TECHNO-ECONOMIC DESIGN AND ASSESMENT OF GRID ISOLATED HYBRID RENEWABLE ENERGY SYSTEM FOR AGRICULTURE SYSTEM

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ABSTRACT:

This paper investigates the techno-economic analysis of standalone PV/wind hybrid system for remote household in North East (NE) region of India, where grid connectivity is not a feasible option. HOMER simulation software is used for sizing, optimization, and to perform the economical analysis of the hybrid system. Sensitivity analysis is carried out with solar radiation data, wind speed data, cost of PV and wind system for a 1 kW PV/wind hybrid system. The analysis is made on the assumption of an annual peak, scaled annual average, and the average load of 694 W, 3.95 kWh/day, and 0.165 kW, respectively, for a remote household. The optimal sizing, cost of electricity (COE), battery profile, and converter profile of PV/wind hybrid system for different NE states are presented in this paper. The outcome of this study shows that COE for the NE states is found to be in the range of 0.271–0.510 $/kWh, which is a acceptable margin and a hybrid PV/wind system will go a long way in addressing the shortage of power faced by a large section of the population on daily basis in the rural areas of the aforementioned region. The development and growth in renewable technologies, practically photovoltaic (PV) arrays and wind turbines (WT) have the key role to achieve the worldwide goal towards sustainable energy systems. Hybrid renewable energy system (HRES) can provide safe, eco-friendly and economic solutions for supplying the electrical load demand. This paper developed an autonomous HRES comprising PV, WT, diesel generator, battery, and converter technologies for electrification of an agriculture-isolated area, in Sudan as a real case study. Techno economic optimization analysis for different hybridization scenarios is performed with a main target to find the most feasible configuration with least cost and harmful emission impact considering technical, economic and environmental perspectives with aid of HOMER Pro software.

INTRODUCTION

Global concern is growing about the lack of traditional energy resources such as burning coal, oil, and its derivatives, pumping natural gas, and others. In addition, these sources constitute pollution to the environment, Therefore, it is necessary to test clean sources, such as exploiting the energy of the sun, whether light or heat, extracting energy from wind as well as other energies such as tides and others, as alternative sources [1]. There are some drawbacks when using renewable energy

including the interruption of the extracted energy according to the continuous change of environmental conditions, such as solar radiation, and wind speed in addition, to their high capital cost. Recently, many types of research have been done on integrating many renewable energy sources into one hybrid system to ensure continuity and reliability in remote regions [2]. The hybrid succeeds in achieving several influential factors compared to other systems in terms of quality, and the emission of carbon dioxide is reduced due to the increase in the non-polluting energy part, as well as raising the reliability [3]. The integration of both solar energy and wind energy has taken the greatest interest in the field of research as a hybrid system [4-7]. AZEREFEGN, et al. (2020) [8] Present 4 different scenarios for integrating the hybrid system of solar panels to represent the energy of the sun and wind turbines with the electric grid in 3 different regions in Ethiopia using the HOMER-Pro program, and the results showed low cost, low emissions, and reliability. Tawfiq, Aiman Abd Elkader, et al. (2021) [9], she studied the optimal size of the solar system to achieve maximum power and reliability with grid connectivity using a modified PSO algorithm. Ahmad, Tanveer, and Dongdong Zhang (2021) [10], The effects of the hybrid system consisting of photovoltaic and wind, if it is connected to the electric grid, were presented economically and technically, and the results showed that the cost of the grid connection is two times less than the cost of the island, more reliable and sensitive. Ospino-Castro, Adalberto, et al. (2017) [11] Assess the suitability of a hybrid renewable system in a residential area consisting of the electrical grid connected to the energy of solar panels as well as the energy of wind turbines in Sanlus Potoisi, Mexico to achieve a balance between three aspects: economic, environmental, and energy availability, the best result by trying different cases has been carried out. Alharthi, Yahya Z, et al. (2019) [12], studied hybrid renewable energy connected to a grid system in the city of Riyadh in Saudi Arabia to reach the optimum point to reduce carbon dioxide emissions from an environmental point of view and reduce costs economically. The system simulation was applied using HOMER software, and it was extracted that the best proposal which yields the lowest price with the highest availability is the wind connected to the grid system. Elkadeem, M. R., et al. (2019) [13], He studied a hybrid power system that includes generators connected to the PV system, diesel, and WT with batteries with the

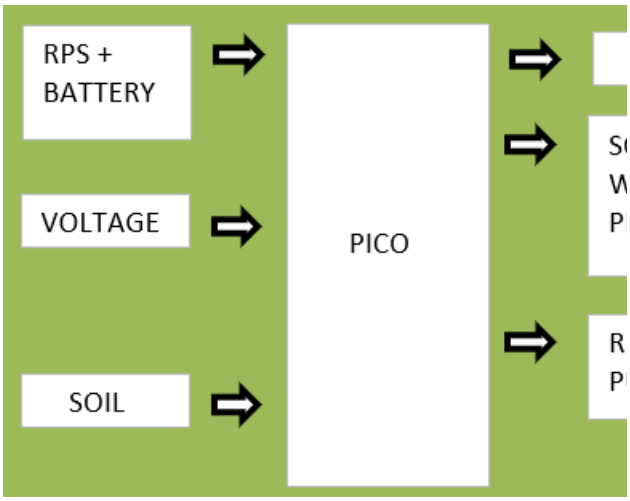
application of converters in order to deliver electricity to an agricultural area in Sudan, resulting achieve economic improvement while reducing the impact of harmful emissions on the environment by experimenting with several methods of blending and hybridization on the HOMER Pro program. The result also indicated that PV/WT/diesel/batteries could be the best solution for feeding this area. Abuelrub, Ahmad, et al. (2019) [14], implemented an optimization technology for a grid-connected regeneration system to discover the best hybrid system integration ratios through two-stage SP technology, achieving annual energy cost reduction while ensuring energy reliability in North Texas. Babatunde, O. M., et al (2017) [15], simulate hybrid renewable energy systems (PV-Wind) with battery and diesel generators, given the prevalence of poverty in developing countries, especially in Abadam Nigeria, the finding that renewable energy can provide more than 50% of the total energy production. Azaroual, et al. (2019) [16], reduced the cost of electricity as well as selling and exporting electricity produced from renewable energy. The system consists of a battery charged from the solar energy system and a wind turbine energy. Two optimization methods have been applied to reach optimal control, namely genetic algorithm, and linear programming techniques. The control system based on linear programming is more economical than the genetic algorithm. In this paper, the Ras Gharib region in Egypt [17], was chosen for study, due to the sunny climate throughout the year and the presence of wind speeds suitable for the presence of many wind turbines. This region is the second city on the Red Sea in terms of a population of about 100,000 people. Many projects have been carried out to generate electricity in this region [18,19]. The output power from renewable energy sources is largely affected by some environmental conditions like sun irradiance and temperature for the PV systems and wind speed for the wind energy systems. These environmental variations lead to changes in the generated power from renewable energy sources. Thus, control design means should be used to improve performance in integrating the sources with the electrical grid as well as obtaining the maximum power from it (MPPT) [20]. MPPT is implemented by regulating DC voltage output from renewable sources through DC-DC converters, which qualifies to ensure working at maximum power point. [20- 21]. The main objective of this paper can be

outlined as: ➢ A hybrid system consisting of PMSG of wind turbines and photovoltaic power with grid connection will be offered. The aim of this research is to reach the minimum generation cost by achieving the design of the optimal ratings for both photovoltaic and wind energy systems. This optimization problem is performed using HOMER software. ➢ Incremental conductance based on MPPT technology is introduced to track the maximum available energy for each of the components of the hybrid system, both PV and WT, in order to extract the maximum amount of system energy. The control process was also helped by the DCDC converter connected to the main inverter connected to the electrical grid through the duty cycle. MATLAB / SIMULINK program was used to develop and simulate the complete system.

PROPOSED SYSTEM

As a result, many people still rely on private diesel generators, which release significant levels of pollutants, and have negative effects on both humans and the environment. Situated in the sunbelt, Sudan is one of the largest countries in Africa endowed with an extremely high solar irradiation potential. However, no work has been done in the literature with a strategic context to study specifically the feasibility of renewable energy systems in Sudan despite the abundance of solar resource. The aim of this study was to utilize Hybrid Optimization Model for Electric Renewables (HOMER) to identify the optimal solar photovoltaic (PV) system for Sudan's conditions, identify the best locations, and analyze the costs and the pollution that might be avoided by employing a PV system in place of a diesel system. HOMER simulation results demonstrated that the optimal type of PV for Sudan is the Studer VarioTrack VT-65 with Generic PV. The utilization of a solar PV system will avoid the production of approximately 27 million kg/year of pollutants and will reduce the cost of energy to USD$ 0.08746/kWh. The optimal locations found in Sudan for utilizing solar energy were Wawa, followed by Kutum, Wadi Halfa, Dongola and Al-Goled due to their low costs of electricity, high clearness index and high levels of solar radiation. Given the recent rapid decrease in PV pricing and predictions for continued reductions, the costs of PV were varied to deliver an understanding on the impact of PV costs on the project economics. Reducing the PV costs by 25% has a significant impact; the cost of energy produced reduces in the range of USD$ 0.06697/kWh and USD$ 0.06808/kWh,

while a reduction in PV costs of 50% further reduces the cost of energy, ranging between USD$ 0.05273/kWh and USD$ 0.05361/kWh in the top five locations in Sudan. The output of this study is projected to raising the potentiality awareness of renewable energy in Sudan and delivering a valuable reference regarding the optimal utilization of solar PV system in energy sector.



The photovoltaic system includes the amount of power desired and the number of panels used. which comprises a set of PV units connected to each other in series and parallels to achieve the required capacity of the system and to reach the highest possible PowerPoint with environmental changes, MEPV 400-HC has been selected to deliver 5.2 MW of power through the system as each module covers an area of 1.98 m2 (1979 mm×1002 mm). Table 1, shows the details of the PV module. The cost is about $0.18144/WP, with very low operating and maintenance costs. The wind system is modeled to extract mechanical energy through changes in wind speed using PMSG wind turbines [28]. Although there are many types of wind generators, the permanent magnet synchronous generator (PMSG) is the most widely used because it achieves high torque at small speeds, has no gearbox in its structure, has simplicity of design, stable performance with electronic transformers and low operating cost and maintenance [29]. Enron 1.5 MW turbines were selected costing around $1,300,000/MW, Table 2, shows the data of the wind turbine. According to the potential of the winds in the Ras Gharib region, it was found in studies that the higher the hub height of the turbine, the better the performance [30], and in this study, the heights of the turbine used range from 65 to 100 meters. The electric grid is more reliable than solar PV and wind turbine systems, which rely exclusively on renewable sources. When the energy generated from the system exceeds consumption, this excess can be sold to the grid, thus reducing the total cost of energy [31]. Accordingly, electricity prices are changed every period, as shown in Table 3, Which presents a comparison of the electricity tariff for the

last two years in Egypt, including domestic and commercial uses. The DC-DC converter is also used as a connector between the maximum output power and the loads. The boost converter used in this study, which works to raise the output voltage, appears in Fig. 4. The rectifier is also used in the wind energy part to convert the power of the wind turbines to direct current to connect it to the DC line. Then the inverter is used to convert the DC bus current to alternating current to feed the AC loads and connect to the AC bus that is also connected to the electrical grid. And in this study, it was selected using a rating of 20% more than peak demand

CONCLUSION

This paper studies different aspects of the hybrid system PV/Wind connected to a grid for the Ras Gharib area in the Red Sea Governorate in Egypt. To increase the reliability and performance of the system, MPPT has been applied to the system. And uses lower costs to reach the required power capacity of electrical loads. By optimizing the system, it was found that the optimal solution is 5.2 MW from the PV plant and 7.5 MW from the wind farm, at a total cost of about 18,048,6298 $. The system achieves a flow of power at a constant frequency, and when the electrical grid is connected to the AC bus, which is also connected to the output of the hybrid system (PV-WT), the energy produced is also at a constant volt to feed the AC loads.

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V2V SYSTEM CONGESTION CONTROL VALIDATION AND PERFORMANCE USING CAN COMMUNICATION AND TRACKING OF VEHICLE

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AIM:

This project aims in designing a system which helps in monitoring and controlling multi-regions using CAN (Controller Area Network) protocol. This system helps in achieving communication between multiple devices.

PURPOSE:

The main objective of this project is to provide CAN communication based vehicle security for automobiles, this system also avoid rear end collision using sensors and wireless communication.

ABSTRACT:

This paper proposes a vehicle-to-vehicle communication protocol for cooperative collision warning. Emerging wireless technologies for vehicle-to-vehicle (V2V) and vehicleto-roadside (V2R) communications such as CAN [1] are promising to dramatically reduce the number of fatal roadway accidents by providing early warnings. One major technical challenge addressed in this paper is to achieve low-latency in delivering emergency warnings in various road situations. Based on a careful analysis of application requirements, we design an effective protocol, comprising congestion control policies, service differentiation mechanisms and methods for emergency warning dissemination. Simulation results demonstrate that the proposed protocol achieves low latency in delivering emergency warnings and efficient bandwidth usage in stressful road scenario

INTRODUCTION

Major U.S., European, and Japanese automakers such as General Motors, Volkswagen, and Toyota have recently either equipped some of their production vehicles with Dedicated Short Range Communications (DSRC) systems or plan to do so [1]–[3]. The U.S. Department of Transportation (USDOT) issued in January

2017 a Notice for Proposed Rule-Making (NPRM) with the eventual aim of mandating the deployment of Vehicle-to-Vehicle (V2V) safety communication based on DSRC on all new light vehicles sold in the United States. The DSRC-based V2V technology is an outcome of nearly 15 years of efforts of the industry, academia, and the government. The DSRC-based V2V system builds atop several Institute of Electrical and Electronics Engineers (IEEE) and Society of Automotive Engineers (SAE) standards towards connected vehicles technology for safety and crash avoidance applications Such safety applications are based on V2V safety communication that includes broadcast of vehicle status information through Basic Safety Messages (BSMs). The BSMs include core state information such as Global Navigation Satellite System (GNSS) location, speed, acceleration, brake status, and path history [4] [5], with communication ranges of 400-500 meters, or more. In particular, such V2V systems use the SAE J2945/1 standard [6] that is based on several IEEE and SAE standards: • The Medium Access Control (MAC) and Physical Layer (PHY) protocol follow the IEEE 802.11p standard. The Federal Communications Commission (FCC) has dedicated 75 MHz of spectrum in the 5.9 GHz band for communication between vehicles (V2V) and between vehicles and roadside infrastructure (V2I). • The BSMs follow the Wireless Access in Vehicular Environments (WAVE) Short Message (WSM) using the WAVE Short Message Protocol (WSMP) as defined in the IEEE 1609.3 standard. • The BSM security is based upon compliance to the security certification as per the IEEE 1609.2 standard. It includes digital signatures along with security certificates or certificate digests to validate the sender's BSMs. • The WAVE Provider Service ID (PSID) of the BSMs is defined as per the IEEE 1609.12 standard and is used to distinguish between DSRC messages. • The message data dictionary, content and format of a BSM is as per the SAE J2735 standard. The J2945/1 V2V standard, published in 2016, provides a set of minimum performance requirements (MPR) for V2V communication to support safety applications for crash warning and avoidance [7]. In particular, detailed performance requirements are specified to ensure the accuracy of GNSS position, speed, heading, acceleration, and yaw rate among other factors with respect to ground truth. In a high traffic environment, where there is a high number of vehicles (transmitters), the channel suffers congestion due to rising interference and channel contention [8]. When it comes to channel capacity, [9] presented some fundamental limits especially as a wireless

network scales. The conventional approach to handle interference in the IEEE 802.11p standard is to use Carrier-Sense Multiple Access with Collision Avoidance (CSMA/CA) as the medium access protocol [10]. In CSMA/CA, when a node (or vehicle) has a packet to transmit it first listens to the channel. If the channel is deemed idle or unoccupied, it transmit the packet. Otherwise, the node waits for a random back-off time before transmitting the packet. While this mechanism reduces the chances of packet collisions, it does not avoid it entirely. In large and dense V2V networks, the performance of safety applications may therefore unnecessarily suffer if all vehicles send their BSMs at the same high transmission rate and transmit power. The consequent high packet losses affect V2V situational awareness and make it difficult to predict a vehicle's movement or recognize an imminent crash in a timely manner. Hence, mitigating the channel congestion has been widely studied to address the challenge of scalability and to make the safety applications robust. The authors in [11] have shown that communication and safety performance degrades significantly in a congested environment without a congestion control mechanism. For example, the authors have reported about 70% Packet Error Ratio (PER) with 360 transmitting nodes at a fixed 10 Hz transmission rate and 20 dBm transmit power. In [12], a congestion control algorithm is proposed that adapts the message rate of a vehicle according its motion dynamics so that neighboring vehicles can accurately track it. Additionally, the transmit power is adapted to maintain the channel load at a target level. In [13], a distributed transmit power control method is proposed, which reduces the power of safety message transmissions during congestion in order to control the load placed on the DSRC channel. In [14], a message rate control based approach is proposed to adapt the BSM transmission rate (frequency) based on a binary comparison between measured channel load and a target threshold. Binary message rate control is also the subject of [11], in which the authors propose using an Additive Increase Multiplicative Decrease (AIMD) message rate update mechanism for DSRC vehicular safety communication. They present results from prototype radio tests and computer simulations that illustrate effective message rate control for hundreds of emulated or simulated vehicles. The authors in [15] present simulation of two popular rate algorithms (ONOE and AARF) and compare the performance with different metrics. In [16], the authors propose an algorithm to minimize the average system information age in a

congested environment. Through the simulations, they also show that simple contention window size adaptations (i.e. increasing or decreasing the window size) are unsuitable for reducing the information age. The authors in [13], propose a distributed transmit power control method which helps reduce BSM load and thus reserves bandwidth for emergency messages with higher priorities. All these factors and considerations have been merged in the SAE J2945/1 standard which provides a congestion control (CC) protocol that adapts the transmit power and rate control of V2V BSM transmissions in order to achieve satisfactory safety performance. The CC protocol executes distributedly on each DSRC-equipped On-board Equipment (OBE) installed in a vehicle and adapts its radiated (transmit) power and the Inter-Transmit Time (ITT) based on the channel congestion levels the OBE experiences locally. The underlying algorithm is designed to be opportunistic to ensure channel utilization remains below the saturation level while V2V safety applications can have a good performance

LITERATURE REVIEW

K. A. Hafeez, L. Zhao, B. Ma, and J. W. Mark, "Performance analysis and enhancement of the dsrc for vanet's safety applications," IEEE Transactions on Vehicular Technology, vol. 62, no. 7, pp. 3069–3083, 2013 An analytical model for the reliability of a dedicated short-range communication (DSRC) control channel (CCH) to handle safety applications in vehicular ad hoc networks (VANETs) is proposed. Specifically, the model enables the determination of the probability of receiving status and safety messages from all vehicles within a transmitter's range and vehicles up to a certain distance, respectively. The proposed model is built based on a new mobility model that takes into account the vehicle's follow-on safety rule to derive accurately the relationship between the average vehicle speed and density. Moreover, the model takes into consideration 1) the impact of mobility on the density of vehicles around the transmitter, 2) the impact of the transmitter's and receiver's speeds on the system reliability, 3) the impact of channel fading by modeling the communication range as a random variable, and 4) the hidden terminal problem and transmission collisions from neighboring vehicles. It is shown that the current specifications of the DSRC may lead to severe performance degradation in dense and high-mobility conditions. Therefore, an adaptive algorithm is introduced to increase system reliability in terms of the probability of

successful reception of the packet and the delay of emergency messages in a harsh vehicular environment. The proposed model and the enhancement algorithm are validated by simulation using realistic vehicular traces. T HE RESEARCH and application development in vehicular ad hoc networks (VANETs) have been driven by dedicated short-range communication (DSRC) technology or IEEE 802.11p [1], which is designed to help drivers travel more safely and reduce the number of fatalities due to road accidents. The IEEE 802.11p medium access control (MAC) uses carrier sense multiple access with collision avoidance and some concepts from the enhanced distributed channel access (EDCA) [2]. In this technology, there are four access classes (ACs) with different arbitration interframe space numbers (AIFSNs) to insure less waiting time for high-priority packets, as listed in Table I. The DSRC is licensed at 5.9 GHz with a 75-MHz spectrum, which is divided into seven 10-MHz channels and a 5-MHz guard band. The control channel (CCH) will be used for safety applications, whereas the other six channels, called service channels (SCHs), will be used for infotainment or commercial applications to make this technology more cost effective. Vehicles will synchronize the switching between the CCH and one or more of the SCHs; hence, safety-related messages would not be missed or lost. The synchronization interval (SI) contains a CCH interval (CCI), followed by a SCH interval [3]. Increasing the CCI will enhance the reliability of safety applications and challenge the coexistence of both safety and nonsafety applications on the DSRC. The VANET is a self-organizing network that works on both intervehicle communication (IVC) and vehicle-toinfrastructure communication. In this paper, IVC is taken into consideration, where vehicles will be equipped with sensors and Global Positioning Systems to collect information about their position, speed, acceleration, and direction to be broadcasted to all vehicles within their range. These status messages should be periodically broadcasted in every CCI. In IEEE 802.11p, vehicles will not send any acknowledgement for the broadcasted packets. Therefore, the transmitter cannot detect the failure of the packet reception; hence, the transmitter will not retransmit it. This is a serious problem in collision warning applications where all vehicles behind the accident have to receive the warning message successfully in a short time to avoid chain collisions. This problem motivates us to propose an analytical model for assessing the DSRC reliability and delay, taking into account the multipath fading channel in VANETs, vehicles' high mobility, hidden terminal

problems, and transmission collisions. More specifically, the probability of successfully receiving the status messages from all vehicles around the tagged vehicle, the probability of receiving the safety (or emergency) messages from all vehicles up to a certain distance behind the accident scene, and the delay for that safety messages to reach their intended recipients will be studied, assuming unsaturated conditions. The proposed model is built based on a new mobility model that takes into account the vehicle's follow-on safety rule to derive accurately the relationship between vehicle's speed and network density. It is shown that the current specifications of the DSRC may lead to severe performance degradation in dense and highmobility conditions. Therefore, a new adaptive and mobilitybased algorithm (AMBA) is introduced to increase the system reliability in terms of the probability of successful reception of packets and the time delay of emergency messages in a harsh vehicular environment The MAC protocol of IEEE 802.11p [1] is based on the distributed coordination function of IEEE 802.11, which has been investigated extensively in the literature, analytically, and by simulations. Simulation-based analysis of the IEEE 802.11p shows that, as the network density increases, the system latency increases, and the packet successful reception rate decreases [5]–[10]. To ensure a successful reception of emergency messages, Torrent-Moreno et al. [7] and Vaneenennaam et al. [8] introduced an algorithm to control the load of periodic status messages. The channel access delay of the DSRC has been analyzed in [9] and compared with a self-organizing timedivision multiple-access scheme, which has been proven more suitable for VANETs' real-time applications. In [10], Wang and Hassan proposed a framework for sharing the DSRC between vehicular safety and nonsafety applications. By assuming uniform distribution of vehicles on the road, their simulations show that nonsafety applications may have to be severely restricted, such that safety applications are not compromised, particularly in high-density networks. Many analytical models have been proposed to study the DSRC or, in general, the IEEE 802.11 MAC protocol. Although DSRC is based on IEEE 802.11 and EDCA, the unicast analytical models for IEEE 802.11 [11] and EDCA [12], [13] cannot be used for broadcast communication mode in IEEE 802.11p because no acknowledgment is communicated. Therefore, the transmitter cannot detect a collision from a successful transmission. In [14], a 1-D Markov chain has been used to calculate the delay and the reception rate in VANETs without

including the delay in each stage due to a busy channel. Eichler [15] analyzed the DSRC based on the average delay for each AC without taking into account the back-off delay. An analytical model that accounts for the mutual influence among nodes in a multichannel environment and the broadcast message frequency has been proposed in [16]. In this model, Campolo et al. assumed the static distribution of vehicles on the road with no hidden terminals. Moreover, they did not take into account how the vehicle speed affects the network density; hence, there is a need to throttle the message transmission frequency to increase the successful reception rate. In [17], an analytical model for the performance of delivering vehicular safety messages is proposed, without taking into account the mobility of vehicles. This model considers only the neighborhood of a single roadside unit operating in a nonsaturation traffic regime. A 2-D Markov chain is used in [18] to model the impact of the differentiated AIFS on a stationary vehicular scenario in an urban intersection. They assume a fixed number of vehicles within the range of the transmitter and have not included vehicle mobility in their model. In [19] and [20], Ma and Chen and Ma and Wu studied the saturation performance of the broadcast scheme in VANETs, taking into account the consecutive freeze situation of the back-off counter. They assume saturation conditions, i.e., stationary distribution without considering the impact of vehicle mobility on the system performance. In [21], an analytical model for delivering safety messages within IVC is derived. They assume a perfect channel access and have not accounted for the hidden terminal problem, collision probability, and vehicle mobility. Hassan et al. [22] studied the performance of IEEE 802.11p based on the delay of status packets by modeling each vehicle as an M/G/1 queue with an infinite buffer, without taking vehicle mobility into consideration. In [23], Fallah et al. analyzed the effect of different sets of data rates and communication ranges on the performance of the DSRC safety applications. They derive the probability of successful reception without taking the busy channel probability in each back-off stage. They introduced a power control algorithm based only on the average channel occupancy to change only the used communication range. As the channel occupancy increases, they decrease the communication range to maintain an acceptable channel capacity. We will compare their algorithm and the one we have proposed in the analysis and simulation sections. The connectivity in VANETs has been studied in [24]–[26] based on the assumption that vehicles have a uniform stationary distribution without

including VANET mobility. By assuming that vehicle positions are known by either simulation or observation, Jim and Recker in [27] presented an analytical model for VANETs. A mobility model has been derived in [28], considering the arrival of vehicles to a service area as a Poisson distribution. Abuelela et al. [29] derived the probability of the end-to-end connectivity between clusters of vehicles distributed uniformly on the road. They introduce a new opportunistic packet-relaying protocol that switches between data muling and local routing with the help of vehicles on the other direction. In contrast to our mobility model, all of these models do not consider how the speed of transmitters and receivers affect the connectivity and the packet reception rates. The mobility model is a crucial part in analyzing and testing VANET applications. Modeling vehicle mobility is quite challenging since the movement of each vehicle is constrained by many factors such as road topology, movements of neighbor vehicles, information on the messaging signs along the road, and driver's reactions to these factors. In [30], a set of movement changes is introduced, such as changing lanes, slowing down, or even changing routes, to allow a micromobility behavior control. In [31], Sommer and Dressler argued that coupling more than one simulator is an important step toward a realistic VANET mobility model. Therefore, we built our simulations by coupling the mobility model (MOVE) [32] with the microtraffic simulator Simulation of Urban MObility (SUMO) [33], to produce realistic vehicle movement traces for the network simulator ns-2 [34]. we propose an analytical model for the analysis of broadcast services in the DSRC protocol, taking into account the high dynamics of vehicles, the hidden terminal problem, collision probability, and nonsaturation conditions. We also derive the delay for emergency messages to reach their intended recipients. The new analysis is based on a new mobility model that takes into account the vehicle's follow-on safety rule to derive accurately the relationship between the vehicles' density and their speeds. The new mobility model considers how the speeds of transmitters and receivers affect the connectivity and the packet reception rates. It also has the capacity to handle the sudden increase in vehicles' density (from jam, accident, or other events) to keep safe distance between vehicles. The packet reception rate is derived, taking into account the interdistance between the transmitter and all potential receivers and their speeds. The proposed model uses a Markov chain approach, which includes the probability of a busy channel in each state, to derive the probability of

transmitting status packets and their delay. An adaptive and mobility-aware algorithm is introduced to enhance the performance of VANETs. Simulation results show that the proposed model is quite accurate, and the proposed algorithm enhances the DSRC performance compared with other algorithms in the literature

Rostami, B. Cheng, G. Bansal, K. Sjoberg, M. Gruteser, and J. B. ¨ Kenney, "Stability challenges and enhancements for vehicular channel congestion control approaches," IEEE Transactions on Intelligent Transportation Systems, vol. 17, no. 10, pp. 2935–2948, 2016. Channel congestion is one of the major challenges for IEEE 802.11p-based vehicular networks. Unless controlled, congestion increases with vehicle density, leading to high packet loss and degraded safety application performance. We study two classes of congestion control algorithms, i.e., reactive state-based and linear adaptive. In this paper, the reactive state-based approach is represented by the decentralized congestion control framework defined in the European Telecommunications Standards Institute. The linear adaptive approach is represented by the LInear MEssage Rate Integrated Control (LIMERIC) algorithm. Both approaches control safety message transmissions as a function of channel load [i.e., channel busy percentage (CBP)]. A reactive state-based approach uses CBP directly, defining an appropriate transmission behavior for each CBP value, e.g., via a table lookup. By contrast, a linear adaptive approach identifies the transmission behavior that drives CBP toward a target channel load. Little is known about the relative performance of these approaches and any existing comparison is limited by incomplete implementations or stability anomalies. To address this, this paper makes three main contributions. First, we study and compare the two aforementioned approaches in terms of channel stability and show that the reactive state-based approach can be subject to major oscillation. Second, we identify the root causes and introduce stable reactive algorithms. Finally, we compare the performance of the stable reactive approach with the linear adaptive approach and the legacy IEEE 802.11p. It is shown that the linear adaptive approach still achieves a higher message throughput for any given vehicle density for the defined performance metrics COOPERATIVE intelligent transport system (C-ITS) technology enables a wide variety of vehicular ad hoc networking applications, including collision avoidance, road hazard awareness, and route guidance. Based on the Medium Access Control (MAC) and

Physical Layer (PHY) protocols specified in the IEEE 802.11p standard [1], C-ITS is moving rapidly towards deployment in Europe and other regions. Twelve members of the Car-2-Car Communications Consortium (C2C-CC) have mutually pledged to begin equipping their vehicles with C-ITS by the end of 2015 [2]. In the US, where the technology is known as Dedicated Short Range Communication (DSRC), the Department of Transportation has published an Advance Notice of Proposed Rulemaking with an intention to require this equipment in new cars within a few years [3]. While most aspects of the communication system have been finalized and standardized (i.e., in IEEE 1609 WG [4], [5]), one remaining aspect in need of further study is channel congestion control [6]. With a typical communication range of hundreds of meters, a C-ITS device may share a 10 MHz channel with hundreds or even a few thousand other devices. The Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA) MAC protocol used in C-ITS is optimized for low-to-moderate channel loads. [7] illustrates that for higher density of vehicles, IEEE 802.11p shows a behavior similar to ALOHA. With increasing channel load due to high density of vehicles, the channel becomes saturated, the probability of overlapping transmissions (i.e., packet collisions) increases considerably, and the aggregate channel throughput falls off after reaching a plateau [8], [9]. While in general a C-ITS channel may support a variety of applications, congestion in the 5.9 GHz spectrum is likely to be associated with a high volume of vehicle safety messages. These are Cooperative Awareness Messages (CAMs) [10] in Europe and Basic Safety Messages (BSMs) [11] in the US. Congestion reduces the rate at which these safety messages are successfully communicated to neighbors, and the resulting reduced awareness harms the C-ITS safety mission. Broadcast channel congestion has previously been investigated in the context of Mobile Ad Hoc Networks (MANET) [12], but the car-2-car communication settings differs. Previous studies on MANETs, such as [13], focus on techniques to control congestion arising due to re-broadcasting in multi-hop protocols. These techniques do not apply when congestion arises due to frequent broadcast in a single-hop communication setting, which we discuss in this paper. In addition, known congestion control techniques such as Internet flow control do not adequately address this issue due to the unique characteristics of the vehicular networking environment. These include broadcast transmissions, one hop communication, and a shared wireless channel. Therefore,

researchers have proposed several algorithms [14]–[16] for the vehicular network environment that are considered in the ETSI standardization process. The effectiveness of these algorithms have largely been evaluated individually and there are few comparative studies available that evaluate the algorithms under common assumptions and scenarios [17], [18]. To the best of our knowledge, however, no prior work has considered a complete implementation of DCC with mandatory CAM generation rate control in the facilities layer or proposed DCC versions that do not suffer from stability issues. Since these protocols are serious contenders for standardization, a thorough understanding of their performance and stability is particularly important With increasing demands for a shared resource, such as a wireless channel, control mechanisms become a requirement to prevent poor service. Perhaps best known in this domain is the extensive work on Internet congestion control algorithms (e.g., [20]–[22]). While there is some overlap between Internet congestion control and vehicular network channel congestion control issues, existing congestion control algorithms are not suitable for delay sensitive, reliable single hop communications over wireless networks and rely on acknowledgment feedback which is unavailable in vehicular network broadcast messaging. Instead, vehicular network congestion control algorithms can exploit richer direct measurements of the congestion level than a TCP agent in an Internet environment. With this precise feedback, it becomes beneficial to use more fine-grained control algorithms, as shown for example in a comparison [23] of a binary adaptive control algorithms (e.g., AIMD algorithm as used in TCP) with more fine-grained linear adaptive control algorithms such as LIMERIC [15]. There are some other efforts to solve the congestion control problem for MANETs by focusing on rate-based flow control and broadcast application's characteristics [24], [25], but still the main assumption of these works is the wireless networks with re-broadcast requirement, mostly for the routing phase. The current vision for vehicular safety messages, however, assumes an environment with only single-hop broadcast communication [26]. The safety applications considered here do not require messages to be re-broadcast or flooded through the network. Existing MAC standards, such as IEEE 802.11p, cannot maintain optimal throughput while the number of wireless devices increases, unless they rely on a higher layer control mechanism. [27] shows how adaptive congestion control can outperform legacy IEEE 802.11p and motivates the use of a

channel congestion control mechanism on top of the legacy IEEE 802.11p MAC layer. To date, several proposals have been presented to conquer the wireless channel congestion problem. In [28], the authors use both power and rate control to reach asymptotically optimal performance. [29] also proposes another adaptive scheme to solve the channel congestion issue. The authors use both rate and power control to overcome this issue, but manipulate the transmission power only once the message rate is already reduced to the minimum defined in the protocol. [30] introduces a new adaptive approach that controls channel congestion while it tries to meet minimum application requirements for multihop information dissemination. This paper's focus, however, is on transmission rate control (TRC) approaches, since some previous works, such as [31], concluded that message rate is the most effective control parameter in terms of reachability. Hence, we focus on TRC technique, which we will detail in the next section. Few comparative evaluations of congestion control algorithms exist. [32] compares the Linear Memoryless Range Control (LMRC) and the Gradient Descent Range Control (GDRC) congestion control algorithms. The authors observed that when local channel load measurement is used, LMRC suffers instability. They concluded that a global CBP measurement can improve stability of adaptive congestion control. The focus, however, is on a different approach, where the control parameter is the transmission power with a fixed message rate. Another work, [33] compares European DCC with Selforganizing Time Division Multiple Access (SoTDMA) in terms of awareness and emergency coverage range, focusing on the effect of simultaneous transmissions. The bottom line of the work is that DCC provides slightly better performance, but the work does not provide the resource management analysis to explain why the results are such as they are. These studies do not compare algorithms that are serious candidates for standardization. Several studies have reported instability for the DCC algorithm. [34] conducts a simulation experiment to show that fewer number of control parameters could lead to a better performance of DCC. It has chosen PHY data rate as the control parameter of a simpler DCC algorithm. While the results show that DCC with just PHY data rate as the control parameter works better than the DCC, the authors did not explain why playing with one control parameter leads to such a better performance or why the resulting loss of range due to PHY rate increases is tolerable. [18] identifies an oscillation problem in the DCC approach. The authors of this work conclude that this

oscillatory behavior is due to frequent state changes in DCC's Finite State Machine (FSM), however, the study does not appear to implement the recently approved CAM generation rules required by ETSI in [10]. Similar results have also been presented by [31], albeit also without the CAM generation rules. Additionally, the authors also compare the impact of different DCC control parameters in terms of reachability and stability. They emphasize the transmission rate control as the most important control parameter in terms of reachability. [17] compares the awareness level of WAVE with European DCC approach. One of the observations is again channel load oscillation due to frequent state changes. This study also does not implement the CAM algorithm

EXISTING:

In existing system only CAN based communication using in automobiles for vehicle internal communication ,but there is no separate system to provide security to avoid accidents like rear end collision.

