

SMART ACCIDENT DETECTION AND THEFT CONTROL SYSTEM USING IOT TECHNOLOGY

ABSTARCT:

Road accidents are increasing in our country, most of them are caused due to negligence of drink and drive and over speeding which many leads to death or severe injuries due to lack of medical treatments provided to the injured person at right time. The main objective of this system is to design a accident detection and theft control that provides safety to motorcyclist and to prevent drink and drive. It detects accident and alert the guardian about accident and prevents over speeding and to develop an android application to monitor motorcyclist and send alert SMS. The health parameters of the driver is updated to the family members and well wishers. Then receiver the send the those driver details directly to the cloud. This paper describes the prototype of theft control using IOT, which ensures the safety and security of the bike rider. Nowadays automobiles technologies are rapidly increase each and every year and also each every second accident count also increase. so while using some technologies like automatic accident detection system. it will be used to send information about the accident to the near by hospitals. the given sensor is connected to the Arduino and it is just record the various driving data parameters. the system is having external sensor like vibration sensor, accelerometer, alcohol sensor and global positioning system to collect the data and to send the position of the vehicle. In a developing nation like India, with advancement in the transportation technology and rise in the total number of vehicles, road accidents increases rapidly. Two wheelers accounts for 25% of total road crash death. This project provides an intelligent system for two wheeler accident prevention and detection for human life safety. The prevention part involves, Smart Helmet, which automatically checks whether the person is wearing the helmet

CHAPTER 1

INTRODUCTION

In recent times helmets have been made compulsory in Telangana State. Traffic accidents in India have been increased every year. As per Section 129 of Motor Vehicles Act, 1988, every single person riding a two-wheeler is required to wear protective headgear following the standards of BIS (Bureau of Indian Standards). Also drunken driving under the influence (DUI) is a criminal offence according to the Motor Vehicle act 1939, which states that the bike rider will get punishment. Currently bike riders easily escape from the law [1]. These are the three main issues which motivate us for developing this project. The first step is to identify whether the helmet is worn or not. If helmet is worn then ignition will start otherwise it remains off. For this, Force Sensing Sensor (FSR) sensor is used. The second step is alcohol detection[2]. Alcohol sensor is used as breath analyser which detects the presence of alcohol in rider's breath and if it exceeds permissible limit ignition cannot start. It will send message to the number saying that "Rider is drunk and is trying to ride the bike". MQ-3 sensor is used for this purpose. When these two conditions are satisfied then only ignition starts. The third main issue is accident and late medical help. If the rider has met with an accident, he may not receive medical help instantly, which is one of the main reasons for death. Every second person dies due to delay in medical help, or in the case where the place of accident is unmanned. In fall detection, we place accelerometer in the bike unit. By this mechanism accidents can be detected. The aim of this project is to make a protection system in a helmet for the safety of bike rider. The smart helmet that is made is fitted with different sensors responsible for detection[3].

OBJECTIVES:

There are two main units in this project. Each unit uses a microcontroller. Signal transmission between the helmet unit and bike unit is done using a RF module. In less developed countries, road traffic accidents were the most significant cause of injuries, ranking eleventh among the most important causes of lost years of healthy life. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such cities. The problems with state drunk driving control systems can be solved in many ways. The most effective will follow several principles: They will invest authority and responsibility in people and organizations at all levels, local to national, because drunken driving control requires action at all levels. They will operate in the public eye, using the media to report on problems and solutions, because ultimate decisions on priorities and resources to control drunk driving must have public support. They will not promise instant solutions based on a single action but rather will take

steady steps towards long-term improvement. And they will establish mechanisms for identifying and solving problems rather than attempting to apply one-size fits-all methods. Hence Road Safety becomes a major issue of concern. Therefore it becomes necessary to implement such a technique which is not easy to bypass the basic rule of wearing helmet and to avoid drunken driving. Here we designed a system which checks the two conditions before turned ON the engine of the bike. Our system includes an alcohol sensor and a helmet sensing switch. A switch is used to detect whether the biker is wearing helmet. Alcohol sensor is used to detect the biker is drunk, the output is fed to the MCU. Both the switch and the alcohol sensor are fitted in the helmet. If any of the two conditions are violated the engine will not turned ON. Alcohol sensor MQ3 is used here for detecting the alcohol concentration present in the driver's breath. Sensor provides an analog resistive output based on the alcohol concentration. MCU is the microcontroller unit, which controls all the functions of other blocks in this system. MCU takes or read data from the sensors and controls all the functions of the whole system by manipulating these data.

MOTIVATION:

Alcohol sensor is connected to the MCU through an interfacing circuit and the helmet sensing switch is directly connected to the MCU. MCU receives data from these sensors and it gives a digital data corresponding to the output of sensors to the encoder only if the two conditions are satisfied. A traffic accident is defined as any vehicle accident occurring on public highway roads .The thought of developing this project comes to do some good things towards the society. Two wheeler accidents are increasing day by day and lead to loss of many lives. The main aim of our project is to build a safety system which is integrated with the smart helmet and intelligent bike to reduce the probability of two-wheeler accidents. If any accident occurs no persons at place where to give information to the ambulance or parents. This is a situation we observe our day to day life, a thought of finding some solution to resolve this problem come up with this idea of giving the information about accident as soon as possible and in time. Smart helmet focusing on three major applications which are helpful in our day to day life. At first and most one is the ignition of the bike will not on if we are not wearing the helmet. Secondly alcoholic driving is not possible by using this smart helmet. If the rider is alcoholic, the bike will not start. Third application is accident detection. If person met with an accident, no one is there to help him and simply leaving or ignoring the person, In such situation informing to ambulance or family members through mobile to rescue him for an extent. Various technologies are now available for bike rider safety. Wireless communication between bike to helmet and bike to traffic signal and speed breaker[1]. The system will be comprised of a helmet module including stereo speakers and microphone, and a bike mounted

base unit. The system will make use of different wireless communication protocols including ZigBee and another radio frequency protocols. when the rider or driver driving a bike he don't know where the speed breakers are there. By using RF technology they will find out where the speed breakers are there. Smart Helmet with Sensors for Accident Prevention [2], the microcontroller used in the system is Peripheral Interface Controller (PIC). Force Sensing Resistance (FSR) and the speed sensor are used as sensors to operate this system. Signal transmission between the two circuits is using a radio frequency concept. 315 MHz Radio Frequency Module is used since the range between the circuits is short. Drawback of this work as the motorcycles engine will only start is the helmet is worn and the belt has been buckled. A Solar Powered Smart Helmet With Multifeatures[3].In this helmet have multi features like Engine control system with the smart, in built Bluetooth system ,accident alert system, emergency alert switch (it gives the emergency message to police or family members) and cell phone charging with the solar power. Accidental Avoidance and Cabin Safety System for Automobiles [4].This system endures mainly with two modules namely Gas sensing module and Obstacle detection module these are interfaced with ATmega16 microcontroller. IR sensors transmit signal from its sensor head and INTERNATIONAL JOURNAL OF CURRENT ENGINEERING AND SCIENTIFIC RESEARCH (IJCESR) ISSN (PRINT): 2393-8374, (ONLINE): 2394-0697, VOLUME-5, ISSUE-5, 2018 30 again receive the signal reflected from an obstacle and instruct the microcontroller which alerts the driver with an alarm and controls the vehicle by stopping it. The gas sensor here is mounted inside the vehicle detects the level of the toxic gases it informs to the microcontroller which alerts the persons inside the vehicle with an alarm. Smart Helmet Using GSM and GPS Technology for Accident Detection and Reporting System [5], vibration sensors are placed in different places of helmet where the probability of hitting is more which are connected to microcontroller board. So when the rider crashes and the helmet hit the ground, these sensors sense and then controller extract GPS data using the and when the data exceeds minimum stress limit then GSM module automatically sends message to ambulance or family members. Smart Helmet by Kajal Thakare[6], systems which are already implemented are using various sensors such as FSR sensor, Alcohol sensor, Vibration sensor. In some cases for detecting the road accidents and locating the address GSM and GPS techniques are used. The bioelectric sensors for monitoring Brain, Cardiac and Respiratory Activity. Hence smart helmet is a special idea which makes motorcycle driving safer than before. Alcohol detection by AbhinavAnand[7], mainly to detect the alcohol drunken people.MQ-3 sensors are used here to detect the alcohol content in the breath and if the rider is alcoholic the bike will not start.Communication possible by using RF module. Intelligent accident identification and

location display system[8] This system has been developed and implemented using the smart sensors and LPC2148 controller based mobile technology. If the accident occurred then this system immediately transmit the location of the accident and persons heart beat status to the emergency care centre phone number through SMS. Bike rider's safety using helmet [9].The system design will be such that without wearing the helmet the rider cannot start two wheelers. The helmet will be connected to vehicle key ignition systems which will be electronically controlled. Smart Helmet For Indian Bike Riders [10], provides an excellent alternative to the existing accidental avoidance techniques. These include Hi-tech helmet and an electronic system which can be applied in mechanical system as two wheelers to avoid accidents on roads by compulsion of wearing helmet II. TECHNICAL STUDY The technics here we used in our project are alcohol detection and accident prevention. The ignition of the bike starts only if we wore the helmet. For the above applications three sensors and GPS GSM interfacing also used. A. FLEX SENSOR The Flex sensor is used to detect whether the helmet is worn or not. Here the flex sensor is connected with the Arduino in the helmet unit. It is a flex sensor which is 2.2 inches in length. This sensor works by bending the sensor itself. As the sensor is being flexed or bent, the resistance across the sensor increases. The greater the angle of bending, the greater the resistance. This can be tested with multimeter. Fig-1:Basic flex sensor circuit B. MQ-3 SENSOR The alcohol Sensor(MQ3) module is useful for gas leakage detection and it is also suitable for detecting Alcohol, Benzene, CH₄, Hexane, LPG, CO. Due to its fast response time and high sensitivity, measurements can be taken as soon as possible. The sensitivity of the sensor can be adjusted by using the potentiometer. The MQ3 gas sensor is alcohol sensor which is used to detect the alcohol concentration in the breath. This sensor provides an analog resistive output based on alcohol concentration. C. Accelerometer ADXL335 The ADXL335 is a small, thin, low power, complete 3-axis accelerometer sensor with signal conditioned voltage outputs. The sensor can measure the static acceleration of gravity in tilt sensing applications, as well as dynamic acceleration resulting from motion, shock, or vibrations. Road accidents are increasing day by day because the riders are not using the helmet and due to consumption of alcohol. In today's world, huge numbers of people are dying on road accidents. By using smart helmet, the accidents can be detected. The main target of the project is designing a smart helmet for accident avoidance and alcohol detection. The IR sensor checks if the person is wearing the helmet or not. The Gas sensor recognizes the alcoholic substance in the rider's breath. If the person is not wearing the helmet and if he consumes alcohol, the bike will not start. If there is no sign of alcoholic substance present and helmet is used, then only the bike will start. At the point when the rider met with an accident, the sensor recognizes the condition of the motorbike and

reports the accident. Then the GPS in the bike will send the location of the accident place to main server of the nearby hospitals.

: Fatal Road accidents can be easily avoided by understanding the psychological state of drivers. Majority of road accidents occur during night driving due to drowsiness state of vehicle drivers (Subject). This paper provides Eye Blink Monitoring System (EBM) that alerts the subject during state of drowsiness. An embedded system based on psychological state of Subject by monitoring eye movements and head movements are useful in warning drivers during initial sleep cycle phase of drowsiness. The physiological sleep state analysis of subject can be determined by monitoring subjects eye-blink rate using an IR sensor and head movement using an accelerometer. A normal eye blink rate has no effect on the output of the system. However, if subject is in extreme state of sleep-cycle, then IR sensor receives abnormal eye blinking rate & an alarm is initiated to wake the subject. An Internet of Things (IOT) enabled sensors are used to transmit the entire data collected by sensors over a smart grid network for quick response team to take actions under emergency conditions.

The Internet of Things (IOT) is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure. Typically, IOT offers advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is implemented in nearly all fields of automation enabling advanced applications like a Smart Grid. The term —things|| in the IOT refers to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, or field operation devices that assist fire-fighters in search and rescue. Current market examples include thermostat systems and washer/dryers that utilize Wi-Fi for remote monitoring. In this project we are presenting an internet based system entitled ‘Eye Blink and head movement Monitoring System’ which will help drivers to alert in drowsiness. This system is based on principle of monitoring eye movements of driver continuously using an IR sensor and head movement using accelerometer. If he/she falls asleep, then an alarm will ring to wake him/her up. Integration with the Internet implies that devices will utilize an IP address as a unique identifier. However, due to the limited address space of IPv4 (which allows for 4.3 billion unique addresses), objects in the IOT will have to use IPv6 to accommodate the extremely large address space required. Objects in the IOT will not only be devices with sensory capabilities, but also provide actuation capabilities (e.g., bulbs or locks controlled over the Internet). Largely, the future of the Internet of Things will not be possible

without the support of IPv6; and consequently the global adoption of IPv6 in the coming years will be critical for the successful development of the IOT in the future.

