CAR ACCIDENT AND ALCOHOL DETECTION DEVICE

Sanket Kanse, Saurabh Shinde, Pranjal Shinde, Vikas Solanke.

[1] *Student, Computer Engineering, MM Polytechnic,Thergaon Pune*
[2] *Student, Computer Engineering ,MM Polytechnic Thergaon Pune*
[3] *Student, Computer Engineering,MM Polytechnic,Thergaon Pune*
[4] *Professor, Computer Engineering,MM Polytechnic,Thergaon Pune*

ABSTRACT

We have develop a product which can warning driver when object is detect in front of the car. In this project, an IoT based car accident detection system is developed in order to detect vehicle accident and send the location information of the accident place to driver. The accident is detected through sensor and buzzer. We have also use GPS/GSM to detect location and send message to home or hospital to accident car. The project is developed for real time data fetching form the hardware device using sensors and store in the web server. This project approximately provides the accurate detection of the location of accident occurred, and send notification to the nearest police station and hospital. This project also using the alcohol sensor use to measure alcohol level of driver. This project approximately provides the accurate detection of the location of accident occurred, and send notification to the nearest police station and hospital.

Keyword - *Car, vehicle, Accident , Accident Detection and Car crash detection*

1. Introduction

Car detection device is a car safety technology. Approximately 20% of vehicle accidents have sleep deprivation. When driver drinking alcohol chances to increase accident due to we have use alcohol sensor to check the alcohol level of driver. IoT is a new concept that has evolved from the convergence of wireless technologies. Wireless communication is the transfer of information or signal between two or more points. In IoT devices equipped with Wi-Fi allow the machine to-machine communication. IoT is a new concept that has evolved from the convergence of wireless technologies. Wireless communication is the transfer of information or signal between two or more points that are not connected by an electrical conductor. In IoT devices equipped with Wi-Fi allow the machine to-machine communication.

1.1 RELATED STUDY

Drowsiness detection can be divided into three main categories Drowsiness detection is based on these three parameters. A detailed review on insight on the present systems, issues associated with them .
(1) Vehicle based : A number of metrics, including deviations from lane position, movement of the steering wheel, pressure on the acceleration pedal,
(2) Behavioural based : The behaviour of the driver, including yawning, eye closure, eye blinking, head pose, etc.
(3) Physiological based : The correlation between physiological signals ECG (Electrocardiogram) and EOG (Electrooculogram).

1.2 FACTORS CAUSING DRIVING DROWSINESS :

Driver Fatigue is caused by four main factors: sleep, work, time of day, and physical. The lack of sleep builds up over a number of days and the next thing that happens is the body finally collapses and The person falls asleep. Time of day factors can often affect the body. The human brain is trained to think there are times the body should be asleep. These are often associated with seeing the sunrise and sunset. Between the hours of 2 AM and 6 AM, the brain tells the body it should be asleep. People sometimes are on medications that create driver detection or have

physical ailments that cause these issues. Being physically unfit, by being either under or overweight, will cause fatigue.

An Arduino UNO is used here for automation technique and controlling of the other supporting components those are GPS, GSM, vibration sensor, LCD display, puss 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. Major constituents of the GPS-based tracking are:

1. GPS tracking: The device fits into the vehicle and trace the GPS location information at regular intervals to a central server. Other vehicle data that can contain fuel amount, engine temperature, latitude, longitude, reverse geographical programming, door open/close, tire pressure, cut off fuel, turn off ignition, turn on headlight, turn on battery status, GSM area code/cell code decoded, number of GPS satellites in view, glass open/close, fuel amount, emergency button status, quantity increased, computed odometer, engine RPM, throttle position, GPRS status and a lot more functions. Capability of these components actually fix the actual capability of the whole tracking system; most vehicle tracking systems, in addition to providing the vehicle's location data, functions a wide range of communication ports that can be used to interfaced other on board systems, allowing to check their status and control or automate their results.
2. GPS tracking server: The tracking server has three main authority: receiving data from the GPS tracking unit, storing with high security, and serving this information on the demand to the user.

3. User interface: The UI determines how one will be able to access the information more easily, viewing the vehicle data, and to obtain important details from it.