PROPOSED:

In proposed system we implemented sensors and RF based data transmission to the nearer vehicles while driving time. So that this system can detect the front vehicle sudden obstacle conditions using ultrasonic sensor and send signal to the can controller using microcontroller unit. Then microcontroller control the front vehicle ignition and following vehicle ignition automatically through RF wireless communication.

BLOCK DIAGRAM:

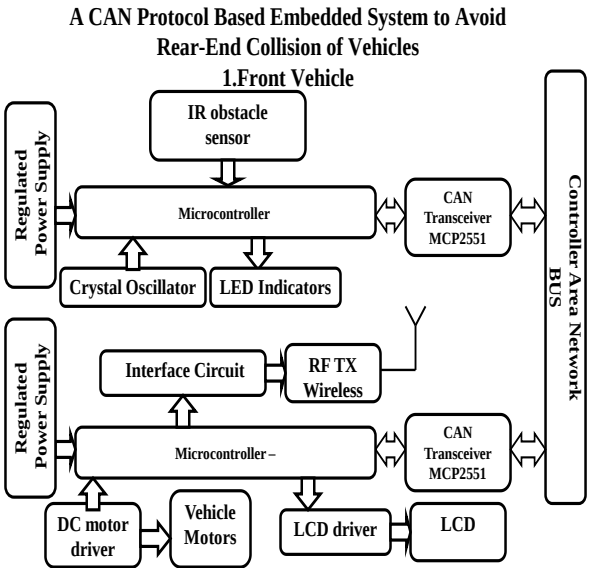

FIG 1: Block diagram of CAN based real time implementation in automobile

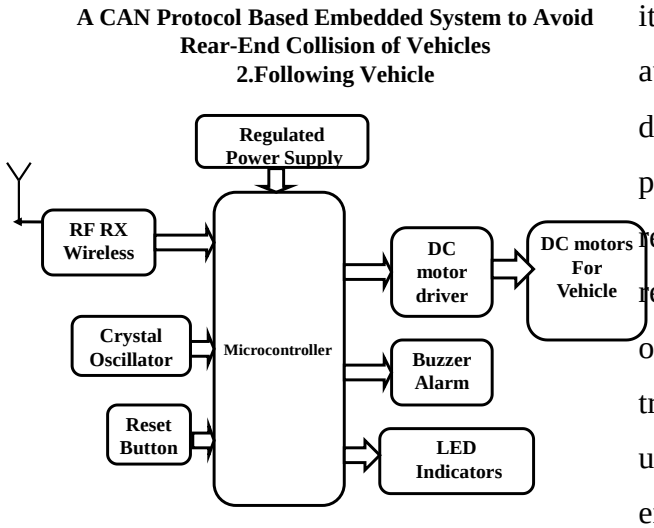

FIG 2: Block diagram of CAN based real time implementation in automobile

A vehicle can become an abnormal vehicle (AV) due to its own mechanical failure or due to unexpected road hazards. A vehicle can also become an AV by reacting to other AVs nearby. Once an AV resumes it regular movement, the vehicle is said no longer an AV and it returns back to the normal state. In general, the abnormal behavior of a vehicle can be detected using various sensors within the vehicle. Exactly how normal and abnormal status of vehicles are detected is beyond the scope of this paper. We assume that a vehicle controller can automatically monitor the vehicle dynamics and activate the collision warning communication module when it enters an abnormal state. A vehicle that receives the EWMs can verify the relevancy to the emergency event based on its relative motion to the AV, and give audio or visual warnings/advice to the driver. Each message used in VCWC protocol is intended for a group of receivers, and the group of intended receivers changes fast due to high mobility of vehicles, which necessitate the message transmissions using broadcast instead of unicast. To ensure reliable delivery of emergency warnings over unreliable wireless channel, EWMs need to be repeatedly transmitted. Conventionally, to achieve network stability, congestion control has been used to adjust the transmission rate based on the channel feedback. If a packet successful goes through, transmission rate is increased; while the rate is decreased if a packet gets lost. Unlike conventional congestion control, here, there is no channel feedback available for the rate adjustment of EWMs due to the broadcast nature of EWM transmissions. Instead, we identify more application-specific properties to help EWM congestion control, which consists of the EWM transmission rate adjustment algorithm and the state transition mechanism for AVs. While congestion control policies are the focus of this paper, the proposed VCWC protocol also includes emergency warning dissemination methodsthat make use of both natural response of human drivers and EWM message forwarding, and a message

differentiation mechanism that enables cooperative vehicular collision warning application to share a common channel with other non-safety related applications. Without loss of continuity, the latter two components are largely skipped due to space limitation, however, details for them can be found in

CONCLUSIONS We have presented field test results on DSRC-based V2V system in a congestion environment, which complied with the SAE J2945/1 standard for V2V minimum performance requirements. Our tests provide vehicle-level validation for the congestion control protocol and also demonstrate that the GNSS position of a vehicle can be tracked to within 1.5m of ground truth position even with ITTs of 600 ms. Our results demonstrate the readiness of DSRC-based V2V systems for active safety and crash avoidance

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DRIVER DROWSINESS MONITORING SYSTEM USING MACHINE LEARNING

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ABSTRACT—Drowsy driving is one of the major causes of road accidents and death. Hence, detection of driver's fatigue and its indication is an active research area. Most of the conventional methods are either vehicle based, or behavioural based or physiological based. Few methods are intrusive and distract the driver, some require expensive sensors and data handling. Therefore, in this study, a low cost, real time driver's drowsiness detection system is developed with acceptable accuracy. In the developed system, a webcam records the video and driver's face is detected in each frame employing image processing techniques. Facial landmarks on the detected face are pointed and subsequently the eye aspect ratio, mouth opening ratio and nose length ratio are computed and depending on their values, drowsiness is detected based on developed adaptive thresholding. Machine learning algorithms have been implemented as well in an offline manner. A sensitivity of 95.58% and specificity of 100% has been achieved in Support Vector Machine based classification.

Keywords: Drowsiness detection, visual behaviour, eye aspect ratio, mouth opening ratio, nose length ratio.

I. INTRODUCTION Drowsy driving is one of the major causes of deaths occurring in road accidents. The truck drivers who drive for continuous long hours (especially at night), bus drivers of long distance route or overnight buses are more susceptible to this problem. Driver drowsiness is an overcast nightmare to passengers in every country. Every year, a large number of injuries and deaths occur due to fatigue related road accidents. Hence, detection of driver's fatigue and its indication is an active area of research due to its immense practical applicability. The basic drowsiness detection system has three blocks/modules; acquisition system, processing system and warning system. Here, the video of the driver's frontal face is captured in acquisition system and transferred to the processing block where it is processed

online to detect drowsiness. If drowsiness is detected, a warning or alarm is send to the driver from the warning system. Generally, the methods to detect drowsy drivers are classified in three types; vehicle based, behavioural based and physiological based. In vehicle based method, a number of metrics like steering wheel movement, accelerator or brake pattern, vehicle speed, lateral acceleration, deviations from lane position etc. are monitored continuously. Detection of any abnormal change in these values is considered as driverdrowsiness. This is a nonintrusive measurement as the sensors are not attached on the driver. In behavioural based method [17], the visual behavior of the driver i.e., eye blinking, eye closing, yawn, head bending etc. are analyzed to detect drowsiness. This is also nonintrusive measurement as simple camera is used to detect these features. In physiological based method [8,9], the physiological signals like Electrocardiogram (ECG), Electooculogram (EOG), Electroencephalogram (EEG), heartbeat, pulse rate etc. are monitored and from these metrics, drowsiness or fatigue level is detected. This is intrusive measurement as the sensors are attached on the driver which will distract the driver. Depending on the sensors used in the system, system cost as well as size will increase. However, inclusion of more parameters/features will increase the accuracy of the system to a certain extent. These factors motivate us to develop a low-cost, real time driver's drowsiness detection system with acceptable accuracy. Hence, we have proposed a webcam based system to detect driver's fatigue from the face image only using image processing and machine learning techniques to make the system low-cost as well as portable.

THE PROPOSED SYSTEM AND COMPUTATION OF PARAMETERS A block diagram of the proposed driver drowsiness monitoring system has been depicted in Fig 1. At first, the video is recorded using a webcam. The camera will be positioned in front of the driver to capture the front face image. From the video, the frames are extracted to obtain 2- D images. Face is detected in the frames using histogram of oriented gradients (HOG) and linear support vector machine (SVM) for object detection [10]. After detecting the face, facial landmarks [11] like positions of eye, nose, and mouth are marked on the images. From the facial landmarks, eye aspect ratio, mouth opening ratio and position of the head are quantified and using these features and machine learning

approach, a decision is obtained about the drowsiness of the driver. If drowsiness is detected, an alarm will be sent to the driver to alert him/her. The details of each block are discussed below.

EXISTING SYSTEM :-

- Generally, the methods to detect drowsy drivers are classified in three types;
    - Vehicle based,
    - Behavioural based
    - Physiological based
- In vehicle based method, a number of metrics like steering wheel movement, accelerator or brake pattern, vehicle speed, lateral acceleration, deviations from lane position etc. are monitored continuously. Detection of any abnormal change in these values is considered as driver drowsiness. This is a nonintrusive measurement as the sensors are not attached on the driver
- In behavioural based method [1- 7], the visual behavior of the driver i.e., eye blinking, eye closing, yawn, head bending etc. are analyzed to detect drowsiness. This is also nonintrusive measurement as simple camera is used to detect these features.
- In physiological based method [8,9], the physiological signals like Electrocardiogram (ECG), Electooculogram (EOG), Electroencephalogram (EEG), heartbeat, pulse rate etc. are monitored and from these metrics, drowsiness or fatigue level is detected. This is intrusive measurement as the sensors are attached on the driver which will distract the driver

DIS-ADVANTAGES :-

•Depending on the sensors used in the system, system cost as well as size will increase. However, inclusion of more parameters/features will increase the accuracy of the system to a certain extent

PROPOSED SYSTEM: -

we have proposed a webcam based system to detect driver's fatigue from the face image only using image processing and machine learning techniques to make the system low-cost as well as portable. A block diagram of the proposed driver drowsiness monitoring system has been depicted in Fig

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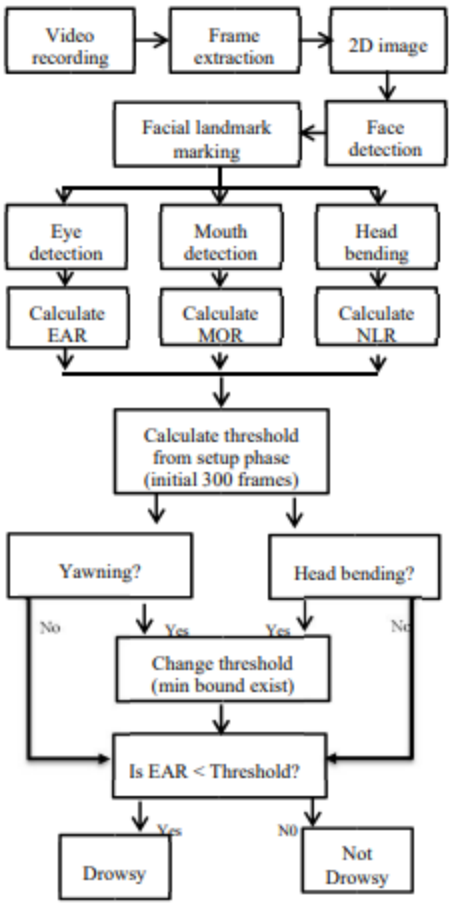

Fig1 : The block diagram of the proposed drowsiness detection system

A. Data Acquisition The video is recorded using webcam (Sony CMUBR300) and the frames are extracted and processed in a laptop. After extracting the frames, image processing techniques are applied on these 2D images. Presently, synthetic driver data has been generated. The volunteers are asked to look at the webcam with intermittent eye blinking, eye closing, yawning and head bending. The video is captured for 30 minutes duration.

B. Face Detection After extracting the frames, first the human faces are detected. Numerous online face detection algorithms are there. In this study, histogram of oriented gradients (HOG) and linear SVM method [10] is used. In this method, positive samples of 118728 fixed window size are taken from the images and HOG descriptors are computed on them. Subsequently, negative samples (samples that do not contain the required object to be detected i.e., human face here) of same size are taken and HOG descriptors are calculated. Usually the number of negative samples is very greater than number of positive samples. After obtaining the features for both the classes, a linear SVM is trained for the classification task. To improve the accuracy of SVM, hard negative mining is used. In this method, after training, the classifier is tested on the labeled data and the false positive sample feature values are used again for training purpose. For the test image, the fixed size window is translated over the image and the classifier computes the output for each window location. Finally, the maximum value output is considered as the detected face and a bounding box is drawn around the face. This non-maximum suppression step removes the redundant and overlapping bounding boxes.

C. Facial Landmark marking After detecting the face, the next task is to find the locations of different facial features like the corners of the eyes and mouth, the tip of the nose and so on. Prior to that, the face images should be normalized in order to reduce the effect of distance from the camera, non-uniform illumination and varying image resolution. Therefore, the face image is resized to a width of 500 pixels and converted to grayscale image. After image normalization, ensemble of regression trees [11] is used to estimate the landmark positions on face from a sparse subset of pixel intensities. In this method, the sum of square error loss is optimized using gradient boosting learning. Different priors are used to find different structures. Using this method, the boundary points of eyes, mouth and the central line of the nose are marked and the number of points for eye, mouth and nose are given in Table I. The facial landmarks are shown in Fig 2. The red points are the detected landmarks for further processing.

Table I: Facial landmark points

Parts	Landmark Points
Mouth	[13-24]
Right eye	[1-6]
Left eye	[7-12]
Nose	[25-28]

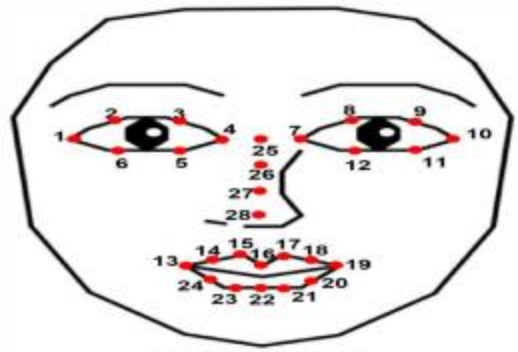

Fig. 2 The facial landmark points

CONCLUSION In this paper, a low cost, real time driver drowsiness monitoring system has been proposed based on visual behavior and machine learning. Here, visual behavior features like eye aspect ratio, mouth opening ratio and nose length ratio are computed from the streaming video, captured by a webcam. An adaptive thresholding technique has been developed to detect driver drowsiness in real time. The developed system works accurately with the generated synthetic data. Subsequently, the feature values are stored and machine learning algorithms have been used for classification. Bayesian classifier, FLDA and SVM have been explored here. It has been observed that FLDA and SVM outperform Bayesian classifier. The sensitivity of FLDA and SVM is 0.896 and 0.956 respectively whereas the specificity is 1 for both. As FLDA and SVM give better accuracy, work will be carried out to implement them in the developed system to do the classification (i.e., drowsiness detection) online. Also, the system will be implemented in hardware to make it portable for car system and pilot study on drivers will be carried out to validate the developed system.

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LOW COST IOT SENSOR SYSTEM INDUSTRIAL AUTOMATION USING SYSTEM ON CHIP (SOC)

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ABSTRACT: Internet of Things (IoT) is rapidly increasing technology. IoT is the network of physical objects or things embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data. In this paper, we are developing a system which will automatically monitor the industrial applications and generate Alerts/Alarms or take intelligent decisions using concept of IoT. IoT has given us a promising way to build powerful industrial systems and applications by using wireless devices, Android, and sensors. A main contribution of this review paper is that it summarizes uses of IoT in industries with Artificial Intelligence to monitor and control the Industry. Index Terms— Artificial Intelligence, IoT, Sensors, embedded electronics.

I. INTRODUCTION

In recent years a wide range of industrial IoT applications have been developed and deployed. Evolution of this starts from RFID technology, which allows microchips to transmit the identification information to a reader through wireless communication. By using RFID readers, people can identify, track, and monitor any objects attached with RFID tags automatically. Another technology is the wireless sensor networks (WSNs), which mainly use interconnected intelligent sensors to sense and monitoring. Its applications include environmental monitoring, industrial monitoring, traffic monitoring. Both RFID and WSN are used to develop IoT[1]. Then upcoming technology is IoT with Artificial Intelligent. In previous year, Industry was monitored manually, but this paper introduces Artificial Intelligent to monitor as well as control the Industry autonomously without human intervention.

II. GOALS AND OBJECTIVES To develop a system which will automatically monitor the industrial applications and generate Alerts/Alarms or take intelligent Decision using concept of IoT. And also design the system to Take Intelligent Decision and Control Devices.

III. EXISTING SYSTEM No ways to detect un-even condition in industry. Manual intervention required for monitoring. CCTV used which only monitor but no Alert generation. Alert and their appropriate actions not present manually. Time consuming approach to detect and generate Alert Manually

IV. NEED OF SYSTEM Industry alert are based on manual intervention. Notification for any circumstances in Industry not provided. Appropriate action for this condition taking.

V. OVERVIEW OF SYSTEM In this modern era of automation and advanced computing using IoT with Artificial Intelligence offer promising solutions towards the automation of Industry. In order to understand the development of IoT in industries, this paper reviews the current research of IoT, key enabling technologies, major IoT applications in industries, and identifies research trends and challenges. The Internet of Things allows objects to be sensed and controlled remotely across existing network infrastructure. This is implemented as in figure1.

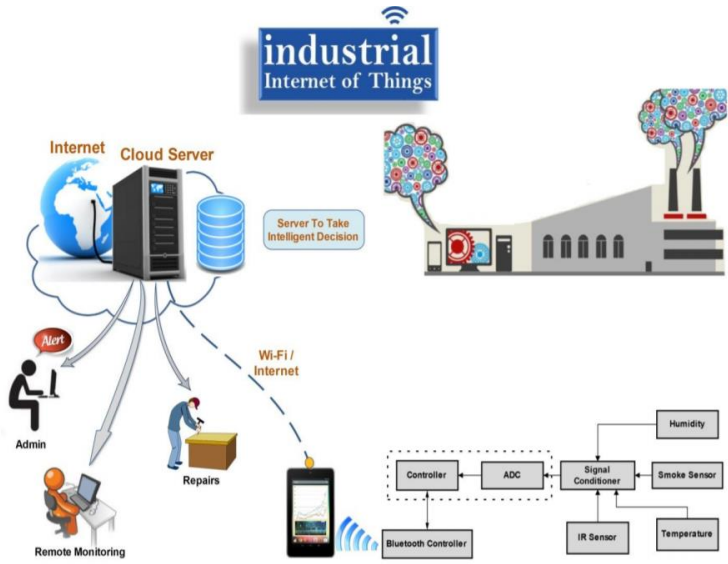

Fig: Block Diagram Of The System

VI.LITERATURE REVIEW:

In "E. A. Lee, "Computing Foundations and Practice for Cyber- Physical Systems:A Preliminary Report," Tech. Rep., 2007. [Online]. Available: http://www.eecs.berkeley.edu/Pubs/TechRpts/2007/EECS-2007-72.pdf"

Cyber-Physical Systems (CPS) are integrations of computation and physical processes. Embedded computers and networks monitor and control the physical processes, usually with feedback loops where physical processes affect computations and vice versa. The economic and societal potential of such systems is vastly greater than what has been realized, and major investments are being made worldwide to develop the technology. There are considerable

challenges, particularly because the physical components of such systems introduce safety and reliability requirements qualitatively different from those in general-purpose computing. This report examines the potential technical obstacles impeding progress, and in particular raises the question of whether today's computing and networking technologies provide an adequate foundation for CPS. It concludes that it will not be sufficient to improve design processes, raise the level of abstraction, or verify (formally or otherwise) designs that are built on today's abstractions. To realize the full potential of CPS, we will have to rebuild computing and networking abstractions. These abstractions will have to embrace physical dynamics and computation in a unified way. Cyber-Physical Systems (CPS) are integrations of computation with physical processes. Embedded computers and networks monitor and control the physical processes, usually with feedback loops where physical processes affect computations and vice versa. In the physical world, the passage of time is inexorable and concurrency is intrinsic. Neither of these properties is present in today's computing and networking abstractions. This report examines this mismatch of abstractions. Applications of CPS arguably have the potential to dwarf the 20-th century IT revolution. They include high confidence medical devices and systems, assisted living, traffic control and safety, advanced automotive systems, process control, energy conservation, environmental control, avionics, instrumentation, critical infrastructure control (electric power, water resources, and communications systems for example), distributed robotics (telepresence, telemedicine), defense systems, manufacturing, and smart structures. It is easy to envision new capabilities, such as distributed micro power generation coupled into the power grid, where timing precision and security issues loom large. Transportation systems could benefit considerably from better embedded intelligence in automobiles, which could improve safety and efficiency. Networked autonomous vehicles could dramatically enhance the effectiveness of our military and could offer substantially more effective disaster recovery techniques. Networked building control systems (such as HVAC and lighting) could significantly improve energy efficiency and demand variability, reducing our dependence on fossil fuels and our greenhouse gas emissions. In communications, cognitive radio could benefit enormously from distributed consensus about available bandwidth and

from distributed control technologies. Financial networks could be dramatically changed by precision timing. Large scale services systems leveraging RFID and other technologies for tracking of goods and services could acquire the nature of distributed real-time control systems. Distributed real-time games that integrate sensors and actuators could change the (relatively passive) nature of on-line social interactions. Tight integration of physical devices and distributed computing could make "programmable matter" a reality. The positive economic impact of any one of these applications areas would be enormous. Today's computing and networking technologies, however, may have properties that unnecessarily impede progress towards these applications. For example, the lack of temporal semantics and adequate concurrency models in computing, and today's "best effort" networking technologies make predictable and reliable real-time performance difficult, at best. Many of these applications may not be achievable without substantial changes in the core abstractions.

If the US fails to lead the development of these applications, we would almost certainly find our economic and military leadership position compromised. To prevent that from happening, this report will identify the potential disruptive technologies and recommend research investments to ensure that if such technologies are successfully developed, that they are developed in the US.

IN "R. R. RAJKUMAR, I. LEE, L. SHA, AND J. STANKOVIC, "CYBER-PHYSICAL SYSTEMS," IN PROCEEDINGS OF THE 47TH DESIGN AUTOMATION CONFERENCE - DAC'10. NEW YORK, USA: ACM PRESS, 2010, P. 731. [ONLINE].AVAILABLE:HTTP://PORTAL.ACM.ORG/CITATION.CFM?DOID=1837274.1837461"

Cyber-physical systems (CPS) are physical and engineered systems whose operations are monitored, coordinated, controlled and integrated by a computing and communication core. Just as the internet transformed how humans interact with one another, cyber-physical systems will transform how we interact with the physical world around us. Many grand challenges await in the economically vital domains of transportation, health-care, manufacturing, agriculture, energy, defense, aerospace and buildings. The design, construction and verification of cyber-physical systems pose a multitude of technical challenges that must be

addressed by a cross-disciplinary community of researchers and educators.

IN "THE INDUSTRIAL INTERNET OF THINGS (IIOT): AN ANALYSIS FRAMEWORK" Historically, Industrial Automation and Control Systems (IACS) were largely isolated from conventional digital networks such as enterprise ICT environments. Where connectivity was required, a zoned architecture was adopted, with firewalls and/or demilitarized zones used to protect the core control system components. The adoption and deployment of 'Internet of Things' (IoT) technologies is leading to architectural changes to IACS, including greater connectivity to industrial systems. This paper reviews what is meant by Industrial IoT (IIoT) and relationships to concepts such as cyber-physical systems and Industry 4.0. The paper develops a definition of IIoT and analyses related partial IoT taxonomies. It develops an analysis framework for IIoT that can be used to enumerate and characterise IIoT devices when studying system architectures and analysing security threats and vulnerabilities. The concept of Industrial Automation and Control Systems (IACS) is well established. These systems, often referred to as Operational Technology (OT), are employed in diverse industries including manufacturing, transportation and utilities, and are sometimes referred to as cyber-physical systems (CPS). Since the term Internet of Things (IoT) [1] was first used in 1999, it has been applied to connected devices in consumer, domestic, business and industrial settings [2]. Although there is a significant amount of literature attempting to define IoT, its uses, and its typical components, it is rarely made obvious how any of this applies in the industrial setting. Because current definitions of IoT invariably imply a similar approach to the high-level architecture of a system, the ubiquitous use of the term IoT to refer to the use of digital technologies in industry is unhelpful as it hinders the analysis of alternative system architectures, including the location and nature of the data or information processing, and associated performance and security issues. The aims of this paper are to improve on existing definitions of Industrial IoT (IIoT) and to propose a framework for IIoT components as a basis for analysing the use and deployment of IoT technologies in industrial settings. In undertaking this research our aim was to establish a framework that allows us to analyse the nature of IIoT devices and their uses, which is to be used as part of a vulnerability and threat analysis process for these devices. By being able to

characterise the devices in a systematic manner, we anticipate being able to analyse cross-cutting threats and vulnerabilities and identify patterns that may be obscured when focusing on the technology employed or sector specific issues. Whilst researching IIoT we have reviewed a wide range of academic literature and found that when combining the search terms: ("Industrial Machines" OR "Industrial Systems") AND "Internet" OR ("Industrial Internet") AND "Machines"

The following terms were amongst those most regularly found:
Cyber Physical Systems (CPS), Industrial Control Systems (ICS), Supervisory Control and Data Acquisition (SCADA), and Industrial Internet. Although not an exhaustive list, it does represent the most commonly used terms in both academic and relevant non-academic literature, for white\ papers and corporate blogs. In the rest of this section we define Industry 4.0 and review the above terms before moving on to develop our definition of IIoT and the taxonomy.

INDUSTRY 4.0

The first three industrial revolutions are characterised as being driven by mechanical production relying on water and steam power, use of mass labour and electrical energy, and the use of electronic, automated production respectively [3]. Whilst the supposed fourth industrial revolution ('Industry 4.0') was first proposed in 2011 in the context of the goal of developing the German economy [4]. This revolution is characterised by its reliance on the use of CPS capable of communication with one another and of making autonomous, de-centralised decisions, with the aim of increasing industrial efficiency, productivity, safety, and transparency. There is a considerable overlap between the concept of Industry 4.0 developed in Germany and the Industrial Internet concept (see 2.6), which originated in the United States. The definition of the latter now encompasses change for both business and individuals: "…the industrial internet is an internet of things, machines, computers and people enabling intelligent industrial operations using advanced data analytics for transformational business outcomes, and it is redefining the landscape for business and individuals alike" [5]. A definition of 'Industrie 4.0′ a term which, in its English cognate, the authors treat as synonymous with IIoT, is: "…we define Industrie 4.0 as

follows: Industrie 4.0 is a collective term for technologies and concepts of value chain organisation. Within the modular structured Smart Factories of Industrie 4.0, CPS monitor physical processes, create a virtual copy of the physical world and make decentralized decisions. Over the IoT, CPS communicate and cooperate with each other and humans in real time. Via the IoS [Internet of Services], both internal and cross- organizational services are offered and utilised by participants of the value chain." [6]

CYBER-PHYSICAL SYSTEMS (CPS)

Whilst there are a number of definitions of CPS [7], [8], [9], [10], [11], this paper uses: "A system comprising a set of interacting physical and digital components, which may be centralised or distributed, that provides a combination of sensing, control, computation and networking functions, to influence outcomes in the real world through physical processes." [12] What sets CPS apart from more conventional information and communications systems (IT or ICT) is the real-time character of their interactions with the physical world. Whilst both CPS and ICT systems process data and/or information, the focus of CPS is on the control of physical processes. CPS use sensors to receive information about, including measurements of, physical parameters, and actuators to engage in control over physical processes. CPS often involve a large degree of autonomy. For example, CPS often have the capacity to determine whether to change the state of an actuator or to draw a human operator's attention to some feature of the environment being sensed.

INDUSTRIAL AUTOMATION & CONTROL SYSTEMS (IACS)

IACS or ICS is a collective term typically used to describe different types of control systems and associated instrumentation, which include the devices, systems, networks, and controls used to operate and/or automate industrial processes. Descriptions of ICS from authoritative American and European organisations are respectively: "Initially, ICS had little resemblance to traditional information technology (IT) systems in that ICS were isolated systems running proprietary control protocols using specialized hardware and software. Many ICS components were in physically secured areas and the components were not connected to IT networks or systems. Widely available, low-cost Internet Protocol (IP) devices are now replacing proprietary solutions" [13]; and "Today ICS products are mostly based on standard embedded systems platforms, applied in various devices, such as routers or cable

modems, and they often use commercial off-the shelf software" and "command and control networks and systems designed to support industrial processes. The largest subgroup of ICS is SCADA" [14].

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)

SCADA has been described as: A system that allows an operator, in a location central to a widely distributed process, such as an oil or gas field, pipeline system, or hydroelectric generating complex, to make set point changes on distant process controllers, to open or close valves or switches, to monitor alarms, and to gather measurement information [15]; Similar to a Distributed Control System with the exception of sub-control systems being geographically dispersed over large areas and accessed using Remote Terminal Servers [16]. Where a Distributed Control System (DCS) is a supervisory control system typically controls and monitors set points to sub-controllers distributed geographically throughout a factory [17]; and SCADA applications are made up of two elements: the process/system/machinery you want to monitor and control, which can take the form of a power plant, a water system, a network or a system of traffic lights; and a network of intelligent devices that interface with the first system through sensors and control outputs. This network, which is the platform system, provides the capability to measure and control specific elements of the first system [18]. The nature of SCADA has led to conflicting views as to whether it forms part of the IIoT ecosystem. For example, discussion of SCADA system forensic analysis within IIoT [19] contrasts with a view that SCADA is simply the predecessor to IIoT especially as SCADA systems have evolved to connect to the internet but do not have the analytics and level of connectivity that is found in IIoT [20].

INDUSTRIAL INTERNET

The concept of an Industrial Internet was first articulated by General Electric (GE) [21], and described as: "The definition of the Industrial Internet includes two key components: The connection of industrial machine sensors and actuators to local processing and to the Internet; The onward connection to other important industrial networks that can independently generate value. The main difference between the consumer/social Internets and the Industrial Internet is in how and how much value is created. For consumer/social Internets, the majority of value is created from advertisements" [22]. This description clearly separates the Internet and the Industrial Internet, although in both cases the function of the Internet is to

provide the wide area networking. More recently the Industrial Internet has been defined as:

"… a source of both operational efficiency and innovation that is the outcome of a compelling recipe of technology developments [sic]. The resulting sum of those parts gives you the Industrial Internet—the tight integration of the physical and digital worlds. The Industrial Internet enables companies to use sensors, software, machine-to-machine learning and other technologies to gather and analyse data from physical objects or other large data streams—and then use those analyses to manage operations and in some cases to offer new, value-added services" [23].

From this definition, it is apparent that the authors consider a key component of the Industrial Internet to be the ability to analyse data, which is corroborated by a statement later in their report, in which it is stated that "…Big Data analytics is the foundation of the Industrial Internet…". This desire to collect and analyses data is a feature in common with Industry 4.0.

IN "INDUSTRIAL AUTOMATION USING IOT": Internet of things(ioT) is rapidly incresasing technology.IOT is the network of physical objects or things embeded with electronic software, sensors, and network connectivity which enables these objects to collect and exchange data. In this paper, we are developing a system which will automatically monitor the industrial applications and generate Alerts/Alarms or take intelligent decisions using concept of IoT. Safety from leaking of raw gas and fire are the most important requirements of home and industries security system for people. A traditional security system gives the signals in terms of alarm. Automation is one of the incerasing need with in industries as well as for domsatic applications.Automatio reduces the human effords by replacing the human effords by system which are self operated, The Intenet is one way of he growing platfrom for automation,through which new advancedment are made through which on easily monitor as well control the system using internet.As we are making use of Internet the system becomes secured and live data monitoring is also possible using IoT sysytem. Within industries the various hazardous gas are being processed, hence to provide security to those employ working within those industreis, it becomes important issue to work on their security,If leakage of gas takes place then these system alerts by turning ON alram which notifies the employers. This system also helps us take some crucial decision from any point of

the world within internet network.Wifi shield is being used to act as service point between network and connecting network Industrial Automation Using Internet of Things (IOT) In this paper, they are developing a system which will automatically monitor the industrial applications and generate Alerts/Alarms or take intelligent decisions using concept of IoT.[1]. RASPBERRY PI AND IOT BASED INDUSTRIAL AUTOMATION . IOT is achieved by using local networking standards and remotely controlling and monitoring industrial device parameters by using Raspberry Pi and Embedded web server Technology. Raspberry Pi module consists of ARM11 processor and Real Time Operating system whereas embedded web server technology is the combination of embedded device and Internet technology .Using embedded web server along with raspberry pi it is possible to monitor and control industrial devices remotely by using local internet browser.[2] A REVIEW ON INDUSTRIAL AUTOMATION USING IOT.They have developed new technologies that have allowed us to move from the First generation of the Internet into the current transition into the Fourth generation. This generation has been propelled by the concept of the Internet of Things (IoT). [3] IOT BASED AUTOMATED TEMPERATURE AND HUMIDITY MONITORING AND CONTROL In this paper, a raspberry pi running with Linux OS coded with C++ program that retrieves the temperature as well as humidity readings and these values are sensed and sent to the internet. [4] I NDUSTRIAL TEMPERATURE MONITORING AND CONTROL SYSTEM THROUGH ETHERNET LAN This paper presents a PC based temperature monitoring and control system using virtual instrumentation, LabVIEW. Data acquisition is an important role in industry in order to ensure the quality of service. Temperature sensor measures the temperature and produce corresponding analog signal which is further processed by the microcontroller. The simulator acquires data from the microcontroller through Ethernet port. The data will be displayed on the LCD in microcontroller and PC monitor. Automation and control can be done with the help of control circuitry

IN “L. HU, N. XIE, Z. KUANG, AND K. ZHAO, “REVIEW OF CYBER-PHYSICAL SYSTEM ARCHITECTURE,” IN 2012 IEEE 15TH INTERNATIONAL SYMPOSIUM ON OBJECT/COMPONENT/SERVICE-ORIENTED REAL-TIME

DISTRIBUTED COMPUTING WORKSHOPS. IEEE, 2012, PP. 25–30. [ONLINE]. AVAILABLE: HTTP: //IEEEXPLORE.IEEE.ORG/LPDOCS/ EPIC03/WRAPPER.HTM?ARNUMBER=6196100"

With the goal of accomplish the ubiquitous intelligence in social life, Cyber-Physical Systems (CPS) are getting growing attentions of researchers and engineers. However, the complexity of computing and physical dynamics bring a lot of challenges in the development of CPS, such as integration of heterogeneous physical devices, system verification, security assurance, and so on. A general or unified architecture plays an important part in the process of CPS design. In this paper, we review the current and previous works of CPS architecture, and introduce the main challenges and techniques of architecture development : real-time control, security assurance, integration mechanism. Then we propose a general CPS architecture based on Service-Oriented Architecture (SOA), the main advantage of this proposed architecture is the integration flexibility of services and components. At the end, we introduce the typical applications of CPS, and suggest the future research areas. There is no unified concept of Cyber-Physical Systems (CPS). Generally, CPS is defined as the fuse of cyber world and the dynamic physical world. CPS perceive the physical world, process the data by computers, and affect and change the physical world. He JiFeng presented the concepts of "3C":Computation, Communication, and Control. With "information" as the center, fusion the computation and communication and control, to achieve the real-time sensing, dynamic control and information service in large scale systems[1]. CPS have close relationships with embedded systems, sensors,and wireless network, but have their own characteristics, for example, the complexity and dynamics of environment, the big problem space and solution space are closely related with the environment, the requirement for high reliability of the system. In the early stage, CPS had a two-tier structure inherently, the physical part and computing part. The physical part sense the physical environment, collect data, and execute the decision made by the computing part; the computing part analyze and process the data from the physical part, and then make decision. This is a kind of feedback control relation of the two parts. In [2], Hyun Jung La et al. proposed a 3-Tiers architecture of CPS : Environmental Tiers: consists of physical devices and a target environment which includes end-users using the devices and

their associated physical environment. Service Tiers: a typical computing environment with services in SOA and CC (Cloud Computering).