In this project we are implementing EBM (Eye Blink Monitoring Technique) to detect drowsiness of night drivers and preventing accidents. The other technologies that detect Drowsiness are EEG or Brain waves monitoring technique. Such a technique requires sophisticated system to map or monitor the brain of subject and determine the state of drowsiness based on the neurological sleep cycle. Though EEG technique is accurate to a larger extent, yet it is not cost effective and has a difficult implementation. On the other hand Eye Blink Monitoring Technique is dependent on physiological state of sleep of the subject and by understanding it, drowsiness can be detected and accident can be prevented. Drowsiness causing accident can be effectively prevented by designing an embedded system that is efficient enough to take critical decisions during emergency conditions. Majority of accident prevention systems come into picture when accident happens, however the proposed system is equipped with advantage of taking decisions by analyzing the symptoms of accident causing events. Brain wave technique only measures the drowsiness level but, EBM technique can be interfaced with a network of sensors in a cost effective manner to provide an efficient accident prevention system. The following key points were considered while estimating the feasibility and wide expansion of IOT based devices

Vehicle accidents are most common due to the imperceptibility of obstacles. Obstacles can strike the vehicle and causes severe damage. In order to reduce the number of crash and collision, 4 ultrasonic sensors are fixed on the four sides of the vehicle. These sensors detect the obstacles and gives notification through the LCD display and alarm sound. Temperature sensor is used to know the engine temperature. If the engine's temperature is above the predefined temperature, then it indicates through alarm and cooling fan will be turned ON. Micro Electro Mechanical System(MEMS) sensor first calculate the X,Y,Z co ordinate of the vehicle, if there is any significant form of changes occurs, then the image of that location will be shared to the concern person and their family's smart phone. The shared location helps for the Rescue team and the police control room for the rescue operation. By this idea human lives can be saved and prevents the vehicle from damage.

In less developed countries, road traffic accidents were the most significant cause of injuries, ranking eleventh among the most important causes of lost years of healthy life. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such a cities. The problems with state drunk driving control systems can be solved in many ways. The most effective will follow several principles: They will invest authority and responsibility in people

and organizations at all levels, local to national, because drunken driving control requires action at all levels. They will operate in the public eye, using the media to report on problems and solutions, because ultimate decisions on priorities and resources to control drunk driving must have public support. They will not promise instant solutions based on a single action but rather will take steady steps towards long-term improvement. And they will establish mechanisms for identifying and solving problems rather than attempting to apply one-size fits-all methods. Hence Road Safety becomes a major issue of concern. Therefore it becomes necessary to implement such a technique which is not easy to bypass the basic rule of wearing helmet and to avoid drunken driving. Here we designed a system which checks the two conditions before turned ON the engine of the bike. Our system includes an alcohol sensor and a helmet sensing switch. A switch is used to detect whether the biker is wearing helmet. Alcohol sensor is used to detect the biker is drunk, the output is fed to the MCU. Both the switch and the alcohol sensor are fitted in the helmet. If any of the two conditions are violated the engine will not turned ON. Alcohol sensor MQ3 is used here for detecting the alcohol concentration present in the driver's breath. Sensor provides an analog resistive output based on the alcohol concentration. MCU is the microcontroller unit, which controls all the functions of other blocks in this system. MCU takes or read data from the sensors and controls all the functions of the whole system by manipulating these data. Alcohol sensor is connected to the MCU through an interfacing circuit and the helmet sensing switch is directly connected to the MCU. MCU receives data from these sensors and it gives a digital data

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standards of BIS (Bureau of Indian Standards). Also drunken driving under the influence (DUI) is a criminal offence according to the Motor Vehicle act 1939, which states that the bike rider will get punishment. Currently bike riders easily escape from the law [1]. These are the three main issues which motivates us for developing this project. The first step is to identify whether the helmet is worn or not. If helmet is worn then ignition will start otherwise it remains off. For this, Force Sensing Sensor (FSR) sensor is used. The second step is alcohol detection[2]. Alcohol sensor is used as breath analyser which detects the presence of alcohol in rider's breath and if it exceeds permissible limit ignition cannot start. It will send message to the number saying that "Rider is drunk and is trying to ride the bike". MQ-3 sensor is used for this purpose. When these two conditions are satisfied then only ignition starts. The third main issue is accident and late medical help. If the rider has met with an accident, he may not receive medical help instantly, which is one of the main reasons for death. Every second people dies due to delay in medical help, or in the case where the place of accident is unmanned. In fall detection, we place accelerometer in the bike unit. By this mechanism accidents can be detected. The aim of this project is to make a protection system in a helmet for the safety of bike rider. The smart helmet that is made is fitted with different sensors responsible for detection[3]. There are two main units in this project. Each unit uses a microcontroller. Signal transmission between the helmet unit and bike unit is done using a RF module.

CHAPTER 2

LITERATURE SURVEY

2.1 IOT BASED SMART VEHICLE AND ACCIDENT PREVENTION SYSTEM

It gives an idea about the accident prevention system and vehicle theft system. Nowadays accidents and vehicle theft cases of two-wheelers are increasing at an alarming rate. Speed is the cause of most number of traffic accidents. The number of two-wheelers on the road is more than four-wheelers and eight wheelers. It has been estimated by WHO (World Health Organization) that there is an increase in the number of deaths due to accidents by two wheelers than fourwheelers. Bike-theft is a major problem; several underlying problems have led to this increase in bike-theft. Traditional solution for accident detection uses the Global Positioning System (GPS) to get the location of the accident and a message is sent through a microcontroller or a mobile device. The survey conducted by Government of India during the year 2010, says that there were close to 5 lakh accidents happened, which resulted in more than 1.3 lakh deaths and inflicted injuries on 5.2 lakh persons. These numbers translate into one road accident every minute, and one road accident death every 4 minutes. Over speeding is the main cause when it comes to road accidents in the city. Statistics available with the traffic police shows that nearly 27% of the total accidents are taking place due to over speeding. Exceeding the lawful speed limit is the single biggest reason for road accidents. This led to the creation of accident prevention system where you can access the speed limit. Every year nearly 36,000 vehicles worth Rs.115 crore are stolen in India. Only about 15,000 are traced, often in un road worthy condition, with many components missing. These are stolen because the thief is given the opportunity. As a result, The increasing advantages of accident prevention and vehicle theft system now are at highest position thus as a result it provides an estimated and immediate help to the individual. The application for the accident prevention system and vehicle theft system is useful for the security and enhancing the awareness of the accident prone and theft prone scenarios for the secured and well-being of the individual. One of such system which is of major importance is of providing an immediate notification to the individual and their related people about either of the scenarios and hence prevents them.

Objectives: In recognition to the importance of safety and security of an individual , this project is tried to achieve the following objectives: 1. To build an excessive speed indication system and warning alert system via voice alert, remote accessing of speed by parents. 2. To provide an accident detection system and driver condition monitoring system using IOT Artificial Intelligence photos. 3. To provide location tracking using Google map plotting. 4. To provide information to parents and also helps in providing police complaint and sending messages to ambulance. 5. To prevent bike theft and provide vehicle stopping facility by owner. **Methodology:** The following gives the methodology provided for the above objectives as follows:

Methodology for Objective-1: Calculating the speed and GPS network to collect vehicle data. If the rider exceeds the speed limit, it provides voice alert and if the rider neglects the alert then parents will have the access to stop the vehicle through smart phones. Methodology for Objective-2: Using accident detection sensor, camera present in smart phones will send and receive pictures. Methodology for Objective-3: The GPS modem will continuously give the data i.e., the latitude and longitude indicating the position of the vehicle. Methodology for Objective-4: Identifying the nearest hospitals and police stations is done by Map my India application and it sends the location details to parents through message or E-mail. Methodology for Objective-5: Data from the accelerometer is evaluated with several threshold values and position data to determine a problem which helps in recognizing the bike theft and hence the owner can prevent it. Results and conclusion: The results of the project are described as follows: 1. The IoT based application and the guardian based application is created. 2. The IoT based application includes the options for providing specific information such as the respective phone numbers, email id of the guardian. 3. The guardian receives the message notification regarding the start of the hardware system and the vehicle where the system is implemented in the vehicle. 4. The guardian based application has specific features for the accessibility of the vehicle such as location, photo and voice alert options, complaint options, nearest medical assistance and police station information. It also includes the facility of stopping the vehicle. 5. The guardian requests for the photo option which is sent to the respective email id provided in the IoT based application. 6. The guardian requests for the location which is obtained as a message notification in the form of latitudes and longitudes. 7. The complaint is sent by the guardian in case of vehicle theft. 8. The guardian receives the message regarding the occurrence of accidents and the nearest medical assistance and police station information can be obtained by providing the specific latitude and longitude information for the provision to former and latter facility. 9. The speed based application is accessed by the guardian where in the specific speed limit for the vehicle is set and if the vehicle exceeds the speed limit, the over speed message is obtained by the guardian.

Scope for future work:

The project proposed certainly has some improvisations which can be implemented in future as some of the ideas proposed. 1. The hardware can be further more improvised using a alcohol sensor, where most of the accidents are occurring due to intoxication. This can be implemented by placing alcohol sensor as to detect the alcohol by giving certain limit value of the alcohol. 2. This project can also have eye blink sensor which prevents the individual who meets with an accident due to drowsiness. It can be overcome by placing eye blink

sensor as required for the individual. 3. Can do graphical software development in order to track the vehicle.

2.2 PROACTIVE ACCIDENT AVOIDANCE SYSTEM USING IOT

Lots of Accidents are happening due to the Drivers mistake. The main causes of vehicle accident are related to Alcohol Consumption, Drowsiness and distracted vision. The aim of the proposed system is to help in analyzing these factors and develop accident avoidance systems. Here we Detect Driver Drowsiness by using a camera attached to the steering. The image of the driver's face captured by the camera is analyzed using Mat Lab tool and is alerted incase if the drowsiness is detected. Apart from that we also include Alcohol sensing and collision monitoring. Alcohol sensor is used to identify the drunk drivers and SMS is sent to the police in case of drunk & Drive. Ultrasonic sensor is used to measure distance in front of cars and incase of any risk of collision vehicle is stopped or slowed down.

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AIMS & OBJECTIVES

This project prototyped is aimed to design & implement uniquely identifiable embedded computing devices within existing internet infrastructure for night vehicle drivers to locate and prevent road accident caused due to drowsiness. The objectives of proposed model are summarized below : I. Establish an eye blink & head movement monitoring sensor system for Drowsiness detection. II. In case of drowsiness detected a) Alert the driver via a wake call (vibration /Buzzer) b) Reduce speed and stabilize vehicle. III. Mediate the Sensor information and locate accident location using GPRS for help and rescue. III.Display the activities of designed system on LCD display. V.

PROBLEM STATEMENT The problem statement includes improving the quality of data acquisition about distraction-related crashes along with better analysis techniques. By analysing the understanding of the extent and nature of the distraction problem. The main aim is to reduce the driver workload associated with performing tasks using both built-in and portable in-vehicle devices via limiting the visual and manual demand associated with in-vehicle device interface designs. Better device interfaces and integrated wearable computers will help to minimize the amount of time and effort involved in a driver performing a task using the device. Minimizing the workload associated with performing non-driving, or —secondary,|| tasks with a device enables the driver to maximize the attention they focus toward the primary task of driving. Keep drivers safe through the introduction of crash avoidance technologies. These include the use of crash warning systems to re-focus the attention of distracted drivers as well as vehicle initiated (i.e., automatic) braking and steering to prevent or mitigate distracted driver crashes. Educate drivers about the risks and consequences of distracted driving are performed by targeted media messages, drafting and publishing sample text messaging laws.

2.3 An IoT Based Accident Prevention & Tracking System for Night Drivers

Fatal Road accidents can be easily avoided by understanding the psychological state of drivers. Majority of road accidents occur during night driving due to drowsiness state of vehicle drivers (Subject). This paper provides Eye Blink Monitoring System (EBM) that alerts the subject during state of drowsiness. An embedded system based on psychological state of Subject by monitoring eye movements and head movements are useful in warning drivers during initial sleep cycle phase of drowsiness. The physiological sleep state analysis of subject can be determined by monitoring subjects eye-blink rate using an IR sensor and head movement using an accelerometer. A normal eye blink rate has no effect on the output of the system. However, if subject is in extreme state of sleep-cycle, then IR sensor receives

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accident prevention systems come into picture when accident happens , however the proposed system is equipped with advantage of taking decisions by analyzing the symptoms of accident causing events. Brain wave technique only measures the drowsiness level but, EBM technique can be interfaced with a network of sensors in a cost effective manner to provide an efficient accident prevention system. The following key points were considered while estimating the feasibility and wide expansion of IOT based devices

Vehicle accidents are most common due to the imperceptibility of obstacles. Obstacles can strike the vehicle and causes severe damage. In order to reduce the number of crash and collision, 4 ultrasonic sensors are fixed on the four sides of the vehicle. These sensors detect the obstacles and gives notification through the LCD display and alarm sound. Temperature sensor is used to know the engine temperature. If the engine's temperature is above the predefined temperature, then it indicates through alarm and cooling fan will be turned ON. Micro Electro Mechanical System(MEMS) sensor first calculate the X,Y,Z co ordinate of the vehicle, if there is any significant form of changes occurs, then the image of that location will be shared to the concern person and their family's smart phone. The shared location helps for the Rescue team and the police control room for the rescue operation. By this idea human lives can be saved and prevents the vehicle from damage.

