

WIRELESS BLOCK BOX USING FOR DRIVER SAFETY AND VEHICLE ACCIDENTAL MONITORING

G.V. SWATHI¹, GUGULOTHU NARESH², GUMMADI VENKATARAMANA³, D. YASHWANTH REDDY⁴

¹Assistant Professor at ACE Engineering College, Dept of Electrical and Electronics Engineering, Telangana, India

^{2,3,4}Student's of ACE Engineering College, Dept of Electrical and Electronics Engineering, Telangana, India

Abstract: The main aim of the paper is to avoid drunk and drive and to detect the accident occurred location of the vehicle. Now a days, every system is automated in order to face new challenges in the present day situation. Automated systems have less manual operations, so that the flexibility, reliabilities are high and accurate. Hence every field prefers automated control systems. Especially in the field of electronics automated systems are doing better performance increasingly. The main objective of the proposed system is to avoid accident occurrence due to driver abnormal behavior. At the time of vehicle start, alcohol sensor will detects the alcohol consumption of the driver if the driver alcohol consumption is above 30mg means access for user is denied by locking of ignition. And if alcohol consumed is limited means the vehicle will be running and next the driver may meet accident so the vehicle is stopped and buzzer will blow. The accident detection is monitor by vibration sensor, whenever sensor crosses its limited threshold value, GPS track location and send SMS through the GSM modem, to authorized persons.

KEY WORDS: Drunk and drive, Automated control systems, Alcohol sensor, locking of ignition, Vibration sensor, GSM modem.

1. INTRODUCTION

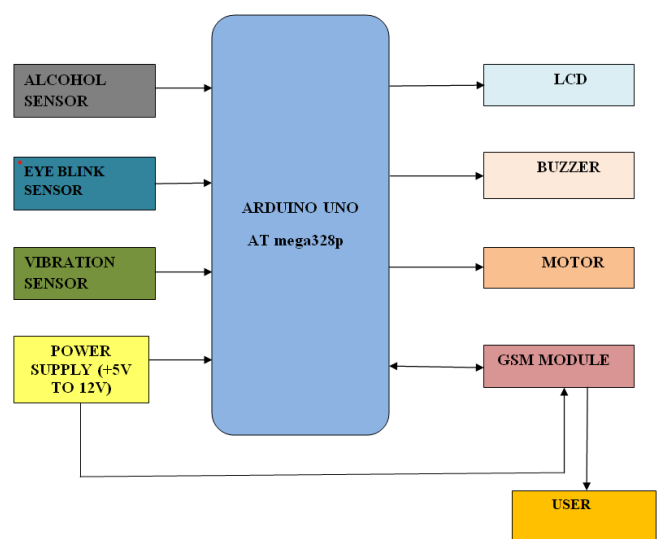
Now a days the motorcycle accidents were taking place because of drunk and driving the vehicles, tiredness and drowsiness of the driver. This is because the person who has done this has put their own life and the life of others at risk on the road. So, this is because a lot of vehicle accidents occurring in the present day scenario. Many people losing their loved ones in these type of incidents. Due to lack of information in time, and there is no proper medication on time to the patients. To avoid these type of problems by implementing the automated system in the vehicles. Using the Arduino UNO to control the system and passes the commands to the various connected to sensors and devices. The alcohol sensor is used to detect the alcohol content present in the driver, the eye blink sensor for the detection of tiredness and drowsiness of the driver, and the vibration sensor is detection of accident. Finally the GSM module is used to collect the information from Arduino UNO and send's SMS or message to user's mobile/ambulance/family

members, whose contact number is provided in the system. And also will be displayed on the 16X2 LCD display.

