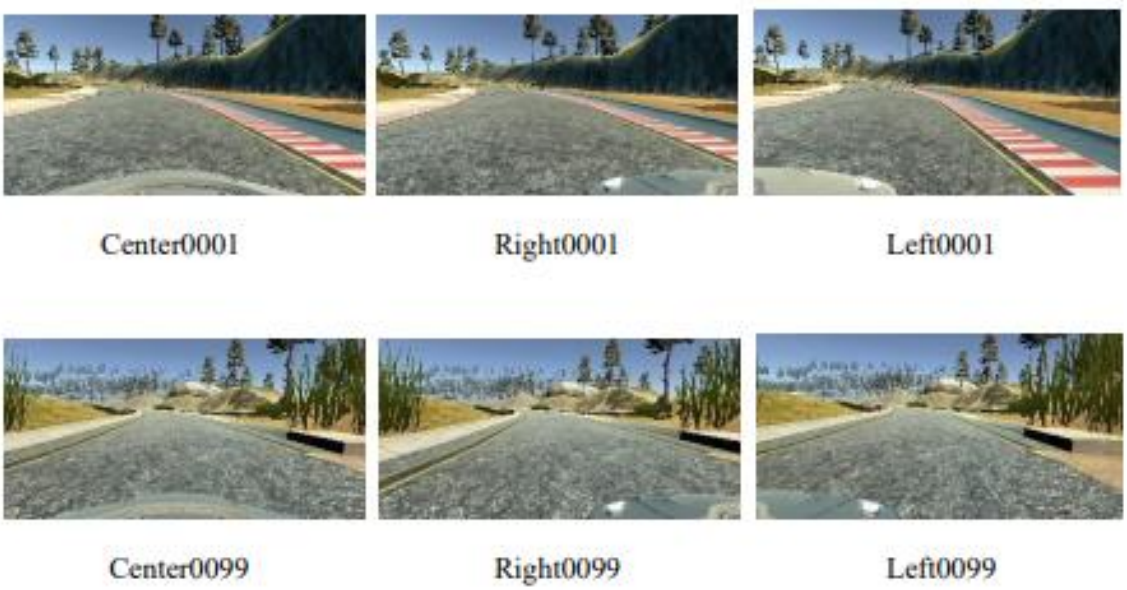

Fig 12. Dataset sample

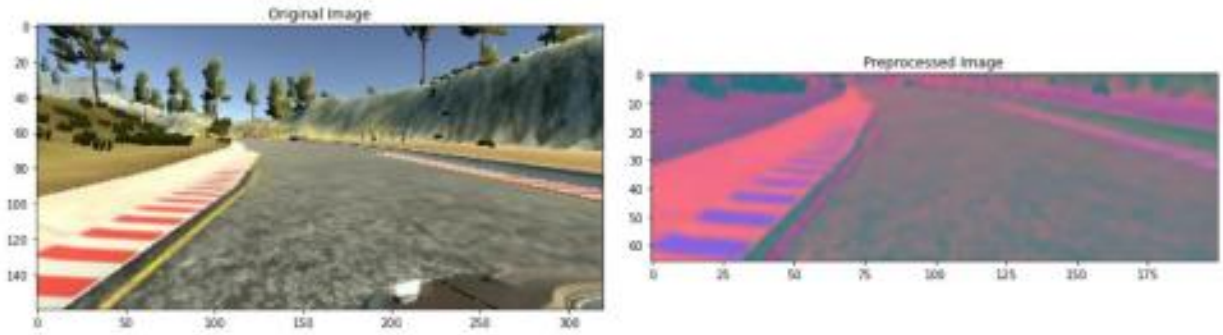

Fig 27. Pre Processed image

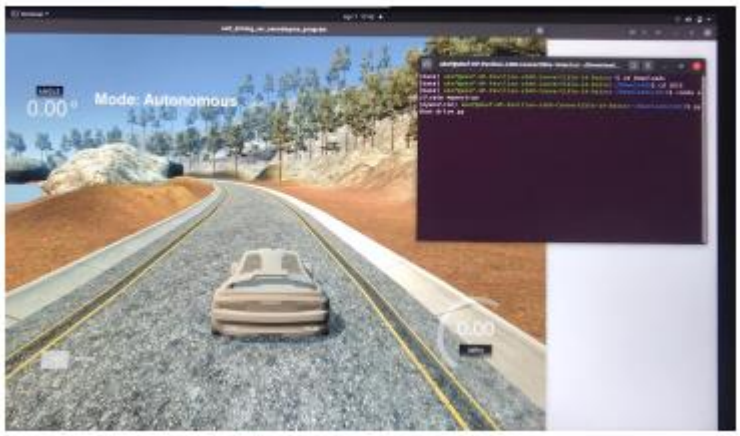

Fig 30. Simulation results

Fig 30. Continued

OUTCOME OF THE PROJECT:

In the implementation of the project the deep neural network layers were used in sequential models. Use of parallel network of network layers to learn track specific behavior on separate branches can be a significant improvement towards the performance of the project. One of the branches can have CNN layers, the other with the RNN layers and combining the output with a dense layer at the end. There are similar problems that are solved using RESNET (Deep Residual networks) [8], a modular learning framework. RESNET are deeper than their 'plain' counterparts (state-of-art deep neural networks) yet require similar number of parameters (weights).

Implementing Reinforcement Learning approaches for determining steering angles, throttle and brake can also be a great way of tackling such problems. Placing fake cars and obstacles on the tracks, would increase the level of challenges faced to solve this problem, however, it will take it much closer to the real-time environment that the self-driving cars would be facing in the real world. How well the model performs on real world data could be a good challenge.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

Title of the Project :**PROCESS AND SYSTEM EFFICIENT BIODIESEL PRODUCTION**

Certificate :https://drive.google.com/file/d/1MSKEhCpyOqLfb3cWhnuv1EI3dpgu2TnS/view?usp=sharing

Abstract : In the development of this project recycled or reused waste cooking oils were collected from restaurants and fast food centres for production of biodiesel.

The process by which biodiesel is produced is known as transesterification

In which organically derived oils (triglycerides, fatty acids) are combined with alcohol (ethanol or methanol) in the presence of a catalyst to form ethyl or methyl ester along with a by-product which has glycerol

PROCEDURAL HIGHLIGHTS OF BIODIESEL EXTRACTION

1. This method uses microwave irradiation technique and thus effectively converts waste cooking oil into biodiesel.
2. This project introduces a commercially available enzymatic catalyst which is responsible for getting desired yield i.e. up to 95 %.
3. A gravity separator is used for separating biodiesel and byproducts
4. A microcontroller based automation system aids in continuous collection of biodiesel produced. An indicator panel indicates various stages involved in the biodiesel production.

In the post transesterification reaction phase, the catalyst and excess alcohol can be retrieved by the process of distillation which can be reused later

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Photos :

https://drive.google.com/file/d/1VxINbFjEhNtc2bwmV2gcJUDnkiYZy_Lp/view?usp=sharing

https://drive.google.com/file/d/1mLQJK8TpqJl5Dv07PeRNWYvaCdAdql4T/view?usp=sharing

https://www.youtube.com/watch?v=jcj8nQAvsaI

MJCET R&D Project Granted Indian Patent

FREEDOM PRESS BUREAU

Hyderabad, July 23: Muffakham Jah College of Engineering and Technology (MJCET), Hyderabad, a college withstanding of 40 years, has 8 B.E Courses, and 5 M.E courses.

In addition to that, MJCET has Research Centres approved by Osmania University in 5 Engineering Departments to pursue doctoral studies in which 69 scholars are pursuing their PhD.

The institute has been consistently ranked by leading national magazines among top 100 Government and Private Engineering colleges across India. MJCET has 60 faculty members with PhD qualifications and 18 faculty members are Osmania University approved Research Supervisors. To promote R&D culture in the college, Zafar Javeed, Secretary, SUES has sanctioned substantial R&D funding and has always encouraged research projects and patenting of the same.

One of the successfully completed R&D projects is the "Bio-diesel Production Process". This project was filed for a patent in December 2019 and got published in January 2020. The Government of India has granted a patent for the same on 19th July 2021 for a term of 20 years from 31st December 2019.

The Patent No. is 372207 titled "Process and System for Efficient Biodiesel Production". The inventors of the patent are Dr. M.G.V. Satyanarayana of the Chemistry Department and Dr. Ishrat Meera Mirzana of the Mechanical Engineering Department.

SUES Secretary Zafar Javeed congratulated inventors of patent Dr. M.G.V. Satyanarayana and Dr. Ishrat Meera Mirzana.

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

A milestone achieved: MJCET R & D Project Granted Indian Patent

Muffakham Jah College of Engineering and Technology (MJCET), Hyderabad, a college with standing of 40 years, has 8 B.E Courses, and 5 M.E courses. In addition to that, MJCET has Research Centres approved by Osmania University in 5 Engineering Departments to pursue doctoral studies in which 69 scholars are pursuing their PhD.

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The inventees of the patent are: Dr. M.G.V. Satyanaryana of Chemistry Department and Dr. Ishrat Meera Mirzana of Mechanical Engineering Department.

The project and patenting was funded by R & D, Cell and was encouraged and supported by Advisor cum Director, MJCET- Dr. Basheer Ahmed. The inventees were felicitated and appreciated by Hon. Secretary, SUES-Janab Zafar Javeed Saheb. On this occasion, Advisor cum Director, MJCET- Dr. Basheer Ahmed and Registrar, MJCET- Mr. K.V. Narshima Rao were also present.

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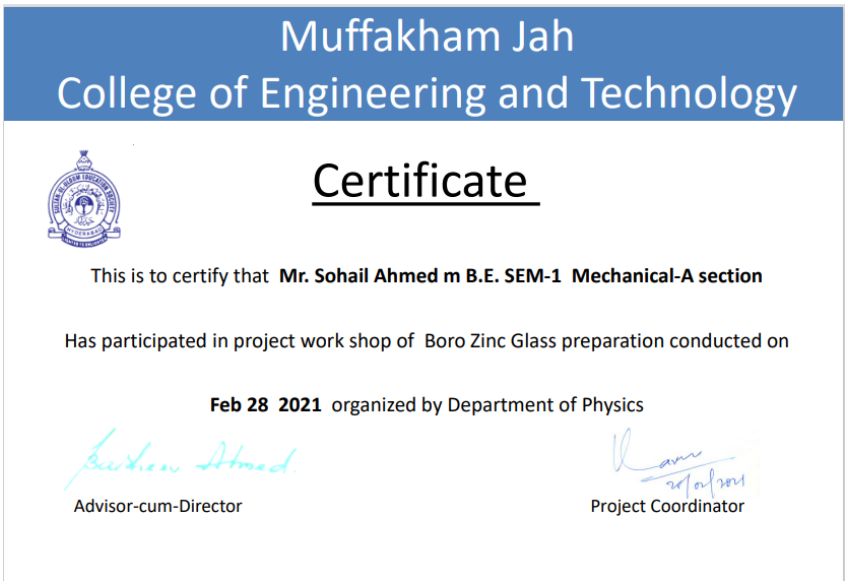
BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title Preparation of Boro Zinc glasses for radiation shielding applications

2. Certificate duly signed and stamped



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College of Engineering and Technology

Certificate

This is to certify that **Mr. Sohail Ahmed m B.E. SEM-1 Mechanical-A section**

Has participated in project work shop of Boro Zinc Glass preparation conducted on

Feb 28 2021 organized by Department of Physics

Advisor-cum-Director

Project Coordinator

3. Abstract

In the present study, the gamma ray and fast neutron radiation shielding abilities of $xZnO\text{-}(80\text{-}x)TeO_2\text{-}10B_2O_3\text{-}10GeO_2$ (x = 40, 45, 50, 55, 60 and 65) glass system were examined. The mass attenuation coefficient (μ_m) values determined experimentally and compared with the theoretical values confirmed via Phy-x software at four different photon energies (356, 662, 1173 and 1330 keV). The mean free path (MFP), half value layer (HVL), effective atomic number (Z_{eff}), electron density (N_{eff}), exposure building factor (EBF) and fast neutron removal cross-section have been calculated experimentally and theoretically. The obtained results were observed to be in good harmony. As observed from the above results that the glass with x=65 has the highest values μ_m and $Z_{eff}$and the the lowest values of MFP and HVL were observed for X=55.

Therefore, we think that high bismuth containing tellurium boro germinate glasses can serve as a promising candidates for gamma photon shielding applications. Moreover, the fast neutron shielding capability was tested in terms of Σ_R which decreased with the increase of ZnO. Therefore, X=45 mole% glass seems to serve best as a candidate

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for fast neutron shielding applications. The comparison study of the MFP, HVL, Z_{eff} and Σ_R with some standard shielding materials implies that the present prepared ZnO-TeO_2-B_2O_3-GeO_2 glasses have better shielding competence than other shielding glasses. The present glasses would be useful in various radiation protection applications such as exposure controls.

4. Functioning Photos./Output Screenshots

Glass making Process

5. Impact to the society.

These glasses can be proposed to gama ray shielding applications in different fields such as Nuclear energy

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title:Smart Energy Monitoring Of Home Appliances Using IOT

2. Certificate

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(Estd. by Sultan-Ul-Uloom Education Society in 1980)

(Affiliated to Osmania University, Hyderabad)

CERTIFICATE

This is to certify that the project entitled **"SMART ENERGY MONITORING OF HOME APPLIANCES USING IoT** is submitted by

MOHAMMED AHSAN ANSARI	(160417734028)
MOHAMMAD SAIFUDDIN	(160417734018)
SYED SOHAIL AHMED	(160417734034)

to Muffakham Jah college of Engineering and Technology, in partial fulfilment for the award of the degree of **Bachelor of Engineering** in **Electrical and Electronics Engineering**.

This is a bonafide work done under our guidance and supervision and the results embodied in this project report has not been submitted to any other university or institute for the award of any other degree/diploma/fellowship.

Project Guide	Project Co-Guide	Head of Department
Dr.Md. Haseeb Khan	Arshad Mohammed	Dr.Md. Haseeb Khan
Professor & Head	Assistant Professor	Professor & Head

25/01/202

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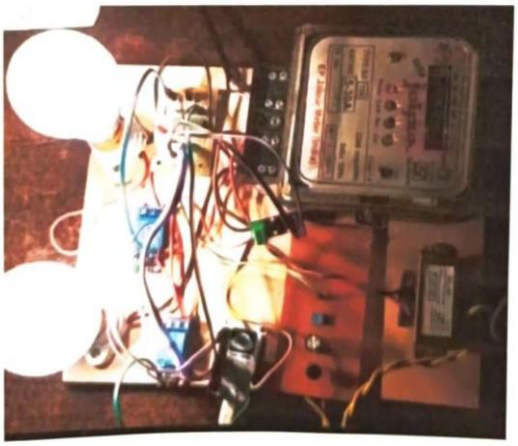
Engineering & Technology
Banjara Hills, Road No. 3,
HYDERABAD-500 034.(T.S.)

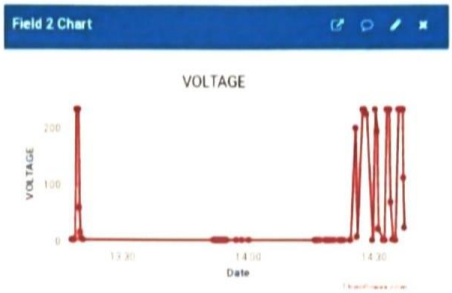
3. Abstract

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

The demand for power has increased exponentially over the last century. One avenue through which today's energy problems can be addressed is through the reduction of energy usage in households. This has increased the emphasis on the need for accurate and economic methods of power measurement. This project proposes a smart energy monitoring system for home appliances incorporating IoT. The sensor circuit of this project consists of ADC IC (Analog to Digital Converter integrated circuit) MCP3008, Voltage sensor and current sensor. Firstly, a NodeMCU based smart plug serving as the gateway, that is able to read the current and voltage data from the home appliances and we are able to calculate the power consumed using the Arduino programming and that data is then being put into ThingSpeak and being graphically represented on the screen. Proper energy utilisation is an enormous hurdle to overcome, especially in this era where population is expected to increase rapidly, and global warming is already showing its effect. In a nutshell, this project will help propel the utilisation of IoT within the field of home energy management system and create a cost-effective solution for consumers. It can also be helpful to find any power theft after the current values crosses a particular value which can be decided while designing the project.

4. Functioning Photos. /Output Screenshots





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5. Impact to the society.

Energy monitoring helps to control and conserve energy in the future. Without conducting energy monitoring, you won't be able to distinguish where inefficiencies lie within your business to effectively rectify the situation. Energy monitoring becomes even more effective when it is conducted in real-time. As soon as an asset breaks down, instant notifications can be sent to the maintenance team to rectify the situation before excessive amounts of energy is wasted. In addition, the continuous monitoring and analysis of equipment data means predictive maintenance can take place, so assets can continue to operate efficiently at all times with fewer failures. Monitoring real-time energy data also provides energy managers with better insights into cost per unit of energy. This metric helps organizations to reduce costs in demand or power factor.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title:Anti-Collision Mechanism In Vehicles

2. Certificate

MUFFAKHAM JAH
COLLEGE OF ENGINEERING &TECHNOLOGY
(Est. by Sultan-Ul-Uloom Education Society in 1980)
(Affiliated to Osmania University, Hyderabad)
Approved by the AICTE & Accredited by NBA

CERTIFICATE

This is to certify that the project entitled **'Anti-Collision Mechanism in Vehicle'** submitted **by Mohammad Abdul Mussavier Ahmed (Roll No: 1604-17-734-023), Shaik Md Mahaboob (Roll No: 1604-17-734-032), Shaik Zuber (Roll No: 1604-17- 734-301)** in partial fulfilment of the requirements for the award of the Degree of **Bachelor of Engineering, in Electrical and Electronics Engineering** is a bonafide record of work carried out by them under our guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

Mr. J.E MURALIDHAR
Associate Professor
EED, MJCET, Hyderabad
Project Guide

Dr. Mohd. Haseeb Khan
Professor and Head EED,
MJCET, Hyderabad

PRINCIPAL
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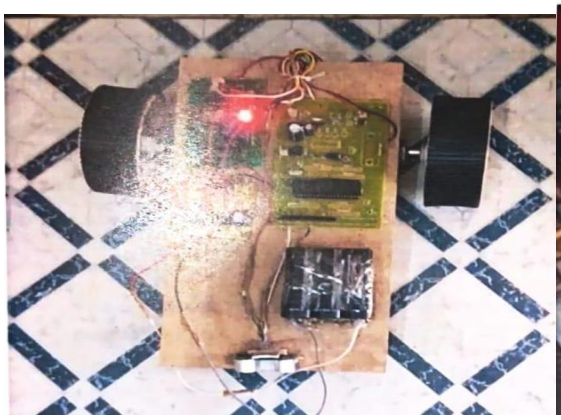
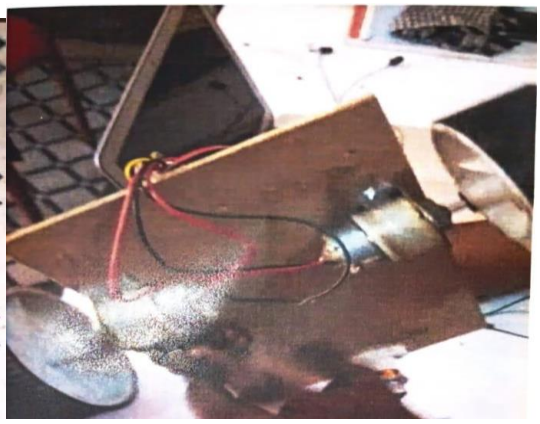
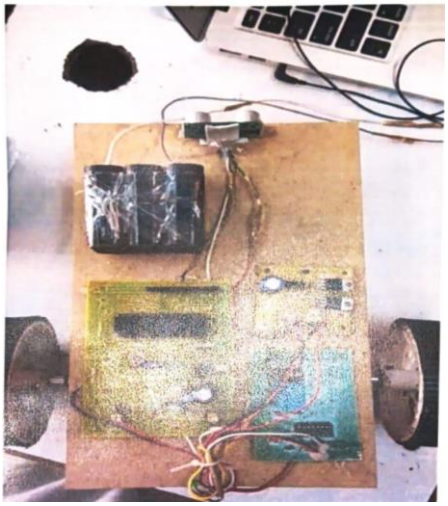
3. Abstract

Vehicle technology has increased rapidly in recent years, particularly in relation to braking system and sensing system. In parallel to the development of braking technologies, sensors have been developed that are capable of detecting physical obstacles, other vehicles or pedestrians around the vehicle. This development prevents accidents of vehicles using stereo multi-purpose cameras, automated emergency braking systems and ultrasonic sensors. The stereo multi-purpose camera provides spatial intelligence of up to 50metres in front of the Vehicle and there is an environment recognition of 500metres. Cars can automatically brake due to obstacles or any hindrance when the sensor senses the obstacles. The braking circuit function is to brake the car automatically after receiving signal from the sensors. All cars are competent in applying brakes automatically to a maximum extent of deceleration of 0.4g. Integrated safety systems are based on three principles. They are: collision avoidance, collision mitigation braking systems and forward collision warning.

4. Functioning Photos. /Output Screenshots







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5. Impact to the society.

Automated anti-collision system by detecting obstacles for automobile industry is one the emerging technologies nowadays. An automated vehicle anti-collision system is an automobile safety system which prevents collision among cars and objects automatically. system specializes in detecting obstacles by sharp distance sensor and alerts within close distance of collision and hereafter brakes automatically by actuator in critical distance without the help of driving person. If somehow driver fails avoiding the collision, this system will automatically stop the vehicle as it monitors the condition of the vehicle continuously. So it is a user friendly and versatile system which can prevent road accidents, reduce the rate of accidents as well as accidental death of human life. It can be used in any kind of automobile vehicle as it's a cost effective system

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title:Automatic Street Light Control by Detecting Vehicle Movement

2. Certificate

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CERTIFICATE

This is to certify that the dissertation titled **'Automatic Street Light Control By Detecting Vehicle Movement'** submitted by **Shaik Shoaib (Roll No: 1604-17-734-305), Talha Athar (Roll No: 1604-17-734-308), MD Sameer (Roll No: 1604-17-734-310)** in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering, in Electrical and Electronics Engineering** is a bonafide record of work carried out by them under our guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree.

J. Namratha

Dr. J. Namratha Manohar
Project Guide, Professor EED,
MJCET, Hyderabad

Dr. Mohd. Haseeb Khan,
Professor and
Head of Dept. EED,
MJCET, Hyderabad

Professor & Head
Electrical Engineering Department,
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3. Abstract

Energy saving is the objective of one and all in the society. The advancements in technology is providing various techniques to plan, implement, monitor and control the consumption of electric energy, at any place for any application to the extent of a micro-watt. Integrating the latest technologies in various areas low power consumption bulbs, remote control systems and Internet-of-Things technology, it is proposed to develop a Smart-Lightening system so as to control the lights at various locations as streets and parking to consume power as less as possible.

The components that are used in developing the projects are LDR, ARDUINO UNO, LED'S, RESISTORS, IR PROXIMITY SENSORS. LDR stands for light dependent resistor whose resistance depends on the light impinging on it. ARDUINO UNO is a microcontroller based chip and had IDE (Integrated Development Environment) for writing, compiling, uploading codes to microcontroller. LED- Light Emitting Diode which is a PN junction diode which gives visible light when it is activated. A resistor has a proper to limit the flow of current through it in the circuit. IR PROXIMITY SENSORS are one which consists of infrared transmitter, an infrared receiver and a potentiometer for adjusting distance. Whenever an object passes in front of it the emitted rays reflects back to receiver from transmitter and it will consider it as motion.

4. Functioning Photos. /Output Screenshots

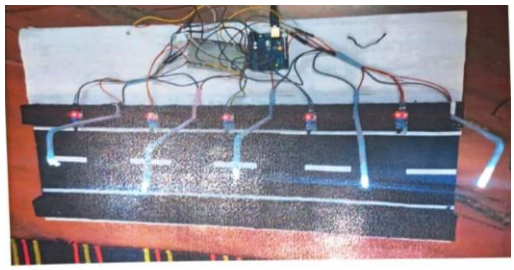

Fig 5.1 Operation phase 1

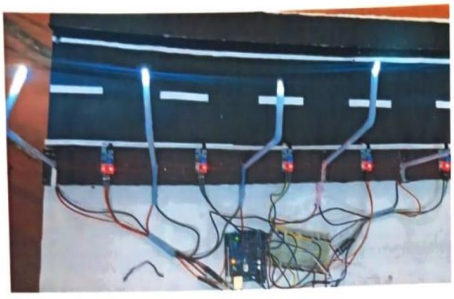

Fig5.2 Operation phase 2

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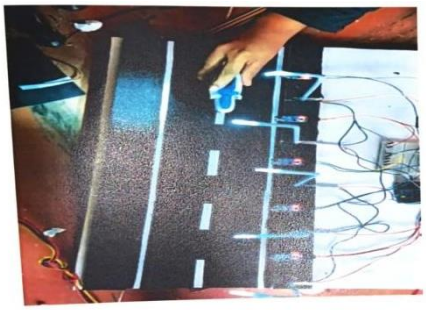

Fig 5.3 operational phase 3

5. Impact to the society

The amount of power consumed by lighting and streets shares a major energy demand. The vehicles are passing over always and a part of places will be consisting of less density areas and even no vehicle moments itself in few areas. But during night all street lights will be on in conventional street lighting system. To overcome from this issue, a proper energy saving methods and lighting control to be implemented. In this project street lights are controlled based on vehicles and pedestrian moments with bright and dim mode of operation and to switch off lights during no vehicles and pedestrian. From the proposed method the overall energy being utilized now-a-days for lighting can be minimized. Moreover the automatic and intelligent control schemes are required to control the complex lighting system due to growth of cities and standard of living.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title:Remote Monitoring of Sensor Data Using Raspberry pi

2. Certificate

MUFFAKHAM JAH

COLLEGE OF ENGINEERING & TECHNOLOGY

(Estd. by Sultan-Ul-Uloom Education Society in 1980)

(Affiliated to Osmania University, Hyderabad)

CERTIFICATE

This is to certify that the Project Seminar Report entitled "**Remote Monitoring Of Sensor Data Using Raspberry Pi**" being submitted by **Amtul Hafsa (1604-17-739-007), Masleh Uddin Siddiqui (1604-17-739-009)** and **Abdul Muqeet (1604-17-739-021)** to Muffakham Jah College of Engineering and Technology, Hyderabad for the partial fulfillment of the award Degree of the **Bachelor of Engineering** in **Electronics and Instrumentation Engineering.**

This is a bonafide work done by them under our guidance and supervision and the results embodied in this project report have not been submitted to any other university or institute for the award of any degree or diploma or fellowship.

Project Guide
Dr. Md. Abdul Muqeet

Head of the Department
Dr. Haseeeb Khan

3. Abstract

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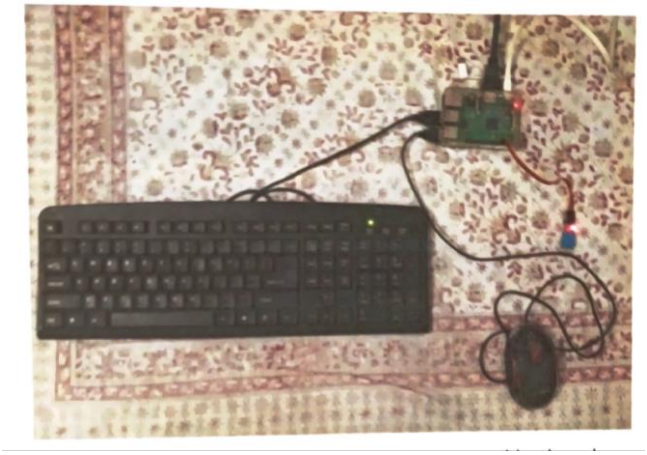
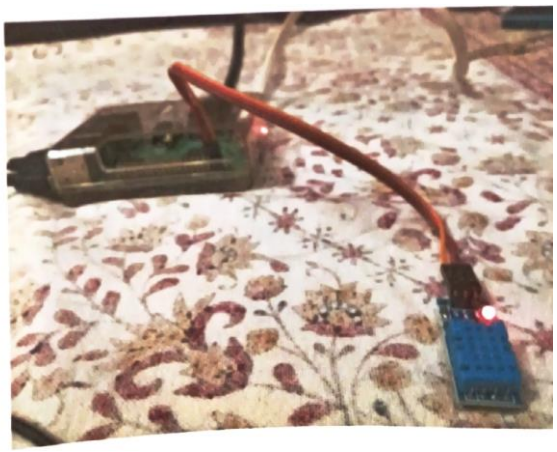
HYDERABAD-500 034.(T.S.)