2.4 SMART HELMET FOR ACCIDENT PREVENTION

- In a developing nation like India, with advancement in the transportation technology and rise in the total number of vehicles, road accidents increases rapidly. This advancement in technology also increased the traffic hazards. Two wheelers accounts for 25% of total road crash death. Hence the ratio of road accidents that take place frequently increases causing immense loss of life due to poor emergency facilities. This paper provides an intelligent system for two wheeler accident prevention and detection for human life safety. The prevention part involves, Smart Helmet, which automatically checks whether the person is wearing the helmet and has non- alcoholic breath while driving. The relay does not ON the engine if these two conditions are not satisfied. The microcontroller controls the function of relay and thus the ignition. The system also enables detection of an accident at any place and reports about the accident to predefined numbers with GSM module. The Microcontroller continuously records all the parameters of automobile for prevention and detection of accident

In less developed countries, road traffic accidents were the most significant cause of injuries, ranking eleventh among the most important causes of lost years of healthy life. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such a cities. The

problems with state drunk driving control systems can be solved in many ways. The most effective will follow several principles: They will invest authority and responsibility in people and organizations at all levels, local to national, because drunken driving control requires action at all levels. They will operate in the public eye, using the media to report on problems and solutions, because ultimate decisions on priorities and resources to control drunk driving must have public support. They will not promise instant solutions based on a single action but rather will take steady steps towards long-term improvement. And they will establish mechanisms for identifying and solving problems rather than attempting to apply one-size fits-all methods. Hence Road Safety becomes a major issue of concern. Therefore it becomes necessary to implement such a technique which is not easy to bypass the basic rule of wearing helmet and to avoid drunken driving. Here we designed a system which checks the two conditions before turned ON the engine of the bike. Our system includes an alcohol sensor and a helmet sensing switch. A switch is used to detect whether the biker is wearing helmet. Alcohol sensor is used to detect the biker is drunk, the output is fed to the MCU. Both the switch and the alcohol sensor are fitted in the helmet. If any of the two conditions are violated the engine will not turned ON. Alcohol sensor MQ3 is used here for detecting the alcohol concentration present in the driver's breath. Sensor provides an analog resistive output based on the alcohol concentration. MCU is the microcontroller unit, which controls all the functions of other blocks in this system. MCU takes or read data from the sensors and controls all the functions of the whole system by manipulating these data. Alcohol sensor is connected to the MCU through an interfacing circuit and the helmet sensing switch is directly connected to the MCU. MCU receives data from these sensors and it gives a digital data corresponding to the output of sensors to the encoder only if the two conditions are satisfied.

2. RELATED WORK →

1.1 Tushar Raut et.al(1) The Author has discussed safety and security of the riders in contradiction of accident. Measuring the alcohol level of the bike rider and checking the speed of the bike is the main advantage of this project. The ignition will be off if the alcohol level crosses the predefined value. It also has the GPS. By using this location of the accident happen is detected. And it sends the sms to the concerned people. → Lakshmi Devi P et.al

(2) This project explains about the Zigbee transmitter and Zigbee receiver. This project has done only with the purpose of accident information to the concerned people. Here when ever the accident is happened, the location of the accident is send to the noted mobile number. The disadvantage is that the helmet cost is still high and it is of only one purpose.

Road accidents are increasing day by day because the riders are not using the helmet and due to consumption of alcohol. In today's world, huge numbers of people are dying on road accidents. By using smart helmet, the accidents can be detected. The main target of the project is designing a smart helmet for accident avoidance and alcohol detection. The IR sensor checks if the person is wearing the helmet or not. The Gas sensor recognizes the alcoholic substance in the rider's breath. If the person is not wearing the helmet and if he consumes alcohol, the bike will not start. If there is no sign of alcoholic substance present and helmet is used, then only the bike will start. At the point when the rider met with an accident, the sensor recognizes the condition of the motorbike and reports the accident. Then the GPS in the bike will send the location of the accident place to main server of the nearby hospitals. t. A smart helmet is a type of protective headgear used by the rider which makes bike driving safer than before. The main purpose of this helmet is to provide safety for the rider. This can be implemented by using advanced features like alcohol detection, accident identification, location tracking, use as a hands free device, fall detection. This makes it not only a smart helmet but also a feature of a smart bike. It is compulsory to wear the helmet, without which the ignition switch cannot turn ON. An RF Module can be used as wireless link for communication between transmitter and receiver. If the rider is drunk the ignition gets automatically locked, and sends a message to the registered number with his current location. In case of an accident it will send a message through GSM along with location with the help of GPS module. The distinctive utility of project is fall detection; if the rider falls down from the bike it sends a message.

2.5 SMART HELMET AND INTELLIGENT BIKE SYSTEM

The main objective of this paper is to build a safety system which is integrated with the smart helmet and intelligent bike to reduce the probability of two-wheeler accidents and drunk drive cases. The flex sensor checks if the person wearing the helmet or not. Alcohol sensors detect the alcoholic content in riders' breath. If the rider is not wearing the helmet or if there is any alcohol content found in rider's breath, the bike remains off. The bike will start until the rider wears the helmet and if there is no alcoholic content present. When the rider crashes, helmet hits the ground, sensors detect the motion and tilts of helmet and reports the occurrence of an accident. It sends information of the corresponding location to family members of the rider and emergency contact number

Index Terms: Biker's safety, Accident detection, Smart helmet, Alcohol detection.

A traffic accident is defined as any vehicle accident occurring on public highway roads .The thought of developing this project comes to do some good things towards the society. Two

wheeler accidents are increasing day by day and lead to loss of many lives. The main aim of our project is to build a safety system which is integrated with the smart helmet and intelligent bike to reduce the probability of two-wheeler accidents. If any accident occurs no persons at place where to give information to the ambulance or parents. This is a situation we observe our day to day life, a thought of finding some solution to resolve this problem come up with this idea of giving the information about accident as soon as possible and in time. Smart helmet focusing on three major applications which are helpful in our day to day life. At first and most one is the ignition of the bike will not on if we are not wearing the helmet. Secondly alcoholic driving is not possible by using this smart helmet. If the rider is alcoholic, the bike will not start. Third application is accident detection. If person met with an accident, no one is there to help him and simply leaving or ignoring the person, In such situation informing to ambulance or family members through mobile to rescue him for an extent. Various technologies are now available for bike rider safety. Wireless communication between bike to helmet and bike to traffic signal and speed breaker[1]. The system will be comprised of a helmet module including stereo speakers and microphone, and a bike mounted base unit. The system will make use of different wireless communication protocols including ZigBee and another radio frequency protocols. when the rider or driver driving a bike he don't know where the speed breakers are there. By using RF technology they will find out where the speed breakers are there. Smart Helmet with Sensors for Accident Prevention [2], the microcontroller used in the system is Peripheral Interface Controller (PIC). Force Sensing Resistance (FSR) and the speed sensor are used as sensors to operate this system. Signal transmission between the two circuits is using a radio frequency concept. 315 MHz Radio Frequency Module is used since the range between the circuits is short. Drawback of this work as the motorcycles engine will only start is the helmet is worn and the belt has been buckled. A Solar Powered Smart Helmet With Multifeatures[3].In this helmet have multi features like Engine control system with the smart, in built Bluetooth system ,accident alert system, emergency alert switch (it gives the emergency message to police or family members) and cell phone charging with the solar power. Accidental Avoidance and Cabin Safety System for Automobiles [4].This system endures mainly with two modules namely Gas sensing module and Obstacle detection module these are interfaced with ATmega16 microcontroller. IR sensors transmit signal from its sensor head and again receive the signal reflected from an obstacle and instruct the microcontroller which alerts the driver with an alarm and controls the vehicle by stopping it. The gas sensor here is mounted inside the vehicle detects the level of the toxic gases it informs to the microcontroller which alerts the persons inside the vehicle with an alarm. Smart Helmet Using GSM and GPS Technology for

Accident Detection and Reporting System [5], vibration sensors are placed in different places of helmet where the probability of hitting is more which are connected to microcontroller board. So when the rider crashes and the helmet hit the ground, these sensors sense and then controller extract GPS data using the and when the data exceeds minimum stress limit then GSM module automatically sends message to ambulance or family members. Smart Helmet by Kajal Thakare[6], systems which are already implemented are using various sensors such as FSR sensor, Alcohol sensor, Vibration sensor. In some cases for detecting the road accidents and locating the address GSM and GPS techniques are used. The bioelectric sensors for monitoring Brain, Cardiac and Respiratory Activity. Hence smart helmet is a special idea which makes motorcycle driving safer than before. Alcohol detection by AbhinavAnand[7], mainly to detect the alcohol drunken people. MQ-3 sensors are used here to detect the alcohol content in the breath and if the rider is alcoholic the bike will not start. Communication possible by using RF module. Intelligent accident identification and location display system[8] This system has been developed and implemented using the smart sensors and LPC2148 controller based mobile technology. If the accident occurred then this system immediately transmit the location of the accident and persons heart beat status to the emergency care centre phone number through SMS. Bike rider's safety using helmet [9]. The system design will be such that without wearing the helmet the rider cannot start two wheelers. The helmet will be connected to vehicle key ignition systems which will be electronically controlled. Smart Helmet For Indian Bike Riders [10], provides an excellent alternative to the existing accidental avoidance techniques. These include Hi-tech helmet and an electronic system which can be applied in mechanical system as two wheelers to avoid accidents on roads by compulsion of wearing helmet II. TECHNICAL STUDY The technics here we used in our project are alcohol detection and accident prevention. The ignition of the bike starts only if we wore the helmet. For the above applications three sensors and GPS GSM interfacing also used. A. FLEX SENSOR The Flex sensor is used to detect whether the helmet is worn or not. Here the flex sensor is connected with the Arduino in the helmet unit. It is a flex sensor which is 2.2 inches in length. This sensor works by bending the sensor itself. As the sensor is being flexed or bent, the resistance across the sensor increases. The greater the angle of bending, the greater the resistance. This can be tested with multimeter.

CHAPTER 3

SYSTEM DESIGN

EXISTING SYSTEM

In the existing system, when the accident is detected means, only the message will be send to the ambulance with the help of the gsm.Despite many efforts taken by different governmental and non-governmental organizations all around the world by various programs to aware against careless driving, yet accidents are taking place every now and then. However, many lives could have been saved if the emergency service could get the crash information in time. A study by Virtanen et al. shows that 4.6% of the fatalities in accidents could have been

prevented only in Finland if the emergency services could be provided at the place of accident at the proper time. In the existing system, the sensors are used such as IR sensor, load sensor, vibration sensor and gas sensor, mems. The gas sensor detects the measure of liquor consists in the breath of a person wearing the helmet. The Alcohol recognition sensors connected with the helmet distinguish the Alcohol detection. MEMS based handle bar control of the vehicle. The Vibration sensor is used to detect any accident. Load checking to recognize the load of the vehicle and alongside the sensor to locate the quantity of individuals travelling in the bike.

PROBLEM STATEMENT

- Hard to implementation
- It is not cost effective
- We can't get able update of the driver status.
- Data transmission speed is very less compared to IOT technology
- Cloud updates are not possible

PROPOSED SYSTEM:

- The core element of the model is the arduino board which controls and manages all the functions performed by the other components of the model. The location of the vehicle will be transferred to the cloud page to monitor.
- MEMS Sensor will detect the tilt and record the values based on co-ordinate system and sends the signal to the arduino board. The Gas sensor MQ3 has high sensitivity to alcohol and sends signal to stop the vehicle. This module provides both digital and analog output.
- Heart beat and vibration sensor comes into picture when the rider feels any heart problem and accident detected. buzzer is used to alert the sound when any problem to the driver.
- SOS message can be sent when rider meets with an accident. This is achieved using android app, sensors, Wifi and Cloud. Cloud send the data to the concerned person through Wifi. The android app analyzes data and performs specific actions.

- The IOT Technology is used to transmit the sensor data to the webpage by vehicles with the ultra speed .then these datas are uploaded to the IOT Cloud with the help of Node MCU.
- To avoid the theft of the vehicle, we placed vibration sensor to alert. The motor is attached to the Arduino board to stop and start of the vehicles
- The live monitoring of the driver and vehicle status is possible with this project. Then alert will goen on to the gmail and sms based alert system.

