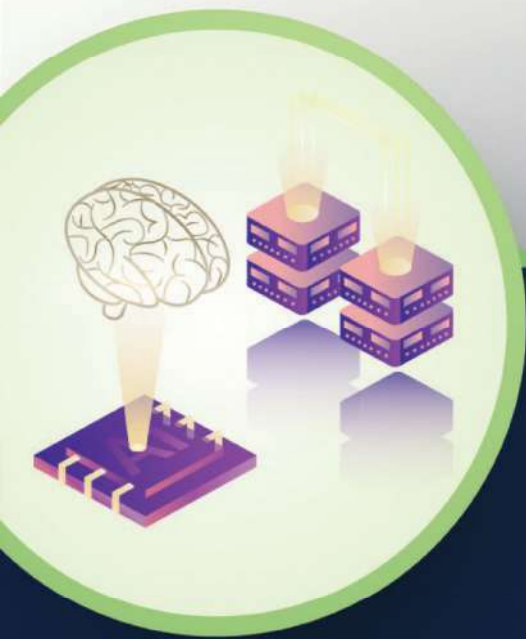


PCE JOURNAL OF ELECTRONICS & TELECOMMUNICATION



JUNE '19



FROM THE HEAD OF DEPARTMENT'S DESK

It has been an absolute pleasure seeing the final year students of the EXTC department work on their projects. The innovative ideas thought and implemented by them is quite impressive. Not only have they made sure their projects are efficient, they also made sure that it is cost-effective, a factor one needs to keep in mind while making a project with actual use. The paper submitted by them to the journal showcase their work to the rest of the college. By the means of the project, it has been made sure that their work done by these students does not go unnoticed. The efforts taken by the journal committee to make sure the whole college sees the talent of our department is much appreciated and applauded. I wish the students good luck for their future and hope they continue taking such innovative approaches in life.

With Best Wishes,

Dr Avinash Vaidya

Head of the Department

(Electronics and Telecommunication)

FROM THE TEACHER'S DESK

The annual journal of the EXTC department is a place where the projects formed by the student of the department are showcased in front of the whole college. The papers submitted by the students act as an excellent source of information that can be referred by the other students. The hard work done by the Journal committee has been immense. The committee members not only designed the journal, but also lend a hand to the students writing the papers. The punctuality with which the work has been done by them is really commendable. The technical papers submitted this year showcase how innovative the thinking of the students has become and indicates towards a promising future. I wish good luck to the committee and look forward to more wonderful issues of this journal.

prof. Jayshree Bhosle

faculty

(Electronics and Telecommunication)

Project Work is a learning experience which aims to provide students with the opportunity to synthesize knowledge from various areas of learning, and critically and creatively apply it to real life situations. This year's projects have all been very much fascinating and at the same time productive in their own way. We came across various networking projects, energy management based projects which is the need of present day scenario and many more such amazing works. All of which were cost effective as well as creatively executed, showing the capability of the students to think outside the box. The members of journal committee have worked immensely well in showcasing the potential of our department students. The journal team was swift enough to get things done before the deadlines and made sure that the papers submitted did not have a shred of error. I appreciate the cooperative spirit and the attention to detail that enabled us to streamline the entire process to achieve success and meet our goals.

prof. Suchitra Patil

faculty

(Electronics and Telecommunication)

CONTENTS

AQUA ROBOT

ELECTRONIC VOTING MACHINE

**SMART BIKE HELMET USING GSM,GPS,GPRS & RF
MODULE**

SMART PARKING SYSTEM USING IOT

**FINGERPRINT BASED BIOMETRIC VOTING MACHINE
USING RASPBERRY PI**

SAFETY ELECTRONIC FOR RAILWAY BRIDGE

**DESIGN OF RESTAURANT MANAGEMENT SYSTEM
USING IOT**

SPEECH RECODNITION ROBOTIC VEHICLE CONTROL

**PIC BASED BANK LOCKER SECURITY SYSTEM WITH
SMS ALERT AND CALL**

RAILWAY TRACK DETECTION SYSTEM

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PROF. JAYSHREEBHOSALE

ABSTRACT—In this project we demonstrate the idea of an aqua robot with the help of Arduino. The mechanism used for our design is such that it collects the waste which floats on water bodies and the collected waste can be easily disposed from the product, our product cleans the wastes found such as plastic wastes, garlands and other wastes found floating on water. Prime objective of our project is to collect all the wastes which are found floating on water bodies and to minimize labour work. We can use our robot in land cleaning also.
Keywords: Arduino, LM 293D motor driver IC, 12V DC Motor, conveyor belt, RF Transmitter and Receiver.

For cleaning the waste conveyor belt and it is on by a switch used in remote controller.

1.2 OBJECTIVE

The main objective is that to develop a robot which is waterproof and floats on water.

The objective of this work is:-

Clean up the rivers, lakes, ponds, etc.

Easily float on water.

Remote operating robot.

1.3 SCOPE

This project is made only for a small lake and by doing some modification in its size and capacity it can be used in big lakes and rivers like Ganga.

The machine can be designed for deep cleaning. Solar panel can be used for providing power to the machine and engine can be used.

A arm can be designed for pick and place.

At the place of wheels we can use fins or moveable fins.

II. Problem Definition:

As the project is water based some problem came that water is entered in robot. Then balancing the weight of motors and circuit in the box but overcome that and result is successful.

I. INTRODUCTION

1.1 FUNDAMENTAL

Water is the basic need of all living organisms, it is important to maintain the cleanliness of water. Water gets polluted due to many reasons such as waste from industries, garbage waste, sewage waste etc. Water from lakes and ponds are cleaned by traditional methods. We have to incorporate technology in such that cleaning work is done efficiently and effectively. So we design the robot which cleans the water and minimize the labour work.

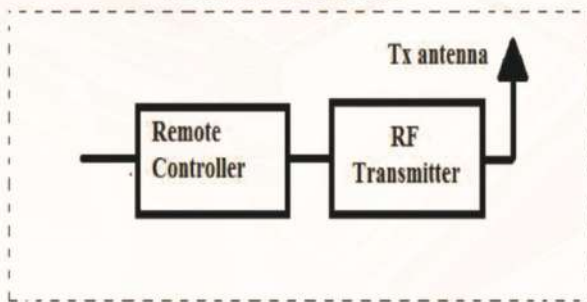
The robot will float on water and collect the waste if the bin box is the indication will be given that the bin is full. The robot is controlled by the remote controller.

programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

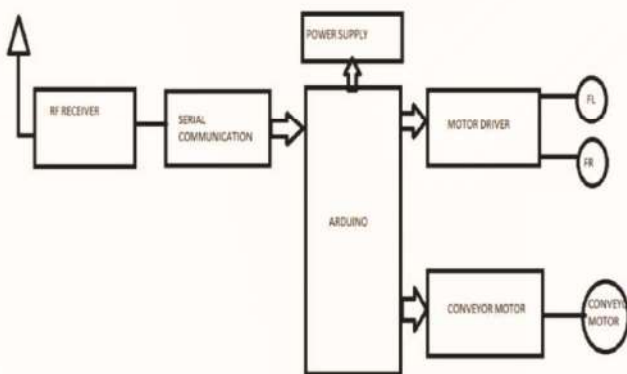
The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board, we can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the microcontroller into a more accessible package.

III. SYSTEM DESCRIPTION

TRANSMITTER SECTION



RECEIVER SECTION



3.1 ARDUINO



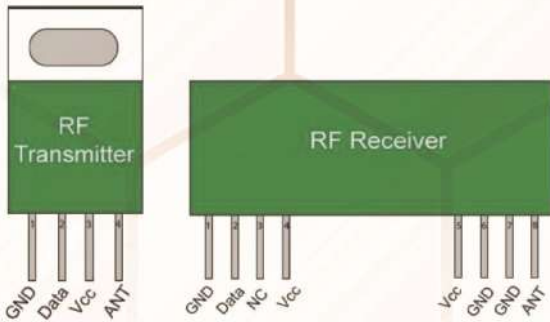
Arduino is an open-source platform used for building electronics projects. Arduino consists of both physical

3.2-MOTOR DRIVER IC (LM293D)



LM293D is a dual motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors. LM293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operation of two motors can be controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 0 or 1 will stop the corresponding motor. Logic 0 and 1 will rotate it in clockwise and anticlockwise directions, respectively.

3.3 RF TRANSMITTER AND RECEIVER



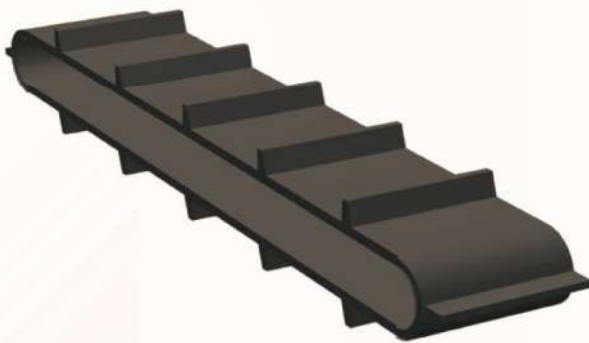
Radio Frequency Transmitter

This wireless data is the easiest to use, lowest cost RF link. Use these components to transmit position data, temperature, and even current program register values wirelessly to the receiver. These modules have up to 500 Ft. range in open space. The transmitter operates from 2-12V.

Radio Frequency Receiver

This receiver type is good for data rates up to 4800 bps and will only work with the 434MHz to 315 MHz transmitter. Multiple 434MHz or 315MHz receivers can listen to one 434MHz transmitter or 315MHz transmitter. The receiver is operated at 5V.

3.4 CONVEYOR BELT



A conveyor belt is the carrying medium of a belt conveyor system (often shortened to belt conveyor). A belt conveyor system is one of many types of conveyor systems. A belt conveyor system consists of two or more pulleys (sometimes referred to as drums), with an endless loop of carrying medium. The conveyor belt, that rotates about them. One or both of the pulleys are powered, moving the belt and the material on the belt forward. The powered pulley is called the drive pulley

while the unpowered pulley is called the idler pulley.

There are two main industrial classes of belt conveyors; Those in general material handling such as those moving boxes along inside a factory and bulk material handling such as those used to transport large volumes resources and agricultural materials, such as grain, salt, coal, ore, sand, overburden and more.

VI. CONCLUSION

About 71 percent of the Earth's surface is water-covered and only about 0.3 percent of that fresh water is found in the surface water of lakes, rivers, and swamps. In developing countries, 70 percent of industrial wastes are dumped untreated into waters, polluting the usable water supply. On average, 22 million tons of fertilizers and chemicals are used each year.

Aqua robot will be designed with an intention of cleaning the water debris floating on the lake, by using our robot we can collect many floating wastes like plastic bottles, bags, flowers without any human interference and then dispose the waste easily, one can clean the lake just by operating it with the help of remote control. Also, our product helps in reducing the water pollutant to a certain extent. The major advantage is the safety provided by our product that is one need not risk his life while he is cleaning the lake and we just need one person to control the aqua robot. The product is socially helpful for the laborers who clean the lake and economically viable. If the product is used in large numbers, it would be a perfect example for "Technological application in environmental protection".

VII. ACKNOWLEDGEMENT

As we know electronics and telecommunication engineering is the art of combining the knowledge of science, engineering and physics to acquire the ability to design a system, component, or process to meet desired needs. So we would like to thank and express our sincere gratitude to the principal Dr. Sandeep Joshi and also Dr. Avinash Vaidya, Head of Department for all the support and giving us this chance to work on this topic even if it is part of the course. Our thanks and appreciations also go to our colleagues in developing the project and people who have willingly helped us out with their abilities

V.REFERENCE

- [1] Mr.Abhijeet.M. Balade, Mr. Vishal.S. Garde, Mr.Akash.S.LahaneandMr.Pranav.V.Boob,“Design& fabricationofrivercleaningsystem”,IJMTERVolume04, Issue2,[February–2017]ISSN
- [2]Mr.P.M.Sirsat,Dr.I.A.Khan,Mr.P.V.Jadhav,Mr. P.T.Date,“Designand fabricationofRiverWaste CleaningMachine”,IJCMES2017SpecialIssue-1
- [3]PankajSinghSirohi,RahulDev,Shubham Gautam, Vinay KumarSingh,SarojKumar,“Review onAdvance RiverCleaner”,IJIRVol-3,Issue-4,2017ISSN:2454-1362.[5]Ndubuisic.Daniels,“DrainageSystemCleanerA Solution to Environmental Hazards”, IRJES) ISSN (Online)2319-183X,Volume3,Issue3(March2014)
- [4] Osiany Nurlansa, Dewi Anisa Istiqomah, and MahendraAstuSangghaPawitra,“AGATOR(Automatic GarbageColector)asAutomaticGarbageColectorRobot Model” InternationalJournalofFutureComputerand Communication, Vol.3, No.5, October2014.