4. Functioning Photos. /Output Screenshots





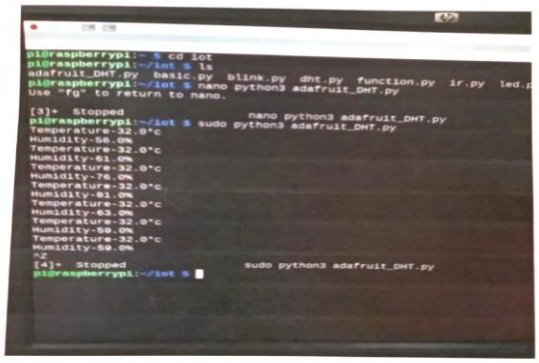


Figure 16: Command Terminal of Raspberry Pi

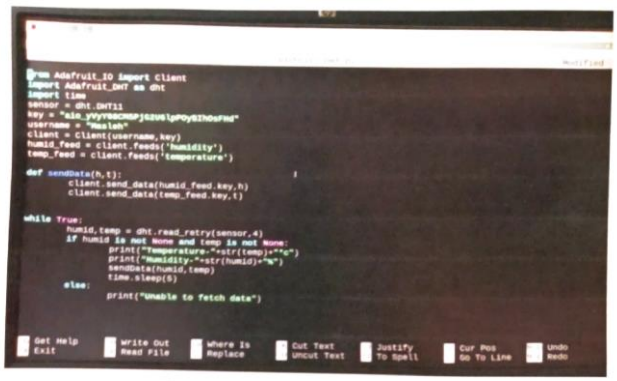


Figure 15: Program Code In Raspberry Pi

5. Impact to the society

The work was successful in building a monitoring device which works as a thermometer for measuring temperature and humidity inside a building, house or a room; it is capable of measuring humidity and temperature outdoors. Compared to expensive sensor, the IoT based monitoring system successfully reduces the power consumption, cost and complexity of the process. The performance of the system was accurate and reliable with some error in measurement and limitations of the used sensor.

This IoT-based framework can be reached out for controlling distinctive electronic and electrical device from remote areas and the framework can likewise reached out. This project will help the society in building up remote monitoring systems where human access in restricted or not possible

Project-5

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Banjara Hills, Road No. 3,
HYDERABAD-500 034.(T.S.)

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title:IOT Based EMG Monitoring System

2. Certificate

MUFFAKHAM JAH
COLLEGE OF ENGINEERING &TECHNOLOGY
Estd. By Sultan-Ul-Uloom Education Society in 1980)
(Affiliated to Osmania University, Hyderabad)

CERTIFICATE

This is to certify that the project entitled "**IOT Based EMG monitoring system**" is being submitted by **P. PAVAN BHARADWAJ (1604-15-739-009), SHAIK RAIS UL ISLAM (1604-15-739-026),** to Muffakham Jah college of Engineering and Technology, in partial fulfillment for the award of the degree of **Bachelor of Engineering** in **Electronics and Instrumentation Engineering.**

This is a Bonafide work done by them under our guidance and supervision and the results embodied in this project report have not been submitted to any other university or institute for the award of any degree or diploma or fellowship.

Project Guide

Mr. Mohammed Umair Quadri

(Assistant Professor)

Head of Department

Dr. Mohd Haseeb Khan

HEAD,
Dept. of Electrical Engineering
M.J. College of Engg. & Tech.
Hyderabad-500 34

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Muffakham Jah College Of
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Banjara Hills, Road No. 3,
HYDERABAD-500 034.(T.S.)

3. Abstract

Movement disorder therapies involving sonography and rhythmic entrainment have shown lasting improvement to gait dynamics. This project can be considered as a tool for acquisition of muscle activity, their analysis and presentation as a live biofeedback signals that distinguishes between typical and atypical gait patterns. Muscle activity is recorded and analysed on Arduino, then sent to remote service with the help of IoT concepts, where MQTT protocol is been used where this help in the telemetry of the obtained signals using cloud. The live recordings are also obtained on the PC using the python and the input is given to Node MCU. By developing this tool that can be used at home, user will be able to train daily and maintain longer rehabilitation programs, thus encouraging neural reorganization. This can also help us in monitoring the progress of the patient treatment even if the physiotherapist could come and data can be directly sent to them.

A technique used to record, evaluate and analyse the electrical activity produced by muscles is called electromyography. This technique helps in detecting the issues that harm the muscle tissues, nerves and spot the location where they are joining. In some industries, even with all the available material handling equipment, manual lifting is used regularly for moving or changing thing's position. As a result, low productivity and low performance of workers occur due to heavy weights or over weight lifting that affects soft tissues and muscles. The aim is to develop an EMG monitoring device based on IoT, for analyzing EMG signals. These EMG signals are generated from biceps branchi to check the performance of fatigue in that muscle. The generated raw EMG signal are saved and sent over internet using Wi-Fi Module ESP8266 using TCP/IP protocol making it a IoT device. Therefore, a methodology is proposed in this study which shows that frequent manual lifting will lead to tiredness in muscles of all phases.

4. Functioning Photos. /Output Screenshots

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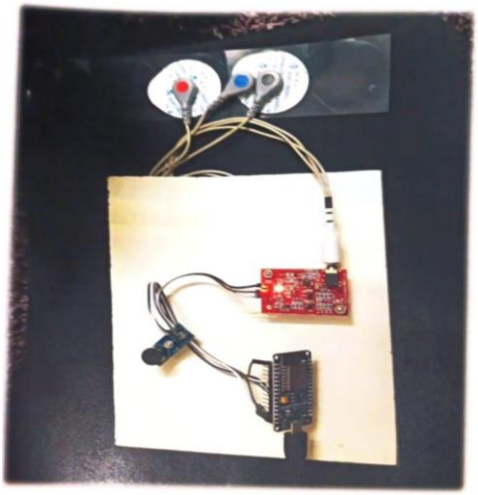
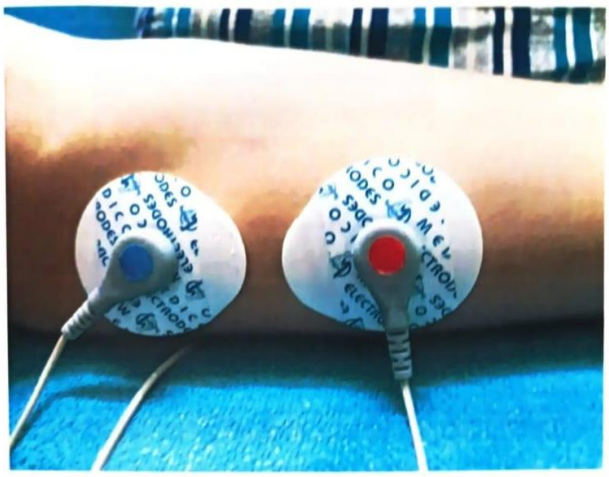
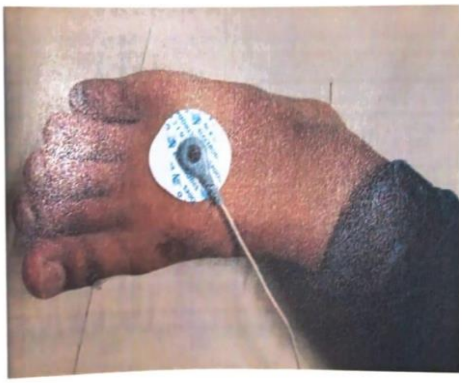
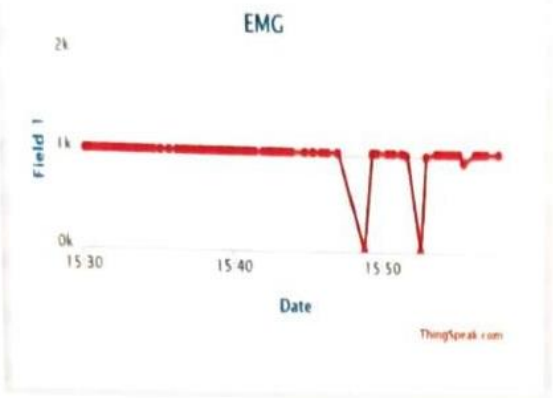
HYDERABAD-500 034.(T.S.)









5. Impact to the society

This project can be considered as a tool for acquisition of muscle activity, their analysis and presentation as a live biofeedback signals that distinguishes between typical and atypical gait patterns. Muscle activity is recorded and analysed on Arduino, then sent to remote service with the help of IoT concepts, where MQTT protocol is been used where this help in the telemetry of the obtained signals using cloud. The live recordings are also obtained on the PC using the python and the input is given to Node MCU. By developing this tool that can be used at home, user will be able to train daily and maintain longer rehabilitation programs, thus encouraging neural re organization. This can also help us in monitoring the progress of the patient treatment

A technique used to record, evaluate and analyse the electrical activity produced by muscles is called electromyography. This technique helps in detecting the issues that harm the muscle tissues, nerves and spot the location where they are joining. In some industries, even with all the available material handling equipment, manual lifting is used regularly for moving or changing thing's position. As a result, low productivity and low performance of workers occur due to heavy weights or over weight lifting that affects soft tissues and muscles. The aim is to develop an EMG monitoring device based on IoT, for analysing EMG signals. The generated raw EMG signal are

saved and sent over internet using Wi- Fi Module ESP8266 using TCP/IP protocol making it a IoT device. Therefore, a methodology is proposed in this study which shows that frequent manual lifting will lead to tiredness in muscles of all phases.Thisproject will help the society/personnel in interpreting the functional effects of disability.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title: Wearable Health Devices-Vital sign monitoring systems and Technologies

2. Certificate

MUFFAKHAM JAH
COLLEGE OF ENGINEERING & TECHNOLOGY
(Est. by Sultan-Ul-Uloom Education Society in 1908)
(Affiliated to Osmania University, Hyderabad)

CERTIFICATE

This is to certify that the project entitled **"WEARABLE HEALTH DEVICES-VITAL SIGN MONITORING SYSTEMS AND TECHNOLOGIES"** is submitted by **Md. Abdul Quavi (1604-15-739-036), Abdul Hannan (1604-15-739-042)** to Muffakham Jah college of Engineering and Technology, in partial fulfillment for the award of the degree of **Bachelor of Engineering** in **Electronics and Instrumentation Engineering**.

This is a Bonafide work done under our guidance and supervision and the results embodied in this project report has not been submitted to any other university or institute for the award of any other degree/diploma/fellowship.

Project Guide
Md Umair Quadri

Head of the Department
Dr. Md. Haseeb Khan
Professor & Head
Electrical Engineering Department
M.J. College of Engg. & Tech.
Rd. No. 3, Banjara Hills, Hyd.-34

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HYDERABAD-500 034.(T.S.)

3. Abstract

Wearable Health Devices (WHDs) are increasingly helping people to better monitor their health status both at an activity/fitness level for self-health tracking and at a medical level providing more data to clinicians with a potential for earlier diagnostic and guidance of treatment.[1] Wearable health systems: from smart technologies to real applications - PubMed (nih.gov) The technology revolution in the miniaturization of electronic devices is enabling to design more reliable and adaptable wearables, contributing for a world-wide change in the health monitoring approach. In this paper we review important aspects in the WHDs area, listing the state-of-the-art of wearable vital signs sensing technologies plus their system architectures and specifications. A focus on vital signs acquired by WHDs is made: first a discussion about the most important vital signs for health assessment using WHDs is presented and then for each vital sign a description is made concerning its origin and effect on heath, monitoring needs, acquisition methods and WHDs and recent scientific developments on the area (electrocardiogram, heart rate, blood pressure, respiration rate, blood oxygen saturation, blood glucose, skin perspiration, capnography, body temperature, motion evaluation, cardiac implantable devices and ambient parameters). A general WHDs system architecture is presented based on the state-of-the-art. After a global review of WHDs, we zoom in into cardiovascular WHDs, analyzing commercial devices and their applicability versus quality, extending this subject to smart t-shirts for medical purposes.[2] Furthermore, we present a continued evolution of these devices based on the prototypes developed along the years. Finally, we discuss likely market trends and future challenges for the emerging WHDs area.[3]

4. Functioning Photos. /Output Screenshots

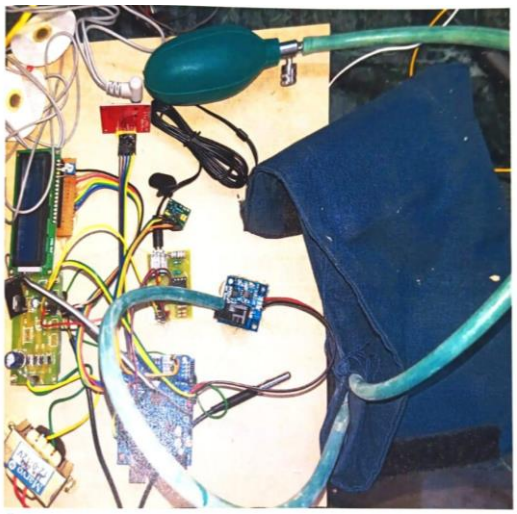

Fig 20.1: Image of the hardware components, while the kit is off.

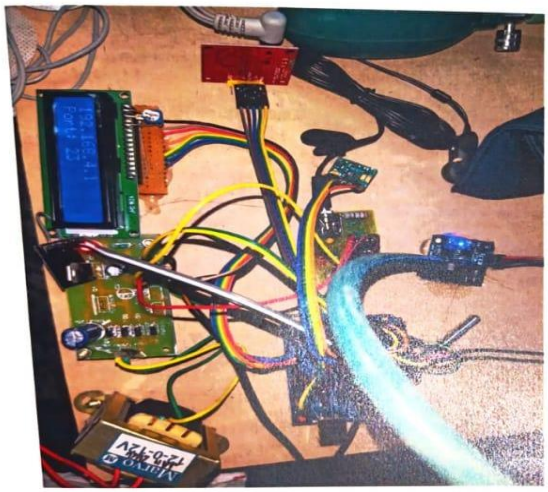

Fig 20.9: Image showing the TCP IP and PORT address for the IOT.

5. Impact to the society

Wearable Health Devices (WHDs) are increasingly helping people to better monitor their health status both at an activity/fitness level for self-health tracking and at a medical level providing more data to clinicians with a potential for earlier diagnostic and guidance of treatment. The technology revolution in the miniaturization of electronic devices is enabling to design more reliable and adaptable wearables, contributing for a world-wide change in the health monitoring approach. In this project we review important aspects in the WHDs area, listing the state-of-the-art of wearable vital signs sensing technologies plus their system architectures and specifications. A focus on vital signs acquired by WHDs is made first a discussion about the most important vital signs for health assessment using WHDs is presented and then for each vital sign a description is made concerning its origin and effect on heath, monitoring needs, acquisition methods and WHDs (heart rate, blood pressure, respiration rate, blood oxygen saturation, body temperature). A general WHDs system architecture is presented based on the state-of-the-art. This project will help the society/personnel in getting their vitals like BP, heart rate, SPO_2 on a regular basis and provides sharing the information to doctors by using different apps.

1. Title: Implantation of deep Learning- based prediction of nCOVID-19 Disease using chest Disease using chest X-Ray Images

2. Certificate

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COLLEGE OF ENGINEERING & TECHNOLOGY

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CERTIFICATE

This is to certify that the Project Seminar Report entitled **"Implementation of Deep Learning-based Prediction of nCOVID-19 Disease using Chest X-Ray Images (CXRIs)"** being submitted by **Zeba Urooj (1604-17-739-001), Karrar Nawaz Khan (1604-17-739-042)** and **Shaik Faiz Ahmed (1604-17-739-048)** to Muffakham Jah College of Engineering and Technology, Hyderabad for the partial fulfillment of the award Degree of the **Bachelor of Engineering** in **Electronics and Instrumentation Engineering.**

This is a bonafide work done by them under our guidance and supervision and the results embodied in this project report have not been submitted to any other university or institute for the award of any degree or diploma or fellowship.

Project Guide

Dr. Md. Abdul Muqeet
Associate Professor, EED

Head of the Department

Dr. Haseeeb Khan
Professor & Head
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M.J. College of Engg. & Tech.,
Rd. No. 3, Banjara Hills, Hyd.-155.

25/01/202

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Banjara Hills, Road No. 3,
HYDERABAD-500 034.(T.S.)

3. Abstract

Coronaviruses are a large family of viruses that are known to cause illness ranging from common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). A novel coronavirus (nCOVID-19) was identified in Wuhan, China. This is a new coronavirus that has not been previously identified in humans.

The nCOVID-19 turned into a pandemic and has affected routine lives, health and the global economy. It is crucial to identify the infectious patients as early as possible to avoid further spread of the nCOVID-19 and to rapidly treat affected patients. Recent studies suggested that such CXRIs contain salient details about the nCOVID-19. Application of deep learning to such CXRIs can be supportive for the precise detection of this disease along with the regular RT-PCR test for nCOVID-19.

In this project, we will examine the application of deep learning (DL) models to detect nCOVID-19 patients from normal patients via considering the CXRIs. We will first prepare a dataset of 1800 CXRIs from the publicly existing database. Transfer learning on 80% of the dataset will be applied to train three popular convolutional neural networks (CNNs), including VGG16, VGG19 and ResNet50 to classify and predict nCOVID-19 infected patients from the CXRIs. These models are to be evaluated on the CXRIs and most of these CNNs can achieve good sensitivity and specificity values. We can also exhibit the accuracy and loss value curves for the selected number of epochs. The experimentations of the proposed work are to be carried out in Google Colab.

4. Functioning Photos. /Output Screenshots

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Fig 15 Test Case 1- Detection of nCovid-19

Fig 16 Test Case 2- Detection of nCovid-19

5. Impact to the society

Corona viruses are a large family of viruses that are known to cause illness ranging from common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). A novel corona virus (nCOVID-19) was identified in Wuhan, China. This is a new corona virus that has not been previously identified in humans.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

In this project, we have implemented a deep-learning based model to detect and classify nCOVID-19 cases from X-ray images. Our model has an end-to-end layout that eliminates the need for manual function extraction. The model was trained using 100 nCOVID-19 images and 100 normal images of X-rays of patients. It was then given 20 test cases to verify the prediction it made. The hallmarks of COVID-19 lung infection on CXR are bilateral and peripheral hazy lung opacities and air space consolidation. Our built system is capable of performing tasks with a 99.38% accuracy.

Expert radiologists can evaluate the established model's output and compare it against a larger database. This device can be used to solve a shortage of radiologists in remote areas of countries affected by COVID-19. Some chest-related illnesses, such as tuberculosis and pneumonia, may also be diagnosed using this model.

Thus this project can help the community and society a lot in the pandemic situations.

1. Title: IOT Based Remote Patient Health Monitoring System

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2. Certificate

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CERTIFICATE

This is to certify that the Project Seminar Report entitled **"IOT BASED REMOTE PATIENT HEALTH MONITORING SYSTEM"** being submitted **RAYYAN ZAKI AHMED (1604-15-739-021), SYED ALI MAZHER ABIDI (1604-15-739-035)** and **MOHAMMED ZAHED HABEEB (1604-15-739-057)** to Muffakham Jah College of Engineering and Technology, Hyderabad for the partial fulfillment of the award Degree of the **Bachelor of Engineering** in **Electronics and Instrumentation Engineering.**

This is a bonafide work done by them under our guidance and supervision and the results embodied in this project report have not been submitted to any other university or institute for the award of any degree or diploma or fellowship.

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3. Abstract

Having good health is something everyone wants. It is equally important to monitor a person's health regularly to avoid any kind of abrupt changes in the future. Also, simple monitoring of health status for older people is equally necessary, and in this fast and modern world, long

hospital queues and ambulatory monitoring is well known. These issues demand the system to develop a basic health monitoring system that can be used in homes or wherever possible with primary health parameters. We know that advanced technology has led to many wireless devices and the internet of things. Using IOT, we can capture data and transmit data through the internet, providing data interoperability methods. Nowadays, IOT plays a vital role in capturing data and monitoring, analyzing a series of data, recording storage, and displaying. We analyze parameters such as body temperature, blood pressure, pulse sensor, and GPS to track the patient's current location in this project. We use Adriano Board as a processor where the collected data is sent to Adriano and is processed further. We use the WIFI module to transmit data over the internet for analysis. This analyzed data is stored and used for flexible purposes. Results are automatically sent to the doctor when a critical condition is detected.

4. Functioning Photos. /Output Screenshots

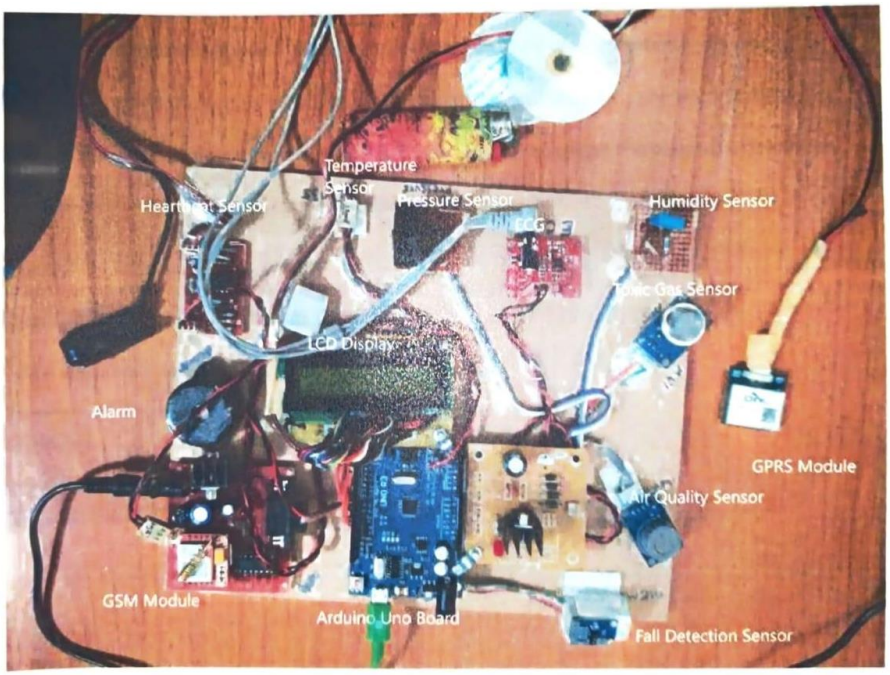

Figure 20: System setup

5. Impact to the society

Remote health monitoring can provide useful physiological information in the home. This monitoring is useful for elderly or chronically ill patients who would like to avoid a long hospital stay. Wireless sensors are used to collect and transmit signals of interest and a processor is programmed to receive and automatically analyze the sensor signals.

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In this project, you are to choose appropriate sensors according to what you would like to detect and design algorithms to realize your detection. Examples are the detection of a fall, monitoring cardiac signals. Using a single parameter monitoring system an approach to a remote health monitoring system was designed that extends healthcare from the traditional clinic or hospital setting to the patient's home.

The system was to collect a heartbeat detection system data, fall detection system data, temperature data and few other parameters. The data from the single parameter monitoring systems was then availed for remote detection. During design the following characteristics of the future medical applications adhered:

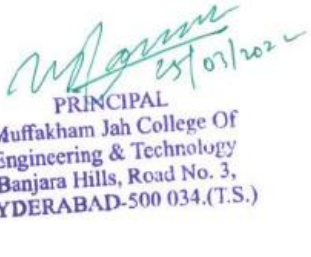
a) Integration with current trends in medical practices and technology.

b) Real-time, long-term, remote monitoring, miniature, wearable sensors and long battery life of a designed device.

c) Assistance to the elderly and chronic patients. The device should be easy to use with minimal buttons.

1. Title: Water Distribution System Using PLC Wirelessly

2. Certificate



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This is to certify that the project entitled "**Water Distribution System using PLC Wirelessly**" is being submitted by **SYED TAUSEEF ULLAH (1604-15-739-014), B. FARAZ ALI KHAN (1604-15-739-016)** and **MD FEROZ AHMED (1604-15-739-043)** to Muffakham Jah college of Engineering and Technology, in partial fulfillment for the award of the degree of **Bachelor of Engineering** in **Electronics and Instrumentation Engineering.**

This is a bonafide work done by them under our guidance and supervision and the results embodied in this project report have not been submitted to any other university or institute for the award of any degree or diploma or fellowship.

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3. Abstract

Water is one of the most important resource for all living beings on the earth. But as it so happens, a significant portion of the world population is deprived of this essential resource owing to the haphazard distribution of water over the world. To avoid this unequal distribution of water, we are planning for smart distribution of water. This project is used for controlling the distribution of water. It can also be used to prevent water theft during the distribution period. Some of the previously existing water distribution models require a person-in-charge having to manually go from place to place and open or close the valve for a particular time period, resulting in the wastage of time. The proposed system is fully automated by connecting it to a PLC. Here human work and

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time is reduced. The water wastage due to leakages, human negligence and operating error can also be avoided.

This proposed automated water distribution system can be used wirelessly. By making use of a PLC and a wireless communication module, the HC12, a robust, reliable and rugged system has been designed. This system can be employed in harsh conditions as well owing to its robustness. Add to that the wireless communication capability and the system's usefulness increases exponentially. The PLC is an essential part of this system which helps to reduce manual interference and wastage of water. In order to have control over the water distribution elements wirelessly, Adriano UNOs have also been utilized. The other key components used are level sensors, solenoid valve and the relay circuit. The level sensor senses the level of water and signals for stopping the flow of water through the solenoid valve, thus restricting the flow of water from the main tank.

4. Functioning Photos. /Output Screenshots

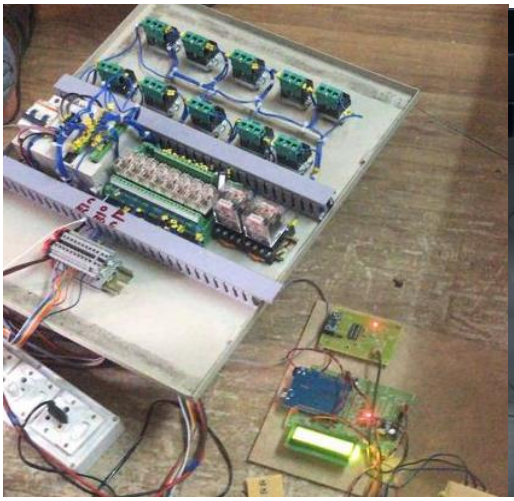

Figure 1: Transmitter sideFigure 2: Receiver side

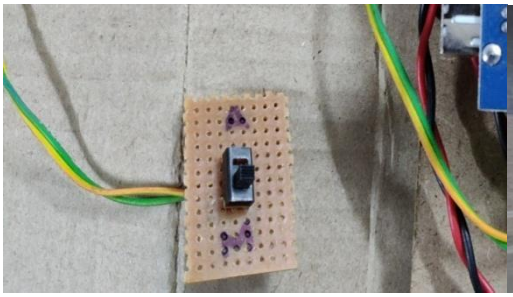

Figure 3: Automatic/ manual switch

Figure 4: Level sensor inside tank

5. Impact to the society

Management of water is an issue that has to be addressed with the utmost urgency, especially in a country like India, which is the second most populated country in the world. Some of the issues faced in the distribution of water include, but are not limited to water leakages, low water levels, low pressure in water supply pipes, etc. All these factors contribute to the improper distribution of water. Moreover, in places, antiquated practices still exist, which also contribute to the issue of improper water distribution. An example of such a practice is when a person goes to a particular place to switch on the supply of water for a certain amount of time, and then switches it off. This results in excessive waste of time and manpower.

With this project, we hope to automate the water distribution systems at a block level. By making use of an industrial grade PLC and several low cost auxiliary components, we hope to implement a system that is capable of directly managing the water distribution system based on the tanks level. Moreover, the proposed system is implemented wirelessly, which gives us an opportunity to have a better, centralized placement of the main processing unit in a secure, yet easily accessible location. Centralized placing of the processing and control unit also means that in times of maintenance and repair operations, the system can be controlled from a single spot. With the readings from the flow sensors installed in the water supply lines, it is possible to detect any case of water theft, which would result in abnormalities in the water flow rate.This project will help the society in building up fully automated by connecting it to a PLC. Here human work and time is reduced. The water wastage due to leakages, human negligence and operating error can also be avoid

1. Title: Automation of Home Appliances Using AI Assistance

2. Certificate

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This is to certify that the dissertation titled '**Automation of Home Appliances using AI Assistant**' submitted by **Syed Shamsheer Ahmed, Mohammed Mustafa Nawaz, Saber Ikram Ali** bearing Roll Numbers: 1604-16-734-019, 1604-16-734-023 and 1604-16-734-034 respectively in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering in Electrical and Electronics Engineering**, is a bona-fide record of work carried out by them under our guidance and supervision during the year 2019-2020. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

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3. Abstract

From the inception of electricity, electrical appliances in any household or commercial establishment are controlled via switches that regulate the electricity to these devices. As the world advances technologically every day, we find ourselves embedded deeper in newer technology in our daily lives even at home. Home Automation is getting more and more popular around the world and is becoming a customary practice in Households. The process of home automation works by making everything in the house automatically controlled using technology to control i.e. IoT, and do the jobs that we would normally do manually. Automation system can have a vital role in reducing the total energy consumed by home appliances.

This project presents a design and prototype of Home Automation system that will use ESP8266 Wi-Fi module as a network provider in connecting with other appliances. The proposed system has two main components. The first main part is Arduino, which controls and manages input of Wi-Fi module. The other main component is Wi-Fi module through Wi-Fi module a web server can be added to the module which will help in controlling of devices over Internet. One server can manage many hardware interface modules as long as it exists on Wi-Fi network coverage. The proposed control of the Wi-Fi Module is utilizing an AI Assistant like Google Assistant or Alexa. The project shall support a wide range of home automation devices like power management components, and security components in future advancement. The project provides a climbable and price effective Home Automation system for the common man.

4. Functioning Photos. /Output Screenshots

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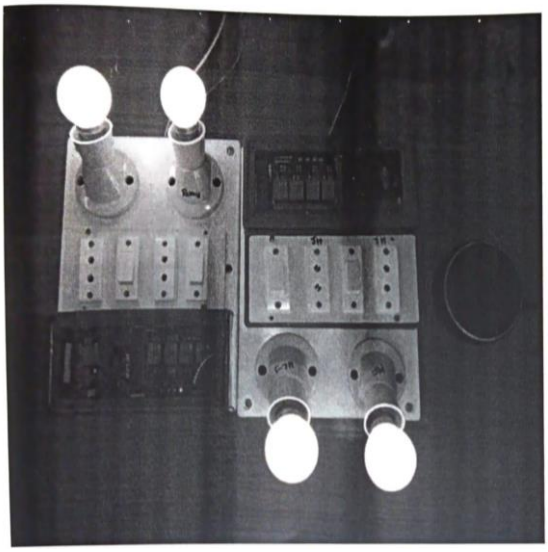
Fig 30 & 31

Screenshots of Amazon Alexa's App Interface for the demonstration of Home Automation.