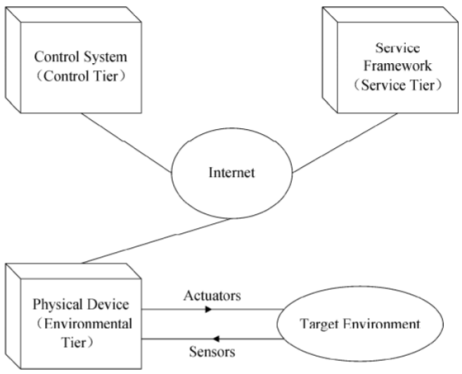

Fig: The three tiers of CPS architecture

Cyber world and physical world are different essentially, but they are connected and affect each other by information. One of the main features of physical world is dynamic, the same entity at different time showed different properties. Therefore, when modeling the physical world entities, the dynamic features should be considered in particular. In the cyber world, changes are represented by state transitions, thus, simulating the physical world may lead to state explosion. This is an important feature to be considered in the modeling and design process of CPS. As the base of CPS research, architecure is very important, but currently, there were no unified framework or general architecture can be used in most applications. In this paper, we review the developments of CPS from the architecture aspects. Based on this, in section 3, a general architecture is proposed based on SOA. This architecture extends the traditional concept of SOA, and introduce it in CPS architecture design. In the 4th section of this article, typical applications of CPS will be introduced. Finally, we discuss the current problems in CPS research, and give future research directions

IMPLEMENTATION:

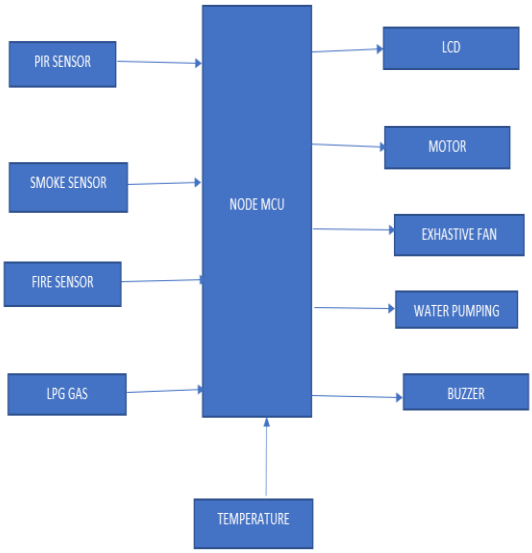

Fig: Block Diagram Of Smart Sensor SoC Architecture For The Industrial Internet Of Things

Sensors (Pir Sensor, Smoke Sensor, Fire Sensor, Lpg) are used to percept the environment and object conditions. Analog signal are provided to android device produced by sensors. Admin set threshold to every sensors placed in Industry. Android check this threshold against

incoming analog signal. When it encounter an uneven condition devices (Buzzer, Alarm, motor, fan) are use to take accurate measures such as Alarm/Alert are generated, it send messages and email to Admin. Then with the help of Artificial Intelligent it takes

APPLICATIONS

Industry and office:-We can implement sensors in wide area over the machines and instruments. Control and Monitor circumstances by using concept of Artificial Intelligence and IoT.

Hospital and Labs: -We can plot sensors on patient's body and Doctor can check current status on his android phone and also take necessary actions and decisions.

Home:-We can implement sensors to household appliances and monitor and control with the help of Artificial Intelligence.

CHALLENGES TO OVERCOME Wi-Fi/Internet Connection is fluctuating which may create problems. SMS/Email Alerts has to send but may have range problem. Decision Making is very difficult as this is question of many life & industry. Wrong tool Selection for Development

CONCLUSION Nowadays we need everything computerized. Earlier we can only monitor the situations with the help of cameras. In industries to reduce manual overhead we have implemented Internet of Things (IoT) in Industry to monitor as well as to inform the responsible person to take appropriate measures, but this will partially fulfill our requirement. As sometimes it will be late in this process and it will harm to property as well as life. For this purpose we are developing a system for Industrial Automation using IoT with the help of Artificial Intelligence to make system automated which will take intelligent decisions.

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ADVANCED CENTRALIZED RTO SYSTEM

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ABSTRACT - The current RTO system for vehicle registration includes numerous stages with tremendous man-power. In current system, there is no privilege for online registration of vehicle. So in that case every user must visit RTO office multiple times for registration. It takes more time to register the vehicle. Also, in tollbooth system user has to spend time for toll payment because current system is manual. In this system more manpower is used for toll collection and traffic management. As the number of vehicles increases, the system need to be automated. We can optimize the whole process using automation. This document describes the project of SMART RTO SYSTEM in which we are providing centralized database. The database stores all the information related to owner and his/her vehicle. In this project we are providing account control with different roles to different users. Each user can sign up in the system by filling his/her personal details. In sign up process, user is verified using OTP. With the help of created account, user can register a vehicle using vehicle registration form. Then user can schedule for appointment for verification by authorized person at RTO. RTO officer will have to verify user details and vehicle details in scheduled appointment. Once verified, officer will assign GPS ID, RFID and vehicle number and save it in the database. Authenticated user profile will contain e-wallet for toll payment. We can automate the toll payment process by using RFID given to each vehicle. By using IOT we can identify particular vehicle and access its data from database using RFID and GPS ID. After identifying vehicle at toll plaza, toll amount is deducted from respective user's wallet. For query solution we are going to implement chat bot. Graphical representation of toll plazas activity is shown to the toll controller with the help of Power BI.

KEYWORDS: Vehicle Registration, Tollbooth, Automated, Smart RTO, Centralized Database, Account Control, OTP, GPS ID, RFID, E-wallet, IoT, Chat bot, Power bi

INTRODUCTION

Vehicle management is one of the primary problem that developing countries are facing. The main issue in the vehicle management is that when new vehicle is registered then there is no centralised database that saves the whole information of vehicle and owner. Problem: The current system includes the database which stores vehicle information but it is not centralised hence toll management system cannot access this data [1]. So toll automation [2] is not present in current system. More man-power engaged in current system. The system is manual hence time and money increased. As the population increases in developing country like

PROFESSOR[1], UG SCHOLAR[2,3&4]

DEPARTMENT OF ECE, MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (UGC-AUTONOMOUS) MAISAMMAGUDA, HYDERABAD-500100

India, the number of vehicles also increases which results in overload on current RTO and toll plaza system. According to survey, India's population was 1.324 billion (2016) is projected to grow up to 8.6 billion by 2030. This count of population is directly proportional to the number of vehicles being sold. If we consider only Maharashtra, there are approx. 23.4 million vehicles. The total number of registered motor vehicles in Maharashtra State, increased from 3,07,030 as on 31st. March, 1971 to 2,78,69,866 as on 31st. March, 2016. And 50 RTO offices are currently active in Maharashtra. As the RTO and toll process is manual, it is difficult to handle such huge count of vehicles. At each toll on an average 20000 vehicles pay the toll. For each vehicle at least 3 min. of time is required. Hence long traffic queue is formed. The system is manual hence it is difficult to handle the process.

SOLUTIONWe can automate this process by assigning RFID and GPS id to each vehicle and by online process we can register vehicles and manage central database. By using this automated system, manpower, time, money will be reduced. Hence at each toll plaza due to system is automated time required for each vehicle reduces to few seconds. Each vehicle having GPS associated with it, so tracking of vehicle become easy [3]. For query solution we are going to implement chat bot [4]. Graphical representation of toll plazas activity is shown to the toll controller with the help of Power BI [5].

MOTIVATIONAs the population increases, the vehicles will in turn increase. Due to increase in vehicles traffic on road and load on toll plaza increases. We can automate these system by online registering [6] the vehicle and by calculating toll automatically [2]. We can also save manpower, locate the vehicle using GPS ID and save each vehicle information at global storage. Also this automation system plays important role in efficient traffic management.

OBJECTIVEMain objective of the system is to reduce the wastage of manpower and to auto-mate the whole process of vehicle registration and toll management [2]. This would reduce multiple trips to go to RTO office and waiting time in queues for toll payment. In the proposed system we will be developing a smart RTO system which will register new vehicle and assign RFID, GPS ID and registration number. RFID is used to automate the toll booth system [3]. Location of the particular vehicle can be found out using GPS ID.

SCOPEFor initial stage, username and password [7] is to be given as input to the application software for the purpose of logging in the user.

- Once the login is successful [8], user can fill up his personal details, vehicle information and schedule for appointment.
- On the appointment date, verification against documents will be done and RFID, GPS ID is assigned to the vehicle. Thus the user is authenticated by RTO officer.These all information is stored in central database
- When the vehicle is at toll, IOT system captures RFID and information associated with that RFID is retrieved.
- Toll is deducted from the e-wallet [9] of associated user account automatically. Major input: Login Credentials and vehicle information.
- Output: Status of user application and e-wallet transactions [10].

GOAL

- Account control with different roles to different users and user will be able to register new vehicle with its personal information.
- To reduce manual work.
- To manage the registration and monitoring of vehicles.

LITERATURE SURVEY

STEVEN GIANVECCHIO, MENGJUN XIE, MEMBER, IEEE, ZHENYU WU, AND HAINING WANG, SENIOR MEMBER, IEEE " HUMANS AND BOTS IN INTERNET CHAT: MEASUREMENT, ANALYSIS, AND AUTOMATED CLASSIFICATION "IEEE/ACM TRANSACTIONS ON NETWORKING, VOL. 19, NO. 5, OCTOBER 2011 AND BOTS IN INTERNET CHAT. [5]

Description: Proposed system which consists of two components:

1) an entropy-based classifier and

2) a Bayesian-based classifier.

Advantages: 1) An entropy-based classifier is more accurate to detect chat bots. 2) Bayesian based classifier is faster to detect known chat bots. 3) System is highly effective in differentiating chat bots from humans. 4) Accuracy and good speed.

Disadvantages: 1) Not suitable for messages which are small in size or shorter messages. 2) Cannot identify whether the message is generated by bot or human.

EDDY PRASETYO NUGROHO, RIZKY RACHMAN JUDHIE PUTRA, IMAN MUHAMAD RAMADHAN DEPARTMENT OF COMPUTER SCIENCE EDUCATION, FACULTY OF MATHEMATICS AND NATURAL SCIENCES EDUCATION INDONESIA UNIVERSITY OF EDUCATION BANDUNG, WEST JAVA, INDONESIA, 40154 "SMS AUTHENTICATION CODE GENERATED BY ADVANCE ENCRYPTION STANDARD (AES) 256 BITS MODIFICATION ALGORITHM AND ONE TIME PASSWORD (OTP) TO ACTIVATE NEW APPLICANT ACCOUNT"2016 2ND INTERNATIONAL CONFERENCE ON SCIENCE IN INFORMATION TECHNOLOGY (ICSITECH). [7]

Description: This describes the way to enhance security measures in registration process by generating authentication code to verify and activate the account.

Advantages: 1) Authentication code is generated through activation message. 2) Activation message is encrypted using Advanced Encryption Standard (AES). 3) Provides enhanced security measures. 4) Detect fake accounts and avoids creating of fake accounts.

Disadvantages: 1) The algorithm takes more time to execute. 2) As it contains key combination it takes longer time to decrypt the message

SILKE HOLTMANNS ,IAN OLIVER "SMS AND ONE-TIME PASSWORD INTERCEPTION IN LTE NETWORKS"IEEE ICC 2017 COMMUNICATION AND INFORMATION SYSTEMS SECURITY SYMPOSIUM. [8]

Description: Network providers are now moving towards diameter based LTE networks with hope that the additional security provided in the protocol also improves overall interconnection security.

Advantages: 1) SS7 protocol provides additional security. 2) Improved overall interconnection security.

Disadvantages: 1) OTP generated can be intercepted by an intrusion

PROF. CHANDRAKANT UMARANI1, RASHMITEGGI2, PRACHI SHETTI3, LAVANYA DODAMANI4, YOGITA HAVALE5 ASSISTANT PROFESSOR1, STUDENT2, 3, 4, 5 "SMART RTO WEB AND ANDROID APPLICATION" INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE AND COMPUTING, JUNE 2017.[6]

Description: By storing all the information related to vehicle and driver at database by RTO administrator. And android application is provided to traffic police to retrieve vehicle and license information.

Advantages: 1) Eliminates human interaction. 2) Auto generation of challan and amount of penalty. 3) It is very time efficient. 4) It also saves paper because all data are in digital format.

Disadvantages: 1) There is possibility of humans becoming lazy.

RAMA B. TAKBHATE AND PROF S.D CHAVAN "AUTOMATED TOLL BOOTH SYSTEM" INTERNATIONAL JOURNAL OF RESEARCH STUDIES IN COMPUTER SCIENCE AND ENGINEERING (IJRSCSE) VOLUME. 1, ISSUE 3, JULY 2014, PP 69- 76 ISSN 2349-4840 (PRINT) & ISSN 2349-4859(ONLINE). [2]

Description: This document examines the image of the number plate and class of vehicle, the respective information will be processed for toll collection system, to make more efficient and perfect. **Advantages:** 1) No need human interaction. 2) No or shorter queues at toll plazas by increasing toll booth service turnaround rates. 3) Faster and more efficient service. 4) No need to request for receipts **Disadvantages:** 1) Requires best quality cameras as image processing requires best quality of image captured by camera. 2) Algorithm used for image processing is complex and inefficient.

SALTO MARTÍNEZ RODRIGO, JACQUES GARCÍA FAUSTO ABRAHAM "DEVELOPMENT AND IMPLEMENTATION OF A CHAT BOT IN A SOCIAL NETWORK" 978-0-7695-4654-4/12 $26.00 © 2012 IEEE DOI 10.1109/ITNG.2012.14. [4]

Description: This describes how to implement a Chat Bot on Twitter social network for entertainment and viral advertising using database and a simple algorithm.

Advantages: 1) Message processing is fast. 2) Messages are divided into words and phrase for classification.

Disadvantages: 1) Inefficient to handle grammatical errors. 2) Unable to identify message generated by bot.

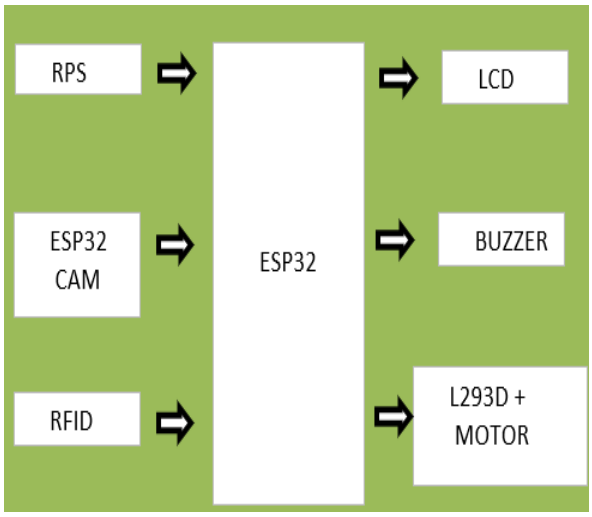
EXISTING SYSTEM APPROACH

Existing system Disadvantage

- There is no centralised database that saves the whole information of vehicle and owner.

- Toll automation is not present in current system.
- GPS module is not implemented in current vehicles to track them.

PROPOSED SYSTEM



The current RTO system for vehicle registration includes numerous stages with tremendous man-power. In current system, there is no privilege for online registration of vehicle. So in that case every user must visit RTO office multiple times for registration. It takes more time to register the vehicle. Also, in tollbooth system user has to spend time for toll payment because current system is manual. In this system more manpower is used for toll collection and traffic management. As the number of vehicles increases, the system need to be automated.

CONCLUSION

The current system for vehicle registration includes numerous stages with tremendous manpower. In current system there is no privilege for online registration of vehicles. Also, in tollbooth system more man power is used for toll collection and traffic management at toll plaza. In proposed system whole process is automated and optimized. Parsons's personal information and vehicle information is stored at central database. As we have integrated RFID and GPS ID with each and every vehicle we can easily identify and locate the specific vehicle. Due to RFID we have automated tollbooth system. It saves time, reduces traffic and minimizes the fuel consumption during idle condition of the vehicle. It can be used to remove draw-backs of current system such as time and human efforts.

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RFID BASED INTELLIGENT BUS MANAGEMENT AND MONITORING SYSTEM

DR.N.SREEKANTH[1], K.MANASA[2], K.VANI[3], K.DEVI[4]

ABSTRACT: As we know that there are number of factors affecting bus travel time, such as departure time, work day, current bus location, number of links, number of intersections, passenger demand at each stop and traffic status of the urban network, etc. This paper presents a statistical approach to predict the public bus arrival time based on GPS information Management system. The most of the time wasted by the people is on waiting for buses on the bus stops which is really horrible. Thus it becomes essential to track the buses real location using GPS and provide passengers predicted time of bus arriving at the bus stop and also people must get the bus information like where the bus is, is it in traffic. On route being anywhere like in house or on road, this can be happening only by using mobile computing. And for getting information about bus on mobility device (Mobile phone) first it must be there at some central monitoring and control side that must be updated from time to time. But to being with, the survey has to be done to design the proposed system. Many researchers have paid a great contribution for the same since last decade but still the scopes for improvement continue. Thus this paper contains the survey of various real-time issues faced by people and some survey about the latest researches in the same field.

INTRODUCTION

In the current era we know that traffic plays an important role in modern urban society. Based on report from United Nations Population Division, there are almost 64 billion people will live in urban in 2050, and the annual growth rate is around 1.5% [1]. It will cause an obviously increase of trip demand. Because of the limitation of the traffic resources, those increments will lead to urban traffic congestion. Traffic congestion, already costing United Sates of American 87.2 billion USD in 2007, is only getting worse, according to a new report from the Texas Transportation Institute [2].In order to relieve the congestion, and provide buses on time for the passengers while waiting long time and passengers want be able to bus

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arrival time of their bus. Because of too much traffic in the road bus arrival time might be late and have to wait long time still bus arrived. Public transport is a shared passenger transportation service which is available for use by the general public. The governments or public transport authorities are developing public transportation system. A key problem in the development process is to provide adequate public transportation service or enhance the service level. The problem is also faced by public transportation planners and operators. For example, the accurate prediction of bus arrival times and the timely dissemination of the information to transit users may reduce their wait time, and thus increase the service quality. As per the survey made by our team regarding the PMT bus public transport, we met many passengers on the bus stop and enquired for the troubles that they are facing currently. The troubles that the passengers are facing are as mentioned below: The first comes troublesome issue is about the passengers don't have any idea exactly when the bus is going to reach their bus stop. So they don't know till when they have to wait on bus stop for the bus.

Figure1. Bus breakdown Issue

The second major issue is that the passengers are not aware about the bus for which passengers are waiting on the bus stop, is coming or not. Many passengers said that we waited for bus on the stop for around 1 hour and then came too know that the bus has broken down mid-way and there was no way to know about the running status of the bus. The third major issue passengers faced due to current PMT transport is that even if the bus destination station is the one which they are waiting for, still the bus routes are different for e.g. a bus from Hadapsar to Swargate has two routes to follow, and the passengers don't really know which route the bus will be following. The passenger's has to rely on the announcers of the bus stops for getting the information about the buses and the bus routes which is not always audible to traffic noise. So to resolve the issues faced be existing system problems and to overcome the disadvantages of the previous researches, the proposed system will be implemented.

LITERATURE SURVEY

A. Public Bus Arrival Time Prediction Based on Traffic Information Management System The main factors which affect public bus arrival time are traffic conditions then come sequences or the bus time and the bus stops, then comes the number of intersections, and finally any other factors. By analyzing the historical data, authors found the public

bus arrival time are combinations of two main parts: residuals and linear parts. In Figure 1, taken from [1] authors have shown the relationship between the bus arrival time and the distance it has traveled. Both of 338 those bus lines (No. 61 and 75) have shown strongly linear relationship between travel time and distance. In this model, authors have considered the factors of traffic conditions, dwell time, intersections and departure time. Just as author mentioned above, the main part of the bus traveling time are affected by them. The public bus arrive time prediction model (1) is a formally linear model which has already described the main part of the bus travel time, but author have to estimate its parameters. Meanwhile author still need to improve its accuracy by considering the other factors

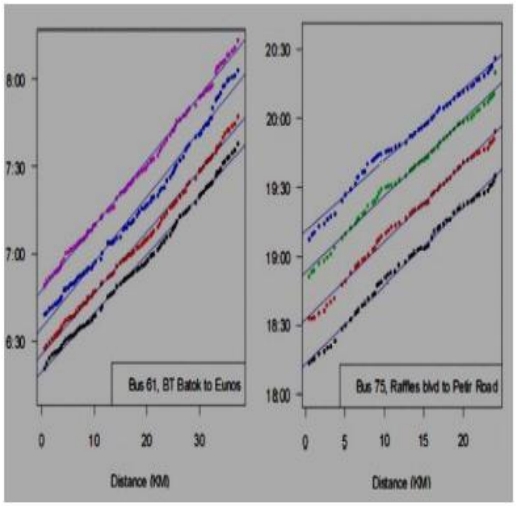


Figure 2.. Linear relationship between time and distance.

B. Automotive Navigation System An automotive Navigation System is design for using in vehicle. It uses GPS device to acquire position data to locate the user on a road any unit MAP database. Using the road database unit can give direction to other locations along road also in the database for greater consistency there is use gyroscope an accelerometer as GPS signal are loss.

Figure3. Automotive Navigation System

C. How Long Time to Wait? Predicting Bus Arrival Time with Mobile Phone Based Participatory Sensing Our early attempts to build practical applications on Star Track revealed substantial efficiency and scalability problems, with unnecessary data transfers, frequent clientserver roundtrips, costly similarity comparisons involving thousands of tracks and poor fault-tolerance. To remedy these limitations, author revised the overall system architecture, API, and

implementation. The API was extended to operate on group of tracks rather than individual tracks, delay query execution, and permit caching of query results. Track trees, New data structures were introduced to speed the common operation of searching for similar tracks. Map matching algorithms system were adopted to convert each track into a more compact and canonical sequence of road segments. And the underlying track database was divided and duplicate among multiple servers. Altogether, these changes not only simplified the construction of track-based applications, which author confirmed by building applications using our new API, but also resulted in considerable performance gains. Analysis of similarity queries, for example, show two to three orders of magnitude improvement in query times

D. Bus Management System Using RFID in WSN Phones These paper authors present a new approach to integrate RFID (Radio Frequency Identification) in WSN (Wireless sensor network)

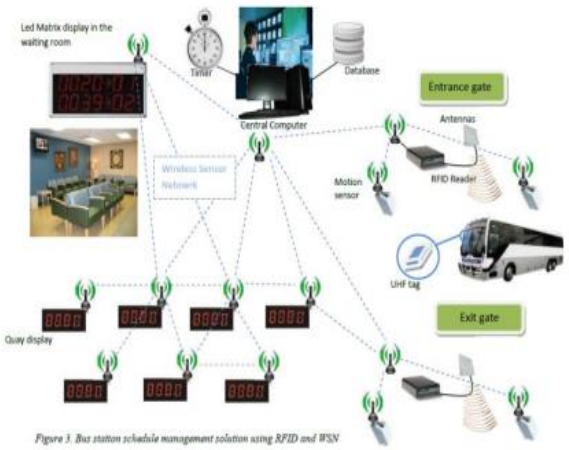


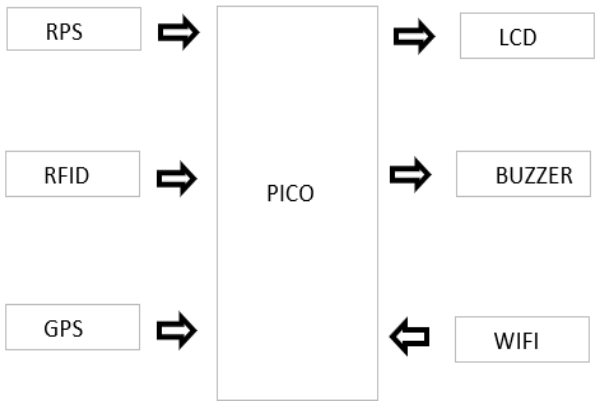
Fig -4 : Bus station schedule management using RFID and WSN

WSN is used to support RFID identification process by prolonging the read range of an RFID system. Besides, by the access of the WSN author can monitor the environment of an object and optimize RFID reader's presentation and energy. Then, method to integrate RFID technology, wireless sensor network to form an intelligent bus tracking application is studied. The proposed system can monitor bus traffic secret expansive bus stations, and can inform administrators whether the bus is arriving on time, early or late. This bus information is then displayed on the different wireless displays outside and inside the bus station.

E. Real Time Web based Vehicle Tracking using GPS 1. This uses GPS receiver to arrest the current location and vehicle speed. Speed data and Location provided by GPS is not in human understandable format. This data needs to be processed to convert it into useful

information that can be displayed on the map. To process this raw data CPU is required. 2. The raw data provided by the GPS receiver is taken by the CPU and processed to mine the required location and speed information CPU is also responsible for monitoring the microcontroller selected to serve as CPU for vehicle unit. When all required information is extracted and processed, it needs to be transmitted to a remote Tracking Server high will be able to display this information to the end user. 3.GPS (Global Positioning System) antenna get signals from GPS satellites and it must face towards sky for correct computation of the current location by GPS receiver. Area location data information is transferred to microcontroller through serial interface. Then processing of the data provided by GPS receiver, microcontroller pass on this information to remote location using GPRS Modem. 4. Microcontroller controls the operation of GPRS modem through serial interface using AT commands. External GPS antenna is required by the GPS modem for reliable receiving and transmission of data. When modem gets any command sent by tracking server, it passes this information to with respect to the PMT and others buses services. The survey there by concludes that the system is not ate developed and the researched system is not giving accuracy and too have lot of disadvantages so to get accuracy

PROPOSED SYSTEM



The proposed system architecture for intelligent bus management and monitoring system A black-box containing RFID reader, GPS modem is equipped in the moving bus. As the bus approaches a bus stop with an RFID tag, the distance between the reader and the tag decreases so that they can interact with each other. This communication also produces data and the data gained is sent to the BASE-Station via GPS. The entire system consists of three modules: BASE-Station Module, In-Bus Module and Bus-Stop Module. The architecture and working of these modules is described in this section.

CONCLUSION In this paper, a statistical approach was present to forecast the arrival time at each stop for public bus. Based on the assessment of all factors which will have impact on the bus arrival time prediction, a linear model was

proposed. Thus the survey for the bus tracking and bus breakdown management is carried out with the help of previous research as the prevailing system in the market with respect to the PMT services. The survey thereby concludes that the previous system proposed could not efficiently make the bus tracking and passengers' service so convenient that the proposed system will be providing. Also a deep study regarding the prevailing system in the PMT bus transport system was studied to understand, the current information providing system to the passengers regarding the buses.

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COAL MINE MONITORING USING IOT

DR. N.JAGADEESHAN[1], GOPU ANUPAMA[2], G.SIVA SAI SRIYA[3], J.SARIKA[4]

ABSTRACT The Long Range (Lora) Network is a wireless technology in which a low power transmitter sends small packet data to a receiver, usually over long distances. The limit for rural environments is about 20 km. However in the urban environment, it is 5 km. An example of a low power wide area network is Lorawan technology, private cellular (single-hop) communications in the industrial sector. In particular, they were useful in regular IoT applications such as environmental monitoring.The system has several lora nodes with sensors to measure industry temperature and gas volume. In this paper, proposed the design of a wireless sensor network (WSN) with the help of the Arduino controller, which can monitor and control the industrial climate.

KEYWORDS—long range; sensor; industry; temperature; private cellular network.

INTRODUCTION

A mining accident is an accident that occurs while mining minerals or metals. Every year thousands of miners die in mining accidents, especially in underground coal mining, and accidents in hard rock mines. Coal mining is considered more dangerous than hard rock mining due to the flat lying layer, generally inefficient rock, methane gas and coal dust. Most of the deaths these days occur in developing countries and in rural areas of developed countries where safety measures are not fully implemented. Mining accidents can be caused by a variety of

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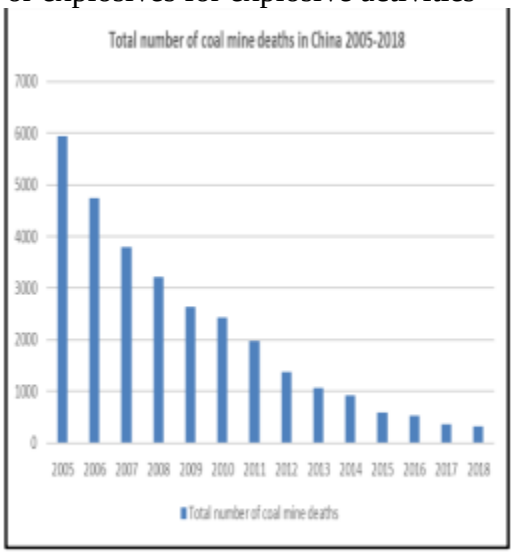
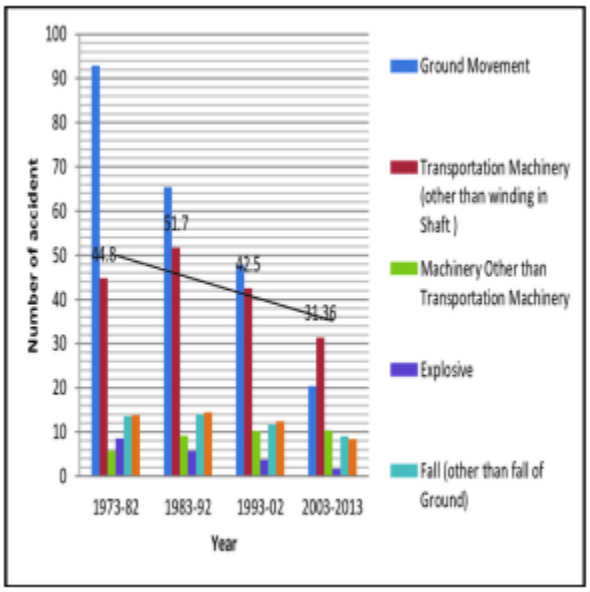
factors, including hydrogen sulfide or explosive natural gases, especially firetamp or methane, dust explosions, mine stops collapsing, mine-triggered earthquakes, floods, or the leakage of toxic gases from a public machine. Errors from improperly used or inactive mining equipment (such as safety lights or electrical equipment). Methane and coal dust explosions can be caused by improper use of underground explosives. This coal mining is causing insecurity and bigotry material size and, in some cases, even personal damage. Today most deaths occur in developing countries, especially China. China's coal mines are the worst in the world, killing an average of 13 miners a day. China accounts for only 80% of the world's total coal mining deaths, although it produces only 35% of the world's coal. In a comparison, the U.S. In the early 20th century, coal mining deaths were more than 1,000 per year, down from an average of 450 annual deaths in the 1950s and 141 in the 1970s. The most common accidents that occur in the mining industry are accidents involving the use of poison or explosive gases or explosives for explosive activities



Total number of coal mine deaths in China 2005-2018



Methane may be a extremely explosive gas treed within coal layers. Mechanical errors will trigger gas and initiate continuous coal dirt eruptions by improperly used or malfunctioning mining instrumentality (such as safety lights or electrical equipment) or the utilization of improper explosives ensuing section describes lora technology

LORA TECHNOLOGY OVERVIEW

Lora is a lengthy-distance protocol. This Capable of sending records over lengthy distances. A unmarried front covers a place of 100 rectangular kilometers. Long Lora generation variety it makes use of because of its connectivity price range and the laughter diffusion spectrum modulation it causes. Lora makes use of the chirp unfold Spectrum modulation approach. This

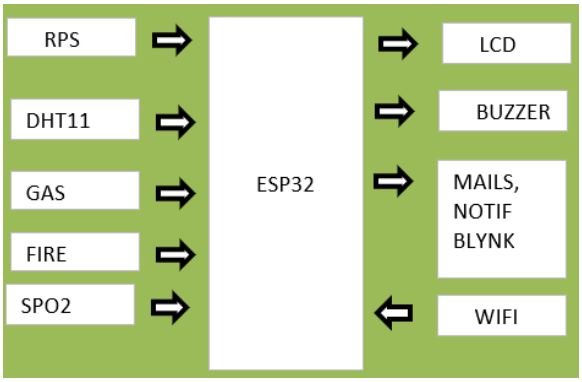
approach is utilized in navy and aerospace communications for many years its robustness and lengthy variety capability. It is used now Commercial Lora Communication. It affords Immunity to multipath and fading. The Chirp spectrum calls for low transmission power. Chirp is a sign whose frequency will increase or decreases over time. Thus, a chirp sign may be up-chirp and down-chirp. The desired ones in the chirpp spread spectrum modulation are amplified with the data signal chirp signal. It transmits bandwidth signal beyond the bandwidth of the original data. The signal received at the receiver end is amplified again with a locally generated copy of the chirp signal. It compresses the modified signal back to the original bandwidth. This reduces noise and interference. The increase in signal frequency provides error free data sent over long distances. It may be visualized by comparing the Lora modulated sensitivity to the frequency change key to the modulated signal. The chirp diffusion spectrum is the sensitivity of the modulated signal. The frequency change force is much higher than the modulation. Lora Technology has a connection budget that is higher than any other technology currently available. Connection budget accounts for its long distance. The connection budget is the accounting of all gains and losses in a transfer system. Link budget is the power derived receiver side. Lora's merger budget is high Its high sensitivity accounts. Most of the technologies used. Uses Frequency Shift Key (FSK) to connect to IoT Modulation

Battery Lifetime. The most important criteria of embedded device is its battery lifetime. Most of the embedded devices required communicate with other devices near or far away. It consumes more power. All embedded devices are mostly battery driven. So, this embedded essential needs the devices are its battery lifetime. Most algorithms or the techniques used to create an embedded device are now in a day using the highest power, the battery lifespan decreases. Lora has improves battery consumption on a device and battery operated is very suitable for embedded device. Lora uses the lowest power compared to the existing everything technologies. Lora networks are low battery consumption accounts for Asynchronous Communications of the Nodes Network. Only the nodes in a Lora network are involved. When they have any data to send whether energy is operated or not planned. They follow Aloha's method. Aloha frame will be sent only when there is any data to

send otherwise any transaction will not be held. If the frame is received successfully sent another frame or the same frame sent back. Aloha mode saves battery life network transmission makes when there is any information. This does not make any other transaction. And, for most other technologies are mesh network or accepted coherent correlation to get rid of the edges synchronize occasionally. It uses more power. Lora technology is revealed in the latest study of 4-5 times better than any other technology. Star network is used in Lora network. The LoRa network gateway receives data from large number of nodes. For this the gateway must have high capacity. This is achieved by adaptive data rate and multichannel multimodem transceiver at the gateway

WORKING PRINCIPLE In this document, the main topic is industrial surveillance. Monitor the gas level and temperature, and then transmit it to the data controller. Then, the LORA technology used transmits the data to the master node. Receive data from the Lora transmitter and then send it to the receiver. Praise the teacher. Regulator. The slave never sends data and never receives a request from the master. The slave stations will never influence each other. Master/Slave is an asymmetric communication or control model in which one device or process ("Master") controls one or more other devices or processes. The master node is a complete node that enables node operators to perform basic agreed functions to start the blockchain. In the node temperature device, the slave LM35 continuously monitors the industry temperature. The gas temperature sensor can monitor wax in the industry. The vibration sensor detects vibration. What is happening in the industry?The Lora transmitter sends the sensor value to the Lora receiver. any vibration is detected by vibration sensor, then the alarm will ON

BLOCK DIAGRAM



CONCLUSION The developed robot is reliable and can be used in any working environment. The sensor used is very sensitive. The gas sensor can also detect other leaks, such as hydrogen, smoke, etc. The model can also be used for other

purposes. Seen from the control room. Because Wi-Fi is used, data can be transferred from anywhere. Avoid the danger of suffocation when working in the mine. This application can be used in all industrial fields where human intervention can be avoided for safety reasons. This application can also be used in hospitals and shopping malls.This design can be enhanced by spraying water on the robot. In case of fire, spray water in the right place. In addition, there are some other sensors, such as B. Dust sensor and humidity sensor can be connected to each other to improve the convenience of the staff.

