

DRIVER ACCIDENT DETECTION DEVICE

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ABSTRACT

Transportation is a need of society. It make Human life easy .Now a days Transportation is increase in day to day life as well as accident is also increased. Accident can cause major as well minor damage ,like death of human and damage any part of body. To avoid this particular action, We take an effort to implement the system i.e Driver Alertness Detection System. using GPS and GSM .In this system Infrared sensor is used for as an input to the system and corresponding response is analyzing by the Arduino. In such condition it take appropriate action, when object is detected near car .If an accident occurs location is detect by GPS and GSM sends a SMS to authorities and provide immediate help to the people who have been injured in accident. The proposed embedded approach provides the assured result.

Keyword - Car, Arduino , GSM, GPS, LCD, Ultrasonic Sensor.

1. Introduction

In twentieth century, the number of vehicles exponentially increase due to growth in the automobile industry field. As the number of vehicle increases, the accidents also increases. The reasons for the most road accidents are because of traffic and lack of traffic separation. According to World Health Organization (WHO), India is leading country in the road accident deaths. In India,13 Thousand peoples were dead in road accident in the year of 2018-19. These accidental records statistics are reported but there are numbers of accident which are unreported. Hence the numbers of actual reported accident are more than the results of WHO. According to the survey of Global Status Report on Road Safety, the reasons of the road accident are increasing, drunken driving, minimum use of safety appliances lie helmet seat belts and breaking of traffic rules etc. The existing system mostly concentrate on the safety of the passenger but not on the immediate help after accident. Our aim for the Integrated Automotive Safety system is to provide a level playing of all vehicles, regardless of age, when it comes to outfitting car as well as possible for any possible risk one can face on the road. These risks include roll-overs,collision and non-responsive drivers after accidents and lack of location information after accident has occurred. These type of risks plague every driver in the US and abroad, But sadly only the newest vehicle provide protection from dangers such like these. Where does that left the average teen driving a late 90s, early 2000s high mileages car or perhaps an elderly person driving the same car they were had for 40 years? These car likely do not have sufficient safeguards for today risks and possibilities of accidents, but our project can be remedy this. India has earned the dubious distinction of having more number of fatals accidents due to road accident in the world. Road safety is emerging out as a major social concern around the world especially in India. Drinking and driving is already serious social health problem, which is likely to emerge out as one of the most significant problems in near future. The system implemented by us goals on reducing the road accidents in the near future due to drunken driving. The system detects the presence of Fire with respect to that detected person in the vehicle and immediately locks the engine of the vehicle.

1.1 The constituents of the GPS-based tracking system are:

1.GPS tracking: The Global Positioning System location tracking system is a compass device usually handled by a moving vehicle or that person which uses the Global Positioning System(GPS) to track the devices movements and identify its location. The resulted location data can either be stored in tracking unit or transmitted to an internet connected device, radio and satellite modem implemented in the unit. This allows the location that to be

implemented or display in front of a map backdrop either in real time or after analyze the track letter, using global positioning system tracking device. Data tracking software or device is available for android phone with GPS functionality.

2. GPS tracking server: Global Positioning System(GPS) team develop unique GPS tracking platform which track that software which is implemented or designed to make individual tracking server. GPS tracking is web base application of program which will be operate globally. Our project will work for u not against you, start your individual GPS tracking server

3. User interface: The communication limitations between the GPS and other system, as like as within the GPS itself, are known as user interface.

The high approach of automobiles as also increase the traffic problems and the road accidents. Numbers of peoples life are in risk. These is because the reason of lack of best emergency facilities available in our country. An automatic alarm software or device for vehicle accident must be explain in these paper. This is a system which can detect accidents less time and provides the basic information to near health care within a few second geographical co-ordinates, the time system and the angle which present in the vehicle accident had occurred. The accident can be detected precisely with the help of ultrasonic sensor. This application gives the optimum solution to less emergency facilities provided to the roads accidents in the most feasible way

1.2 FACTORS CAUSING DRIVING ALERTNESS :

The two most frequently recognised factors related to automobile accidents are speeding and alcohol, but inattentiveness, fatigue and sleepiness are primary or contributing factors. Driver alertness has a great impact on safety of Driver Alertness and sleeping at the wheel have been identified as the major reasons behind fatal crashes and freeway accidents caused by car and/or truck drivers. It have shown that there is an odds ratio of 2.7 between sleeping less than 5 hours (5 h) in the last 24 hours (24 h) compared to more than 5 hours sleep and being implicated in a sleep-related accident. Driving between the midnight was associated with accidents with an odds ratio of 5.6 compared to driving at any other time of the day.