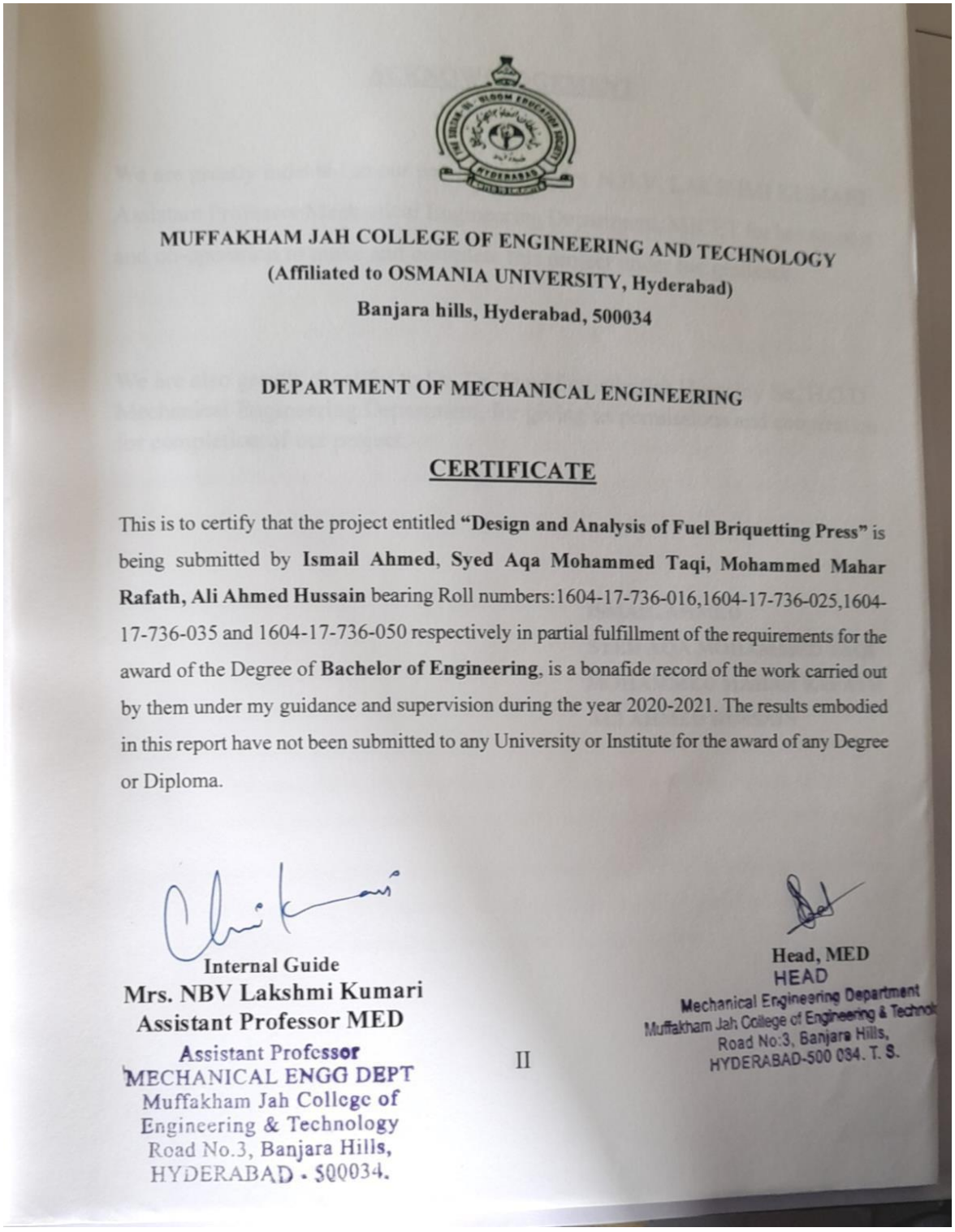


5. Impact to the society

Linking home appliances to smart system can improve a home's productivity. Integrating smart home products and systems also provides invaluable peace of mind. Such interconnectivity enables users to remotely manage and monitor thermostats, review surveillance camera footage, program indoor and outdoor lights, and more, all without having to leave their workplace. This also saves money on utility bills. A smart thermostat can modify your home's temperature based on local weather conditions, making the space more comfortable for its occupants. Through the interconnectivity of smart home technology, and real-time surveillance and monitoring, homeowners can know exactly what's happening, and receive alert on *any* questionable occurrences

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title: **DESIGN AND ANALYSIS OF FUEL BRIQUETTINGPRESS**



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DEPARTMENT OF MECHANICAL ENGINEERING

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This is to certify that the project entitled **"Design and Analysis of Fuel Briquetting Press"** is being submitted by **Ismail Ahmed**, **Syed Aqa Mohammed Taqi, Mohammed Mahar Rafath, Ali Ahmed Hussain** bearing Roll numbers:1604-17-736-016,1604-17-736-025,1604-17-736-035 and 1604-17-736-050 respectively in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering**, is a bonafide record of the work carried out by them under my guidance and supervision during the year 2020-2021. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

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II

2. Certificate

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3. Abstract

Energy consumption in the rural sector of India, particularly in the form of petroleum-based fuels, has increased manifold during the last 40 years or more. Fast depleting stocks of fossil fuels and steep increases in their prices may lead to an energy crisis in the not-too-distant future. Such a crisis will have a serious effect on all economic and domestic activity, particularly in the vast rural areas. Women of the rural India have always suffered from lung diseases and several other problems by using traditional fuels for cooking. Wood, coal, kerosene, cow dung etc., which when burnt, give off smoke and other harmful gases, which in the long run, not only damage the health of rural women, but also significantly contribute to the air pollution and influence climate change. So there is a pressing need to develop an alternate cooking fuel, which not only minimizes the above listed problems but is also economically feasible to rural India.

One of the solutions for this is the Biomass Briquette fuel, which can be made from any kind of organic waste, which is easily available everywhere. The organic waste can be made into briquettes by mixing it with a thick solution of paper pulp. This mixture is then poured into a briquetting press to remove water and make them into solid pieces. These briquettes can be dried and used as an alternative cooking fuel. Briquetting of waste materials to produce cooking fuel reduces solid waste to be disposed of, reduces air pollution, reduces carbon foot print, empowers the poor and establishes a model “people-friendly-eco-friendly” technology.

The main objective of this project is to design a pneumatic type of fuel briquetting press which can be used for the getting the briquettes. The design of the machine is carried out using CAD software and the structural analysis is carried out using Ansys software.

4. Functioning Photos. /OutputScreenshots

Material used in the fuel briquette making

5. Impact to thesociety.

A fuel briquetting machine made up of mild steel has been fabricated which can produce five briquettes in one cycle. As it is made of mild steel the machine is more rigid and durable, greater force could be applied. Since the machine produces five briquettes at a time, there has a been a tremendous increase in productivity. Manual labor cost was reduced. There by it can be said that it is a feasible, sustainable fuel briquetting machine. Along with the engineering aspect, the team also framed a financial model for the project. This model was followed by the team in order to have a regulated expenditure and also to complete the project as per the schedule. There is a vast scope for this system in various areas. As of now, its use is limited to only some select areas. Therefore, the aim is to spread information regarding this system everywhere in order to help tackle issues due to present power generation techniques and provide an eco-friendly solution.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title: **DESIGN AND FABRICATION OF INDUCTION HEATING PROCESS BY SOLARENERGY**

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(Approved by the AICTE & Accreditated by NBA)

CERTIFICATE

This is to certify that the project entitled " **DESIGN AND FABRICATION OF INDUCTION HEATING PROCESS BY SOLAR ENERGY**" is being submitted by Ali Bin Omer, Khaja Afraluddin, Ilham Hussain, Mirza Rivar Baig bearing Roll numbers:1604-14-736-038,1604-14-736-042 , 1604-14-736-307 and 1604-14-736-310 respectively in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering**, is a bonafide record of the work carried out by them under my guidance and supervision during the year 2017-2018. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

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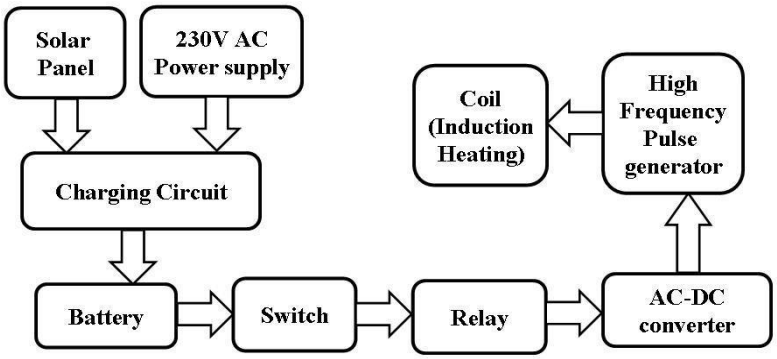
3. Abstract

Induction heating is a non-contact heating process. It uses high frequency electricity to heat materials that are electrically conductive. Since it is non-contact, the heating process does not contaminate the material being heated. It is also very efficient since the heat is actually generated inside the work piece. This can be contrasted with other heating methods where heat is generated in a flame or heating element, which is then applied to the work piece. For these reasons Induction Heating lends itself to some unique applications inindustry.

The project aims at designing a boiler which is powered by solar and heating is done through Induction heating mechanism. The applications of induction heating include melting, welding and brazing or metals, Induction cooking hobs and rice cookers, Metal hardening of ammunition, gear teeth, saw blades and drive shafts, etc. This project is an industrial solar powered water heater control using the heating induction heating equipment. The system uses solar power as the power supply. Thus, the project saves the electrical power up to the maximum extent.

The project makes use of a solar panels. The solar energy obtained is stored to a battery. The battery supply is fed to pulse generator and in turn to a MOSFET which is capable of generating ON/OFF pulses of different frequencies. The generated pulses are fed to copper coil,which creates electromagnetic effect. When any conductive metal is placed in this strong electromagnetic effect, the current flow causes larger heat.

4. Functioning Photos. /OutputScreenshots



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5. Impact to thesociety.

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

The power consumption is 100W by an Induction heater compared to the conventional heating system. The power output generated by a solar panel is 168W. Time required for charging the battery is about 7 hours. Hence comparing the solar induction heating compared to the conventional heating system is found to be advantageous and can be used for heating application with the advancement in the technology, project helps in building the lifelong learning skills in

the student to face real world challenges and provide solutions.

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

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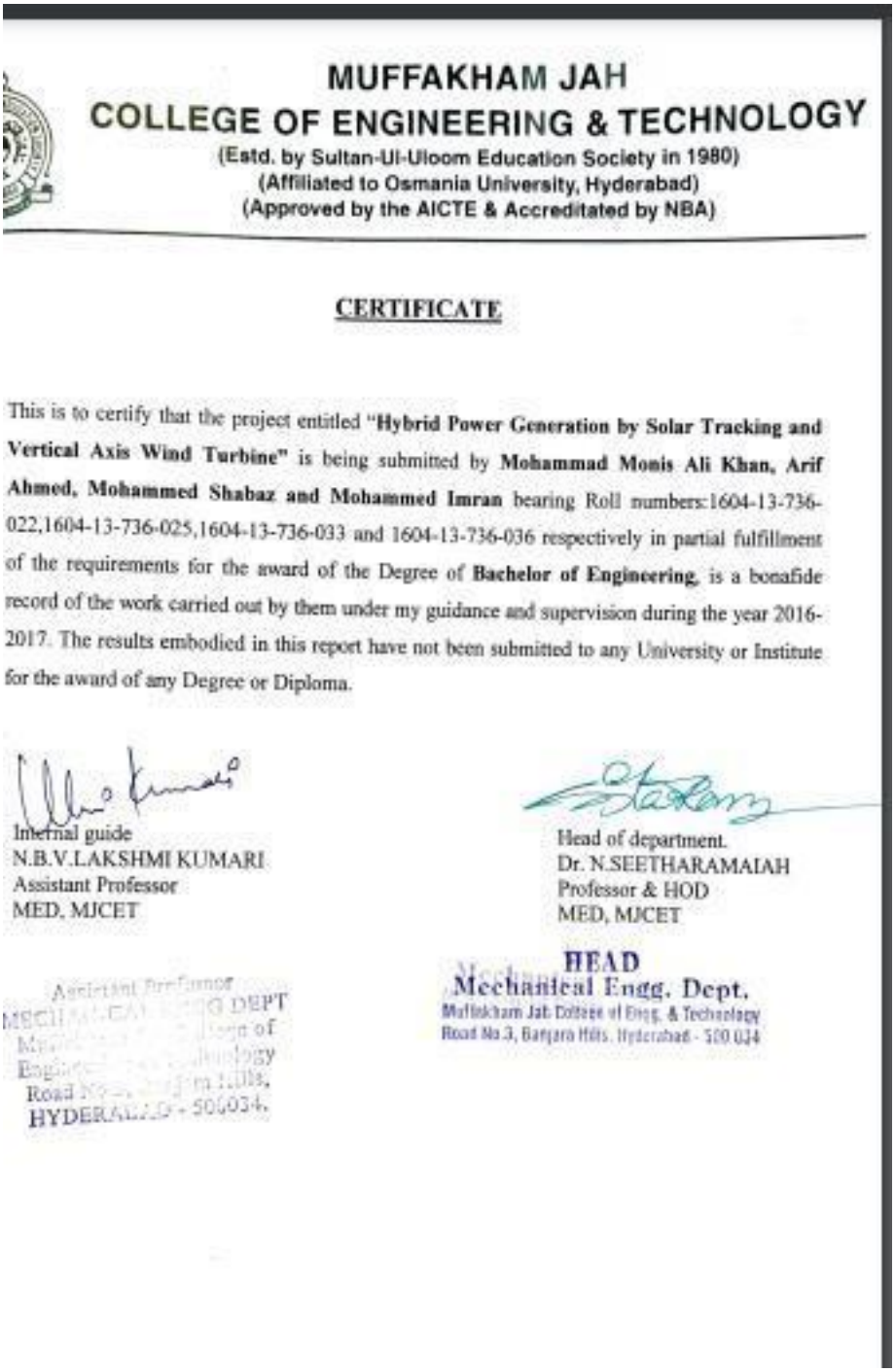
BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

1. Title: **HYBRID POWER GENERATION BY SOLAR TRACKING AND VERTICAL AXIS WINDTURBINE**

2. Certificate



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CERTIFICATE

This is to certify that the project entitled **"Hybrid Power Generation by Solar Tracking and Vertical Axis Wind Turbine"** is being submitted by **Mohammad Monis Ali Khan, Arif Ahmed, Mohammed Shabaz and Mohammed Imran** bearing Roll numbers:1604-13-736-022,1604-13-736-025,1604-13-736-033 and 1604-13-736-036 respectively in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Engineering**, is a bonafide record of the work carried out by them under my guidance and supervision during the year 2016-2017. The results embodied in this report have not been submitted to any University or Institute for the award of any Degree or Diploma.

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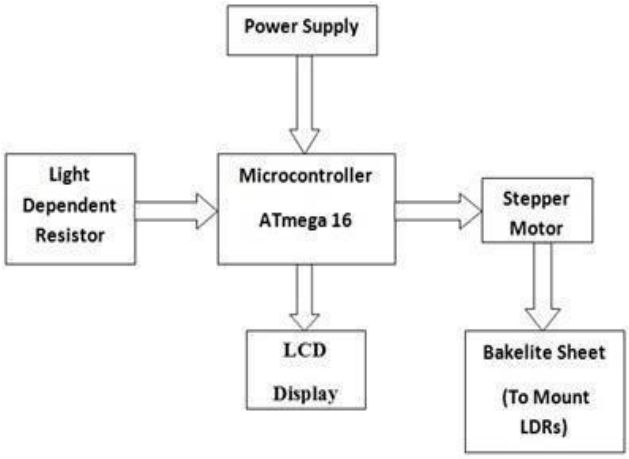
3.Abstract:

The main objective of this project is “Hybrid Power Generation by Solar Tracking and Vertical Axis Wind Turbine” wherein, design of the components and their analysis has been carried out and, the fabrication of the model has been done as per the calculations that have been obtained from the design and analysis.

Electricity has helped in reducing physical efforts to a very large extent, but, the way in which it is produced is quite a matter of concern. Even today, most of the electricity that we use is produced through conventional methods. These conventional methods commonly use fossil fuels to produce electricity. Not only are these methods expensive, but also cause grave damage to the environment. The use of fuels for the generation of electricity results in increased costs and emissions of hazardous pollutants. The only alternative is a new method that is not only cheap and efficient, but also eco-friendly.

4. Functioning Photos. /Output Screenshots



Block Diagram of SolarTracking System

WorkingSetup

5. Impact to thesociety.

Engineering knowledge of areas such as Solar Energy, Wind Energy and Electricity has been applied in order to couple both Solar and Wind Power systems

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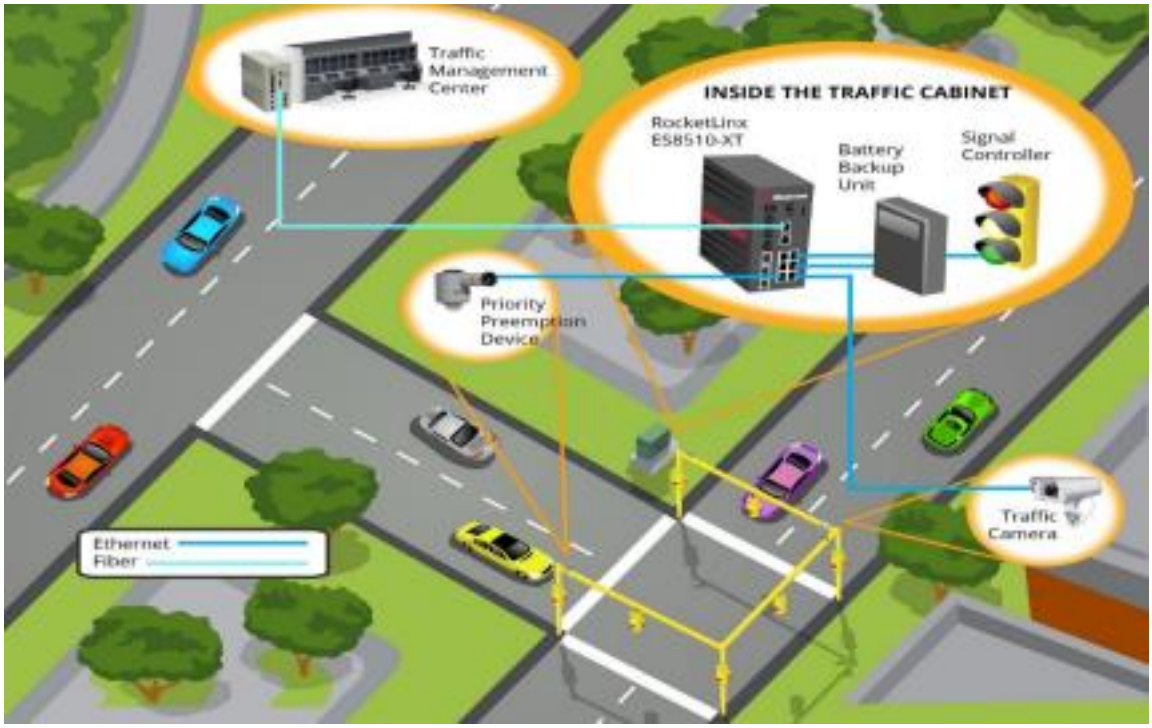
and obtain a single unit. The main problem in today's power generation systems is the availability of a single source. When this sole source's availability is limited or almost nil, it could lead to severe shortage of power. This was the problem that was analyzed while developing the project. The above mentioned problem was analyzed and its solution was found in the form of a dual system having a combination of both solar and wind power generation units i.e. the Hybrid Wind power Generation System. The Hybrid Power Generation System uses the sophisticated technology of Solar Tracking. This is

done in order to ensure continuous irradiance and constant power generation throughout the day. This system is quite beneficial to the society due to its minimal cost and favorable electricity generation. It can be easily installed at any place. For example, its services could be used in rural areas in order to overcome the electricity shortage in such areas. This power generation system relies upon renewable energies and hence is quite environment-friendly. Also, due to the presence of two sources (Sun and Wind) for power generation, it stands out to be a very sustainablemethod.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

SMART TRAFFIC MANAGEMENT SYSTEM



BY:

MOHD RAFI(1604-17-733-096)

MOHD KHAJA RIYANUDDIN(1604-17-733-087)

MOHD FAIZ MOHIUDDIN(1604-17-733-092)

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

SMART TRAFFIC MANAGEMENT SYSTEM

Abstract

As the problem of urban traffic congestion intensifies, there is a pressing need for the introduction of advanced technology and equipment to improve the state-of-theart of traffic control. The current methods used such as timers or human control are proved to be inferior to alleviate this crisis. In this paper, a system to control the traffic by measuring the real-time vehicle density using canny edge detection with digital image processing is proposed. This imposing traffic control system offers significant improvement in response time, vehicle management, automation, reliability and

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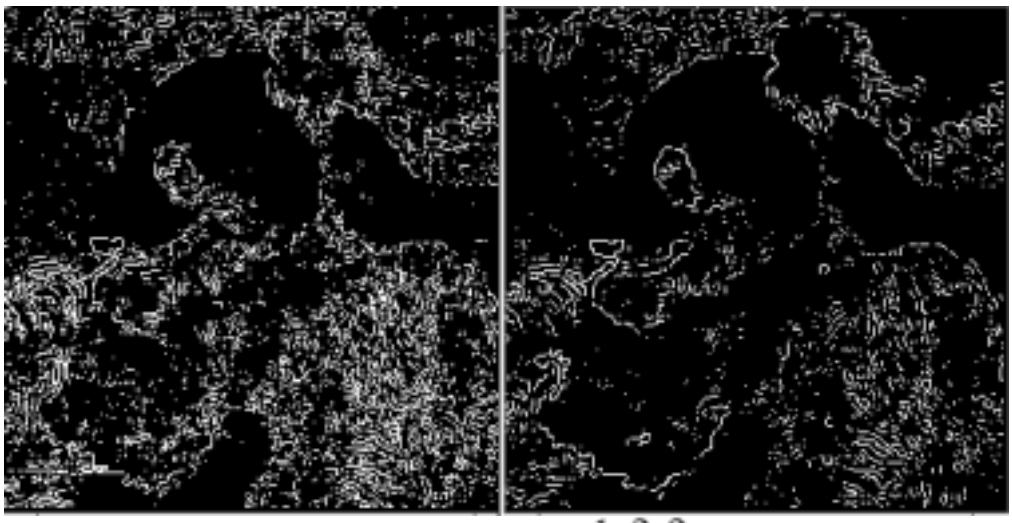
Edge detection by LoG and

DoG:

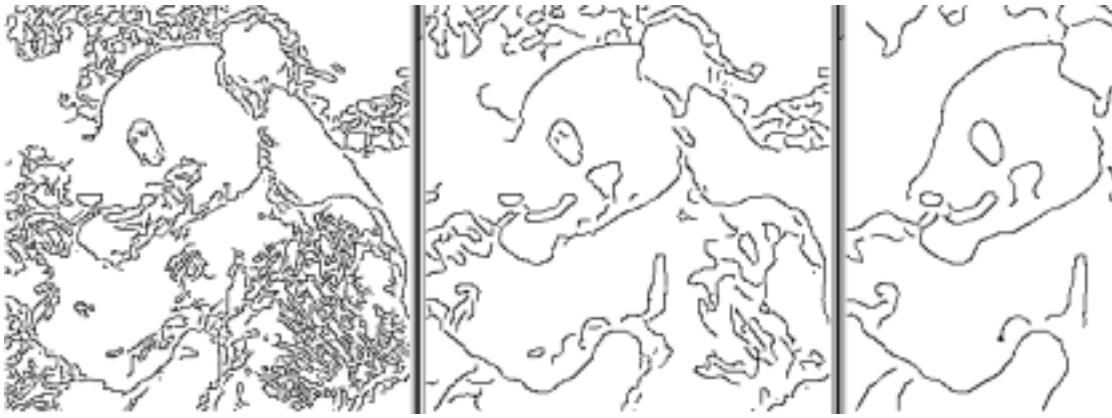


$\sigma = 1, 2, 3$

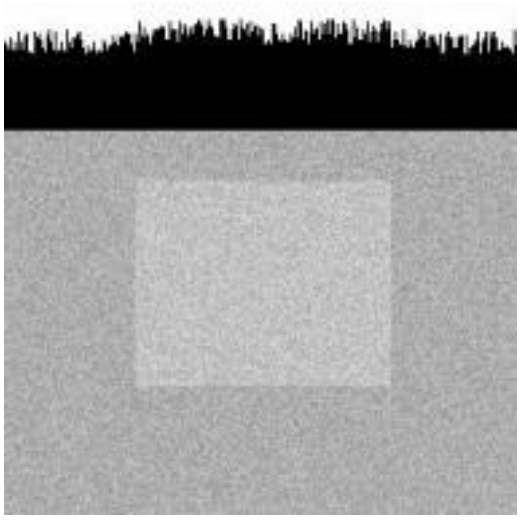
Edge detection by Canny method (,

$\tau_1 = 0.3$ $\tau_2 = 0.7$

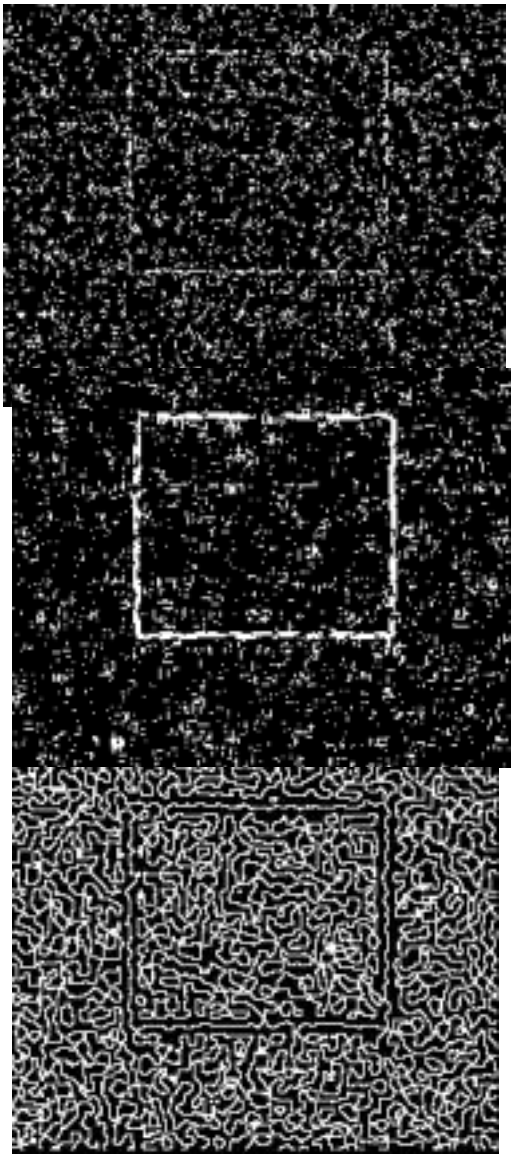
,):



Example 2:



Edge detection results by Sobel, Prewitt gradient operators, by DoG method and by Canny's method ($\sigma = 5$, $\tau_1 = 0.8$, $\tau_2 = 0.95$):



6.2.1. Upload Image:

• A smart traffic control system availing image processing as an instrument for measuring the density has been proposed.

• Besides explaining the limitations of current near obsolete traffic control system, the advantages of proposed traffic control system have been demonstrated.

• For this purpose, four sample images of different traffic scenario have been attained. Upon completion of edge detection, the similarity between sample images with the reference image has been calculated.

• Using this similarity, time allocation has been carried out for each individual image in accordance with the time allocation algorithm.

• In addition, similarity in percentage and time allocation have been illustrated for each of the four sample images using Python programming language.

• Besides presenting the schematics for the proposed smart traffic control system, all the necessary results have been verified by hardware implementation.

MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHNOLOGY

Seminar Report of Major Project on

SMART PARKING SYSTEM

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BY:

U. POOJITHA (1 6 0 4 -17-733-010)

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

K. PUNYA REDDY (1 6 04 -17-733-018)

A. SAI CHARAN (1 6 0 4 -17-733-028)

Under the Guidance Of:

G. RAJESHAM- Asst Professor

CSE- Department

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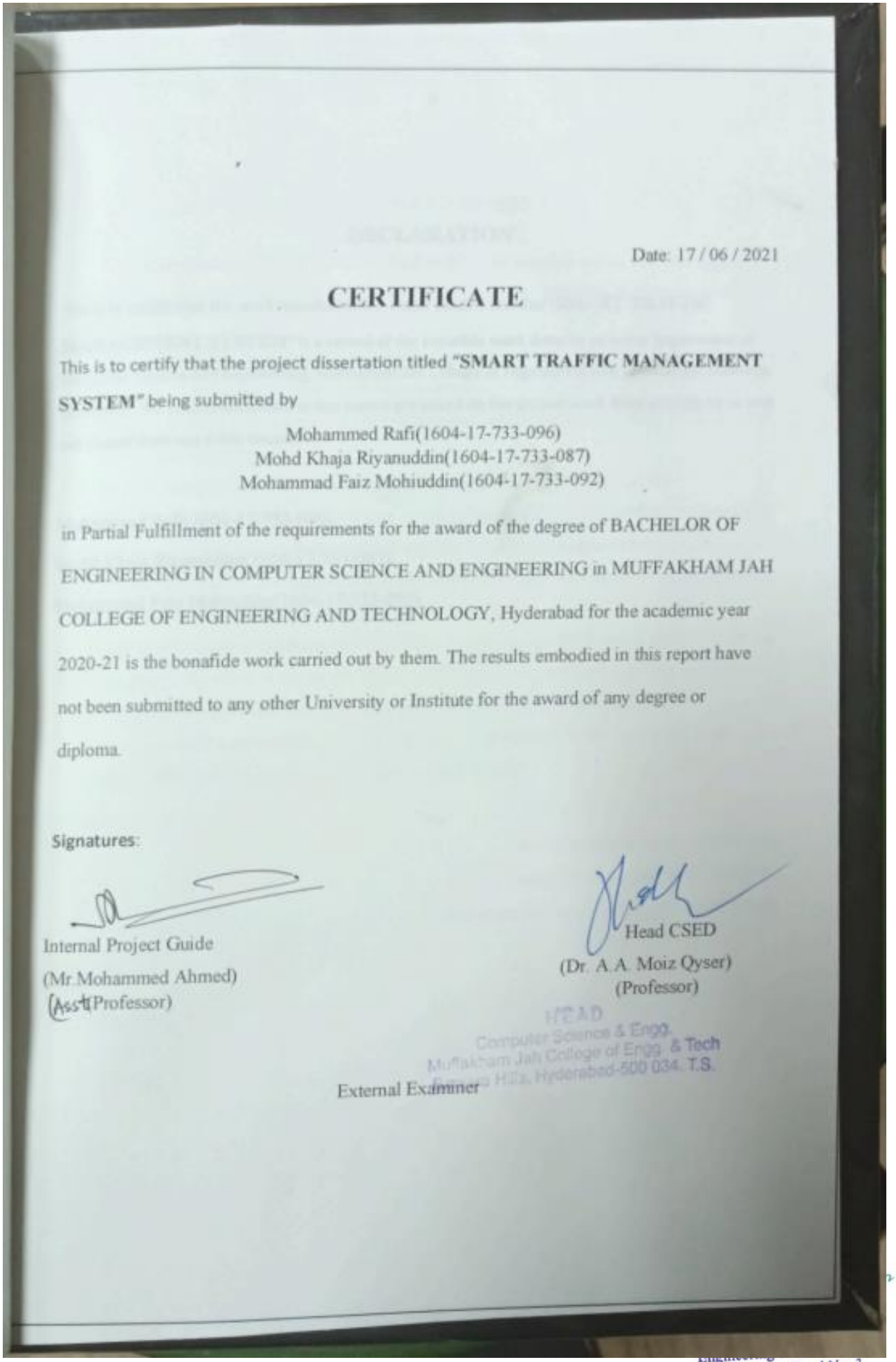

Date: 17 / 06 / 2021

CERTIFICATE

This is to certify that the project dissertation titled **"SMART TRAFFIC MANAGEMENT SYSTEM"** being submitted by

Mohammed Rafi(1604-17-733-096)
Mohd Khaja Riyanuddin(1604-17-733-087)
Mohammad Faiz Mohiuddin(1604-17-733-092)

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Signatures:

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(Asst Professor)

Head CSED
(Dr. A.A. Moiz Qyser)
(Professor)

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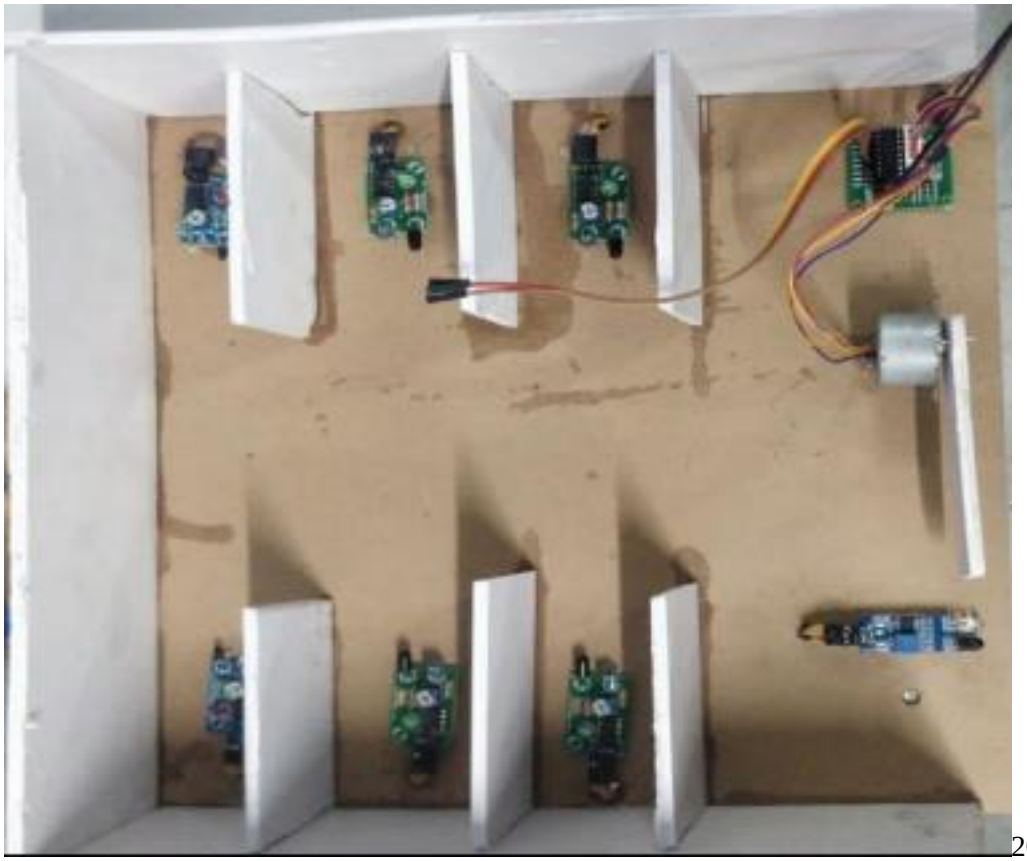
ABSTRACT

In recent times the concept of smart cities have gained grate popularity. Thanks to the evolution of Internet of things the idea of smart city now seems to be achievable. Consistent efforts are being made in the field of IoT in order to maximize the productivity and reliability of urban infrastructure. Problems such as, traffic congestion, limited car parking facilities and road safety are being addressed by IoT. In this paper, we present an IoT based cloud integrated smart parking system. The proposed Smart Parking system consists of an on-site deployment of an IoT module that is used to monitor and signalize the state of availability of each single parking space. A mobile application is also provided that allows an end user to check the availability of parking space and book a parking slot accordingly. The paper also describes a high-level view of the system architecture. Towards the end, the paper discusses the working of the system in form of a use case that proves the correctness of the proposed model. The concept of Internet of Things (IoT) started with things with identity communication devices. The devices could be tracked, controlled ormonitored using remote computers connected through Internet. Physical Object + Controller, Sensor and Actuators + Internet = Internet of Things The ideal of creating a Smart City is now becoming possible with the emergence of the Internet of Things. In present day cities finding an available parking spot is always difficult for drivers, and it tends to become

harder with ever increasing number of private car users. This situation can be seen as an opportunity for smart cities to undertake actions in order enhance the efficiency their parking resources thus leading to reduction in searching times, traffic congestion and road accidents. Problems pertaining to parking and traffic congestion can be solved if the drivers can be informed in advance about the availability of parking spaces at and around their intended destination. The concept of Smart Cities have always been a dream for humanity. Smart parking facilities and traffic management systems have always been at the core of constructing smart cities. One of the main problems in many big and crowded cities is finding parking spaces for vehicles. With IoT technology and mobile applications, in this paper, we propose a design and development of a real smart parking system that can

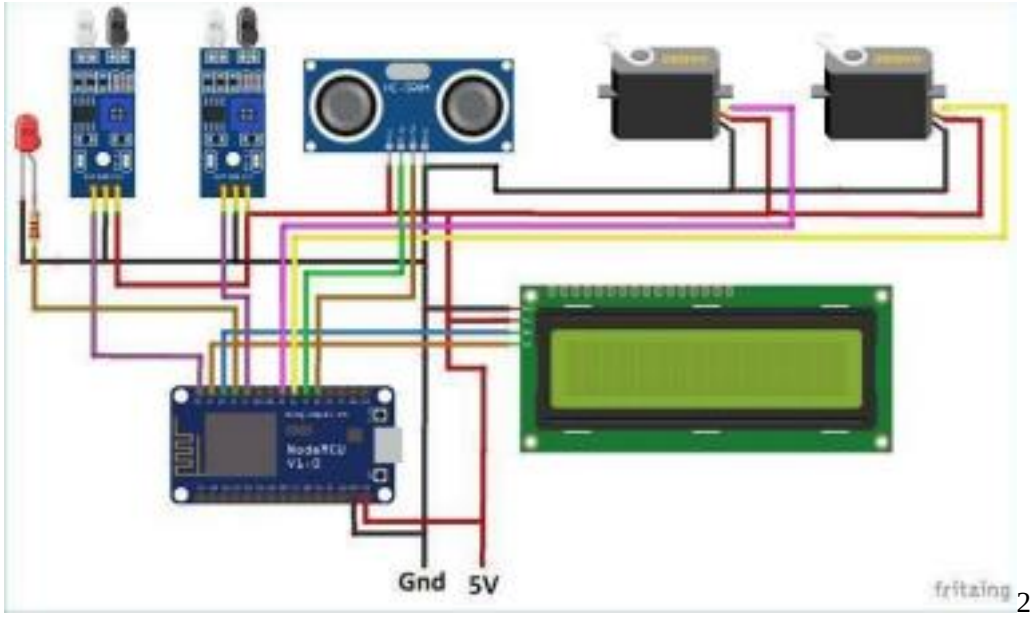
5 SYSTEM DESIGN

5.1 Real set-up



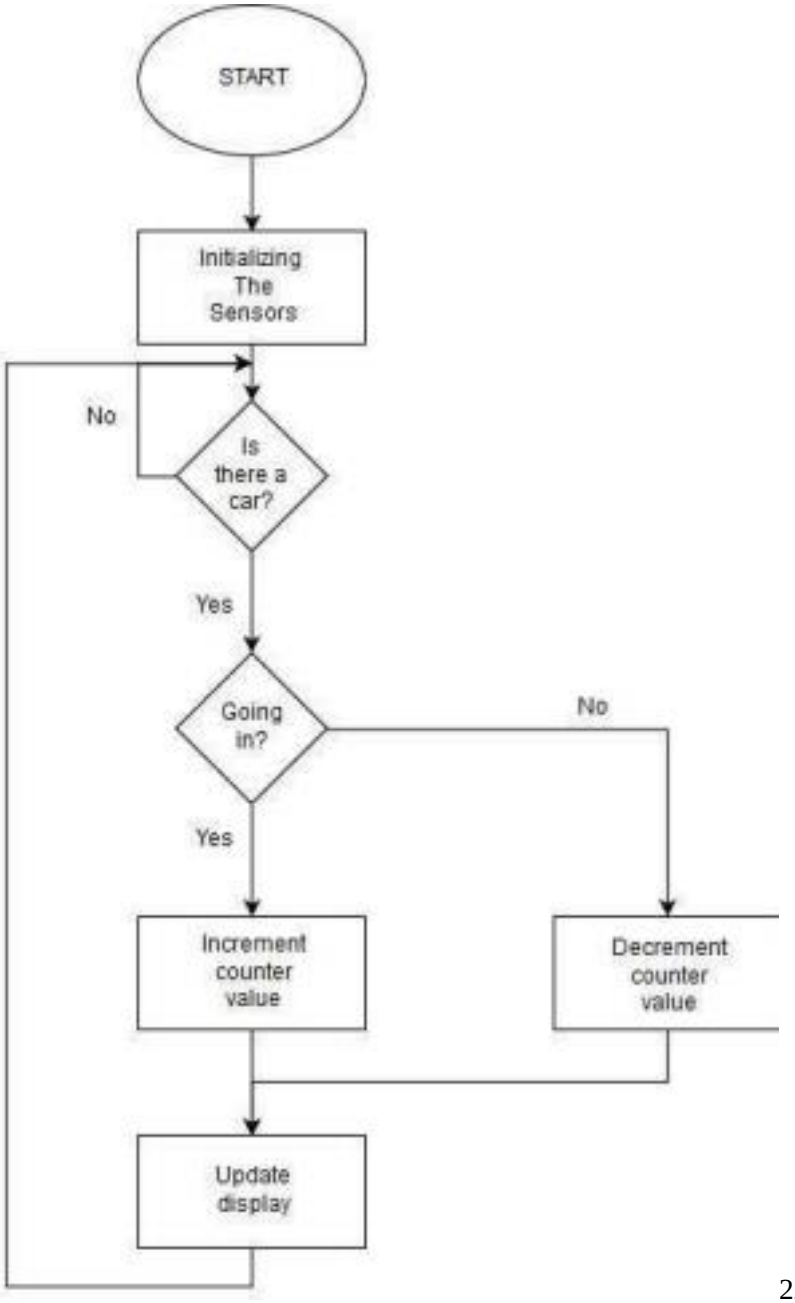
20

5.2 Circuit diagram



21

5.3 Flowchart



8 Results:

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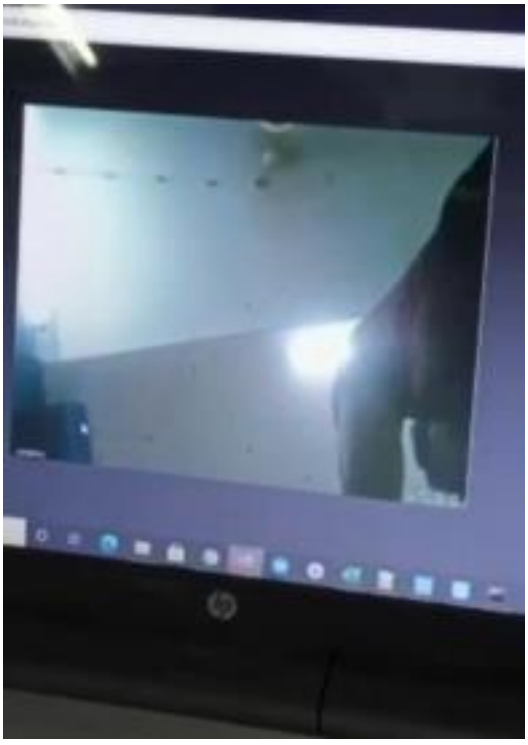

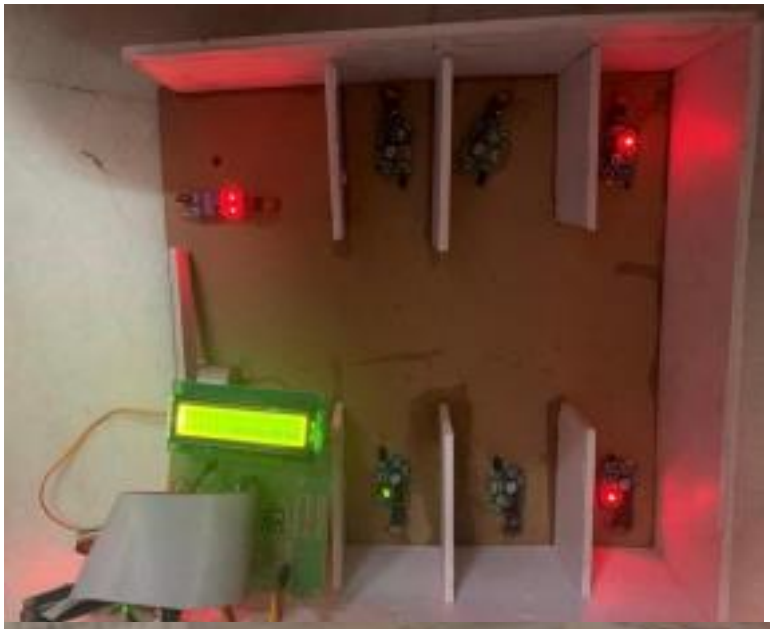

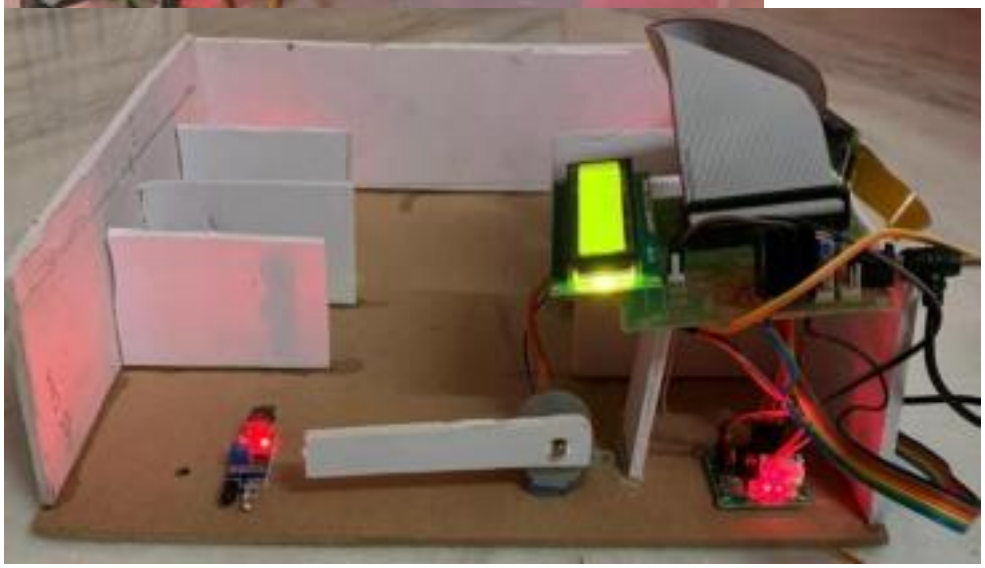

9.CONCLUSION& FUTURE SCOPE:

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

The concepts of smart cities have always been a dream. There have been advancements made from the past couple of years to make smart city dream to reality. The advancement of internet of things and cloud technologies has given rise to the new possibilities in terms ofsmart cities. Smart parking facilities have always been the core of constructing smart cities. The system provides a real time process and information of the parking slots. This paper enhances the performance of saving users time to locate an appropriate parking space. It helps to resolve the growing problem of traffic congestion. As for the future work the users can book a parking space from a remote location. GPS, reservation facilities and license plate scanner can be included in the future.

Since the past couple of years large advancements have been made in making smart cities a reality. The growth of Internet of Things and Cloud technologies have give rise to new possibilities in termsofsmart cities. Smart parking facilities and traffic management systems have always been at the core of constructing smart cities. In this paper, we address the issue of parking and present an IoT based Cloud integrated smart parking system. The system that we propose provides real time information regarding availability of parking slots in a parking area. Users from remote locations could book a parking slot for them by the use of our mobile application. The efforts made in this paper are indented to improve the parking facilities of a city and thereby aiming to enhance the quality of life of its people.

The system benefits of smart parking go well beyond avoiding time wasting. Developing a smart parking solutions with in a city solves the pollution problem Shows IOT development in various day to day use.

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SECURE REMOTE E-VOTING

Project Report Submitted

In Partial Fulfillment of the Requirements

For the Degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted by

Amina Begum (1604-17-733-068)

SyedaJuveriaHussaini (1604-17-733-069)

Under the Guidance of

Prof. Mr. Ahmed

COMPUTER SCIENCE AND ENGINEERING

DEPARTMENT MUFFAKHAM JAH

COLLEGE OFENGINEERING &

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TECHNOLOGY (Affiliated to Osmania University)

Mount Pleasant, 8-2-249, Road No. 3, Banjara Hills, Hyderabad-34

2021

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

Date: 13/ 05 / 2021

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2.SYEDA JUVERIA HUSSAINI (1604-17-733-072)

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Signatures:

14/5/2021

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(Associate Professor)

Head CSED
(Dr. A.A. Moiz Qyser)
HEAD
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Muffakham Jah College of Engg. & T
Banjara Hills, Hyderabad-500 034, T

External Examiner

2

ABSTRACT

The Secured Remote E-Voting System tends to maximize user participation, by allowing them to vote from anywhere and allowing access from different computer systems and from any device that has an internet connection. Today, E-Voting has already been deployed in a number of countries but it generally works like a trusted “black-box” that is critically dependent on the integrity of the internal software implementation. However, voters have no means to verify the internal software. Publishing the source code can help promote trust, but it cannot resolve the fundamental problem as one cannot guarantee that the same software is used unmodified on the election day. To address the trust problem on E-Voting software, a software-independent voting system must be used. The most promising approach to build a software-independent voting system involves applying cryptography to make the system End-to-End verifiable. It encompasses the following aspects:

• Cast-as-intended: A voter can verify that a ballot is cast correctly for the intended candidate.

• Recorded-as-cast: A voter can verify that a cast ballot is recorded correctly in the system.

• Tallied-as-recorded: A public observer can verify that all the recorded ballots are tallied correctly.

Project Modules:

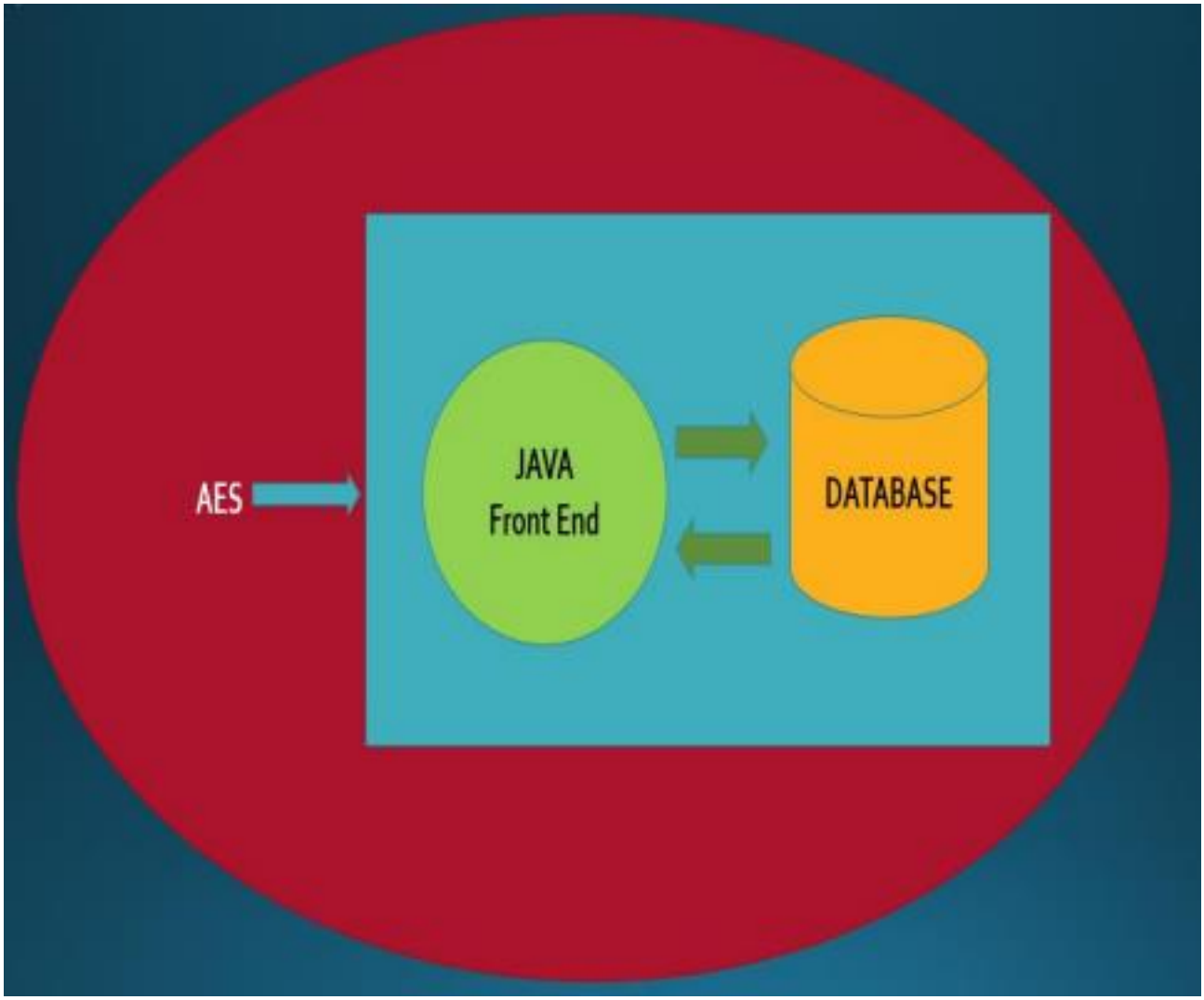
• End-to-End verification: Making the system end-to-end verifiable by using cryptography thereby protecting the system from hackers.

• Digital Authentication: verifying the authenticity of certificates during voting process using double encryption.

• Automated and fast Result Evaluation: Making the E-Voting trustworthy, reliable and fast by removing the overhead of tallying authorities and providing instant results.

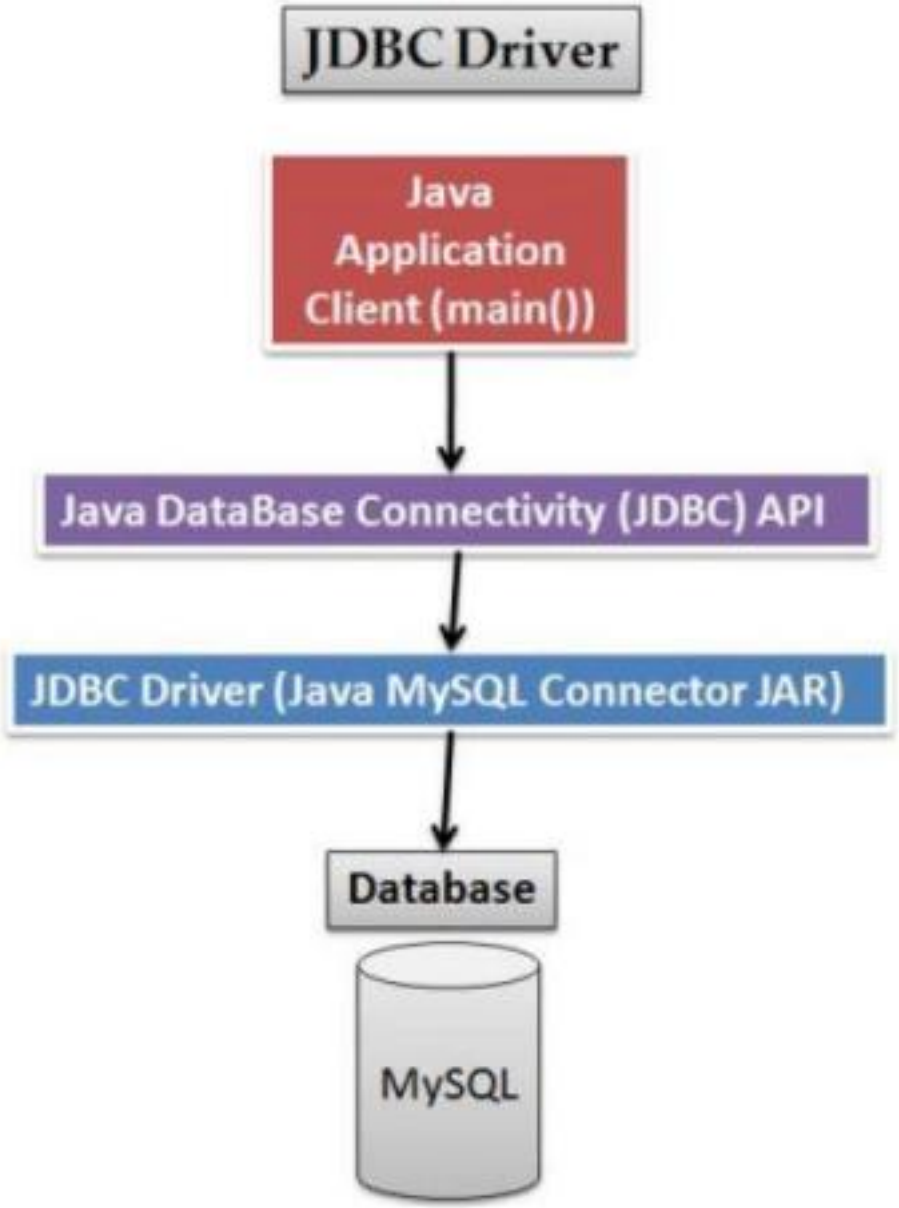
4.SYSTEM DESIGN

4.1 General Architecture



19

4.2 SYSTEM ARCHITECTURE



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4.3 ENCRYPTION/DECRYPTION ALGORITHM FLOWCHART

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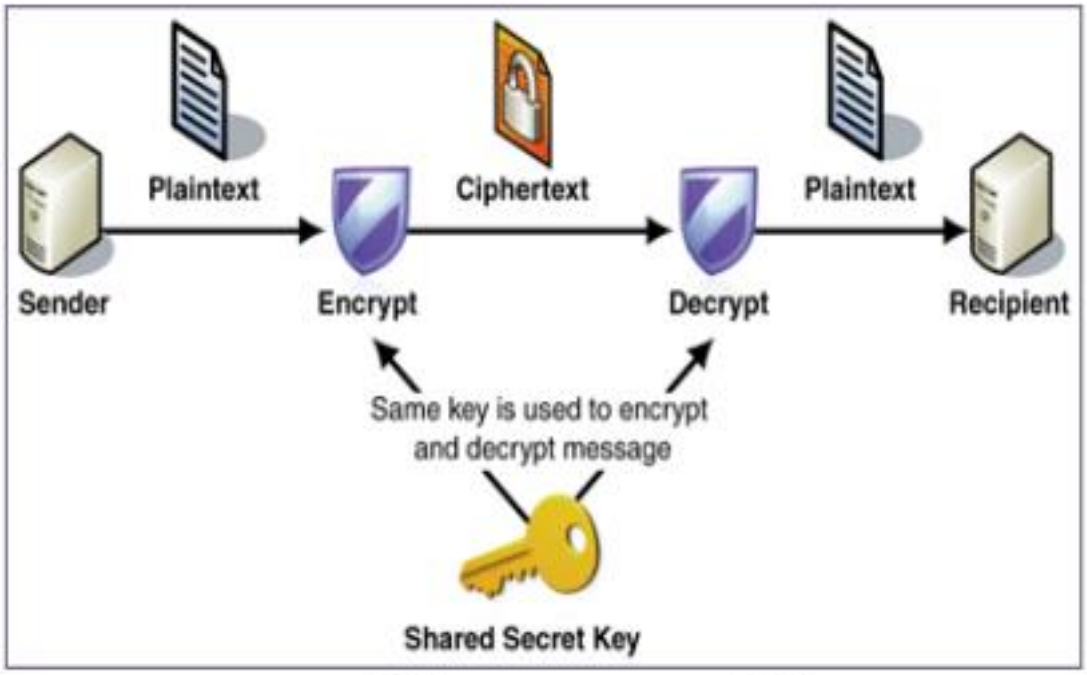

