A
PROJECT REPORT
ON

“ACCIDENT DETECTION AND ALERT SYSTEM & ALCOHOL DETECTION SYSTEM ”

Submitted in Partial fulfillment of the Requirements for the Degree of

Bachelor of Engineering

In

Computer Science & Engineering

NACC ACCREDITED “A++” GRADE
(2021-2025)

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CERTIFICATE

Certified that the project work entitled **"ACCIDENT DETECTION AND ALERT SYSTEM & ALCOHOL DETECTION SYSTEM** Is record of work by **TUSHAR SHRIVASTAVA M ROLL NUMBER- (211022177)** carried out under the supervision of Prof. AJAY MAVAI (Head Of Department Computer Science Engineering)in the partial fulfilment of the requirement for the award of B.E. Computer Science Engineering degree of during the academic session 2021–2025.

project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Prof. Ajay Mavai		**Dr. Sanjay Gupta**
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DECLARATION

We, the students of 8th semester of Computer Science and Engineering, INSTITUTE OF ENGINEERING, JIWAJI UNIVERSITY, GWALIOR declare that the work entitled " **ACCIDENT DETECTION AND ALERT SYSTEM & ALCOHOL DETECTION SYSTEM** " has been successfully completed under the guidance of Prof. Ajay Mavai, Computer Science and Engineering Department, INSTITUTE OF ENGINEERING, JIWAJI UNIVERSITY, GWALIOR.

This dissertation work is submitted in partial fulfillment of the requirements for the award of Degree of Bachelor of Engineering in Computer Science and Engineering during the academic year 2021 - 2025. Further the matter embodied in the project report has not been submitted previously by anybody for the award of any degree or diploma to any university.

Place:

Date:

Team members:

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Roll No.-211022177

ABSTRACT

Speed is one of the basic reasons for vehicle accident. Many lives could have been saved if emergency services could get accident information and reach in time. This project deals with accident detection system when the accident occurs it uses various components and alerts the Rescue team for help. An efficient automatic accident detection with an automatic notification to the emergency service with the accident location is a prime need to save the precious human life**.** The proposed system deals with accident alerting and detection. It reads the exact latitude and longitude of the vehicle involved in the accident and sends this information to nearest emergency service provider. The goal of the project is to detect accidents and alert the rescue team in time.

In this context, an Arduino-based alcohol detector is an example of a device that has the potential to detect the presence of alcohol in the surrounding environment. It is possible to use this tool to check the results of individuals who have drank alcohol while operating a motor vehicle. A MQ-3 alcohol sensor is utilized by the device in order to ascertain whether or not alcohol is readily available. The component that constitutes the sensor is the component that heats the layer of conducting material while simultaneously measuring the resistance of the substrate.

There is a change in the resistance of the MQ-3 sensor whenever it is subjected to scents or vapors of alcohol. Signals of both digital and analogue types can be obtained from the sensor. A distinction can be made between the two in a very plain way. There are only two conceivable states that digital output can take while communicating with a microcontroller. These states are high and low, which means that they represent the values 1 and 0, respectively.

An analog signal, on the other hand, is received by the microcontroller, and it provides an indication of the amount of alcohol present in the environment by utilizing a wide range of values, ranging from 0 to 1023. An LED, a MQ-3 alcohol sensor, and an Arduino Uno are two of the components that are required to construct the device. In confined areas or for showing straightforward applications on a small scale, this device performs admirably.

The process of installing the gadget in vehicles is yet another approach that may be used to lessen the number of accidents that are caused by drunk driving. In addition to being user-friendly and easy to repair, the device has a high level of sensitivity to alcohol.

Keywords: Arduino-based alcohol detector; MQ-3 alcohol sensor; Microcontroller; Sensitivity; Alcohol.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to Prof. Ajay Mavai for his invaluable guidance, support, and encouragement throughout the course of this project. His expertise and insights were instrumental in the successful completion of our work on the“ACCIDENT DETECTION AND ALERT SYSTEM & ALCOHOLDETECTION SYSTEM ”

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LIST OF ABBREVATIONS

GSM	**Global System for mobile Communication**
GPS	**Global Positioning System**
GPRS	**General Packet Radio Service**
PCB	**Printed Circuit Board**

CHAPTER 1

INTRODUCTION

The development of a transportation system has been the generative power for human beings to have the highest civilization above creatures in the earth. Automobile has a great importance in our daily life. We utilize it to go to our work place, keep in touch with our friends and family, and deliver our goods. But it can also bring disaster to us and even can kill us through accidents. Speed is one of the most important and basic risk factors in driving. It not only affects the severity of a crash, but also increases risk of being involved in a crash.

An alcohol detector is a piece of equipment that has the capability of determining whether or not alcohol is present in the bloodstream or in the breath. It is often used to reduce the number of accidents that are caused by drunk driving and other mishaps related to alcohol. An effective method for constructing an alcohol detector is to make use of an Arduino microcontroller in conjunction with a MQ-3 alcohol sensor. The MQ-3 sensor is an example of a portable, low-cost gadget that is capable of detecting ethanol in the air.

1.1 Relevance of the Project

- The accidental detection and alert system are designed to detect the accidents and alert rescue team in time.
- Arduino is major control unit to communicate between devices when an accident occurs, which helps in transferring messages to different devices in the system.
- Receiving pin of GSM module and transmitting pin of GPS module are used to communication.
- GPS module will find the location of the vehicle and the information is fetched by the receiver through the coordinates and the received data is sent to Arduino and the alert to rescue team by GSM module.
- . It is possible to successfully connect the MQ-3 sensor to the Arduino board in a short amount of time and with only a few jumper wires
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- The accelerometer and gyroscope detect the accident occurrence by the reading produced by the movements of the vehicle.
- The vibration sensor is also used to detect the accident by producing voltage from the impact of vehicle movements.

1.1.1 Block Diagram

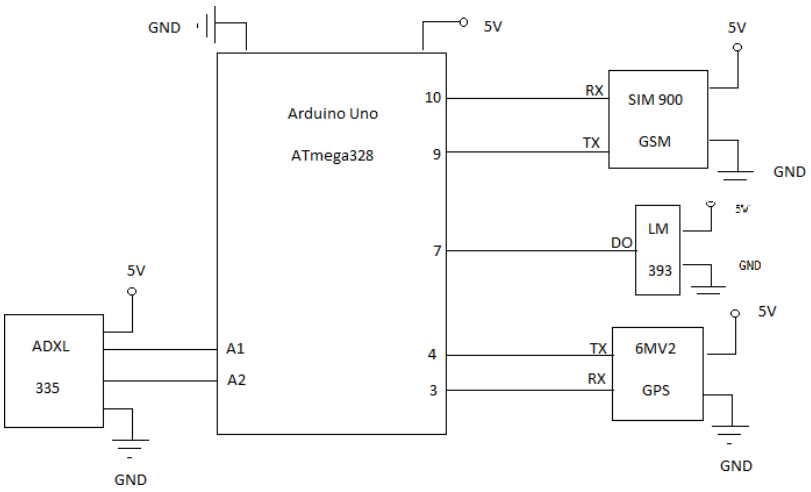
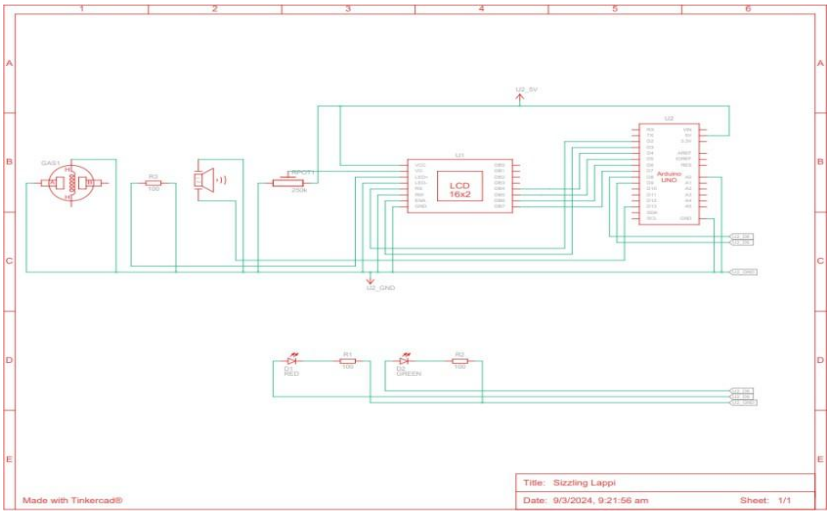