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INTELLIGENT MEDICINE RECOGNITION SYSTEM

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ABSTRACT

An intelligent medicine recognition system based on deep learning techniques, named ST-Med-Box. The proposed system can assist chronic patients in taking multiple medications correctly and avoiding in taking the wrong medications, which may cause drug interactions, and can provide other medication-related functionalities such as reminders to take medications on time, medication information, and chronic patient information management. The proposed system consists of an intelligent medicine recognition device, an app running on an Android-based mobile device, a deep learning training server, and a cloud-based management platform. Currently, eight different medicines can be recognized by the proposed system. The experimental results show that the recognition accuracy reaches 96.6%. Therefore, the proposed system can effectively reduce the problem of drug interactions caused by taking incorrect drugs, thereby reducing the cost of medical treatment and giving patients with chronic diseases a safe medication environment

OVERVIEW

Currently, the world's society is aging. Among the 7.5 billion people in the world, the elderly population accounts for 600 million, including 480 million people with chronic diseases. According to statistics from the World Health Organization (WHO), the average elderly person suffers from 1.4 chronic diseases, and the typical medication dosage of an elderly person is five times that of a younger person. Elderly people are also seven times more likely to take the wrong medicine because of declining physiological functions. The WHO also indicates that one-third of the world's deaths are caused not by diseases themselves but by the incorrect use of drugs, and the costs associated with such improper drug use amount to nearly 28.5 billion U.S. dollars every year. Due to the abovementioned problem of deaths caused by the improper use of drugs, the smart medicine pillboxes available on the market are constantly being updated. For example, the Pill Drill [1], [2], a smart medicine pillbox, can help users conveniently store and distribute medication and has a reminder function to remind users who forget to take their medicine.

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However, a patient cannot know whether the medications he or she has taken are correct. Due to the wide variety of drugs used for patients with chronic diseases, their classification is obviously a complex task, and misidentification of medications caused by negligence may lead to the possibility of taking the wrong medicine. Taking the wrong medicine may result in harmful interactions or offset the intended effects of the drugs, leading to further serious consequences such as acute complications. To address this problem, this paper proposes a deep-learning-based intelligent medicine recognition system, named ST-Med-Box, that can recognize medications and remind patients with chronic diseases when to take their medications. By using the proposed system, patients with chronic diseases can know whether a drug is taken correctly the first time, thus reducing the probability of taking the wrong medicine and the cost of social medical care.

"Prevention is better than cure", is universal truth. In the human life Health is the most important factor. So now a days there is need to do the prediction of diseases. Many researchers have used data mining and machine learning techniques for predicting the diseases based on the medical data or pathological data [1]. These approaches are used for doing the prediction of diseases and reoccurrence of those diseases. Also, some another approaches used to predict the diseases and control the diseases. This approach also controls the progression of particular diseases. The recent success of deep learning in different areas of machine learning has driven a shift towards model of machine learning that can learn hierarchical and rich representations of raw data with the pre-processing and produce more accurate result [1]. Diseases related numbers of papers have been published on several data mining and machine learning techniques. In that various data mining and machine learning techniques are used like Naive Bayes algorithm, neural network, decision Tree algorithm, K-nearest neighbors algorithm bagging algorithm, so on [2].Also Heart related numbers of papers are published using data mining and machine learning techniques [5]. Those techniques such as support vector machine, kernel density, automatically defined of heart groups for showing different levels of accuracy in diseases prediction [20]. Generally Waikato Environment for Knowledge Analysis (WEKA) tool is used in this type of researches. Previously existing systems do the prediction on diseases but cannot predict the subtypes of diseases. Those systems also can't find the diseases which are caused by occurrences of any previously diseases. Those systems fail to predict possible conditions of people. Previous system can handle only structured data but not an unstructured data. In current past, countless disease estimate classifications have been advanced. The standing organizations

arrange a machine learning algorithms which can predict exact diseases. In the proposed system we use the artificial neural network (ANN) and stochastic gradient algorithm for learning and doing the effective prediction of diseases. This system handles the both structured data and unstructured data with the help of preprocessing. For that we collect the patient previous history like patient diseases details. Also we can collect the various data sets from UCI Repository, Kaggle, dataset data.gov, and Pima datasets. By using that collected data we prepared new dataset. In our project we contain the three diseases like heart, kidney, and diabetics. We collect the all diseases related data. We combined that dataset into one dataset. In that we first take the common attributes from that datasets and also take the some another important attributes related to that three diseases. For that combined dataset we find the all missing values by using the decision tree liner regression method and generate the missing values. Finally we build the proper dataset. By using that dataset we build the model with artificial neural network (ANN) for predicting the decease and do the predictions using proposed model with better accuracy.

1.1. IMPORTANCE OF DISEASES AND ITS TYPES Now a days in world diseases percentage is increased because of the change in the weather, change in human habits' and many more reasons. There is the need for preventing the diseases and also predicting the diseases. In the world every human have some small or big health related problem. So there is needed to take care from those problems. In the world many more diseases are present that cause the human life

Table1. Diseases with attributes

Sr. No	Diseases	Attributes
1.	Heart	Age, Sex, Blood Pressure, Blood Sugar, chest pain, Cholesterol, restecorg (resting electrocardiographic), thalach (maximum heart rate), exang (exercise included by angina)
2.	Kidney	Age, Sex, Blood Pressure, Blood Sugar, sg (specific gravity), al(albumin), rbc (red blood cells), sc(Serum)
3.	Diabetes	Age, Sex, Blood Pressure, Blood Sugar, BMI (Body Mass Index)

In that project we discuss about the few diseases. For that we do the early prediction for avoiding and take caring of that disease. In this project we take the three types of diseases like heart, kidney, and diabetes diseases shown in the Table 1. In that we show the three diseases with its attributes like age, sex, blood pressure, blood sugar, Cholesterol, restecorg, thalach , exang, sg, al, rbc, sc, BMI for the

heart, kidney and diabetes. Now a day's those three diseases are very common in the human life. Many people are dies because the heart and kidney diseases because those diseases treatment are very costly. For that we can build the new model based on the artificial neural network for predicting those diseases early. By predicting diseases early we can gives the good treatment to that particular patient and save the life of that person in less cost

EXISTING SYSTEM

Min Chen et al., [1] developed techniques for predicting the diseases with the help of machine learning. They can propose new techniques based on the machine learning concept with the help of convoluational neural network. They proposed new method as multimodal disease risk prediction (MDRP) for predicting the chronic diseases. By using MDRP methods chronic diseases are effectively predicted .with the help of structured and unstructured data they can predict the diseases. They use machine learning and deep learning algorithms for prediction. In that machine learning algorithm such as k-nearest neighbor, naive Bayesian and decision algorithms and deep learning algorithm convoluational neural network used to predicting the diseases risk. MDRP algorithm process the datasets into two parts as training set and testing set which is train and test the data respectively for better prediction of diseases with good accuracy. By using this technique predict the whether the patient have a chronic diseases or not. The predicting accuracy of proposed algorithm is 94.8% with the high speed of predicting the diseases. But with the help of convoluational neural network it is difficult to determine window size of data and it can't handle the sequential data.

LITERATURE REVIEW

- R.Tamilarasi et al., [2] proposed a system for predicting hearth diseases with the help of data mining techniques. In medical science large amount data is generated from patient clinical reports other patient symptoms. Data mining is used to handle that large amount of data with the help of classification and clustering. They studied different data mining techniques that can useful to predict the heart diseases. Such data mining classifiers technique are used for effective and efficient heart diseases diagnosis. In that they use various attributes and decision tress method for predicting diseases. Data mining techniques are used to analyze the data from different dimension and

identify their relationships. For predicting the diseases they uses data mining algorithms like decision tree algorithm, naive bayes algorithm, neural network algorithm, k- nearest neighbor algorithm with the classification of diseases. This data mining techniques helps to healthcare professional for diagnosis of heart disease with better accuracy. Proposed system accuracy is 85%. But some disadvantages of data mining techniques like they are lazy

- Darcy A. Davis et al., [3] proposed the method for predicting the diseases which is based on patient medical history. They propose a CARE, collaborative Assessment and Recommendation Engine which depends on the medical history of patient. They use the IDC-9-CM codes to predict the diseases risks. This method is used for predicting the chronic diseases. In that they also describes a Iterative version of CARE, as ICARE which is incorporates ensembles concepts, but those approach did not have positive capacity of prediction. CARE system can do the prediction based on the vector similarity, inverse frequency and clustering with the medical data of patients. In that IDC-9-CM is the 3-digit code, which represents the small group of similar or related diseases of patients. CARE framework is used explore the border history of diseases suggestions related to previous unconsidered concerns about the prevention. But CARE system generates prediction on only feature visits of patients based on medical history.
- Feixiang Huang et al., [4] developed a system for predicting the diseases by using data mining techniques with the healthcare information. For that they apply data mining process which predicts the hypertension of patient by using the patient medical records. In that 9862 sample cases are studied. This sample is extracted from the real word information system databases. That information system databases contain 309383 medical records is used to generate diseases prediction. For that prediction data mining techniques are used such as naive Bayesian and RJ-48 classifiers. In that WEKA data mining tool is used to generate those data mining techniques. Confusion matrix is

used to represent the performance of naive Bayesian algorithm. In that they use a simple approach of considering the present or absents of diseases in medical history of patient. Accuracy of proposed system is 83.5%.

- AbhishekRairikar et al., [5] proposed prediction model for predicting the heart diseases with the data mining techniques. In that they uses a different more numbers of patients attributes, such as gender , blood pressure, cholesterol like other some attributes for predicting the heart diseases. Healthcare industries produce massive volume of data which is forms of numbers, text, images, and charts. Data mining provides the various classification methods like K-nearest neighbor, decision tree, CART, C4.5, J48 and so on. In this system three different data mining classification techniques such as K-nearest neighbor, decision tree and naive bayes are used to analyze the datasets. K-nearest neighbor classification and regression methods are used to pattern reorganization and decision tree are used to build the good decision. But the KNN algorithm is lazy algorithm, where the functions are only locally approximated and also in that need to determine values of parameters of previous neighbor.
- Saurabh Pandey et al., [6] developed efficient way to predicting the diabetes of patient by using the bio medical signal data with the help of artificial intelligence techniques. This system gives brief overview of diagnosis of diabetes using patient medical bio signal data. In that they use the artificial intelligence approach like ANN, Fuzzy for fixing the wide variety of issues in different application of area. They propose the suitable approach for prediction of diseases based on the dietetics bio medical signal data. Workflow of the methodology is like feature selection as symptoms of diseases then building the datasets with data homoscedasticity after that training and testing of datasets are done by using AI techniques. For the simulation result they use the algorithm which is developed by using MATLAB for detection of diabetes. For that datasets are used with the number of input value which is selected by using regression analysis. In that they use the 768 input samples in

diabetes datasets. After that gives the value of regression coefficient which shows the output dependency of every input sample that gives the prediction of diseases. For accurately representing the statistical properties of real time data which is does not possible to predict diseases.

- Dr.B.Srinivasan et al., [7] studied the data mining techniques for efficiently predicting the diseases in healthcare sectors. They can introduce the various data mining techniques which are useful in medical fields for better decision making related to the diseases. In medical filed huge amount of data produced like the patient details, diagnosis history and varies medications, such data is used to predicting the diseases by using data mining approaches. They introduce the data mining knowledge discovery for converting the low level data to high level data knowledge. For that data cleaning, data integration data selection, data transformation pattern evaluation, knowledge representation such steps are required. In that they studied various data mining technique like as, Bayesian classifiers, decision tree, support vector machine and artificial neural networks for predicting diseases. They discussed about various diseases like Eye diseases, Cancer, Heart diseases, Diabetics, etc. Data mining based prediction systems reduce the cost and human effects but they are time consuming and lazy learning methods.
- ParithoshKhubchandani et al., [8] proposed a system based on artificial intelligence and probabilistic model for medical prediction. Prediction is the important factor in the medical domain. In that they can use the artificial intelligence for decision making in medical filed to predicting the diseases. This system can generate the important data for the evolution of diseases diagnosis. Therefore main advantages of artificial intelligence are it creates tools that should better work than human. In that they present the new approach suitable for medical prediction which is based on the probabilistic modeling. When the information is large and complex the system uses this approach. Knowledge based approach cannot handle the large or

complex data, so probabilistic approach is used to medical prediction. The statistical approach associates a probability each output of medical data for that bayes theorem is used for prediction. By using this system physicians can focus on important activities of patients. Some result of technique take more time to evaluation and some computations are complex that is effects on the other factors of prediction.

- Smita .T et al., [9] developed an efficient algorithm for predicting the diseases with the help of multidimensional data. Main objectives of this system create a easy, fast, effective approach for diseases prediction. They introduced new hybrid algorithm for diseases identification and prediction by using data mining techniques. New algorithm is diseases identification and prediction (DIP) it is combination of decision tree and association rule. This is used for doing prediction of some diseases in particular area. Also it is shows the relationships between the different parameters of diseases. For that they use data mining approach for extracting the information which is previously not known. It also used for analyzing the information for prediction. This research work is based on different data mining approach on the multidirectional data analysis. For that they uses the common data mining models for prediction , such as Association rule, decision tree, clustering, classification rule and various statistical data mining tools. For DIP decision tree and Association rule which construct the Apriori principle. Apply the statistical mining techniques in cluster analysis for extracting the data.DIP predicts the diseases only on multidimensional data. The result is represented in graphical format.
- AnandanadarajahNishanth et al., [10] proposed a new method for early detection of the chronic kidney diseases by identifying the important features from the datasets. Chronic kidney diseases (CKD) are the not know those medical testes of patients are take for the other purposes that is useful for the diseases. In that they use the kidney dataset for identifying and detecting the kidney diseases. In that dataset various attributes are preset like the blood sugar, blood pressure, specific gravity,

Albumin. Serum, blood glucose and so on. In this paper they use the different techniques for the detection like CSP and LDA. CPA is the Common Spatial Pattern and the LDA is the Linear Discriminnant Analysis which is identifies the important attributes and detects the chronic kidney diseases. In this paper classification methods is used for the identifying the attributes of diseases. This analysis contains the albumin, haemoglobin, specific gravity, haemoglobin, with the serum like important features for early detection of kidney diseases. With the Linear Discriminnant Analysis get the 98% accuracy of chronic kidney diseases.

- Fatma Taher et al., [11] proposed a system for detecting the lung cancer by sing artificial neural network and fuzzy clustering method. Lung cancer is the common cause of death of people among the world because its symptoms are appears at only advanced stage. There are many techniques such as x-ray, CT scan, MRI is available for diagnosis of lung cancer but they are very expensive and time consuming. These systems solve the problem effectively with the help of artificial network and fuzzy clustering. For that they use a segmentation process which detects the lung cancer early stage. In that two segmentation techniques are used that is Hopfield Neural Network (HNN) and Fuzzy C-Mean (FCM). Hopfield Neural Network (HNN) it is the one of the artificial neural network which is used for image segmentation. Those propose the segmentation process for both black and white and colour images. HNN can very sensitive and it can detect the overlapping classes of images. Fuzzy C-Mean (FCM) is for fuzzy identification and pattern recognition which is based on the distance criteria. This algorithm contains a predefined numbers of inputs and gives the clusters of outputs. For input they can takes the number of image dataset of diseases and applies the both algorithm and gives the prediction on that image data. But this system is gives the result only on image datasets which requires more numbers of image datasets.
- In the medical field, adverse events (AEs) are the leading cause of morbidity and mortality [3],

according to data from the U.S. Food and Drug Administration (FDA). Since 1997, the number of all AE cases reported by the FDA has increased by nearly a factor of five, and between 2006 and 2014, the number of deaths due to AE cases increased by 232%. To address such problems, many pharmaceutical companies are trying to deal with the increased number of cases by means of manual case records, but this is not a sustainable solution because of the considerable growth in the incidence of AE cases [3]. To address AE-related problems, Dev et al. [4] identified an increasing number of adverse drugs and new drugs. They used deep learning based on a word2vec module for AE case classification. The results showed increased robustness to unseen AE cases and medical words, but due to FDA restrictions, this work lacked interpretability, which led to difficulties in application. With the rapid development of contemporary medicine, one of the key AE-related problems is adverse drug events. To avoid adverse drug events, a high-accuracy automatic medicine recognition system is needed to assist people in recognizing various kinds of drugs. To meet this requirement, many related drug recognition technologies and systems have been addressed, discussed, and developed. To develop pill image recognition techniques, the U.S. National Library of Medicine (NLM) held a challenge competition in 2016. Yaniv et al. [5] reported the results of this challenge competition. Ushizima et al. [6] investigated pill recognition approaches on a new pill image dataset for the NLM competition. They also discussed some data planning strategies for effective content-based image retrieval.

- Ribeiro et al. [7] proposed a medicine box recognition system that adopted a three-stage (barcode recognition, text recognition, and feature matching) approach. Their proposed system used a camera mounted on a device and used an Android system to correctly recognize medicine packages to provide people experiencing difficulties (such as elderly individuals and individuals with visual impairments) with related medication packaging information. Bar code detection and optical

character recognition (OCR) were used to recognize the names on the medicine packages. Their proposed system achieved a recognition success of up to 80%. However, the system had a recognition blind spot in the case of medicine packages bearing the same name but with different contents (number of tablets, dosage, and/or route of administration).

- Wang et al. [8] also presented a deep-learningbased recognition methodology for recognizing drug blister packages.
- Yu et al. [9] presented an accurate and automatic pill recognition system that combined imprint extraction and description to make use of imprint information. Moreover, a loopy-belief-propagation-based image segmentation approach was applied to the imprint on the pill to solve the problem of incoherent and coarse strokes. The experimental results showed that this pill recognition system achieved accuracies of 90.46% on the top rank and 97.16% on the top five ranks.
- Neto et al. [10] proposed a pill feature extractor based on shape and color, called CoforDes. In this work, K-nearest neighbor (K-NN)-, support vector machine (SVM)-,and Bayes-based techniques were adopted to evaluate the extracted features. Moreover, CoforDes can be executed as a part of real-time embedded applications.
- Calix et al. [11] presented a method for medical personnel to use in tracking and monitoring the safe use of drugs, called the Deep Gramulator, which is designed to automatically extract tweets related to personal health experience from social media. In this work, classifiers were built based on a variety of machine learning algorithms, such as deep neural networks (DNNs), to help detect such data. However, when the Deep Gramulator was applied to an independent test set of 3,156 samples, the classifier did not perform well in terms of accuracy. Another important issue is medication adherence. Poor medication adherence can threaten people's health. Hence, many medication adherence monitoring and tracking systems have been proposed [12]–[15].
- Kalantarian et al. [12], [13] proposed a smartwatch-based system in which built-in 3-axial

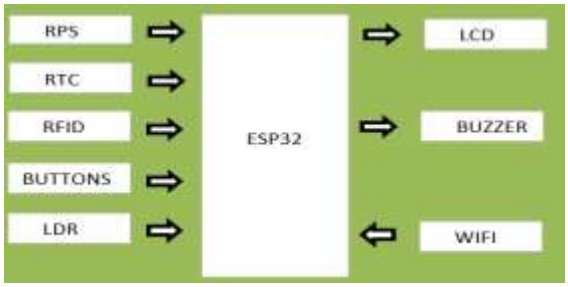
accelerometers and gyroscopes were adopted to recognize several motions for medication adherence detection. Ma et al. [14] also developed a smartwatch-based adherence monitoring system, which used machine learning and distributed computing techniques. Moreover, data were collected from built-in inertial sensors to monitor the sequence of actions occurring during a person's medication intake.

- Aldeer et al. [15] designed a noninvasive medication adherence monitoring system based on integrated collaborative sensing technology in a wireless sensor network (WSN) environment. Several sensors were mounted on the pill bottle to monitor medication adherence behavior regarding pill intake. Other related issues have also been addressed [16]–[31] in attempts to provide immediate medication records, cloudbased online medicine management systems, and personalized telemedicine services. Given several instances,
- Chen et al. [16] proposed a comprehensive medicine management system that integrated medical information from various sources. The proposed system could automatically detect inappropriate drugs. Moreover, every participant could fully track the patients' most recent medicine use online in real time.
- Kim [17] developed a medication compliance monitoring system for checking medication compliance in clinical trials. The proposed system was composed of a clinical trial database management platform and a PDA with a barcode scanner for each clinical trial participant. Related healthcare ecosystems have also been addressed, discussed and proposed [19]–[31] to enable new personalized, predictive, preemptive, pervasive, and precise e-health services.
- Jiménez-Fernández et al. [32] discussed possible issues of adaptation usability and sensor device interoperability for chronic disease management systems. They noted that a large percentage of chronic patients are also elderly patients. Their experimental results showed that sensor-network-based systems could play an important role in monitoring patients. Hence, the usability of such a sensor-network-based system must be adapted to meet the patients' needs.

- Although many solutions have been published for adverse drug events and systems for providing immediate medication records and personalized services have been developed for patients, their functions are often not comprehensive or easy to use. Therefore, in this paper, we develop an intelligent medicine recognition system based on deep learning technology. The proposed system has many benefits, such as its capabilities of perfect recording and high-precision recognition, its simple operation, and its friendly interface. Compared to other machine learning approaches, deep learning is the most effective recognition approach, achieving high recognition rates [33]. The proposed system incorporates edge computing [34] capabilities to reduce delay and to make the connected application more sensitive, thus enabling realtime computing capabilities and the performance optimization of applications based on artificial intelligence over the Internet of Things (AIoT).
- From the above survey it is observed that Disease prediction was done with traditional models such as machine learning, Data Mining using various algorithms like logistic regression, decision tree and so on. Previously existing techniques do the prediction on diseases but cannot predict the subtypes of diseases. Those systems also can't find the diseases which are caused by occurrences of any previously diseases. That fails to do predictions of all possible conditions of patients. Existing systems can handles the only structured data but ca not handles the unstructured data. Existing systems predicts the particular diseases with the help of data mining techniques which are ambiguous [18]. In the existing systems the datasets size is .small, for the patients and diseases are present some specific conditions and the characteristics are selected from experience. So such a pre selected characteristics are not satisfy the changes in the diseases and its influence factors. Those systems have a lower accuracy of diseases predictions. By using Data mining techniques algorithms such as KNN they consumes more time of prediction because those algorithms are lazy

PROPOSED SYSTEM:

BLOCK DIAGRAM



The proposed system can assist chronic patients in taking multiple medications correctly and in avoiding taking the wrong medications, which may cause drug interactions, and can provide other medication-related functionalities such as reminders to take medications on time, medication information, and chronic patient information management. The proposed system consists of an intelligent medicine recognition device, an app running on an Android-based mobile device, a deep learning training server, and a cloud-based management platform. Currently, eight different medicines can be recognized by the proposed system. The experimental results show that the recognition accuracy reaches 96.6%. Therefore, the proposed system can effectively reduce the problem of drug interactions caused by taking incorrect drugs, thereby reducing the cost of medical treatment and giving patients with chronic diseases a safe medication environment.

CONCLUSION: For home human services different innovation have advanced as audit considered, in this paper medication, its planning has all around centered which is useful to improve productivity of endorsed tranquilize and diminish financial factor. To improve the current home human services method number of checking innovation has seen which prompts home wellbeing observing framework. The checking framework can be actualized with detecting component and remote module which should need to verify so message containing the wellbeing related data ought not be degenerate. IOT (Internet of Things) assume a crucial job in imparting the two gadgets, the utilization of informing standard and correspondence convention we can safely move the significant messages with respect to wellbeing. open source IOT cloud will be powerful for putting away sensors data,the advantage of carefully putting away is the recovering of information is simple and quicker way if there should be an occurrence of crisis for secure wellbeing. For the client individual personality and Encryption/Decryption purposes the RFID will best

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DEVELOPMENT OF AN INTELLIGENT TRAFFIC CONTROL SYSTEM WITH BACKTRACKING

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ABSTRACT Fast road transportation systems are the key factors which influence the economic and industrial development of any country. Traffic congestion is an increasing problem in cities and suburbs such that suburban commuters now spend more time commuting to their work, schools and social events. Existing timer automated traffic control systems has considerably contributed to some of the problems of time wasting since vehicles have to wait at intersections, even though there is little or no traffic in the other direction. In this work, an attempt was made to develop an intelligent traffic control system with the ability to monitor and automatically pass the lane with more vehicles while also keeping track of the other lanes with fewer vehicles so as not to keep the vehicles in those other lanes waiting longer than necessary. The design was focused on sensing the traffic level on each of the lanes of the road depending on the density of each lane using Light Dependent Resistors (LDR) sensors. The arrangement of the sensors on the road layout was positioned to perform this function. For each lane of traffic to be controlled, four sensor arrays was deployed and arranged in an array of four, two transmitters and two receivers. The whole system was trained using decision tree algorithm in order to adapt to real time processing at the intersections. The testing of the project was carried out in an open field where there was little or no shades. The system was able to provide the quickest possible clearance to vehicular traffic in all directions at a junction, as well as monitor, regulate and pave way for vehicles on congested lanes while keeping track of the other lanes. Intelligent traffic control systems can be improved by training the system to adapt to real time processes using decision tree, a type of machine learning algorithm used for classification problems.

Keywords: Transportation, Light Dependent Sensor, Algorithm, Traffic Control, Machine Learning.

INTRODUCTION

Fast road transportation systems are the key factors which influence the economic and industrial development of any country. Traffic congestion is an increasing problem in cities and suburbs such that suburban commuters now spend more time commuting to their work, schools and social events. Existing timer automated traffic control systems has considerably contributed to some of the problems of time wasting since vehicles have to wait at intersections, even though there is little or no traffic in the other direction.

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In this work, an attempt was made to develop an intelligent traffic control system with the ability to monitor and automatically pass the lane with more vehicles while also keeping track of the other lanes with fewer vehicles so as not to keep the vehicles in those other lanes waiting longer than necessary. The design was focused on sensing the traffic level on each of the lanes of the road depending on the density of each lane using Light Dependent Resistors (LDR) sensors. The arrangement of the sensors on the road layout was positioned to perform this function. For each lane of traffic to be controlled, four sensor arrays was deployed and arranged in an array of four, two transmitters and two receivers. The whole system was trained using decision tree algorithm in order to adapt to real time processing at the intersections. The testing of the project was carried out in an open field where there was little or no shades. The system was able to provide the quickest possible clearance to vehicular traffic in all directions at a junction, as well as monitor, regulate and pave way for vehicles on congested lanes while keeping track of the other lanes Intelligent traffic control systems can be improved by training the system to adapt to real time processes using decision tree, a type of machine learning algorithm used for classification problems.

LITERATURE REVIEW

Traffic Congestion According to Wikipedia, Traffic congestion is a condition in transport that is characterized by slower speed, longer trip times, and increased vehicular queueing. Traffic congestion on urban road networks has increased substantially since 1950s (Caves 2004). When traffic demand is great enough that the interaction between vehicles slows the speed of the traffic stream, this results in some congestion as shown in figure 2.1a below. However, it has been argued that there is no single widely accepted definition of traffic congestion. The reason for this is associated with operational and user perspectives. The Joint Transport Research Centre (2007) of the Organization for Economic Cooperation and Development (OECD) and the European Conference of Ministers of Transport (ECMT) has provided the following definitions of traffic congestion to reflect the different broad perspectives: • Congestion is a situation in which demand for road space exceeds supply. • Congestion is the impedance vehicles impose on each other, due to the speed-flow relationship, in conditions where the use of a transport system approaches capacity. • Congestion is essentially a relative phenomenon that is linked to the difference between the roadway system performance that users expect and how the system actually performs. Just as the definitions of traffic congestion are broad so are the causes. There are many causes of traffic congestion and these differ from place to place, it is sometimes the result of urban development, housing, employment,

cultural policies which cause people to live and work relative e to one another in close proximity (ECMT, 2007).

Figure 2.1a: Highly congested Intersection (Source: Destination tips, 2018)

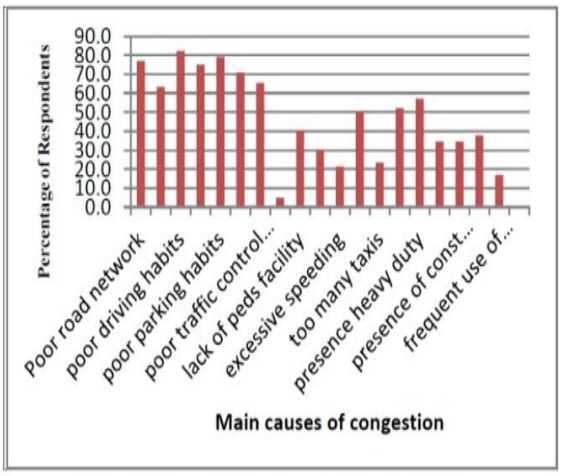


Figure 2.1b: Causes of traffic congestion (source: IJET, 2012)

A research work carried out by Joseph and Anderson (2012) showed that poor driving habits are the most significant cause of traffic congestion in Nigerian urban cities. Other major causes of traffic congestion they cited include: poor parking habits, poor road network, inadequate road capacity, lack of parking, poor drainage, presence of heavy vehicles, poorly designed junctions and roundabouts, lack of efficient mass transport system and poor traffic control/ management. Figure 2.1b shows the summary of a survey carried out to determine the main causes of traffic congestion in a certain city in Nigeria

INTELLIGENT TRAFFIC CONTROL SYSTEMS Intelligent traffic control system is defined as the application of advanced sensors, computer electronics and telecommunication technologies and management strategies in an integrated way to improve the safety and efficiency of the transportation system (Cai et al., 2013). According to Vanajakshi (2010), the major goal of intelligent transportation systems is to evaluate, develop, analyze and integrate the sensors, information communication technologies, and concept to make efficient traffic flow to improve environmental quality, save energy, conserve time as well as enhance the comfort of drivers, pedestrian and other traffic users

Backtracking Backtracking is a general algorithm for finding all (or some) solutions to some computational problems, notably constraint satisfaction problems that incrementally builds candidates to the solutions, and abandons a candidate ("backtracks") as soon as it determines that the candidate cannot possibly be completed to a valid solution (Gurari and

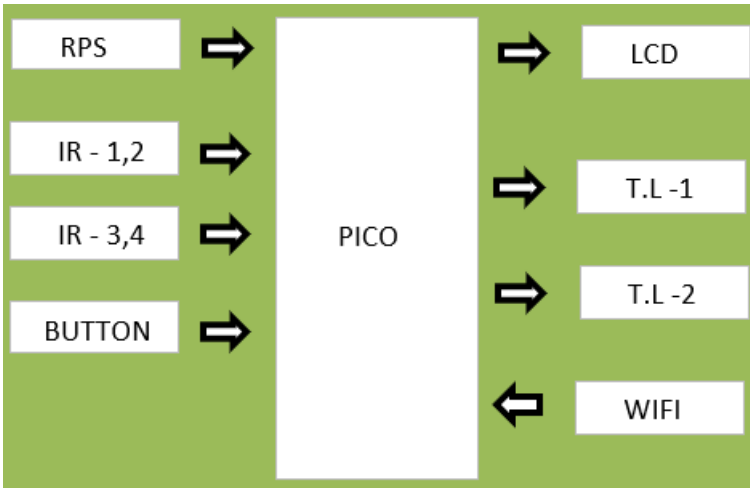
Eitan, 1999). The term "backtrack" was coined by American mathematician D. H. Lehmer in the 1950s (Rossi et al., 2006). The pioneer string-processing language SNOBOL (1962) may have been the first to provide a built-in general backtracking facility. Backtracking is an algorithmic-technique for solving problems recursively by trying to build a solution incrementally, one piece at a time, removing those solutions that fail to satisfy the constraints of the problem at any point of time (by time, here, is referred to the time elapsed till reaching any level of the search tree). A typical backtracking state tree with all the solutions is shown in figure 2.8 below. Basically, there are three types of problems in backtracking which include: • Decision Problem – In this category, we search for a feasible solution. • Optimization Problem – In this category, we search for the best solution. • Enumeration Problem – In this category, we find all feasible solutions. Backtracking can be applied only for problems which admit the concept of a "partial candidate solution" and a relatively quick test of whether it can possibly be completed to a valid solution. It is useless, for example, for locating a given value in an unordered table. When it is applicable, however, backtracking is often much faster than brute force enumeration of all complete candidates, since it can eliminate many candidates with a single test. Backtracking is an important tool for solving constraint satisfaction problems,PPsuch as crosswords, verbal arithmetic, Sudoku, and many other puzzles (Gurari, 1999). It is often the most convenient technique for parsing, for the knapsack problem and other combinational optimization problems (Biere, 2009). It is also the basis of the so-called logic programming languages such as Icon, Planner and Prolog.

HISTORICAL DEVELOPMENT OF TRAFFIC CONTROL SYSTEMS Road traffic control systems collect and analyze driving information of vehicles in an area, perform an optimal traffic signal control in accordance with the constantly changing road traffic situation, and provide useful road information to road users based on the data collected. A number of studies have been conducted in Nigeria and elsewhere concerning traffic control systems. Research efforts in traffic engineering studies have yielded the queue traffic light model in which vehicles arrive at an intersection controlled by a traffic light and form a queue. Several research efforts developed different techniques tailored towards the evaluation of the lengths of the queue in each lane on street width and the number of vehicles that are expected at a given time of day. The efficiency of the traffic light in the queue

model however, is affected by the occurrence of unexpected events such as the break-down of a vehicle or road traffic accidents thereby causing disruption to the flow of vehicles (Osigwe et al., 2011). Fathy et al., (1995) proposed an algorithm based on the queue model. The algorithm consisted of motion detection and vehicle detection operations, both of which were based on extracting the edges of the scene to reduce the effects of variations in lighting conditions. The first automated system for controlling traffic signals was developed by Leonard Casciato and Josef Kates and was first used in Toronto in 1954 (Engelmann, 1996). In 1996, Tan et al described a fuzzy logic controller for a single junction that should mimic human intelligence. The order of states was predetermined, but the controller was able to skip a state if there was no traffic in a certain direction. The amount of arriving and waiting vehicles were quantified into fuzzy variables, like many, medium and none. In experiments the fuzzy logic controller showed to be more flexible than fixed controllers and vehicle actuated controllers, allowing traffic to flow more smoothly, and reducing waiting time. A disadvantage of the controller was its dependence on the preset quantification values for the fuzzy variables which indicated that the system could fail if the total amount of traffic varies. Furthermore, the system was only tested on a single junction (Tan et al., 1996). A decentralized control model was described by Jin and Ozguner (1999). This model was a combination of multi-destination routing and real time traffic light control based on a concept of cost-to-go to different destinations. GiYoung et al., (2001) believed that electro-sensitive traffic lights had better efficiency than fixed preset traffic signal cycles because they were able to extend or shorten the signal cycle when the number of vehicles increases or decreases suddenly. Their work was centered on creating an optimal traffic signal using fuzzy control. Fuzzy membership function values between 0 and 1 were used to estimate the uncertain length of a vehicle, vehicle speed and width of a road and different kinds of conditions such as car type, speed, delay in starting time and the volume of cars in traffic were stored. Also, Findler and Stapp (2002) described a network of roads connected by traffic light based expert systems. For each traffic light controller, the set of rules were optimized by analyzing how often each rule fires, and the success it had. The system was said to be able to learn new rules. Research have shown that their system has the ability to improve performance, but they had to make some simplifying assumptions to avoid too much computation. Huang and

Miller (2004) established a believe that electronic traffic signal is expected to augment the traditional traffic light system in future intelligent transportation environments because it has the advantage of being easily visible to machines. Their work presented a basic electronic traffic signaling protocol framework and two of its derivatives, a reliable protocol for intersection traffic signals and one for stop sign signals. These protocols enabled recipient vehicles to robustly differentiate the signal's designated directions despite of potential threats (confusions) caused by reflections. They also demonstrated how to use one of the protocols to construct a sample application: a red- light alert system and also raised the issue of potential inconsistency threats caused by the uncertainty of location system being used and discuss means to handle them. Chattaraj et al., (2008) proposed a novel architecture for creating Intelligent Systems for controlling road traffic. Their system was based on the principle of the use of Radio Frequency Identification (RFID) tracking of vehicles. This architecture can be used in places where RFID tagging of vehicles is compulsory and the efficiency of the system lied in the fact that it operated traffic signals based on the current situation of vehicular volume in different directions of a road crossing and not on pre-assigned times.