An Arduino MEGA is used for automation technique and controlling of the other supporting components which are GPS, GSM, infrared sensor, LCD display, buzzer etc. This paper gives a practical model of a vehicle accident detection and rescue information system which can do routing, tracing the vehicle & moving vehicle as well as detect accident in large environment field. An Arduino MEGA is used here for automation technique and controlling of the other supporting components those are GPS, GSM, vibration sensor, LCD display, push switch, buzzer etc. Actually this paper gives a practical model of a vehicle accident detection and rescue information system which can do routing, tracing the vehicle & moving vehicle as well as detect accident in large environment. Actually this system consists of two section, the first one is capturing location which is done by GPS in it and as the car travels the location of the car change systematically, the GPS observes the location in terms of two co-ordinates that are longitude and latitude. These two coordinates communicate with GSM modem which is shown in the block diagram. The second one is detection of accident through vibration sensor. To detect accident, a threshold is set to a highest vibration value. If the vibration value is greater than the threshold value, then it will consider that accident occur and wait up to 60 second for a confirmation of incident. After detection of an accident the system request the accident location to the web server. The web server then responses the car owner ,nearest police station and hospital through web service using web application/ mobile application/ mobile SMS system.

2. Literature survey

Now-a-days, mobile phone is used almost by all people. With internet usage are also at all. So these mobile phone also provide communication platform as they are equipped with 3G & 4G network. There are lots of cause of accident of car and they are drunkenness of driver, drowsiness of driver, unconsciousness of driver and many time what happen driver is not responsible for accident but their neighboring car behavior also have made role to enforce accident. There are also some system have been implemented to avoid the accident but that do not give proper

solution to implemented in car to avoid various accidents that they are normally being happen. For example, when driver at speed suppose 80km/h suddenly stop ignition system may leads to changes of dangerous accident.

3. Problem statement :

I want to develop a hardware device for Car Crash Detection , Device which can send the SOS signal on crash of vehicle to the centralized command center or Relative of the driver data is manage by smartphone network (Hardware Device)to solve accident problem which is very serious issue of the world

4. Advantages:

- The main purpose behind the implementation of the Accident prevention is to minimize the road accidents which causes the loss of valuable human life and other valuable goods.
- Accident Prevention And Detection System(APDS) save lives by reducing the time required for emergency responders to arrive
- Easy to operate
- Sophisticated security.
- Simple and Reliable Design.
- Isolates both GSM and GPS signal

5. Technical Requirements:

5.1 Hardware requirement :

- Arduino Mega : It is a microcontroller board based on the ATmega1280 (datasheet). The Arduino has 54 digital I/O pins (of which 14 can be used as PWM outputs). It has 16 analog inputs and 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.

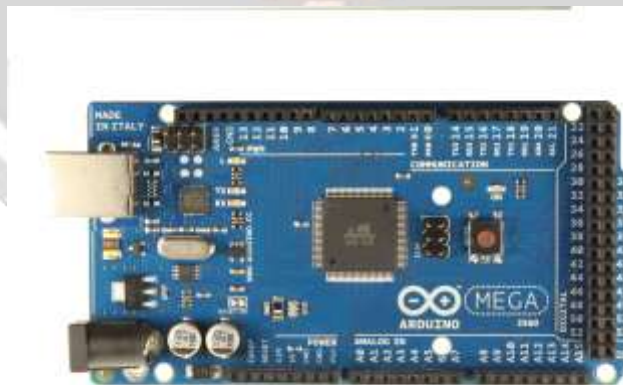


Fig -2 Arduino Mega

- Ultrasonic sensor : It indicates, ultrasonic sensors measure distance by using ultrasonic waves. The sensor head emits an ultrasonic waves and receives the wave reflected back from the target. Ultrasonic sensor measures distance to the target by measuring the time between the emission and reception.



Fig -3 Ultrasonic sensor

- GSM SIM 900A: It is an ultra compact wireless module. The SIM 900A is a complete Dual-band GSM and GPRS solution in a SMT module can be embedded in the customer allowing you to benefit from small dimensions and cost-effective solutions. Featuring an industry-standard interface, It can deliver GSM and GPRS 900/1800MHz performance for voice, SMS, Data, and Fax in a small form low power consumption. The configuration of SIM 900A is 24mm x 24mm x 3 mm, It can fit almost all the space requirements in an applications, especially for slim and compact of design.



Fig-3 GSM SIM 900A

- **GPS module** : It is a satellite-based system that can use satellites and ground stations to measure and compute its position on Earth. This device fits into the car and captures the GPS location information. This device indicates actual location of car. The antenna of this device draws about 10mA. The device is connected with 5 meter long cable, so it will easily reach whenever you need it to. The antenna of this device is magnetic so it will stick to top of a car.