Fig 1: Block diagram of the circuit



1.1.2 Agile Methodology or Summary of approaches

Story ID	Requirements Description	User Stories/task	Description
1.	Prediction of Sudden Speed Drop	As a project developer we should design to detect the speed changes using Accelerometer	Piezoelectric effect and meter readings.
2.	Confirmation of Accident	Getting alerts through accelerometer data one should confirm whether accident occurred or not	Switches
3.	GPS Co-ordinates	Upon the confirmation of accident, it should get the GPS co-ordinates from module	Trilateration
4.	SMS through GSM	Sends the GPS co-ordinates to nearby hospitals through GSM module	Cellular Technology

1.2 Scope of the Project

- The scope of the project is to design an accidental detection system that detect the accidents and alert rescue team in time.
- Arduino is major control unit to detect or alert when an accident occurs, which helps in transferring messages to different devices in the system.
- Receiving pin of GSM module and transmitting pin of GPS module are used to communication
- GPS module will find the location of the vehicle and the information is fetched by the receiver through the coordinates and the received data is sent to Arduino and the alert to rescue team by GSM module.
- The purpose of measuring different kinds of gases for a variety of purposes, a number of different gas sensors have been developed. Methane, butane, LPG, and smoke are all able to be detected by the MQ-2 sensor.
- On the other hand, the MQ-3 sensor is primarily focused on detecting alcohol, ethanol, and smoke above the other substances. When it comes to detecting gases.
- The MQ-5 is specifically designed to identify natural gas and propane, whilst the MQ-4 is utilized for identifying methane and compressed natural gas with its specialized capabilities.

1.3 Objectives

- The objective is to overcome accidents by monitoring any change in the speed of the vehicle whereas the accelerometer can detect the fall.
- The Arduino is the major control unit to detect or alert when an accident occurs. It collects the data from the accelerometer, GPS, GSM modules and reflects the output.
- This will reach the rescue service in time and save lives.

1.4 Methodology

- Monitoring the speed of the vehicle and detecting if there is any sudden drop in the speed of the vehicle.
- Arduino UNO is used as controlling unit, it reads the values from accelerometer. Accelerometer detects if there is any fall in axis.
- If Arduino observes any drastic change in the speed of the vehicle. It reads the current location from GPS module and sends it to the mobile number through SMS by using GSM module.
- Before sending the SMS Arduino activates the buzzer, after thirty seconds of beeping it goes off and the SMS will be sent.
- But if the passenger is not in danger, he can press the "IAM OKAY" button. This is done to prevent the situations where it would it lead false accident rescue.
- One of the most well-known applications of Arduino is in the detection of alcohol, with the MQ-3 alcohol sensor being a component that is frequently used

1.5 Problem Statements

• The goal of the project is to detect accidents and alert the rescue team in time.

• The gap between the existing systems in place and the ideal system is that automated system is used once the accident occurs which can give latitude and longitude of accident occurred area without delay. More Human life can be saved using this system.

• Driving under the influence of alcohol and doing so at the same time is a serious offense that carries a lot of consequences

1.6 Existing System

Many researchers carried out their studies on accident detection system. Traditional traffic accident prediction uses long-term traffic data such as annual average daily traffic and hourly volume. In contrast to traditional traffic accident prediction, real-time traffic accident prediction relates accident occurrences to real-time traffic data obtained from various detectors such as induction loops, infrared detector, camera etc. Real-time traffic accident prediction focuses on the change of traffic conditions before an accident occurrence, while traffic incident detection studies are concerned with the change of traffic conditions after an incident occurrence. However, the performance of these detection and prediction system is greatly restricted by the number of monitoring sensor, available fund, algorithms used to confirm an accident, weather, traffic flow etc.

Besides the automatic detection system, manual incident detection methods detects the accident from the motorist report, transportation department or public crews report, aerial surveillance or close circuit camera surveillance. The drawback of this type of detection system is that someone has to witness the incident. Moreover, there are delays and inaccuracies due to the expression problem of the witness. Compared to these detection method, driver initiated incident detection system has more advantages which includes the quick reaction, more incident information etc. However, with the severity of the accident, driver may not be able to report at all.

Conventional built-in automatic accident detection system utilizes impact senor or the car airbag senor to detect an accident and GPS to locate the accident place.

1.7 Proposed System

• Arduino Nano is used as controlling unit, communicating between modules for better information transformation at time.

• Accelerometer can be used for detecting the collision direction from tri-lateral axis movements.

• Gyroscope can be used for rollover collisions after a threshold of roll and pitch values, the weight and centre of gravity of vehicle plays an important role in rollover.

• The device also confirms from vibration sensors which detects the collision after a threshold voltage increase.

• Then a buzzer is provided to abort the false detection of accident to the passenger.

• Within of limited time of buzzer signal the GPS module collects the coordinates from Google Module.

• These co-ordinates nearby hospitals are alerted for emergency rescue call to passenger.

• The hospital approves the accident by verifying the accident at specified location and confirms the accident.

• The saved personal members of family are informed regarding the accident through GSM module.

- It is possible to build an alcohol detector by utilizing an Arduino and a MQ-3 alcohol sensor both together.
- It is the MQ-3 metal oxide semiconductor (MOS) sensor that is responsible for adjusting its electrical resistance in response to the amount of alcohol that is present in the air. Signals of both digital and analogue types could be produced by the sensor.
- The Arduino Uno is the ideal option for beginners because of how simple it is to use and how many resources are available to them. They include every type of microcontroller, but the Arduino Uno is the best option. Moreover, a MQ-3 alcohol sensor is necessary in order to provide accurate detection of the level of alcohol present. In addition, a red light-emitting diode (LED) that serves as a visual signal will light up if the sensor detects the presence of alcohol.
- The first step in constructing an alcohol detector using Arduino is to put all of thes components together for assembly. This simple project may be finished by using only fundamental components like as an Arduino, an LED, and alcohol sensors that are readily available.
- Additionally incorporated into the sensor are a power LED as well as a status LED. An intermittent blinking of the status LED will occur whenever the sensor detects the presence of alcohol vapors.