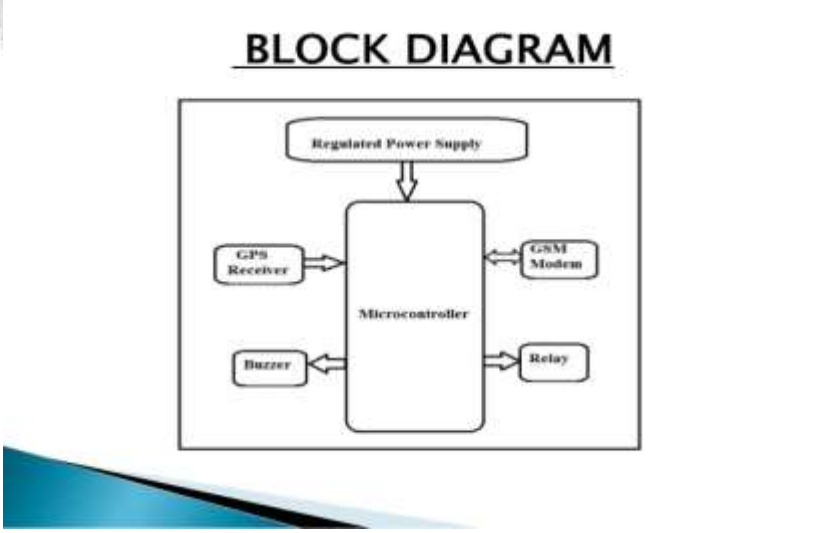

Figure 1- Block diagram

Car Crash Detection component which can send the SOS (Save Our Ship)signal on crash of vehicle to the centralized command center or Relative of the driver data is manage by Smartphone network (Hardware Device) Sensors collect information from the surrounding or object under measurement and turn it into useful data. This layer covers everything from legacy industrial devices to robotic camera systems, water-level detectors, air quality

sensors, accelerometers, and heart rate monitors(MI BAND-3). And the scope of the IoT is enlarging rapidly, thanks in part to low-power wireless sensor network technologies and Power over Ethernet, which enable devices on a wired LAN to work without the need for an A/C power source Even with the recently focus given to security for IoT components, it can be easy to overlook the need for end-to-end security. Every part of a platform should be analyzed for security purpose. From internet connections to the applications and components to the transfered and stored data, there is a potential for an attack vector. Without question, one of the most important & non-functional requirement of an IoT platform is that it also offers robust security

3. Mobile Application

An android application has been developed for android mobile phones that receive request data from the web server. This android application serves all the features available in the website.

- Messenger
- Phone call application
- Android OS

In this, automatic detection of accidents using smartphones is explained. Car manufacturers like BMW or GM have incorporated a built-in automatic collision notification system, They use various sensors like accelerometer and airbag deployment monitors in their vehicles to determine an accident event and send this information by using built-in cellular radios to response center. uncertainly most cars do not have automatic collision notification system. So in place of this system, smartphone is used which not only detects the incidents but also after detecting, this information is send to the concerned department on its own as well.

3.2 Device side (safety detection kit)

• Gather information or status of the bike

• Sensor sense data and perform alert and send to application

• Accurate detection and call to center centralized command center or Relative of the driver

• Low cost and power and compact

4. Literature survey

- www.wikipedia.org
- www.ardiuno.com
- www.google.com

5. 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

6. Hardware requirement :

- Arduino Uno : It is an open-source device based on hardware and software. To read inputs - light on a sensor- and turn it into an output - activating a motor, publishing something online. Sending a set of instructions to arduino on the board. The Arduino board started changing to new needs and challenges, differentiating its offer from simple 8-bit boards to products for to applications, wearable, 3D printing, and embedded. All Arduino boards are completely open-source users to build them independently.

Figure -2 Arduino Uno

- IR sensor : It is infrared sensor that emits infrared radiation. Infrared sensor sense obstacle front of the car. (1) Photodiode: It is considered as Light dependent Resistor (LDR), it is very High resistance in absence of light. Which has a P-N junction, means it start conducting the current in reverse direction when Light falls on it, and the amount of current flow is proportional to the amount of Light. This property makes it useful for IR detection.