Electronic Voting Machine

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Abstract—To conduct fair voting machine mechanism has always been a difficult task. In a country like India which has the largest democratic country in the world, having a riot free voting machine becomes very significant. Crore of rupees are spent in order to meet this demand. But now-a-days its quiet common for people to indulge in malpractices like fake votes, invalid votes, checking of results by unauthorized users etc. This project aims to eliminate all such issues by using a biometric based voting machine which involves finger print based sensor. As we know the fingerprint of every human is a unique feature, so we use thumb impression for authentication of users. This will eliminate the malpractices and also speeds up the process. Hence we have an edge over the current voting machines. A database is created in the constitution of all the eligible voting users. During the day of election, thumb impression of every user is given as the input to the system. This is then compared to the existing record of the database. Only those users whose thumb impression matches with the existing record are allowed to cast votes. But the pattern doesn't match with the record of database or in the case of repetition, access to cast a vote is denied.

I. INTRODUCTION

One of the major problem in the voting machines are the malpractices due to invalid and doubtful votes. The Electronic voting machine designed by us eliminates the maximum malpractices. The process of counting is more faster than the existing EVM. The amount of paper used is significantly reduced making the whole process eco friendly. Hence It reduces cost of printing (almost nil).

Security is considered to be the heart of voting method. So it becomes necessary to design a secure voting machine. If we consider the security aspect as primary feature then the voting machine becomes very expensive and inconvenient. The

security of the EVM we have designed is achieved by using finger print based sensor. This will ensure that only the valid voters can cast votes. Also the same voter is forbidden from casting vote twice. Once the user has voted, it will be displayed on the LCD that he/she has voted for a particular party. This reduces the usage of ballot paper and thereby giving an assurance that the user's vote is considered.

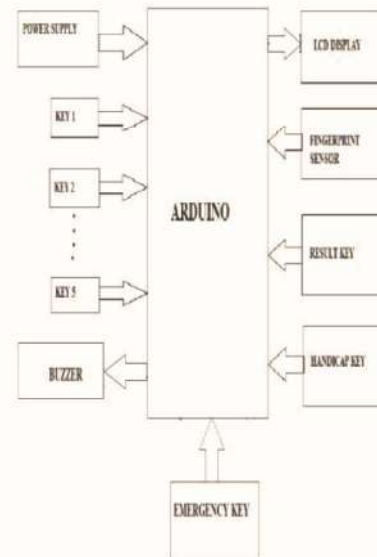
The user should show his voter ID card whenever he goes to the booth for poll his vote. This is often a time consuming method because the person needs to check the voter ID card with the list he has, make sure it has an authorized card and then enable the person to poll his vote. Thus, to avoid time consuming procedure, we designed a finger print based voting machine where the individuals need not carry his/her ID card for verification. The person at the booth should show his Finger, then Finger print reader reads the details from the tag. collected information is passed to the controlling unit for the verification. After controller reads DATA from the reader and compares this data with the already existing data. If the data matches with the already stored information, the person is allowed to poll his vote. If not, then message is displayed on LCD and hence the person won't allow to poll his vote. The polling mechanism carries out manually using the switches. LCD is used to display the related messages.

II. METHODOLOGY

This project aims electronic approaches for storage and transmission of data. The user who wants to cast votes needs to carry the necessary documents for identification. However in

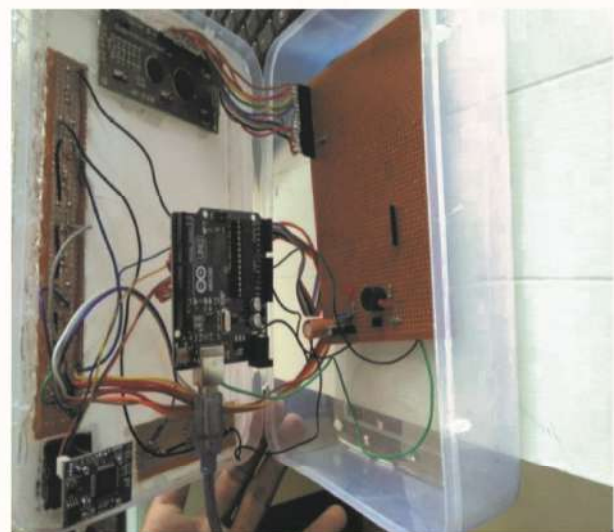
this project one need not carry the documents. Because we have already saved the necessary information in the database. When the finger print is shown by the users, the module reads the present data. The whole process can be explained using three stages 1.Enrolling mode and identification 2.Casting vote 3.Results Enrolling mode:-During this mode, the controller waits for the input. The input for the controller is the finger print of the user. The voter's finger print is scanned and a unique character code is generated The voter's has to show his/her finger print twice. This is then stored in the memory for further references.Now the system is ready to take input. Casting mode:-Once the necessary details has been saved in the database,the voting mechanism can be initiated.First the user will press the module,an algorithm will check if this finger print matches with the database. If the voter information is valid,then the voter ID of the user is displayed. The voter is then asked to choose from one of the 4 candidates of the party. Once this is done a message is displayed on the LCD that the user has voted for so and so party.

Identification:-Before casting the vote,the candidate has to verify his identification. At first "Show Finger" message is displayed on LCD.When the user places his finger on the module,the character code which will be generated is checked from the existing database. In case if the user is not authorized,an alert message will be generated saying "Wrong ID" and a alert beep will be produced.The user is forbidden from casting vote.



III. EXPERIMENTATION

The entire procedure of the voting mechanism is shown as follows.Starting from verification of the user identification to displaying the results on excel sheets.





IV. RESULTS AND DISCUSSION

This proposed work aims at the basic stage of a smart voting machine system. This stage helps in detecting the number of votes casted and verification. The detection of users using finger print gave us more accurate result. The complete system is working as per specifications given.

V. CONCLUSIONS

Our project overcomes most of the difficulties faced by the current voting machine while providing security. The major advantage of EVM we designed is we have used finger print which provides an edge over the current voting system. As we know finger print of every human is unique so there will not be any possibility of malpractices. One user cannot vote for more

than once. This is a time saving process, because no need of manual counting, the results will be displayed using a particular algorithm. The system is not working under the influence of internet so the chances of hacking the system is very low. This makes the system best suited for conducting elections in rural areas.

Future Work:

1. After a predefined time, we can stop the voting machine automatically using a timer.
2. We can add sound effect or speech to make it more interactive.
3. For additional storage of information, we can use EEPROM.
4. We can use 2 EVM's each at different location and connect each other and show the final result on LCD as a combination.

REFERENCES

1. Vishal Vilas Natu, 2014. Smart-Voting using Biometric "International Journal of Emerging Technology and Advanced Engineering, 4(6).
2. Khasawneh, M., M. Malkawi and O. Al-Jarrah, 2008. A Biometric-Secure e-Voting System for Election Process, Proceeding of the 5th International Symposium on Mechatronics and its Applications (ISMA08), Amman, Jordan.
3. Virendra Kumar Yadav, Saumya Batham, Mradul Jain, Shivani Sharma, 2014. An Approach to Electronic Voting System using UIDAI, International Conference on Electronics and Communication Systems.
4. Chaum, D.L., 1981. Untraceable Electronic Mail, Return Addresses and Digital Pseudonyms, Communications of the ACM, 24(2): 84-88.
5. Virendra Kumar Yadav, Saumya Batham, Mradul Jain, Shivani Sharma, 2014. An Approach to Electronic Voting System using UIDAI, 2014 International Conference on Electronics and Communication Systems.
6. Ashok, Kumar D. and T. Ummal Begum, 2011. A Novel design of Electronic Voting System Using Fingerprint.

SMART BIKE HELMET USING GSM, GPS, GPRS AND RF MODULE

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1. ABSTRACT

There was a survey till 31 Mar 2015, Which clear tells that there are total of 154.3 million two-wheelers are there in India, considering only the registered and renewed vehicle in to consideration, as the density of the two-wheelers increases, there the main risk factor is to provide the safety to the riders. 70% of the accidents reported are subjected to two-wheelers and out 3 accidents in India 2 accidents involve two-wheelers as a victims, accidents of two-wheelers are because of high density roads, heavy traffic, rash or negligence driving, drunk & Drive and a Sleepy riding, many times even after the accidents, accidents will not be reported properly or even the medical aid or assistance will not be available to the riders because of poor or no communication of the accidents, which leads to any number of the death in the recent years. In this paper we are developing an Arduino based product called Smart bike helmet, which comprises of two units, bike unit, and helmet unit, Helmet unit consists of the alcohol sensor and Force sensing resistor, Alcohol Sensor will not allow rider to take on bike after drinking alcohol and Force sensing resistor will make sure that the rider wears the helmet. Motor unit is able to communicate with the bike unit using RF module and the Global Positioning System(GPS) helps the system to track the location of the bike in case of the accidents, also this system act as accident prevention and detection system. If the rider meets with an accident the GPS module will send the SMS to the predefined number giving longitude and latitude values.

KEYWORDS

Microcontroller - Arduino Uno, Arduino IDE software, Alcohol Sensor, RF-Transmitter Receiver, FSR, GPS, Vibration Sensor

2. INTRODUCTION

Security and safety are one of the most important topics in almost every aspect. By proposing this project comes to do some good things towards society. The two-wheeler accidents are increasing day by days which leads to the loss of many lives. Accord to a survey of India there are around 698 accidents occurring due to bike crashes per year. The reasons may be many such as no proper driving knowledge, no fitness of the bike, the fast riding of a bike, drunken and drive, etc. Sometimes the person injured, the accident may not be directly responsible for the injury, it may be the fault of the rider, but the end of the day it's both the drivers involved in the accidents who are going to suffer. Another reason for death is lack of treatment on proper time. The survey tells us that on an average 698 accidents occur per year, in which nearly half the injured people die due to lack

of treatment in proper time. The many reasons for this are such as late arrival of an ambulance, no persons at a place where the accident occur to give information to the ambulance or parents. Actually in existence system, if the person met with an accident we can't get the information regarding that accident, so the person may die due to the late medication, by using this proposed system can send that information like accident alert and position of the accident place to the particular number or ambulance emergency number so we can provide the medication to the victim just in time and the main drawback in existence helmet is that one can drink and drive which is genuinely intolerable while riding if we want to put an end to this then by using purposed system it can be done.

3. LITERATURE SURVEY

A smart helmet is a type of protective headgear used by the rider which makes bike riding safer than before. The main purpose of this smart bike helmet is to provide safety for the rider. This is implemented by using advanced techniques like alcohol detection, accident identification, location tracking, use a hand free device, fall detection. Using such a smart headgear makes a feature of the smart bike. It's compulsory to wear a helmet, without a helmet ignition switch cannot ON. An RF Module as a wireless link which able to communicate between transmitter and receiver. If rider getting drunk it gets automatically ignition switch is locked, and send a message automatically to their registered number with their current location. So when an accident occurs, it will send a message by GSM to register numbers with their current location by GPS module. The distinctive utility of project is fall detection if the bike rider falls from the bike it will send a message automatically. These are the three main issues which motivate us for developing this project. The primary step is to identify the helmet is wear or not. If a helmet is worn then ignition will start otherwise it will remain off till helmet is not wear. For these, we use the FSR sensor. The second step is alcohol detection. Alcohol sensor is used as breath analyzer which detects the presence of alcohol in rider breathe if it exceeds permissible range ignition will not take place. It will show the message on LCD located on the bike. To start the ignition these two conditions must be satisfied. The third main issue is an accident and lack of medical help in proper time. If the rider met an accident with him he cannot receive medical help instantly, its big reason for deaths. Around every second people die due to late medical help or

the accident place is unmanned. In fall detection, an accelerometer is placed in the bike unit. Due to these mechanisms, we detect the accident occurs or not. This project aims to make a protection system in a helmet for a good safety of bike rider. The smart helmet that we made is fixed with sensors which sense that helmet is worn or not. There are two microcontrollers used in this project. Each unit has used a separate microcontroller, for bike unit we have a different microcontroller and for helmet unit we use a different microcontroller. An RF concept is used to signal transmission between the helmet and the bike unit.