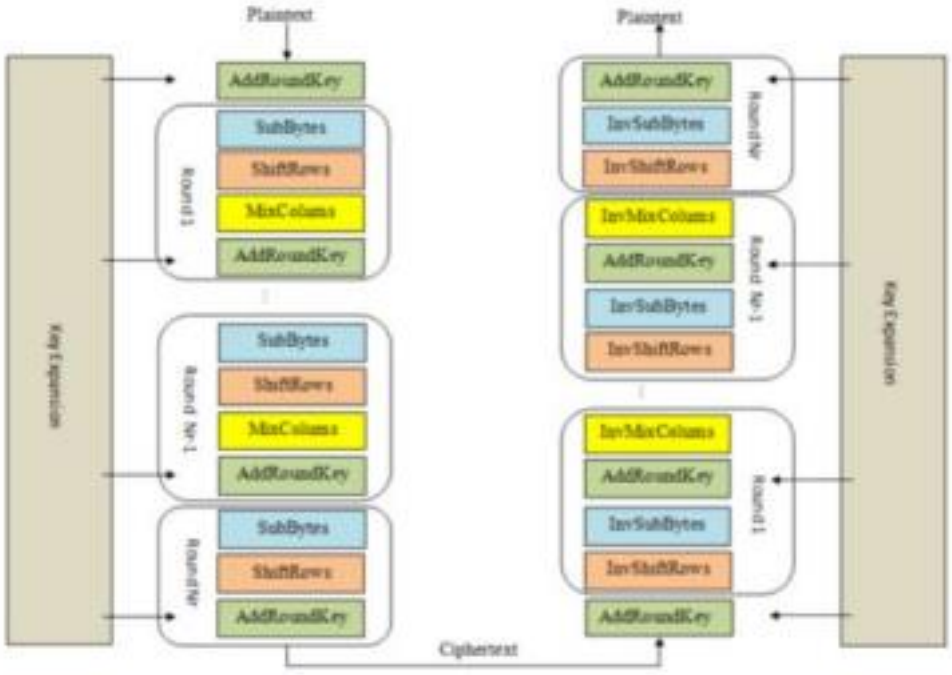

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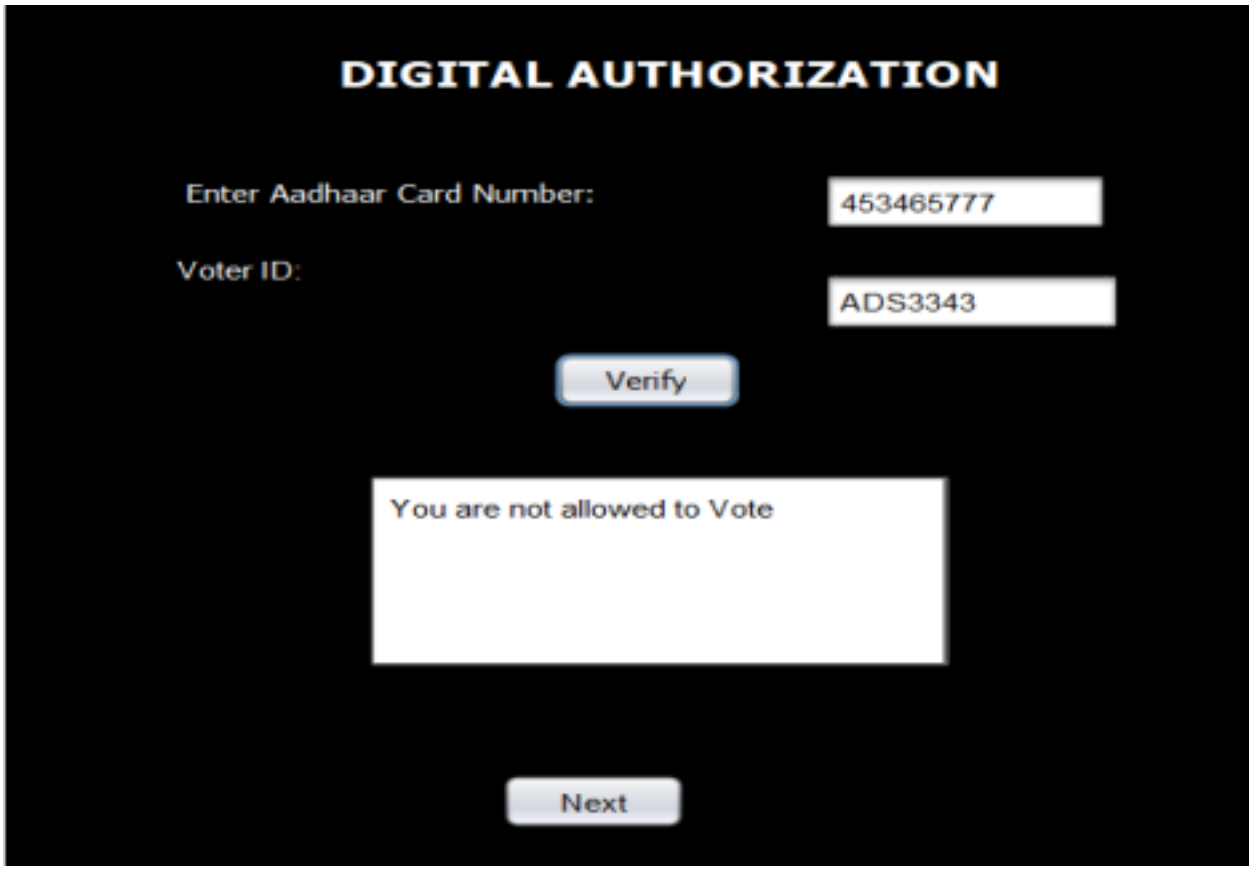
HYDERABAD-500 034.(T.S.)

```
The Original String is:
123456789A
The Encrypted String is:
rz3flMY5ZU5TrTCVvztBZQ==
The Decrypted String is:
123456789A
```

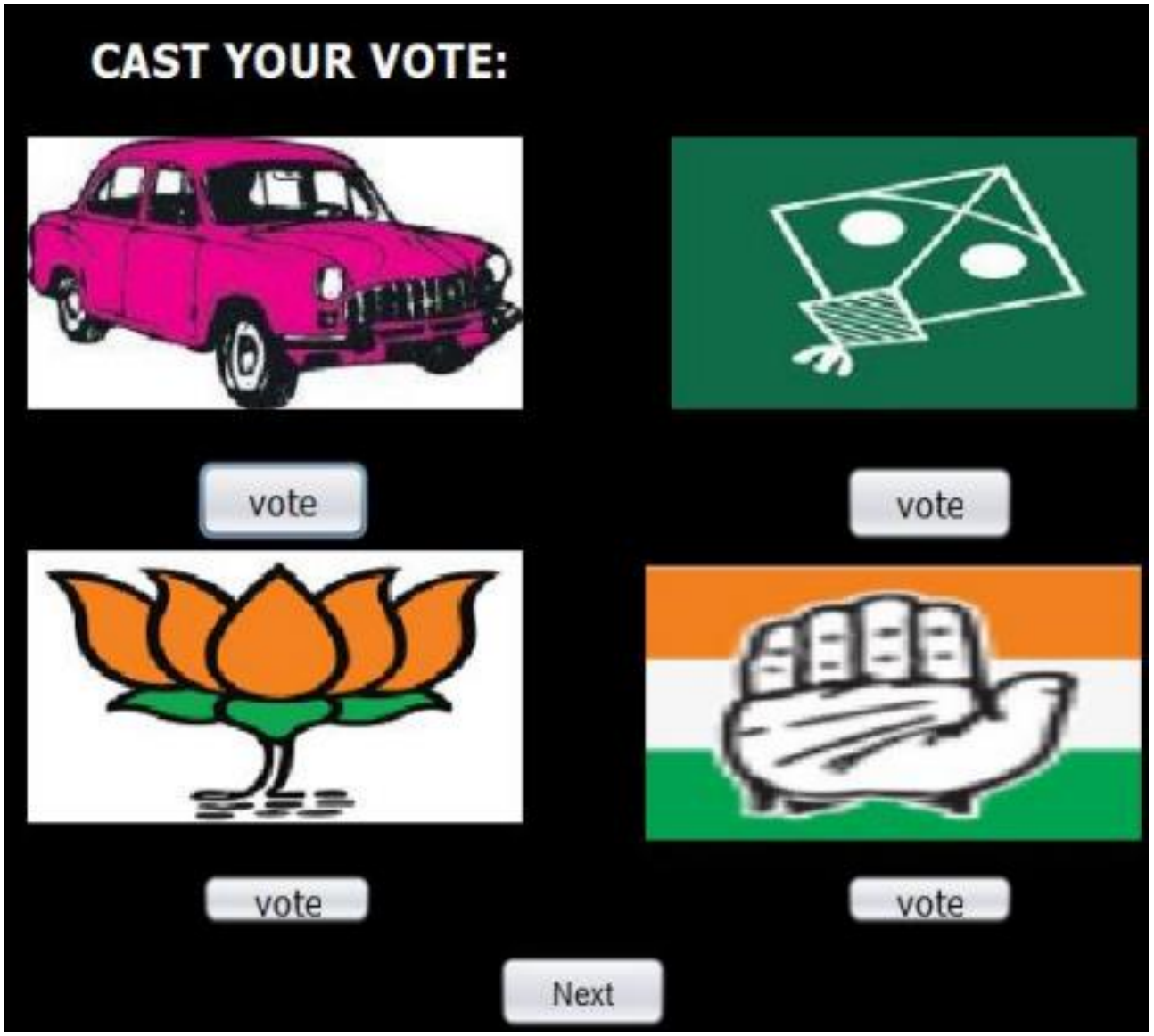


5.1.2 Casting the vote:

Once the user is digitally authorized, then he is asked to cast the vote from the list of parties.

The user is allowed to vote only once.

The votes that are casted by the user is stored in the database and is incremented each time when the user casts the vote for a party respectively.

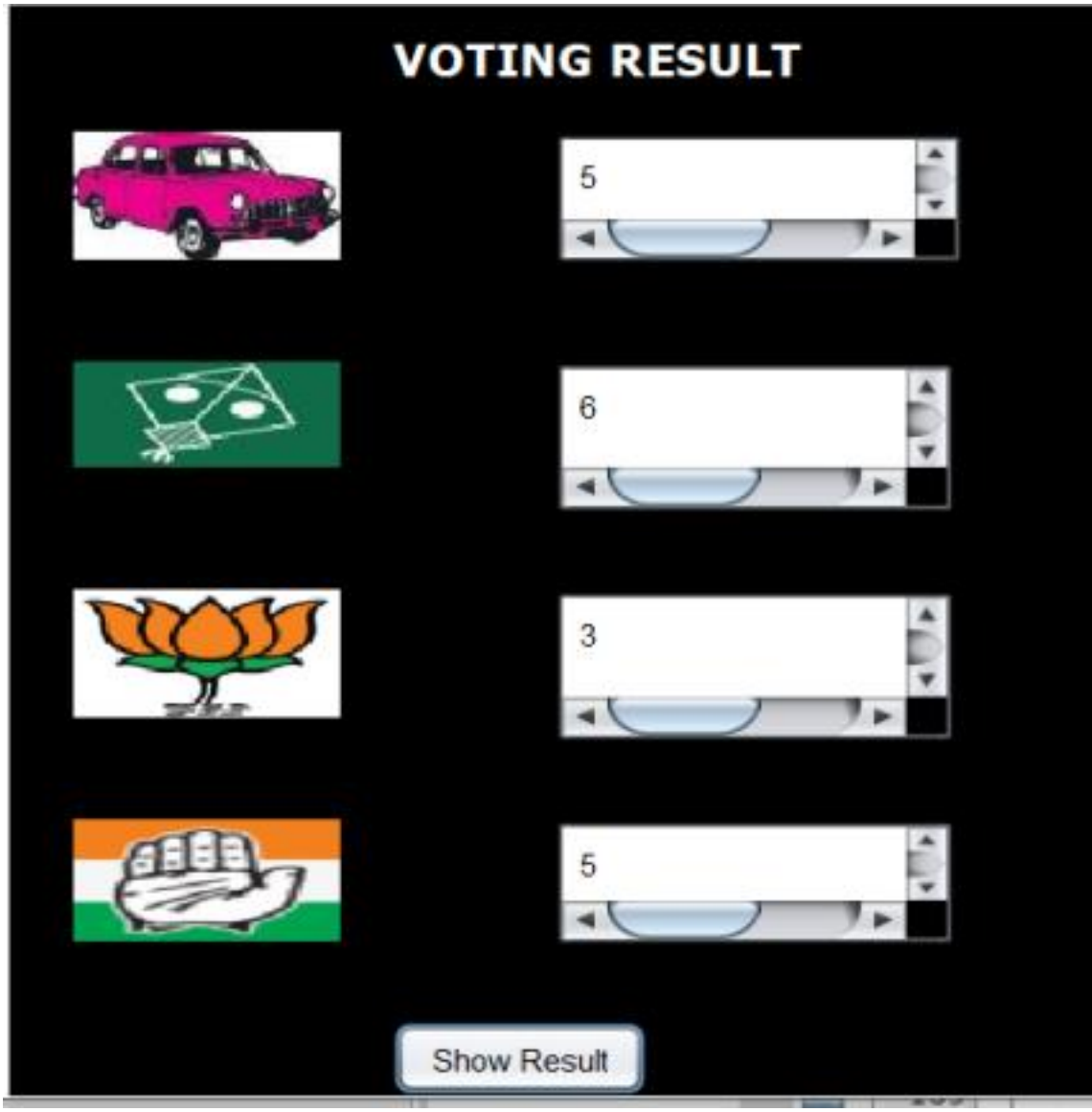


5.1.3 Display of the Result:

The voting results are displayed immediately.

There is no overhead of tallying authorities for manual counting of votes and it also reduces the time.

It also reduces the chances of manipulation so that user can easily trust the machine which increases the number of voters.



7.SCREENSHOTS

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HYDERABAD-500 034.(T.S.)

```
The Original String is:
123456789A
The Encrypted String is:
rz3flMY5ZU5TrTCVvztBZQ==
The Decrypted String is:
123456789A
```

73
74
75

8.CONCLUSION

Secure Remote e-voting system is preferable over traditional paper ballots because it is "safer", "quicker", "more secured" and "easier to use".

It is safer because it is trustworthy and everything is done by the machine itself and no man power is required.

It is quicker because the result evaluation does not require any tallying authorities.

It is more secure because it is encrypted using AES algorithm which cannot be decrypted easily by the hackers.

It is easier to use because remote e-voting allows us to use from anywhere which increases the number of voters.

9.FUTURE ENHANCEMENTS

We look forward to add more features to our project such as adding the feature of facial recognition in the digital authorization module in order to make it more secure.

We also look forward to add biometric fingerprint to provide two factor authentication.

Healthcare Analysis for training a model using Machine Learning Tools (Social Distancing)

Project Report

Project Report Submitted

Submitted

In Partial Fulfilment of the requirements for

The Degree Of

In Partial Fulfilment of the requirements for

The Degree Of

PRINCIPAL
Muffakham Jah College Of
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Banjara Hills, Road No. 3,
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BACHELORS OF ENGINEERING

IN

BACHELORS OF ENGINEERING

COMPUTER SCIENCE AND ENGINEERING

IN

COMPUTER SCIENCE

AND ENGINEERING

Submitted

by

Syed Muzammil Ahmed 1604-17-733-107 Sohail Ahmed 1604-17-733-109 SaadMohiuddin 1604-17-733-113

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Hyderabad-34 2021

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2. SOHAIL AHMED (1604-17-733-109)
3. SAAD MOHIUDDIN (1604-17-733-113)

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External Examiner

ABSTRACT

ABSTRACT

Machine Learning is the learning from data, focusing on algorithms, finding patterns in huge amounts of data.
The purpose of machine learning is to produce more positive outcome with increasing precise predictions. Healthcare is one the most challenging, complex industry and has more scope to progress further. It has many challenging issues due to large volumes of variety of data, missing data.

As per McKinsey report machine learning and big data in pharmacy and medicine could generate revenue up to $100B annually. This is due to the faster decision-making, improved efficiency clinical trials, optimized innovation. There are

various applications of ml in healthcare (i.e. Disease identification/Diagnosis, Personalized treatment, Drug discovery and etc). Machine learning can be applied to health care data to develop robust risk models. Healthcare industry is already overburdened with the exploding population and lack of trained doctors. The ratio of doctor to patients in India is 1:1700 which is far higher than the recommended ratio of 1 in every 1000 patients by WHO.

The outcome, using of these technologies will help in serving more patients in a less time and also improve healthcare outcomes and reduce the healthcare expenses.

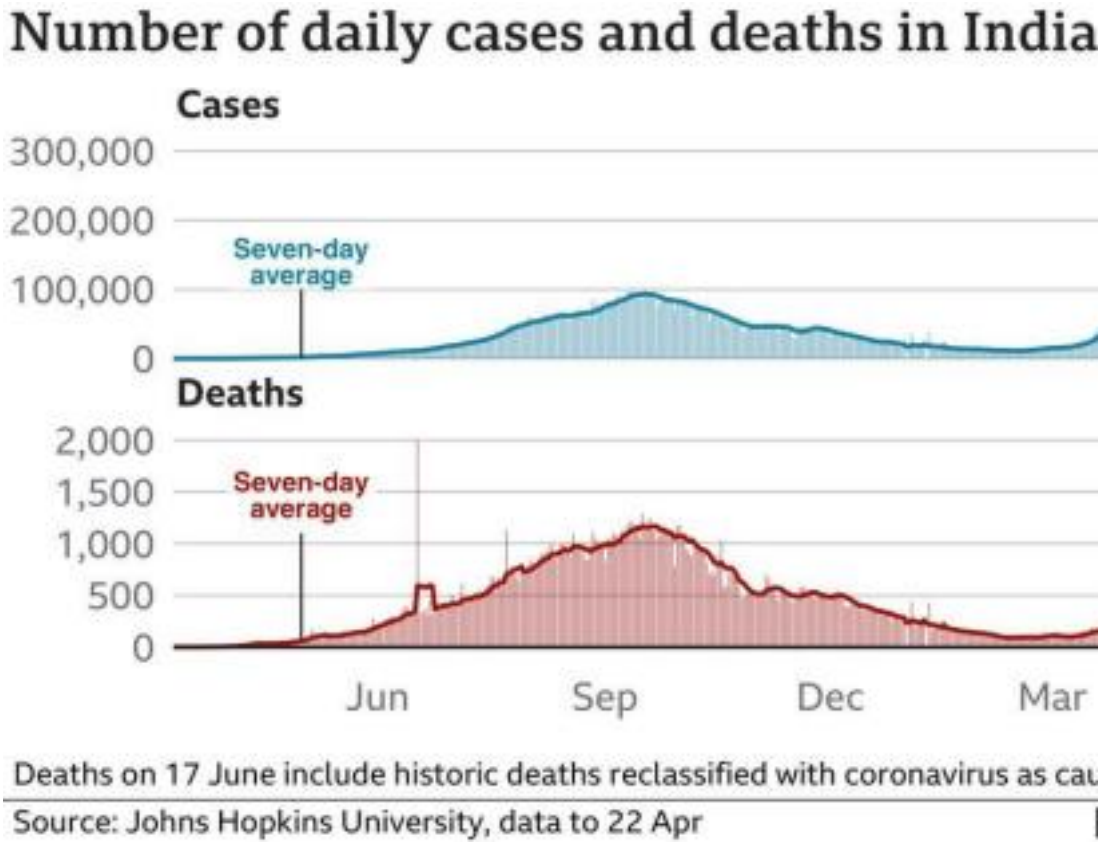

FIGURE:1.1

1.3What is Social Distancing

Social distancing, also called “physical distancing,” means keeping a safe space between yourself and other people who are not from your household.

To practice social or physical distancing, stay at least 6 feet (about 2 arm lengths) from other people who are not from your household in both indoor and outdoor spaces.

Social distancing should be practiced in combination with other everyday preventive actions to reduce the spread of COVID-19, including wearing masks, avoiding touching your face with unwashed hands, and frequently washing your hands with soap and water for at least 20 seconds.

10

FIGURE 1.2

1.3.1 Why Social Distancing ?

COVID-19 spreads mainly among people who are in close contact (within about 6 feet) for a prolonged period. Spread happens when an infected person coughs, sneezes, or talks, and droplets from their mouth or nose are launched into the air and land in the mouths or noses of people nearby. The droplets can also be inhaled into the lungs. Recent studies indicate that people who are infected but do not have symptoms likely also play a role in the spread of COVID-19. Sincepeople can spread the virus before they know they are sick, it is important to stay at least 6 feet away from others when possible, even if you—or they—do not have any symptoms. Social distancing is especially important for people who are at higher risk for severe illness from COVID-19.

If you are sick with COVID-19, have symptoms consistent with COVID-19, or have been in close contact with someone who has COVID-19, it is important to stay home and away from other people until it is safe to be around others.

COVID-19 can live for hours or days on a surface, depending on factors such as sunlight, humidity, and the type of surface. It may be possible that a person can getCOVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or eyes. However, this is not thought to be the main way the virus spreads. Social distancing helps limit opportunities to come in contact with contaminated surfaces and infected people outside the home.

Although the risk of severe illness may be different for everyone, anyone can get and spread COVID-19. Everyone has a role to play in slowing the spread and protecting themselves, their family, and their community. In addition to practicing everyday steps to prevent COVID-19, keeping space between you and

others is one of the best tools we have to avoid being exposed to this virus and slowing its spread in communities.

FIGURE 1.3

1.4 Symptoms, precautions and prevention from Covid

1.4.1 COVID-19 symptoms include:

- Cough
- Fever or chills
- Shortness of breath or difficulty breathing
- Muscle or body aches
- Sore throat
- New loss of taste or smell
- Diarrhoea
- Headache
- New fatigue
- Nausea or vomiting
- Congestion or runny nose

1.4.2 Precautions

Fig 2.1: Original image

Fig 2.2: Image and corresponding features generate by the Feature Network. The picture for feature was generated by collapsing the 3rd dimension into one number, the other 2 dimensions were scaled to be of comparable size to the original picture.

The RPN is usually a simple network with a 3 convolutional layers. There is one common layer which feeds into a two layers — one for classification and the other for bounding box regression. The purpose of RPN is to generate a number of bounding boxes called Region of Interests (ROIs) that has high probability of containing any object. The output from this network is a number of bounding boxes identified by the pixel co-ordinates of two

diagonal corners, and a value (1, 0, or -1, indicating whether an object is in the bounding box or not or the box can be ignored respectively).

The Detection Network (sometimes also called the RCNN network) takes input from both the Feature Network and RPN , and generates the final class and bounding box. It is normally composed of 4 Fully Connected or Dense layers. There are 2 stacked common layers shared by a classification layer and a bounding box regression layer. To help it classify only the inside of the bounding boxes, the features are cropped according to the bounding boxes.

Both the RPN and Detection Network needs to be trained. This is where most of the complexities of Faster-RCNN lies.

Training the RPN

For training the RPN, first a number of bounding boxes are generated by a mechanism called anchor boxes. Every ‘pixel’ of the feature image is considered an anchor. Each anchor corresponds to a larger set of squares of pixel in the original image (some reshaping is usually done on the original image before feature extraction). As can be seen in Fig 3 , anchors are positioned uniformly across both dimensions of the (reshaped) image. The input that is required from the feature

generation layer to generate anchor boxes is the shape of the tensor, not the full feature tensor itself.

Fig 2.3: Anchors (red dots) , 9 out of thousands of anchor boxes (light blue) , and ground truth boxes (green) overlaid on the original image.

A number of rectangular boxes of different shapes and sizes are generated centered on each anchor. Usually 9 boxes are generated per anchor (3 sizes x 3 shapes) as shown in Fig 4. Hence, there are 10s of thousands of anchor boxes per image. For example in Fig 1, 38x57x9 = 19494 anchor boxes are generated.

2.2 TensorFlow Zoo Model

Generally, the object detection task is carried out in three steps:

- Generates the small segments in the input as shown in the image below. As you can see the large set of bounding boxes are spanning the full image

FIGURE 2.8

- Feature extraction is carried out for each segmented rectangular area to predict whether the rectangle contains a valid object.

FIGURE 2.9

- Overlapping boxes are combined into a single bounding rectangle (Non Maximum Suppression)

FIGURE 2.10

Tensorflow is an open-source library for numerical computation and large-scale machine learning that ease Google Brain TensorFlow, the process of acquiring data, training models, serving predictions, and refining future results.

- Tensorflow bundles together Machine Learning and Deep Learning models and algorithms.
- It uses Python as a convenient front-end and runs it efficiently in optimized C++.

• Tensorflow allows developers to create a graph of computations to perform.

• Each node in the graph represents a mathematical operation and each connection represents data. Hence, instead of dealing with low-details like figuring out proper ways to hitch the output of one function to the input of another, the developer can focus on the overall logic of the application.

FIGURE 2.11

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4.3 Flow Chart

Figure 4.3

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5.Implementation

5.1 Image detection

A General Framework for Object Detection

Typically, we follow three steps when building an object detection framework:

1. First, a deep learning model or algorithm is used to generate a large set of bounding boxes spanning the full image (that is, an object localization component)

Fig 5.1

2. Next, visual features are extracted for each of the bounding boxes. They are evaluated and it is determined whether and which objects are present in the boxes based on visual features (i.e. an object classification component)

Fig 5.2

3. In the final post-processing step, overlapping boxes are combined into a single bounding box (that is, non-maximum suppression)

Fig 5.3

Tensorflow object detection model zoo have been trained on the **COCO dataset**(Common Objects in COntext). This dataset contains 120,000 images with a total 880,000 labeled objects in these images. These models are trained to detect the **90 different types of objects** labeled in this dataset.

Faster RCNN

State-of-the-art object detection networks depend on region proposal algorithms to hypothesize object locations. Advances like SPPnet and Fast R-CNN have reduced the running time of these detection networks, exposing region proposal computation as a bottleneck.

In Faster RCNN, we feed the input image to the convolutional neural network to generate a convolutional feature map. From the convolutional feature map, we identify the region of proposals and warp them into squares. And by using an RoI (Region Of Interest layer) pooling layer, we reshape them into a fixed size so that it can be fed into a fully connected layer.

From the RoI feature vector, we use a softmax layer to predict the class of the proposed region and also the offset values for the bounding box.

Fig 5.4

5.2 TensorFlow

TensorFlow is an open-source library for numerical computation and large-scale machine learning. TensorFlow bundles together a slew of machine learning and deep learning (aka neural networking) models and algorithms and makes them useful by way of a common

metaphor. It uses Python to provide a convenient front end API for building applications with the framework, while executing those applications in high-performance C++.

TensorFlow can train and run deep neural networks for handwritten digit classification, image recognition, word embeddings, recurrent neural networks, sequence-to-sequence models for machine translation, natural language processing, and PDE (partial differential equation) based simulations. Best of all, TensorFlow supports production prediction at scale, with the same models used for training.

TensorFlow allows developers to create *dataflow graphs*—structures that describe how data moves through a graph, or a series of processing nodes. Each node in the graph represents a mathematical operation, and each connection or edge between nodes is a multidimensional data array, or *tensor*.

TensorFlow provides all of this for the programmer by way of the Python language. Python is easy to learn and work with, and provides convenient ways to express how high-level abstractions can be coupled together. Nodes and tensors in TensorFlow are Python objects, and TensorFlow applications are themselves Pythonapplications.

The actual math operations, however, are not performed in Python. The libraries of transformations that are

available through TensorFlow are written as high performance C++ binaries.

FIG :5.5

5.3 Bounding Boxes

A **bounding box** is an imaginary rectangle that serves as a point of reference for object detection and creates a collision box for that object.

Data annotators draw these rectangles over images, outlining the object of interest within each image by defining its X and Y coordinates. This makes it easier for machine learning algorithms to find what they're looking for, determine collision paths, and conserves valuable computing resources.

Bounding boxes are one of the most popular image annotation techniques in deep learning. Compared to other image processing methods, this method can reduce costs and increase annotation efficiency.