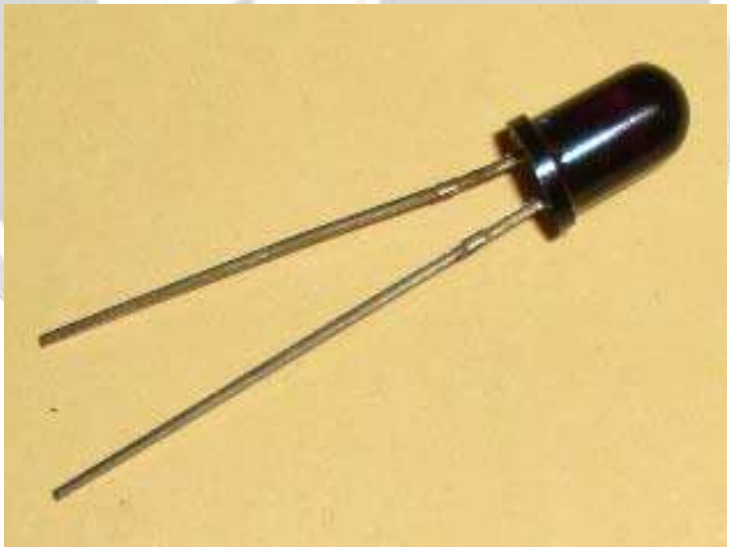

Figure -3 Photo Diode

- IR LED : It is emitts light, in the range of Infrared frequency. Which produce heat. Infrared has same properties as visible light, like it can be focused, reflected and polarised like visible light. IR LED is a normal LED and also operates like a normal LED. It depends upon the type of IR transmitter. Some transmitters have the range in kilometres.

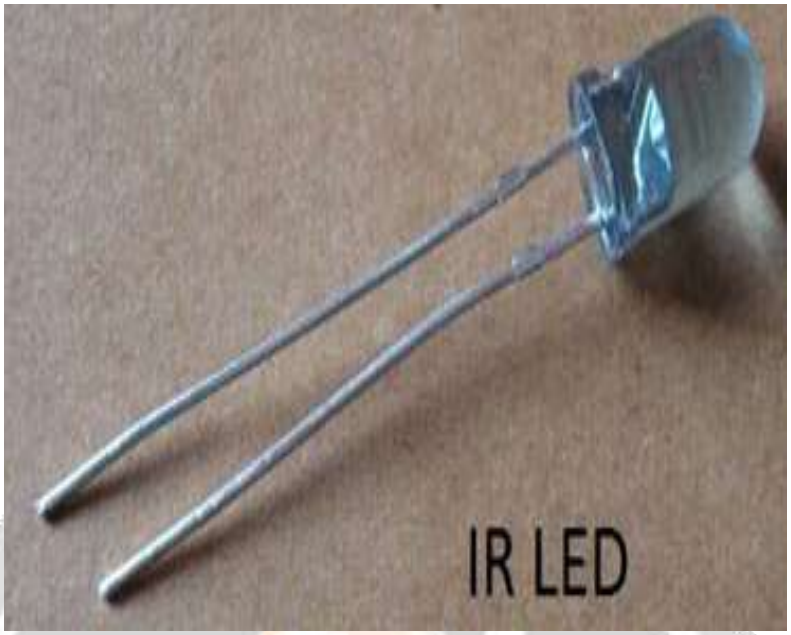

Figure 4- IR LED

- GSM SIM 900A: A GSM modem is af modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. When a GSM modem is connected to a computer, the computer to use the GSM modem to communicate the mobile network. While these GSM modems are most used to mobile internet connectivity and used for sending and receiving SMS and MMS messages. This is an ultra reliable wireless module. The SIM900A is a Dual-band GSM/GPRS in a SMT module. The SIM900A delivers GSM/GPRS 900/1800MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption.

Figure-3 GSM SIM 900A

- GPS module : The device fits into the car and captures the GPS location information. This device is use to actual location of car. This antenna draws about 10mA.It is got 5 meter long cable so it will easily reach whenever you need it to. The antenna is magnetic so it will stick to a car.

Figure-4 GPS module

- Buzzer: In this project we have use buzzer for accident detection alaram. Buzzers can be found in alarm devices, computers. A buzzer or beeper is an audio signalling device.

Figure -5 Buzzer

- Jumper pins : A jump wire (also known as jumper wire, or jumper) is an electrical wire, or group of them in a cable, with a connector or pin at each end which is normally used to interconnect the components of a breadboard test circuit

Figure-6 jumper wire

- Interface Cable : it is just a printer wire to transfer the data to ardiuno code into h/w from ide of computer

Figure-7 printer cable /firewire

7. Software requirement

- The Arduino integrated development environment (IDE) :The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board.

Figure-8 Arduino Software (IDE)

8. CONCLUSIONS

This paper tries to look at the emerging technologies and determine the best approaches in trying to prevent the number one cause of fatal vehicle crashes. This device is capable of reading and collecting the required data and sends them securely to the database stored in server. This system can do tracking of a vehicle which have this device. Besides, if an accident occur this system can communicate nearest hospital and police station. Police station and hospitals authority can see the shortest route to reach the accident spot using this system which have a web application and mobile application. Web based real time data visualization makes this system more convenient to see all the data in a clean, formatted and user friendly way.

9. REFERENCES

[1]. Road accidents statistics in India. . sites.ndtv.com.
[2]. Road accidents in India. Indianexpress.com.
[3]. An Introduction to the Internet of Things, UL LLC.
[4]. The Internet of Things: An Overview. www.internetsociety.org.