ADVANTAGES:

- A safe 4 wheeler journey is possible which would decrease the head injuries throughout accidents caused from the absence of helmet .
- The driver health parameters are continuously monitored
- The alert message is getting updated to the important persons.
- Additionally reduce the accident rate due to drunken driving.
- The Transmission speed of the data is very high.

PROJECT EXPLANATION

- The Collision preventive system is engaged whenever the vehcile is turned ON. The ultrasonic sensor fixed in the vehicle is used to detect the obstacle in front of the vehicle. The ultrasonic sensor is also used to calculate the distance between the obstacle and the vehicle.
- The distance between the vehicle and the obstacle would be preset. If the obstacle is recognized at the 90 cms then the alarm will go on. The alert system goes on at the decrease of every 15 cms.
- This project focuses on building a user-friendly device that specializes in detecting intrusions besides doing close range obstacle detection.
- Automobile safety can be improved by anticipating a crash before it occurs and thereby providing additional time to deploy safety technologies.
- Warnings can be like buzzer if the driver is approaching a pothole or any obstruction, driver may be warned in advanced regarding what the road entails.

- The project's ultimate aim thus finalized as, one to build a general, easy-to-use and versatile system that can prevent fatal accidents.

SENSOR MODULE

All the sensors are connected to the Arduino microcontroller to monitor the driver status, vehicle theft and accident systems.

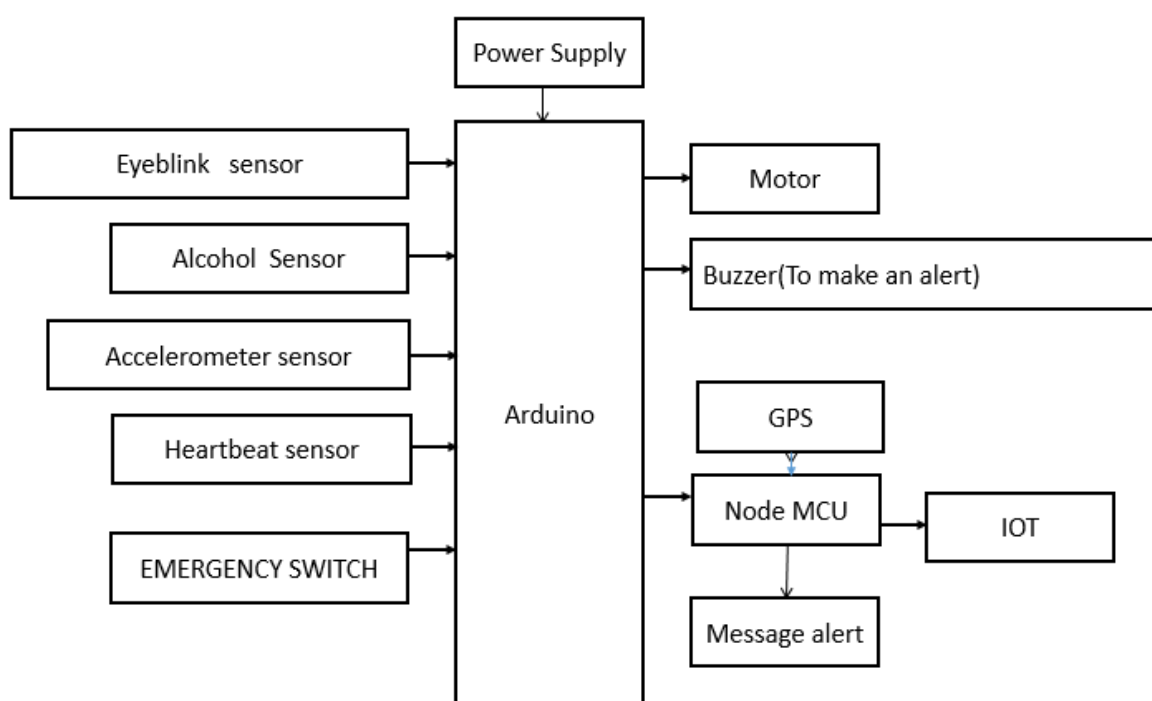
ALERT SYSTEM

The sms and mail alert is possible with this project. Through the alert system we save the vehicle and driver.

IOT MODULE

The live monitoring is possible with IOT systems.

BLOCK DIAGRAM:



HARDWARE REQUIREMENTS

- Arduino
- Alcohol sensor
- Eyeblick Sensor
- Acceleration sensor
- Heart beat sensor
- Buzzer
- Node MCU
- IOT MODULE
- Motor

SOFTWARE REQUIREMENTS

- Arduino IDE
- EMBEDDED C.
- Proteus simulation tool
- IOT Cloud Software.

CHAPTER 4

HARDWARE DESIGN

ARDUINO UNO AND ITS PROGRAMMING

Arduino is a tool for making computers that can sense and control more of the physical world than your desktop computer. It's an open-source physical computing platform based on a simple microcontroller board, and a development environment for writing software for the board.

Arduino can be used to develop interactive objects, taking inputs from a variety of switches or sensors, and controlling a variety of lights, motors, and other physical outputs. Arduino projects can be stand-alone, or they can be communicate with software running on your computer. The boards can be assembled by hand or purchased preassembled; the open-source IDE can be downloaded for free.

The Arduino programming language is an implementation of Wiring, a similar physical computing platform, which is based on the Processing multimedia programming environment.

Arduino Uno:



Fig 3.1 ARDUINO UNO

2.1 Overview

The Arduino microcontroller is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market. The Arduino is open-source, which means hardware is reasonably priced and development software is free. This guide is for students in ME 211, or students anywhere who are confronting the Arduino for the first time. For advanced Arduino users, prowl the web; there are lots of resources.

This guide covers the Arduino Uno board (Spark fun DEV-09950, \$29.95), a good choice for students and educators. With the Arduino board, you can write programs and create interface circuits to read switches and other sensors, and to control motors and lights with very little effort. Many of the pictures and drawings in this guide were taken from the documentation on the

This is what the Arduino board looks like.



The Duemilanove board features an Atmel ATmega328 microcontroller operating at 5 V with 2 Kb of RAM, 32 Kb of flash memory for storing programs and 1 Kb of EEPROM for storing parameters. The clock speed is 16 MHz, which translates to about executing about 300,000 lines of C source code per second. The board has 14 digital I/O pins and 6 analog input pins. There is a USB connector for talking to the host computer and a DC power jack for connecting an external 6-20 V power source, for example a 9 V battery, when running a program while not connected to the host computer. Headers are provided for interfacing to the I/O pins using 22 g solid wire or header connectors.

The Arduino programming language is a simplified version of C/C++. If you know C, programming the Arduino will be familiar. If you do not know C, no need to worry as only a few commands are needed to perform useful functions.

An important feature of the Arduino is that you can create a control program on the host PC, download it to the Arduino and it will run automatically. Remove the USB cable connection to the PC, and the program will still run from the top each time you push the reset button.

Remove the battery and put the Arduino board in a closet for six months. When you reconnect the battery, the last program you stored will run. This means that you connect the board to the host PC to develop and debug your program, but once that is done, you no longer need the PC to run the program.

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

2.2 Summary:

Microcontroller ATmega328

Operating Voltage 5V

Input Voltage (recommended) 7-12V

Input Voltage (limits) 6-20V

Digital I/O Pins 14 (of which 6 provide PWM output)

Analog Input Pins 6

DC Current per I/O Pin 40 mA

DC Current for 3.3V Pin 50 mA

Flash Memory 32 KB (ATmega328) of which 0.5 KB used by bootloader

SRAM 2 KB (ATmega328)

EEPROM 1 KB (ATmega328)

Clock Speed 16 MHz

2.3 Pin Configuration

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically.

External (non-USB) power can come either from an AC-to-DC adapter (wall- wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

- **VIN.** The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- **5V.** this pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board.
- **3V3.** A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50mA.
- **GND.** Ground pins.
- **IOREF.** This pin on the Arduino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source or enable voltage translators on the outputs for working with the 5V or 3.3V.

Memory

The ATmega328 has 32 KB (with 0.5 KB used for the bootloader). It also has 2 KB of SRAM and 1 KB of EEPROM.

Input and Output

Each of the 14 digital pins on the Uno can be used as an input or output, using `pinMode()`, `digitalWrite()`, and `digitalRead()` functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kohms. In addition, some pins have specialized functions:

- **Serial: 0 (RX) and 1 (TX).** Used to receive (RX) and Transmit (TX) TTL serial data.

These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip.

- **External Interrupts: 2 and 3.** These pins can be configured to trigger an interrupt on a lowvalue, a rising or falling edge, or a change in value. See the `attachInterrupt()` function for details.

- **PWM: 3, 5, 6, 9, 10, and 11.** Provide 8-bit PWM output with the `analogWrite()` function.

- **SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK).** These pins support SPI communication using the SPI library.

- **LED: 13.** There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

The Uno has 6 analog inputs, labeled A0 through A5, each of which provide 10 bits of resolution (i.e. 1024 different values). By default they measure from ground to 5 volts, though it is possible to change the upper end of their range using the AREF pin and the `analogReference()` function. Additionally, some pins have specialized functionality:

- **I2C: A4 or SDA pin and A5 or SCL pin.** Support I2C communication using the Wire library.

There are a couple of other pins on the board:

- **AREF.** Reference voltage for the analog inputs. Used with analog Reference ().

Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

2.4 Communication

Microcontrollers depend on a host computer for developing and compiling programs. The software used on the host computer is known as an integrated development environment, or IDE. For the Arduino, the development environment is based on the open source Processing platform (www.processing.org) which is described by its creators as a “programming language and environment for people who want to program images, animation, and interactions.” The Arduino programming language leverages an open source project known as Wiring (wiring.org.co). The Arduino language is based on good old- fashioned C. If you are unfamiliar with this language, don’t worry; it’s not hard to learn, and the Arduino IDE provides some feedback when you make mistakes in your programs.

The Arduino Uno has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The '16U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, a inf file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1).

A Software Serial library allows for serial communication on any of the Uno's digital pins. The ATmega328 also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus; see the documentation for details. For SPI communication, use the SPI library.

As you go through the list of programming statements available in the Arduino IDE (choose Help->Reference), you might think there isn’t much power for doing things like running servos, operating stepper motors, reading potentiometers, or displaying text on an LCD. Like most any language based on C, the Arduino supports the notion of “libraries” code

Repositories that extend core programming functionality. Libraries let you re- use code without having to physically copy and paste it into all your programs. The standard Arduino software installation comes with several libraries you may use, and you can download others from the Arduino support pages and from third-party websites that publish Arduino library code. A good example of a library you'll use with the Robot and likely many other robot projects is

Servo. This library allows you to connect one or more hobby R/C servos to the Arduino's digital I/O pins. The Servo library comes with the standard Arduino installation package Library->Servo. This adds the line

```
#include <Servo.h>
```

Which tells the Arduino IDE that you wish to include the Servo library in your sketch. With the functionality of the library now available to you, you can use its various functions to control one or more servos. For example, you can use the write function to rotate a servo to a specific position, from 0 to 180 degrees. The following code

```
myServo.write(90);
```

Moves a servo to its midpoint, or 90 degree position. Structurally, Arduino sketches are very straightforward and are pretty easy to read and understand. The Arduino program contains two main parts: setup () and loop (). These are programming functions that do what their names suggest: setup () sets up the Arduino hardware, such as specifying which I/O lines you plan to use, and whether

They are inputs or outputs. The loop () function is repeated endlessly when the Arduino is operating.