2. WORKING

Supply is given simultaneously to both the devices Arduino UNO and GSM module. When the alcohol consumption is detected above the threshold value, the alcohol sensor which senses it and passes information to the Arduino. Thereafter, that information is reaches to the GSM. GSM send the SMS/ Message to the users that the "driver is drunk". It also displayed on the 16X2 LCD display. Eye blink sensor which detects the tiredness or drowsiness of the driver and which blows the buzzer, to alert driver from the drowsiness. On LCD display, displays drowsiness is detected. When the Vibration sensor is activated by heavy vibrations of the vehicle, the vibration sensor which lost the conduction at certain instant and detects the accident. The vibration sensor is connected to the Arduino it collects the information send signal to the GSM. Through the GSM we get the message alert to the user mobile/ambulance/family members. which provided contact information in the GSM module. At that time we can provide necessary medication on time to the injured persons, and saves their life from dangerous incidents

3. Block Diagram



3.1 Arduino UNO

The Arduino Uno Rev3 SMD 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 16MHz ceramic resonator (CSTCE16M0V53-R0), 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 battery to get started. "Uno" means "One" in Italian and is named to mark the upcoming release of Arduino 1.0. The Arduino which controls all the Input/output pins of sensors, GSM modem, and also 16X2 LCD display.

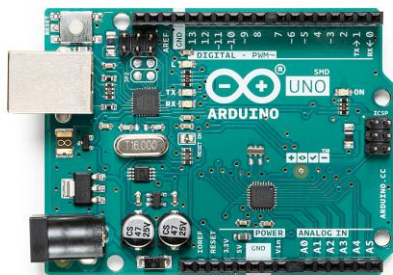


Fig-1: Arduino UNO

3.2 GSM (Global system for mobile communication)

A GSM modem or GSM module is a device that uses GSM mobile telephone technology to provide a wireless link to a network. GSM modems are used in mobile telephones and other equipments that communicates with mobile telephone networks. In these we have used the SIM800L to identify the device to the network.

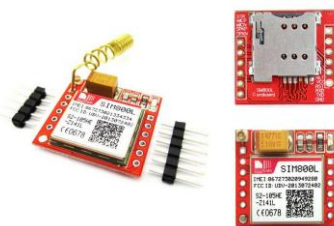


Fig-2: GSM

3.3 Alcohol Sensor

An alcohol sensor detects the attentiveness of alcohol gas in the air and an analog voltage is an output reading. The sensor can activate at temperatures ranging from -10 to 50⁰ C with a power supply is less than 150mA to 5V. The sensing range of sensor is from 0.04mg/L to 4mg/L. which is suitable for breathalyzers. In these system the alcohol sensor which detects the percentage of alcohol concentration present in the body is above its threshold value then the sensor activates and sends the message alert.



Fig-3: Alcohol Sensor

3.4 Eye Blink Sensor

The eye blink sensor illuminates the eye with infrared light and monitors the changes in the reflected light. The sensor output is active high for Eye close and can be given directly to Arduino UNO/microcontroller for interfacing application. If the drowsiness detected in the system then the sensor is activated and blows the buzzer and slow down the motor fan speed to alert the driver. After the certain instant the buzzer will be turned off.



Fig-4: Eye blink Sensor

3.5 Vibration Sensor

The vibration sensor is also called a piezoelectric sensor. These sensors are flexible devices which are used for measuring various processes. This sensor uses the piezoelectric effects while measuring the changes within acceleration, pressure, temperature, force otherwise strain by changing to an electrical charge. The sensitivity of these sensors normally from 10mV/g to 100mV/g and there are lower and higher sensitivities are also accessible. The sensitivity of the sensor can be selected based on the application. The vibration sensor in these module used to detect the vibrations of the system and indicates the accident occurrence of the vehicle.



Fig-5: Vibration Sensor

3.6 LCD (Liquid Crystal Display)

The Liquid Crystal Display, which is also known as the LCD. It is commonly used to display data in electronic devices. In these prototype the result will be displayed on the LCD.



Fig-6: LCD

3.7 DC Motor Fan

In these, prototype the dc motor fan is used as moving vehicle. When the system normal the fan will rotate continuously, which indicates that the vehicle is moving. When the alcohol sensor senses the alcohol content at that instant the fan rotation will be interrupted, and also when the vibration sensor is observes the heavy vibrations in the system the dc motor is stops rotation. At that time the Arduino takes information from the motor and it passes the information to the GSM then the GSM will sends message alert to the user mobile phone. And also displayed on LCD "Accident Detected".