4. EXISTING IMPLEMENTATION

Actually in existence system, if the person met with an accident we can't get the information regarding that accident so the person may die due to the late medication, by using this proposed system can send that information like accident alert and position of the accident place to the particular number or ambulance emergency number so we can provide the medication to the victim just in time and the main drawback in existence helmet is that one can drink and drive which is genuinely intolerable while riding if we want to put an end to this then by using purposed system it can be done. By avoiding these problems the proposed system will be helped. In these proposed system one vibration sensor will be arranged so whenever the person meets an accident ignition will stop automatically and the message will be given to the controller. And another main feature ignition control using a helmet. Whenever the rider where this helmet then only the engine will be started unless we can't start the bike. So using this application in bike we can reduce the accident deaths.

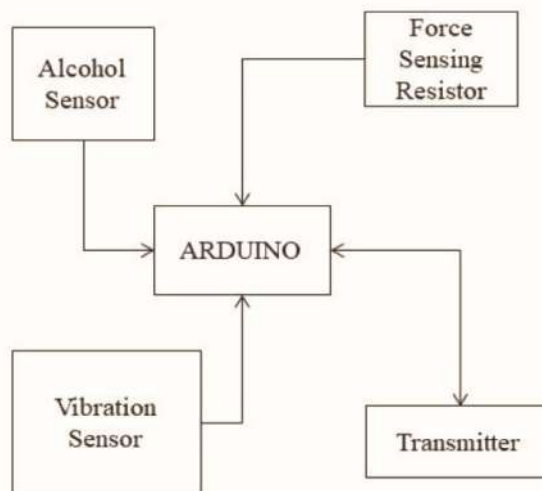
5. PROPOSED SYSTEM

We are presenting an system consists of two modules, one in Helmet and other one in vehicle, helmet unit comprises of Alcohol and Vibration Sensor, alcohol sensor will not allow rider to take the bike and Vibration Sensor identifies the accident detections, we are also using force sensing resistor, which identifies whether the rider has worn the helmet or not. Two wheeler consists of the GPS, GSM and RF receiver module, GSM for communication, GSM for the Location tracking and RF receiver module to communicate with helmet unit. Both the units are connected via RF Transmitter and Receiver. The proposed system aims at recognizing the user head through force sensing resistor in order to estimate the risk level of accident in an industrial facility. This involves measure and controls the vibration & alcohol content using vibration sensor & alcohol detector. The Vibration sensor is mounted on helmet unit, when the rider meets an accident and when the helmet hits the ground the vibration sensor sense the vibration and gives the corresponding signal to the controller. Alcohol detector detects the content of alcohol in the breath and thus it attempts to clamp down alcoholics. This system uses microcontroller, LCD display, alcohol detector, GSM and buzzer. The output of the sensor is directly proportional to the content of alcohol consumed. This output is given to logic circuit to indicate the alarm. This involves controlling accident due to ignorance to importance of wearing helmet & alcohol detector. Here one vibration sensor and alcohol detector is fixed in vehicle where if anybody drinks it is indicated through alarm, LCD

and GSM. This sensor measures the content of alcohol from the breath of drunken people. Output of the sensor is directly proportional to the alcohol content. When the alcohol molecules in the air meet the electrode that is between alumina and tin dioxide in the sensor, ethanol burns into acetic acid then more current is produced. The output of the sensors is in the analog nature which should be converted into digital format. This is done by the analog to digital converter of the microcontroller unit. The microcontroller controls the entire circuit, The LCD displays the message, GSM sends message and buzzer produces alarm. The working conditions and various constraints were properly studied before carrying out further steps. When a user approaches a vehicle with the proposed system installed and tries to turn on the vehicle ignition, the vehicle module communicates with the helmet module to check if the helmet has been worn by the user. The helmet module checks if the sensing switch has been activated. If activated, it means the helmet has been worn and hence sends a corresponding signal to the vehicle module. Along with the activation of the switch, the helmet module also checks if the user has consumed alcohol and sends a corresponding signal to the vehicle module. The vehicle module, on receiving a correct combination of signals from the helmet module, proceeds to activating the electrical system of the vehicle accordingly.

A. HELMET MODULE

This module consists of various sensors and a transmitter Circuitry. Two sensors have been used, namely alcohol sensor and vibration sensor. Alcohol sensor has been used to detect the alcohol concentration. The alcohol sensor will be placed near the mouth of the rider, inside the helmet. The shock sensor will be used for collision detection. The vibration sensor will sense the change in vibration and determine the impact of the accident. A Force Sensing Resistor is used to check whether the helmet is worn or not. An RF transmitter which can transmit data up to 3 KHz from any microprocessor/controller or standard Encode IC has been used. The RF transmitter transmits the data from the microcontroller on the helmet side to the receiver on the vehicle side.

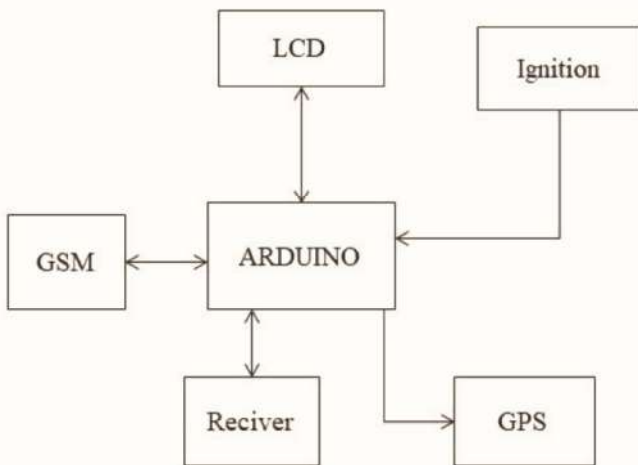


Helmet Module

Figure: 1

B. BIKE MODULE

This module consists of a LCD, GSM module, RF receiver, Arduino, ignition switch and GPS module. The RF receiver receives the data and sends it to the microcontroller for further Processing. In the advent of an accident, the GPS module will acquire the co-ordinates of the accident site. These co-ordinates are sent via the GSM module to a pre saved number. The ignition status is controlled by the microcontroller depending on various conditions such as wearing of helmet, alcohol concentration level. These indications are also shown through LCD which is mounted on bike.



Bike Module

Figure: 2

6. COMPONENTS

A. ARDUINO

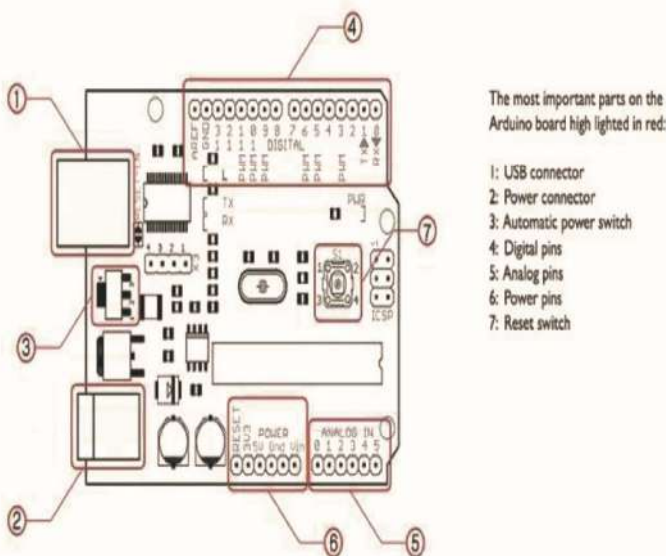


Figure: 3

Arduino Pin Diagram

Digital I/Ps

It comprises of 14-digital I/O pins, each pin take up and provides 40mA current. Some of the pins have special functions like pins 0 & 1, which acts as a transmitter and receiver respectively. For serial communication, pins-2 & 3 are external interrupts, 3,5,6,9,11 pins delivers PWM o/p and pin-13 is used to connect LED.

Analog i/ps : It has 6-analog I/O pins, each pin provide a 10 bits resolution.

Aref : This pin gives a reference to the analog i/ps.

Reset: When the pin is low, then it resets the microcontroller.

B. GSM

A **GSM Module** is basically a GSM Modem (like SIM 900) connected to a PCB with different types of output taken from the board – say TTL Output (for Arduino, 8051 and other microcontrollers) and RS232 Output to interface directly with a PC (personal computer). The board will also have pins or provisions to attach mic and speaker, to take out +5V or other values of power and ground connections. These types of provisions vary with different modules.

C. GPS

The Global Positioning System (GPS) is a satellite-based navigation system made up of at least 24 satellites. GPS works in any weather conditions, anywhere in the world, 24 hours a day, with no subscription fees or setup charges.

D. RF MODULE

RF Module is a cheap wireless communication module for low cost application. RF Module comprises of a transmitter and a receiver that operate at a radio frequency range. Usually, the frequency at which these modules communicate will be 315 MHz or 434 MH

E. LCD

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits.

F. ALCOHOL SENSOR

An alcohol sensor detects the attentiveness of alcohol gas in the air and an analog voltage is an output reading. The sensor can activate at temperatures ranging from -10 to 50° C with a power supply is less than 150 Ma to 5V.

The MQ-135 alcohol sensor consists of a tin dioxide (SnO₂), a perspective layer inside aluminum oxide micro tubes (measuring electrodes) and a heating element inside a tubular casing. The end face of the sensor is enclosed by a stainless steel net and the back side holds the connection terminals.

7. CONCLUSION

In this project, we will develop a smart helmet based system which will successfully able to detect whether the rider has worn the helmet or not. It will also set an alarm if he has consumed alcohol beyond permissible levels. This helmet can reduce the number of road accidents that takes place every day. It ensures the safety of the biker as well as sends the victim's location to family members and nearby police station. Also, the death rate can drastically be reduced by implementing this circuit as mandatory while driving and make everyone's life easier and smoother. The project can be enhanced by adding Google Glass Technology. Through this technology, a biker can see the upcoming road before reaching that particular place. It can prevent biker from pits and pitiful condition of roads. Also, a biker can see navigation on it and can alert him while taking sharp turns. Further, it can implement on cars also. People can use a car seat belt to start the ignition of the car which can enhance the safety of the driver.

8. REFERENCE

[1] <https://www.arduino.cc>

[2] <https://www.edgefxkits.com>

[3] <https://www.playground.com>

[4] <https://engineeringgarage.com>

[5] <https://www.electronicshub.org/arduino>

[6] <https://www.ecstatictrends.com>

[7] <http://www.circuitstoday.com/interface-gsm-module-with-arduino>

[8] <https://idyl.io/arduino/how-to/interface-gps-module-arduino>

[9] <https://www.hackster.io/ruchir1674/how-to-interface-gps-module-neo-6m-with-arduino->

[10] Arduino programming by Brain W. Evans

[11] Manjesh N, Prof. Sudarshan Raj, "Smart Helmet Using GSM &GPS Technology for Accident Detection and Reporting System", International Journal of Electrical and Electronics Research, Vol. 2, Issue 4, October - December 2014.

[12] Wireless accident information using GPS AND GSM" September 15, 2012, Research Journal of Applied Sciences, Engineering and Technology, Maxwell Scientific Organization, 2012.

SMART PARKING SYSTEM USING IOT

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Abstract - In today's world, the idea of smart cities is gaining a lot of popularity. Developing countries are adapting this technology almost everywhere. The heart of smart cities is IOT. IOT is basically connecting everything in our environment to the internet so that we can operate it from remote locations. Since smart city is an upcoming infrastructure a lot of research is being done on the same so as to invent an efficient smart city. One small module of the smart city is the smart parking system. With the increase of traffic parking has become an upcoming issue. Car drivers searching for parking add to the traffic on road. With the help of this project we try to make it easier for people to identify the vacant parking slots around them. This not only helps people in reducing traffic but also reduces human efforts to help people park their vehicles. This system uses automation as well as IOT and aims to enlighten people about the nearby parking spots at their fingertips.

Keywords – IOT, Smart cities, Smart parking system, Automation.

1. INTRODUCTION

The most irritating problem that car owners face in a heavy traffic ridden city is to find a spot to park their car. Finding a parking spot in a parking lot many a times becomes a serious problem and cost people a lot of money and other resources like time and fuel. This problem is rising and to bring it down we need to implement some smart parking

solutions. It is revolutionary solution for this matter and its prototype projects are already running in many cities. Just as smart home systems these smart parking systems are linked to many internet cables devices; in other words, the whole parking lot is designed with the help of IOT

2. LITERATURE SURVEY

In this paper, the author presents an IoT based cloud integrated smart parking system. The proposed Smart Parking System consists of an on-site deployment of an IoT module that is used to monitor and signalize the state of availability of each single parking space. A mobile application is also provided that allows an end user to check the availability of parking space and book a parking slot accordingly. The paper also describes a high-level view of the system architecture. Towards the end, the paper discusses the working of the system in form of a use case that proves the correctness of the proposed model. This paper also talks about factors response of Cloud-IoT integration.