Arduino IDE (Integrated development environment) is used to write the program and dump into the Arduino board

2.5 ARDUINO SOFTWARE:

1. Open Arduino IDE as shown below

Open Arduino IDE

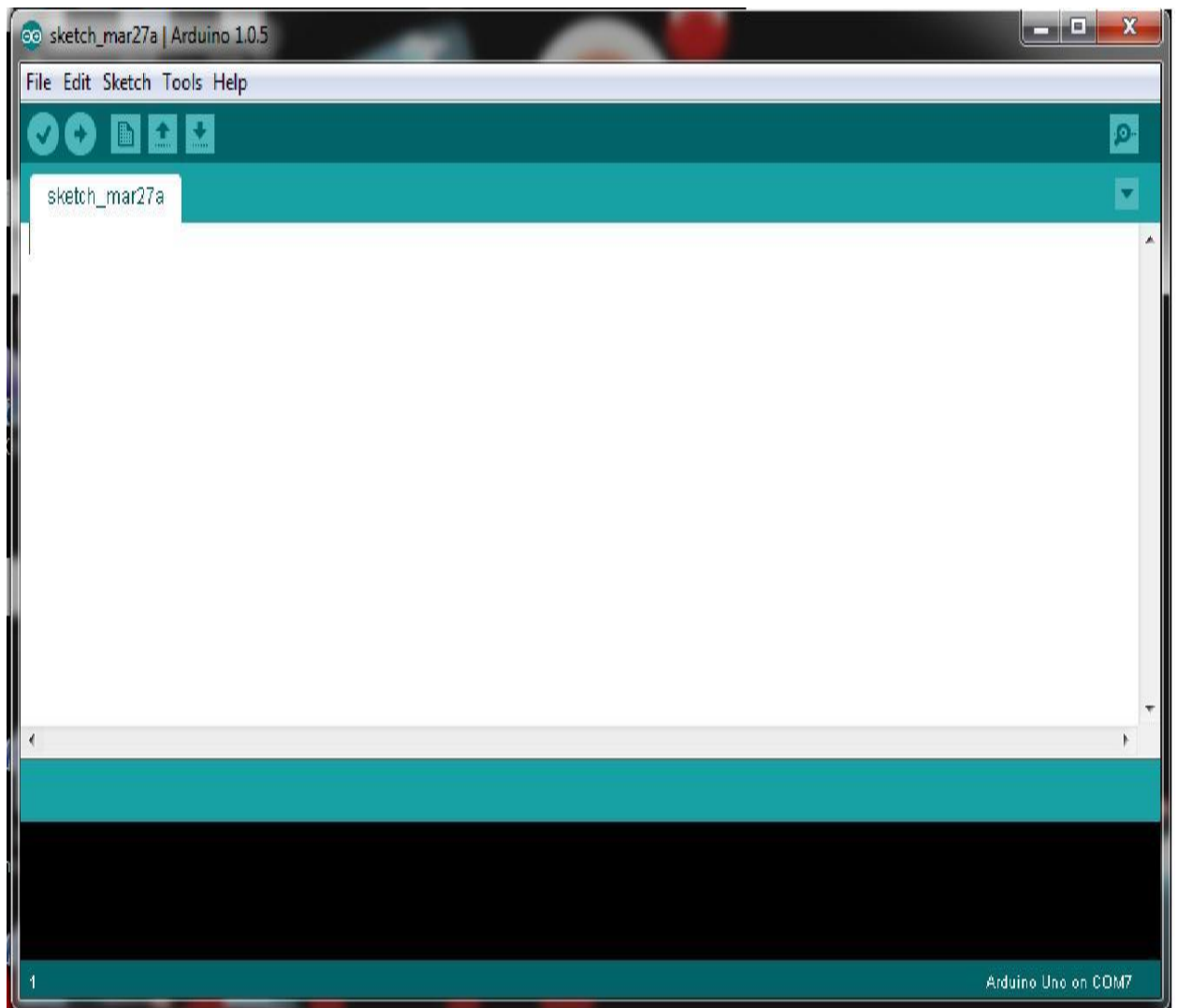


Fig 3.2

2. Select the COM Port from tool

Select the COM Port

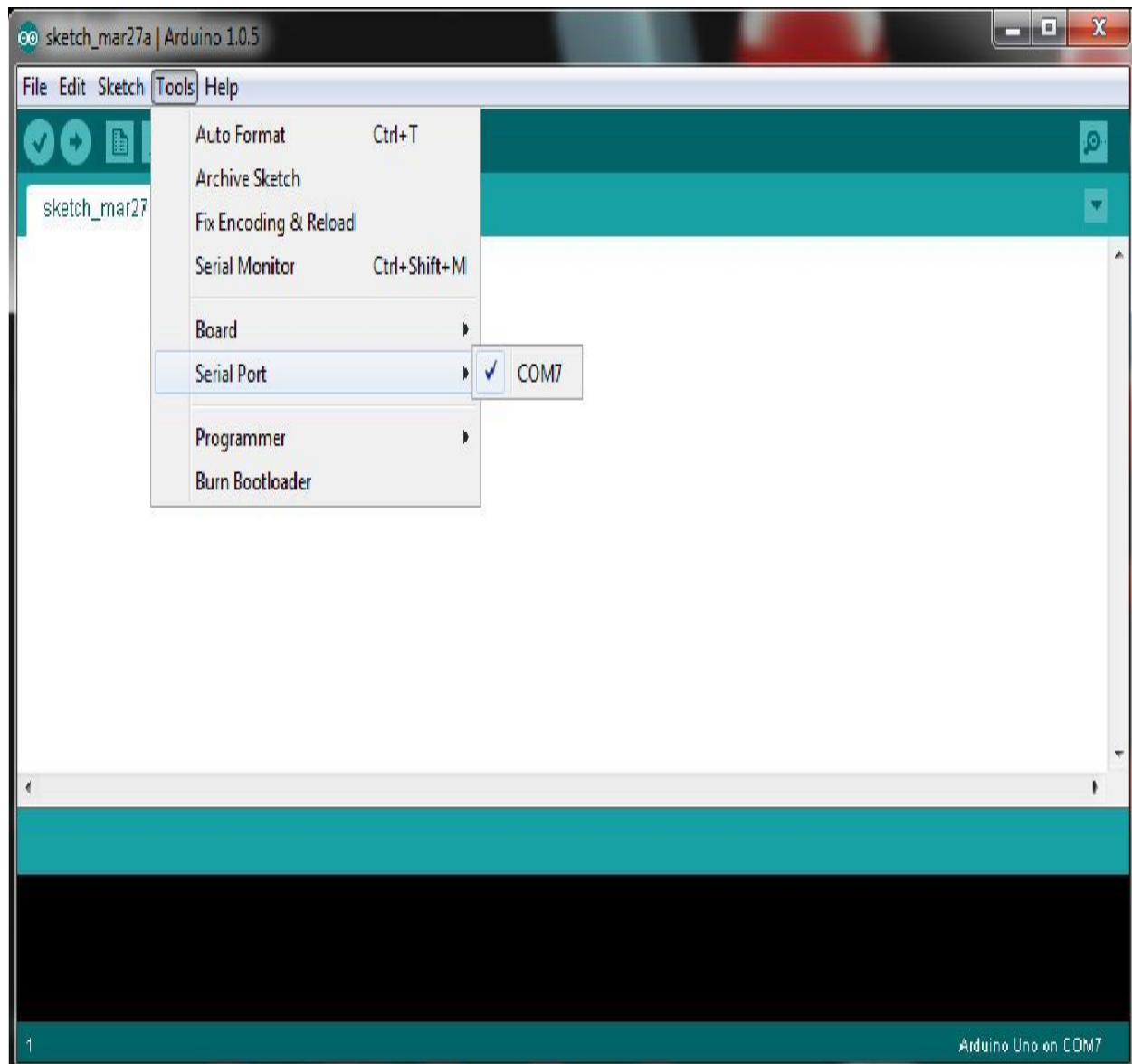


Fig 3.3

3. Select the required Arduino board from Tools as shown below

Select the required Arduino board

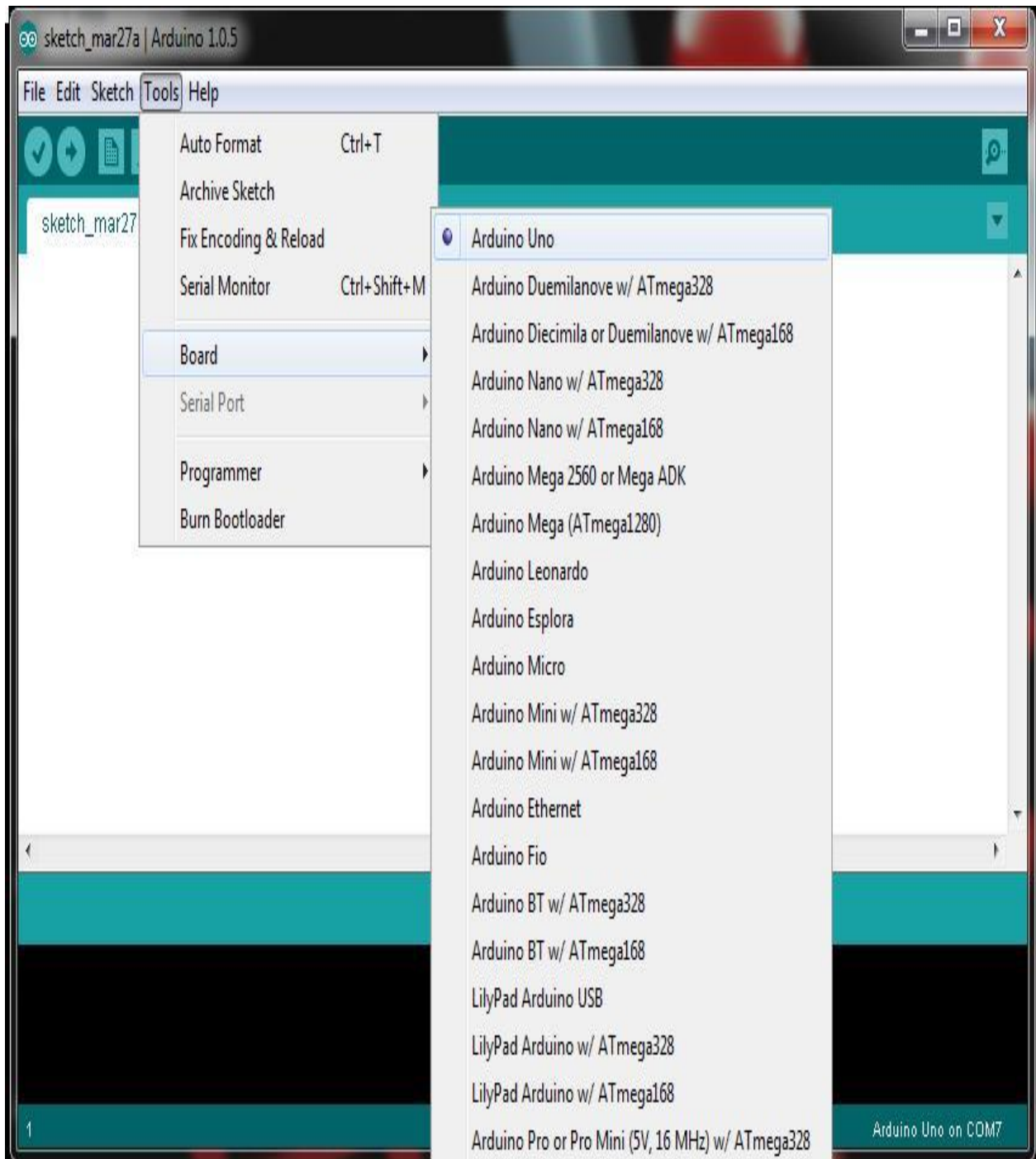


Fig 3.4

4. Write the sketch in Arduino IDE

Sketch in Arduino IDE



```
sketch_mar28a$  
#include <Servo.h> //includes the servo library  
int motor_pin1 = 4;  
int motor_pin2 = 5;  
int motor_pin3 = 6;  
int motor_pin4 = 7;  
int servopin = 8;  
int sensorpin = 0;  
int dist = 0;  
int leftdist = 0;  
int rightdist = 0;  
int object = 500; //distance at which the robot should look for another route  
const int RightSensor = 1; // This pin is used to read the value of the Right Sensor.  
const int LeftSensor = 2; // This pin is used to read the value of the Left Sensor.  
int SensorLeft; // This stores the value of the Left Sensor pin to use later on in the sketch  
int SensorRight; // This stores the value of the Right Sensor pin to use later on in the sketch  
int SensorDifference; // This value is used to determine the difference between the Left and Right
```

1 Arduino Uno on COM7

Fig 3.5

5. Compile and upload the Sketch to Arduino boardupload the Sketch to Arduino board



Fig 3.6

NODE MCU

NodeMCU is an open-source Lua based firmware and **development board** specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module

Programming NodeMCU ESP8266 with Arduino IDE

The NodeMCU Development Board can be easily programmed with Arduino IDE since it is easy to use.

Programming NodeMCU with the Arduino IDE will hardly take 5-10 minutes. All you need is the Arduino IDE, a USB cable and the NodeMCU board itself. You can check this [Getting Started Tutorial for NodeMCU](#) to prepare your Arduino IDE for NodeMCU.

NodeMCU is an open source firmware for which open source [prototyping](#) board designs are available. The name "NodeMCU" combines "[node](#)" and "MCU" ([micro-controller](#) unit).^[8] The term "NodeMCU" strictly speaking refers to the firmware rather than the associated [development kits](#).^[citation needed]

Both the firmware and prototyping board designs are [open source](#).^[8]

The firmware uses the [Lua](#) scripting language. The firmware is based on the eLua project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open source projects, such as lua-cjson^[9] and [SPIFFS](#).^[10] Due to resource constraints, users need to select the modules relevant for their project and build a firmware tailored to their needs. Support for the 32-bit [ESP32](#) has also been implemented.