PROPOSED SYSTEM



Smith et al., (2013) proposed a scalable urban traffic control system that monitors the number of vehicles in real-time by installing detectors at intersection by scanning the sensors installed in vehicles. The traffic data gathered are transferred to the traffic control to set up a scheduled scheme to apply to the intersections. Chavan et al., (2009) proposed an intelligent traffic light controller using an embedded system. The driver receives route suggestions as a reference to the destination by processing using, which connecting with analyzing the traffic flow data came from sensors set of intersections. Nie (2018) developed an intelligent traffic lights system using object detection to find out the number of vehicles at an intersection by cameras. Then fine-tune the traffic light switching by the results of the traffic density. Although those systems performed well, they gave up other vital elements like the

precision that an incorrect vehicle queue was detected by a container truck. Also, they may be costly, especially the scalable urban traffic control system (Smith et al, 2013), that needs to install an extra component to vehicles which means the system cannot be operated if vehicles pass through the road without installing sensors. Emami et al., (2018) suggested that machine learning technology is a way to solve the problem as a result of the old-styled applications not being able to satisfy the requirements in modern cities. In using deep learning, more precise information such as the type and speed of the vehicle were realized. Hawi et al., (2015) introduced fuzzy expert systems and established that wireless sensor networks proposed by Yousef et al., (2010) assist to optimized traffic in intersections when the traffic data are shared between the intersections. While fuzzy logic and wireless technologies become famous in solving this type of issue, the fundamental problem has not been resolved. That is, sensors are required to maintain the detection; hence much more costs will be required based on the well-developed traffic network such as Hong Kong. Furthermore, to conduct the data sharing between intersections and massive power to support the data exchange is also needed. While performing site testing may not be permitted in Hong Kong, simulation can perform different conditions virtually that will not affect the real traffic, especially in high traffic flow districts. Simulation of Urban Mobility (SUMO) simulator has been applied to generate the actual scenario in Mong Kok by Behrisch et al., (2011). SUMO created the road map according to the online maps. Then, the traffic flow was made and imported to the simulator. Although SUMO can generate traffic flow very well, it cannot fulfill the present day traffic needs. The traffic map cannot be modified once created so that there is a barrier to making a change to the road according to rapid constructions made or new facilities being implemented. In summary, sensors are frequently used in different solutions in detecting traffic conditions. However, limited data gathering and maintenance of these devices has become complicated (Nie, 2018).

CONCLUSION

In this paper, a smart traffic light controlling system using image processing technique to switch the traffic lights automatically was designed and developed. The proposed system was working 24 hours, and the system was adjusting with time changes. In the daytime mode was able to calculate the number of vehicles by using image subtraction technique, while, in the night-

time mode, the system was able to calculate the number of vehicles by measuring number of headlights. According to the crowdedness on lanes, the traffic signals will be switched. So, lanes with highest number of vehicles will have a longer time of green light signal. This proposed system offers the following benefits: providing easy method to control traffic light, adding intelligent to the traffic light to be more efficient, reducing the average waiting time at red lights, reducing the wastage of time for empty roads and saving energy wastage during wait at red light. As a result, this leads to greener environment and reducing the rates of accidents.

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ADVANCES RESERVATIONAND SMARTPARKING SYSTEM FOR SMART CITIES USING IOT NETWORK

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ABSTARCT:
In recent times the concept of smart cities have become very popular. Thanks to the Internet of things the idea of smart city now seems to be completed. 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

1. INTRODUCTION

The concept of Internet of Things (IoT) started with things with identity communication devices. The devices could be tracked, controlled or monitored using remote computers connected through Internet. IoT extends the use of Internet providing the communication, and thus inter-network of the devices and physical objects, or 'Things'. Internet means a vast global network of connected servers, computers, tablets and mobiles using the internationally used protocols and connecting systems. Internet enables sending, receiving, or communicating of information. Thing in English has number of uses and meanings. Dictionary meaning of 'Thing' is a term used to reference to a physical object, an action or idea, situation or activity, in case when we do not wish to be precise. IoT, in general consists of inter-network of the devices and physical objects, number of objects can gather the data at remote locations and communicate to units managing, acquiring, organizing and analyzing the data in the processes and services. It provides a vision where things (wearable, watch, alarm clock, home devices, surrounding objects with)

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become smart and behave alive through sensing, computing and communicating by embedded small devices which interact with remote objects or persons
through connectivity. The scalable and robust nature of Cloud computing is allowing developers
to create and host their applications on it. Cloud acts as a perfect partner for IoT as it acts as a platform where all the sensor data can be stored and accessed from remote locations. These factors gave rise to the amalgamation of both technologies thus leading to the formation of a new technology called Cloud of Things (CoT). In CoT the things (nodes) could be accessed, monitored and controlled from any remote location through the cloud. Due to high scalability in cloud any number of node could be added or Removed from the IoT system on a real time basis. In simple terms IoT can be explained in form of an equation stating: Physical Object + Controller, Sensor and Actuators + Internet = Internet of Things

The idea of creating a Smart City is now becoming possible. With the emergence of the Internet of Things. One of the key issues that smart cities relate to is car parking facilities and traffic management systems. 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. Recent advances in creating low-cost, low-power embedded systems are helping developers to

build new applications for Internet of Things. Followed by the developments in sensor technology, many modern cities have opted for deploying various IoT based systems in and around the cities for the purpose of monitoring. A recent survey performed by the International Parking Institute reflects an increase in number of innovative ideas related to parking systems. At present there are certain parking systems that claim to citizens of delivering real time information about, available parking spaces. Such systems require efficient sensors to be deployed in the parking areas for monitoring the occupancy as well as quick data processing units in order to gain practical insights from data collected over various sources.

2. PROBLEM STATEMENT & OBJECTIVE

Problem Statement

- Parking management influences drivers search time and cost for parking spaces.
- It may also causes traffic congestion.
- Finding a parking space in most metropolitan areas, especially during the rush hours, is difficult for drivers.
- Difficulty arises from not knowing where the available spaces may be at that time traffic congestion may occur.

Objective

- Parking space reservation can help drivers to reduce the search time dramatically.
- With the real-time reservation service, the drivers can find and reserve their desired vacant parking spaces quickly. Therefore, the gasoline and time in search of vacant parking space is reduced.
- It reduces time in search of vacant parking spaces is reduced so it reduces traffic congestion caused due that.

IMPLEMENTATION

At User:

2. At Parking Area:

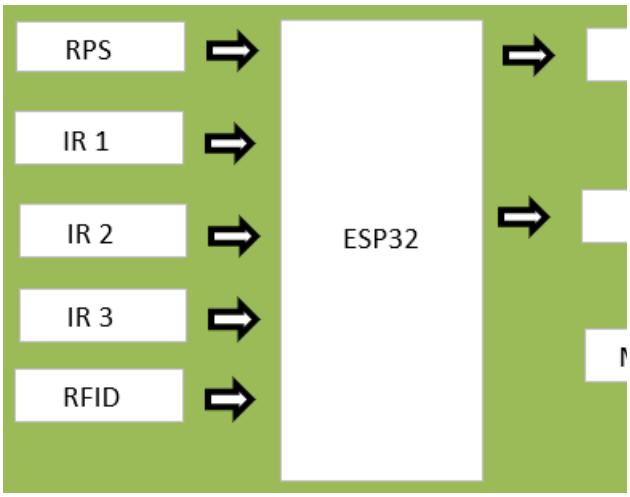

Fig 3.1 : Block diagram smart parking system for smart cities using IOT network

WORKING PRINCIPLE Algorithm

- Start.
- Turn on the power supply.
- IR sensor will get activated.
- Search online for empty parking slot from android application.
- Space detection will start.
- If space is detected data sends and stored on cloud by sending system status by IOT.
- LED will start showing the number of parking slots
- Display on front LCD that the slot is booked.
- Else go to step 5.
- Shows space on cloud.
- We can now book empty parking slot online.
- LED indication will get off.
- IR sensor will open a gate.
- End.

CONCLUSION The concept of Smart Cities have always been a dream for humanity. 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 given rise to new possibilities in terms of smart 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.

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A MOTIONLESS HAND GESTICULATION AND FACE RECOGNITION SYSTEM FOR BLIND PEOPLE

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ABSTRACT Recognizing others is a major challenge for people with visual impairments (VIPs) and can hinder their social engagement. We present Accessibility Bot, a research prototype bot on Facebook Messenger, which leverages state-of-the-art computer vision algorithms and the existing set of tagged photos of a user's friends on Facebook to help people with visually impairments recognize their friends. Accessibility Bot provides users information about the identity of friends in camera and their facial expressions and attributes. To guide our design, we interviewed eight VIPs to understand their challenges and needs in social activities. We then conducted a diary study with six VIPs to study the use of Accessibility Bot in everyday life. While most participants found the Bot helpful, their experience was undermined by perceived low recognition accuracy, difficulty aiming a camera, and lack of knowledge about the phone's status. We discuss these real-world challenges, identify suitable use cases for Accessibility Bot, and distill design implications for future face recognition applications.

Author Keywords Visual impairment; face recognition; social activity

ACM Classification Keywords H.5.1. Information interfaces and presentation: Multimedia Information Systems; K.4.2. Computers and Society: Social Issues.

INTRODUCTION

Recognizing people is a major challenge for people with visual impairments (VIPs) [15,42], preventing them from fully engaging in many social activities and undermining their sense of privacy and physical security [4]. For example, when a VIP enters a meeting room, classroom, or cafeteria, it is difficult for her to know who is present. As a result, VIPs can be reluctant to leave their homes, which may cause more anxiety and depression [17,42]. Face recognition technology presents an opportunity for VIPs to overcome this challenge. State-of-the-art computer vision algorithms can detect [31,39,57] and recognize faces This system acts as an Intelligent virtual assistant which helps in bringing the world closer and helps in meeting different ends together. Through this system use of facial recognition and hand

gesture to assist and work with the environment to make it a better place to live for the blind. There are different ways in which it is helping to make this happen and for that hand gesture and facial recognition, system is being used. This system is using computer vision technology this tech has been used for human computer interaction (HCI) using a physical medium where hand gesture and facial recognition plays a major role. Hand gestures have been done since the dawn of civilization and have various meaning depending on the geographical location [1]. Hand gesture have various application in military gaming etc. Methods without using computer vision has also been developed like the wearable gloves but they are too costly as they need sensors and other hardware devices there are numerous algorithm for hand gesture recognition like KNN (K Nearest Neighbor), artificial neural network but most of the algorithm require large amount of samples for training and recognition to overcome this problem convex hull and convexity hull defects are used for gesture recognition. The recognition of hand gestures are of two types, that is, Dynamic gesture and static gesture, so in this research we have covered the section of static gesture recognition. In facial recognition system, two methods are used Haar cascade method and Linear Binary Pattern (LBP) for better prediction we use LBP method. In 2004, a Haar cascade classifier technique was proposed by Voila Jones which has been a motivation to various face recognition systems.[2] LBP is used as a visual description in which classification using computer vision is made using open cv each image is converted into a series of code. a pixel is taken and then the image is given a particular value. This value is predefined based on a series of codes. A LBP histogram mainly works on four parameters: radius, neighbor, Grid X, Grid Y. A radius has an initial value 1, which builds a central pixel, which is used to build circular local binary pattern. Neighbors on the other hand are used to create a sample points to increase the accuracy of facial detection but it comes with drawback of increasing computational cost. Grid x and Grid y are horizontal and vertical features to recognize an image

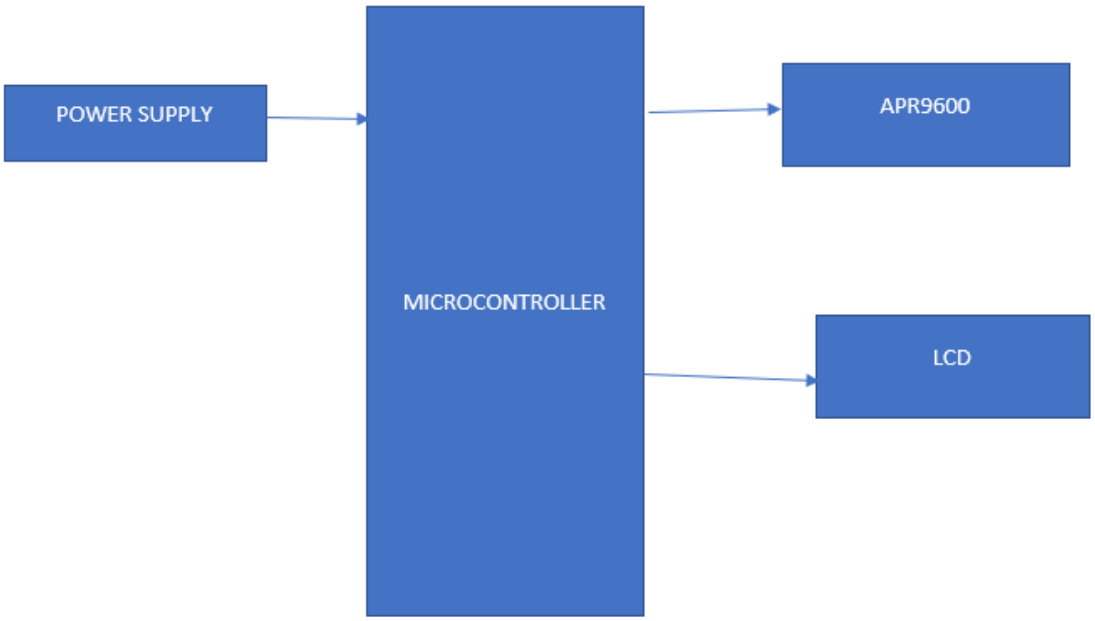
EXISTING SYSTEM

The existing recognition system has only having the hand gesture recognisation. That system doesn’t having the image recognisation.

DISADVANTAGES

- Sometimes may get less image quality.
- Storage issue.

BLOCK DIAGRAM



The input is taken from front facing Camera. The proposed Recognition System is divided into two parts –

- Hand Gesture Recognition
- Facial Recognition

HAND REGION DETECTION

In order to split hand from the real time images RGB colour

$$\begin{aligned} Y &= 0.257R + 0.564G + 0.098B + 16 \\ Cb &= -0.148R - 0.291G + 0.439B + 128 \\ Cr &= 0.5R - 0.419G - 0.081B + 128 \end{aligned} \quad (1)$$

space is converted to YCbCr colour space. [4]

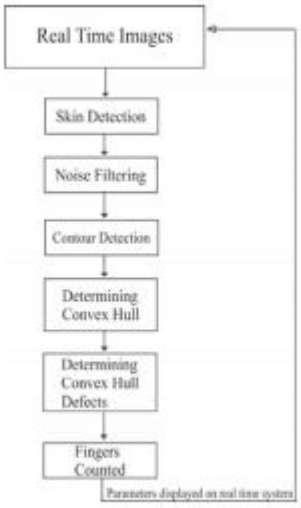


Figure 1: Proposed System Architecture for Hand Gesture Recognition

FACE DETECTION It is an object detection method used to discover faces or cars or any object. This system is provided with positive and negative images and selection of features along with the classifier training and integral images [7]. Each feature is the difference sum of the pixels within two rectangular regions. These rectangular regions are nothing but the darker and the lighter regions. These sectors have same size and shape horizontally or vertically. To find the sum of pixels, under black and white regions, the concept of integral images is introduced. No matter how large may be the number of pixels; it operates over only a AdaBoost does the selection of most appropriate features out of a large set of features. Weak classifiers are combined to form the final classifier. They are weak because alone they cannot identify the object. Each stage of cascade must not have a low false negative rate as when face is classified as non-object then the classification stops. Each stage must have a high false positive rate which means the erroneous detection of an object as face, thus this error can be corrected in (n+1)th stage and succeeding stages in classifier

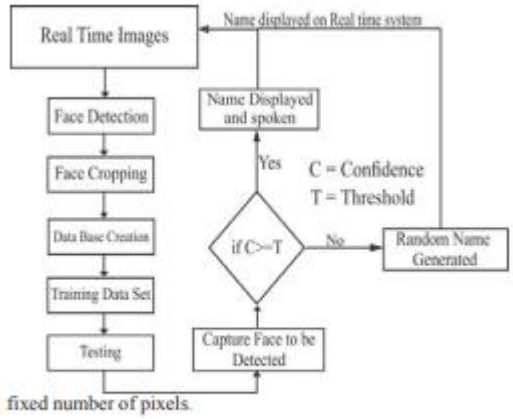
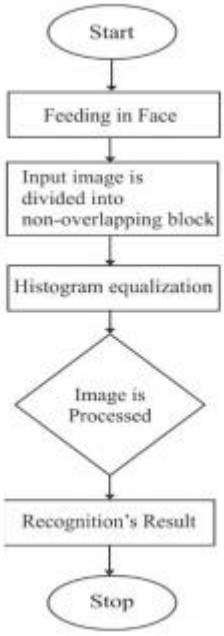


Figure 4: Proposed System Architecture for Face Recognition

FLOW CHART:



The system introduced in this paper can be helpful for a blind person and can act as a virtual assistant for it. Haar cascade Classifiers and LBPH recognizers has been used for face detection and identification in the real time whereas Convex hull and Convex defects algorithm has been used to detect the Hand gestures in real time. Skin color recognition has been in YCbCr color space and different threshold ranges have been used to detect skin color in different lighting conditions and skin color. Hand gestures are recognized with an accuracy of 95.2% and face recognition and identification has been done with an accuracy of 92%. There are some limitations, which are needed to be addressed. Recognizing more amount of

gestures would be helpful for performing more tasks. Alternate methods like MLBPH [12] or LBPH + CNN [13] can be used to improve the gesture recognition and face recognition must be considered.

ADVANTAGES

- No need of man power
- No man errors.
- Save time

APPLICATIONS Application is limited only by our imagination. Not only blind people can use it but also a number of industries can use this technology. Hand gestures can be applied in the field of telemedicine or surgery and even in locking systems. Industrial robots can also take an advantage of hand gestures. While Facial recognition have its own applications like it is used in security, criminal identification, Advertising and Healthcare. Due to use of LBPH Recognizers, facial recognition can also be done in low light.

CONCLUSION AND FUTURESCOPE The system introduced in this paper can be helpful for a blind person and can act as a virtual assistant for it. Haar cascade Classifiers and LBPH recognizers has been used for face detection and identification in the real time whereas Convex hull and Convex defects algorithm has been used to detect the Hand gestures in real time. Skin color recognition has been in YCbCr color space and different threshold ranges have been used to detect skin color in different lighting conditions and skin color. Hand gestures are recognized with an accuracy of 95.2% and face recognition and identification has been done with an accuracy of 92%. There are some limitations, which are needed to be addressed. Recognizing more amount of gestures would be helpful for performing more tasks. Alternate methods like MLBPH [12] or LBPH + CNN [13] can be used to improve the gesture recognition and face recognition must be considered.

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A ROBUST SECURITY FRAMEWORK FOR CLOUD-BASED LOGISTICS SERVICES

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ABSTRACT:

In recent years, cloud-based logistics services are quite popular among business enterprises. Cloud computing is attributed to amassed competitiveness by focusing on cost reduction, higher elasticity, flexibility and maximum utilization of resources, which results in successfully achieving business goals. Further, Logistics is the area that requires effective and integrated means of communication, shared risk, collaboration, and orchestration to work successfully and the cloud computing has a lot to offer to this domain. While implementing the cloud-based logistics services, security is considered to be one of the major concerns for corporate entities. This project proposes a robust security framework for cloud-based logistics services. As a result, upon implementation, this model can provide long-term benefits for the business enterprises by improving the overall cloud-based logistics services security.

Keywords: Logistic, Cloud, robust security, security.

INTRODUCTION In recent years, the development of cloud computing has been considered as a unique feature among the key progresses in the area of computing. The distribution of quick, reasonably-priced and scalable services to people and corporate establishments is referred to as cloud computing. It is a ground-breaking standard that expedites the clienteles to implement their project operations and also aides to store the information in the third-party possessed servers. Since the implementation of cloud computing standards has several benefits like pliability, universal availability, convenience, easy maintenance, and economic pay-per-use billing models for corporate entities [1] [2]. The cloud computing services are divided into three major categories, software as a service (SaaS), Platform as a Service (PaaS), and infrastructure as a

service. The applications are running in the cloud are known as SaaS, and it presents an architecture that can run several instances of itself regardless of location. PaaS is a platform that enables developers to write applications to run on the cloud. This would have various applications that can be deployed instantly. The last category is infrastructure as a service that can be accessible by internet technologies and shares the computing infrastructure. The sharing resources are like servers, storage, security, databases, etc. Four different models are suggested in cloud computing. The first model is the public deployment model in which the third parties or any organization operated and distribute services to the public domains. The second is the private model, which is owned and operated by the organization and severed for their internal users. The third model is a community model which operated and organized for specific communities. The last model is a hybrid, which is a mixture of two or more clouds [3][4][5][51][52]. These providers also account for modern-day networks, such as 5G, Internet of Things, as well as novel allocation strategies for handling diversified services [6][7]. Mostly, the Cloud Service Providers are responsible for handling and functioning of the Public cloud infrastructure [51]. Furthermore, it is accessed by an extensive assortment of registered clienteles, and the CSP is liable for the configuration and organization of these services. While considering the private cloud infrastructure, it is handled and functioned by either the CSP or clienteles. However, in some particular scenarios, both the CSP and clienteles are involved in handling and managing the private cloud infrastructure that is owned by a solitary client. The community cloud infrastructure is catered for the needs and utility of a particular selective cluster of establishments. The hybrid cloud is the amalgamation of several disparate cloud models like the public, private and community exemplars for providing tailored infrastructure utilities depending on the needs of an establishment or institution [8][9][10][11]. The organizations can evade a conciliation of their functioning efficacy by implementing the cloud associated infrastructure for swiftly enhancing, successfully recognizing and utilizing the scientific elucidations [12]. Amongst the corporate entities, the private and public cloud associated elucidations are mutually attaining prominence. Nevertheless, as a result of witnessing the goals of the business entities and also considering the cost-to-serve metrics, it can be observed that solely the private cloud models are contending with the predominantly available public cloud models. Additionally, hybrid clouds are designed and tailored based on the specific necessities of corporate organizations. Furthermore, for constructing a hybrid cloud model, at least a solitary public and a

single private cloud infrastructure are essential. Moreover, based on the necessities of corporate enterprises, numerous public and private cloud services can be amalgamated together to build a hybrid cloud infrastructure. Besides, the hybrid cloud services are a seamless and an equilateral blend of both the exterior and interior assets that offer a perfect fusion of swiftness, cost leadership, dynamism and servicelevels [13].

EXISTING SYSTEM:

In the existing system, the details regarding logistics been saved in a cloud so that one can view that anytime. No security to the logistics is provided to logistics as this system is entirely software based.

Drawbacks:

- No security to logistics.
- Purely software based.

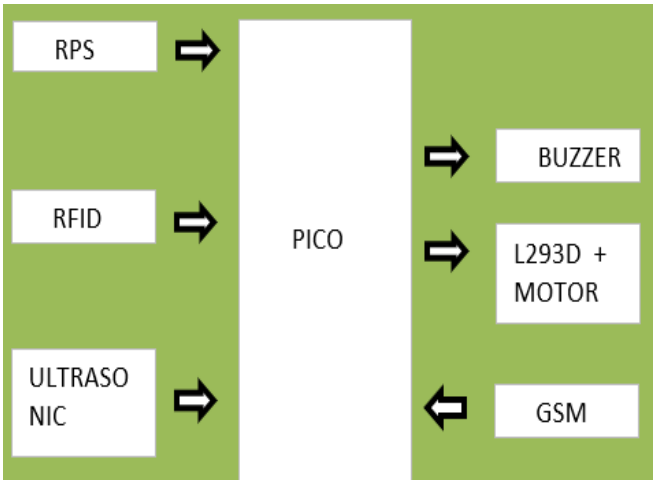
LITERATURE REVIEW

Cloud computing supports various business organizations through high financial savings. The cloud provides streamline processes of the enterprise with adequate productivity and transforming business processes and reducing the cost. The cloud computing helps in business to attain scalability, more satisfied customers and provide reliable backups. In the era of cloud computing, various researches have been conducted to enhance the facilities of cloud-driven networks. Uchenna et al. [31] gave a cloudbased virtual organization framework that Integrates Cloud Computing Model (CCM) with the Virtual Value Creation (VVC) framework of Virtual Organization (VO) to improve traditional methods of business. Mushtaq et al. [32] focused on information security in cloud computing. The authors focused on secure data transmission, encryption of data and it is Processing, Secure database, Shell, and logs in the clouds. Ukil et al. [33] give a security framework to manage the cloud system more efficiently and provide security and mitigate threats. Tawalbeh et al. [34] suggested cloud computing framework in which the data is classified based on the importance and important data is encrypted. Arjunan and Modi [35] suggested an intrusion detection system for clouds based on signature and anomaly-based techniques. The IDS helps to identify various attacks in the cloud. Marwan et al. [36] suggested a

secure framework for cloudbased medical image storage in which segmentation and watermarking mechanisms are used to provide privacy in the saving of a medical image. Al-Bahadili et al. [37] suggested Cloud Collaborative Commerce (cc-commerce) model to Supports cost-effective computing resources for businesses and reduce installation and running costs, delay, Security, etc. Tawalbeh et al. [38] presented the secure mobile cloud computing framework which used trust delegation technique to provide better security and performance. The state-of-the-art comparison of existing approach for cloud-driven networks is presented in Table 1. Some other research works to follow are, cloud computing governance [39], securing the cloud-Governance[40, big data fraud detection[41], single sign-on for clouds[42], proactive user-centric security[43], preventing insider cyber threats[44], authentication and authorizations[45], email spam prevention in logistics[46], proxy network formations[47], firewall management[48][49]and big-traffic evaluations [50].

PROPOSED SYSTEM:

In the proposed system, we have used the hardware interface in order to provide security and safety to the logistics. For intruder detection, an IR sensor is used; for fire detection, a fire sensor is used. If any of these conditions becomes true, the camera will capture the image and will send it to the authorized person.



Advantages:

- Security to logistics

- Immediate alert when a fire accident occurs or intruder comes.
- Hardware interface makes it more efficient to use.

Applications:

- In Industries like automation, manufacturing to provide security and safety for logistics.

CONCLUSION Cloud-based logistics management helps business organizations to support flexible and reliable handling of a large amount of data. The article discussed unmentioned and undiscovered security issues that positively affect cloud systems. Recently, a wide range of researchers emphasized the known problems of the cloud systems and suggest various solutions. However, if a cloud system is to be widely adopted, better solutions are still needed. In this article, a conceptualized robust security framework for cloud-based logistics services is presented. Moreover, a security enhancement layer is included at each layer of the cloud with a feasibility study on protecting user information in the logistics services ambiance. Also, the Data Residency for cloud-based logistics services is elaborated with Data Security analysis. Further, the article discusses the possible solutions to handle the security concerns of the logistic model. In the future, the cloud-based security through misbehavior detections and vulnerabilities assessment will be focused.

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A REAL-TIME HEALTH MONITORING SYSTEM FOR PATIENTS USING NON-INVASIVE SENSOR

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ABSTRACT

This paper introduces a wearable Tele-ECG and heart rate (HR) monitoring system which has a novel architecture including a stretchable singlet redesigned with textile electrodes (TEs), textile threads, snap fasteners, Velcro, sponges, and an ECG circuit. In addition, a Bluetooth low energy (BLE), a smartphone, a server, and a web page have been added to the system for remote monitoring. The TE can be attached to and removed from the singlet by a Velcro, which allows the user to dry-clean the TE easily for long-term use. A new holter-based ECG system has been designed to evaluate the TE-based ECG system and the average correlation between the recorded ECG signals is obtained as 99.23%. A filtered digital signal, with a high signal-to-noise ratio of 45.62 dB, is transmitted to the smartphone via BLE. The ECG signal is plotted, the HR is calculated with 1.83% mean absolute percentage error, and displayed. The data are sent to the server, allowing the patient's physician to analyze the signals in real time through the web page or the smartphone. If HR reaches beyond the normal range or user presses the "HELP" button on the smartphone screen, the physician is informed automatically by an short message service (SMS) with a location pin on the map. The battery lasts approximately 14 days and when it needs replacement, the system automatically alerts the users by an SMS and a flashing LED. This fast and uninterrupted telemonitoring system has the potential to improve the patient's life quality by providing a psychological reassurance

INTRODUCTION:

During the recent decade, rapid advancements in healthcare services and low cost wireless communication have

greatly assisted in coping with the problem of fewer medical facilities. The integration of mobile communications with wearable sensors has facilitated the shift of healthcare services from clinic-centric to patient-centric and is termed as "Telemedicine" in the literature [1]. In the larger perspective, telemedicine can be of two types: (1) live communication type, where the presence of the doctor and patient is necessary with additional requirements of high bandwidth and good data speed, and (2) store and forward type, which requires acquisition of medical parameters such as vital signs, images, videos, and transmission of patients data to concerned specialist in hospital [2, 3]. According to existing medical surveys, telemedicine has been adopted to take care of the patients with cardiac diseases, diabetes, hypotension, hypertension, hyperthermia, and hypothermia [4–8]. The most promising application is in real-time monitoring of chronic illnesses such as cardiopulmonary disease, asthma, and heart failure in patients located far from the medical care facilities through wireless monitoring systems [9]. Heart diseases have become one of the leading causes of human fatalities around the world; for instance, approximately 2.8 million people die each year as a result of being overweight or obese as obesity can lead to adverse metabolic effects on blood pressure and cholesterol which ultimately increases the risks of coronary heart disease, ischemic stroke, diabetes mellitus, and a number of common cancers [10]. According to WHO, it has been estimated that heart disease rate might increase to 23.3% worldwide by the year 2030 [11]. The treatment of such chronic diseases requires continuous and long term monitoring to control threat. PATIENT care demands on hospitals are on the rise in parallel with the growth of the world population and the accompanying rise in chronic diseases. According to the mortality statistics recorded in 2015, 17.7 million people have lost their lives due to cardiovascular diseases in the world. This number corresponds to 31% of the total number of deaths [1]. Instrumentation and measurement (I and M) are a keystone to diagnose each disease [2]. ECG measuring is quite important to examine and monitor a patient with heart problems. In a conventional ECG measuring system, Ag/AgCl electrodes are attached to the body, with conducive gel at the electrode–skin interface, for signal acquisition to derive certain ECG leads. The conductive gel may be toxic and cause skin irritation [3], [4] and the Ag/AgCl electrodes may cause allergic reactions of the skin [5]. Despite their high conductance initially, after prolonged use, Ag/AgCl, lose their adherence resulting in signal loss and

requiring replacement. Therefore, the use of Ag/AgCl electrodes for extended periods of patient monitoring is not appropriate. As alternatives, dry metal electrodes have been used [6], [7] and some studies have explored textile electrode (TE) that has a minimal effect on patient's normal lifestyle [8]–[12]. The TE also has high contact conductivity that is essential for a reliable ECG acquisition [13], [14]. TE can be used to pick up ECG, EEG, and electromyogram (EMG) signals and they have been proven to be as reliable as Ag/AgCl electrodes [15]. In normal conditions, the conductance of TEbased ECG monitor is regarded as equivalent to Ag/AgCl. Humid conditions are advantageous rather than detrimental to TE-based monitor due to the electrolytic properties of sweat. The electrolyte includes molecules and ions. Therefore, it increases electrical conductivity [16], [17]. Contactless ECG sensors provide the convenience of monitoring in nonhospital environments [18]. Diverse ECG measurement systems have been reported including systems that can be fixed to chair [19], bed [8] or can be adapted to clothes [20]–[22]. Nemati et al. [3] demonstrated a wireless ECG monitoring system which consisted of a belt stretched inside a T-shirt and equipped with three capacitive electrodes, where the ECG measuring is transmitted to a PC, requiring the user to own a PC. However, once this proposed system is preferred, the patients can use their existing cell phone for monitoring the vital signs. Mahmud et al. [6] collected ECG signals using two electric potential integrated circuit sensors fitted in a phone case and were able to transmit the signal with an Rfduino through Bluetooth low energy (BLE) and displayed the ECG signal on a cell phone. They also use smartphone memory to save ECG data, which is not appropriate for multiple usages due to limited data storage. In this paper, both local memory and server are implemented to allow multiple patient follow-ups without limitation to data storage. Chamadiya et al. [8] performed ECG measurements with electrodes fitted on stretchers, wheelchairs, and patient beds. They installed the conventional Ag/AgCl and TE on the same measurement setup to compare the results of both electrode types and concluded that there was no discrepancy between the measurements of the two types. In their work, the patient had to be stable in the supine position dictated by the measurement system or had to maintain contact with electrodes reclining back in a chair, which restricts the movement of the patient. On the other hand, in this paper, the person does not need to recline against or maintain contact with anything and, hence, favorable since the ECG is acquired

under normal motion and living conditions. Pani et al. [23] concluded that ECG devices as wearable devices, using either dry or wet TE, without any discomfort to the patients. TE is used in this paper as well. For remote monitoring, a smartphone, an Internet of Things (IoT) server, and a web interface are implemented in the system. To monitor ECG, Yoo et al. [24] developed a 24-h data acquisition system comprising TE in a smart dress. However, they reported ECG signal without heart rate (HR) or location. Lamonaca et al. [25] equipped a smartphone with new sensors and used existing sensors on the smartphone to measure the body posture, falling, HR, blood oxygen saturation, eye pathologies, and respiratory system. Their system does not have a wearable part, and the HR was calculated using captured face image providing an added benefit for the user in case of instant HR measurement [25]. However, in case HR must be measured continuously, the system proposed in this paper would be preferred since the system measures ECG and HR continuously in real time. Pandian et al. [26] measured noninvasive physiological parameters and saved ECG data using electrodes placed on a vest. They also indicated photoplethysmogram, body temperature, blood pressure, galvanic skin response, and HR [26]. They used wireless and GPS module with their circuits for data transmitting without smartphone or BLE. As a result, their system consumes more power, and they reported that their system runs for a limited time of 4.5 h, which is not optimal. However, the proposed system in this paper can run approximately 335 h (14 days) continuously. Using a smartphone instead of a device without GPS was found more useful [27]. Arteaga-Falconi et al. [28] utilized the benefits of smartphone and developed a mobile biometric authentication by using measured ECG signal. This could be merged with the wearable ECG monitoring systems. To solve energy consumption, Luo et al. [29] proposed an ECG compression process, using which allowed lowering of data transmission and power consumption. They send the data to a computer with a wireless module. The user is required to use a computer for the initial setup. However, once the proposed system is chosen, the users do not need to have a computer. They can easily use an existing smartphone with the developed custom application. Dionisi et al. [30] proposed a flexible solar panel for their wearable monitoring system, which is a convenience to the user as it mitigates power consumption and frequent battery replacement problems. However, in the evening or midnight, the system stops since it needs daylight to operate. In this

paper, the demonstrated system runs uninterrupted for a long time independent of daylight. In the future, a hybrid system could be developed, consisting of both solar panel and a battery. In this paper, a wearable Tele-ECG monitoring system with a novel architecture consisted of TE, Velcro, textile thread, snap fasteners, sponge, and ECG front end has been designed to monitor ECG of the users while allowing the users to have a comfortable daily life and maintain better hygiene. In the previous studies, TE was generally sewn on a T-shirt or belt [9], [13]. In this case, cleaning of TE is not easy since the TE needs to be dry-cleaned. In addition, the TEs have to be sewn to different sized clothes for different weighted people. On the other hand, in this paper, the novel architecture is designed to achieve good quality ECG signal with TEs that can be easily attached, transferred, or removed from any different sized clothes by the Velcro. The TE can be easily dry-cleaned and its position adjusted on a human body. Also, there is no electrical cable on the system as the ECG signal is carried by the textile thread. The attached snap fasteners receive the ECG signals from the textile thread and transfer it to the electronic ECG circuit. The developed ECG I and M system measures the ECG signal, detect the HR, monitor them on both a cell phone and a web page, and record the signals both in the cell phone memory (if necessary) and custom server. The ECG front-end circuit has been designed and integrated with a CC2650MODA which is a 32-bit ARM Cortex-M3-M0 microcontroller (MCU) in industrial scientific and medical band incorporating a BLE to transmit the data using a radio link. The electronic card prototype has been enclosed in a case produced with a 3-D printer. The circuit card and three TEs have been fitted inside the stretchable singlet. Analog signals picked up by TE are amplified and filtered by the front-end circuit, then digitized and further filtered by a digital filter (DF) in the MCU and ultimately sent to a smartphone using the BLE. In addition to viewing the ECG signal and HR on the physicians' smartphone screen, the data are retransmitted to the server. Moreover, the physician can be alerted automatically during an emergency HR level or by pressing a specialized "HELP" button for immediate attention, which could provide faster healthcare access to the patients. The medical specialists can view the ECG, HR, medical history, and location information of patients. To evaluate ECG, a holter-based new ECG system has also been designed and the data have been recorded from both TE- and holter-based systems. Their average correlation of ECG signals is 99.23% and maximum signal-to-noise

ratio (SNR) value of TE-based system is 45.62 dB. To evaluate HR, the both designed system and a fingertip pulse oximeter have measured the HR values in the same condition and their minimum mean absolute error (MAE) and mean absolute percentage error (MAPE) are 1.1% and 1.83%, respectively. Merging new technologies provides several novelties to this paper as easily washable TE and BLE usage are more novel than Ag/AgCL electrodes and Bluetooth/cable usage. Battery life of nearly 14 days of the proposed study is another novelty. The automated emergency alert with calculated HR value, manual help request, and battery replacement alert contribute novelties of the system that are aimed to enhance user experience. Additional novelties are that the physician can control the system; can add or remove new patients, follow vital signs in real time with location information, and add patients' medical history to the server and observe them continuously on the smartphone or web interfaces. The developed system is appraised to be quite beneficial for cardiac patients and their physicians