Figure 7.4

7.2Birdview_transform.py

Figure 7.5

In this module a transformation matrix is generated from the bounding box coordinates that will be detected in the object detection face where each frame from the video will be analysed .

In this we have the function perspective transform in this the birds view is obtained for the image for which the four points were specified ,these are stored in the array the using opencv functions(perspective transform()) the matrix is returned with the value.

Next in the compute_point_perspective_transformation function the ground points are transformed then the values are stored in the list .

Figure 7.6

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7.3 model_object_detection.py

Figure 7.7

In this module the model from the ZOO Model of the Tensorflow is Selected.

The model is stored in the model folder it utilizes the faster R_CNN V2 for the object detection ,it include multiple object detection, The way tensorflow models have been designed to work is by using graphs. The first step implies loading the model into a Tensorflow graph. This graph will contain the different operations that will be done in order to get the desired detections. The next step is creating a session which is an entity responsible of executing the operations defined in the previous graph.

Figure 7.8

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7.4social_distanciation_video_detection.py

Figure 7.9

In this module we first import all the functions from various modules that we be required for the analysis,

Then bounding boxes are found the one that satisfies the min threshold is selected , from this the coordinates are taken to find the ground points for that particular bounding box for a human in the frame, then centroid are coloured in red and then the bounding boxes are also marked for reference.

Then the config (4 points are imported) so that the boundaries are marked over the frames.

Then the model used is selected from the list in the prompt window , then the name of the video must be provide and also the minimum distance for calculating violators.

matrix,imgOutput = compute_perspective_transform(corner_points,width_og, height_og,cv2.imread(img_ path))

height,width,_ = imgOutput.shape

then transformation matrix is formed.

Then the video is streamed, then the image for displaying the birds view is loaded, then the Euclidean distance is calculated for all the detected in the matrix, then the violators are marked in red in both the windows and the non violators are marked in green. The outputs are stored in the folder named output that contains both views.

Figure 7.10

Figure 7.11

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FIGURE 7.12 &7.13

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FIGURE 7.14 & 7.15

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Figure 7.16 & 7.17

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8.Conclusion

Social distancing along with other basic sanitary measures are very important to keep the spread of the Covid-19 as slow as possible. But this project is only a proof of concept and was not made to be use to monitor social distancing in public or private areas because of ethical and privacy issues.

Social distancing is the most effective way to prevent the spread of a disease, if people are not close together, they cannot spread germs, thereby slowing the transmission rate which in turn allow the medical and administrative authorities to ramp up resources and other necessary steps to contain its spread.

For me , Social distancing is much more effective than masking every individual, by the time medication is made available, but this task requires sense of responsibility from citizens that how crucial social distancing is for them as well as for others safety.

8.1 Future Work

I am well aware that this project is not perfect so these are a few ideas how this application be improved :

- Using a faster model in order to perform real-time social distancing analysis.
- Use a model more robust to occlusions.
- Automatic calibration is a very well known problem in Computer vision and could improve a

lot the bird eye view transformation on different scenes.

- Facial Recognition of individuals to charging penalty points

- Implementation for live videos as well

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AFFILIATED UNDER OSMANIA UNIVERSITY, HYD, APPROVED BY

AICTE & GOVT.OF TELANGANA.

MAJOR PROJECT REPORT

on

FACE MASK DETECTION SYSTEM

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Submitted in partial fulfillment of the

requirement for the award of Degree of

Bachelor of Engineering

In

Computer Science and Engineering

Submitted by:

Syed Mohammed Danish (1604-17-733-038)

Mohammed Royesh (1604-17-733-051)

Abdul Rahman (1604-17-733-055)

Department of Computer

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ABSTRACT

With the coronavirus pandemic becoming ever more widespread with each passing day, the need for following social distancing norms and personal hygiene is of paramount importance. Masks have been proven to be one of the most effective and simplest way to avoid the spread of virus.

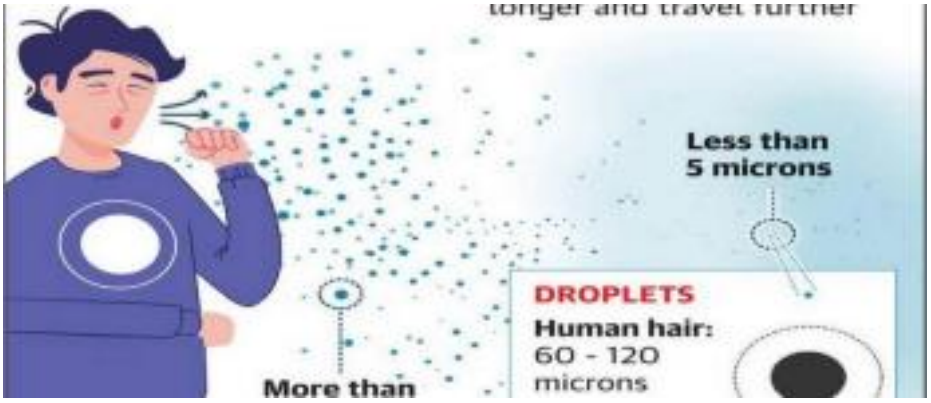
With the help of Machine Learning, we aim at developing a model which can automatically detect whether a person is wearing a mask or not. It is very important for every individual to wear a mask whenever in public space. Till date the covid-19 pandemic which initially originated in the Chinese city of Wuhan has managed to spread to each and every nook and corner of the world. According to the website “worldometers.info”, till date over a 106 million people have been affected worldwide with almost two and a half million deaths reported.

Many developed and developing countries have started to work on a vaccine which could help people develop immunity against the SARS CoV-2 virus which is responsible for spreading the deadly covid-19 disease. At the moment, the vaccine is in its initial trial phase but although some countries have certified it for usage among the general public.

PROBLEM STATEMENT

Face Mask detection has turned up to be an astonishing problem in the domain of image processing and computer vision. Face detection has various use cases ranging from face recognition to capturing facial motions, where the latter calls for the face to be revealed with very high precision.

Due to the rapid advancement in the domain of machine learning algorithms, the jeopardies of face mask detection technology seem to be well addressed yet. This technology is more relevant today because it is used to detect faces not only in static images and videos but also in real-timeinspection and supervision.



With the advancements of convolution neural networks and deep learning, very high accuracy in image classification and object detection can be achieved but the major problem with these pre-existing models is that they were made to recognize face not a mask.

Consequently, there is no dedicated system at present to help detect whether a person is wearing a facemask or not.

SOLUTION

Masks are a key measure to suppress transmission and save lives. Masks should be used as part of a comprehensive 'Do it all!' approach including physical distancing, avoiding crowded settings, good ventilation, cleaning hands, covering sneezes and coughs.

Face Mask detection has become a trending application due to the Covid-19 pandemic, which

demands a person to wear face masks, keep social distancing, and use hand sanitizers to wash their hands.

Wearing a mask is essential, particularly for those people who are at a greater risk of severe illness from COVID-19 diseases. It is found that the spread of COVID-19 is mainly among people who are in immediate contact with one another (nearly about 6 feet), it can be spread by people who do not have symptoms and are unaware of the fact that they are infected.

So Centers for Disease Control and Prevention (CDC) recommended all people 2 years of age and older to wear a mask in public areas especially when other social distancing measures are difficult to maintain. Hence by reducing the risk

of transmission of this deadly virus from an infected person to a healthy, the virus' spread and disease severity can be reduced to a great extent.

SCREENSHOTS

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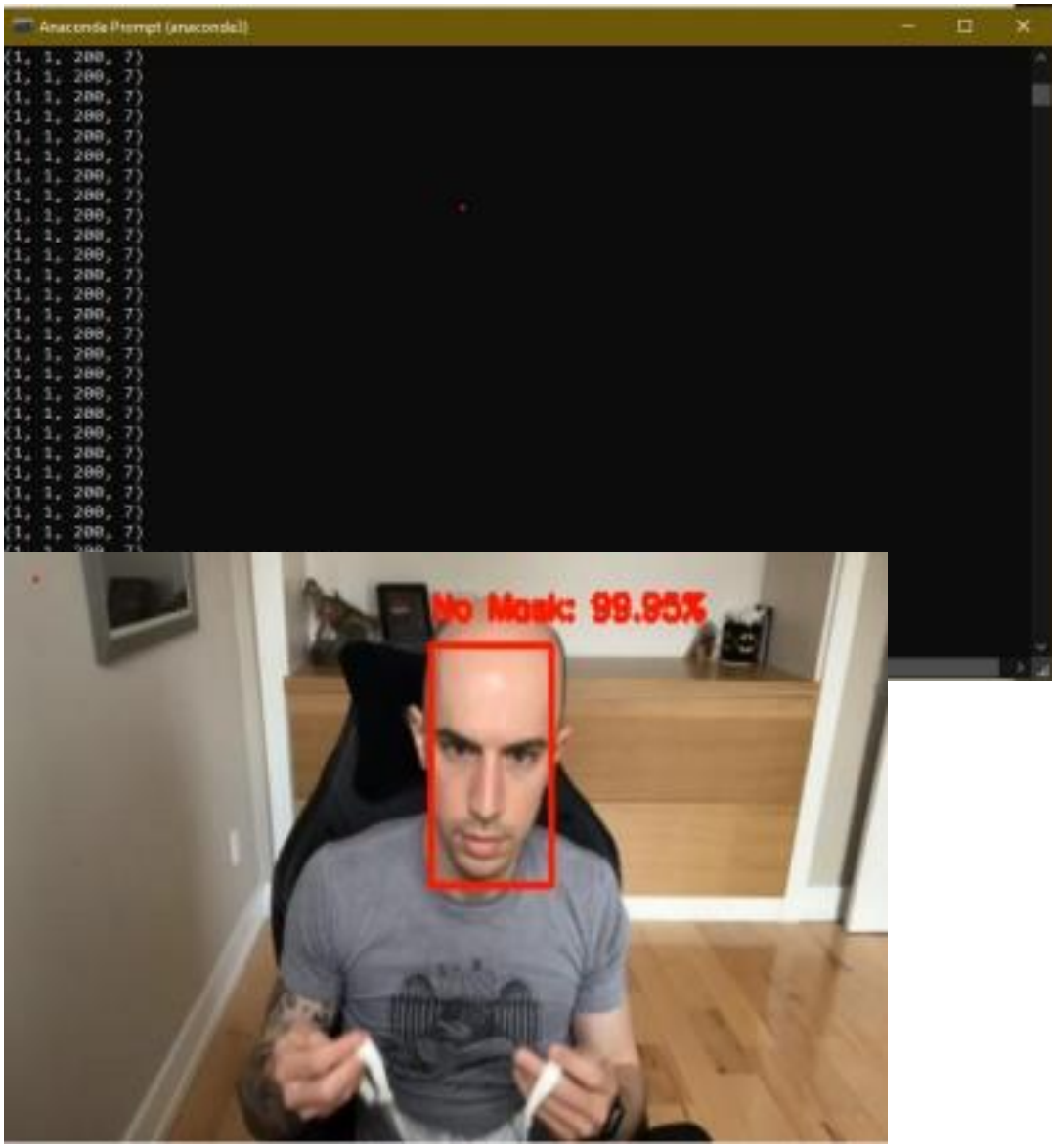

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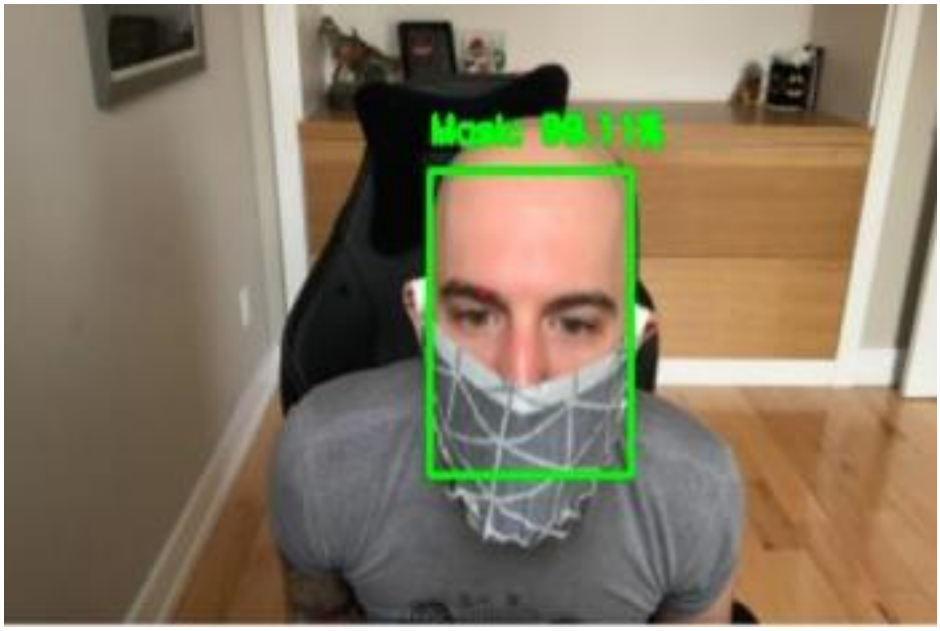

CONCLUSION

In the proposed face mask detection model named SSDMNV2, both the training and development of the image dataset, which was divided into categories of people having masks and people not having masks have been done successfully. The technique of OpenCV deep neural networks used in this model generated fruitful results. Classification of images was done accurately using the MobilenetV2 image classifier, which is one of the uniqueness of the proposed approach.

Many existing researches faced problematic results, while some were able to generate better accuracy with their dataset. The problem of various wrong predictions have been successfully

removed from the model as the dataset used was collected from various other sources and images used in the dataset was cleaned manually to increase the accuracy of the results. Real world applications are a much more challenging issue for the upcoming future. The SSDMNV2 model should hopefully help the concerned authorities in this great pandemic situation which had largely gained roots in most of the world; other researchers can use the dataset provided in this paper for further advanced models such as those of face recognition, facial landmarks, and facial part detection process.

EXTRACTIVE SUMMARIZATION OF NEWSARTICLES Project Report Submitted

In Partial Fulfillment of the Requirements

For the Degree Of

BACHELOR OF ENGINEERING

In

COMPUTER SCIENCE AND ENGINEERING

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18

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ABSTRACT

Automatic summarization is the process of shortening a text document computationally i to create a summary that retains the most important points of the original document. As the proble information overload has grown, and as the quantity of data has increased, so has interest in autom summarization.

Summarization methods can be classified into Extractive and Abstractive summarizati extractive summarization method consists of selecting important sentences, paragraphs etc. f original document and concatenating them into shorter form. The importance of sentences is based on statistical and linguistic features of sentences. The extractive summarization syst typically based on techniques for sentence extraction and aim to cover the set of sentences that important for the overall understanding of a given document.

Text summarization in NLP is the process of summarizing the information in large t quicker consumption. We can extract content in web pages from a variety of domains such mining, information retrieval etc.

In this we created an NLP-based project with Python. This approach is to extract a news the web page and summarize it, along with a few more key information. We convert information f news source or news articles into the short text to provide a superficial and multiple reading. the html of just an article's body text is help but because it allows us to retain some of the information in the html it will help us displaying the extracted article in the form of brief inform a summary.

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7. SCREENSHOTS

Fig. Screenshot of News Article Summarizer GUI

Fig. Screenshot of a news article-(sample1)

Fig.Screenshot of generated summary for the news article-

(sample1)

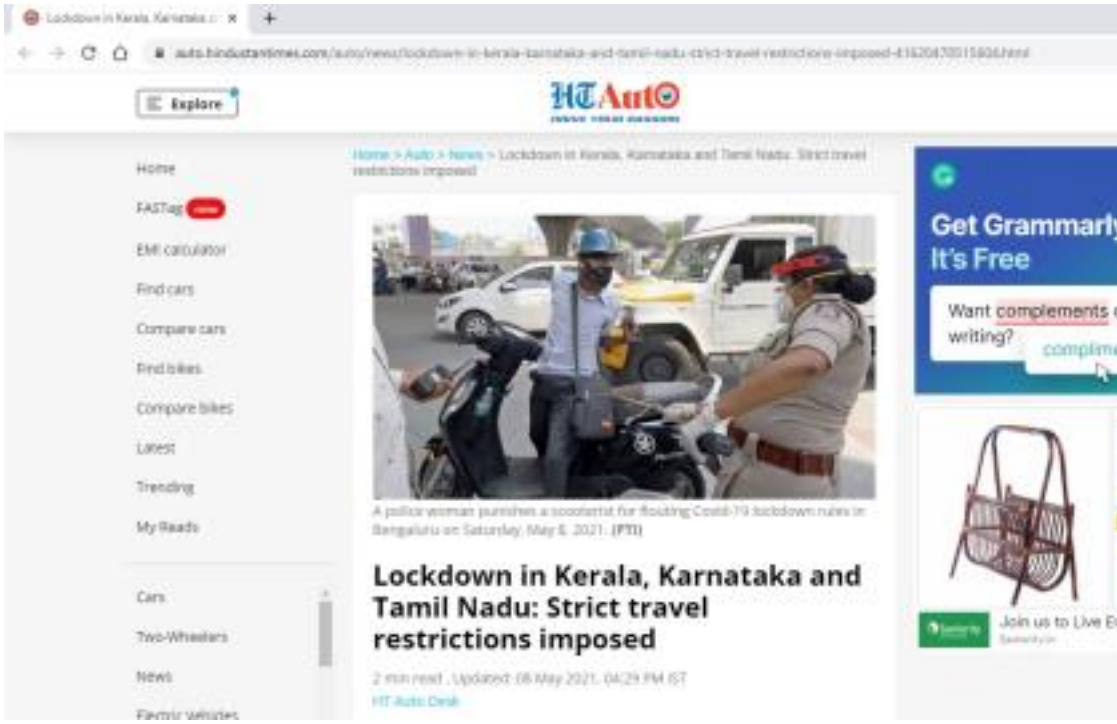

Fig. Screenshot of a news article-(sample2)

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Fig. Screenshot of generated summary for the news article-

(sample2)

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8. CONCLUSION

With the ever-growing text data, text summarization seems to have the potential for reducingthereadingtime by showing summaries of the texts that capture the key points in the original text data. Textsummarization is the task of creating a short, accurate, and fluent summary of anarticle.Extractive summarization means identifying important parts of the text. Extractive summarizationinNLP is the process of summarizing the information in large texts for quicker consumption. Themain objective is to identify the significant sentences of the text in the news article andaddthemto the summary. In the solution provided, we have brought a Python solution for thosewhowanttoreadthe news that is curious on news sites in a more brief way with additional informationaboutthenewsarticle or who want to perform similar processes faster due to their work. In future work abstractive methods can be implemented. In abstractive method buildaninternalsemantic representation and then use natural language generation techniques to create a summary.

EASYRES - PROFESSIONAL RESUME BUILDER BUILDING A TAILORED RESUME

Project Report Submitted

In Partial Fulfilment of the Requirements

For the Degree Of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted By

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

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2021

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External Examiner

ABSTRACT

EASYRES - Professional Resume Builder

Everybody has a dream job; a career that they aspire to achieve. However, at times, despite their best efforts, one may find it difficult to move a step

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closer to this sought after job. Not getting a call back from the employer or a trail going cold usually means one thing - a rejection. There can be various reasons why recruiters don't get back to you, majority of them being

1. Not paying attention to Job description

2. Not Beating Applicant Tracking Systems

Although most candidates are rejected from ATSs, you could be among the successful applicants – if you address a few issues before firing off your application, that is.

Apart from principles like keeping the text error-free, not overusing buzzwords, highlighting successes, etc. that remain constant, there are new rules to the game. Firstly, ensure the same keywords from the job description are incorporated into your CV naturally and, secondly, one common mistake job seekers make is using a standard resume while applying for job openings. Instead, they must tailor their resume to demonstrate how they are the right fit for the role."

All of this can be tiring and time consuming if needed to be done repeatedly. Our project addresses this very issue.

All you need to do is just provide the Job description to the system and the rest is taken care of. Our system will generate a tailored resume that fits the job description picking from your profile only the skills and projects relevant to that Job description every time you apply for a new job. So that you won't have to use the same resume for different job applications. Our system will keep track of all the projects you do and all the skills you gain, saving you from the hassle of updating your profile every now and then. While job searches do come with a fair share of challenges, there are none that can't be overcome. All you need to do is strategize and

implement those practices that are best suited for the context.

PROBLEM STATEMENT

1. Having No Clear Direction

If you have a scattergun approach when it comes to job-hunting, you're unlikely to be very successful. So, if you find yourself firing off 20 applications a day in the hopes that you'll get called for at least one of them, you should probably take a step back and rethink your approach. Pay close attention to the job spec and make sure you have the required skills and experience, and then some. That way you will be focusing on jobs that you are perfectly capable of doing and will have a better chance of securing a new job.

2. Not Beating Applicant Tracking Systems

With applicant tracking systems remaining at the forefront of the recruiting process, it's often hard for your CV to reach the hands of a qualified recruiter.

HR managers are increasingly relying on the power of ATSs to find suitable candidates based on keyword matches – undoubtedly one of the worst pieces of technology to solve a human problem. And although most candidates are rejected from ATSs, you could be among the successful applicants – if you address a few issues before firing off your application, that is. Firstly, ensure the same keywords from the job description are incorporated into your CV naturally and, secondly, run your CV through an online ATS to spot any mistakes or missed opportunities before sending it to the hiring manager.

An applicant tracking system (ATS) is a human resources software that acts as a database for job applicants. ATS are

used by companies of all sizes to organize, search, and communicate with large groups of applicants. Ninety-nine percent of Fortune 500 companies use an ATS as part of their recruiting strategy.

How do applicant tracking systems (ATS) work? Applicant tracking systems act as an electronic gatekeeper for an employer. The ATS parses a resume's content into categories and then scans it for specific keywords to determine if the job application should be passed along to the recruiter.

PROPOSED SOLUTION

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

Although most candidates are rejected from ATSs, you could be among the successful applicants – if you address a few issues before firing off your application that is.

Before drafting a perfect Resume you need a keep tons of things in mind from keeping the text error -free, not overusing buzzwords, highlighting successes to ensuring the keywords from the job description are incorporated into your CV and also using a different resume while applying for different job openings.

But do you really want to take that much of hassle every single time you apply for a job?

If your answer is no worry not we got you covered. Our project addresses this very issue..

All you need to do is just provide the Job description to the system and the rest is taken care of. Our system will generate a tailored resume that fits the job description picking from

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your profile only the skills and projects relevant to that Job description every time you apply for a new job. So that you won't have to use the same resume for different job applications. Our system will keep track of all the projects you do and all the skills you gain, saving you from the hassle of updating your profile every now and then.

WORKING

TECH STACK:

We are developing a full stack website in which the technologies included are: Front-End : HTML, CSS, JavaScript,

Back-End :Django

Database: Firebase

Programming Language: Python

Libraries: Gensim NLP Library,

Selenium web driver,

Beautifulsoup,

Reportlab

Firebase:

Firebase Authentication

Most apps need to know the identity of a user. Knowing a user's identity allows an app to securely save user data in the cloud

and provide the same personalized experience across all of the user's devices.

Firebase Authentication provides backend services, easy-to-use SDKs, and ready made UI libraries to authenticate users to your app. It supports authentication using passwords, phone numbers, popular federated identity providers like Google, Facebook and Twitter, and more.

Firebase Authentication integrates tightly with other Firebase services, and it leverages industry standards like OAuth 2.0 and OpenID Connect, so it can be easily integrated with your custom backend.

How does it work?

To sign a user into your app, you first get authentication credentials from the user. These credentials can be the user's email address and password, or an OAuthtoken from a federated identity provider. Then, you pass these credentials to the Firebase Authentication SDK. Our backend services will then verify those credentials and return a response to the client.

After a successful sign in, you can access the user's basic profile information, and you can control the user's access to data stored

in other Firebase products. You can also use the provided authentication token to verify the identity of users in your own backend services.

Firebase Real time Database

Store and sync data with our NoSQL cloud database. Data is synced across all clients in realtime, and remains available when your app goes offline.

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in realtime to every connected client. When you build cross-platform apps with our iOS, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates with the newest data.

How does it work?

The Firebase Realtime Database lets you build rich, collaborative applications by allowing secure access to the database directly from client-side code. Data is persisted locally, and even while offline, realtime events continue to fire, giving the end user a responsive experience. When the device regains connection, the Realtime Database synchronizes the local data changes with the remote updates that occurred while the client was offline, merging any conflicts automatically.

The Realtime Database provides a flexible, expression-based rules language, called FirebaseRealtime Database Security Rules, to define how your data should be structured and when data can be read from or written to. When integrated with Firebase Authentication, developers can define who has access to what data, and how they can access it.

The Realtime Database is a NoSQL database and as such has different optimizations and functionality compared to a relational database. The Realtime Database API is designed to only allow operations that can be executed quickly. This enables you to build a great realtime experience that can serve millions of users without compromising on responsiveness. Because of this, it is important to think about how users need to access your data and then structure it accordingly.

Report Lab

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ReportLab is the time-proven, ultra-robust open-source engine for creating complex, data driven PDF documents and custom vector graphics. It's free, open-source , and written in Python. The package sees 50,000+ downloads per month, is part of standard Linux distributions, is embedded in many products, and was selected to power the print/export feature for Wikipedia.

The ReportLab Toolkit has evolved over the years in direct response to the real-world reporting needs of large institutions. The library implements three main layers:

- A graphics canvas API that 'draws' PDF pages
- A charts and widgets library for creating reusable data graphics.
- A page layout engine - PLATYPUS ("Page Layout and TYPography Using Scripts") - which builds documents from elements such as headlines, paragraphs, fonts, tables and vector graphics.

The open-source ReportLab Toolkit provides the core of our commercial product, ReportLab PLUS, which generates PDF at higher speed and allows use of our smart XML-based templating language RML. ReportLab PLUS contains significant upgrades over the open source library that allows for a much faster development cycle. If you are putting substantial time into building a solution please consider the commercial version; it is faster, does more, and the revenues directly support ongoing development

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OUTPUT

33

34

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CONCLUSION

As the Culture and expectations in the talent market continue to evolve, companies and job seekers must embrace the new rules of the game – the changing cultural dynamics, and new technologies to stay relevant in a changing world.

While job searches do come with a fair share of challenges , there are none that can't be overcome. It is necessary that job seekers must embrace the new rules of the game and implement those practices that are best suited for the context.

CYBER BULLYING DETECTION Project Report Submitted

In Partial Fulfilment of the Requirements For the Degree Of

BACHELOR OF ENGINEERING

COMPUTER SCIENCE AND ENGINEERING Submitted By

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(1604-17-733-005) (1604-17-733-017) (1604-17-733-060)

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

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MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHNOLOGY

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Mount Pleasant, 8-2-249, Road No. 3, Banjara Hills, Hyderabad-34 **2021**

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

Date: 02

CERTIFICATE

This is to certify that the project dissertation titled "**CYBER BU**
DETECTION" being submitted by

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3. SHAIK SAIFUDDIN QUAZI (1604-17-733-060)

in partial fulfillment of the requirements for the award of the degree of BAC
OF ENGINEERING IN COMPUTER SCIENCE AND ENGINEER
MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHN
Hyderabad for the academic year 2020-21 is the bonafide work carried out
The results embodied in this report have not been submitted to any other Univ
Institute for the award of any degree or diploma.

Signatures:

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(Mrs. Maniza Hijab)
(Associate Professor)

Head, CSED
(Dr. A.A. Moiz Qyse

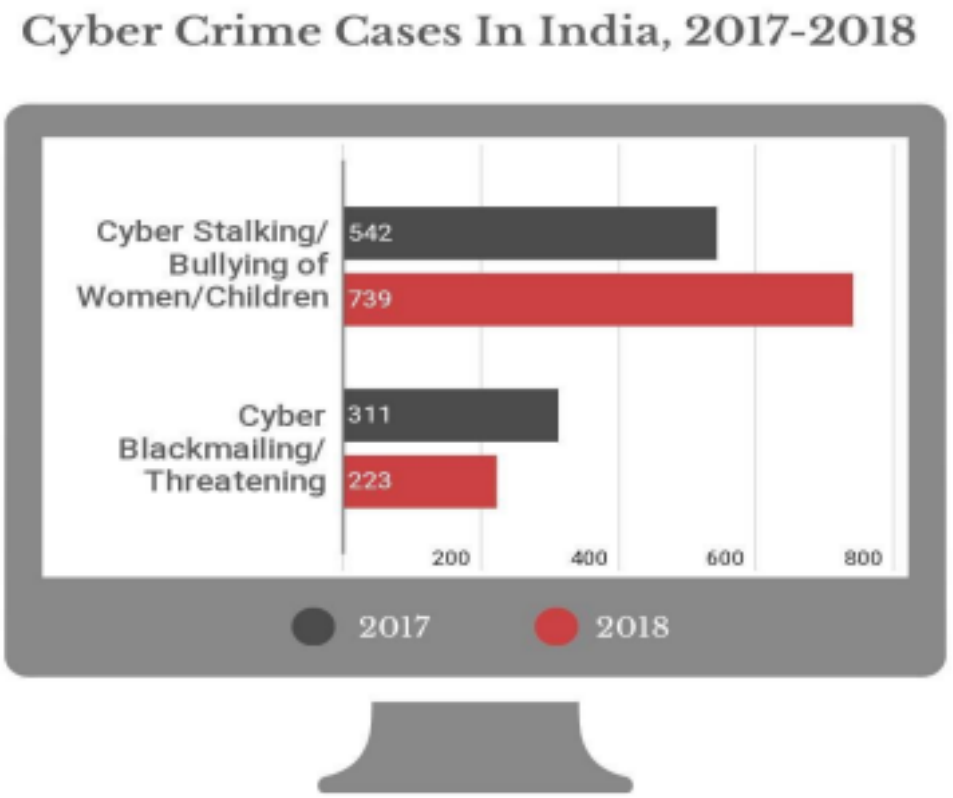
External Examiner

ABSTRACT

Cyberbullying is a relatively new medium through which bullying occurs. Cyberbullying and cyber-aggression are increasingly worrisome phenomena affecting people across all demographics. More than half of young social media users worldwide have been exposed to such prolonged and/or coordinated digital harassment. Victims can experience a wide range of emotions, with negative consequences such as embarrassment, depression, isolation from other community members, which embed the risk to lead to even more critical consequences, such as suicide attempts.