Fig-4 GPS module

- **Jumper pins** : It consists small set pins. It is a low length of conductor uses to close and open an electric circuit. It is typically used to set up and configure printed circuit boards, such as the motherboards of computers.

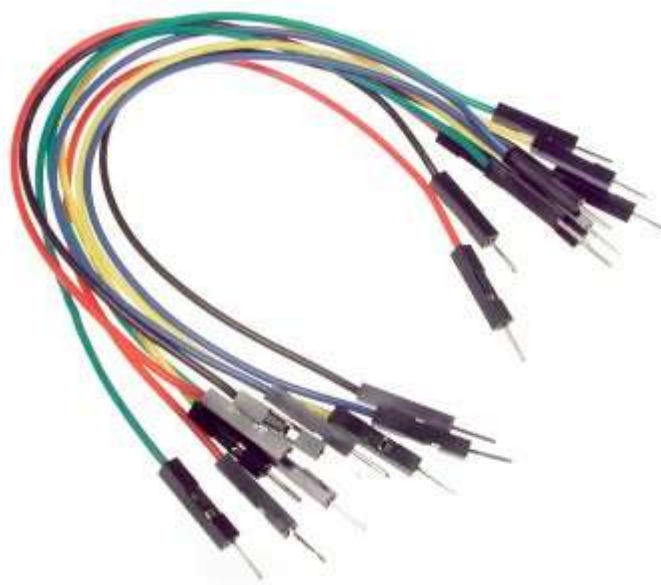


Fig-6 jumper wire

- Interface Cable : The hardware interface cable is used to connect two or more electronic devices with each other.



Fig-7 printer cable /fire wire

- 16X2 LCD Display : 16x2 LCD means it can display 16 character per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. The LCD have two registers, namely, command and data. The command register stores the command instruction given to the LCD. A command is an instruction gives to LCD to do a predefined task like initializing it, clearing it's screen, setting the cursor position, controlling display etc.

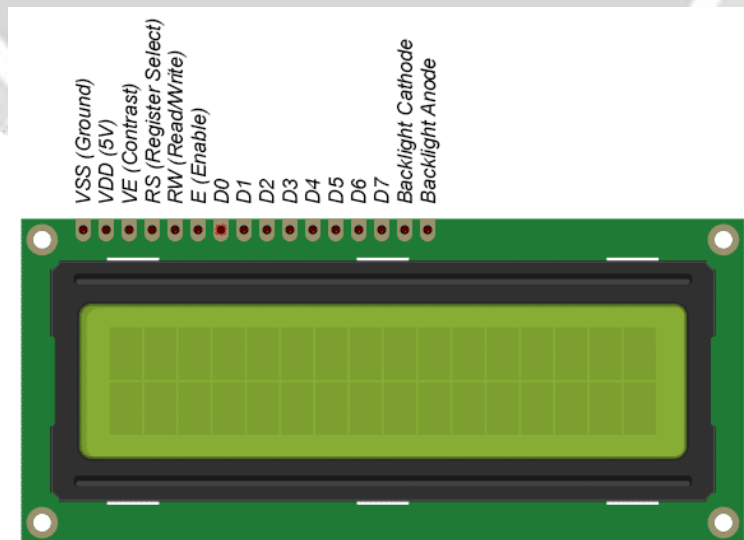


Fig-7 16*2 LCD Display

- **Buzzer:** It is an audio signal device, which is a mechanical and piezoelectric device. Typical uses of buzzers include alarm devices, timers, and conformation of user input such as a mouse click or keystroke.



Fig-8 Buzzer

5.2. Software requirement

- The Arduino integrated development environment (IDE) : Arduino IDE consists of both a physical programmable circuit board as well as piece of software, or IDE that runs on your computer system,. It is used to write and upload computer code on to the physical board.



Fig-8 Arduino Software (IDE)

6. CONCLUSIONS

The proposed system is developed to provide the information about the accident occur and the location of the accident. It helps to easily provide the assistant and help to the victim of the accident. This system uses GPS module to locate the vehicle. GSM is used to provide the information of accident. The results of the proposed systems are satisfactory

7. Future Scope

Further this system can be implemented by using sound sensor, in order to make it more accurate and efficient to detect an accident. This is extended with alcoholic detection also. If the person get alcohol who is driving the vehicle then the vehicle will be stopped immediately and giving alarm. This can also be developed by interconnecting camera to the controller module that takes the photograph of the accident spot makes tracking easier.

8. REFERENCES

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