Internet of Things (IoT) technology promises to connect all our surrounding things to a network and communicating with each other with less human involvement. There is lot of researches and implementations are currently being going on in all respective areas. Depending on the context, application of IoT has different definitions. Shortly it is defined

as the things present in the physical world or in an environment are attached with sensors or with any embedded systems and made connected to network via wired or wireless connections. These connected devices are called as smart devices. And it consists of smart machines which communicating interacting with other machines, environment, objects etc. Also, it incorporates to connect any two machines, machine to human and vice-versa etc.

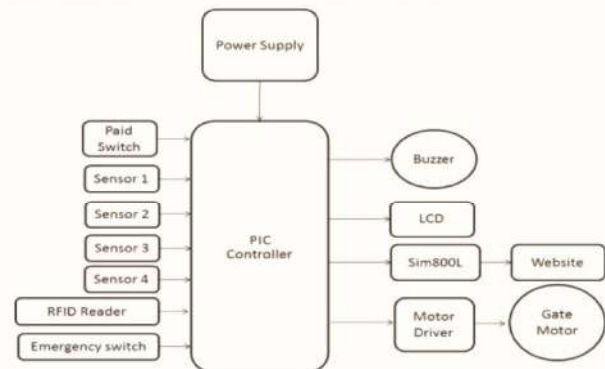
3. PROPOSED WORK

The problem faced by today's world is lack of knowledge about the available parking lots around them. A person might waste time finding a parking lot whereas there might be some other parking lots lying vacant. This is an unwanted consumption of energy and time. Some of the advanced parking spaces have an option of booking a slot prior so that the person can directly go and park their vehicle but this is not an efficient system. For example, if a person A is at a distance of 30 minutes from the parking and books a slot, person B who is very near to parking lot will see that all the slots are filled even though that is not the case. Many such cases are bound to happen. This problem not only keeps the slots idle but also adds to the traffic congestion. 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. This system improves the parking facilities of a city and thereby aims to enhance the quality of life of its people. It eliminates unnecessary travelling of vehicles across the filled parking slots in a city. So, it reduces time and it is cost effective.

The scope of our project is to provide our user a hassle-free parking facility.

4. SYSTEM ARCHITECTURE

This section describes the high-level architecture for the smart parking system.



5. REQUIREMENT ANALYSIS

5.1 Software

MPLAB is marketed under and protected by a registered trade name and is an integrated environment to develop embedded applications on different micro-controllers such as PIC and dsPIC. The latest addition to the MPLAB X. This software helps to support management of projects, editing of codes, programming and debugging of different micro controllers. Different types of MPLABs are MPLAB 8.X and MPLAB X. MPLAB supports compilers such as MPLAB MPASM assembler, MPLAB ASM30 assembler, MPLAB C compiler and HI-TECH C.

5.2 Hardware

A PIC micro-controller is the main component of our system. All other sensors and modules are connected to the microcontroller to provide serial communication among each other and real-time data to the user. The Obstacle sensors are used to check whether a particular parking slot is filled or empty. The sensor will report the status of the slots to the central controller.

RFID reader EM18 is used to read the 125KHz RFID tags used in the system for billing. The reader will read the unique code on the card and provide it to the central controller. The central controller then performs the counting operations.

The sim800L module is used to connect with the internet. The central controller will then communicate with the sim800L module and sends the parking lot availability to the server. Once the data is on the server, one can view it in the mobile phone as well through the browser and a webpage.

The gate motor is used to stop the drivers before they exit from the parking lot to complete the payment. Once the payment is done, gate motor will open the gate and let the driver exit. The Paid switch is used to indicate the completion of payment.

The LCD display is used to display different states of the system and final payment as well. It will display the parking lot status in the ideal state.

The emergency switch is used to indicate the state of emergency such as fire, structural damage etc. The central controller then rings the buzzer and also sends the alert message to the local action teams. Also, the exit gates of the parking lot are opened.

6. RESULT



The display lets the driver know whether the four parking slots are available for parking or not



The display shows that the driver has punched his card near the gate to get access into the parking lot



The display shows that the driver has departed the parking lot and paid his/her due



The website lets the gate keeper know the availability of parking slots whether it is available for parking or not

7. ACKNOWLEDGEMENT

It is our privilege to express our sincerest regards to our supervisor, Prof. Sonali Kathare for the valuable inputs, able guidance, encouragement and co-operation throughout the duration of this work. We express our sincere thanks to HOD, Dr. Avinash Vaidya and Principal, Dr. Sandeep M. Joshi for encouraging and allowing us to present this work.

8. REFERENCES

1. Bsavaraju S.R, “Automatic Smart Parking System using IOT”, International Journal of Scientific and Research Publication, Volume 5, Issue 12 Dec 2015
2. Abhiroop Khanna, Rishi Anand “IOT Based Smart Parking System”, 2016 International Conference on Internet of Things and Applications (IOTA) Maharashtra Institute of Technology, Pune, India 22 Jan-24 Jan 2016
3. Bilodeau, V.P., Intelligent Parking Technology 2010

FINGERPRINT BASED BIOMETRIC VOTING

MACHINE USING RASPBERRY PI

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Abstract - Through the centuries, different technologies have done their best. Stones and pot shards dropped in Greek vases gave way to paper ballots dropped in sealed boxes. Mechanical voting booths, punch cards, and then optical scan machines replaced hand-counted ballots. Electronic Voting Machine was introduced to replace Ballot boxes from 1998 in India. The voting machines used in India are a combination of two components namely the Balloting unit and Control unit. Balloting unit on which the voters press the button. Control unit gives the polling officer stationed at the poll booth to supervise the process. An EVM runs on 6v batteries and removes the requirement of an external power source. It is designed to record 64 candidate names and 3,840 votes at the max. The 64 candidate names can be split across 4 units connected in parallel, with 16 names on each of the unit. New computerized voting machines promise even more efficiency, and Internet voting even more convenience.

Keywords- Raspberry PI, Fingerprint Sensor, Cloud Website, URAT, GPIO.

I. INTRODUCTION

1. The goal of the Project was to build several tools to evaluate and devise the technological option that best suits the social, demographic and institutional characteristics of India.
2. The procedure of Election with straightforwardness and security is basic in any nation to guarantee the privilege of voting in favor of the residents. As misleading is an unavoidable danger to voting, it is key that an electronic voting structure gives an anomalous condition of security. Currently available Electronic Voting Machines in India have been applauded for their straightforward configuration, usability, and dependability, yet as of late they have additionally been condemned taking after across the board reports of race abnormalities.

3. Notwithstanding this feedback, numerous subtle elements of the machine's outline have never been freely unveiled, and they have not been subjected to a thorough, autonomous security assessment. We know the entire world effectively dismisses the electronic voting machine and just a couple of nations are currently utilizing the electronic voting machines. The paper gives an establishment in planning secure and down to earth voting plans to create a protected, productive and freely adequate execution of voting process in this present reality.

II. SCOPE

To overcome these complications and to reinforce the checking procedure the use of fingerprint identification using reliable biometric technologies is purposed. Use of biometrics in voting systems has been an acclaimed one as fingerprints are unique to individual's the system suggested uses the fingerprint of the voter to compare to a predetermined database where the information on the voters ID card must match to their corresponding fingerprint.

After the verification and matching of the two data, the voter is allowed to proceed to voting. With the automation and use of two layers of identification systems, the procedure removes the chance of any fraudulent entrants.

Thus an election system should be able to withstand a variety of fraudulent behaviors and should be sufficiently transparent and comprehensible that voters and candidates can accept the result of an election.

III. PROBLEM DEFINITION

Electronic voting machine (EVM) was introduced in 20th centuries, it is widely used. Traditional Electronic Voting Machines can store only voting count of each candidate. Voter identification and allow for vote is done manually by Polling Officer using voter list. Polling officer use an indelible ink for identifies the dummy voter. These methods require additional man power. To overcome these problems, we proposed new technique which is based on Internet of Things (IoT). Here we are connecting voting machine to Internet of things. Government of Indian has stored biometric information of every citizen of India. The main idea behind Biometric Voting System using IOT is to prevent the rigging and reduce the manpower cost.

It has found its vast use in law enforcement and immigration purposes.

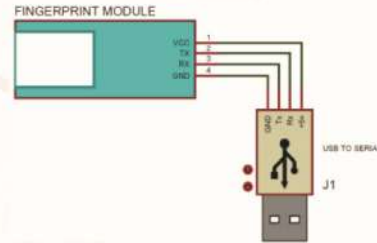
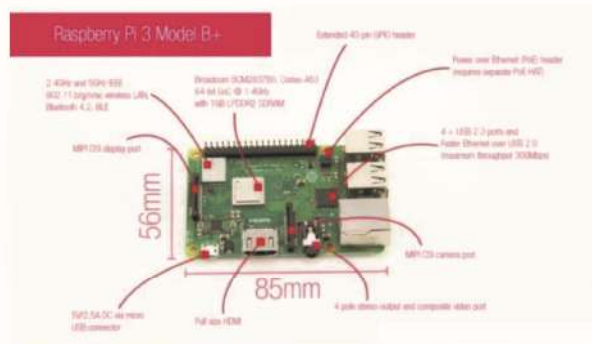


FIG. FINGERPRINT SENSOR

2) Raspberry pi Module

Raspberry pi is a heart of our system. Raspberry pi is capable of accepting different kind of data and process on it. In this system raspberry pi act as controller of whole system. All input output processing is done at this module. This module provides the main interface all devices such as thumb scanner, Voting keypad, LCD display, as well as cloud.



3) Cloud Database

Data related to voter such as Unique Identification (UID), finger print data, all these kind of data is stored in cloud database. This data is used for authenticating voter. In database voters count also stored i.e. how many voters have casted their votes and from which area. The storing of data can be maintained for long period of time.

4) Display Unit

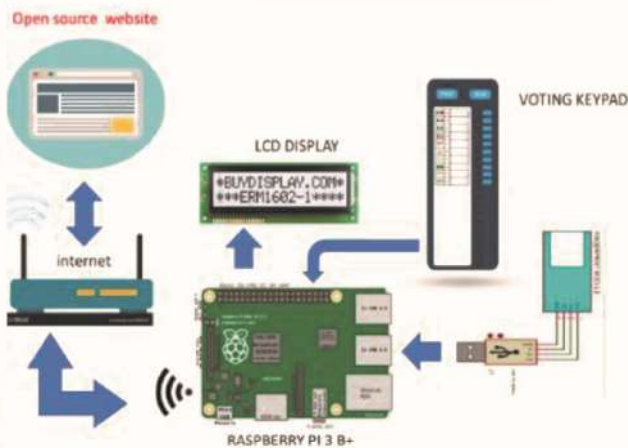
LCD display displays messages like invalid voter if the voter is not valid or he has already casted his vote. The total number voters casted their vote this count information also displayed on display.



5) Voting keypad

If voter is authenticated successfully then he is allowed to cast his vote. Voter cast his vote through EVM and EVM will perform its intended tasks such as storing votes, displaying result etc. The Election Commission of India developed the country's EVMs in partnership with two government-owned companies, the

IV. SYSTEM DESCRIPTION:



The proposed system consists of five major modules making the proposed system more robust and modularized to achieve the goal of the system.

1) Voter Authentication

The major outcome of proposed system is voter authentication. The finger print scanner module scans the voter thumb impression. The scanned thumb impression is verified with stored data in cloud database through raspberry module. If voter is valid then he is allowed to cast his vote. The device is the most popular among all the identification devices because of its ease in acquisition, and also the number of sources that are available for its data collection.

Electronics Corporation of India (ECIL) and Bharat Electronics Limited (BEL). Though these companies are owned by the Indian government, they are not under the administrative control of the Election Commission.



Algorithm of system

1. First step is to collect the data of finger prints of all the people individually.
2. Then send collected finger and GPS location from RPI to Cloud.
3. According to collected finger print checks with UID data base and retrieve voter ID.
4. Fetches the voter list in the cloud.
5. In the stored database checks the voter who is already voted. If no then store the voter's information in database and send acknowledgement to Raspberry pi.
6. Raspberry pi checks the acknowledgement. If yes then switch on the voting keypad to cast a Vote.