Tackling cyberbullying requires awareness, education for actors involved incyberbullying development of software to detect cyberbullying and including actors in the monitoring of cyberbullying. The proposed idea is to detect cyberbullying by classification of text using Machine learning classifiers, training Twitter datasets. We present a robust methodology to distinguish bullies and aggressors from normal Twitter user's in-order to detect bullying in short time with high accuracy.

96%, the data show. Yet, the reported cases of threatening/blackmail fell 28.3% from 311 to 223 during the same period, which experts said is largely due to underreporting. In all, there has been a 25% increase in the number of cybercrime cases from 2017 to 2018, the NCRB data show.



Source: Crime in India report for 2017, 2018, National Crime Records Bure

Figure 1 : Cyber Crime cases in India during 2017-2018

According to a study conducted by Child Rights and You (CRY), half of the cyberbullied victims don't register a report with officials. Around 9.2% of 630 adolescents surveyed in Delhi-National Capital Region had experienced cyberbullying and half of them had not reported it to anyone.

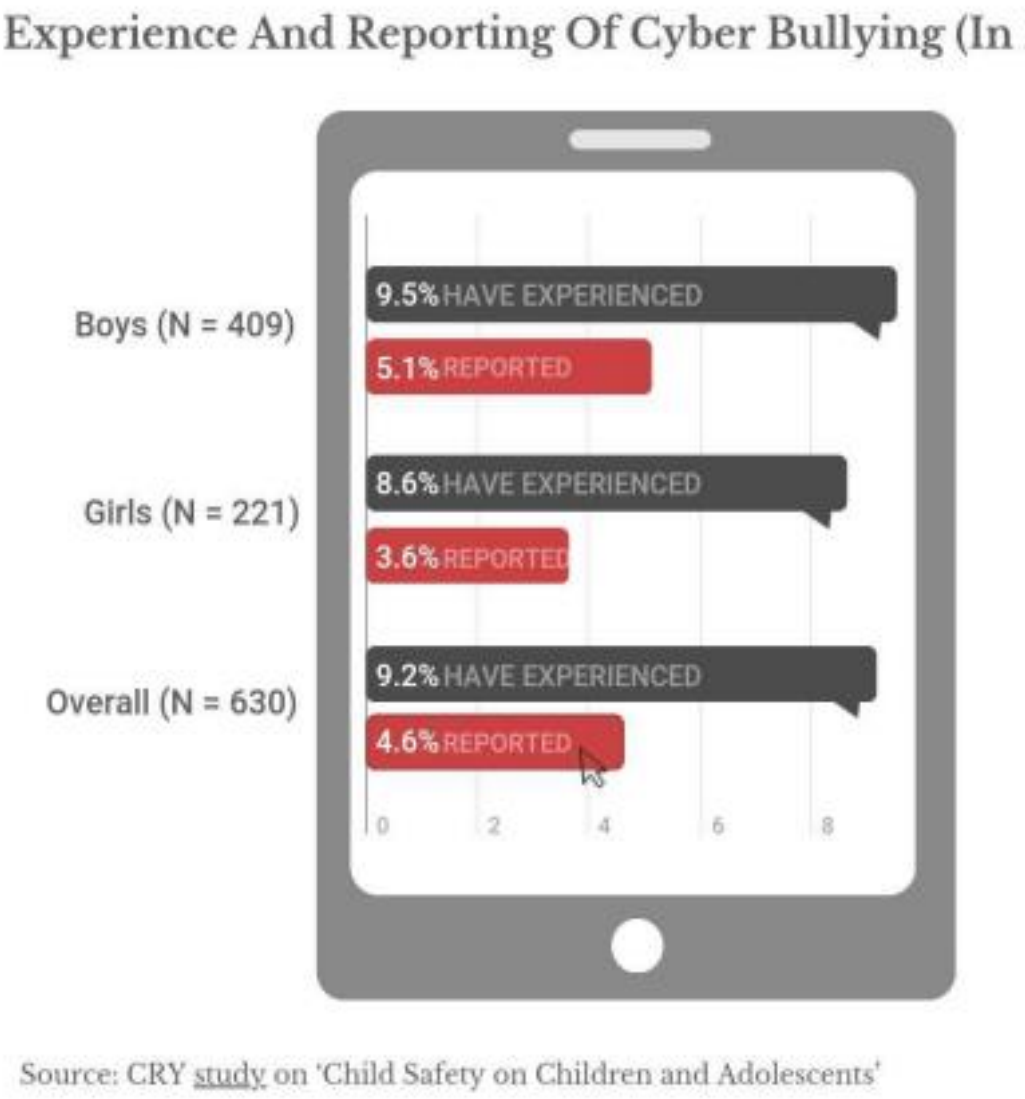


Figure 2 : Experience and reporting of Cyberbullying expressed in percentage

2.3 Previous attempts to curb Cyberbullying

- Pendar 2007 used a statistical approach to automatically distinguish between communication of sexual predators and victims. Classifier performance ranged from 40 to95%.

- Kontostathis et al also attempted to recognize sexual predation and the resulting classifier correctly predicted predator speech 60 % of the time. These results seem promising. However, these studies

have some limitations. First, the datasets used for the experiments were small.

4. PROPOSED WORK

System Architecture

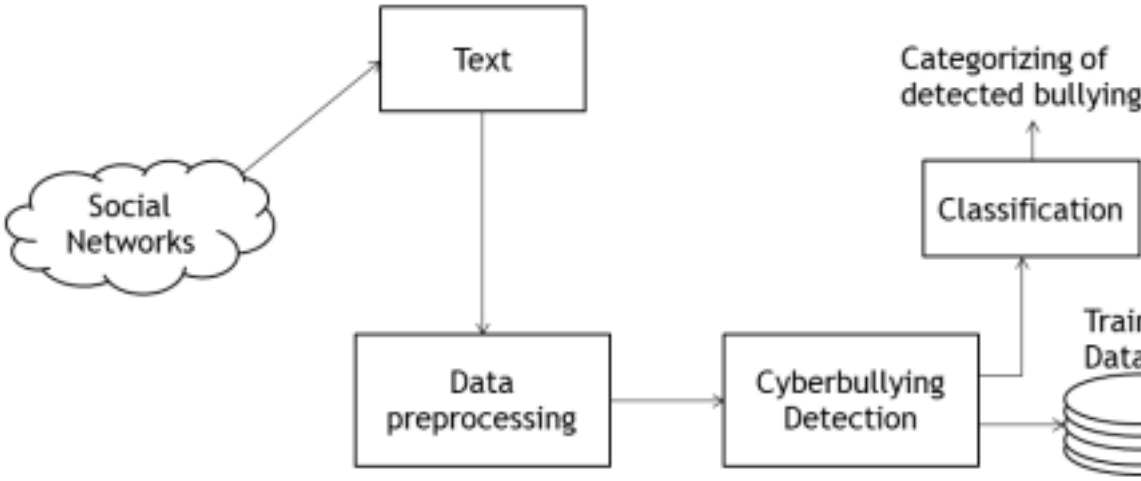


Figure 3 : System Architecture

4.4 Flowchart

4.4.1 Data Wrangling

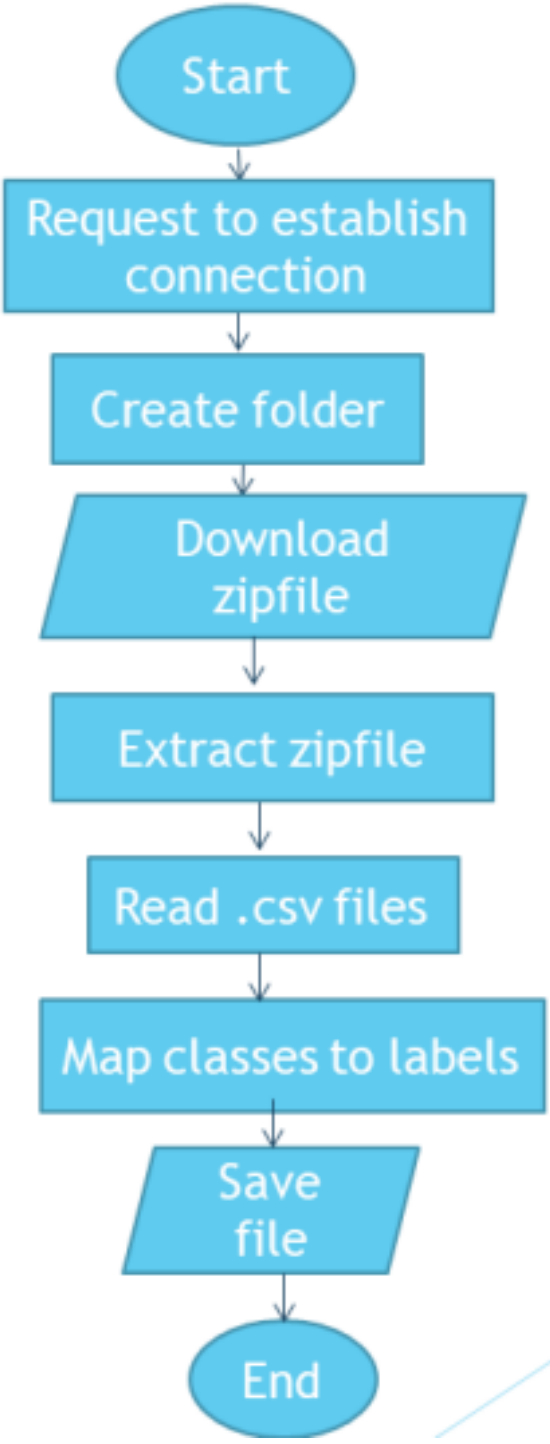


Figure 4 : Flow diagram of data wrangling module 22

4.4.2 Detecting Cyberbullying tweets

Figure 5 : Flow Diagram of cyberbullying detection module

5.2.3 Detecting Cyberbullying in Tweets : Loading and Analysing the data

Figure 8: Screenshot of module 2 – Loading and analysing the data

5.2.4 Detecting Cyberbullying in Tweets: Distribution of tweets in combined dataset, classified as offensive and non-offensive in a pie chart.

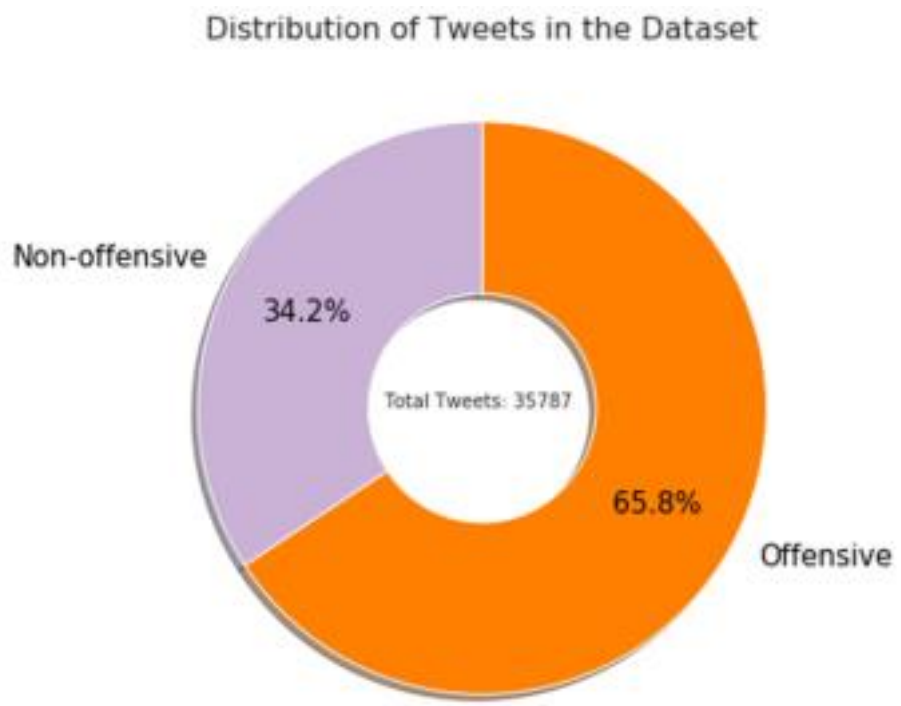


Figure 9: Pie chart representing percentage of offensive and non-offensive tweets.

5.2.5 Detecting Cyberbullying in Tweets: Implementing training and predicting pipeline.

Implementing a training and predicting Pipeline

Separate training and testing data:

In [10]:
```
X_train, X_test, y_train, y_test = train_test_split(df['full_text'],
                                                    df['label'],
                                                    random_state=42)

print('Number of rows in the total set: {}'.format(df.shape[0]))
print('Number of rows in the training set: {}'.format(X_train.shape[0]))
print('Number of rows in the test set: {}'.format(X_test.shape[0]))
```

```
Number of rows in the total set: 35787
Number of rows in the training set: 26840
Number of rows in the test set: 8947
```

Vectorize the data:

In [11]:
```
# Instantiate the CountVectorizer method
count_vector = CountVectorizer(stop_words = 'english', lowercase = True)

# Fit the training data and then return the matrix
training_data = count_vector.fit_transform(X_train)

# Transform testing data and return the matrix. Note we are not fitting the testing data into the CountVectorizer()
testing_data = count_vector.transform(X_test)
```

Implement Pipeline

In [12]:
```
def pipeline(learner_list, X_train, y_train, X_test, y_test):
```

Figure 10: Screenshot of module 2 – implementing the pipeline

6 RESULT AND ANALYSIS

Analyze the results of the Pipeline

```
In [16]: results.reset_index(drop = True)
```

Out[16]:

	Algorithm	Accuracy: Test	Precision: Test	Recall: Test	F1 Score: Test	Prediction Time	Accuracy: Train	Precision: Train	Recall: Train	F1 Score: Train	Training Time
0	BaggingClassifier	0.927797	0.965493	0.923129	0.943836	0.419815	0.988376	0.996507	0.985780	0.991114	41.754808
1	SGDClassifier	0.927462	0.961044	0.927211	0.943824	0.001418	0.982526	0.992377	0.980964	0.986638	0.068617
2	LogisticRegression	0.926344	0.964089	0.922279	0.942721	0.002266	0.978763	0.990242	0.977338	0.983748	0.467848
3	DecisionTreeClassifier	0.923438	0.952132	0.930272	0.941075	0.027815	0.998645	0.999943	0.998300	0.999121	5.974688
4	LinearSVC	0.916732	0.946599	0.925510	0.936936	0.001932	0.997019	0.998298	0.997167	0.997733	0.681417
5	RandomForestClassifier	0.910137	0.951120	0.910034	0.930123	0.347698	0.991990	0.997773	0.990029	0.993886	6.237272
6	AdaBoostClassifier	0.907567	0.972508	0.884354	0.926338	0.341812	0.909650	0.971744	0.888448	0.928231	1.964057
7	MultinomialNB	0.893372	0.901663	0.940306	0.920579	0.004461	0.944560	0.956763	0.959039	0.957900	0.025667
8	KNeighborsClassifier	0.857606	0.895161	0.887245	0.891186	32.587579	0.897727	0.927596	0.915982	0.921753	0.002175

```
In [17]: results.describe().loc[['min', 'max'], :]
```

Out[17]:

	Accuracy: Test	Precision: Test	Recall: Test	F1 Score: Test	Prediction Time	Accuracy: Train	Precision: Train	Recall: Train	F1 Score: Train	Training Time
min	0.857606	0.895161	0.884354	0.891186	0.001418	0.897727	0.927596	0.888448	0.921753	0.002175
max	0.927797	0.972508	0.940306	0.943836	32.587579	0.998645	0.999943	0.998300	0.999121	41.754808

Figure 11: Screenshot of table – results of pipeline

4.2.7 Detecting Cyberbullying in Tweets: Classification summary of applied ML algorithms based on performance parameters mapped as a bar graph

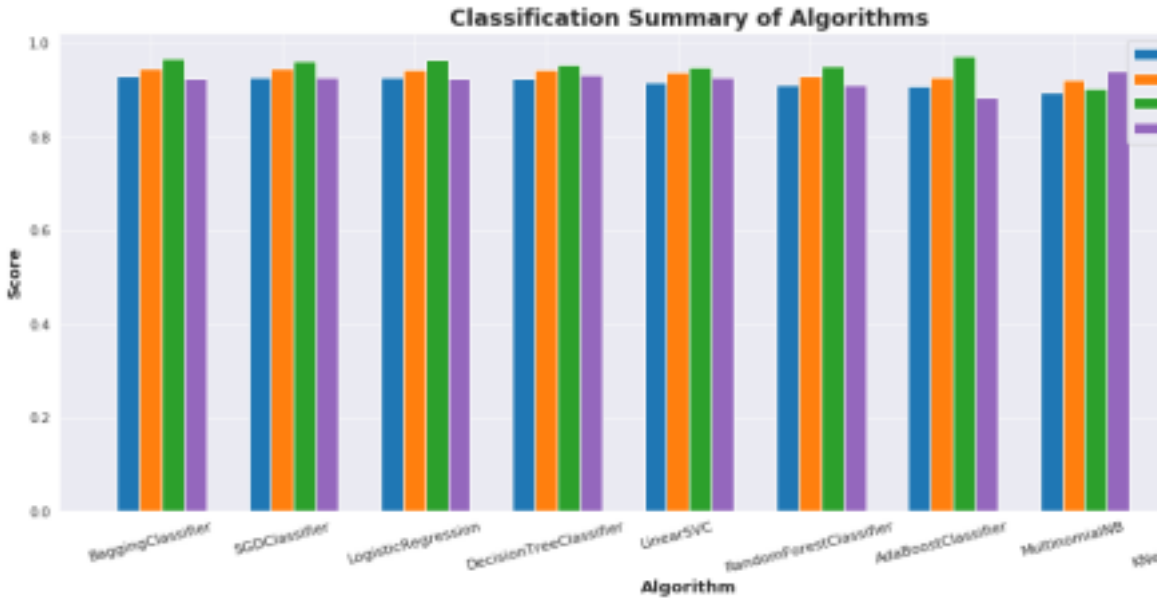


Figure 12: Bar graph representing performance of algorithms

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4.2.8 Detecting Cyberbullying in Tweets: Time complexity of algorithms represented in bar graph.

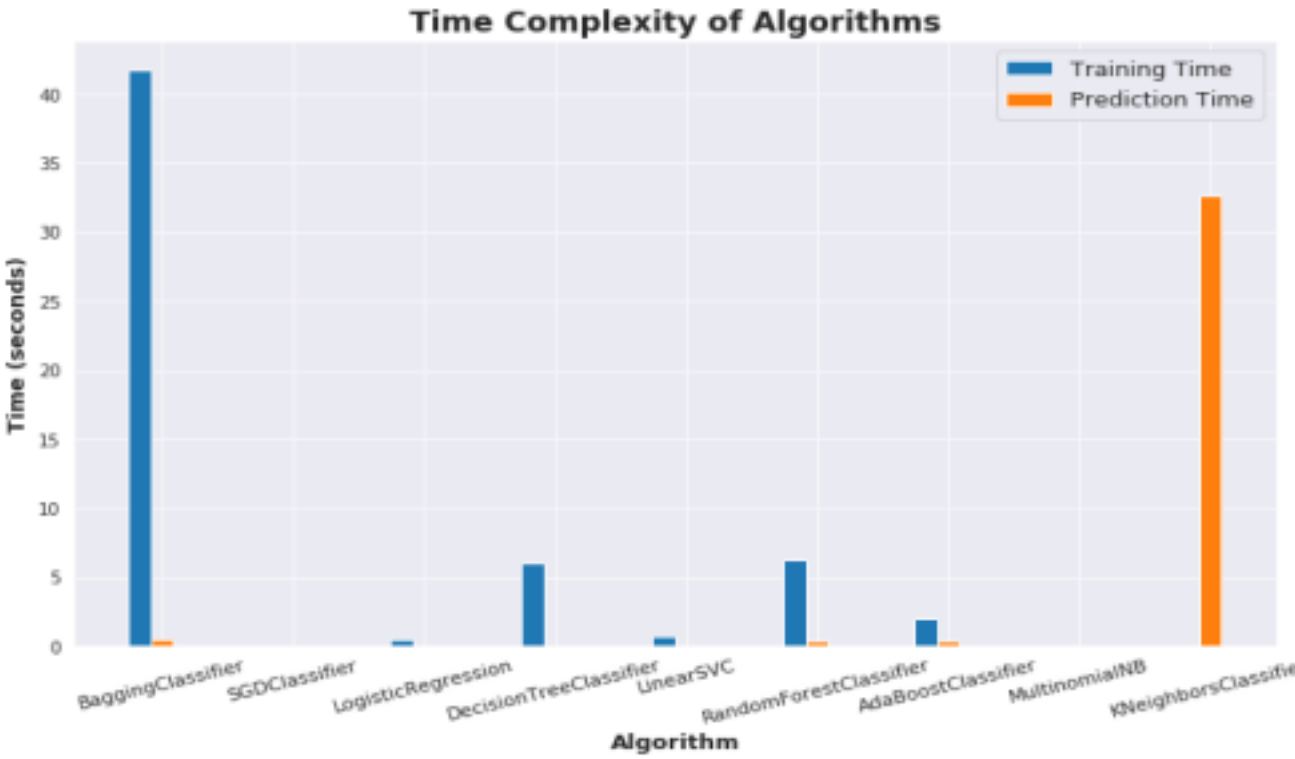


Figure 13: Bar graph representing time complexity of algorithms

4.2.9 Detecting Cyberbullying in Tweets:TuningHyperparameters

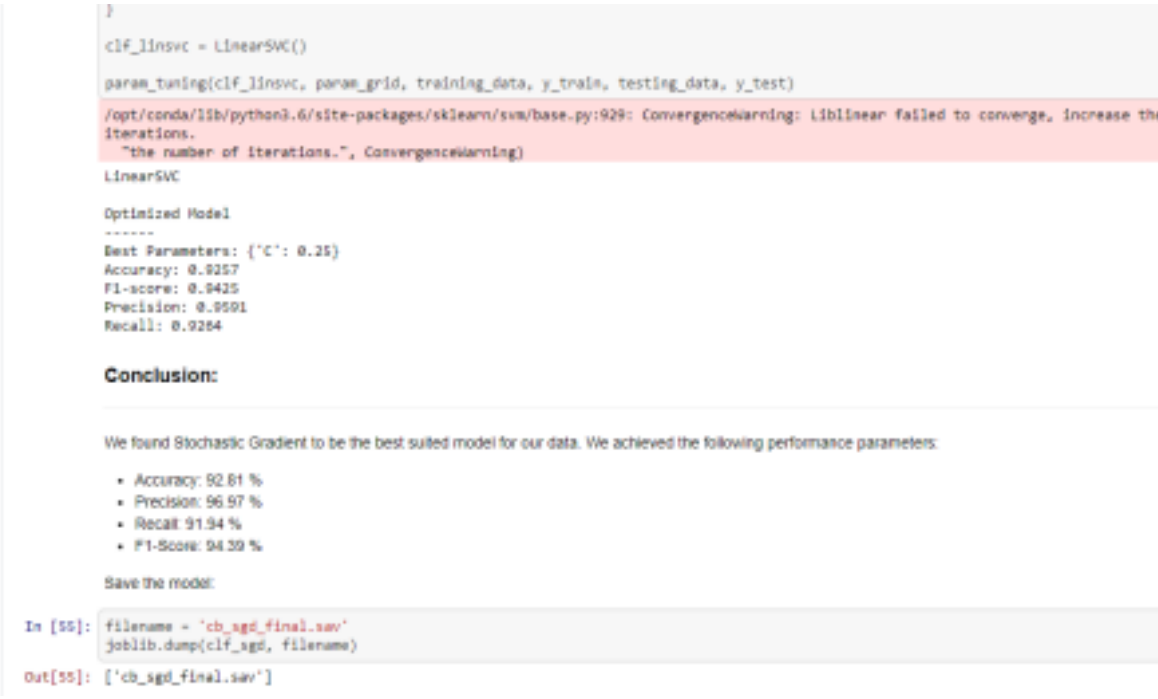
Tuning Hyperparameters

In [20]:

```
def param_tuning(clf, param_dict, X_train, y_train, X_test, y_test):

    # make scorer object
    scorer = make_scorer(f1_score)

    # perform Grid Search for Parameters
    grid_obj = GridSearchCV(estimator = clf,
                            param_grid = param_dict,
                            scoring = scorer,
                            cv = 5)

    grid_fit = grid_obj.fit(X_train, y_train)

    # Get the estimator
    best_clf = grid_fit.best_estimator_

    # Make predictions using the unoptimized and model
    predictions = (clf.fit(X_train, y_train)).predict(X_test)
    best_predictions = best_clf.predict(X_test)

    # Report the before-and-afterscores
    print(clf.__class__.__name__)
    print("\nOptimized Model\n------")
    print("Best Parameters: {}".format(grid_fit.best_params_))
    print("Accuracy: {:.4f}".format(accuracy_score(y_test, best_predictions)))
    print("F1-score: {:.4f}".format(f1_score(y_test, best_predictions)))
    print("Precision: {:.4f}".format(precision_score(y_test, best_predictions)))
    print("Recall: {:.4f}".format(recall_score(y_test, best_predictions)))
```

Figure 14: Screenshot of module 2 – Hyper tuning the parameters

4.2.9 Detecting Cyberbullying in Tweets: Conclusion



```
}

clf_linsvc = LinearSVC()

param_tuning(clf_linsvc, param_grid, training_data, y_train, testing_data, y_test)
```

```
/opt/conda/lib/python3.6/site-packages/sklearn/svm/base.py:929: ConvergenceWarning: Liblinear failed to converge, increase the
iterations.
  "the number of iterations.", ConvergenceWarning)
```

```
LinearSVC

Optimized Model
------
Best Parameters: {'C': 0.25}
Accuracy: 0.9257
F1-score: 0.9425
Precision: 0.9591
Recall: 0.9264
```

Conclusion:

We found Stochastic Gradient to be the best suited model for our data. We achieved the following performance parameters:

- Accuracy: 92.81 %
- Precision: 96.97 %
- Recall: 91.94 %
- F1-Score: 94.39 %

Save the model:

```
In [55]: filename = 'cb_sgd_final.sav'
         joblib.dump(clf_sgd, filename)

Out[55]: ['cb_sgd_final.sav']
```

Figure 15: Screenshot of module 2 - conclusion

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6.1 RESULT ANALYSIS

- After tuning hyper-parameters to optimize the algorithms, *Stochastic Gradient Descent* was found to be the best algorithm.
- *Performance* and *time complexity* was taken into account when choosing best model, thus we were able to obtain excellent performance metrics as follows :

Accuracy: 92.81 %

Precision: 96.97 %

Recall: 91.94 %

F1-Score: 94.39 %

7.CONCLUSION

- We were able to successfully train the program according to the collected datasets to identify the bullying tweets.
- The best suited model is decided based on the performance parameters : Accuracy, F1-score, Precision, Recall.
- Hence, we achieved our objective to detect cyber bullying in text. • Thereby, we conclude that among Machine learning classifiers, the best classifier suited to detect cyberbullying in text with optimum efficiency and least time complexity is *Stochastic Gradient Descent*.

8.FUTURE WORK

- Our ultimate goal of cyberbullying detection on social media is to flag as many online threats as possible so as to reduce manual patrolling efforts on social media. We aim to do this by focusing on further optimizing our precision and recall.
- We can include other detection modules and plan to detect all kinds of bullying in images, audio and video of all formats..
- We also plan on further categorizing our polarity of positive, negative by assigning degrees to them i.e. very positive, positive, very negative and negative. This will improve our research in terms of accurate detectingcyberbullying.
- In addition to that, we can classify our tweets according to the type of cyberbullying i.e. threat, insult, curse etc. This will give us insight into which kind of bullying is more prominent over social media.

BLIND ASSISTANCE SYSTEM

Project Report Submitted

In Partial Fulfillment of the Requirements

For the Degree Of

BACHELOR OF ENGINEERING

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted By

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Mehnaz Fatima (1604-17-733-070)

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BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

Date: 4 / 06 / 2021

CERTIFICATE

This is to certify that the project dissertation titled "**BLIND ASSISTANCE SYSTEM**"

being submitted by

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2. Mehnaz Fatima (1604-17-733-070)
3. Syed Iftaqar Hussain (1604-17-733-318)

In Partial Fulfilments of the requirements for the award of the degree of BACHELO OF ENGINEERING IN COMPUTER SCIENCE AND ENGINEERING MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHNOLOG Hyderabad for the academic year 2020-21 is the bonafide work carried out by them. T results embodied in this report have not been submitted to any other University or Institu for the award of any degree or diploma.

Signatures:

Internal Project Guide

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Banjara Hills, Hyderabad-500 034, T.S.

Associate Professor CSE (Mrs Krishna Keerthi)

External Examiner

Abstract

The machine learning model project helps blind and visually impaired people to detection and recognition the office tools around them, which they see through a small camera. This technique helps providing job opportunities for the blind, especially office work through a voice message sent to an earphone placed on the blind ear to help him/her find various items easily and independently. This saves time and efforts.