LITERATURE REVIEW:

In "S. Shirmohammadi, K. Barbe, D. Grimaldi, S. Rapuano, and S. Grassini, "Instrumentation and measurement in medical, biomedical, and healthcare systems," IEEE Instrum. Meas. Mag., vol. 19, no. 5, pp. 6–12, Oct. 2016"

Proper measurement is crucial in the medical, biomedical, and healthcare fields because it forms the basis of medical diagnosis, prognosis, and evaluation. In fact, it is known that "measuring is the cornerstone of medical research and clinical practice" [1]. Medical professionals such as doctors or clinical laboratory scientists must have confidence in the results reported by their instruments or their measurement methods to make the correct decision for their patient. While in many industries incorrect measurements would simply lead to customer dissatisfaction or loss of money, in the medical field incorrect measurements could be fatal and lead to loss of life. Hence, we can say that proper instrumentation and measurement is vital in the medical field. In this article, we take a look at the latest biomedical topics from the perspective of Instrumentation and Measurement (I&M), and we summarize the latest medical I&M topics published in IEEE Transactions on Instrumentation and Measurement (TIM), to familiarize medical practitioners and researchers in how to achieve a proper medical I&M paper. We also briefly introduce the IEEE Instrumentation and Measurement Society's (IMS) main medical conference,

the IEEE Symposium on Medical Measurements and Applications (IEEE MeMeA), which promotes the I&M aspects of the medical field in general, and we present guidelines on the I&M aspects that are useful for authors with primarily biomedical backgrounds who would like to publish in IEEE TIM. I&M as a field is primarily interested in measuring, detecting, monitoring, and recording of a phenomenon referred to as the measurand, and associated calibration, uncertainty, tools, and applications. The fundamentals of I&M apply to any kind of instrument or measurement, including medical ones. As such, it is not surprising to see that IEEE TIM, the flagship journal of the IMS, receives a significant number of submissions in the medical field. Many of the submissions are in medical imaging, which we consider part of Vision Based Measurement, a subject area already discussed in another overview article [2]. The remaining submissions, especially in recent years, are mostly in the subject areas of physiological monitors and sensors, and health parameters monitoring, which are the subjects of this article. It is not surprising to see more submissions in these specific subject areas because of the ever-increasing advancements in today's mobile devices with touchscreens, context monitoring, voice and gesture recognition, etc., which has created a boom in their usage in medical applications. It should be noted that this article is meant as an overview only and we cannot cover in detail the complete range of I&M aspects in the medical field: measurement accuracy, uncertainty, instrument reliability, calibration against the gold standard, and complying with various regional, national, or international medical regulations. With this in mind, let us start by looking at physiological monitors and sensors from an I&M perspective. Physiological Instruments The technological revolution in recent years has opened opportunities for bringing medical facilities to everyone's home doorstep. This is realized not only by numerous apps available for smartphones, such as [3] and [4], but also by specialized devices, which are provided in portable format. For such devices, two major open questions arise for the I&M community: ◗ How can we safeguard that the clinical quality of measurements is achieved using the low cost measurement equipment in a home environment? and ◗ How are abuse and misusage avoided when medical devices are brought into a home environment and then operated by a lay user? The most important key to solving these questions is to enhance the signal quality. Since specialized equipment forces the price extremely high, inexpensive low cost equipment can be

equipped with advanced signal processing tools, which are not expensive. In addition, specialized sensors can be replaced by lower cost sensors or measurement devices, which a layperson can operate that have a dedicated mathematical model or data analysis technique that can compute the physiological parameter of interest from the acquired measurements.

IN "E. NEMATI, M. J. DEEN, AND T. MONDAL, "A WIRELESS WEARABLE ECG SENSOR FOR LONG-TERM APPLICATIONS," IEEE COMMUN. MAG., VOL. 50, NO. 1, PP. 36–43, JAN. 2012" Ubiquitous vital signs sensing using wireless medical sensors are promising alternatives to conventional, in-hospital healthcare systems. In this work, a wearable ECG sensor is proposed. This sensor system combined an appropriate wireless protocol for data communication with capacitive ECG signal sensing and processing. The ANT protocol was used as a low-data-rate wireless module to reduce the power consumption and size of the sensor. Furthermore, capacitive ECG sensing is a simple technique that avoids direct contact with the skin and provides maximum convenience to the user. In our work, small capacitive electrodes were integrated into a cotton T-shirt together with a signal processing and transmitting board on a two-layer standard printed circuit board design technology. The entire system has small size, is thin, and has low power consumption compared to recent ECG monitoring systems. In addition, appropriate signal conditioning and processing were implemented to remove motion artifacts. The acquired ECG signals are comparable to ones obtained using conventional glued-on electrodes, and are easily read and interpreted by a cardiologist Electrocardiography (ECG) is one of the most widely used vital sign sensing and health monitoring methods and provides useful diagnostic information about the cardiovascular system. It can be used as powerful indicator of some specific physiological and pathological conditions of humans. With the increase in coronary diseases during the past few decades, continuous monitoring of the ECG signal of high-risk patients can play an important role in immediately detecting pathological signatures and arrhythmias. Using this concept, any deviation of the health status of an individual from their norm can be detected and sent to a health center for early and further analysis and preventative actions. Studies have proven that this type of ECG monitoring, if it does not interfere with daily activities, can improve the diagnosis and therapy of some of the most prevalent cardiac diseases [1–3]. Currently, ECG can be performed using

many methods. The conventional clinical ECG system employs 12 or 15 Ag-AgCl electrodes (wet ECG), which are affixed to specific parts of the chest, arms, or hands and legs. This often requires cleaning the attachment site and, if necessary, shaving the hair off some parts of the body. In this way, the electrodes, which consist of gel in the middle of a pad, can be used to provide a conducting medium for charge transfer between the electrodes and the body. To keep the electrodes in place, extra adhesive tape is also applied. Although this type of ECG provides good signal quality, it is inconvenient and may cause skin irritation, allergic reactions, and inflammation due to toxicological issues of the gels in long-term treatments [1–4]. In addition, the quality of the signal will be reduced as the gel dehydrates during prolonged use, and replacement of the gel is typically infeasible. Furthermore, since it is difficult to keep the adhesives entirely separate from each other over the long term, cross-coupling between neighboring electrode sites can occur through leakage current [5]. Therefore, the wet ECG electrode system may be unsuitable for long-term ECG monitoring. One of the main goals of this project is to provide maximum convenience to the user or patient during ECG measurements, especially for prolonged use. Therefore, special consideration is taken regarding two interfaces: the patient-sensor and sensor-cardiologist interfaces. A convenient interface between the body and the sensor can be realized using a non-contact ECG sensing method. An efficient wireless protocol plus well designed software is also needed to assure convenience in the sensor-cardiologist interface. Alternatives for wet ECG that potentially provide comfortable patient-sensor interface are dry-electrode or capacitively-coupled ECG (CC-ECG) methods. In the dry-electrode ECG, a metal plate is placed on the skin instead of wet electrodes, so the problems of using gel are eliminated. However, it still has direct contact with the body, so it may cause skin irritation and allergies after prolonged use. On the other hand, in the capacitive method used in this work, there is no direct contact with the body. Instead, a thin layer of insulator is placed between the body and the metal electrode. In one method, the electrodes can be unnoticeably applied to a cloth that can be worn by the patient to provide ubiquitous (U) healthcare ECG sensing. Following this idea, a wireless, portable ECG sensor was designed in which the following key considerations were targeted: convenience, portability, and small size. Convenience and portability were achieved by using the capacitive ECG sensing approach, utilizing a small wireless module, and also by employing inexpensive standard off-the-

shelf (OTS) integrated circuits (ICs) in small packages. In addition, we used a standard two-layer printed circuit board (PCB) design for the signal processing board, which resulted in a thin, small-area sensor. To obtain long battery lifetime, all components of the sensor were chosen from low-power ones, and some battery-saving techniques such as idle mode signal sampling were employed. In particular, for data communication, which is always one of the most power-hungry parts in similar sensors, an extremely low-power wireless communication protocol was used. These special considerations resulted in a low-power, small form factor, accurate and easy-to-use wireless ECG sensing system

IN "A. M. KHAIRUDDIN, K. N. F. K. AZIR, AND P. E. KAN, "DESIGN AND DEVELOPMENT OF INTELLIGENT ELECTRODES FOR FUTURE DIGITAL HEALTH MONITORING: A REVIEW," IN PROC. IOP CONF. SER., MATER. SCI. ENG., VOL. 318, NO. 1, MAR. 2018, P. 12073" Electrodes are sensors used in electrocardiography (ECG) monitoring system to diagnose heart diseases. Over the years, diverse types of electrodes have been designed and developed to improve ECG monitoring system. However, more recently, with the technological advances and capabilities from the Internet of Things (IoT), cloud computing and data analytics in personalized healthcare, researchers are attempting to design and develop more effective as well as flexible ECG devices by using intelligent electrodes. This paper reviews previous works on electrodes used in electrocardiography (ECG) monitoring devices to identify the key ftures for designing and developing intelligent electrodes in digital health monitoring devices. Traditionally, patients with cardiovascular diseases are required to monitor their heart conditions on a continuously basis. The diagnosis and measurement of the patients' vital signs need to be performed in controlled environment such as at the medical centers or hospitals. This clinic-centric approach requires patients to regularly visit the medical centers and hospitals. This traditional approach however can be very costly, tiring and time consuming for the patients. More recently, the Internet of Things (IoT) and supporting technologies such as cloud computing and big data analytics are helping to shift the clinic-centric approach towards the person-centric model or personalized healthcare [1]–[3]. The adoption of IoT, cloud computing and big data analytics in the healthcare industry is not only changing its landscape but also enables a new way of organizing the delivering of health care and health related services in the industry.

For instance, with IoT, it is now possible to provide high quality personalized health to all individuals anytime, anywhere and when needed. More specifically, the IoT supported personalized healthcare allows health care and health related services to be delivered to an individual based on his or her unique biological, behavioral, cultural, and social characteristics [4]–[6]. As one of the major innovations in digital technology, the IoT is also increasingly changing the way in which the medical centers and hospitals in the health care sector operate. Since its introduction and adoption in the health care sector, this digital technology has been able to provide various medical and health care applications to the medical centers and hospitals. Among the essential medical applications provided by IoT include; remote health monitoring and delivery, chronic diseases and post-surgery care, fitness programs, elderly care, compliance with treatment as well as medication at home In addition, the IoT as interconnected technology enables medical devices such as ECG, sensors, diagnostic and imaging devices to be connected to each other as well as between doctors and their patients. These networks of IoT-based devices have helped to not only improve the detection, prevention and treatment of diseases but also reduce medical costs, increase the quality of life and enhance the experience of the patients that use these medical devices [8]–[10]. The major innovations in digital technologies have also made it possible to design and improve the capabilities of existing medical devices such as ECG devices and their essential components. More specifically, the improvement in the contemporary ECG devices has mainly resulted from the adoption of the advances and capabilities found in the IoT and supporting technologies such as cloud computing and big data analytics. However, the literature reveals not only little research but also limited information on the development of intelligent electrodes used in contemporary ECG devices. This paper reviews previous works on ECG devices to identify the key features that useful for designing and developing intelligent electrodes for digital health monitoring.

IN "M. S. MAHMUD, H. WANG, A. M. ESFAR-E-ALAM, AND H. FANG, "A WIRELESS HEALTH MONITORING SYSTEM USING MOBILE PHONE ACCESSORIES," IEEE INTERNET THINGS J., VOL. 4, NO. 6, PP. 2009–2018, DEC. 2017" This paper presents the design and prototype of a wireless health monitoring system using mobile phone accessories. We focus on measuring real time Electrocardiogram (ECG) and Heart

rate monitoring using a smartphone case. With the increasing number of cardiac patients worldwide, this design can be used for early detection of heart diseases. Unlike most of the existing methods that use an optical sensor to monitor heart rate, our approach is to measure real time ECG with dry electrodes placed on smartphone case. The collected ECG signal can be stored and analyzed in real time through a smartphone application for prognosis and diagnosis. The proposed hardware system consists of a single chip microcontroller (RFduino) embedded with Bluetooth low energy (BLE), hence miniaturizing the size and prolonging battery life. The system called "Smart Case" has been tested in a lab environment. We also designed a 3D printed smartphone case to validate the feasibly of the system. The results demonstrated that the proposed system could be comparable to medical grade devices. H EALTHcare monitoring through smart phones has been increasing rapidly in recent years, due to its ubiquity, accessible and easy to use. However, quality and affordability of the health care systems are major problems around the globe. A large number of people with low income facing issues with the high cost of healthcare system; Moreover, many individuals are not able to get the quality of health care they need. The cost of healthcare monitoring in the United States alone is 393.5 billion in the year of 2005 [1]. According to [2], total medical cost is 4 million each year for non-cardiac cases. With the help of a smartphone based healthcare monitoring system, we can reduce these costs. This system can allow users to have instant medical checkup, lab reports and store these data for later use. The stored information can be used [3]-[4]. Smart phone applications like prescription reminder, calorie measurement, appointment with medical doctors, hospital locators can ease the accessibility. Nowadays, smartphones are not only for communication purpose as they used to be, and they could support a wide range of applications. A large number of smartphone based medical devices are becoming more popular for fitness [5]- [8]. Health monitoring devices are being miniaturized in size and are more user friendly, which allow complex computation and sensing vital information such as heart rate, ECG, Oximetry and respiration. Statistics show that remote monitoring devices have played a vital role to reduce the re-hospitalization rate

BLOCK DIAGRAM:

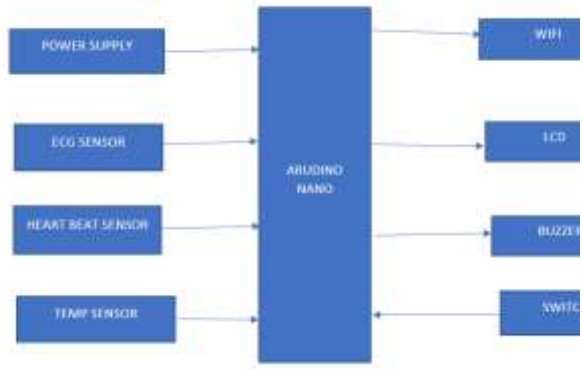
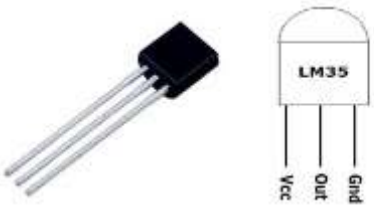


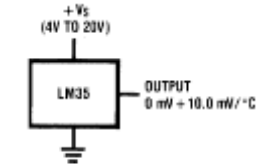
Fig: Block Diagram Of wireless tele-ecg monitoring system using iot

Health monitoring is the major problem in today's world. Due to lack of proper health monitoring, patient suffer from serious health issues. There are lots of IoT devices now days to monitor the health of patient over internet. Health experts are also taking advantage of these smart devices to keep an eye on their patients. With tons of new healthcare technology start-ups, IoT is rapidly revolutionizing the healthcare industry. Here in this project, we will make an **IoT based Health Monitoring System** which records the patient heart beat rate and body temperature and also send an email/SMS alert whenever those readings goes beyond critical values. Pulse rate and body temperature readings are recorded over ThingSpeak and Google sheets so that patient health can be monitored from anywhere in the world over internet. A panic will also be attached so that patient can press it on emergency to send email/sms to their relatives.

LM35 Temperature Sensor

LM35 is a analog linear temperature sensor. Its output is proportional to the temperature (in degree Celsius). The operating temperature range is from -55°C to 150°C. The output voltage varies by 10mV in response to every ^{o}C rise or fall in temperature. It can be operated from a 5V as well as 3.3 V supply and the stand by current is less than 60uA.

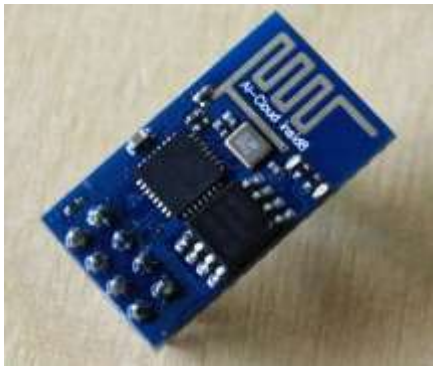




Basic Centigrade Temperature Sensor (+2°C to +150°C)

ESP8266-01

Most people call ESP8266 as a WIFI module, but it is actually a microcontroller. ESP8266 is the name of the microcontroller developed by Espressif Systems which is a company based out of shanghai. This microcontroller has the ability to perform WIFI related activities hence **it is widely used as a WIFI module**.



There are two of ways to work with your ESP8266 module. This tutorial will help you to get started with ESP8266. One way is by using the AT commands. The other way is by using the Arduino IDE. Here we will use AT commands to send data from Arduino to ESP.

ECG MODULE:

AD8232 ECG SENSOR WITH ECG CABLE AND ELECTRODES

The AD8232 Single Lead Heart Rate Monitor is used to measure the electrical activity of the heart. This electrical activity can be charted as an ECG or Electrocardiogram and output as an analog reading.

ECGs can be extremely noisy, the AD8232 Single Lead Heart Rate Monitor acts as an op amp to help obtain a clear signal from the PR and QT Intervals easily. The AD8232 is an integrated signal conditioning block for ECG and other biopotential measurement applications. It is designed to extract, amplify, and filter small biopotential signals in the presence of noisy conditions, such as those created by motion or remote electrode placement.

The AD8232 Heart Rate Monitor breaks out nine connections from the IC that you can solder pins, wires, or other connectors to. SDN, LO+, LO-, OUTPUT, 3.3V, GND provide essential pins for operating this monitor with an Arduino or other development board. Also provided on this board are RA (Right Arm), LA (Left Arm), and RL (Right Leg) pins to attach and use your own custom sensors. Additionally, there is an LED indicator light that will pulsate to the rhythm of a heart beat.

Features :

- Operating Voltage - 3.3V
- Analog Output
- Leads-Off Detection
- 3.5mm Jack for Biomedical Pad Connection

Package Includes :

- 1 x ECG Sensor
- 1 x Professional ECG Cable
- 3 x Disposable Surface Electrode

CONCLUSION In this paper, a wearable wireless Tele-ECG monitoring system is demonstrated. The system has a novel architecture which includes a singlet redesigned by attaching TE, textile thread, snap fasteners, Velcro, soft sponge, ECG front end, and MCU. The instruments on the singlet acquire the ECG signal and transmit it to a cell phone. The ECG signal along with the measured HR is depicted on the cell phone and then transmitted to a server, which allows the physician to observe the signals through the webpage and the smartphone. In addition, a holter-based ECG measuring system has been designed to compare TE-based system. Both systems have been evaluated with 30 volunteers in standing, walking, and going upstairs conditions. The highest SNR value of TE- and holter-based systems is 45.62 and 45.89 dB, respectively. The average correlation of ECG measurements of two systems in each condition is 99.23%. In addition, the HR is measured with both systems for each group and with fingertip pulse oximeter for all patients. The smallest MAE and MAPE are obtained as 1.1% and 1.83% between the TE-based system and the pulse oximeter. The wearable system merges the latest technologies such as TE, BLE, smartphone, server, and webpage to utilize and combine all the advantages into one telemonitor. The significant advantage and novelty of the proposed telemedicine technology is the combination of the best available technologies and the addition of few other features. No single reported device has all the features and benefits of the proposed device: comfort in daily life, easy to clean, high-quality ECG by TE, fast data transmission, long battery life with approximately 14 days, remote multiple-patient following by physicians, manual and automatic emergency requests, medical history, and geographical location tracking. The proposed system can potentially reduce congestion of hospitals and the cost of the medical examination since the patients can be monitored remotely for heart problems. As the future work, additional sensors can be added to the proposed system to measure the temperature, SpO2, and movement of users and the TE can be employed to detect EEG or EMG

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VISION BASED SKIN DISEASE IDENTIFICATION USING DEEP LEARNING

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PROBLEM

Skin disease is the most common health problems worldwide.Human skin is one of the difficult areas topredict. The difficulty is due to rough areas, irregular skin tones, various factors like burns, moles. We have to identify the diseases excluding these factors.In a developing country like India, it is expensive for a large number of people to go to the dermatologist for their skin disease problem.Every year a large number of population in developing countries like India suffer due to different types of skin diseases. So the need for automatic skin disease prediction is increasing for the patients and as well as the dermatologist

ABSTARCT:

Skin disease is the most common health problems worldwide.Human skin is one of the difficult areas topredict. The difficulty is due to rough areas, irregular skin tones, various factors like burns, moles. We have to identify the diseases excluding these factors.In a developing country like India, it is expensive for a large number of people to go to the dermatologist for their skin disease problem.Every year a large number of population in developing countries like India suffer due to different types of skin diseases. So the need for automatic skin disease prediction is increasing for the patients and as well as the dermatologist. In this paper, a method is proposed that uses computer vision-based techniques to detectvariouskinds of dermatological skin diseases. Inception_v3, Mobilenet, Resnetare three deep learning algorithms used for feature extraction in a medical image and machine learning algorithm namely Logistic Regression is used for training and testing the medical images.Using the combined architecture of the three convolutional neural networks considerable efficiency can be achieved.

INTRODUCTION

In this modern world, there are numerous technological advancements which are most helpful for the betterment of our lives. Various technological advancementsare being done in the medical fields. Skin diseases are the most common type of diseases. There are many types of skin diseases. Some are due to allergy while some are due to chronic

diseases. Classifying the proper skin disease and treating them is a tedious one. Various diseases have various symptoms. Treating skin disease wrongly may lead to various other diseases like skin cancer. Every disease may have a pattern. So understanding the disease pattern is the only way to understand the type of disease. Usually, for a dermatologist understanding the patternsare a complex task Using the latest advanced technologies like deep learning &machine learning algorithms skin disease types can be predicted Various type of predictions and analysis are been carried out. The accuracy of the results is improvised.Using Machine Learning algorithms Support Vector Machine, Random Forest, the skin diseasesare predicted. The accuracy of the prediction is biased. The accuracy sometimes may be accurate while sometimes may not. To overcome the accuracy issue,we carry out the transfer learning approach. Transfer Learning is nothing but gaining some basic knowledge on a problem and applying the knowledge known to the similar problem. Application of transfer learning is Deep Learning. Compared to machine learning algorithms, deep learning algorithms are far more improvised in accuracy and efficiency for skin disease prediction. These deep learning algorithms also slightly vary in accuracy. We have used three deep learning models for disease prediction.Inception_v3[5],Resnet[6],Mobilenet[7].These deep learning models will also have accuracy errorbut very less when compared to machine learning models.So we propose an ensemble of these three neural networkmodels[8] for better prediction and accuracy. For feature extraction and classification these models are used. For training and testingdata, LogisticRegression[3] is used. This ensemble model is 80% accurate and can classify up to 15 disease classes. Skin disease analysis and prediction using deep learning methods.

REVIEW:

In this modern world, there are numerous technological advancements which are most helpful for the betterment of our lives. Various technological advancementsare being done in the medical fields. Skin diseases are the most common type of diseases. There are many types of skin diseases. Some are due to allergy while some are due to chronic diseases. Classifying the proper skin disease and treating them is a tedious one. Various diseases have various symptoms. Treating skin disease wrongly may lead to various other diseases like skin cancer. Every disease may have a pattern. So understanding the disease pattern is the only way to understand the type of disease.

Usually, for a dermatologist understanding the patterns are a complex task. Skin detection is the process of finding skin-colored pixels and regions in an image or a video. This process is typically used as a preprocessing step to find regions that potentially have human faces and limbs in images . Skin image recognition is used in a wide range of image processing applications like face recognition, skin dis-ease detection, gesture tracking and human-computer interaction . The primary key for skin recognition from an image is the skin color. But color cannot be the only deciding factor due to the variation in skin tone accord-ing to different races.

EXISTING SYSTEM:

- Skin tone is often combined with other cues like texture and edge features. This is achieved by breaking down the image into individual pixels and classifying them into skin colored and non-skin colored [1]. One simple method is to check if each skin pixel falls into a defined color range or values in some coordinates of a color space. There are many skin color spaces like RGB, HSV, YCbCr, YIQ, YUV, etc. that are used for skin color segmentation
- K -means A clustering method for grouping similar data, that is popular for cluster analysis in data mining .K-means clustering[2] aims to partition observations on different categories. The problem occurs if the dataset is very large, complex and computational of clustering is difficult. So, the proposed method directly uses an ensemble of neural network models [10]where clustering is not used for better efficiency
- Image gradient The edge detector[15] in most of image processing models uses an image gradient algorithm for edge detection.Using Image Gradient algorithm various points are not detected accurately. Differentiating the background pixels and foreground pixels will not be that much accurate. For example, differentiating the skin and the background will be not accurate. This is the major disadvantage of using image gradient algorithm[3]. The proposed approach overcomes this issue. In the proposed system the features are extracted first various values differentiate the background and foreground pixels.

- RGB color algorithm Unique features from the medical image are taken and are segmented using Histogram algorithm. The diseases are classified based on the Histogram values[4] and tolerance level value of the image. We taking into consideration of mean values[4] of images RGB(RED,GREEN,BLUE).The values are calculated and the background of the images is considered to be black. This is not applicable for all images where the error in mean values may occur and the background of the image may not be black always. The proposed model does not take mean values and the features are not extracted based on the histogram. So the possibility of the wrong classification of the image is avoided.

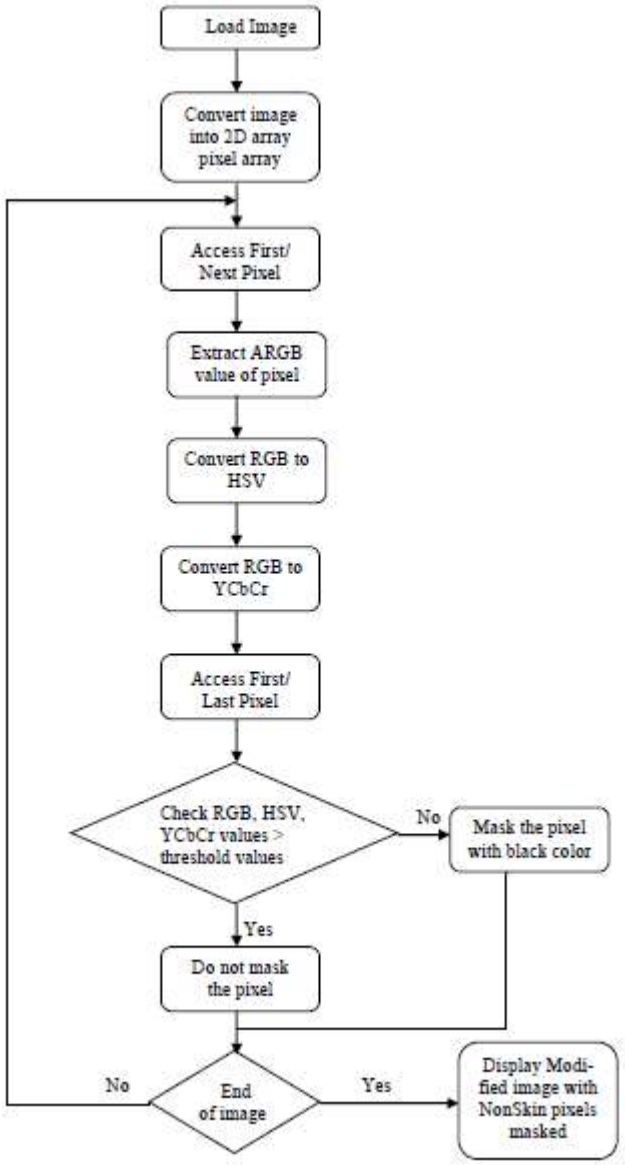
PROPOSED SYSTEM:

The skin detection is influenced by the parameters like Brightness, Contrast, Transparency, Illumination, and Saturation. The detection is normally optimized by taking into consideration combinations of the mentioned parameters in their ideal ranges. The proposed algorithm converts the entire image in a two dimensional matrix in which the column and row size is defined by the width and height of the image respectively. Once the image is divided, each entry consists of a pixel of the image. The ARGB color of that particular pixel is determined. The ARGB value retrieved from the image for each pixel is a 32-bit value. Hence to extract each sub-value i.e. red, green, blue and alpha we right shift this value by 24 bit in order to get the value of alpha. The alpha channel is normally used as an opaci-ty channel. If apixel has a value of 0% in its alpha channel, it is fully transparent (and, thus, invisible), whereas a value of 100% in the alpha channel gives a fully opaque pixel (traditional digital images). Similarly, for red right we shift by 16 bits, for green right shift by 8 bits. The remaining value is of blue color. Bitwise AND operation with 0xff was applied on these calculated values in order to extract only the bits corre-sponding to that particular color. The above entire procedure is applied to each and every pixel of the image. In order to make the recognition more precise the ARGB value is converted to HSV as well as YCbCr value using conversion factors and built-in functions. The HSV, YCbCr and ARGB value of each pixel is compared to the standard values of a skin

pixel and decision is made whether the pixel is a skin pixel or not depending on wheth-er the values lie in a range of predefined threshold values for each parameter

The first step in our process is identifying the techniques that are used for disease prediction and classification.The neural network model consists of two parts Feature Extraction part and classification part.These two are combinedly used to predict the diseases.

- Inception_v3
- Mobilenet
- Resnet(Residual Network)



CONCLUSION: An ensemble-based approach of the neural networks is used to raise more efficiency of individual models. We propose a model in which all three neural networks come under a single architecture. The database that we use is available online. All the medical images are taken from Dermnet[8] .The combined architecture is rather more complex yet the performance evaluation shows increased efficiency and accuracy. The hardware and

software requirements are rapidly increasing. One way of improving our model is to add more neural network models for improved efficiency

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VEHICLE THEFT INTIMATION USING WIRELESS COMMUNICATION AND REMOTE CONTROL OF ITS ENGINE

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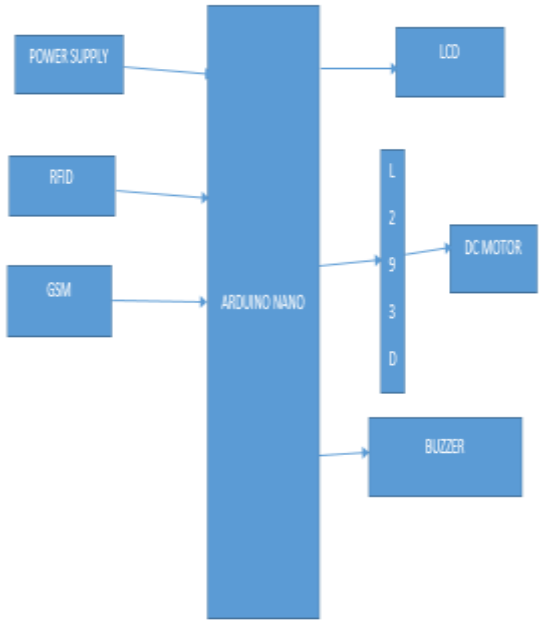
ABSTRACT - The aim of this project is to provide an alert to the user about any unauthorized access of their vehicle with the help of wireless technology. The alert will be in the form of an auto generated SMS sent to the user. In addition to this, the user can reply to this SMS which will disable the ignition of the vehicle. Security system for vehicles is much needed in present times as the percentage of crime keeps on increasing. In this proposed system, if an attempt is made to steal the user's car, the microcontroller gets intimated about this through a switch mechanism, which then sends an alert to the user in the form of an SMS with the help of a GSM modem. The user can then reply to this message and based on his command the microcontroller can disable the ignition of the vehicle, thus stopping the vehicle. With the help of this system the user can turn off the ignition of his car from any place. This system is also integrated with a GPS which can provide the exact position of the vehicle in terms of latitudes and longitudes. This information will be available in the SMS sent to the user.