Fig-7: DC motor Fan

4. FLOW CHART

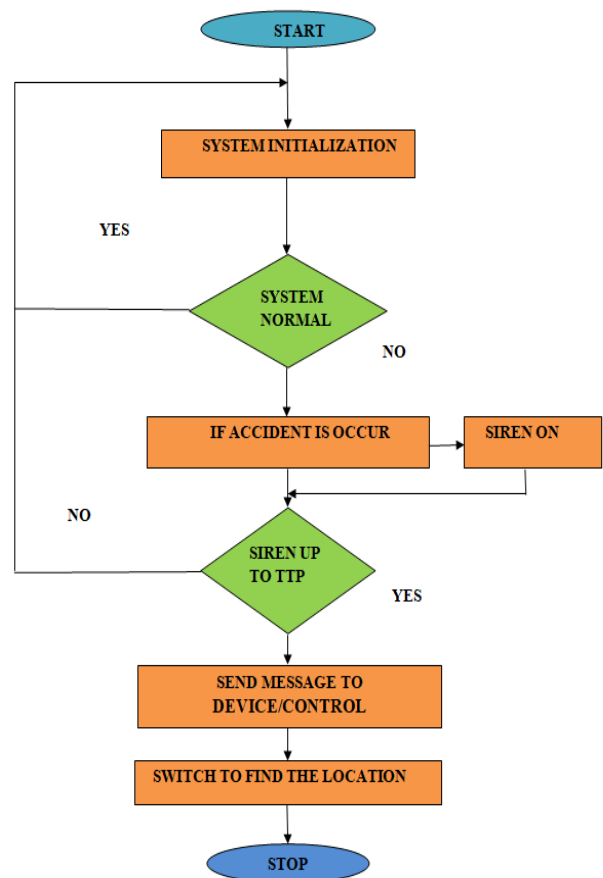
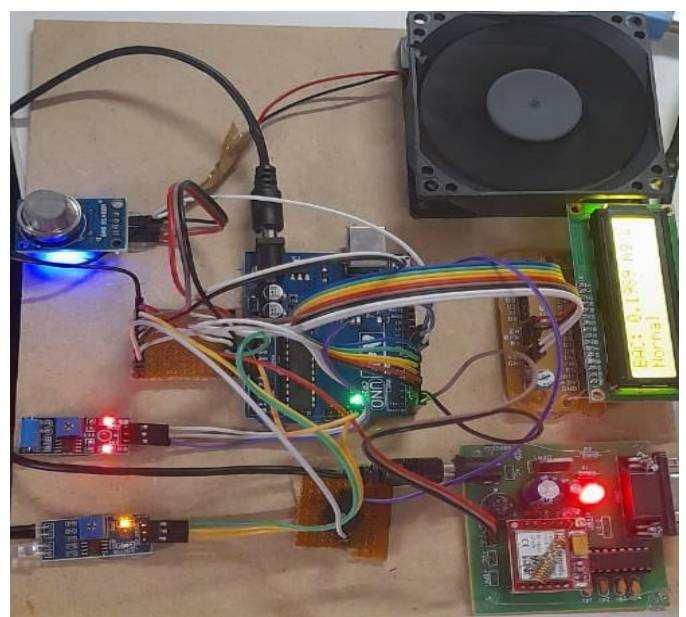


Fig-8: Flow Chart

5. PROTOTYPE



6. RESULT AND DISCUSSION

From these project we came to conclusion that to avoid the major motorcycle accidents due to the drunk drive and other abnormal conditions of the driver in the vehicle by using the Arduino Uno, Alcohol sensor, Eye blink sensor, Vibration sensor. The SMS alert is sending through the GSM modem. Which is also displays on the LCD.