Our aim is to create an intelligent system, imitating the human eye, which transfers different scenes and images to the brain. The brain in turn analyses the images or scenes, and based on previously stored information, the surrounding objects are identified. For this purpose, we use a small device that performs similar to the human brain, called smart phone; it is a small device that analyses the images and scenes with the help of the camera, which moves the images to the small device. Then, the process of analysis begins through long complex algorithms known as the neural network algorithms. This network analyses the images to parts in order to compare them with the most important characteristics of the objects in the images related to the database, through which the images are compared. When ensuring that the characteristics match the mathematical equations programmed in the language of the Python, the objects in the

image are detected. Finally, the sound of each tool in the database is called, and a message is sent to tell the blind about the tools in front of him/ her.

8

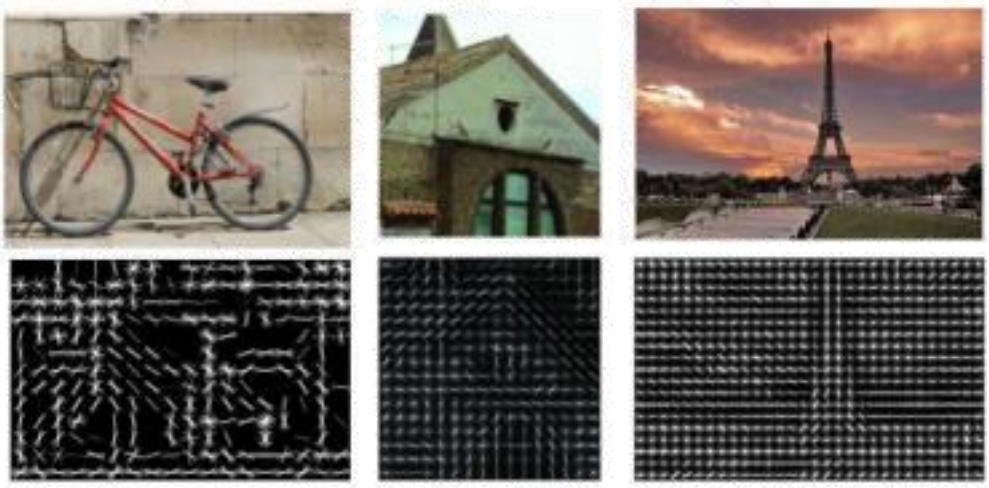


Figure (3.22): ExampleHistogram of Oriented Gradients [44].

Structure Model

Models an object as a number of smaller parts that are allowed to deviate slightly from average appearance. [44].

– Star model - coarse root and higher resolution part filters

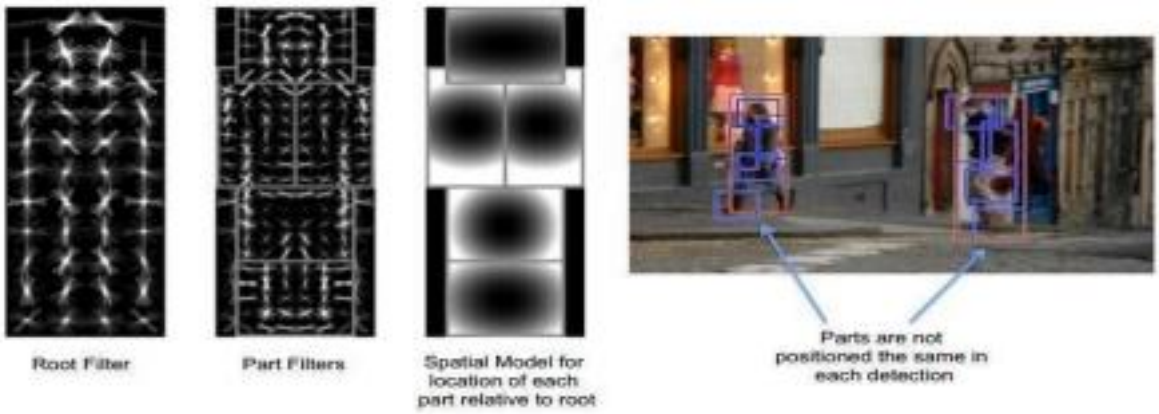


Figure (3.23): Part Based Model [44].

Voting Models

- Create weak detectors by using parts and voting for the objects canter location

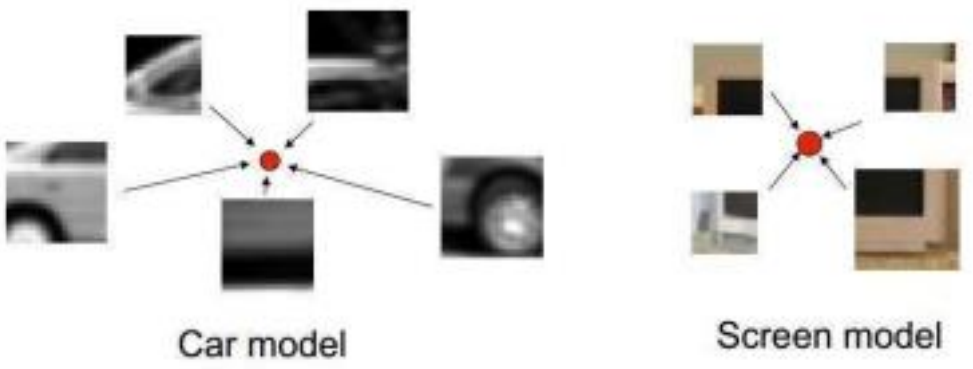


Figure (3.24): Voting Models [44].

Collecting Parts

First, we collect a set of part templates from a set of training objects.

Figure (3.25): Example Collecting Parts [44].

Weak Part Detectors

-We now define a family of “weak detectors” as:

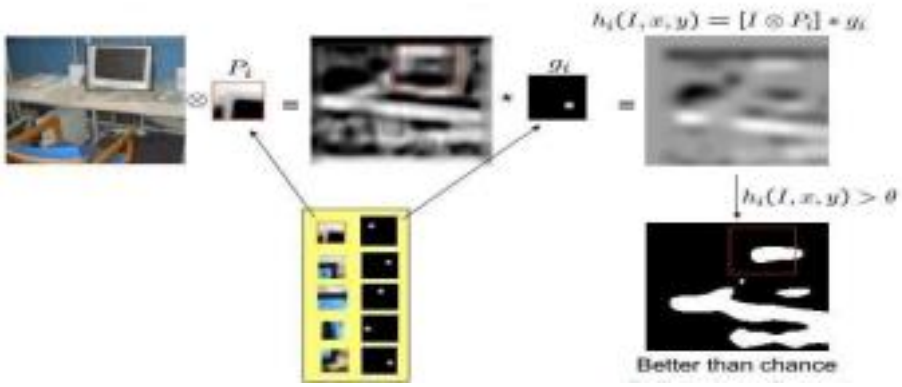


Figure (3.26): Weak Part Detectors [44].

-We can do a better job using filtered images

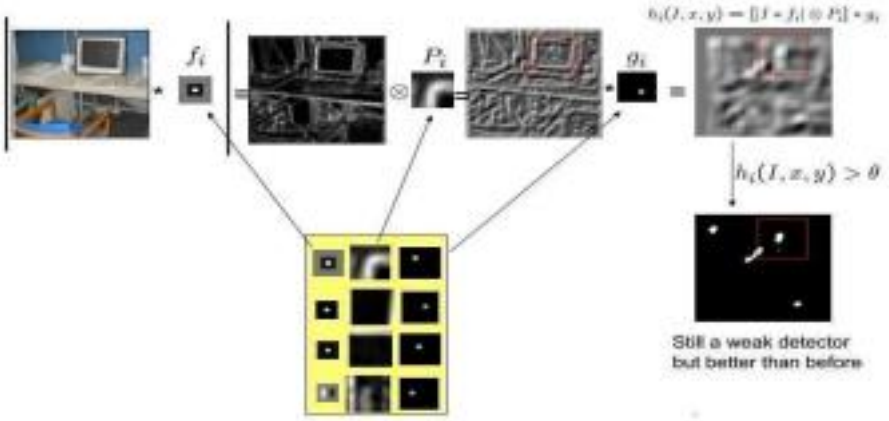


Figure (3.27): Weak Part Detectors using filtered images [44].

Voting Model

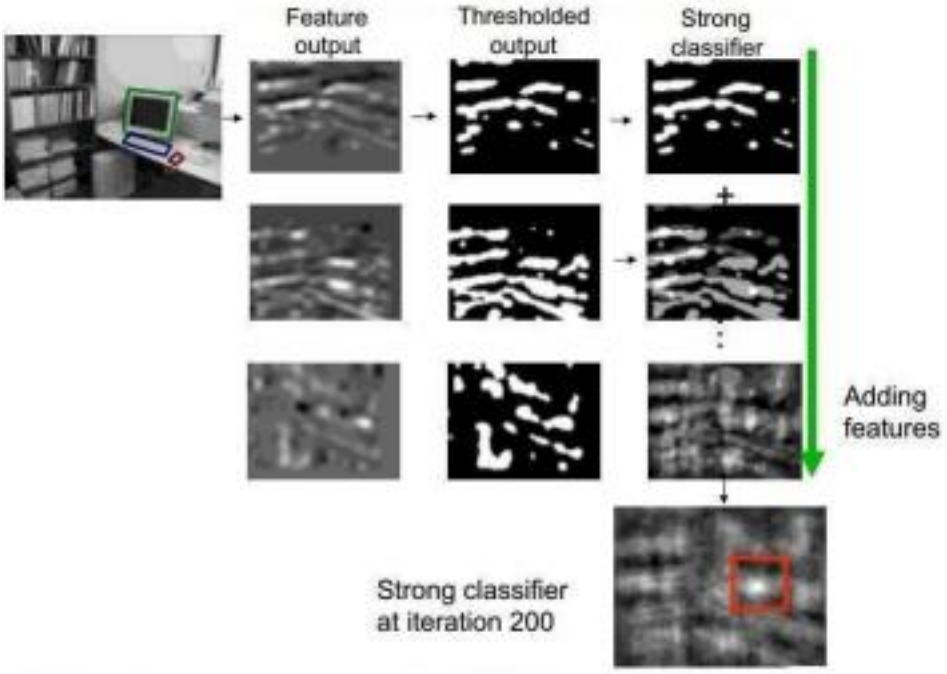


Figure (3.28): Example of Screen Detection [44]

Datasets for Object Classification Detection

• Caltech101

• Caltech256

• PASCAL

• ImageNET

• LabelMe

Figure (5.1): Convolutional Neural Networks(CNN) [65].

5.5 Object detection with Tensor Flow

5.5.1 Computations are done in two steps:

– **First:** Build the graph.

– **Second:**Execute the graph. Both steps can be done in many languages (python, C++) Best supported so far is python [64].

We will walk through all the steps for building a custom object classification model using TensorFlow‟s API**:**

Gathering a data set:

Some very large detection data sets, such as MS-COCO, exist already.

Creating bounding boxes:

Toan train our object detection model, for each image we will need the image‟s width, height, and each class with their respective xmin, xmax, ymin, and ymax bounding box. Simply put, our bounding box is the frame that captures exactly where our class is in the image.

Creating these labels can be a huge ordeal, but thankfully some programs help create bounding boxes. Labelling is an excellent open-source free software that makes the labelling process much easier. It will save individual XML labels for each image, which we will convert into a CSV table for training. The labels for all the images used in the pawn detector we are building are included in the Get Hub repository [64].

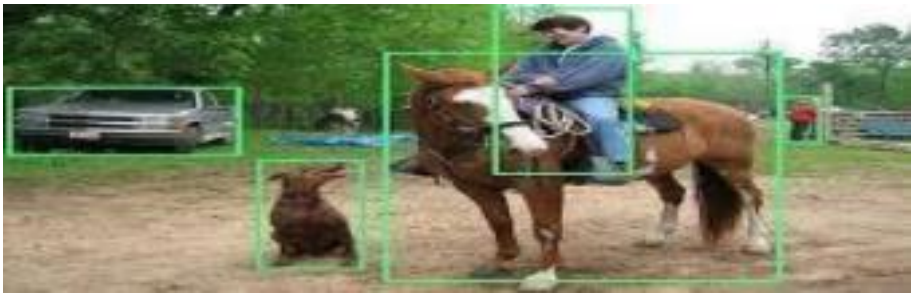


Figure (5.2): Train our object detection model [64].

Install the object detection API:

Before getting started, we have to clone and install the object detection API into our Get Hub repository. Installing the Object detection API is extremely simple; you just need to clone the Tensor Flow Models directory and add some things to your Python path.

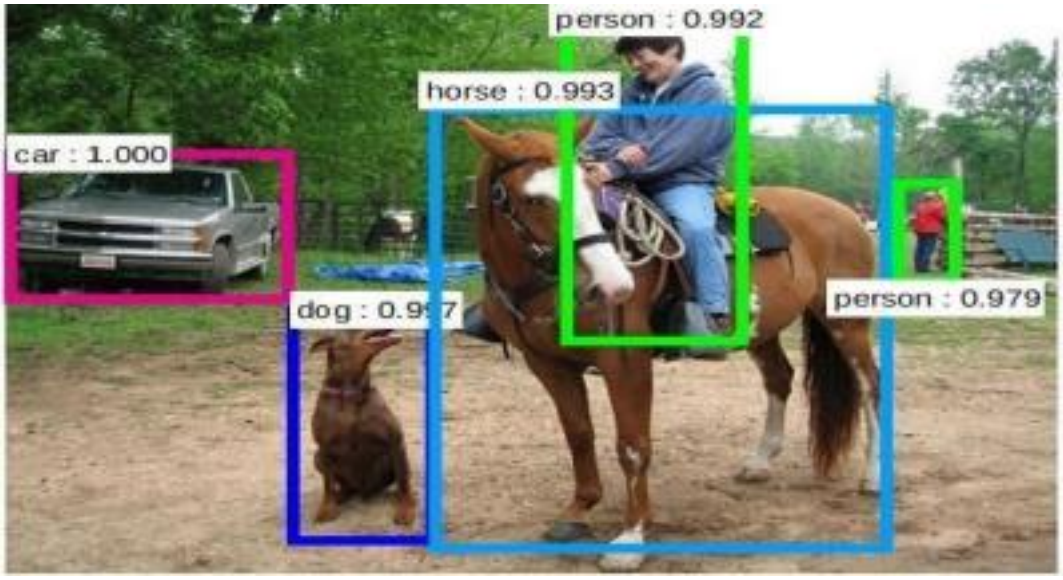
5.5.2 Convert labels to The Tensor Flow Record format:

When training models with Tensor Flow using Tensor Flow Record, files help optimize your data feed. We can generate a Tensor Flow Record file using code adapted from this raccoondetector.

Choose a model:

There are models in the Tensor Flow API you can use depending on your needs. If you want a high-speed model that can work on detecting video feed at high fps, the single-shot detection (SSD) network works best. Some other object detection networks detect objects by sliding different sized boxes across the image and running the classifier many times on different sections of the image, this can be very resource

consuming. As its name suggests, the SSD network determines all bounding box probabilities in one go; hence, it is a vastly faster model [64].



66

Figure (5.4): Single Shot Detector SSD [65].

5.6.2 RCNN (Region Proposal + CNN)

The Region-based Convolutional Network method (RCNN) achieves excellent object detection accuracy by using a deep ConvNet to classify object proposals. R-CNN [65].

Use selective search to come up with regional proposal First object detection method using CNN.

Training RCNN:

Step1: train your own CNN model for classification using the Image Net dataset.

Step2: focus on 20 classes + 1 background. Remove the last FC layer and replace it with asmaller layer and fine-tune the model using the PASCAL VOC dataset.

Step3: extract feature. Store all the features.

Step4: train SVM for each class: -Crop /Warp image.

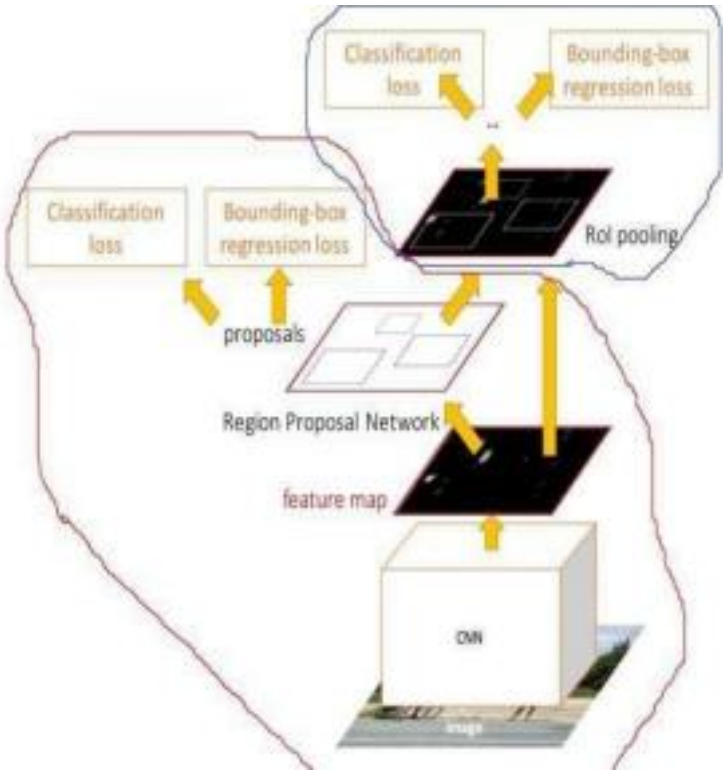


Figure (5.5): RCNN [65].

5.7 Object Recognition with Tensor Flow

A recognition algorithm (image classifier) takes an image as input and outputs what the image contains. In other words, the output is a class label (e.g. “cat”, “dog”, “table” etc.) [66].

5.7.1 Three Steps Recognition:

Step 1: Pre-processing

Often an input image is pre-processed to normalize contrast and brightness effects. A very common pre-processing step is to subtract the mean of image intensities and divide by the standard deviation. Sometimes, gamma correction produces slightly better results. While dealing with colour images, a colour space transformation (e.g. RGB to LAB colour space) may help get better results [66].

Step 2: Feature Extraction

The input image has too much extra information that is not necessary for classification. Therefore, the first step in image classification is to simplify the image by extracting the important information contained in the image and leaving out the rest. For example, if you want to find a shirt and coat buttons in images, you will notice a significant variation in RGB pixel values. However, by running an edge detector on an image we can simplify the image. You can still easily discern the circular shape of the buttons in these edge images and so we can conclude that edge detection retains the essential information while throwing away non essential information. The step is called feature extraction. In traditional computer vision approaches designing these features is crucial to the performance of the algorithm.

Turns out we can do much better than simple edge detection and find features that are much more reliable. In our example of the shirt and coat buttons, a good feature detector will not only capture the circular shape of the buttons but also information about how buttons are different from other circular objects like car tires [66].

Step 3: Learning Algorithm for Classification

In the previous section, we learned how to convert an image to a feature vector. In this section, we will learn how a classification algorithm takes this feature vector as input and outputs a class label (e.g. cat or background).

Before a classification algorithm can do its magic, we need to train it by showing thousands of examples of cats and backgrounds. Different learning algorithms learn differently, but the general principle is that learning algorithms treat feature vectors as points in higher

dimensional space, and try to find planes/surfaces that partition the higher dimensional space in such a way that all examples belonging to the same class are on one side of the plane/surface [66].

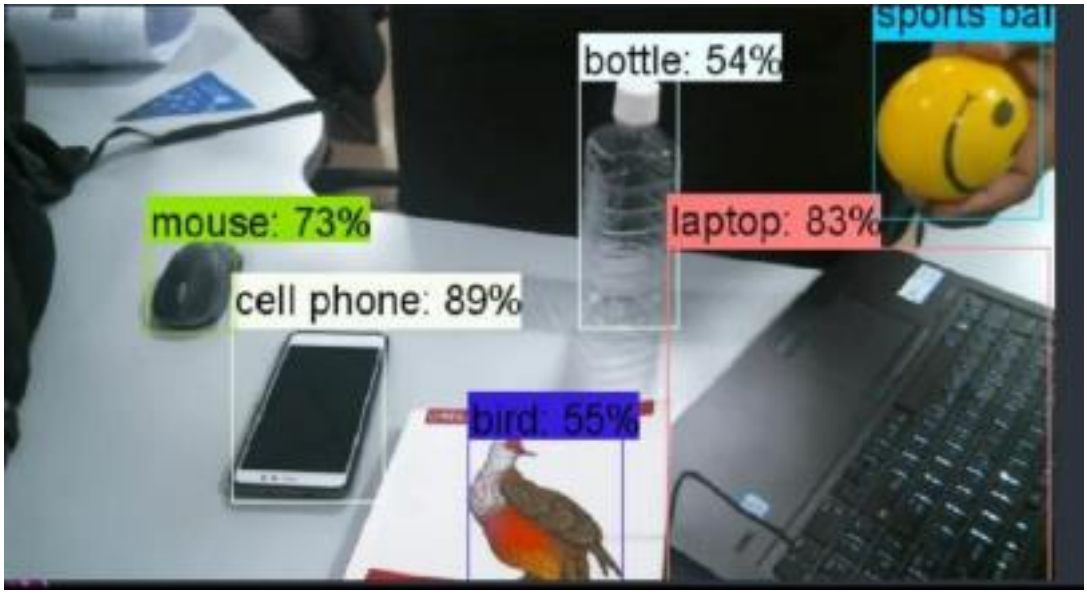


Figure (5.7): Result of Objects Recognition [66].

6.1 Simulation:

6.1.1 Connecting the Camera

The system starts by connecting the OpenCV camera module with the computer/smartphone through a cable, the cable connects between the fast camera Serial Interface bus and the systemon-chip processor, the camera is connected to the computer.

6.1.2 Camera Setup and Configuration

This stage Operating System has already installed all dependence packages on computer/cloud, Programming codes after the system is ready on the side with the correct programs, all required programs that will do the job was written in python.

Here, we will employ a dataset that includes objects captured from images of real life, the dataset consists of more than 300 images of 90 objects. The resolution of images is about 600 x 500 pixels.

6.1.3 Understanding Training process:

Deep neural networks are nothing but mathematical models of intelligence which to a certain extent mimic human brains, Deep learning recognizes objects in images by using three or more layers of artificial neural networks in which each layer is responsible for extracting one or more features of the image [69].

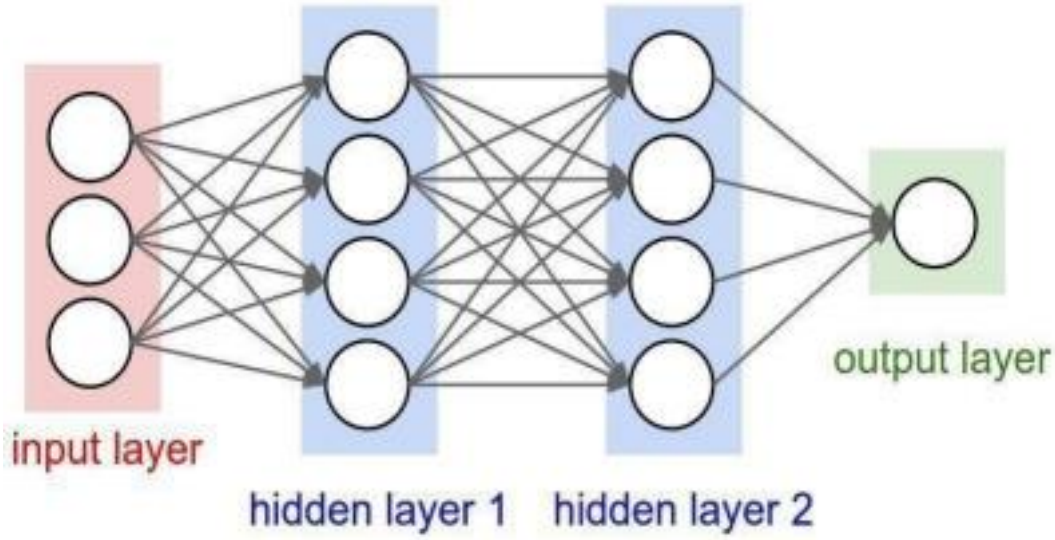


Figure (6.1): Layers in Neural Networks [69].

A neural network is a computational model that is analogous to the arrangement of neurons in the human brain. Each neuron takes an input, performs an operation, and then sends output to one or more adjacent neurons.

Train a Neural Network

Training a Neural Network is very similar to training a little child. You show the child a ball and tell her that it is a "ball". When you do that many times with different kinds of balls, the child figures out that it is the shape of the ball that makes it a ball and not the colour, texture, or size. You then show the child an egg and ask, "What is this?" She responds "Ball." You correct them that it is not a ball, but an egg. When this process is repeated several times, the child can tell the difference between a ball and an egg [68] [69].

To train a Neural Network, you show it several thousand examples of the classes (e.g. table, cup, other) you want it to learn. This kind of training is called **Supervised Learning** because you are providing the Neural Network an image of a class and explicitly telling it that it is an image from that class [68] [69].

To train a Neural Network, we need three things:

1-**Training data:** Thousands of images of each class and the expected output.

2-**Cost function:** We need to know if the current setting is better than the previous knob setting. A cost function sums up the errors made by the neural network over all images in the training set.

3-**How to update the knob settings**: Finally, we need a way to update the knob settings based on the error we observe overall training images [68] [69].

Steps Category Labelling in Image:

The first task in annotating our dataset is determining which object categories are present in each image.

In the next stage, all instances of the object categories in an image were labelled. The final stage is the laborious task of segmenting each object instance, this stage for image segmentation.

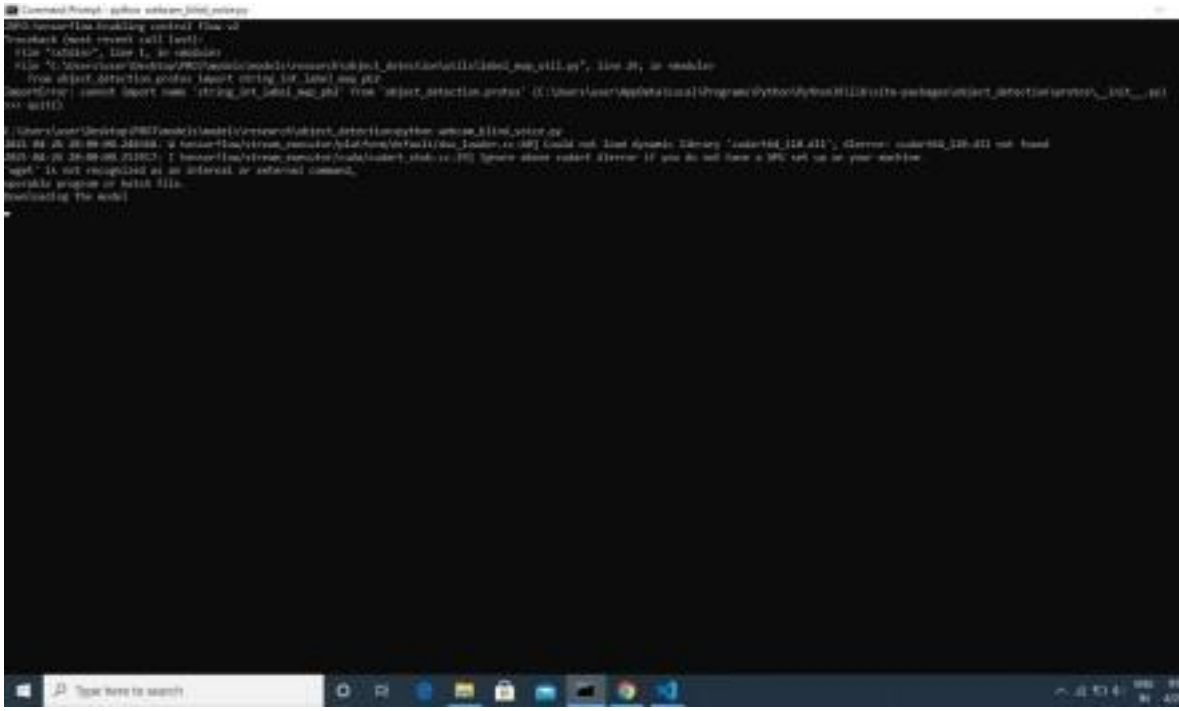
Finally, PASCAL VOC‟s primary application is object detection in natural images. MS COCO is designed for the detection and segmentation of objects occurring in their natural context.

Time Testing

Our graduation project can process and match each training or recognition image in about two seconds on a computer, when

using a smartphone its takes 0.5second to 1 second but is enough and good for blind people to know the object

Run Model:



Some Code Screen Short:

75

76

time system

Results:

77

Figure (6.2): Test of result detection and recognition by camera of project. **Figure (6.2):** Test of result detection and recognition by camera of project.

79

Figure (6.2): Test of result detection and recognition by camera of project.

80

Figure (6.2): Test of result detection and recognition by camera of project. **Figure (6.2):** Test of result detection and recognition by camera of project.

6.3 Challenges

While building the system, there are some challenge was faced, such as: Not all the required cloud subscription for the project are available

Some problems in dealing and Understand Python programming language also with some project development like training machine learning model.

6.4 Conclusion & Future work

We designed and implemented a smart glass for blind people using special mini camera.

Objects detection is used to find objects in the real world from an image of the world that are common in the scenes of a blind. Based on their locations, and the camera is used to detect any objects.

We expect further improvements in the future as we develop new feature types including colour, distance and other features.

We also recommend using this component Movidius Neural Compute Stick (NCS) is a deep learning USB drive. The NCS is powered by the low-power high-performance Movidius Visual Processing Unit (VPU). Run multiple devices on the same platform to scale performance.

BEST PRACTICE 2: STUDENTS PROJECTS CATERING SOCIETAL NEEDS

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