KEYWORDS: GSM Modem, GPS, Microcontrollers, Auto theft

1. INTRODUCTION The percentage of auto thefts has been increasing over the past few year. Around $6.5 billion was lost due to auto thefts in USA during the year 2019. With the automotive sector projected to be increasing in its growth over the forthcoming years, the need for better security systems has become an important issue among automotive industries. The proposed system helps to tackle one of the important drawbacks of the existing security systems. At present there is no tracking facility available in all default security systems but with the proposed system the user will be provided with the exact location of his vehicle at regular intervals of time. The user will also be provided with certain remote control over his vehicle. These improved facilities will help to reduce the rate of crimes related to auto thefts

2. LITERATURE REVIEW A GPS (Global Positioning System) based security system which could find out the location of the stolen vehicle and provide the users with the direction of the vehicle was implemented in automobile security. This system works with the aid of Global Positioning Satellites. This system had an On-Board Module which will be present in the vehicle and a base station which receives information about all the vehicles associated with it. The major drawback of this model is it's over dependency on the base station and also lack of proper security system. To overcome this obstacle, a GSM based model is employed in this security system. Thus the main aim of this model is to use wireless technology for automobile security system

IMPLEMENTATION



DESCRIPTION

BUZZERS

In common parlance a Buzzer is a signaling device that is not a loudspeaker. It can be mechanical, electromechanical, or electronic (a piezo transducer). BeStar produces Buzzers in every available configuration for a wide variety of applications. A Piezo transducer can produce the sound for panel mount buzzers, household goods, medical devices and even very loud sirens. When a lower frequency is required an electromagnetic buzzer can fill the need. These are very common in automotive chimes and higher end clinical diagnostic devices. The BeStar buzzer range includes self drive units with their own drive circuitry (indicators), or external drive units, which allow the designer the flexibility to create their own sound patterns.

NANO

The Arduino Nano, as the name suggests is a compact, complete and bread-board friendly microcontroller board. The Nano board weighs around 7 grams with dimensions of 4.5 cms to 1.8 cms (L to B). This article discusses about the technical specs most importantly the pinout and functions of each and every pin in the Arduino Nano board.

Arduino Nano has similar functionalities as Arduino Duemilanove but with a different package. The Nano is inbuilt with the ATmega328P microcontroller, same as the Arduino UNO. The main difference between them is that the UNO board is presented in PDIP (Plastic Dual-In-line Package) form with 30 pins and Nano is available in TQFP (plastic quad flat pack) with 32 pins. The extra 2 pins of Arduino Nano serve for the ADC functionalities, while UNO has 6 ADC ports but Nano has 8 ADC ports. The Nano board doesn't have a DC power jack as other Arduino boards, but instead has a mini-USB port. This port is used for both programming and serial monitoring. The fascinating feature in Nano is that it will choose the strongest power source with its potential difference, and the power source selecting jumper is invalid.

RFID READER

Active RFID and Passive RFID technologies, while often considered and evaluated together, are fundamentally distinct technologies with substantially different capabilities. In most cases, neither technology provides a complete solution for supply chain asset management applications. Rather, the most effective and complete supply chain solutions leverage the advantages of each technology and combine their use in complementary ways. This need for both technologies must be considered by RFID standards initiatives to effectively meet the requirements of the user community.

GSM

GSM (Global System for Mobile communications) is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. GSM networks operate in four different frequency ranges. Most GSM networks operate in the 900 MHz or 1800 MHz bands. Some countries in the Americas use the 850 MHz and 1900 MHz bands because the 900 and 1800 MHz frequency bands were already allocated.

The rarer 400 and 450 MHz frequency bands are assigned in some countries, where these frequencies were previously used for first-generation systems.

GSM-900 uses 890–915 MHz to send information from the mobile station to the base station (uplink) and 935–960 MHz for the other direction (downlink), providing 124 RF channels (channel numbers 1 to 124) spaced at 200 kHz. Duplex spacing of 45 MHz is used. In some countries the GSM-900 band has been extended to cover a

larger frequency range. This 'extended GSM', E-GSM, uses 880–915 MHz (uplink) and 925–960 MHz (downlink), adding 50 channels (channel numbers 975 to 1023 and 0) to the original GSM-900 band. Time division multiplexing is used to allow eight full-rate or sixteen half-rate speech channels per radio frequency channel. There are eight radio timeslots (giving eight burst periods) grouped into what is called a TDMA frame. Half rate channels use alternate frames in the same timeslot. The channel data rate is 270.833 kbit/s, and the frame duration is 4.615 ms.

CONCLUSIONS

This concludes that the proposed model will provide a better security system for all types of vehicles. This system can be used by people from all walks of life, as it will be cheaper than most of the available security systems. Another major aspect of this system is that, it does not require any separate models for different types of vehicle. Since GPS is used in the tracking system the exact location of the vehicle can be determined.

Some of the limitations of this system are

- It may suffer from network issues in some places where cellular network is not available
- The alert message can be sent only to the registered mobile number

The introduction of a GPS device can solve the network problems. The GPS when used along with apps like Google Maps can make it much easier to locate the stolen vehicle.

FUTURE SCOPE

While the current security system is much more compatible for cars, with some modifications this system can be implemented for two wheelers also. In counties like India where auto thefts involving motorbikes are on a rise and also with an ever-growing market for two wheelers, this system can help to reduce the crime rates relating to auto thefts. This system can be further improved by introducing a dedicated mobile application which could eliminate the limitations regarding unreliable network connections.

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INTERNET OF THINGS-BASED BABY MONITORING SYSTEM FOR SMART CRADLE

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OBJECTIVE:

The objective of this project is to implement an intelligent baby monitoring system, which makes it possible to detect automatically, remotely and in the real time the crying and movements of the **Infant** in his cradle as well as to monitor the temperature of his room. It is based on the "Controller card, the Pi camera, the sound sensor and the temperature sensor to recover sufficient information concerning the baby.

ABSTRACT

Taking care of a baby is a challenging task for working parents. In this paper, we present an intelligent baby monitoring system that allows parents to check on their baby remotely and in real time. The proposed system is based on the "Controller card, a Pi camera, a sound and temperature sensors. To be more efficient, this system uses a convolutional neural network to identify and interpret the baby status in his cradle. The implementation and the experimental results of the proposed system demonstrate its efficiency and accuracy and how it can greatly help parents to take care of their baby.

INTRODUCTION

At present, female participation in the work force in the industrialized nations has greatly increased, thereby affecting infant care in many families. Both parents are required to work due to the high cost of living. However, they still need to look after their babies, thereby increasing workload and stress, especially of the mother. Working parents cannot always care for their babies. They either send their babies to their parents or hire a baby caregiver while they are working. Some parents worry about the safety of their babies in the care of others. Thus, they go home to check on their babies during their free time, such as lunch or tea break. A baby monitoring system that can monitor the babies' condition real time is proposed to solve these problems. A baby monitoring system consisting of a video camera and microphone without limitations of coverage. It can send data and immediately notify the parents about urgent situations, thereby shortening the

time needed to handle such scenarios. Generally, babies cry because they are hungry, tired, unwell, or need their diaper changed. Sudden Infant Death Syndrome (SIDS) is also known as crib death, because many babies who die of SIDS, are found in their cribs. It occurs to infants younger than 12 months old. Most SIDS deaths occur in infants younger than 6months old [1]. Professionals still do not know the causes of SIDS, but risk can be reduced by letting the baby sleep on a firm surface (crib mattress). In addition, the baby should not sleep on a pillow or another a soft surface. The researchers do not know why sleeping on such surfaces increase the risk of SIDS, but they warn that it could be dangerous [2]. For instance, in 2003, a showed that placing an infant to sleep on soft bedding rather than on firm bedding appeared to pose five times the risk of SIDS [3]. Moreover, overheating should be avoided during sleep. Babies should be kept warm during sleep, but the temperature should not be extremely warm. In winter or cold weather, the risk of SIDS increases, because the parents overdress their babies or place them under heavier blanket, thereby overheating them [4]. Therefore, if the room temperature is comfortable for an adult, then it is also appropriate for the baby. Internet of Things (IoT) simply refers to a network of objects that are connected to the internet. It provides devices with the ability to transfer sensor data on the Internet without requiring intervention [5, 6]. The IoT encompasses many devices and is growing at a rapid rate, because it is such a broad category. A forecast states that in 2019, approximately 26.66 billion IoT devices will be active; by 2025, 75 Billion IoT devices worldwide will be available and wirelessly connected to the Internet [7, 8]. Among these connected devices, millions of wearable sensors are widely used in healthcare applications [9]. The total global spending on the IoT in 2016 was 737 billion dollars and was projected to reach 1.29 trillion dollars in 2020. IoT is a prominent field that will increase and grow exponentially [10, 11]. The function of IoT is control, real-time monitoring, and perform autonomy or autonomous function and optimization. Perhaps one of the main reasons why the IoT is extremely large is that it aims to make life more convenient, and people are more likely to invest in things that make their lives easier. Accordingly, the number of IoT applications continues to increase in different fields. In this study, IoT is integrated into our baby monitoring system to achieve a rapid response time and to provide a greater sense of security for parents. Node Micro-Controller Unit (NodeMCU) Wi-Fi-Based Controller

Board is an open source platform for IoT applications and is used as the main micro-controller in this project. It is used to gather data read by the sensors and uploads these data to the MQTT server. It also receives commands given by the user to perform specific tasks via the MQTT server. NodeMCU consists of physical programmable circuit board similar to that of any other development boards, such as Arduino board and Raspberry Pi. The programming of the NodeMCU can be performed using Arduino software, which is an Integrated Development Environment (IDE), where the code of instructions is written and the microcontroller is uploaded. Generally, the baby cradle (Figure 1) is used in various hospitals and maternity homes for infants to sleep in and for soothing them. Conventional cradles are used in villages or non-urban areas because of their low cost and simplicity. However, conventional cradles are manually swung and require manpower. They lack automation and are not electronically equipped. Consequently, conventional cradles should be automated to become more convenient, safe, and efficient in monitoring the baby's situation in real time

Fig: Conventional baby cradle.

BACKGROUND AND RELATED WORKS A. MOTIVATIONS AND PROBLEM STATEMENT Under fast-paced life conditions, everyone is busy in their professional life including parents. They leave the house early in the morning and come back before dinner time. Even the mothers are working. Thus, they do not have sufficient time to take care of their babies. Not all parents could afford a nanny to help them with their children. Then, after working for long hours, the mothers still have to manage the house and take care of their babies simultaneously. Parents might not have the time to soothe their baby to sleep or rock their baby back to sleep in the middle of the night. Studies about the effect of rocking a baby have been carried out and found that babies sleep better while being rocked or swung lightly because the rhythmic movement mimics the gentle rocking they felt while

in their mothers' womb. Most available automated cradles are designed to rock non-stop. However, the rocking movement can make the baby nauseous and uncomfortable. Thus, allowing the automated cradle to rock the baby to sleep in the middle of the night is also a problem. Furthermore, some parents place their baby in a separate room. Therefore, parents could not hear the baby crying and could not be there to ease their baby back to sleep in the middle of the night. Other parents may be occupied withhouse chores. Thus, because they cannot hear their baby crying, they cannot attend to them immediately. Sometimes, the baby only needs a little distraction to return to deep sleep. Several types of baby cradles are available in stores, but they are expensive, and not everyone can afford them. In addition, the existing automatic cradles in the literature have many limitations in terms of functionality, cost, and communication technology support [12-15]. To the best of our knowledge, no previous studies have developed a smart cradle with IoT support from scratch, similar to that in the present study. To overcome this problem, a new automatic IoT-based baby monitoring system (IoT-BBMS) is designed, allowing the parents to access an account to monitor the baby's condition anywhere and anytime

B. RESEARCH CONTRIBUTIONS To address these challenges, we designed and fabricated a baby monitoring system for a smart cradle using NodeMCU as the microcontroller while the system was developed using Arduino IDE. This system consists of a cradle that can swing whenever the sound sensor detects crying. A mini fan is attached on top of the cradle to provide ventilation. The mini fan and the swinging of the cradle can be switched on either by the sensors or through remote control from the MQTT server. An external Wi-Fi camera has been installed on the cradle to enable real-time vision monitoring. The parents can see the baby's condition and talk to the baby using the readymade mobile application of the Wi-Fi camera. An Internet of Things-based baby monitoring system for smart cradle is proposed in this paper. The novelty of this work lies in the proposed IoT-BBMS automation system by adopting the following methodology and contributions: (i) A smart baby cradle prototype is designed and fabricated with auto-swinging support, web camera and musical toy to test the proposed system. (ii) A new Algorithm is proposed and implemented in NodeMCU controller to perform the required monitoring and control tasks. (iii) Utilizing the NodeMCU as the microcontroller and Adafruit MQTT as IoT server to retrieve data from sensors

and send commands to actuators. The system could gather accurate real-time data and response by actuating the proper relay to switching fan, toys and swinging motor.

C. RELATED WORKS Few studies have investigated the possibilities of automated baby cradle using different perspectives. A baby monitoring system has been proposed in [13], in which an enhanced noise cancelling system that monitors the baby and reduces sound pollution has been suggested. The main function of the system is to reduce the noise that might disturb the baby by playing relaxing songs. This system can also adjust the room's light intensity with the aid of a light sensor. However, our system has more advanced features, such as supporting real-time monitoring over the IoT network and vision monitoring using web camera. The authors of [11][12] introduced an E-baby cradle that can swing automatically when it detects crying and stops swinging when the crying stops. The speed for the swinging cradle can be controlled based on the user's need. It has an alarm embedded in the system, which notifies the user when two conditions occurred. First, the alarm goes off when the mattress is wet, indicating that the mattress should be changed. Second, when the baby does not stop crying for a certain time, the alarm alerts the parents to attend to their baby. However, it is only applicable when parents are near the cradle, because it only uses a buzzer alarm, the sound of which might frighten the baby. Parents cannot monitor their baby when they are away from home, for example when at work or when traveling to other places. A similar automatic baby monitoring system was proposed in [18]. The authors developed a low-budget system that swings the cradle when the crying sound is detected, and the cradle stops when the baby stops crying. The built-in alarm goes off under either one of the following conditions: the mattress is wet or the baby does not stop crying after a certain period. A video camera is placed above the cradle to monitor the baby. However, the parents can only receive the notification via SMS and cannot control the system. Therefore, the proposed system in the current study is more advanced, because it utilizes an IoT application to monitor and control the developed smart cradle in real time anywhere and anytime. An Arduino-based resonant cradle designed with infant cry recognition was proposed by [11]. A ball bearing design is adopted to reduce system damping and allows the cradle to swing freely even without electricity. Subsequently, an appropriate sensor is designed to detect the swinging status or angle. The authors claimed that their

system is energy saving and allows parents to record infant cries due to hunger or pain on an SD card stored in an SD module. However, such local control solution is inappropriate when parents are located slightly far from their babies, because it does not allow updating of the data in the IoT server or controlling the cradle remotely. Ref. [20] designed a system for baby monitoring based on Raspberry Pi and Pi camera. The designed system can spot the motion and crying condition of the baby. They used condenser MIC to spot the crying condition and PIR motion sensor to spot the baby movement with the help of Pi camera. The camera is turned on only when the condenser MIC detects a sound and sends a signal to Raspberry Pi. However, the output of this system is only available on monitor display; thus, the parents can only view the data on a limited number of devices within a fixed area. In [21], the authors proposed a system that can monitor the pulse rate and body temperature of the person. Dedicated sensors are placed along with Raspberry Pi and IoT to monitor the health condition and store the obtained data toBluemix cloud. The data stored are sent to a doctor for health analysis and to detect abnormalities. The KG011 sensor is used to measure the heart rate, and the DS18B20 sensor is used to measure the temperature. Then, the readings are shown in the IBM Watson IoT Platform in graph form. The article proposed a good point, which is about using the sensors to send data to the IoT platform. However, this system is unsuitable for infants, because their bodies' immune system is weaker than that of adults. This wearable system might emit some radiation that could harm the infants and cause some side effects. A baby condition monitoring system based on GSM network was proposed in [12]. The authors built a prototype that can measure infants' pulse rate, body temperature, movement, and moisture condition and send information through GSM network. It consists of sensors, LCD screen, GSM interface, and buzzer, which are controlled by a PIC 18f4520 8-bit microcontroller. The LCD module displays the sensor readings, and the GSM interface sends an SMS alert to the parent's mobile number. Although the system was proposed to monitor the baby's condition, appropriate control actions are required to make accurate readings, given that the baby could have crawled around and the sensors might have been detached. The baby might also get injured or electrocuted when the unattended baby touches the system circuit. The system should be improved in terms of safety, cost effectiveness, and user-friendliness. The authors of [13] proposed a mobile-based system that updates parents about the

infants' status. The system measures the temperature, motion, and heart rate, and then sends the data to a server to be analyzed. The analyzed data will then be sent to the parents and generate alert if any abnormality is found. The parents will receive an advisory first-aid information for immediate action, and a nearby clinic will be notified by the system. The system was tested on adults during the prototype stage by collecting data for analysis. The developed system uses Bluetooth as a communication technology, which is limited in range and data rate. Such a system is only applicable for short-distance baby devices. The system does not support the IoT solution, remote control, and vision monitoring as in our proposed system. In [11], a monitoring system was developed for an incubator. A pulse sensor is attached to an infant to measure the infant's pulse rate, and a humidity sensor is used to measure the humidity level. The recorded data will be sent to the computer through Arduino microcontroller, where the data can be referred by the Neonatal Intensive Care Unit (NICU) personnel for diagnostic purposes. An alarm system is designed to send an alarm whenever the data readings reach a dangerous level to prevent the occurrence of a dangerous situation. The system underwent tests on infants aged 0–3 months, 3–6 months, and 6–12 months. However, the data recorded were only transferred directly to the computer. This approach can be improved by adding a Wi-Fi module to send data via the internet to monitor the infants' conditions anywhere and anytime. Ref. [10] presented an ARM embedded platform project for baby monitoring. The author proposed a system consisting of embedded system platform with a Linux kernel, CMOS image sensor, and control system. The system is used to monitor the baby's activities and room environment through a web browser. If the system detects a baby's cry, then it will alert the parents by transmitting the audio signal to the parents' room. The infant's body temperature is measured by a TMP75 temperature sensor together with a wireless module to send temperature readings to the platform. A bi-directional triode thyristor is used as power regulation component in light control unit. An LCD display module is used to display the measured readings. This project can be improved by designing a cradle installed with control system, which would allow the cradle to swing on its own when the baby cries

CONCLUSION A smart cradle with a baby monitoring system over IoT has been designed and fabricated to monitor a baby's vital parameters, such as crying condition, humidity, and ambient

temperature. NodeMCU was used as the main controller board in the project's circuit design, because it had a built-in Wi-Fi module, which enabled the implementation of IoT concept in the developed system. The demand of IoT was achieved by using the NodeMCU due to its simplicity and open-source nature. Red meranti wood was used as the material to build the baby's cradle, because of its general use in woodworks and due to its workability. Improvements were made during the enhancement phases to ensure that the research outcomes achieved the objectives. The finished prototype was tested by using a mobile phone with a baby crying ringtone, which was placed in the cradle. When the mobile phone rang for a few seconds, the cradle started swinging because of the system's assumption that the baby was crying due to the detected sound. A notification was sent to the mobile phone of the user to signal that the baby is crying. The temperature and humidity of the surroundings were determined, and the mini fan was turned on if the measured temperature was above 28 °C. With the aid of NodeMCU, the parents can control the baby cradle and themini fan using mobile apps or an Internet-connected computer. Real-time vision monitoring was achieved with the help of the wireless camera. The user can monitor the baby through the camera mobile application and talk to the baby through the built-in microphone on the wireless camera. The total cost of the developed system is greatly reduced to approximately RM 700 per unit, which is suitable for mass production after finalizing the prototype.

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DESIGN OF AUTOMATED MEDICINE VENDING MACHINE USING MECHATRONICS TECHNIQUES

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ABSTRACT. An automatic medicine vending machine with a self-contained on-site pill dispensing mechanism and a storage facility for the plurality of pills that can be dispensed based on the user requirement. Major components of the machine are, a scanner to take the input from user, a system that includes servo motors for dispensing the medication, large storage space to store the pills, sensors to detect the motion of pills, an inventory monitoring system to keep track of the storage, an industrial standard vertical foam fill machine to pack the medication separately and a non-contact laser inkjet printer to print the description which includes the time at which the medicine must be taken. The inventory monitoring system also keeps track of the expiry date of each batch of medicine and sends alert to refill the storage when the pills run out. It also holds an inbuilt system to receive money from the user for the drugs that are dispensed. All these systems are monitored by a central microprocessor, which is programmed to receive input from the user via the scanner and to actuate and control all the necessary components required to dispense the medication requested by the user. The machine can be viewed as an automated pharmacy placed on a commercial scale so that infinite number of user will be able to access it anytime.

INTRODUCTION:

Field of invention: The present invention relates to automatic medicine vending machine, in particular to a machine that has the capability to dynamically receive input for the user and then dispense the required type of medicine. The input, here means, the prescription by the physician to the user. The system features a machine that is capable of handling a complete range of prescription.

Background of invention: The growing modern age has also brought with it the dawn of the age of numerous types of diseases. The use of medicine to maintain and regain physical and mental health has been growing at a rapid pace. The doctors prescribe different type of medicine for one particular type of illness. Today it has become common for a person to take at least one type of pill at regular interval each day [1] . A statistical survey shows

that about 21% patients never follow their prescription and 6% patients is not capable of identifying their own medicines. In extreme cases, between 12 and 20% take medicines of other patients [2]. But in case of the elderly people the scenario is awful. They take numerous number of pills at one particular time of the day to maintain their health. Therefore, confusion can arise both concerning the schedule and whether or not the medication has been taken. This problem has been addressed by a number of personal pill dispensing machine in related art. Wherein the dispenser in preloaded with the medicine to be taken and is programmed to dispense the medication at a particular time of the day and alert the user to take the pills. Sometime, improper loading of the medication can cause some dosage issues. Improper medication is reported to be the most common reason why some patients do not respond properly to medical treatment. Patients sometimes forget to take the pill at a particular time and then try to 'catch up' by taking more than prescribed dosage [3] . It becomes difficult to remember when to take the medication when different types of pills are required to be taken at different times. Elderly people frequently do not have sufficient mental alertness to keep track of the frequencies and dosages of their various medicines over a sustained period of time [3] . Not only elderly people but also the people who go to work have this problem due to external factor like work pressure. It is not possible for them to carry a medicine dispenser with them. Even if they carry all the medicine strips with them, there is good chance that they might forget which pill to take at the particular time.

DESIGN OF THE MACHINE

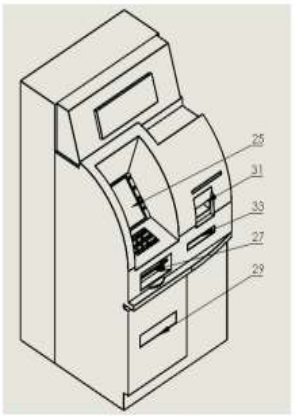


Figure 1. User side of the machine

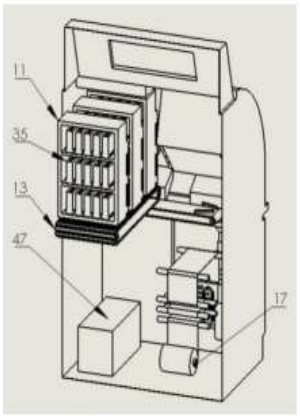
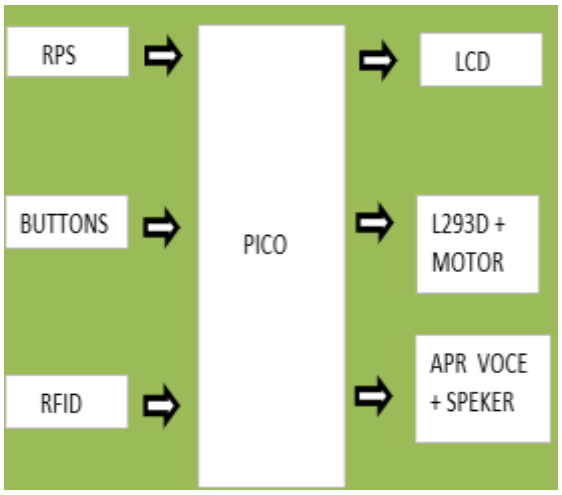


Figure 2. Inside the machine

The design is based on simplicity and the utilizations of low cost materials and components that can be easily available [4] . Figure 1 and 2 shows the major components of the preferred embodiment which includes a major housing that hold within it the central micro controller, a scanner that takes the input from the user; storage space that houses small containers where all the different type of drugs are stored; a conveyor series that takes the pill form storage to packing region; a small size industrial standard vertical foam fill

packing machine; a dispatch area for the user to receive the packed medicine.

BLOCK DIAGRAM



The pills are put into the receptacle as a whole bunch. So there is need to isolate one pill from the plurality of pills in the container. The servo motor placed at the bottom of each division of receptacle does the work. Each division of the receptacle is angled upward from the upper mouth, so that the pill dispensing end is positioned above the input end. In this fashion, the pills that are fed through the chute move upward against gravity [6] . This oblique bottom wall helps to centralize the pill. The pill dispensing mechanism is rotationally controlled using the servo motor by the main controller. The carousal at the bottom has two small slots that are 180° apart at the periphery of the circular disc that is attached to the servo motor. This slot in the disc helps in singulation of the pill. When the servo motor is signaled to rotate, the slot picks up only one pill and rotates along with the carousal. A small hole is placed at the bottom of the division just a little below the carousal. When the slot and the hole match, the pill is dropped to the feed chute which eventually leads to the packing section. The number of slot can be increased to reduce the operating time and increase efficiency. The slot sensor placed adjacent to the servo motor makes sure that one pill is dropped per half rotation of the carousal disc. The signal from the sensor is used to activate the packing mechanism, track the flow of pill and is also used to maintain inventory of medicines. Dust builds up in the sensor over a long working period. Thus maintenance and cleaning of the storage is necessary to assure accurate pill count and equipment life is an economically important consideration [6]

APPLICATION

1.The concept is very much useful in day to day life for common people.

2. This can be implemented everywhere such as shopping malls.

3. It can be implemented on National Highways.

4.It can be installed in Railway stations

5. This medicine vending machine is mostly used in healthcare field.

6. In providing the medical facility at the doorstep to the required one.

7. It will be useful in providing medical facilities in busy areas such as Railway Stations, Airports, markets etc.

8. Provide facilities to people during their journey as this can be installed in the aircrafts, rails and ships.

9. This system can be used by the defense organization such as military, air force etc.

10. It will help rural India to get better medical facilities at much lower costs.

CONCLUSION From this concept we are conclude that, the automatic medicine vending machine is technically feasible to the peoples. It is based on ATmega16 controller provide service. It gives availability of medicines all the time, also in rural areas. it is very helpful and it gives e Automated medical ATM system plays its major role in hostel areas, railway platforms, airports, and rural areas. Implementation of this system reduces man power 24 hours availability service and also reduces time consumption of access also.

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SMART AND SECURED SINGLE ATM CARD LINKING WITH MULTIPLE BANK ACCOUNTS

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ABSTRACT

The idea behind this paper is to embed more than one bank account into single smart card so that the user can transact as he/she wishes with a single swipe. It provides the user one level higher convenience for accessing multiple accounts. The hardware used is PIC microcontroller. Here the microcontroller acts like a smart card that holds the unique card number. In this proposed system admin module and user module are used. Admin module is responsible for entering the user details, user bank details, ATM card details. It is also responsible for clubbing of all accounts of an individual user and updating the database frequently. User module is the interactive module through which the user can log into the system and perform the transactions of the user's choice. Hereby, the users can access multiple accounts by entering a single PIN number.

INTRODUCITON

The ATM is an automated teller machine which is a computerized telecommunications device that provides the customers of a financial institution with access to financial transactions in a public space without the need for a human clerk or bank teller. In ATMs the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smartcard with a chip that contains a unique card number and some security information. The first ATM was installed in Enfield town in London on June 27, 1967 by Barclays Bank. The ATMs are known by various other names as Automated Transaction Machine, Automated Banking Machine, Cash Point (at Britain), Hole in the wall, Ban comet (in Europe and Russia) and Any Time Money (in India) [1]. Some people used to write their PIN and password on some paper or diary which is not at all secure. As, it can be easily attacked and hacked by someone, resulting the account holder can suffer. With the growing sector of banking, everyone is using ATM machines as these machines are located in different places and the customer can access his account anytime

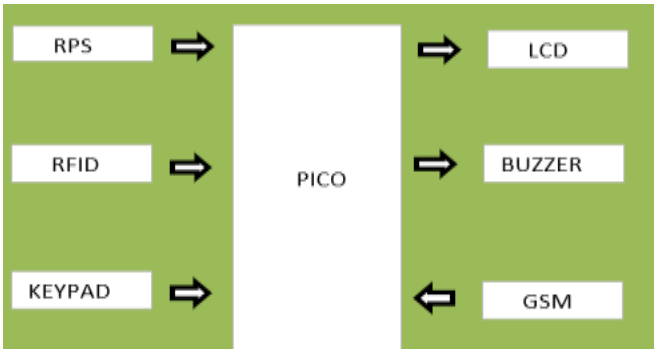
anywhere. A customer holding a bank account can access the account from ATM systems by getting a PIN or password confidentially [2]. Although various biometric technique like-fingerprint, eye recognition, retina and iris recognition, etc have been devised as an authentication method for ATM machines, still there is need to enhance the security in ATM systems to overcome various challenges. The biometrics is a technology that helps to make your data tremendously secure, distinguishing all the users by way of their personal physical characteristics. The biometric information can be used to accurately identify people by using their fingerprint, voice, face, iris, handwriting, or hand geometry and so on. Using biometric identifiers offers several advantages over traditional and current methods [3]. Tokens such as magnetic stripe cards, smart cards and physical keys, can be stolen, lost, duplicated, or left behind; passwords can be shared, forgotten, hacked or unintentionally observed by a third party. There are two key functions offered by a biometric system. One method is identification and the other is verification

LITERATURE REVIEW

The fingerprint technology is the most widely accepted and mature biometric method and is the easiest to deploy and for a higher level of security at your fingertips. It is simple to install and also it takes little time and effort to acquire one's fingerprint with a fingerprint identification device [3]. Thus, finger print recognition is considered among the least intrusive of all biometric verification techniques. Ancient time's officials used thumbprints to seal documents thousands of years ago, and law agencies have been using fingerprint identification since the late 1800s. We here carry the same technology on digital platform. Although fingerprint images are initially captured, the images are not stored anywhere in the system. Instead, the fingerprints are converted to templates rom which the original fingerprints cannot be recreated; hence no misuse of system is possible [6]. The fingerprint based ATM is a desktop application where finger print of the user is used as an authentication. The finger print minutiae features are different for each human being so the user can be identified uniquely. Instead of using ATM card fingerprint based ATM is safer and secure. There is no worry of losing ATM card and no need to carry ATM card in your wallet. You just have to use your fingerprint in order to do any banking transaction

IMPLEMENTATION

BLOCK DIAGRAM



CONCLUSION

This paper presented a prototype design of an ATM access system using fingerprint technology.The system consists of fingerprint module, DC motor and LCD display. These are interfaced to the PIC microcontroller. When a user registers his fingerprint to the fingerprint scanner module, this is fed as input to the microcontroller. The microcontroller is programmed in such a way that the input from. When a authorized person is recognized using finger print scanner module the door is accessed using DC motor. The finger scan technology is being used throughout the world and provides an able solution. The system can be extended using a GSM module. The GSM module sends alert messages to the respective authorities when unauthorized person's finger print is detected.

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IOT BASED SMART AGRICULTURE MONITORING SYSTEM

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ABSTARCT:

Agriculture is done in every country from ages. Agriculture is the science and art of cultivating plants. Agriculture was the key development in the rise of sedentary human civilization. Agriculture is done manually from ages. As the world is trending into new technologies and implementations it is a necessary goal to trend up with agriculture also. IOT plays a very important role in smart agriculture[9][10][11]. IOT sensors are capable of providing information about agriculture fields. we have proposed an IOT and smart agriculture system using automation. This IOT based Agriculture monitoring system makes use of wireless sensor networks that collects data from different sensors deployed at various nodes and sends it through the wireless protocolAgriculture is the backbone of Indian economy. About half of the total population of our country has chosen agriculture as their chief occupation. The states like Maharashtra, Punjab, and Kerala, Assam are highly involved in agriculture. It all started due to the impact of, “Green Revolution” by means of which farmers came to know about the various techniques involved in farming and the advantages in it. As centuries passed, certain modern techniques were invented in agriculture due to the progress in science. These modern techniques included the use of tractors for ploughing the field, production of pesticides, invention of tube-wells etc. Since water is the main necessity in this scenario, techniques were discovered which would help in watering the field easily, consume less water and reduce human efforts. These discoveries improved the standard of living of farmers. Agro-Technology is the process of applying the technology innovation occurring in daily life and applying that to the agriculture sector which improves the efficiency of the crop produced and also to develop a better Mechanical machine to help the agriculture field which reduces the amount and time of work spent on one crop. Hence in this work of project we decided to design a better mechanical machine which is available to the farmers at a cheaper rate and also which can sow and seed the crop at the same time. This project consists of the better design of the machine which can be used specifically for sowing of soybean,

maize, pigeon pea, Bengal gram, groundnut etc. For various agricultural implements and non-availability of sufficient farm labor, various models of seed sowing implements becoming popular in dry land regions of India. The success of crop production depends on timely seeding of these crops with reduced dull work of farm labor. The ultimate objective of seed planting using improve sowing equipment is to achieve precise seed distribution within the row

KEY WORDS: Eye Blink, Rain Sensor, DHT Senesor,Arduino,Wifi

INTRODUCTION

India record of progress in agriculture over the past four decades has been quite impressive. The agriculture sector has been successful in keeping pace with rising demand for food. The contribution of increased land area under agricultural production has declined over time and increases in production in the past two decades have been almost entirely due to increased productivity. Contribution of agricultural growth to overall progress has been widespread. Increased productivity has helped to feed the poor, enhanced farm income and provided opportunities for both direct and indirect employment. The success of India's agriculture is attributed to a series of steps.The major sources of agricultural growth during this period were the spread of modern crop varieties, intensification of input use and investments leading to expansion in the irrigated area. In areas where 'Green Revolution' technologies had major impact, growth has now slowed. New technologies are needed to push out yield frontiers, utilize inputs more efficiently and diversify to more sustainable and higher value cropping patterns". At the same time there is urgency to better exploit potential of rain fed and other less endowed areas. Given the wide range of agro ecological setting and producers, Indian agriculture is faced with a great diversity of needs, opportunities and prospects. Future growth needs to be more rapid, more widely distributed and better targeted. These challenges have profound implications for the way farmers' problems are conceived, researched and transferred to the farmers. "On the one hand agricultural research will increasingly be required to address location specific problems facing the communities on the other the systems will have to position themselves in an increasingly competitive environment to generate and adopt cutting edge technologies to bear upon the solutions facing a vast majority of resource poor farmers".The robotic systems play an immense role in all sections of societies, organization and industrial units. The

objective of the project is to develop a microcontroller based system at helps in on-farm operations like seeding and fertilizing at pre-designated distance and depths with all applicable.Agriculture comes from two Latin words: Ager which means a field. Culturia which means cultivation, Due to traditional methods of agricultural process the Indian farmer faces many problems about productivity of agricultural product than others. It is due to unbalance feeding of fertilizer without knowing the actual requirement of nutrient to a particular crop.Digital models of biological objects have proven to deliver new facilities for the analysis of structural and functional interrelationships as well as developmental processes in a spatial or spatio-temporal context .We are working towards the generation of a generalized 3-D anatomical atlas of developing barley (Hordeum vulgare) grains at different developmental stages. Serving as reference framework for the integration, visualization, and exploration of various data modalities, such inter-individual atlases significantly promote the analysis of developmental gradients and dynamics. Traditional methods include broadcasting manually, opening furrows by a country plough and dropping seeds by hand, and dropping seeds in the furrow through a bamboo/meta funnel attached to a country plough (Pora). For sowing in small areas dibbling i.e., making holes or slits by a stick or tool and dropping seeds by hand is practiced. Multi row traditional seeding devices with manual metering of seeds are quite popular with experienced farmers.In the current generation most of the countries do not have sufficient skilled man power specifically in agricultural sector and it affects the growth of developing countries. So it's a time to automate the sector to overcome this problem. In India there are 70% people dependent on agriculture. So we need to study agriculture. Innovative idea of our project is to automate the process of sowing crops such as sunflower, baby corn, groundnut and vegetables like beans, lady's finger, pumpkin and pulses like black gram, green gram etc & to reduce the human effort and increase the yield.The plantation of seeds is automatically done by using DC motor. The distance between the two seeds are controlled and varied by using Microcontroller. It is also possible to cultivate different kinds of seeds with different distance. When the Robot reaches the end of the field we can change the direction with the help of remote switches. The whole process is controlled by Microcontroller. Seed plantation is our day to day life is done by tractor in farms. The conventional method for seeding is the manual one. But it requires more time &

the man power shortage is faced continuously. India is agrarian economies and most of rural populations depend on agriculture to earn their livelihood. Agriculture is the largest livelihood provided in India mostly in the rural areas. The farmers are in need of seeds for ploughing & cultivation. The seeds are available in packets & many industries deal in manufacture of such seed packets. In Modern world, Automation robot is used in many of the fields such as defence, surveillance, medical field, industries and so on. In this paper, the robot system is used to develop the process of cultivating agricultural land without the use of man power. The aim of the paper is to reduce the man power, time and increase the productivity rate. All the basic automation robot works like weeding, harvesting and so on. In current generation most of the countries do not have sufficient human factor in agricultural sector and it affects the growth of developing countries so it's time to automate the sector to overcome this problem. In India, there are 70% people dependent on agriculture. So we need to study the agriculture. Innovative idea of our project is to automate the process of sowing crops such as groundnut, sunflower, and baby corn and so on. The farming system like ploughing, cultivating, weeding, harvesting, etc is the different process. All the processes are advance to modifying the mechanism in farming which works automatically without the man power requirement.The small machine would be assembled from existing mass produced components without the need of specialized design and tooling. Also energy require to this machine is less as compared with tractors or any agricultural instrument. Seeding preparation is our day to day life we use tractor in farms. But it requires more time and the man shortage is faced continuously. Now a day soil is tested in laboratory and proper analysis of soil is done and amount of various contains and their ratio are measured but laboratories are normally in district places and it is little bit time consuming process. This proposed system contributes to give contain of NPK in soil within some minutes.N (Nitrogen) - for growth of leaves and vegetation. P (Phosphorus)-for root and growth.K (Potassium)-regulation of water.Nutrient in plantcell, flowering, fruiting.Seeding is one of the main process of farming activity. Italso takes more power that can be reduced with this system, seeding is automated which helps linear way of seeding and time consumption is reduced.The NPK value is measured and compared with the standard value for particular crop is known so the difference amount of fertilizer is dispensed by robot

1.1. PROBLEM STATEMENT In the present scenario most of the countries do not have sufficient skilled man power in agricultural sector and that affects the growth of developing countries. Therefore farmers have to use upgraded technology for cultivation activity (digging, seed sowing, fertilizing, spraying etc.). So it's a time to automate the sector to overcome this problem which inturn will also eliminate the requirement of Labors and also avoid the wastage of seeds

1.2 PROBLEM MOTIVATION As we are interested in Embedded Electronics based projects and there are many advantages of the embedded system as well in spite of the electronics based projects. We can control the speed of the DC motor which is an electrical component by using a delay in the source coding. We are motivated for doing this project because it is an autonomous agricultural based project and here we get to deal with the controller, its interfacing with the dc motors, interfacing with the ultrasonic sensor, a linear actuator which is used for opening and closing of the valve required for the dispension of seeds and so on.