V. CONCLUSION:

This system overcomes all the drawback of ordinary voting system such as rigging, fraud votes, and voter authentication mistakes. Fingerprints of every person is unique and hence this system completely reduces the chance of invalidate vote. Illiterate people can also use this system more easily to use. As the present work is focused on the design and development of EVM, for the authentication of voter.

The developed system output is having more advantages as compared with the traditional and other electronic systems in the points of flexibility, portability and effortless understanding, use and maintenance. The developed Raspberry pi based EVM is tested for all the functions and is been under process and is improvised for the working very accurately. It gives confidence in voting system; only the legitimate voter is allowed to gain access to voting.

The system is user friendly, in the sense that the user can easily understand the system even though the user does not known previously. This is because of the designing techniques, and over all we conclude that the EVM is an emerging field and there is a good scope for research and development to implement this system with an advanced features.

VI. ACKNOWLEDGEMENT:

This project consumed huge amount of work, research and dedication. Still, it would not have been possible if we did not have a support of many individuals. Therefore, we would like to extend our sincere gratitude to all of them.

First of all, we are thankful to Prof. Suchitra Patel (Project guide) for your support and for providing necessary guidance concerning projects implementation. We are highly indebted to our Principal Sir Dr. Sandeep Joshi for the constant motivation and encouragement which helped a lot in completion of this report. We are thankful to H.O.D of Electronics and Telecommunication Department Dr. Avinash Vaidya for providing the necessary information and resources. A hearty thanks to Prof. R.H. Khade sir for constant guidance.

We would like to express our sincere thanks towards volunteer researchers who devoted their time and knowledge in the implementation of this project.

X. REFERENCE

- [1] Rudrappa B. Gujanatti, Shivaram N. Tolanur, Murughendra S. Nemagoud, Shanta S. Reddy, Sangameshwar Neelagund, "A Finger Print based Voting System", International Journal of Engineering Research & Technology (IJERT),(ISSN: 2278-0181) ISSN: 2278-0181
- [2] Ms. Nithya.S1, Mr.Ashwin.C2, Mr.Karthikeyan.C3, Mr. Ajith kumar.M4"Advance Secure Voting System Using IoT "International Journal Of Engineering And Computer Science ISSN:2319-7 Volume – 5 Issue -03 March, 2016 Page No. 16033-16037.
- [3] Scott Wolchok Eric Wustrow J. Alex Halderman (The University of Michigan). "Finger print voting system" International Journal of Engineering Research & Technology (IJERT).Security Analysis of India's Electronic Voting Machines.
- [4] Handbook for presiding officers. 2008. "Election Commission of India." http://eci.nic.in/eci_main/Electoral_Laws/HandBooks/Handbook for Presiding Officers.pdf.
- [5] www.ceomaharashtra.co.in
- [6] Voting: What Is; What Could Be, (2001, July). Available: <http://www.vote.caltech.edu/Reports/>
- [7] M. M. Sarker & M. N. Islam, "Management of Sustainable, Credible and Integrated Electronic Voting (E-Voting) System for Bangladesh," Management of Sustainable Development, vol.5, no.1, pp.15-21, 2013.

Safety Electronic For Railway Bridge

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ABSTRACT-- In this project we are demonstrating the idea of electronic safety for railway bridge system with the help of microcontroller. There will be having the availability of sliding platforms attached to per stationary platform. now whenever there will be no train on the platform this sliding platform is in close position, but when train is being coming or its at specific distance, the controlling signal will be given to sliding platform and it will be going to be opened before the coming the train. This is providence for the safety purpose of peoples who will be crossing the sliding platform. Along with the controlling signals, buzzers are also provided. We are going to maintain the more and more safety as well as reliability of our project.

Keywords : 89c51 microcontroller ,LM 293D motor drive IC, 12V DC Motor,Transformer, IR SENSOR

I. INTRODUCTION

1.1 FUNDAMENTAL

Basically, Mumbai is the financial capital of the India. 70-80% peoples are travel by the train. Trains are the lifeline of the Mumbai. According to Indian railway survey 14-15 peoples died everyday. From those, 10 peoples are dying while crossing the railway platform. In our country 75% people don't use railway bridge for crossing. So our project is the solution for that problem.

There will be having the availability of sliding platforms attached to per stationary platform. Now whenever there will be no train on the platform this sliding platform is in close position, but when train is being coming or its at specific distance the controlling signal will be given to sliding platform and it will be opened before the coming train. This is the providence for the

safety purpose of peoples who will be crossing the sliding platform. Along with the controlling signals, buzzers are also provided. We are going to maintain the more and more safety as well as reliability of our project.

1.2 OBJECTIVE

The main objective of this project is to build a Sliding bridge system which improves convenience and safety of passengers as well as reliability of our project.

This project is developed in order to help the INDIAN RAILWAYS.

Project implement a platform in between railway tracks.

This may be helpful to both the handicapped and senior citizens.

1.3 SCOPE

Sensing of the train can be done by signal system method and thus can work more efficiently making the easy move of passengers from one platform to another

The power supply required for the motor operation and signal light is a disadvantage, it can be avoided by means of solar cell.

The obstacle detection part can be implemented by fuzzy logic. As it thinks in different angles or aspects, the system works more efficiently.

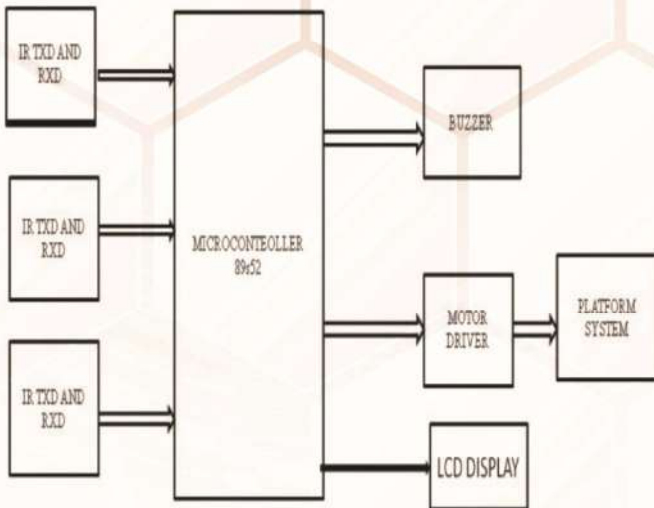
II. Problem Definition :

We can prioritize the current challenges that they require to improve. So, we are focusing on the issue of sensor. Sensors might get failed to sense the particular activity.

Vision – If we get the solution, then it will be very convenient for us to damp the disaster.

Issue Statement - Our problem is that we don't have sensor error indication.

III. SYSTEM DESCRIPTION



3.1 AT89S52



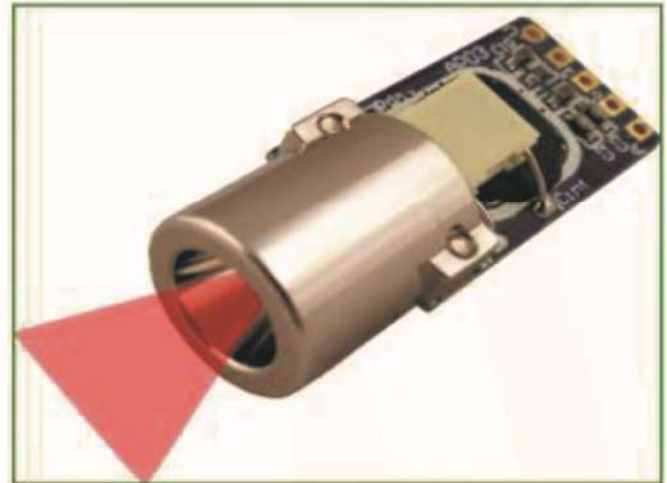
The Atmel AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in a single instruction and executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers.

3.2- MOTOR DRIVER IC (LM293D)



LM293D is a dual motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors. LM293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop the corresponding motor. Logic 01 and 10 will rotate it in clockwise and anticlockwise directions, respectively.

3.3 INFRARED SENSOR-(IR SENSOR)



An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes, that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode

which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and these output voltages, change in proportion to the magnitude of the IR light received.

3.4 7805 VOLTAGE REGULATOR IC

7805 is a voltage regulator integrated circuit. It is a member of 78xx series of fixed linear voltage regulator ICs. The voltage source in a circuit may have fluctuations and would not give the fixed output voltage. The voltage regulator IC maintains the output voltage at a constant value. The xx in 78xx indicates the fixed output voltage it is designed to provide. 7805 provides +5V regulated power supply. Capacitors of suitable values can be connected at input and output pins depending upon the respective voltage levels.

VI. CONCLUSION

The idea of automating the process of railway platform operation will enhance safety for the pedestrian who are disable and unable to use the staircase.

As the system is completely automated it avoid the manual error and thus provides ultimate safety to pedestrian.

The mechanism work on a simple principle and there is not much complexity needed in the circuit.

VII Acknowledgement

As we know, Electronics and telecommunication engineering is an art of combining the knowledge of science, engineering and physics to acquire the ability to design a system, component or process to meet desired needs. So we would like to thank and express our sincere gratitude to the principal Dr. Sandeep Joshi and also Mr. Rajendra Khade, Head of Department for all the support and giving us this chance to work on this topic even if it is part of the course. Our thanks and appreciations also goes to our EXTC colleagues in developing the project and people who have willingly helped us out with their abilities.

V. REFERENCE

- 1.M.B.Nisssen” high performance development of distribution generation”. Potentials,IEEE,vol 28,pp 25-31, 2009
- 2.Huang, S., Xiao, J., Pekny, J., Reklaitis, G., and Liu, A.(2012).
- 3.”Quantifying System-Level Benefits from sliding bridge” J. Energy Eng., 138(2),33–42.
- 4.Maria D. R-Moreno, BonifacioCastaño, David F. Barrero and Agustin M. Hellin (2014). “EfficientServices Railway bridges” Expert Systems with Applications.

- 5.Priyanka Grover and Anshul Ahuja Vol. 1, No. 1, July 2012. “Railway bridge safety”(IJACSA) International Journal of Advanced electronic Science and Applications.<https://en.wikipedia.org/wiki/bridges>
<https://www.ijser.org/paper/AUTOMATIC-bridge-system-SYSTEM.html>

Design of Restaurant Management System Using IoT

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Abstract- In restaurant, waiters keep the record of customer's orders and then order goes to kitchen for preparation. Total amount of bill is calculated by cashier. When number of customer increases then workload on waiters increase due to this confusion happens and many orders are misplaced. Hence overall service quality may be degrading. Therefore, we can replace the older way of taking order by pen and paper by using enhance technology. Advance technology like touch screen menu display i.e. TFT display, RFID tag, RFID reader and Internet of Things (IoT) has been adopted in our system. The tendency of this system is to raise up the dining table service. This system has touchable menu list on table and using fingers customer gives order to restaurant server. Waiters are not required for placing the order.

Index Terms – *TFT display, RFID tag, RFID Reader, Internet of Things*

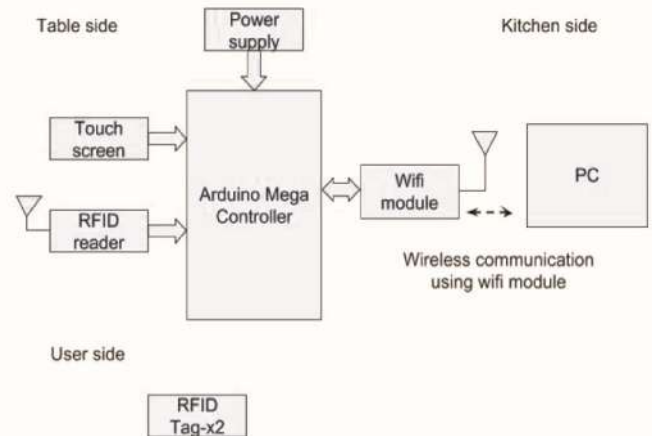
I. INTRODUCTION

In 21st century smart restaurant management system is rapidly growing technology. The main aim of our system is to provide speed of operation,

large storage capacity, large operating range and less time consuming. Now a days IoT is popular technology which hit the market to exchange the information through internet.