Under normal condition:



When the driver is drunk:



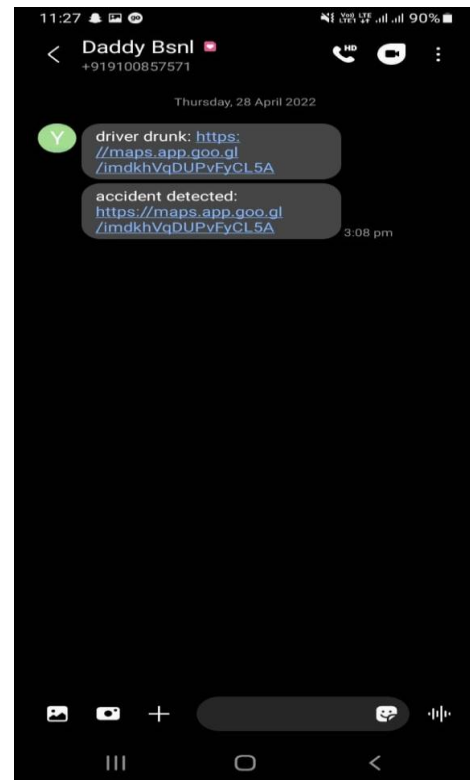
When the driver feeling abnormally sleepy or tired:



Under the condition of heavy vibrations, observed by the vibration sensor the accident of the vehicle is detected.



If the driver drunk and drives the vehicle, then the alcohol senses and passes information to the Arduino, Arduino connected to the GSM module it sends the message alert to users mobile/ambulance/family members the contact numbers which provided for the communication purpose. Similarly, when the accident is occurs the message alert sends to the user mobile phone. In that message we have the link, it provides location of the vehicle.



CONCLUSION

This project gives the overall idea about the prevention of vehicle accident due to the drunk drive tiredness of the driver. Due to these many people lose their life because of there is no proper medication on time for the injured patients at the accident spot. So these system can be detects the accident spot and alert people like ambulance/family members to reach on time and provide the immediate medication on the spot. To minimize the deaths and the severe condition due to accidents the GSM technologies are used where immediate action takes place by the ambulance/police services which might reduces the risk factor of death.

REFERENCES

- [1] Yuan Jie. Design of alcohol concentration detector based on 51 single chip microcomputer[J] .Electronic Design Engineering,2013,21: 173-175.
- [2] ZHAO Xia, BAIFengming. Vehicle Alcohol Detection System Based on Fuzzy Control[J]. Journal of Changchun University of Science and Technology (Natural Science Edition) 2014 (02) :99-103.
- [3] XU Jinglian, HAN Junfeng, PAN Shenghui, TONG Qiwu. Design of Car Alcohol Test System Based on Multi-sensor Data Fusion[J]. Instrument technology and sensors, 2010(7):105-107.

[4] Jonas Ljungblad Bertil Hök Amin Allalou & Hakan Pettersson (2017) Passive in-vehicle driver breath alcohol detection using advanced sensor signal acquisition and fusion Traffic Injury Prevention 18:supl \$31-S36.

[5] Maxim Raya, Jean-Pierre Hubaux. Maxim Raya, Jean-Pierre Hubaux. Securing vehicular ad hoc networks[J]. Journal of Computer Security, 2007, 15(1):39~68.

[6] Chen Li, Zhu Ruixiang, Yun Chao. Design of anti-drunk driving control system based on single chip microcomputer[J]. Sensors and Microsystems. 2009(02):94-96.

BIOGRAPHIES



Mrs. G.V. Swathi, Assistant Professor, EEE department, ACE Engineering College, Hyderabad. She did her B. Tech from G. Narayanamma Institute of Technology and Science (JNTUH), M. Tech from ST' Martin's Engineering College (JNTUH), and pursuing Ph.D. from Lovely professional University.



Mr. Goguloth Naresh student of EEE department India. He did his Diploma from Akshara College, Palleanaram, kodad, pursuing B. Tech from ACE Engineering College, Hyderabad.



Gummadi Venkataramana, Diploma in Siddhartha institute of technology and science, Hyderabad, pursuing B.Tech from ACE engineering college, Hyderabad



Mr. D. Yashwanth Reddy student of EEE department India. He did His diploma in TDR Polytechnic college, Bibi NAGAR, Hyderabad, pursuing B.Tech from ACE Engineering College, Hyderabad