CHAPTER 2

LITERATURE SURVEY

2.1 RESEARCH AND TECHNICAL PAPERS

2.1.1 ACCIDENT DETECTION AND REPORTING SYSTEM USING GPS, GPRS AND GSM TECHNOLOGY (@2012 IEEE):

This paper proposes to utilize the capability of a GPS receiver to monitor the speed of a vehicle and detect an accident basing on the monitored speed and send the location and time of the accident from GPS data processed by a micro-Controller by using the GSM network to the Alert Service Centre.

At high speeds the distance between starting to brake and a complete stand still is longer. The braking distance is proportional to the square of speed. Therefore, the possibility to avoid a collision becomes smaller.

There is a tabular column for predicting the maximum speed after considering the deceleration factors. As such, if the speed is less than these maximum speeds, than it would be assumed that some other deceleration force worked on the vehicle to reduce the speed and an accident has occurred.

Speedometer can also be used to find the speed drops in vehicles, but an analogue to digital converter is required to acquire speed from it. So, a GPS is used to track the speed of vehicle every instance.

The vehicle speed is calculated at every instance by GPS. If there is decrease in new speed values then it raises an ALARM for accident detection. Then 5 secs will be given to abort the emergency Else the emergency is sent to Alert Service Centre and plot the location of accident by the GSM number received. There after rescuing the individual.

2.1.2 REAL TIME DETECTION AND REPORTING OF VEHICLE COLLISION (@2017 IEEE):

This paper proposes to utilize the capability of Accelerometer and Gyroscope to obtain the data and detect an accident basing on the orientation angle and orientation. Then send the location of the accident from GPS data processed by a micro-Controller by using the GSM network to the nearest hospital provided over the network and alerts their family members too.

The accelerometer detects the direction of vehicle collision by bi-directional axis and an axis towards gravitational force with full scale +/-8g. The collision of a vehicle leads to a drastic change in vehicle speed and shows a direct impact on acceleration force along that axis of crash. As the Z-axis is oriented along the gravitational force direction, only X-axis and Y-axis of accelerometer is required to determine the happening and direction of vehicle collision.

The gyroscope is used to calculate the tilt of collision vehicle and is given a full range of +/-500 degree/sec. Angle greater above 46 degree and below -46-degree results in rollover of car. Other than the threshold f roll and pitch values, the weight and centre of gravity of vehicle plays an important role in rollover. Once the threshold is reached, the notification system will be activated informing the family and nearby hospital about the occurrence of vehicle rollover.

In addition, they use GPS tracker too for recording false assumptions from the GPS data acquired.

The notification system notifies the information to family emergency contacts and nearest hospital. Notification system is activated once the threshold for detection is reached. Location is identified by GPS.

2.1.3 VEHICLE ACCIDENT DETECTION SYSTEM BY USING GSM, GPS AND SENSORS (@2019, IRJET):

This paper proposes to utilize the capability of a Piezoelectric sensor to detect an accident basing on the voltage produced by collision and send the location and time of the accident from GPS data processed by a micro-Controller by using the GSM network to the Alert Service Centre.

The Piezoelectric sensor produces a DC voltage proportional to impacts on collision on vehicle. When the voltage increases above threshold value the sensors get triggered.

The Latitude and Longitude are detected using GPS and it is sent as message to rescue team through GSM module. The message is received by another GSM module. Google Map Module: It displays Google map shows you exact location of accident and its details. It gets detail SMS from accident location. Hence there is small variation in co-ordinates .An OFF switch is also provided at times of need to avoid false message.

2.2 COMPARISON BETWEEN RESEARCH PAPERS

	Research/Technical Paper	Process	Advantage
Approach 1	Accident Detection using GPRS,GPS and GSM Technology IEEE @2012	Detects the accident through GPRS and location is sent over GSM to mobile through GPS	Just detects the location of accidents and alerts to mobile
Approach 2	Accident Detection using GPS , GSM, Gyroscope and Accelerometer IEEE 2017	Detects the location of accident by detecting the changes in orientation levels of accelerometer.	Detects the collision directions by accelerometer.
Approach 3	Accident Detection and Prevention by switches Instructables.com	Detects the accident and confirms for the accident	It asks for the passenger confirmation of accident through 2 way switch
Approach 4	Read Time Detection using Vibration Sensor IRJET 2019	Detects the accident by voltage generated through sensors by collision.	Sending of location to nearby hospitals through network.

CHAPTER 3

SYSTEM REQUIREMENTS SPECIFICATION

This Chapter describes about the requirements. It specifies he hardware and software requirements that are in order to run the system properly. The Hardware Requirement Specification is explained in detail, which includes the overview of functional and non-functional requirements.

3.1 Functional Requirements

Functional Requirements defines the function of the system and gives the outline of what the system does.

- Auto detection mode is the identifier it holds the purpose of automatically detects when the accident occurs and it also sends the alert. The pre-condition is that turning on auto detection mode and the post-condition is On detection of accident and alert message will be sent.
- Adding emergency contacts it specifies the contacts that has to be saved, the purpose of doing so helps in sending the alert message when the accident occurs.
- Sending the Alert message this requires the emergency contacts to be saved. It involves the action to be performed when the emergency message pops up.

3.2 Non-Functional Requirements

Non-functional requirements are the requirements which are not directly concerned with the specific function delivered by the system. They specify the criteria that can be used to judge the operation of a system rather than specific behaviours.

The designed system will respond when the accident occurs it uses the proposed methodology of this project in detecting the accident, the detection depends on the speed of GPS in order to locate the spot and send the alert to medical emergency using the GSM module.

3.3 Hardware Requirements

- Arduino
- GPS module
- GSM module
- Accelerometer and Gyroscope
- Vibration Sensor
- Power Supply
- Connecting Wires
- Breadboard or PCB
- MQ3 Sensor

3.3.1 Working of GSM

For providing communication between the GPS, GSM and the allocated mobile number GSM SIM900 module is preferred. The name SIM900 says that, it is a tri band work ranging a frequency of 900MHz to 1900 MHz such as EGSM900 MHz, PCS 1900 MHz and DSC 100 MHz Receiving pin of GSM module and transmitting pin of GPS module are used for communication between the modules and the mobile phone.