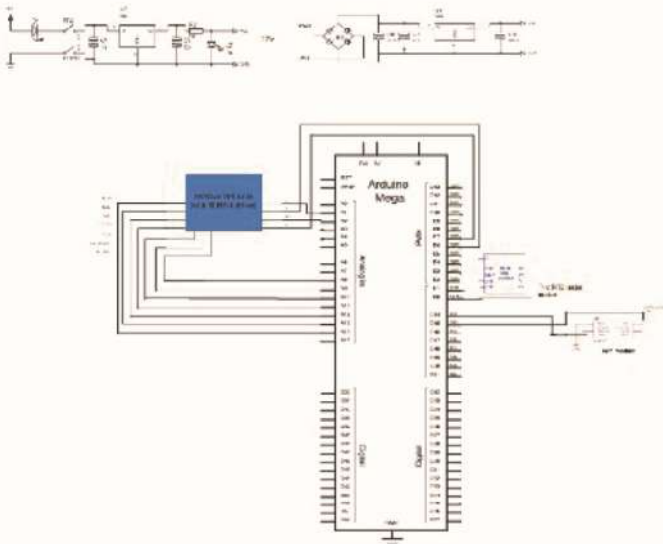
In recent days web enable computer system is implying to control traffic flow of order, to create proper billing, reduce waiting time, reduce human mistake. Usually waiters are required to take order, make reservation, to serve meal. After finishing customers must pay the bill at the counter. Despite this operation is very easy it increases the workload of waiters which is noticeable which degrade service quality. Nowadays by using advanced technology we can improve service quality. Pertaining to a current time wireless device such as touch screen menu display has been taken by choicely to restore old way of taking order

using pen and paper. By using computer system multiple tasks can be done more perfectly without invoking any human error. The advancement of graphical-touchable interactive menu allows customer to view order on top of the table, customer place order by using their fingers and order will be transmitted directly to server in real-time.



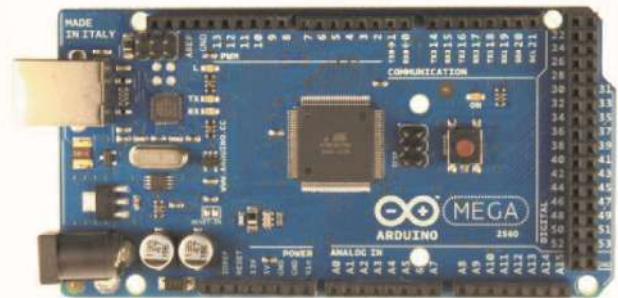
II. METHODOLOGY

A. Circuit Diagram



B. Block Diagram

C. Arduino MEGA controller-2560



The Arduino Mega 2560 is a microcontroller board based on the AT mega 2560. It has 54 digital input/output pins, out of 54 pins 15 can be used as PWM outputs. There are 16 analog inputs, 4 UARTs i.e. hardware serial ports, a 16 MHz crystal oscillator, a power jack, a USB connection, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or supply power with an AC-to-DC adapter or a battery to get started.

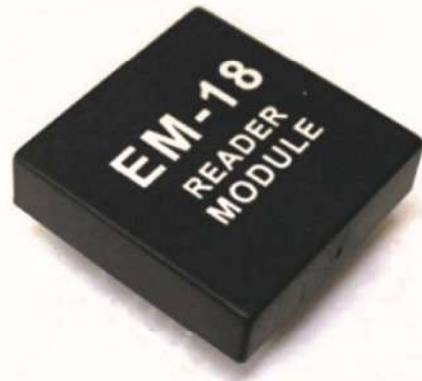
Specifications:

Microcontroller	ATmega2560
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limit)	6-20V
Digital I/O Pins	54 (of which 15 provide PWM output)
Analog Input Pins	16
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	256 KB of which 8 KB used by bootloader
SRAM	8 KB
EEPROM	4 KB
Clock Speed	16 MHz
LED_BUILTIN	13
Length	101.52 mm
Width	53.3 mm
Weight	37 g

tags wait for an interrogating signal from an RFID reader. Once the tag is within range of the interrogation zone, the RFID tag antenna draws energy from the electromagnetic waves.

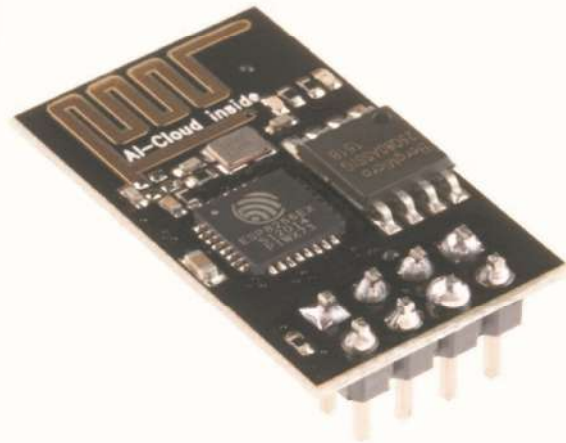
Once the tag's microchip, or integrated circuit, becomes powered, it transmits a signal. The change in the electromagnetic wave is detected by the reader's antenna which interprets the information. the antennas present in both the tag and reader must be at least within several meters of each other for the process to work properly; however, the read range depends on the transmit frequency, equipment settings, and other environmental factors.

D. RFID Reader and Tag



A passive RFID transponder consist of a microchip and an antenna; the two together are commonly referred to as a RFID inlay. Passive

E. Wi-Fi module - ESP8266



The ESP8266 is a low-cost Wi-Fi chip with full TCP/IP stack and MCU(microcontroller unit) capability produced by Shanghai-based Chinese manufacturer.

The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network.

The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking

functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set, it means we can simply connect this our Arduino device and get as much Wi-Fi-ability as a Wi-Fi Shield offers .

F. TFT touch screen



Newhaven Display 4.3" TFT LCD Touchscreen Module + Arduino Shields offer a simple, compact solution for developing with touchscreen capable TFT displays. The Touchscreen Shields are available in six different models. Each shield features a 480px x 272px resolution TFT display in either Sunlight Readable, Premium (MVA), or Standard LCD display types. The modules are offered with capacitive touch and resistive touch options.

These 4.3" Touchscreen Shields are designed to connect directly to commonly-used Arduino development boards. This greatly reduces software and hardware development time, simplifying the design process. No extra controller boards or cables are required, providing a much faster and effortless experience developing with a touchscreen TFT. By utilizing the vastly growing Arduino community, engineers

can take advantage of shared code developed by other engineers as well as code created by Newhaven Display engineers.

III. APPLICATIONS

A. Ordering from Table: -

There may happen a situation where customers are ready to order their choice of food, but their servers aka waiter are down the drain. This makes customer impatient and frustrated. Those who do not have enough time to keep waiting for their server/waiter to arrive for them, order from the table would be the most exciting part and IoT makes such things possible.

B. Direct payment from Table: -

Another way where IoT can be used in the restaurant is to permit customers to pay their bill directly from the table. Ordering from table compress waiter time from those traditional approaches where a huge amount of time slots was consumed just to take peoples order.

C. Improvement in Restaurant Operations:-

IoT hits great improvement in restaurant working channel. It offers tablet to the customer table where they can order their favorite appetizer and drink. Here need of menu is eliminated. When the restaurant app is provided to them, they can give their order to the server else can continue to opt for table side services. The main agenda of this concept is to leverage more options and faster services to the peoples.

IV. CONCLUSION

The presence of each component has been reasoned out and placed very carefully, thus contributing to the best and efficient working of the unit. Secondly using very highly advanced IC's with the help of up growing technology, the project has been successfully developed and implemented.

This project provides an efficient method that help to all the people, and also it is user friendly device. This is our proposed system which reduces the cost of running the restaurants as it doesn't require any waiters. This project also helps in transforming the whole catering industry in the world. This system will help in reducing the waiting time of customer in the restaurant. It will also reduce the manual service given by waiters and serving staff, and eliminating the mistakes.

V. ACKNOWLEDGEMENT

We remain immensely obliged to my project guide Prof. Deepti Nair, for valuable guidance, patience, keen interest and constant encouragement and for her valuable support.

We would like to thank Dr. Avinash Vaidya, Head of Department of Electronics and Telecommunication Engineering and Dr.Sandeep M. Joshi, Principal of PCE, New Panvel for their valuable support and outstanding academic environment.

We would also like to thank all the staff members of the Department of Electronics Engineering for their critical advice and guidance, without which this project would not be possible.

VI. REFERENCES

- [1] Asan, N. Badariah "Zigbee-Based Smart Ordering System (S.O.S)" International Journal of Computer Trends and Technology (IJCTT) – volume 11 number 5 – May 2014.
- [2] K. A. Wadile "E- restaurant management system using robot" in international journal of informative & futuristic research. 2015.
- [3] Khairunnisa K. "The Application of Wireless Food Ordering System" in

MASAUM Journal of Computing, Volume 1 Issue 2, September 2009.

- [4] Kiran Kumar Reddy, B.Naresh "Intelligent E-Restaurant using android OS" international journal of scientific engineering and technology 2014 .
- [5] N. M. Z. Hashim "Smart Ordering System via Bluetooth" in International Journal of Computer Trends and Technology (IJCTT) – volume 4 Issue 7–Month 2013.
- [6] S. R. Patil "e-converse an affordable touch screen solution to intrigue Dining experience" International Journal of Computer Applications (0975 – 8887) Volume 119 – No.21, June 2015 27.

Sushmita Sarkar "Integration of Touch Technology in Restaurants using Android" in International Journal of Computer Science and Mobile Computing 2014.

Speech Recognition Robotic Vehicle Control

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Abstract—Speech recognition is a technology which is used in various application. Propose of this Paper is to design a speech controlled robot. Here, an android Smartphone will be used as the speech recognizing platform and it uses Bluetooth module for establish connection with robot. Additionally along with speech recognition the robot can detect any obstacle in it's path and can notify it to the operator. Assistive as well as industrial work of robot can be done by this method.

Keywords—Android, Speech recognition, Bluetooth module, Ultrasonic sensors

I. INTRODUCTION

Combination of robots includes system such as electrical, mechanical, computing and automation fields of technology. With new innovation in the field of robotics there is a need for less human intervention with machines. One of the way to control the robot is via voice commands. This is one of the way to machines more efficiently. An android Smartphone provides a platform for sending speech signal to the robot. Smartphone's provides many application along with internet connectivity and ha integrated *Bluetooth*. Also *Smartphone* is widely used electronic device in the world. Because of it's flexibility and features it is an ideal option for robotics application.

Bluetooth technology can transfer data over a short range but with effective way. Transferring of data packets done by using shortwave technology . Also the Bluetooth module provides a effective range over 30 meters which is more than sufficient for small scale application.

This robot can interpret six basic commands such as right, left, forward, back, stop, horn. Three ultrasonic sensors are used to detect obstacles in his path and notify to it's operator. The ultrasonic sensors calculates the distance by using the echo time between transmitter and receiver waves.

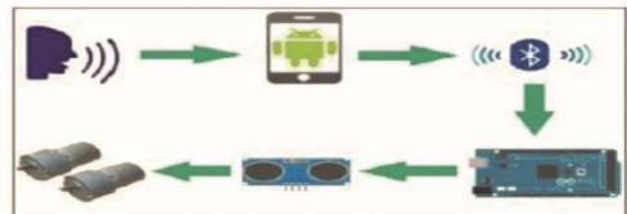


Figure 1: Block Diagram

II. METHADODOLOGY

The model uses android application for recognizing the speech commands and then converts them into text. The text data is then transferred to the robot via Bluetooth module. The features of main components used are as follows:

1. PIC 16F877A-

The PIC16F877A is a CMOS FLASH-based 8-bit microcontroller. It is upward compatible with devices PIC16C5x, PIC12Cxxx and PIC16C7x . Also it has instruction execution time of 200 ns. It has 33 I/O pins and 5 I/O port . It has SRAM memory of 368 bytes and EEPROM memory of 256 and crystal frequency is 20MHz.

Special microcontroller features:

- Self-reprogrammable under software control.
- In-circuit serial programming via two points.
- Watchdog timer with on-chip RC oscillator.
- Protection of programmable code.
- Power-saving sleep mode.



2.HC Serial Bluetooth-

The HC05 Bluetooth module can be used in master slave configuration. Range of 30 meters can be provided. It is the cheapest Bluetooth module one can find in the market . Once the connection is established the Bluetooth module can receive and transfer data in both master as well as slave mode. The data transmission rate is 9600kbps.



3.L293D -

The motor driver IC allows the DC motor to rotate in a particular direction. The L293D is designed as such that it provides bidirectional drive currents of up to 600-MA at voltages from 4.5V to 36V. It receives signals from microprocessor and transmits the signal to the motor.



4.Ultrasonic sensors-

The ultrasonic sensor used is sr04 which is a 4 pin module. The module has two eye like projection in it's front which forms transmitter and receiver . The sensors rand is variable. It can be programmable depending upon requirements. This sensors works on a simple formula which is **Distance = Speed X Time**.