LITERATURE REVIEW

COMPARATIVE PERFORMANCE OF SEEDING DEVICES WITH OTHER SOWING METHODS

Introduction In this multipurpose seeding machine equipment consists of cylindrical shape container in which the seeds can fill. The container is attached on the four wheeled carrier assembly. It consists of metering plate bevel gear mechanism and two holes at the bottom depending on seed size. The working as plate will rotate in container when the bottom holes of container and meter plate hole coincide seeds will flow through pipe to soil. Here the metering plate gets rotating motion by bevel gear assembly and the bevel gears get the motion by rear wheels with the help chain and sprocket assembly.

Crop yield Studies in different parts of the country have shown that seeding devices introduced in rainfed areas have increased crop yields by 10 to 20 percent over conventional methods of seeding due to better plant establishment and proper application of inputs. In most parts of Nortli India, seedcum fertilizer drills are used for sowing whereas seed drills are found in use mostly in the Southern parts of the country.

Energy saving It was reported that by using three row bullock drawn ferti-seed drill for wheat crop, a saving of 76.37

percent man hours and 59.92 per cent bullock-hours was obtained when compared with the behind the plough sowing. (Mehta and Varshney, 1970) Singh (1971) revealed that by using a ferti-seed drill for wheat crop, a saving of 69.96 per cent in man-hours and 55.17 percent in huliock hours was achieved when compared.

Drilling or Line Sowing: In this method seed is sown by seed drill or ferti-seed drill. With the help of this implement seeds drop at uniform depth and results in uniform germination and regular stand. Seed bed should be fine and well levelled free from clods and weeds for the use of seed drill or ferti-seed drill. Seed drills are easily available in the market. They may be either bullock driven or tractor driven. Ferti-seed drill should be used wherever possible to ensure uniform depth of sowing, proper placement of fertilisers and good germination.

Dibbling: It is the placing or dibbling of seeds at cross marks (+) made in the field with the help of maker as per the requirement of the crop in both the directions. It is done manually by dibbler. This method is followed in crops like Groundnut, Castor, and Hy. Cotton, etc. which are having bold size and high value. This method is used in case where supply of seed is limited. Sowing is done with the help of a small implement known as 'Dibbler'. It is a wooden or iron frame with pegs. The frame is pressed in the field and lifted and then one or two seeds are dropped by hand in each of the hole. It is not a common method because it is a very time consuming process.

Putting seeds behind the plough: A majority of farmers use this method. This method consists of dropping the seeds by hand into the furrows that have been opened with local plough. When seed is dropped in furrows by hand, it is called 'Kera' method and when it is dropped through a Pora or Nai or Hazara a special attachment with local plough it is called 'Pora' method. In this method seeds are dropped at a depth of 5-6 centimetre and germination is satisfactory. Manual sowing has the problem of not giving adequate spacing between row to row and plant to plant leading to less population of crops than recommended by the agronomists. Also there is the problem of placing the seeds at correct depth and correct soil coverage.

Weed Mapping Weed mapping is process of recording the position and preferably the density (biomass) of different weed species using aspects of machine vision. One method is to just record the increased leaf area found in weedy areas as weeds are patchy and the crops are planted in

rows (Pedersen 2001). Another more accurate method is to use active shape recognition, originally developed to recognise human faces, to classify weed species by the shape of their outline (Søgaard and Heisel 2002). Current research has shown that up to 19 species can be recognised in this way

Robotic Weeding Robotic weeding Knowing the position and severity of the weeds there are many methods that can kill, remove or retard these unwanted plants (Nørremark and Griepentrog 2004) Different physical methods can be used that rely on physical interaction with the weeds. A classic example is to break the soil and root interface by tillage and promote wilting of the weed plants. This can be achieved in the inter row area easily by using classical spring or duck foot tines. Intra row weeding is more difficult as it requires the position of the crop plant to be known so that the end effector can be steered away. Within the close-to-crop area, tillage cannot be used as any disturbance to the soil is likely to damage the interface between the crop and the soil. Non contact methods are being developed such as laser treatments (Heisel 2001) and micro-spraying. Controlled biodiversity is an opportunity that could be realised with robotic weeding. Non-competitive weeds can be left to grow when they are at a distance from the crop. This is part of the design parameters for the Autonomous Christmas Tree weeder being developed at KVL.

Micro Spraying Micro spraying within the close-to-crop area, great care must be taken not to damage the crop nor disturb the soil. One method of killing weeds close to the crop plants is to use a micro spray that delivers very small amounts directly on to the weed leaf. Machine vision can be used to identify the position of an individual weed plant and a set of nozzles mounted close together can squirt a herbicide on to the weed. Tests have shown that splashing can be reduced when a gel is used as a carrier rather than water (Lund and Søgaard 2005). Other trials have shown that when the right amount of herbicide is placed in the right way at the right time, the usage of herbicide can be drastically reduced to about 1 gram per hectare for an infestation of 100 weeds per square meter (Graglia 2004). A micro spray system is currently under development at DIAS Bygholm, in Denmark

Robotic Gantry Robotic gantry Traditional or macro spraying can be very efficient, especially when they cover large areas. Most equipment manufacturers are developing larger machines, with 42 meter booms currently under development (pers.

com. Hardi International). When mounting booms this big, they have inherent stability problems as the tractor has a relatively small wheelbase and they tend to oscillate. One method to improve stability would be to mount a spray boom between two unmanned robots that travelled in adjacent tramlines. This robotic gantry could apply both liquid sprays and fertiliser and be able to regulate itself according to current weather conditions. If it became too windy then the gantry could just stop and wait until conditions improved. Variable rate, patch spraying, minimising skips and overlaps could all be built into the original design specifications by controlling individual nozzles. Turning on the headland would be different, as it would not include rotation – just translation, as the robots could turn but the boom remains parallel to its working direction. Sensing systems could be mounted on a trolley that could move along the spray boom as in the crop scouting section.

Selective Harvesting Selective harvesting Selective harvesting involves the concept of only harvesting those parts of the crop that meet certain quality thresholds. It can be considered to be a type of pre sorting based on sensory perception. Examples are to only harvest barley below a fixed protein content or combine grain that is dry enough (and leave the rest to dry out) or to select and harvest fruits and vegetables that meet a size criteria. As these criteria often attract quality premiums, increased economic returns could justify the additional sensing. To be able to carry out selective harvesting effectively, two criteria are needed; the ability to sense the quality factor before harvest and the ability to harvest the product of interest without damaging the remaining crop. Most agricultural equipment is getting bigger and hence not suited for this approach. Smaller more versatile selective harvesting equipment is needed. Either the crop can be surveyed before harvest so that the information needed about where the crop of interest is located, or that the harvester may have sensors mounted that can ascertain the crop condition. The selective harvester can then harvest that crop that is ready, while leaving the rest to mature, dry, or ripen etc. Alternatively, small autonomous whole crop harvesters could be used to selectively gather the entire crop from a selected area and transport it to a stationary processing system that could clean, sort and maybe pack the produce. This is not a new idea, but updating a system that used stationary threshing machines from many years ago. Alternatively a stripper header could be used to only gather the cereal heads and send them for threshing

D.S.Suresh, Jyothi Prakash K V, Rajendra C J, "Automated Soil Testing Device", ITSI Transactions on Electrical and Electronics Engineering (ITSI-TEEE) ISSN (PRINT): 2320 – 8945, Volume - 1, Issue -5, 2013.

In country like India the economy is mainly based on agriculture, still we are not able to make optimal, profitable and sustainable use of our land resources. The main reason is the lack of knowledge regarding the soil analysis for the growth of crops. In every state around 9 to 10 lakhs soil samples have been received in laboratories and it is very difficult to test all the soil samples in time by the laboratories. By the time test reports are generated, harvesting is on the verge of completion. Hence there is a need for soil analysis to be made available to the farmer. The main objective of our work is to develop a testing system which can be used for soil analysis, which in term helps the farmers to cultivate and produce the proper crop. The wireless communication system has been incorporated to interact with the experts Automated Soil Testing Device is an electronic device, which can be used to measure N (Nitrogen) P (Phosphorous) K (Potassium) & pH (Potenzy hydrogen) values to ensure the fertility of soil in the field of agriculture to select the suitable crop and also the type of fertilizer to be used. The ionic particles present in the soil sample are sensed by the sensor and the out put of the sensor is processed by signal conditioning circuit. The Microcontroller is used to compare the pre-stored value with the actual values and the measured values are displayed on the LCD. The wireless trans-receiver transmits the data to a remote location or designated authority in the agriculture department for further analysis & suggestions. Automated Soil Testing Device is a portable device which can be used either in laboratories or on the identified spot selected for farming so that the farmer need not take the pain of visiting the soil testing laboratories which are normally located in district headquarters. Automated Soil Testing Device is a simple &user friendly device so that any person can test the soil without the presence of an operator, it is an economical device & thus a common man can easily afford it.

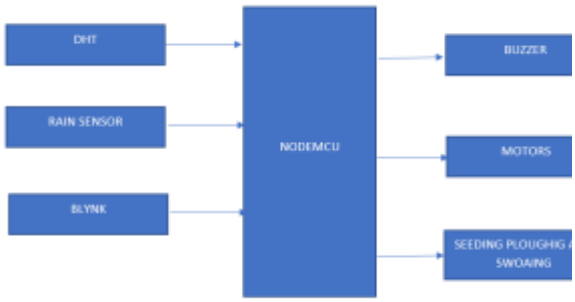
Sneha J. Bansod, ShubhadhaThakre, "Near Infrared Spectroscopy based Soil Nitrogen measurement", International Journal of Current Engineering and Technology E-ISSN 2277 – 4106, P-ISSN 2347 – 5161

Spectroscopy is an emerging technology, having vast applications in food industry and agriculture. The unique quality of Spectroscopy to characterize material from

the reflection or absorbance has been used in the current paper to measure soil Nitrogen content. Taking into account the advantages of Near Infrared (NIR) region over other regions of electromagnetic spectrum, NIR Spectroscopy was decided to be employed for Soil Nitrogen measurement. An expensive, bulky, non-portable Spectrometer was successfully replaced by a small, portable assembly consisting of six LEDs (940, 1050, 1100, 1200, 1300, 1550) corresponding to six Nitrogen sensitive wavebands and six photo-detectors. The detailed structure design and experimental procedure has been described in the paper. Device was calibrated using the most commonly used Partial Least Square Regression (PLSR) analysis which acquired a calibration coefficient of determination (R2) 0.875 and Validation R2 0.803.For increasing crop production, soil testing is helpful for recommending the type of fertilizer and its quantity to be added to the soil. This leads to an efficient fertilizer use, Environment protection, product quality enhancement and increase in yield. The conventional soil testing methods, namely laboratory analysis methods are time consuming, expensive and require expert operator in chemical analysis. At the same time these methods won't be helpful in on-line monitoring processes. Thus, there is an insistent demand for investigating a reliable and cost effective method for instantaneous analysis. Overcoming these disadvantages, Spectroscopy has shown promising results for estimation of soil constituents. Spectroscopy is a rapid, timely, less expensive, nondestructive analytical technique which can be reliably used to estimate different soil properties without the need of chemicals [14]. It is an analytical technique that characterizes the materials according to their absorbance or reflectance in the specific wavelengths. The estimation of constituents is achieved from the soil spectrum, obtained by directing radiation containing all relevant frequencies in the particular range to the sample. Depending on the constituents present in the soil, the radiation will cause individual molecular bonds to vibrate, either by bending or stretching, and the light absorption will correspond to a specific energy quantum equivalent to the difference between two energy levels. Because of its particular bonds and molecular structures, each chemical species produces a unique IR absorption spectrum, which can be used for analytical purposes [15]. Near infrared reflectance (NIR) spectroscopy, with electromagnetic spectrum region from 780-2500nm wavelength, has been used for analysis of minerals, forages, plant material and grains as well as for some soil materials. The NIR region is dominated by weak overtones

and combinations of fundamental vibrations due to the stretching and bending of N-H, O-H and C-H groups [14]. NIR is well supported commercially, is well suited to field portability, remote sensing, copes better with moist samples and can deal with larger bulk soil samples because of its more intense sources and sensitive detectors. The main reason for sensing nitrogen in the farm fields is to determine the amount of fertilizer applied to meet the needs of the crops and to prevent over-applying so as to diminish nitrate leaching down in groundwater reservoirs. Nitrogen is said to be a best indicator of soil fertility. Nitrogen is an essential element of all amino acids, which are the building blocks of proteins. It is also a key component of nucleic acids and chlorophyll. A plant receiving sufficient nitrogen will typically exhibit higher photosynthesis rate and vigorous plant growth. From the surveillance, it is inferred that NIR region of the spectrum is most suitable for predictions of soil Nitrogen contents [14]. In recent decades, Spectroscopy technique has been increasingly used in agricultural and food industries. Many experiments and research has been done to develop spectroscopy based reliable, portable and cost effective device. Felipe et al. [6] developed a low-cost IR absorption spectroscope based on linear variable filter (LVF) technology for the automated detection of gases and vapours, and the semi-automated detection of liquids. Sudduth and Hummel et al. [16] used a portable near infrared spectrophotometer for estimation of soil organic matter with an R2 of 0.89 and a standard error of prediction of 0.40%. Similarly, NIRS has been used for soil total Nitrogen detection by Dalal and Henry et al. [5] using MLR calibration with correlation coefficient R2 of 0.92 over 1100-2500. Reeves and McCarty (2001) used PLSR with R2 of 0.94 in wavelength range 1100-2300. They all employed various spectrophotometers for estimation of soil nutrients through the spectra obtained. But, use of spectrophotometers made the device bulky and very expensive. Replacing the spectrophotometers with LEDs and detector, An et al. (2011) suggested six wavelengths (1550, 1300, 1200, 1100, 1050, and 940 nm) as the sensitive wavebands for soil Nitrogen [16]. The estimation model was obtained using the FT-NIR analyzer with calibration R2 of 0.85, and the validation R2 of 0.77. Further, XiaofeiAn et al. [18] developed the BP-NN estimation model having soil TN content R2 0.88 and the validation R2 0.75. As, these estimation models had a very good accuracy, the six LEDs are used in the present design

BLOCK DIAGRAM:



NODE MCU:

NodeMCU is an open source LUA based firmware developed for ESP8266 wifi chip. By exploring functionality with ESP8266 chip, NodeMCU firmware comes with ESP8266 Development board/kit i.e. NodeMCU Development boardSince NodeMCU is open source platform, their hardware design is open for edit/modify/build.NodeMCU Dev Kit/board consist of ESP8266 wifi enabled chip. The **ESP8266** is a low-cost Wi-Fi chip developed by Espressif Systems with TCP/IP protocol. For more information about ESP8266, you can refer ESP8266 WiFi Module.There is Version2 (V2) available for NodeMCU Dev Kit i.e. **NodeMCU Development Board v1.0 (Version2)**, which usually comes in black colored PCB.

Fig: NodeMCU Development Board

DHT:

These sensors are very basic and slow, but are great for hobbyists who want to do some basic data logging. The DHT sensors are made of two parts, a capacitive humidity sensor and a thermistor. There is also a very basic chip inside that does some analog to digital conversion and spits out a digital signal with the temperature and humidity. The digital signal is fairly easy to read using any microcontroller.

Humidity is the measure of water vapour present in the air. The level of humidity in air affects various physical, chemical and biological processes. In industrial applications, humidity can affect the business cost of the products, health and safety of the employees. So, in semiconductor industries and control system industries measurement of humidity is very important. Humidity measurement determines the amount of moisture present in the gas that can be a mixture of water vapour, nitrogen, argon or pure gas etc… Humidity sensors are of two types based on their measurement units. They are a relative humidity sensor and Absolute humidity sensor. DHT11 is a digital temperature and humidity sensor.

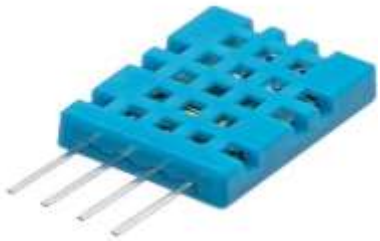
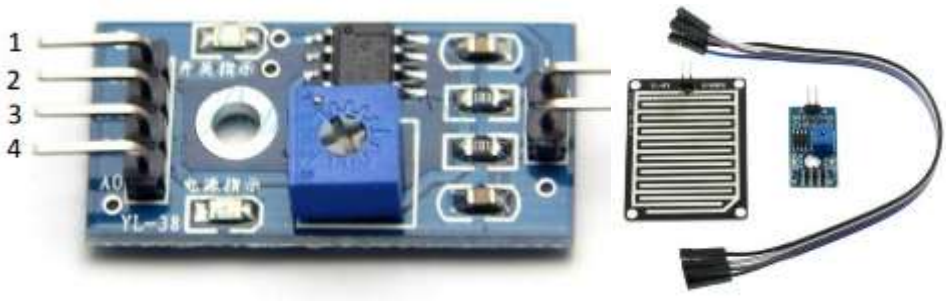


Fig: DHT Sensor

RAIN SENSOR:

A rain sensor or rain switch is a switching device activated by rainfall. There are two main applications for rain sensors. The first is a water conservation device connected to an automatic irrigation system that causes the system to shut down in the event of rainfall. The second is a device used to protect the interior of an automobile from rain and to support the automatic mode of windscreen wipers. An additional application in professional satellite communications antennas is to trigger a rain blower on the aperture of the antenna feed, to remove water droplets from the mylar cover that keeps pressurized and dry air inside the wave-guides

The rain sensor module/board is shown below. Basically, this board includes nickel coated lines and it works on the resistance principle. This sensor module permits to gauge moisture through analog output pins & it gives a digital output while moisture threshold surpasses.



rain-sensor-module

This module is similar to the LM393 IC because it includes the electronic module as well as a PCB. Here PCB is used to collect the raindrops. When the rain falls on the board, then it creates a parallel resistance path to calculate through the operational amplifier.

This sensor is a resistive dipole, and based on the moisture only it shows the resistance. For example, it shows more resistance when it is dry and shows less resistance when it is wet.

Pin Configuration

The pin configuration of this sensor is shown below. This sensor includes four pins which include the following.

- Pin1 (VCC): It is a 5V DC pin
- Pin2 (GND): it is a GND (ground) pin
- Pin3 (DO): It is a low/ high output pin
- Pin4 (AO): It is an analog output pin

Specifications

The specifications of the rain sensor include the following.

Fig:Rain-sensor

- This sensor module uses good quality of double-sided material.
- Anti-conductivity & oxidation with long time use
- The area of this sensor includes 5cm x 4cm and can be built with a nickel plate on the side
- The sensitivity can be adjusted by a potentiometer
- The required voltage is 5V
- The size of the small PCB is 3.2cm x 1.4cm
- For easy installation, it uses bolt holes
- It uses an LM393 comparator with wide voltage
- The output of the comparator is a clean waveform and driving capacity is above 15Ma

APPLICATIONS

The applications of rain sensor include the following.

- This sensor is used as a water preservation device and this is connected to the irrigation system to shut down the system in the event of rainfall.
- This sensor is used to guard the internal parts of an automobile against the rainfall as well as to support the regular windscreen wiper's mode.
- This sensor is used in specialized satellite communications aerials for activating a rain blower over the opening of the aerial feed, to get rid of water droplets from the mylar wrap to keep pressurized as well as dry air within the waveguides.

DC Motor Driver:

The L293 and L293D are quadruple high-current half-H drivers. The L293 is designed to allow for bidirectional drive currents of up to 1 A at voltages from 4.5 V to 36 V. The L293D is planned to provide bidirectional drive currents of up to 600-mA at voltages of 4.5 V to 36 V. Both devices are designed to drive inductive loads such as relays, solenoids, dc and bipolar maltreating motors, as well as other high-current/high up-voltage loads in positive-supply applications.

All inputs are TTL compatible. Each output is a complete totem-pole drive circuit, with a Darlington transistor drop and a pseudo-Darlington source. Drivers are changed in pairs, with drivers 1 and 2 enabled near 1,2EN and drivers 3 and 4 enabled by 3,4EN.When an enable input is high, the linked drivers are enabled and their outputs are active and in phase with their inputs.When the enable input is low, those drivers are disabled and their outputs are off and in the high-impedance state.

With the thoroughly data inputs, each pair of drivers forms a full-H (or bridge) reversible drive suitable for solenoid or motor applications. On the L293, international high-speed output clamp diodes should be used for inductive transient stifling. A VCC1 terminal, classify from VCC2, is provided for the logic inputs to minimize device power dissolution. The L293and L293D are characterized for operation from 0°C to 70°C.

Fig 3.22: L293D IC

APPLICATION, ADVANTAGE, DISADVANTAGE

APPLICATION

1) Farming The design of furrow openers of seed drills varies to suit the soil conditions of particular region. Most of the seed cum fertilizer drills are provided with pointed tool to form a narrow slit in the soil for seed deposition.

2) Gardening Seeds are broadcasted on the soil which results in the loss and damage of the seeds. As the cost of seeds is more and cannot be affordable for the farmers so there is the need for the proper placement of seeds in the soil.

3) Sport's Stadium The fluted roller seed cup is having the arrangement of seed cut-off and controlling flap to control the amount of seeds and fertilizers.

4) Agri Universities The Harrow is one of the important agricultural equipment which is used in the fields of agriculture for seed bed preparation and weed control. This is used before the seeds are sown in the field. This helps in the leveling of the soil and seeds can be sown in the prepare bed easily Polyhouse Seeds are broadcasted on the soil which results in the loss and damage of the seeds. As the cost of seeds is more and cannot be affordable for the farmers so there is the need for the proper placement of seeds in the soil.

ADVANTAGE

• Reduce the manual work Anyone that has ever had the task of relocating a fixed conveyor system knows that this can be a cumbersome undertaking. Through the use of advanced ASSR technology and wireless routing, vehicles can be quickly reprogrammed to change path or operation, eliminating the need for expensive retrofitting. New directions, tasks, and work cells can be created almost

instantaneously without the need for physical equipment installation.

• Less skill technicians is sufficient to operate. Through the advancement of control systems ASSRs offer a safe and predictable method of delivery, while avoiding interference with human and building factors. ASSRs can operate almost around the clock, without the need for breaks and vacation time. In addition, ASSRs operate in conditions that may not be suitable for human operators, such as extreme temperatures and hazardous environments.

• Installation is simplified very much Automated Seed Sowing, combined with RF technology, interface with the Warehouse Control System or Warehouse Management System to improve accuracy and efficiency. ASSRs have little downtime, and operate at a fixed rate to meet a predictable metric for operational activity.

• Labor requirement reduces Optimization of transport flows in accordance with vehicle fleet, traffic and missions.Work flows distributed dynamically between the same ASSRs.Possibility of 24/7 operation without human intervention.

• Quantity of seeds reduces No conventional material-handling infrastructures required. Increase of ASSRs in line with the growth in volume of operations. Updating possible without shutting down the system.Easy reconfiguration of routes or addition of new machines.Reintroduction of vehicles after manual repositioning. Polyhouse Seeds are broadcasted on the soil which results in the loss and damage of the seeds. As the cost of seeds is more and cannot be affordable for the farmers so there is the need for the proper placement of seeds in the soil.

DISADVANTAGE

• Electronics component cannot sustain the vibrations and the high temperature.

• Accuracy should be reduces due to clod and mud.

CONCLUSION The main focus of this system is its Automatic way of sowing the seeds. The seeds are been sowed in a proper sequence which results in proper germination of seeds. This automatic way of sowing seeds using a robot reduces the labor requirement. Here the wastage of seeds is also been reduced to a greater extent. This system has been developed for the sowing of seeds in an automatic way. Here with the help of a robot the seeds are been dispensed in the soil in a proper sequence hereby reducing the wastage of seeds The planting process of the onion crop only has been implemented by using

this Seed Sowing V robot autonomously. This robot will help the farmers to do the farming process efficiently. The project can be enhanced to any other kinds of crop such as fruits, paddy, sugarcane etc. The robot can be designed with chain roller instead of normal wheel. Hence, it can be applicable to the real time agricultural field

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AN ADAPTIVE PEDESTRIANS CROSSING SIGNAL CONTROL SYSTEM FOR INTERSECTION

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ABSTRACT In order to reduce the effect on vehicles in the major road and shorten the waiting time of pedestrians, an adaptive pedestrians crossing signal control system was designed in this paper. The system was composed of capturing units of video and image sequence, control units and display units. Video and image sequences were real-timely acquired by capturing units. The main task of the control units was to adaptively calculate the waiting area and the waiting time of pedestrians. The display units controlled the status changes of signal light based on the processing results. It is pointed that the background of scene can be reconstructed correctly when the pedestrians begin to pass the street, and the total number of pedestrians and the waiting time can be detected effectively. The results indicate that adaptive pedestrian crossing system can control the signal status of pedestrian. Finally, some of the possible extensions of this technique are discussed

INTRODUCTION India is populated with 1.38 billion people. The population is equivalent to 17.7% of total world population living in 3.287 million km some parts of country is below the poverty line for them walking is the only available option for making movement one place to another place pedestrian crossing are become important for them pedestrian are the usable path for the road usable in India.Pedestrian crossing, as an important part of a transportation infrastructure serves to secure lives and possessions and keep traffic flow in order. Therefore an approach to automatically detect pedestrian crossing area with the help of infrared sensors for recognizing the vehicle so as to reduce the traffic safety hazardous and safe guards lives and properties. Vehicle based sensing system provided due to its low cost of application of speedily working and great continence in repeatedly collecting high temporal data and special resolution which makes the clear and efficient supervision

over pedestrian crossing and automatic opening and closing the gate at rest to the pedestrian crossing over the roadside. In terms of pedestrian crossing detection. Current approaches have been focused on that of a single crossing area from detection and recognizing at vehicular angle. This paper develops an approaches to automatically detect pedestrian in using, so they signalize to the vehicular person to stop at the pedestrian crossing, which will make ensure a supervision over the discovering flaking point.The defiling and impairing of pedestrian crossing to reduce potential traffic safety from making of harmful incidents. This paper recognizing the traffic control system to positively supportive and design the finest perfect pedestrian crossing consequently. And also proposes to handle the traffic system to give the instruction to the pedestrian crossing user.

LITERATURE REVIEW

The importance of safety, security, width of the pedestrian sidewalk, streets and comfort with the help of traffic control sensing system.it is explained by Jacob(1961).In year 1964 few elements like pedestrianscale design, convenience and comfort are essential for a pedestrian-friendly environments are developed by Ritter. In Planning for Pedestrians, The general aim of providing a pedestrian system is to express a uniform design identity in terms of function and visual quality and to aid the pedestrian to orient by Antoniou(1971). Brambilla and Longo (1977) identify convenience, security, comfort and safety, as the parameters that are essential for a pedestrian friendly environment. In the previous Geography, Nowhere, Kunstler(1994). provides a scathing critique of vehicle friendly streets. According to him, the important elements of a pedestrian-oriented street are comfort, safety and secure. Shioyama,(2004) and Uddin (2004,2005) either a pedestrian perspective adopted or the length of the pedestrian is collected in the data by assisting it over a road. And all the studies aim to extract pedestrian crossing contours. The position of pedestrian crossing is located, with data from traffic surveillance converged, by constantly monitoring pedestrians moving vehicles detection which results in approach are immune to occlusion or barriers but are subject to surveillance coverage and sensing recognizes the angles unable to estimate to manage traffic control system by Boudet(2009).

IMPLEMENTATION

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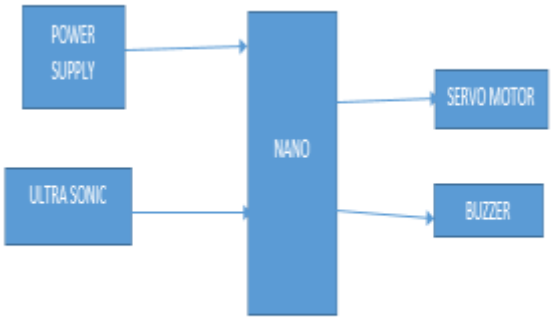

BUZZERS

In common parlance a Buzzer is a signaling device that is not a loudspeaker. It can be mechanical, electromechanical, or electronic (a piezo transducer). BeStar produces Buzzers in every available configuration for a wide variety of applications. A Piezo transducer can produce the sound for panel mount buzzers, household goods, medical devices and even very loud sirens. When a lower frequency is required an electromagnetic buzzer can fill the need. These are very common in automotive chimes and higher end clinical diagnostic devices. The BeStar buzzer range includes self drive units with their own drive circuitry (indicators), or external drive units, which allow the designer the flexibility to create their own sound patterns.

NANO

The Arduino Nano, as the name suggests is a compact, complete and bread-board friendly microcontroller board. The Nano board weighs around 7 grams with dimensions of 4.5 cms to 1.8 cms (L to B). This article discusses about the technical specs most importantly the pinout and functions of each and every pin in the Arduino Nano board.

Arduino Nano has similar functionalities as Arduino Duemilanove but with a different package. The Nano is inbuilt with the ATmega328P microcontroller, same as the Arduino UNO. The main difference between them is that the UNO board is presented in PDIP (Plastic Dual-In-line Package) form with 30 pins and Nano is available in TQFP (plastic quad flat pack) with 32 pins. The extra 2 pins of Arduino Nano serve for the ADC functionalities, while UNO has 6 ADC ports but Nano has 8 ADC ports. The Nano board doesn't have a DC power jack as other Arduino boards, but instead has a mini-USB port. This port is used for both programming and serial monitoring. The fascinating feature in Nano is that it will choose the strongest power source with its potential difference, and the power source selecting jumper is invalid.

ULTRA SONIC SENSOR:

This "ECHO" Ultrasonic Distance Sensor from Rhydolabz is an amazing product that provides very short (2CM) to long-range (4M) detection and ranging. The sensor provides precise, stable non- contact distance measurements from 2cm to 4 meters with very high accuracy. Its compact size, higher range and easy usability make it a handy sensor for distance measurement and mapping. The board can easily be interfaced to microcontrollers where the triggering and measurement can be done using one I/O pin. The sensor transmits an ultrasonic wave and produces an output pulse that corresponds to the time required for the burst echo to return to the sensor. By measuring the echo pulse width, the distance to target can easily be calculated.

What is a Servo Motor?

A **servo motor** is a type of motor that can rotate with great precision. Normally this type of motor consists of a control circuit that provides feedback on the current position of the motor shaft, this feedback allows the servo motors to rotate with great precision. If you want to rotate an object at some specific angles or distance, then you use a servo motor. It is just made up of a simple motor which runs through a **servo mechanism**. If motor is powered by a DC power supply then it is called DC servo motor, and if it is AC-powered motor then it is called AC servo motor. For this tutorial, we will be discussing only about the **DC servo motor working**. Apart from these major classifications, there are many other types of servo motors based on the type of gear arrangement and operating characteristics. A servo motor usually comes with a gear arrangement that allows us to get a very high torque servo motor in small and lightweight packages. Due to these features, they are being used in many applications like toy car, RC helicopters and planes, Robotics, etc.

CONCLUSION

We have developed a portable, smart, and wireless-enabled traffic light system for the crosswalk. It is an efficiently functioning testbed to improve pedestrian safety and convenience by automating traffic light control based on the detection of pedestrians. This system helps pedestrians to cross the road safely without extra efforts to activate the walk signal. Besides, the cost of system installation and construction, needs for maintenance and energy efficiency of the system were among our main considerations. The system's Bluetooth enables the bidirectional communication between the traffic lights of both sides of the crossing road area. The portability nature of the system makes it easy to move and deployed in temporary locations like in universities and schools to help students at in/out times. The system testbed is able to save energy and deduct electricity bills by exploiting LEDs with rechargeable batteries. There are several limitations to this research that have found. One of them is the PIR sensor which has a very wide detection range which is 120 degree and distance of a minimum 3 m. Because of that, the PIR sensor will give a false signal because it can detect the presence of pedestrians at far from the traffic light. To solve this problem, the PIR sensor put inside a hole to narrowing the angle to 45 degree instead and reduce the distance of sensor detection. We suppose that the technical contributions of this paper will be valuable assets for the related applied researches on improving transportation infrastructure that involving pedestrians, particularly in the Smart City environment. A potential extension of the current study is to implement a solar cell to enhance system dependency on the rechargeable battery. The solar panel can provide energy to the system directly during day time and charging the battery to be used in the night time. The utilization of IoT and 5G communication networks in the future.to monitor such crosswalk systems will be helpful.

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