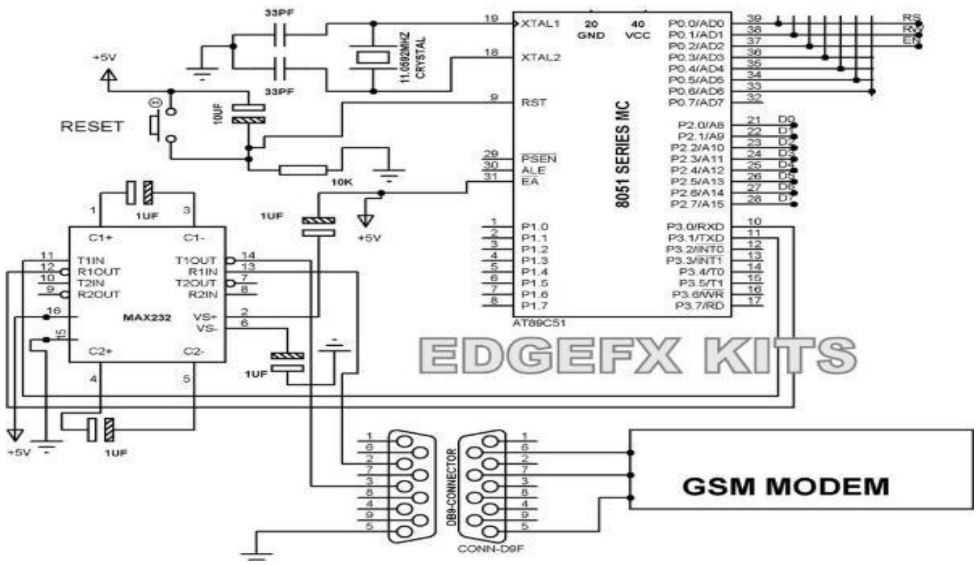


Fig 2: Block diagram of GSM

3.3.2 Working of GPS

To find the location on the earth the whole is divided into some coordinates where the location can be easily captured by a module called GPS module. Here the GPS used is SIM28ML. This GPS module will find the location of the vehicle and the information fetched by the GPS receiver is received through the coordinates and the received data is first send to Arduino and the information is transmitted to the saved contact through GSM module. The frequency is operated in the range of 1575.42 MHz and the output of GPS module is in NMEA format which includes data like location in real time.

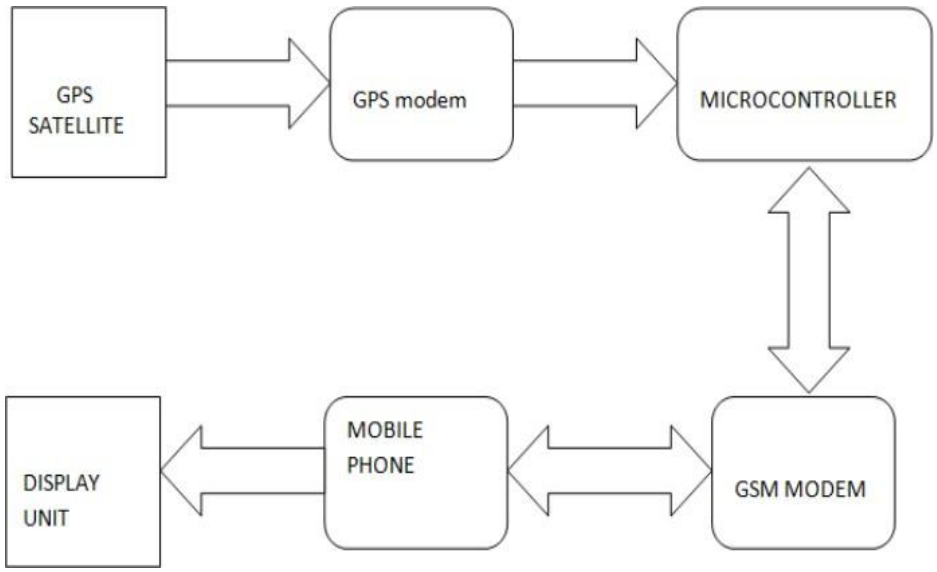


Fig 3: Block diagram of GPS

3.3.3 Working of Arduino

The Arduino UNO is a widely used open-source microcontroller board based on the ATmega328P microcontroller and developed by Arduino.cc. The Arduino is the major control unit to detect or alert when an accident occurs. It collects the data from vibration sensor, GPRS and GSM modules and reflects the output either in display system or through a message. Here vibration sensor plays a major role. This vibration sensor will receive the vibrations of the vehicle which in turn acts as a accident detection module. Arduino gathers the information from all other modules and sends the message to the receiver though GSM module

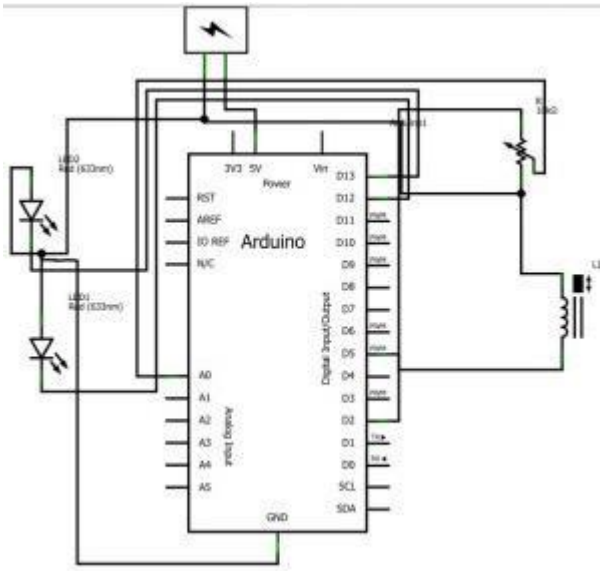


Fig 4: Block diagram of Arduino

3.3.4 Working of Accelerometer

The basic underlying working principle of an accelerometer is such as a dumped mass on a spring. Piezoelectric, piezo resistive and capacitive components are generally used to convert the mechanical motion caused in accelerometer into an electrical signal. Piezoelectric accelerometers are made up of single crystals.

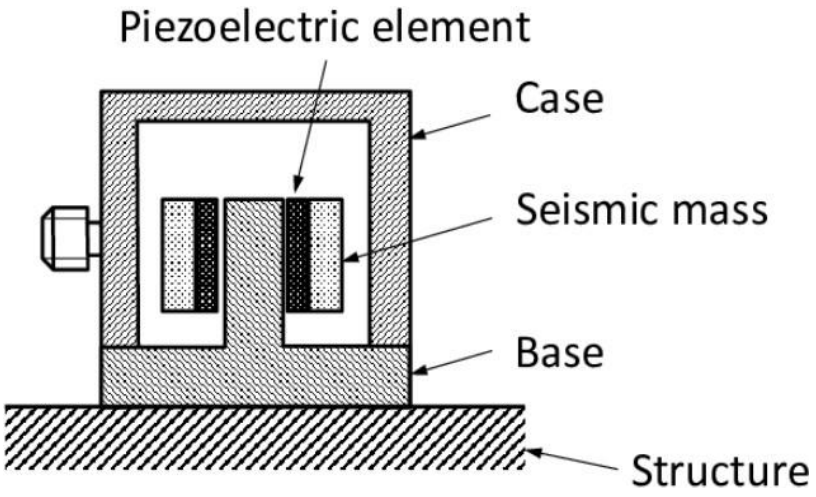


Fig 5: Block diagram of Accelerometer

3.3.5 Working of Gyroscope

A gyroscope is a device designed to have a spinning disc or wheel mounted on a base such that its axis can turn freely in one or more directions in order to maintain its orientation regardless of any movement of the base. However, the orientation changes in response to an external torque and in a different direction.