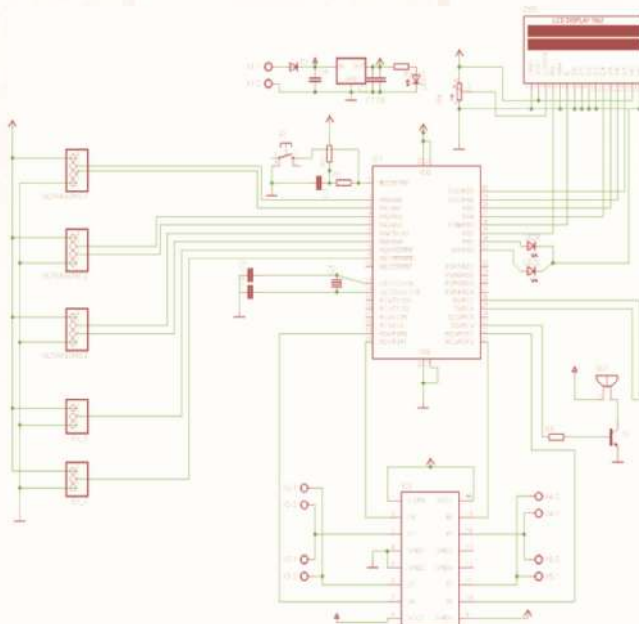
III. WORKING

The system works with PIC16f877A microcontroller.

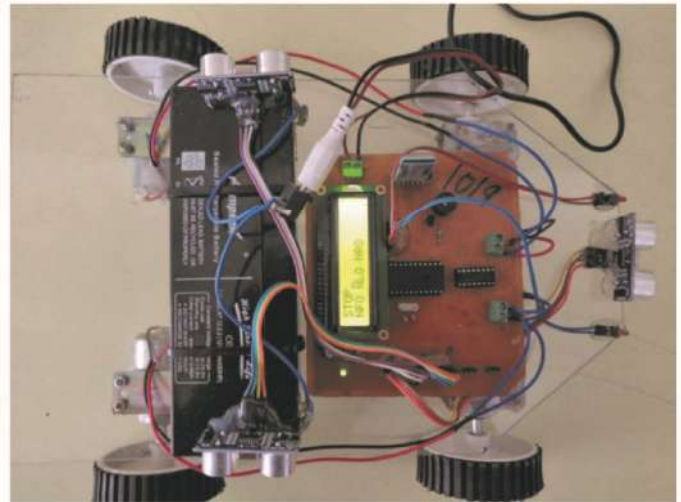
The system will follow following steps of operation :

- **Step 1** : Microcontroller initializes all the peripherals and prepares some initializing tasks.
- **Step 2** : Microcontroller constantly checks for any data from Bluetooth modem.
- **Step 3** : If data is received, it is analyzed to extract the command.
- **Step 4** : If the command is go forward and there is no obstacle in front of vehicle ,it should move forward.
- **Step 5** : If the command is go left and there is no obstacle in front of vehicle, it should move left.
- **Step 6** : If the command is go right and there is no obstacle in front of vehicle, it should move right.
- **Step 7** : If the command is go back and there is no obstacle in front of vehicle, it should move back.
- **Step 8** : If there is any such obstacle in the path then the vehicle stops and notifies it to the operator.

IV. CIRCUIT DIAGRAM



For future medication of automatic storage of information to server GSM module can be interfaced . Along with color detection, audio and video recording. Using a better micro version the range of the Bluetooth can be increased.



V. SCOPE

There are various applications:

1. In disaster management areas such as inaccessible areas by persons.
2. For assistive purpose of a disabled person.
3. For surveillance purpose to send live feed from camera
4. For pick and drop of objects.

VI. CONCLUSION

The aim of the paper was to use voice recognition technology using robot as to increase its efficiency. The vehicle can be easily recognize the voice, commands and perform the task efficiently. The data transfer between the Bluetooth module and microcontroller worked quite well still there were few errors in identification of commands.

VII. REFERENCES

1. A. K. and R. C. , "Voice Controlled Robot," INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY, vol. 1, no. 11, pp. 338- 344, 2014.
2. A. D. A. P. S. N. and L. R. , "Three way controlled android Smartphone based," International Journal of Advanced Research in Computer and Communication Engineering, vol. 4, no. 9, pp. 212-216, September 2015.
3. J. and D. , "Home Automation and security system using android adk," International journal of electronics communication, 2013.
4. S. N. and S. , "Design of a Voice Controlled Robotic Arm for Picking and Placing an object" IOSR Journal of Engineering, vol. 2(4), pp. 670-673, April 2012.

PIC BASED BANK LOCKER SECURITY SYSTEM WITH SMS ALERT AND CALL

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Abstract – The main goal of this project to design and implement a highly secured bank locker security system based on biometric and GSM technology. In traditional methods bank security systems used mechanical key where a user had one of the two keys while an authorized bank official had the other. This method had following Drawbacks :

- Presence of both the user and bank manger is must
- If one of the two key is lost the user may have to face problem while accessing his locker
- The keys can be stolen or replica of the key can be made
- The system is unreliable in the today's world

In this system only authentic person can reclaim money, jewellery or any other documentation from bank locker. Many researchers have published their work to overcome the issue of safety in banking but still there is a scope of improvement. There are many available techniques, the one which is being implemented here is based on GSM.

Keywords:

GSM, Fingerprint module, locking system, keypad

I. INTRODUCTION

In today's world, safety has become an important factor because an unauthorized people tries to steal the important documents and valuable things. To overcome the security threat, user will try various methods to secure there things by installing alarm systems, cctv. There are different type of alarm system available each having different functions.

But there are also disadvantages such as a burglar may cut phone line before entering into the house and also monitoring and communication with your alarm company may be terminated .Sometime false alarm also occur to your system. In some cases the police or fire department may be dispatched to your home before you have a chance to explain the mistake of your security company

The primary disadvantages of home alarm system is it ia highly expensive hence it is unaffordable on a large scale practice. In this paper we have implemented a secured bank locker system which provides security to the important documents, money by using Biometric and GSM technology as it is more advance and secure than other system. Biometric based access control system allows only authorized person to access the lockers using GSM technology. Biometric system uses a each individual person physical characteristic to identify their identity. In this paper fingerprint is used to identify the owner of the locker.

II. METHODOLOGY

In this proposed system bank lockers are provided with high security through Biometric and GSM technology. In biometric there are two process which user has to go through .Firstly the user has to enroll his fingerprint, mobile number and his name in the database and then he has to create the password. And second process is the authentication. During this process scanned fingerprint is compared with the stored fingerprint in order to check whether there is authorized access to the bank locker. If the scanned fingerprint matches with the stored fingerprint from the database the user will then enter a account number and a password through keypad. The lcd will act as a display which gives indication whether the user has entered data correctly or not by giving message such as access granted or access denied. During this process GSM plays a vital role. It gives owner of the locker a message and call alert upon accessing the locker. Also the system has a buzzer. The buzzer gets triggered upon unauthorized access.

III. Hardware Design

The block diagram of the system is shown in Fig.1 The whole system is around Pic 16F877a microcontroller where biometric, GSM, LCD, buzzer are interfaced to it. The components used in the system are described as follows:

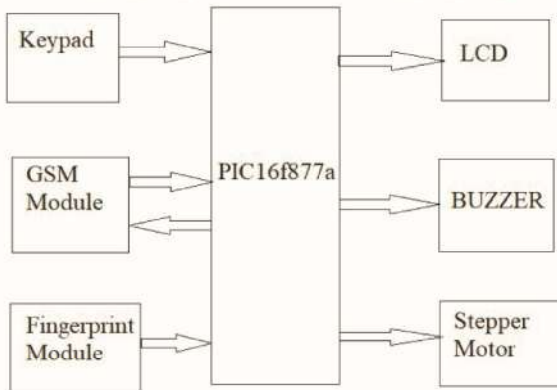


Fig.1:Block Diagram of Pic based Bank locker security system

3.1 PIC(16F877a):

PIC Microcontroller is the main component of the system. It is an 8 bit microcontroller with 40 pins. It has 8kb on chip flash memory, 256 byte EEPROM, 368 byte RAM. It gives high performance with small size and low power. It has various type of serial communication mode-1 UART,SPI,I2C,MSSP.

3.2 LCD:

For generating random custom characters on LCD , it contains Hitachi HD4478 controller. It is used to display 16*2 character. LCD is used as a display to give indication about the input given.

3.3 Keypad:

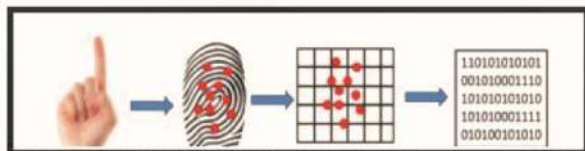
4*4 matrix keypad is used. It is used to enter the password of the locker.

3.4 GSM Module (SIM900A):

The SIM900A is a complete Dual-band GSM/GPRS. The baud rate is configured from 9600-115200 by using AT command. It is suitable for SMS, Voice as well as DATA transfer application. GSM is used to give the call alert and message alert while accessing the locker.

3.5 Fingerprint Module:

Fingerprint module R305 is used in this project. It is connected through TTL-UART to microcontroller .The user can store fingerprint data in the module with id and can configure it in 1:1 or 1:N.



IV. FLOW CHART

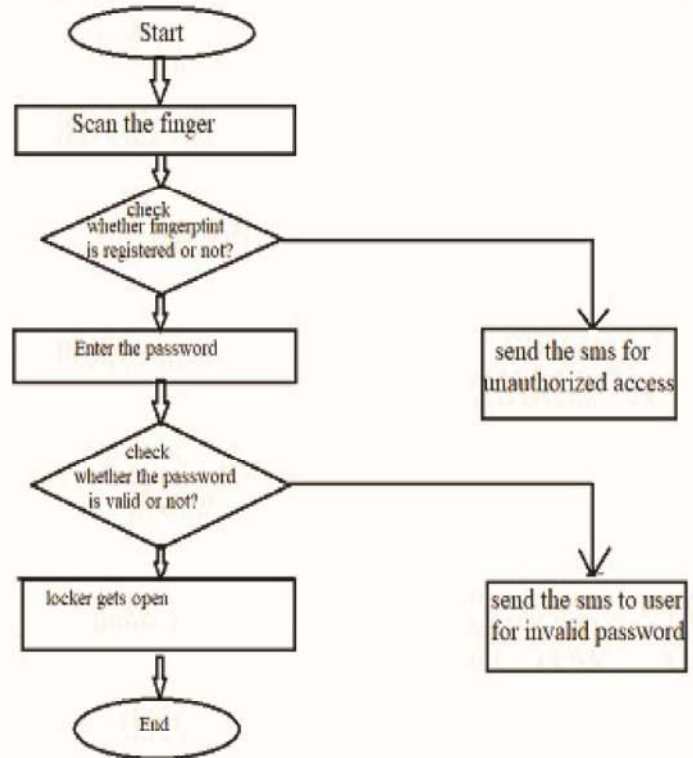


Fig.2 Flowchart of bank locker system

The Flowchart explains the overall concept of the project. First the user register his fingerprint in database. This is known as enrolling process. Later when the user wishes to access his account then he need to scan his fingerprint. The system will check if the scanned fingerprint matches with the registered one and depending on it the user gets its access either granted or denied.

V.RESULTS AND DISCUSSION

I. CONCLUSIONS

Robbery problem is getting increased in day-to-day life . This paper, has laid emphasis on mainly security of bank locker system. For this purpose fingerprint module and password is used for safety purpose.It is highly advanced secured system. GSM provides alert through SMS and call alert.

II.Future scope:

- Laser Protection: In this a motion sensor is used which detects motion around it. Motion sensor stand guard by alerting the control panel system by sending signals whenever the sensor get tripped by changes in motion.
- Image Capturing: In this the image can be captured of the person who is accessing the bank locker system. And this image get stored in the system

REFERENCES

- 1.Sachin S. Malode & Dr. S.B. Patil , “Advanced Security System for Bank Lockers Using Biometric and GSM ”,DEC 2017.
- 2.Nilesh Pralhad Shinde & Sandeep Nelwade, “Multi-Level Secured Bank Locker System ” ,OCT 2017
- 3.P V L N Phani1 & O Narendra Kumar Reddy & R Manisha Reddy, “Keypad Based Bank Locker Security System Using Gsm Technology ”, *Jan. 2015*
- 4.Mule Sonali1 & Sarane Guruedevi & Shinde Shalaka & More Vaishali & Ghodake Y.S, “BANK LOCKER SECURITY SYSTEM USING GSM”, MARCH 2016.
5. Vaibhav Sharma , Pankaj babu, Uttam singh, Vipin Garg & Rahul Agarwal, “Dual Secured Smart Bank Locker Security System”, APRIL 2017.