The prototyping hardware typically used is a circuit board functioning as a [dual in-line package](#) (DIP) which integrates a USB controller with a smaller surface-mounted board containing the MCU and antenna. The choice of the DIP format allows for easy prototyping on [breadboards](#). The design was initially based on the ESP-12 module of the [ESP8266](#), which is a Wi-Fi SoC integrated with a [Tensilica](#) Xtensa LX106 core, widely used in IoT applications (see [related projects](#)).

History[edit]

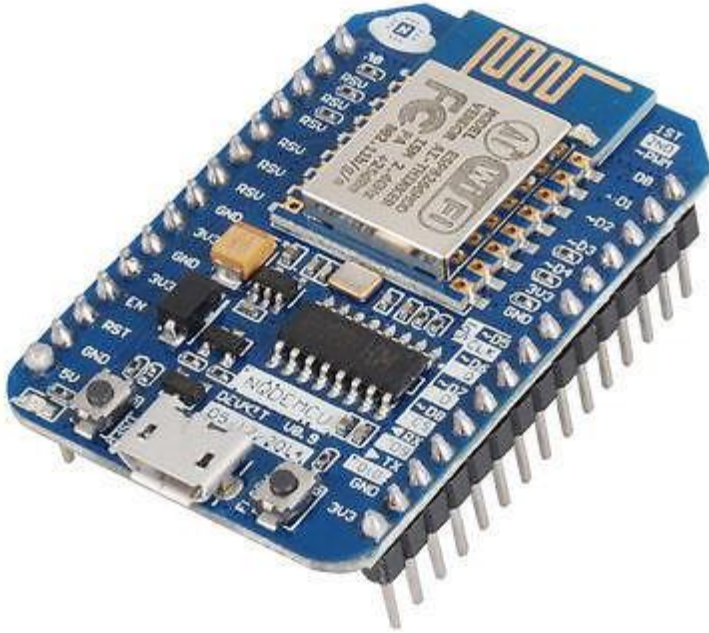
NodeMCU was created shortly after the ESP8266 came out. On December 30, 2013, Espressif Systems began production of the ESP8266. NodeMCU started on 13 Oct 2015, when Hong committed the first file of nodemcu-firmware to GitHub. Two months later, the project expanded to include an open-hardware platform when developer Huang R committed the gerber file of an ESP8266 board, named devkit v0.9. Later that month, Tuan PM ported MQTT client library from Contiki to the ESP8266 SoC platform, and committed to NodeMCU project, then NodeMCU was able to support the MQTT IoT protocol, using Lua to access the MQTT broker. Another important update was made on 30 Jan 2015, when Devsaurus ported the u8glib to the NodeMCU project, enabling NodeMCU to easily drive LCD, Screen, OLED, even VGA displays.

In the summer of 2015 the original creators abandoned the firmware project and a group of independent contributors took over. By the summer of 2016 the NodeMCU included more than 40 different modules.

ESP8266 Arduino Core

As Arduino.cc began developing new MCU boards based on non-AVR processors like the ARM/SAM MCU and used in the Arduino Due, they needed to modify the Arduino IDE so that it would be relatively easy to change the IDE to support alternate toolchains to allow Arduino C/C++ to be compiled for these new processors. They did this with the introduction of the Board Manager and the SAM Core. A "core" is the collection of software components required by the Board Manager and the Arduino IDE to compile an Arduino C/C++ source file for the target MCU's machine language. Some ESP8266 enthusiasts developed an Arduino core for the ESP8266 WiFi SoC, popularly called the "ESP8266 Core for the Arduino IDE".^[17] This has become a leading software development platform for the various ESP8266-based modules and development boards, including NodeMCUs.

NodeMCU is an open-source LUA based firmware developed for the ESP8266 wifi chip. By exploring functionality with the ESP8266 chip, NodeMCU firmware comes with the ESP8266 Development board/kit i.e. NodeMCU Development board.

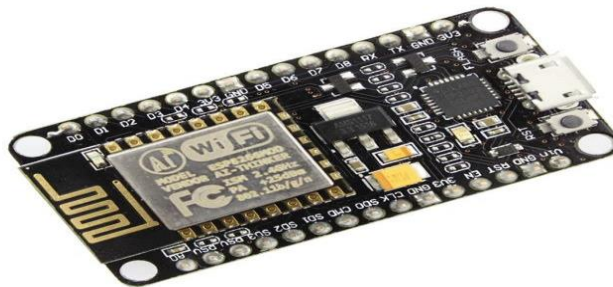


NodeMCU Development Board/kit v0.9 (Version1)

Since NodeMCU is an open-source platform, its hardware design is open for edit/modify/build.

NodeMCU Dev Kit/board consist of ESP8266 wifi enabled chip. The **ESP8266** is a low-cost Wi-Fi chip developed by Espressif Systems with TCP/IP protocol. For more information about ESP8266, you can refer to the [ESP8266 WiFi Module](#).

There is Version2 (V2) available for NodeMCU Dev Kit i.e. **NodeMCU Development Board v1.0 (Version2)**, which usually comes in black colored PCB.



NodeMCU Development Board/kit v1.0 (Version2)

For more information about NodeMCU Boards available in the market refer to [NodeMCU Development Boards](#)

NodeMCU Dev Kit has **Arduino like** Analog (i.e. A0) and Digital (D0-D8) pins on its board.

It supports serial communication protocols i.e. UART, SPI, I2C, etc.

Using such serial protocols we can connect it with serial devices like I2C enabled LCD display, Magnetometer HMC5883, MPU-6050 Gyro meter + Accelerometer, RTC chips, GPS modules, touch screen displays, SD cards, etc.

How to start with NodeMCU?

NodeMCU Development board is featured with wifi capability, analog pin, digital pins, and serial communication protocols.

To get started with using NodeMCU for IoT applications first we need to know about how to write/download NodeMCU firmware in NodeMCU Development Boards. And before that where this NodeMCU firmware will get as per our requirement.

There are online NodeMCU custom builds available using which we can easily get our custom NodeMCU firmware as per our requirement.

To know more about how to build custom NodeMCU firmware online and download it refer to [Getting started with NodeMCU](#)

How to write codes for NodeMCU?

After setting up ESP8266 with Node-MCU firmware, let's see the IDE (Integrated Development Environment) required for the development of NodeMCU.

NodeMCU with ESPlorer IDE

Lua scripts are generally used to code the NodeMCU. Lua is an open-source, lightweight, embeddable scripting language built on top of C programming language.

For more information about how to write Lua script for NodeMCU refer to [Getting started with NodeMCU using ESPlorerIDE](#)

NodeMCU with Arduino IDE

Here is another way of developing NodeMCU with a well-known IDE i.e. Arduino IDE. We can also develop applications on NodeMCU using the Arduino development environment. This makes it easy for Arduino developers than learning a new language and IDE for NodeMCU.

For more information about how to write Arduino sketch for NodeMCU refer to [Getting started with NodeMCU using Arduino IDE](#)

The difference in using ESPlorer and Arduino IDE

Well, there is a programming language difference we can say while developing an application for NodeMCU using ESPlorer IDE and Arduino IDE.

We need to code in C/C++ programming language if we are using Arduino IDE for developing NodeMCU applications and Lua language if we are using ESPlorer IDE.

Basically, NodeMCU is Lua Interpreter, so it can understand Lua script easily. When we write Lua scripts for NodeMCU and send/upload it to NodeMCU, then they will get executed sequentially. It will not build a binary firmware file of code for NodeMCU to write. It will send Lua script as it is to NodeMCU to get executed.

In Arduino IDE when we write and compile code, the ESP8266 toolchain in the background creates a binary firmware file of code we wrote. And when we upload it to NodeMCU then it will flash all NodeMCU firmware with newly generated binary firmware code. In fact, it writes the complete firmware.

That's the reason why NodeMCU not accept further Lua scripts/code after it is getting flashed by Arduino IDE. After getting flashed by Arduino sketch/code it will be no more Lua interpreter and we got an error if we try to upload Lua scripts. To again start with Lua script, we need to flash it with NodeMCU firmware.

Since Arduino IDE compiles and upload/writes complete firmware, it takes more time than ESPlorer IDE.

NodeMCU ESP8266 Specifications & Features

- Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106
- Operating Voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL based on CP2102 is included onboard, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit smartly inside your IoT projects

Eye blink SENSORS

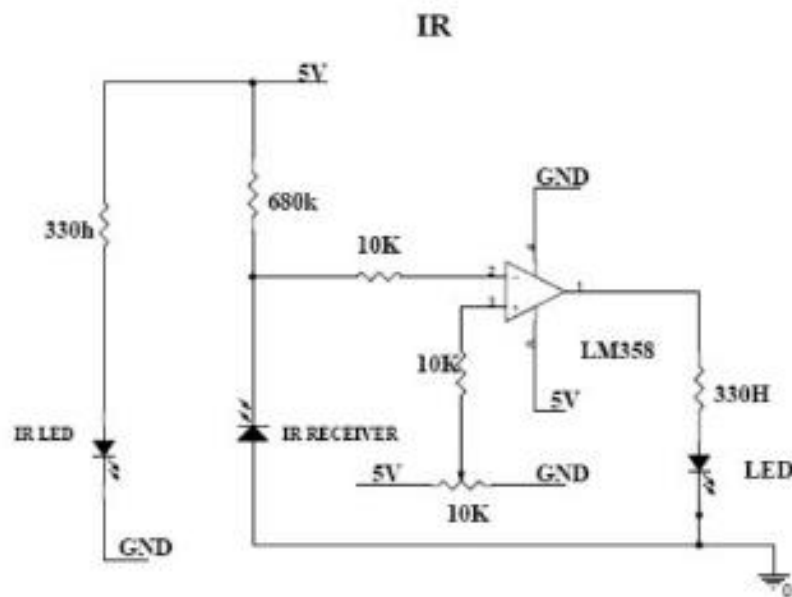
This Eye Blink sensor senses the eyeblink using infrared. The Variation Across the eye will vary as per eye blink. If the eye is closed the output is high otherwise the output is low. This Eye Blink sensor senses the eyeblink using is infrared.

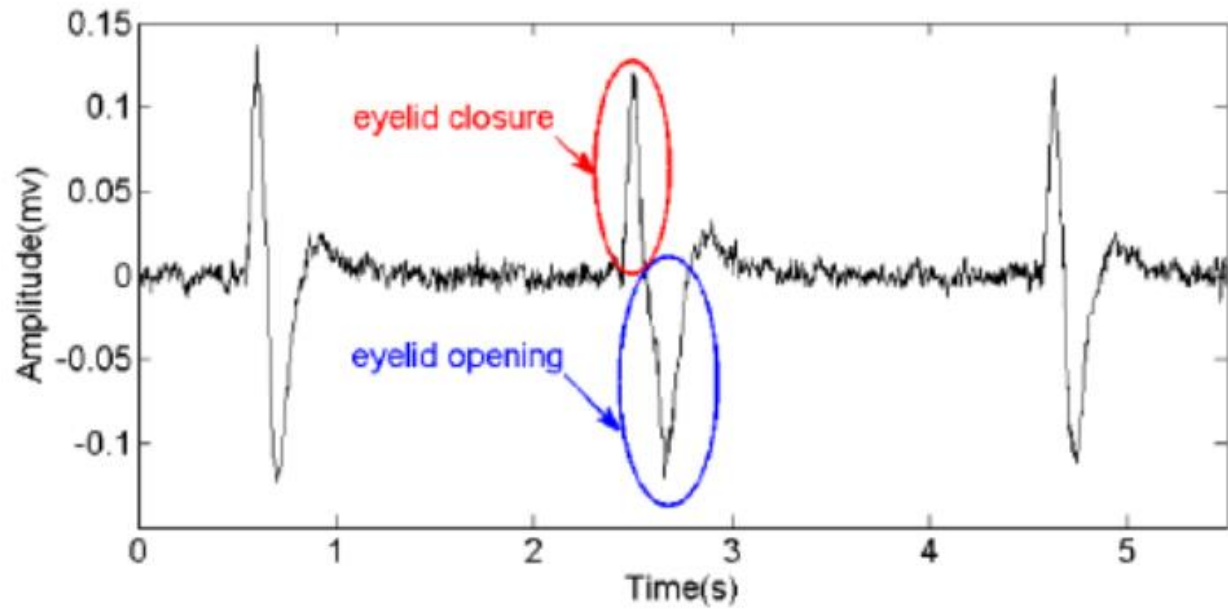
How it works

Vehicle accidents are increasing in today's generation, mainly because of the fast lifestyle. One serious vehicle accident in India occurs every minute. This happen mostly if the

driver is Drowsy or alcoholic. Hence a method should be applied which will address real time monitoring of driver's eyes to the driver himself so that he/she will become aware of their current status. If the driver isn't still aware and crashes the car, the accident alert system will alert a emergency services with the help of GSM. The driver drowsiness system contains an IR based Eye blink sensor, GSM modem, Atmega microcontroller (AT89s52), piezoelectric sensor. The eye blink sensor continuously monitor the movement of eye, it calculates the closing time of eye, normally eye blinking time is stored in microcontroller, every time sensor sense the closing and opening timings, compare to the original values, if time is more, that information is sent to the microcontroller, then that time microcontroller identify that the person is in sleeping mode, then automatically buzzer will ring to wake up the driver. Suppose if accident occurs, the force upon piezoelectric sensor is converted in to electric signal and sent to microcontroller where it's used to send alert message automatically to the rescue team and to the police station. The message is sent through the GSM module. This is a real time system can help to save many lives and thus provides a feasible way to alert emergency or rescue services.