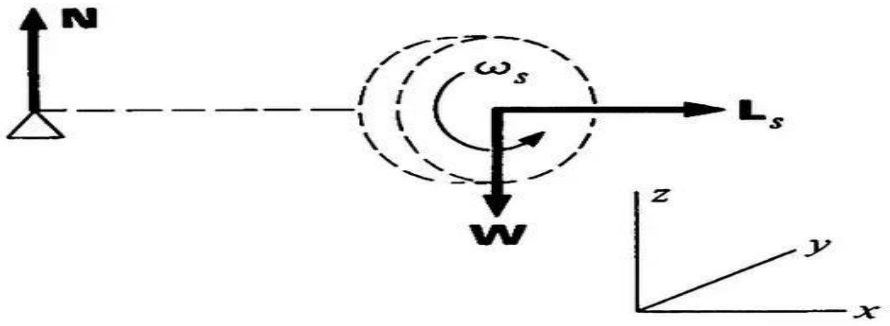


Fig 6: Block diagram of Gyroscope

3.3.6 MQ3 Sensor

An example of a module that is capable of detecting a wide range of gases is the MQ3 alcohol gas sensor. This module can detect alcohol (CH4), benzene, gasoline, hexane, carbon monoxide, and LPG. Through the utilization of a sensitive substance known as SnO2, the device is able to determine whether or not alcohol gas is present. The electrical conductivity of this material reduces after it has been exposed to fresh air. Because it is equipped with a semiconductor alcohol gas sensor, this device is able to detect and monitor the levels of alcohol that are present in the air.

All of the following substances can be identified using the MQ-3 module: benzine, alcohol, liquefied petroleum gas (LPG), hexane, CH4, and carbon monoxide. SnO2, a sensitive substance that exhibits lower conductivity in clean air, is the material that the MQ-3 gas sensor is dependent on. There is a correlation between the conductivity of the sensor and the concentration of the alcohol gas that is being measured. Furthermore, the MQ-3 gas sensor is extremely resistant to interference from fuel,

smoke, and vapour, in addition to having a high level of sensitivity to alcohol.

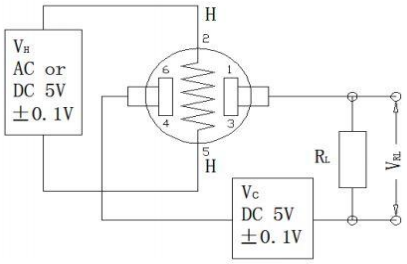


Fig 7: MQ3 sensor

3.4 Software Requirements

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it is growing through the contributions of users worldwide.

CHAPTER 4

SYSTEM ANALYSIS AND DESIGN

4.1 System Design:

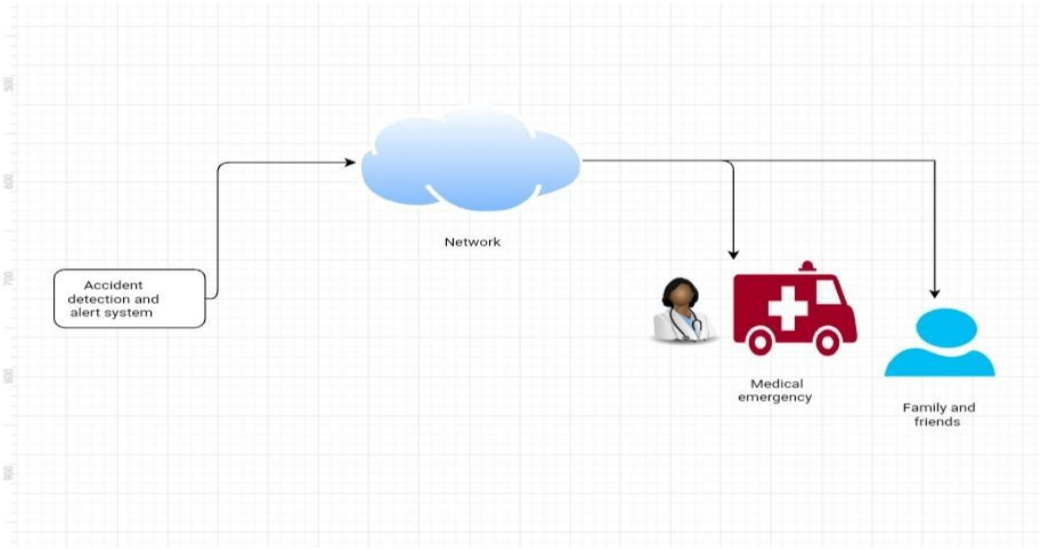


Fig 8: System design

4.2 Flow Chart:

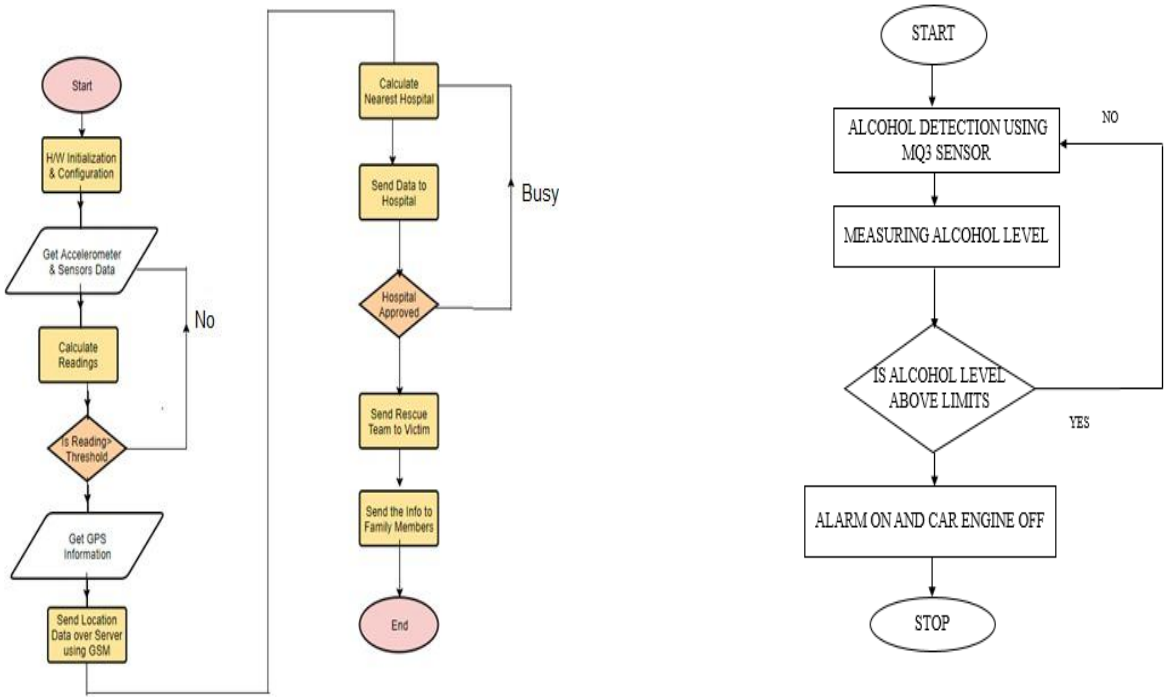


Fig 9: Flowchart

- At start the hardware will be initialised and it takes the reading from hardware every second.
- If the reading overcomes the threshold reading of sensors then Arduino sends the GPS co-ordinates to emergency dial via GPS.
- Emergency dialler checks the coordinates at portal and contacts the nearby hospitals for emergency need and waits for its approval.
- After the hospital approval the rescue team reaches the location of accident and upon confirmation it informs their family members.