Railway Track Detection System

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Abstract—We propose a counter measure against the disastrous problems that can be caused by the defects in the railway tracks. We designed a vehicle that consists of sensors which will detect the defects formed in the tracks overtime and with the help of an IOT module, send a message to the authorities concerned. The message will consist of the location of the damage that will be identified with the help of a GPS module, which is also used to segregate areal location according to which authorities will receive message. The IOT module can also be used to create an online database of all the defects identified and can be accessed by the authorities anytime for research or maintenance purposes. The communication between different devices will be done with the help of Arduino. The vehicle has been designed in such a way that it does not hinder the path of the passing trains, and thus can be used at anytime and not only during maintenance runs.

Keywords—Arduino, GPS, IOT, Sensors, Railway Tracks, Defects.

I. INTRODUCTION

The railway network of any country is the backbone of its transportation system. The total railway track length of all the nations sum up to a total of 1,370,782 km with population of 1.7 billion people commute by trains every year. Although a really efficient way of transportation, the railway network carries risks of accidents like any other means of commuting. The main cause of these accidents has found out to be derailments. Over 53 percent of the train accidents in India alone have been due to trains getting off their track. The main cause of this has been identified as the defects in the tracks. The defects mainly consist of cracks which have been formed overtime due to the trains passing over it periodically. Although most of them are been corrected during maintenance, the human eye is unable to detect very small cracks which can expand spontaneously if large force is applied to it, leading to possibility of a catastrophic event. Hence the maintenance runs are not very efficient in keeping the tracks accident proof. To dwindle the probability of such accidents, a more efficient way of detecting these cracks was required. Hence, the solution of a crack detection vehicle was proposed. This vehicle will travel between the tracks and with the help of two mechanical arms, detect the faults. As soon as a crack is detected on any one of the tracks, the vehicle will send a message to the authorities responsible for the maintenance. The message will consist of the coordinates of the track where the defect has been identified which have been generated with the help of a GPS module. The message is sent with the help of a IOT(Internet Of Things) module

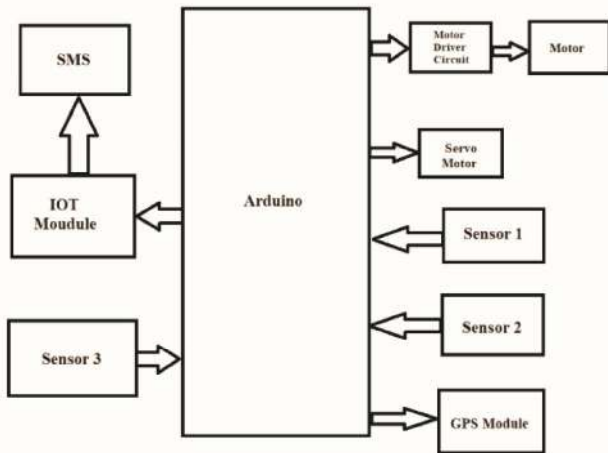
which allows to send the message to multiple people also. With the help of an Aduino module, the vehicle was programmed to send message to different authorities according to the area of maintenance covered by them which were segregated with the help of GPS coordinates. The IOT module is also programmed to store the locations of the faults detected and create a database of it to be send to the authorities with the purpose of helping them in the maintenance runs. As the vehicle travels between the tracks, there is no hindrance to the train travelling. With the help of a sensor, the incoming train is detected and the arms retract inside, allowing thee train to pass above smoothly. This vehicle will decrease manual labor and increase the efficiency of the detection system, thus proliferating the chances of safe commuting.

II. METHODOLOGY

For the idea to work, the selection of the components to be used was a crucial task. The components had to be smaller in size and lighter in weight for the vehicle to be efficient and small in dimension. Being able to interface smoothly and work in perfect synchronization was also an important factor. The dimensions of the chassis of the vehicle were also to be chosen in such a way that they could accommodate all the components on it systematically. If the size of the vehicle was too large it could hinder the path of the trains and if it was too small it would have become inefficient in detecting the cracks. Keeping all these factors in mind, the vehicle was designed.

A. Block Diagram

The Arduino acts as the pith of the whole design. It receives signals from the sensors and sends instructions to other components. The sensors are used to detect the defects in the tracks or if there is an incoming train at distance. The motor drivers are responsible for the movement of the vehicle while the servo motors are responsible for the extension and retraction of the arms which consist of the sensors.

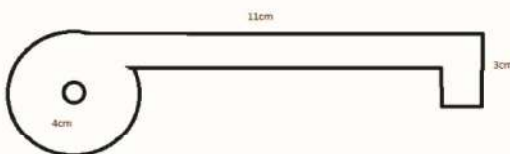


The Arduino works on the information sent by the sensors and acts accordingly. During the time of crack detection, a signal is sent by the Arduino to the IOT module which in turn generates a message consisting of the location recorded by the GPS module and sends it to the concerned authorities.

B. Vehicle Model

The design of the vehicle has been kept simplistic to provide plenty of space for the components to be arranged. Two mechanical arms have been used to sustain the sensors that will detect the cracks. The arms are lightweight even after the sensors are attached to it and will be detecting defects actively with the exception of the time a train is incoming. At that time the arms will retract in front and the vehicle will stop moving. Once the train has passed, the vehicle will start functioning again. The dimensions of the vehicle are as follows.

- Chassis Dimensions: 20cmx11cmx4cm
- Wheel Radius: 2.5cm
- Mechanical arms:
 - Radius:4cm
 - Length:11cm
 - Breadth:3cm



III. HARDWARE IMPLEMENTATION

Each of the hardware components chosen have a profound role in the working of the vehicle. The versions of each of these components has been chosen with the efficiency of the whole model and also leave a room for future improvement. The components used in the project are as follows.

A. Arduino UNO (ATmega 328)

The Arduino UNO has is a microcontroller that acts as the motherboard for this project. All the other components are interconnected to each other by the means of Arduino. It has an operating voltage of 5V which can be provided very easily. The power consumption is 19mA which is very low thus making it efficient. The size of this microcontroller in (18X45) mm which makes it quite compact. It can also act as a power supply to other components. The tasks carried out by the Arduino Uno are as follows

- Receive the Input from the sensors and analyze it.
- Control the IOT and GPS module.
- Receive the coordinates from the GPS module
- Send signal along with the coordinates to the IOT module to send a message.
- Control the movement of the Servo Motors, which are responsible for the movement of the mechanical arms
- Control the Movement of the motor drivers which are responsible for the vehicle movement.

B. HC-SR04 Ultrasonic Sensor

The Ultrasonic sensors are used to detect the cracks in the railway tracks. The HC-SR04 has a working voltage of 5V which is supplied by the Arduino. This sensor can detect in the range of 2cm to 4m and has a measuring angle of about 15 degree, making it suitable for the project as the cracks are not always symmetrical and can be one-sided too. The readings from these sensors is what decides the future process. The functions of the Ultrasonic sensors are as follows.

- Detect the defects on the tracks and report them to the Arduino.
- Detect the upcoming traffic from behind and alert the Arduino.

C. Voltage Regulator

Often there can be a fluctuation in the input voltage due to which the efficiency of the project gets hindered. To ensure the smooth running of the vehicle, a constant voltage needs to be provided, irrespective of the voltage being received. This is where a voltage regulator is been used. It gives a steady voltage, irrespective of the input voltage being high or low than what is required. This ensures the safety of the components as well as the vehicle working without any delay. The voltage regulator consists of the following parts.

- 220V -12V step down transformers
- IC LM7812
- Diodes 1N4007
- 1000 uf 16v capacitor

D. L208 Motor Driver

The motor driver circuit acts as the interface between the Arduino and DC motors. It has a high operating voltage of 40 volts and can also provide large output current. The L298 can use standard logic level signal to control to the DC motors. The PCB size is roughly 4.2X4.2 cm, thus

occupying very little space. The modules in this motor driver use dual H-bridge drive which makes it capable of driving two motors at the same time.

E. NEO6M GPS Module

The Global Positioning System (GPS) is a satellite-based Navigation system that is used to identify the exact position of a person or object anywhere on the earth. It mainly consists of at least 24 satellites which will circle the earth twice in a day on a particular orbit. To make the respected authorities aware of the exact position of the defects, a GPS module is used. The NEO6M module has a operating voltage of 3-5 volts and a baud rate of 9600bps. It is interfaced with the Arduino to give raw GPS data, that is it give the latitude and longitude to the authorities which can be used by them to identify the area of the cracks.

F. Internet Of Things(IOT) Module

The Internet Of Things is a concept in which various computing devices, objects and humans are provided with identifiers that are unique and have the ability to transfer data over the internet in a closed network without the need of human to human interaction we connect everything to the internet. This means that we can control various hardware remotely over the internet without being physically present there. This concept was utilized in this project with the help of an IOT module, which sends message to the authorities informing about the faults in the tracks. It is also used to create weekly database of all the defects with their positioning included for the purpose of the maintenance runs and eventually create a survey of the railway lines getting the most and the least amount of damages over time, thus giving rise to the opportunity of planning ahead.

IV. RESULT

When the vehicle is run between the tracks, it moved smoothly without any hinderance. The two sensors were successfully able to detect cracks of different dept and send a signal to the Arduino, who in return requested the coordinates from the GPS and send them to the IOT Module. On receiving the coordinates, the IOT module sent a message to the authorities with it. When the sensor at the back sensed any object within its range, the two mechanical arms retracted to the front and stopped moving. As soon as the path of the sensor is cleared, the arms extend out again and the vehicle starts moving again. Although functioning of the vehicle is like it was desired, there were a few problems in the initial stages. A delay was occurring in the retraction of the arms due to fluctuation in power supply. Due to the same reason, the vehicle also moved in an unconventional way, thus creating the possibility of false detection of the cracks. These problems were rectified with the use of a voltage regulator which ensured a constant output voltage, thus giving the components the required power to operate smoothly. The IOT module has also been programmed to store all the defects detected with their location which can be accessed later. There was also a problem in the interfacing of the IOT module and GPS due to which accurate coordinates

of the defects were not obtained. After a detailed inspection, the cause was found out to be logical error in the programming of the IOT module. After rectification, the IOT received the GPS coordinates with great pinpoint accuracy. In the process of identifying the problems and solving it, the efficiency and durability of the vehicle was also improved.

V. CONCLUSION

The Sevier consequences that can occur due to faults in the railway track network have been undermined. Derailment, which is one of the biggest reasons of railway accidents is often the end product of defects in tracks. Manual detection of these cracks is no more a reliable option with efficiency and precision both being very low. A more dependable system needs to be used which can detect the smallest of the cracks so that they can be dealt with before they get out of hand. An important factor that needs to be taken into consideration is that the path of the train travelling should not be hindered in anyway during the detection. Th use of a mechanical system can ensure that the detection is done with utmost precision and removes the probability of human error. Using the concept of IOT only increases the widespread of the project as it not only makes the vehicle possible to be operated remotely from any place on the earth, but it also makes the data accessible worldwide. Keeping all these factors in mind, it can be concluded that concluded that there is a need of replacing the standard way of detecting the defects in railway tracks and a mechanical system can be a suitable replacement for the standard methods.

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REFERENCES

- [1] H.Saini,S.Firoz,A.Pandey, "Arduino Based DC Motor Speed Control," IJRDO-Journal of Electrical and Electronics Engineering., vol. 3, Issue-4, April. 2017.
- [2] A.Tayo,G.Adesina,A.Oluwatobi, "Design and Implementation of a Global Positioning System Based Automatic Vehicle Location System," IJRCCCE., vol. 2,Issue 11, Nov. 2014.
- [3] S.Zafar,G. Miraj,R.Baloch,D.Murtaza and K.Arshad. "An IOT Based Real-Time Environmental Monitoring System Using Arduino and Cloud Service ," ETASR., vol. 8, , Nov.2018 .
- [4] G.Yadav,and M. Devi "Arduino based security system," IJETT., Special Issue, April 2017.
- [5] S.Kamalasanan,P.Ramesh,and D.Rao "IOT: Railway Track crack detection Robot using GPRS-GPS," IJIRT., vol.4, Issue 5, Oct. 2017.

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