Designing with piezoelectric sensors





Eye Blink Sensor

This eye blink sensor is based on IR. It consists of an IR transmitter and IR receiver. The eye blink sensor illuminates the eye with infrared light and monitors the changes in the reflected light. The infrared light reflected from the eye is used to determine the results. The sensor output is active high for Eye close and can be given directly to microcontroller for interfacing application (e.g. buzzer). When this output remains high for a specific time period (threshold), the driver is considered to be drowsy. Consequently a buzzer can be activated in order to wake the driver



Eye Blink Sensor Specification:

- **V_{in}: 12V**
- **V_{out}: 0 to 5V**
- **I_{out}: 75mA**
- **Sensor: IR**
- **Sensitivity adjustment: Potentiometer**
- **Position of iris detected by IR**
- **Blinking of eye is exactly using comparators.**

Micro-electromechanical systems (MEMS)

Micro-electromechanical systems (MEMS) is a technology that combines computers with tiny mechanical devices such as sensors, valves, gears, mirrors, and actuators embedded in semiconductor chips. MEMS or what he calls analogy computing will be "the foundational technology of the next decade." MEMS is also sometimes called smart matter.



MEMS are already used as accelerometers in automobile air-bags. They've replaced a less reliable device at lower cost and show promise of being able to inflate a bag not only on the basis of sensed deceleration but also on the basis of the size of the person they are protecting.

Basically, a MEMS device contains micro-circuitry on a tiny silicon chip into which some mechanical device such as a mirror or a sensor has been manufactured. Potentially, such chips can be built in large quantities at low cost, making them cost-effective for many uses.

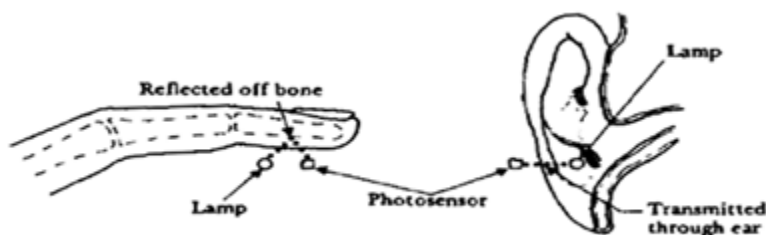
Among the presently available uses of MEMS or those under study are:

- Global position system sensors that can be included with courier parcels for constant tracking and that can also sense parcel treatment en route
- Sensors built into the fabric of an airplane wing so that it can sense and react to air flow by changing the wing surface resistance; effectively creating a myriad of tiny wing flaps
- Optical switching devices that can switch light signals over different paths at 20-nanosecond switching speeds
- Sensor-driven heating and cooling systems that dramatically improve energy savings
- Building supports with imbedded sensors that can alter the flexibility properties of a material based on atmospheric stress sensing

Applications:

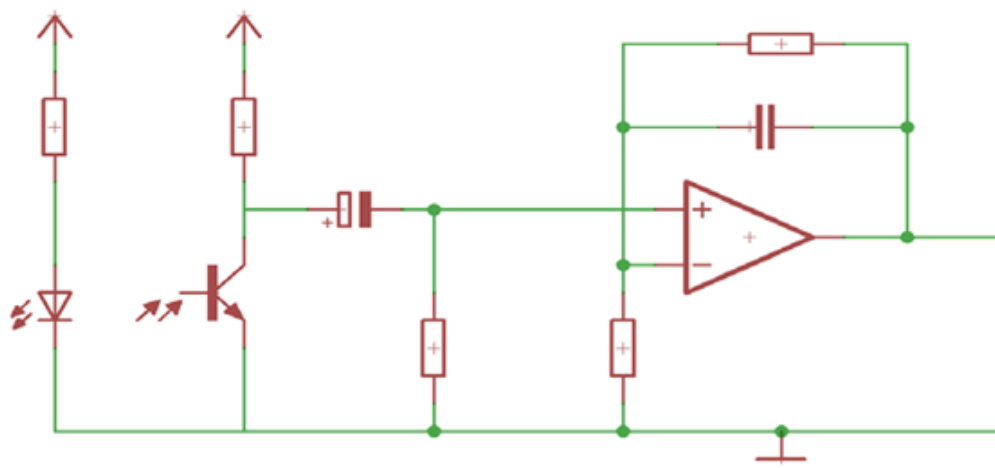
- Vibrations measurement and Tilt inclination (to adjust rotation speed, circuit breaker security, fault prediction),
- Professional and domestic Alarms
- Maintenance management and Asset Tracking for shocks monitoring
- Alarm and Anti Tamper function
- **HEARTBEAT SENSOR**

- A person's heartbeat is the sound of the valves in his/her's heart contracting or expanding as they force blood from one region to another. The number of times the heart beats per minute (BPM), is the heart beat rate and the beat of the heart that can be felt in any artery that lies close to the skin is the pulse.
- **Two Ways to Measure a Heartbeat**
- Manual Way: Heart beat can be checked manually by checking one's pulses at two locations- wrist (the radial pulse) and the neck (carotid pulse). The procedure is to place the two fingers (index and middle finger) on the wrist (or neck below the windpipe) and count the number of pulses for 30 seconds and then multiplying that number by 2 to get the heart beat rate. However pressure should be applied minimum and also fingers should be moved up and down till the pulse is felt.
- Using a sensor: Heart Beat can be measured based on optical power variation as light is scattered or absorbed during its path through the blood as the heart beat changes.
- **Principle of Heartbeat Sensor**
- The heartbeat sensor is based on the principle of photo phlethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ (a vascular region). In case of applications where heart pulse rate is to be monitored, the timing of the pulses is more important. The flow of blood volume is decided by the rate of heart pulses and since light is absorbed by blood, the signal pulses are equivalent to the heart beat pulses.
- There are two types of photophlethysmography:
- Transmission: Light emitted from the light emitting device is transmitted through any vascular region of the body like earlobe and received by the detector.
- Reflection: Light emitted from the light emitting device is reflected by the regions.



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- **Working of a Heartbeat Sensor**

- The basic heartbeat sensor consists of a light emitting diode and a detector like a light detecting resistor or a photodiode. The heart beat pulses causes a variation in the flow of blood to different regions of the body. When a tissue is illuminated with the light source, i.e. light emitted by the led, it either reflects (a finger tissue) or transmits the light (earlobe). Some of the light is absorbed by the blood and the transmitted or the reflected light is received by the light detector. The amount of light absorbed depends on the blood volume in that tissue. The detector output is in form of electrical signal and is proportional to the heart beat rate.
- This signal is actually a DC signal relating to the tissues and the blood volume and the AC component synchronous with the heart beat and caused by pulsatile changes in arterial blood volume is superimposed on the DC signal. Thus the major requirement is to isolate that AC component as it is of prime importance.



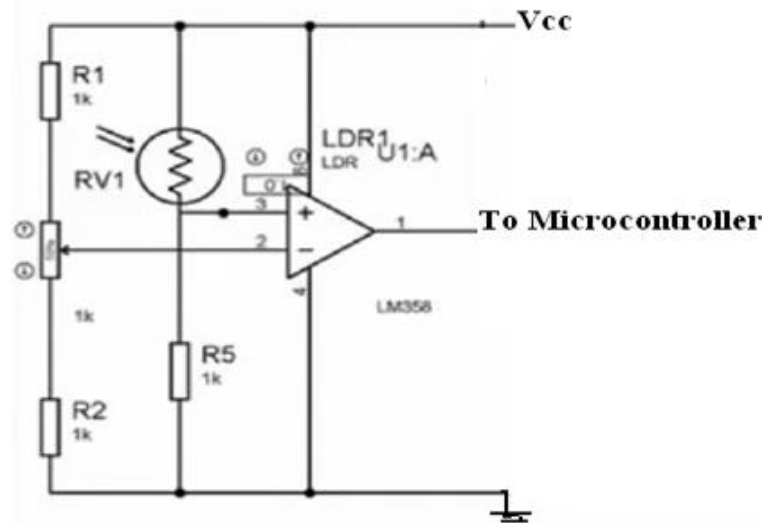
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- To achieve the task of getting the AC signal, the output from the detector is first filtered using a 2 stage HP-LP circuit and is then converted to digital pulses using a comparator circuit or using simple ADC. The digital pulses are given to a microcontroller for calculating the heart beat rate,
- $BPM(\text{Beats per minute}) = 60 \cdot f$
- Where f is the pulse frequency
- **Practical Heartbeat Sensor**
- Practical heartbeat Sensor examples are Heart Rate Sensor (Product No PC-3147). It consists of an infrared led and an ldr embedded onto a clip like structure. The clip is attached to the organ (earlobe or the finger) with the detector part on the flesh.



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- Another example is TCRT1000, having 4 pins-
- Pin1: To give supply voltage to the LED
- Pin2 and 3 are grounded. Pin 4 is the output. Pin 1 is also the enable pin and pulling it high turns the LED on and the sensor starts working. It is embedded on a wearable device which can be worn on the wrist and the output can be sent wirelessly (through Bluetooth) to the computer for processing.



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- Application Developing your own Heartbeat Sensor System
- A basic Heartbeat Sensor system can also be built using basic components like a ldr, comparator IC LM358 and a Microcontroller as given below

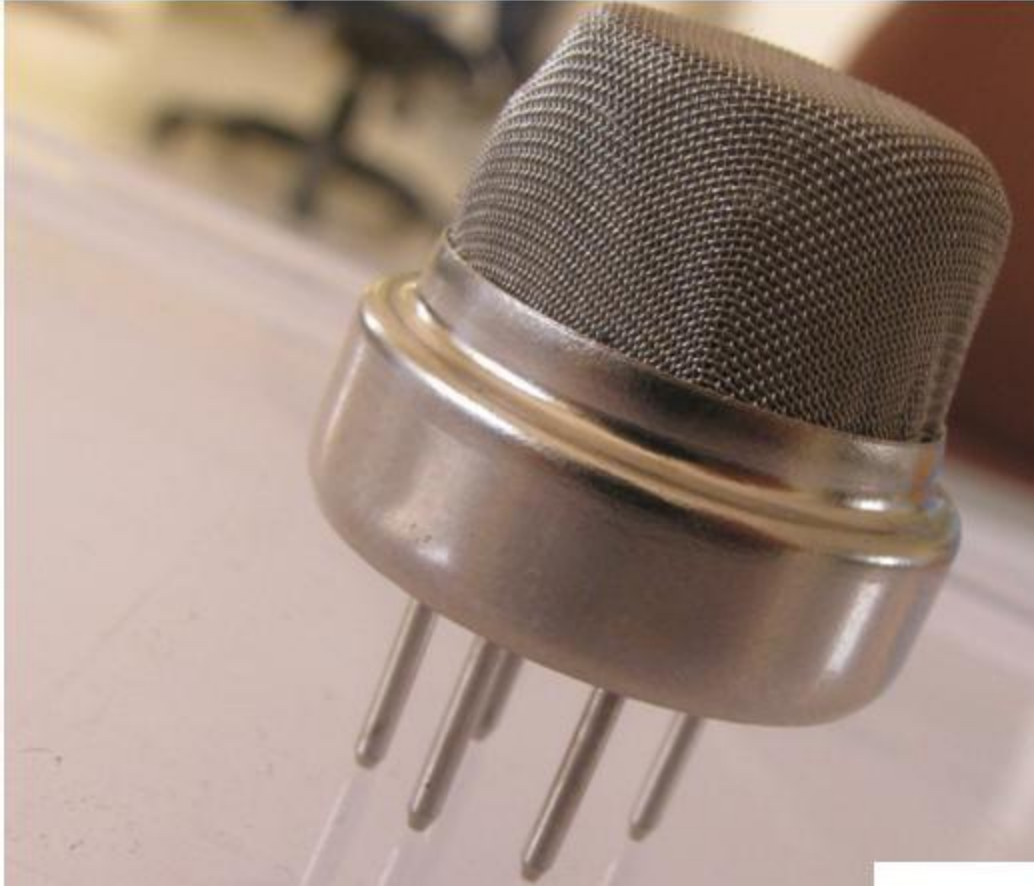


- As described above regarding the principle of heart beat sensor, when the finger tissue or the earlobe tissue is illuminated using a light source, the light is transmitted after getting modulated i.e. a part getting absorbed by the blood and the rest being transmitted. This modulated light is received by the light detector.
- Here a Light Dependant Resistor (LDR) is used as a light detector. It works on the principle that when light falls on the resistor, its resistance changes. As the light intensity increases, the resistance decreases. Thus the voltage drop across the resistor decreases.
- Here a comparator is used which compares the output voltage from the LDR to that of the threshold voltage. The threshold voltage is the voltage drop across the LDR when the light with fixed intensity, from the light source falls directly on it. The inverting terminal of the comparator LM358 is connected to the potential divider arrangement which is set to the threshold voltage and the non-inverting terminal is connected to the LDR. When a human tissue is illuminated using the light source, the intensity of the light reduces. As this reduced light intensity falls on the LDR, the resistance increases and as a result the voltage drop increases. When the voltage drop across the LDR or the non-inverting input exceeds that of the inverting input, a logic high signal is developed at the output of the comparator and in case voltage drop being lesser a logic low output is developed. Thus the output is a series of pulses. These pulses can be fed to the Microcontroller which accordingly processes the information to get the heart beat rate and this is displayed on the Display interfaced to the Microcontroller.