4.3 Use case Diagram:

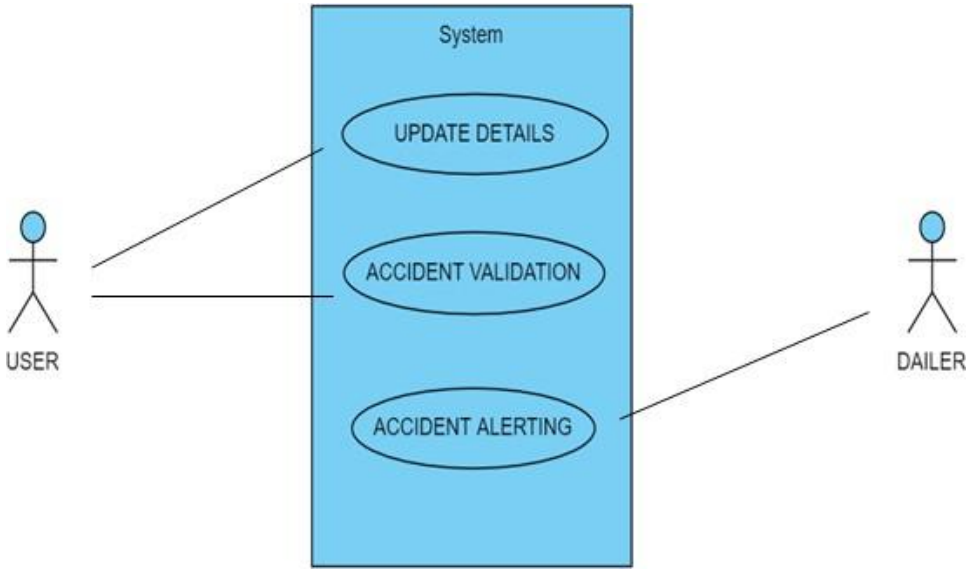


Fig 10: Use case diagram

- The user has the facility to update details of him and emergency contacts.
- The user has the facility to abort the emergency dial to responder by using control switch.
- The dialler/responder is the one who awaits for the accident alert designed from the system.

CHAPTER 5

IMPLEMENTATION

5.1 Proposed Algorithm

Step1: Start

Step2: Set threshold values for sensors

Step3:Calculate Sensor values

If (sensor values < threshold values)

go to step 3

else

go to step 4

Step4: Get GPS co-ordinates

Step5: Send the information to help centre

Step6: Help centre contacts the nearest hospital by GPS co-ordinates

Step7: If (Hospital approves)

go to step 8

else

go to step 6

Step8: Send an ambulance or rescue team to location

Step9: Stop

Arduino Nano is used as controlling unit, communicating between modules for better information transformation at time. Accelerometer can be used for detecting the collision direction from tri-lateral axis movements. Gyroscope can be used for rollover collisions after a threshold of roll and pitch values, the weight and centre of gravity of vehicle plays an important role in rollover. The device also confirms from vibration sensors which detects the collision after a threshold voltage increase. Then a buzzer is provided to abort the false detection of accident to the passenger. Within of limited time of buzzer signal the GPS module collects the coordinates from Google Module.

These co-ordinates nearby hospitals are alerted for emergency rescue call to passenger. The hospital approves the accident by verifying the accident at specified location and confirms the accident. The saved personal members of family are informed regarding the accident through GSM module.

5.2 Code used:

```
#include <math.h>
#include <TinyGPS.h>
#include <SoftwareSerial.h>

const int x_out = A1; /* connect x_out of module to A1 of UNO
board */
const int y_out = A2; /* connect y_out of module to A2 of UNO
board */
int vib_pin=7;

 /* connect z_out of module to A3 of UNO board */
TinyGPS gps;
float lat=12.9647771,lon=77.7088037; SoftwareSerial
gpsSerial(3,4);//rx,tx SoftwareSerial
mySerial(9,10);


void setup() {

  // put your setup code here, to run once: Serial.begin(9600);
mySerial.begin(9600);
gpsSerial.begin(9600);
pinMode(vib_pin,INPUT);
delay(1000);
}
void readgsm()

{

//Begin serial communication with Arduino and Arduino IDE (Serial
Monitor)
  Serial.begin(9600);
  //Begin serial communication with Arduino and SIM900
  mySerial.begin(9600);
      Serial.println("Initializing...");
      delay(1000);
  mySerial.println("AT"); //Handshaking with SIM900
  updateSerial();
  //Serial.println("Hello"); mySerial.println("AT+CMGF=1");
  // Configuring TEXT mode updateSerial();
  //Serial.println("Hello");
  mySerial.println("AT+CMGS=\"+919030246810\"");//change ZZ with
country code and xxxxxxxxxx with phone number to sms
  updateSerial();

//Serial.println("Hello");
mySerial.print("http://maps.google.com/maps?q="); //tex
```

```
      content
mySerial.print(lat);
mySerial.print(",");
mySerial.print(lon);
updateSerial();
mySerial.write(26);
return;
      }
      void updateSerial()
      {
      delay(500);
        while (Serial.available())
        {
        mySerial.write(Serial.read());//Forward what Serial received to
        Software Serial Port
        }
        while(mySerial.available())
        {
          Serial.write(mySerial.read());//Forward what Software Serial
      received to Serial Port
        }
      }
      void readgps(){
        while(gpsSerial.available()){ // check for gps data
        if(gps.encode(gpsSerial.read()))// encode gps data
        {
        gps.f_get_position(&lat,&lon); // get latitude and longitude
        // display position
      //  lcd.clear();
      //  lcd.setCursor(1,0);
      //  lcd.print("GPS Signal");
        Serial.print("Position: ");
        Serial.print("Latitude:");
        Serial.print(lat,6);
        Serial.print(";");
        Serial.print("Longitude:");
        Serial.println(lon,6);
      //  lcd.setCursor(1,0);
      //  lcd.print("LAT:");
      //  lcd.setCursor(5,0);
      // lcd.print(lat);
        Serial.print(lat);
        Serial.print(" ");
      //  lcd.setCursor(0,1);
      //  lcd.print(",LON:");
      //  lcd.setCursor(5,1);
      //  lcd.print(lon);
```

```
 }
}
String latitude = String(lat,6); String
longitude = String(lon,6);
Serial.println(latitude+";"+longitude); delay(1000);
readgsm();
}
void loop() {
  // put your main code here, to run repeatedly:
   vib();
void acc(){
  int x_adc_value, y_adc_value;
  x_adc_value = analogRead(x_out); /* Digital value of voltage on x_out
  pin */
   y_adc_value = analogRead(y_out);
  Serial.print("x = ");
  Serial.println(analogRead(x_out)); Serial.print("y
  = "); Serial.println(analogRead(y_out));
  delay(1000);
  if (((x_adc_value)-(y_adc_value)>=25) || ((y_adc_value)-
(x_adc_value)>=25))
  {
    Serial.println("accident happened");
    Serial.println("$accident happened#");
    delay(1000);
    readgps();
    delay(1000);
    //readGSM();
    delay(10000);
  }
}
acc()
}
void vib()
{
  int val; val=digitalRead(vib_pin);
  if(val==0)
  //if(digitalRead(vib_pin)==0)
{
  Serial.println("$accident occured#"); delay(1000);

  readgps();
  delay(1000);
  //readGSM();
  delay(10000);
//  lcd.clear();
}
}
```

Source Code - Alcohol Detection

```
#include <LiquidCrystal.h> //Libraries LiquidCrystallcd(2, 3, 4,
5, 6, 7); //Arduino pins to lcd #define sensor_pin A0
#define G_led 8

#define R_led 9

#define buzzer 13


float adcValue=0, val=0, mgL=0;

void setup(){// put your setup code here, to run once  pinMode(sensor_pin, INPUT);

pinMode(R_led,OUTPUT); // declare Red LED as output pinMode(G_led,OUTPUT); // declare Green LED as output pinMode(buzzer,OUTPUT); // declare Buzzer as output  lcd.begin(16, 2); // Configura lcd numerocolumnas y filas lcd.clear();

lcd.setCursor (0,0);  lcd.print("
Welcome To   "); lcd.setCursor
(0,1); lcd.print("Alcohol
Detector"); delay(2000);
lcd.clear();
}
```

```
void loop()
{
adcValue=0;
for(int i=0;i<10;i++){
adcValue+= analogRead(sensor_pin); delay(10);
}  val = (adcValue/10) * (5.0/1024.0); mgL =
0.67 * val; lcd.setCursor(0, 0);
lcd.print(" BAC: ");
lcd.print(mgL,3);
lcd.print("mg/L   ");
lcd.setCursor(0, 1);
if(mgL>0.8){
lcd.print("      Drunk     ");
digitalWrite(buzzer, HIGH);  digitalWrite(G_led, LOW); // Turn LED off.  digitalWrite(R_led, HIGH);
// Turn LED on.
delay(300);
}
else
{ lcd.print("    Normal   ");
```

```
digitalWrite(G_led, HIGH); // Turn
LED on. digitalWrite(R_led, LOW);
// Turn LED off.
}
 digitalWrit
e(buzzer,
LOW);
delay(100);
}
```

CHAPTER 6

RESULTS AND DISCUSSION

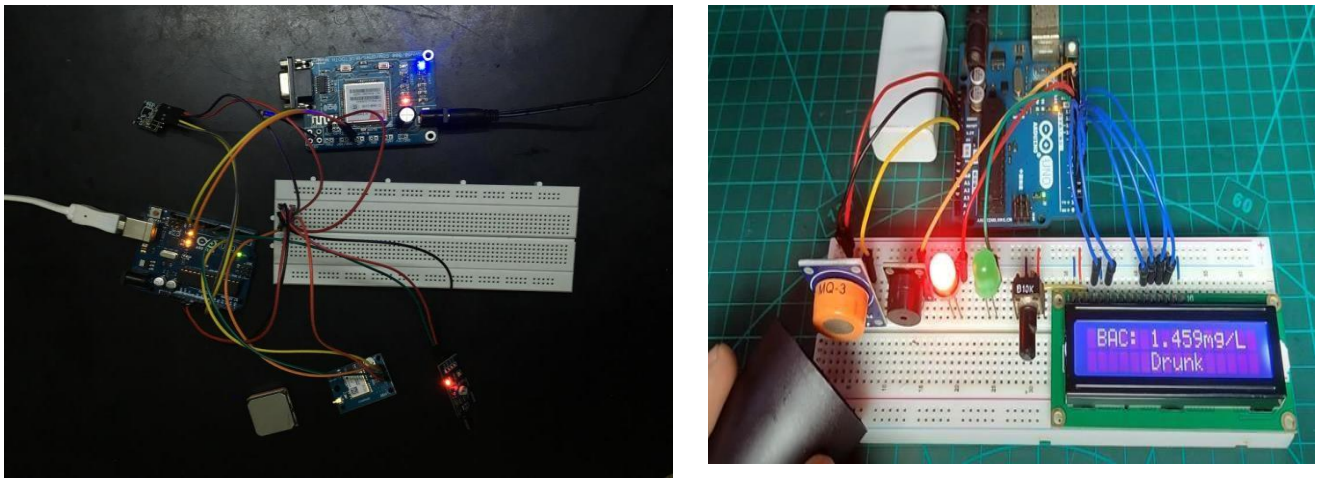


Fig 11: interfacing controller with all other module

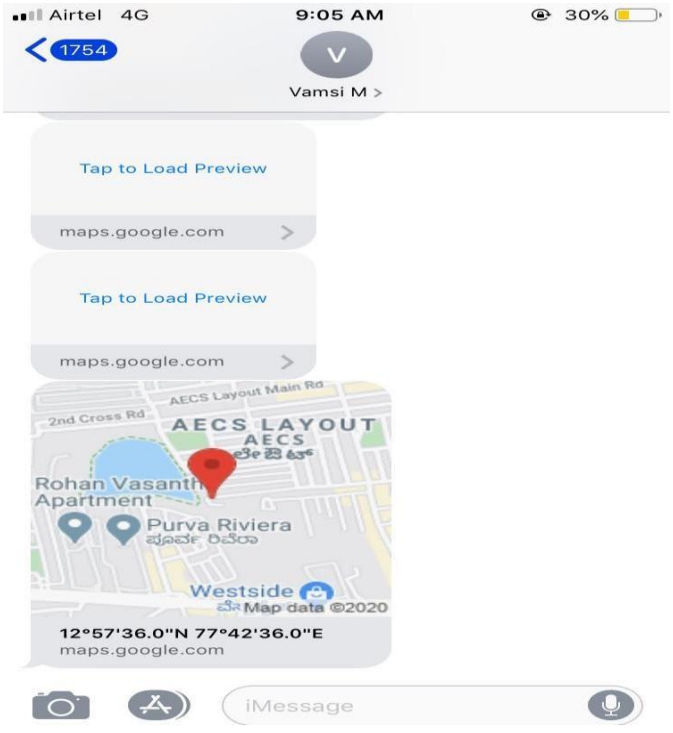


Fig 12: Alert message

CHAPTER 7

TESTING

There are four individual tests that have to be performed before setting up the proposed system.

7.1 Reading data from MPU-6050 module

The Arduino reads data from MPU-6050 gyroscope + accelerometer module; it is based on MEM technology. Both accelerometer and gyroscope is embedded into single chip. This chip uses I2C bus interface which is used for communicating with host interface. It has 8 pins in the chip, In order to check I2C connection between the Arduino and MPU 6050, code should be generated. Wire library's header is included, we define and some variables after this, convert function has to be defined, Setup function which usually checks for serial connection which has to be established.

Fig 13: Testing of Arduino

7.2 Location data Reading from GPS module

U-blox Neo-6M GPS module has to be tested to check if it is able to point the location. GPS receivers actually work by figuring out how far they are from a number of satellites. They are pre-programmed to know where the GPS satellites are at any given time. The satellites transmit information about their position and the current time in the form of radio signals towards the Earth. These signals identify the satellites and tell the receiver where they are located. It indicates the position fix, it will blink at various rates depending on what state it is in. No Blinking indicates that it is searching for the satellites. If it blinks every second which indicates that the position is found.