Gas sensor

In current technology scenario, monitoring of gases produced is very important. From home appliances such as air conditioners to electric chimneys and safety systems at industries monitoring of gases is very crucial. Gas sensors are very important part of such systems. Small like a nose, gas sensors spontaneously react to the gas present, thus keeping the system updated about any alterations that occur in the concentration of molecules at gaseous state.

Gas sensors are available in wide specifications depending on the sensitivity levels, type of gas to be sensed, physical dimensions and numerous other factors. This Insight covers a methane gas sensor that can sense gases such as ammonia which might get produced from methane. When a gas interacts with this sensor, it is first ionized into its constituents and is then adsorbed by the sensing element. This adsorption creates a potential difference on the element which is conveyed to the processor unit through output pins in form of current. What is this sensing element? Is it kept in some chamber or is kept exposed? How does it get current and how it is taken out? Let's find out in this Insight!!!



The gas sensor module consists of a steel exoskeleton under which a sensing element is housed. This sensing element is subjected to current through connecting leads. This current is known as heating current through it, the gases coming close to the sensing element get ionized and are absorbed by the sensing element. This changes the resistance of the sensing element which alters the value of the current going out of it.

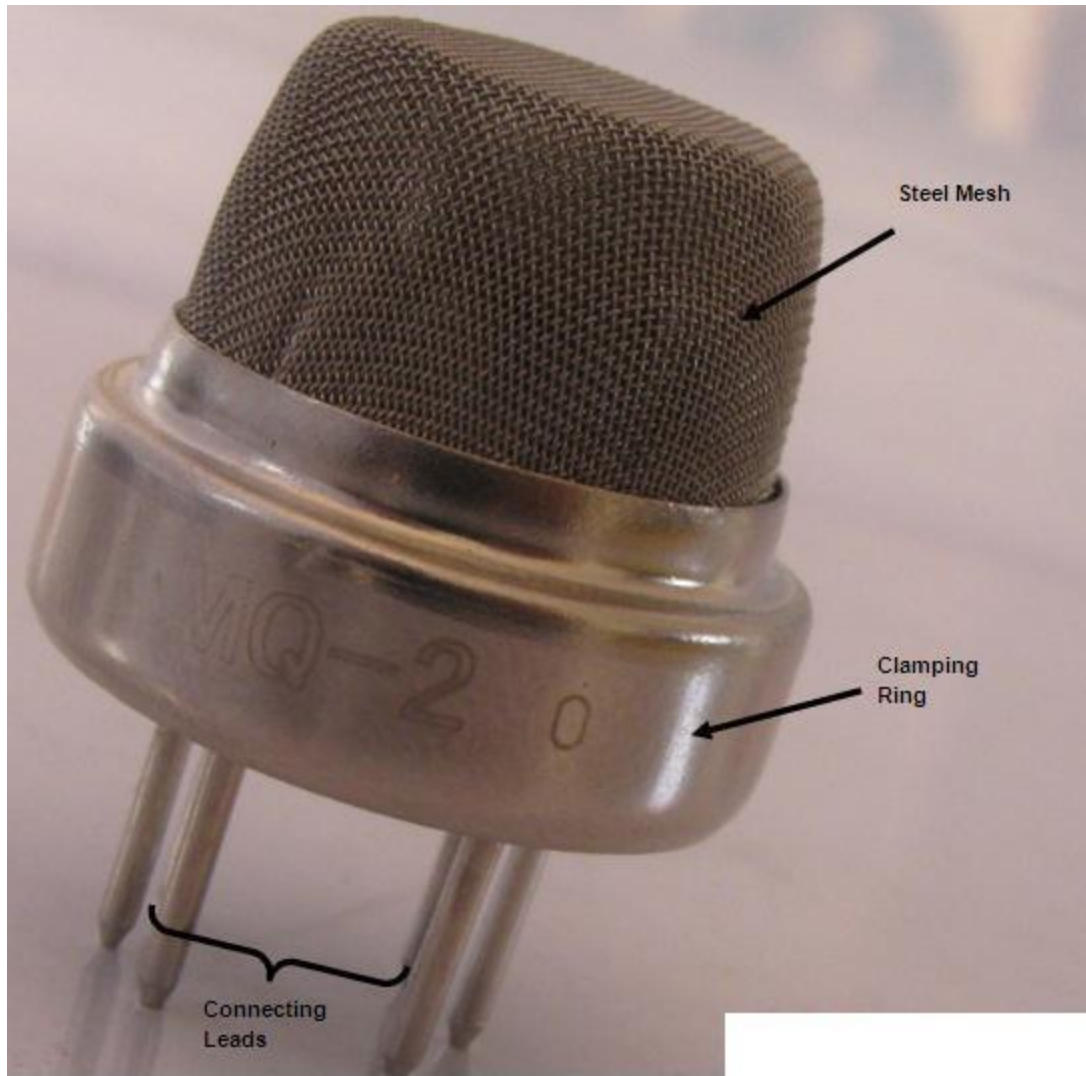


Image shows externals of a standard gas sensor module: a steel mesh, copper clamping ring and connecting leads. The top part is a stainless steel mesh which takes care of the following:

- ✓ Protecting the insides of the sensor.
- ✓ Exhibits an anti-explosion network that keeps the sensor module intact at high temperatures and gas pressures.

In order to manage above listed functions efficiently, the steel mesh is made into two layers. The mesh is bound to rest of the body via a copper plated clamping ring.

The connecting leads of the sensor are thick so that sensor can be connected firmly to the circuit and sufficient amount of heat gets conducted to the inside part. They are casted from copper and have tin plating over them. Four of the six leads (A, B, C, D) are for signal fetching while two (1, 2) are used to provide sufficient heat to the sensing element.

The pins are placed on a Bakelite base which is a good insulator and provides firm gripping to the connecting leads of the sensor. The top of the gas sensor is removed off to see the internal parts of the sensor: sensing element and connection wiring. The hexapod structure is constituted by the sensing element and six connecting legs that extend beyond the Bakelite base.

Image shows the hollow sensing element which is made up from Aluminium Oxide based ceramic and has a coating of tin oxide. Using a ceramic substrate increases the heating efficiency and tin oxide, being sensitive towards adsorbing desired gas' components (in this case methane and its products) suffices as sensing coating.

The leads responsible for heating the sensing element are connected through Nickel-Chromium, well known conductive alloy. Leads responsible for output signals are connected using platinum wires which convey small changes in the current that passes through the sensing element. The platinum wires are connected to the body of the sensing element while Nickel-Chromium wires pass through its hollow structure. While other wires are attached to the outer body of the element, Nickel-Chromium wires are placed inside the element in a spring shaped. Image shows coiled part of the wire which is placed on the inside of the hollow ceramic.

Image shows the ceramic with tin dioxide on the top coating that has good adsorbing property. Any gas to be monitored has specific temperature at which it ionizes. The task of the sensor is to work at the desired temperature so that gas molecules get ionized. Through Nickel-chromium wire, the ceramic region of the sensing element is subjected to heating current. The heat is radiated by the element in the nearby region where gases interact with it and get ionized. Once, ionized, they are absorbed by the tin dioxide. Adsorbed molecules change the resistance of the tin dioxide layer. This changes the current flowing through the sensing element and is conveyed through the output leads to the unit that controls the working of the gas sensor.

CHAPTER 5

CONSTRUCTION

As we mentioned earlier the construction of our system consist of two units namely helmet unit and a bike unit. The flex sensor is placed on inside upper part of the helmet where actually head was touched with sensor surface and the sensor bends. Alcohol sensor is placed on in front of rider's mouth. It can sense easily sense the alcohol content in the breath. The battery and regular circuits was fixed inside the helmet. RF transmitter circuit was placed on inside the helmet, antenna are located outside the helmet. The tilt sensor is placed outside in the left or right position of the helmet. The bike unit is mounted on actual bike.

WORKING AND FLOW CHART If the pin of MQ3 is low and that of flex sensor is high, two signals would be generated and the two data's from the arduino can be encoded and given to the RF transmitter. The engine of the twowheeler is turned on using the relay. The relay is programmed to be turn on only when these two conditions are satisfied. The transmitted data from the helmet unit is received by the RF receiver and is decoded by the decoding circuit and it is given to the digital pin of arduino. The ignition would be switched on only when the rider is not drunk and if he wears the helmet. The information regarding the axis is given to the analog pin of arduino. According to the output of accelerometer, information regarding the accident would be send to the GPS module. The receiver pin of the arduino is connected to the transmitter pin of GPS. When the accelerometer is tilted and detected the threshold, the GSM is turned on and the message is send to the predefined number. The transmitter pin of the arduino is connected to the receiver pin of the GSM. LCD display is used for monitoring the output. All the outputs are displayed on the LCD

Nowadays, rash driving of motor bikes is the major reason for most of accidents. The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. In our project we have a tendency to develop an electronic smart helmet system that efficiently checks the wearing of helmet and drunken driving. By implementing this system a safe 2 wheeler journey is possible which would decrease the head injuries throughout accidents caused from the absence of helmet and additionally reduce the accident rate due to drunken driving. We have a tendency to introduce advanced sensors techniques and radio frequency

wireless communications are included in this project to make it a good one. Our system efficiently checks the wearing of helmet and drunken driving.

RESULT AND DISCUSSIONS

we proposed and implement the accident avoidance system. Using this system we may avoid many accidents happened due to the following system .The system comprises, very low cost components such as ultrasonic sensor. This system might have many advantage such as, Use the knows the distance about following vehicle In future, we are going to reduce the speed of one vehicle according to the following distance of other vehicle. By this system, we may prevent many accidents and INDIA will become a accident less country. Use to know the distance about following vehicles. In future, we are going to reduce the speed of one vehicle according to the following distance of other vehicle. 0m) between one vehicle and another vehicle. The proposed system comprises an idea of having safety while reversing a vehicle, detects any object within the following distance, and displays the distance between one vehicle and another vehicle to the driver

CONCLUSION

The two-wheeler safety system developed with smart helmet and intelligent bike system is reliable and aims to help in the prevention, detection and reporting of accidents hence reducing the probability of the drunk drive cases. It also has several advantages compared to the previous systems. Our proposed system gives the primary importance of preventing the accidents and ensures safety for a greater extent in two wheelers. Nowadays, most accident cases occur due to motor bike. The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. By implementing this system, a safe two wheeler journey is possible which would decrease the head injuries throughout accidents caused due to the absence of helmet and additionally reduce the accident rate due to drunken driving

. ADVANTAGES Accidents can be detected in accident prone zones easily and thus medical services can be provided easily. By using alcohol detector, drunken drive will be simply avoided, hence reduces the probability of accidents. It is economical and can avoid the fine imposed by

making the helmet wearing is compulsory. Easy to implement. Cost effective and efficient. By the usage of various sensors, it is easily replaceable.

FUTURE SCOPE

We can use solar panel for helmet power supply and this same power supply can be used for charging our mobile. In future we have a tendency to construct an intelligent system of compact size. Light dimmer sensors can be used to dim the light automatically when light from other vehicles fall on it. Government should enforce laws to install such system in each two wheelers. We can implement various bioelectric sensors on the helmet to measure various activities. We can use small camera for recording of the driver's activity. It can be used for passing message from one vehicle to another vehicle by using wireless transmitter. If in a case helmet gets stolen then bike can be started by the password.

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- [2] Haran P C and Suriyanarayani R (2012), Embedded System Based Automobile Accident Prevention, Proc. of the Intl. Conf. on Advances in Computer Science and Electronics Engineering.
- [3] SMART HELMET Saravana Kumar K ¹, Anjana.B.S ², Litto.Thomas³, Rahul.K.V ⁴ ¹ Associate Professor, Department of Computer Science, Christ University, Bangalore-560029. ^{2,3,4} Third year MCA students, Department of Computer Science, Christ University, Bangalore-560029