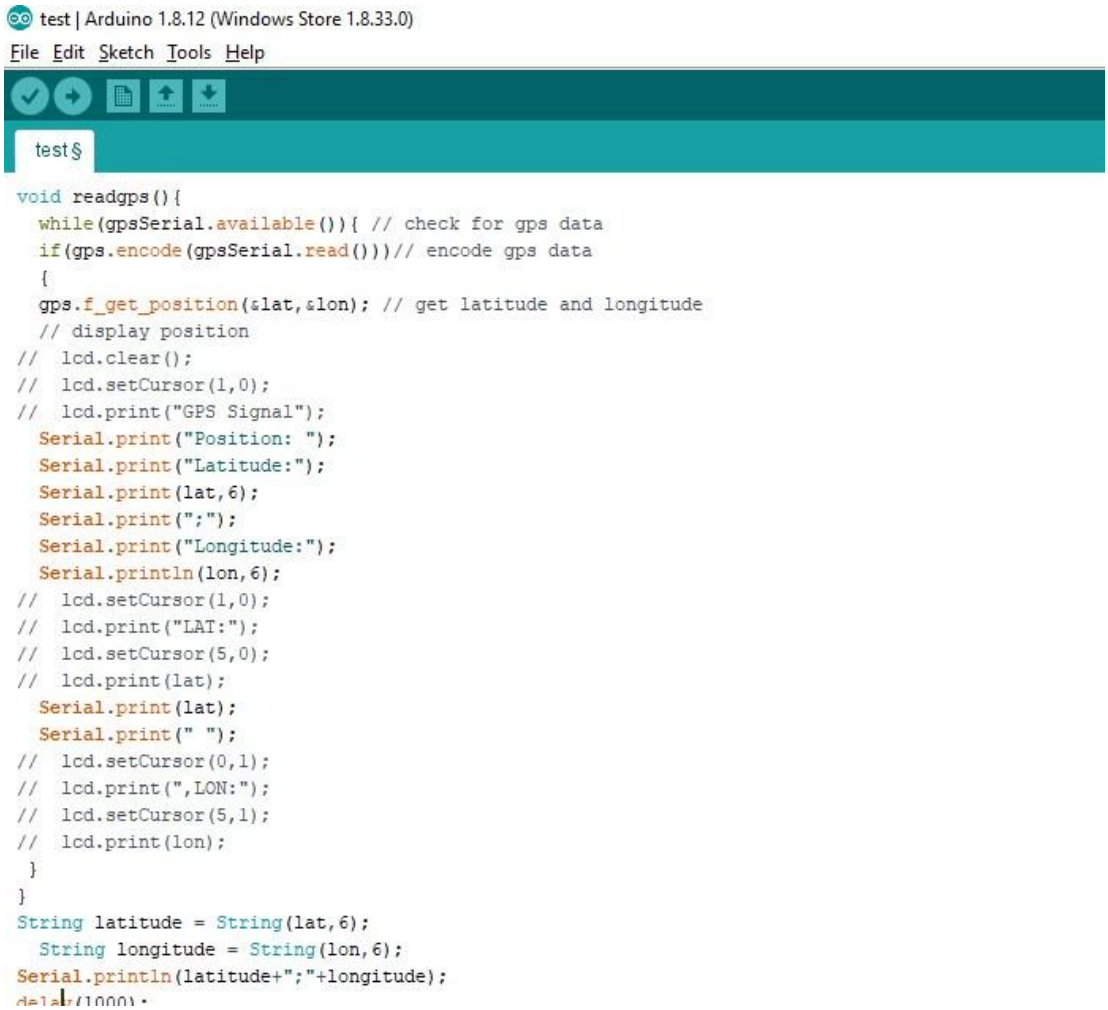


Fig 14: Testing of GPS module

7.3 Sending Alert message by GSM SIM900A module

We have to make sure that the connection is established between Arduino and GSM. There are two ways of doing it, One is to connect TX pin of GSM to RX pin of Arduino and RX pin of GSM module to TX pin of Arduino. Two is by selecting two PWM enabled pins of Arduino (Pin 9, 10). It uses software serial library of Arduino, when the connection is established the data can be fed directly to GSM.

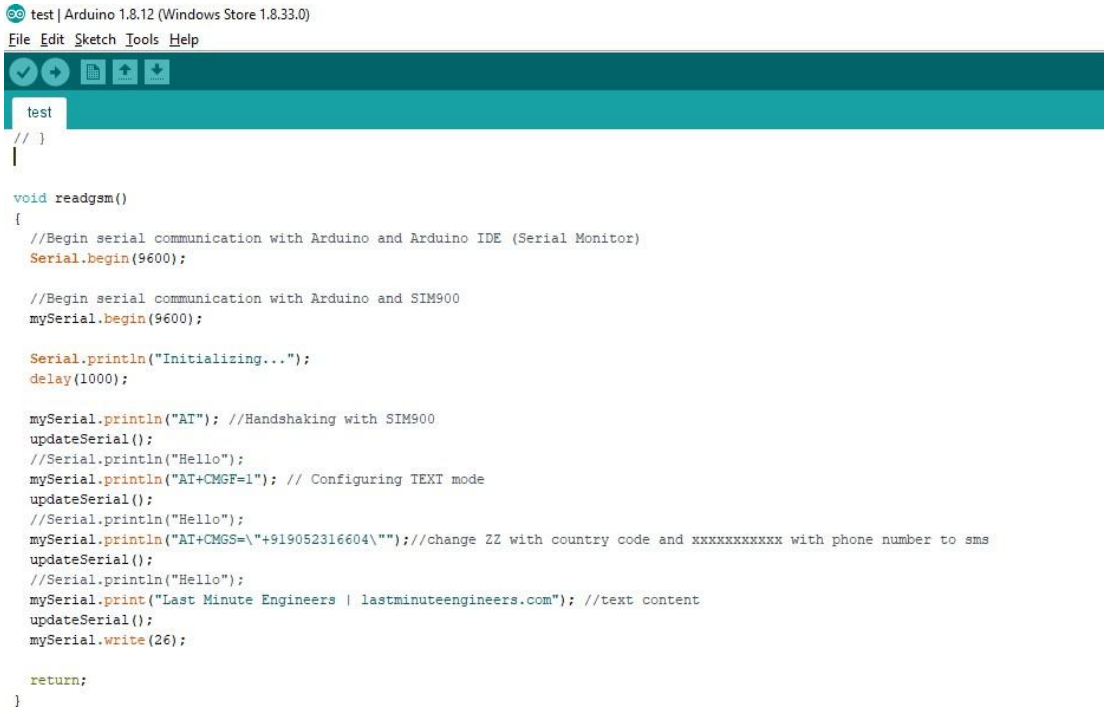


Fig 15: Testing of GSM

7.4 Displaying on LCD

Interfacing between LCD and Arduino is also tested. We should study the schematic carefully. Next is to place your LCD on the bread board. Make sure that the connection is done according to the circuit diagram. Instead of the potentiometer, you can use a 1k resistor and connect Pin 3 of LCD to Vcc via the resistor. Carefully check whether all the connections are tight and correct. Power up your Arduino via USB and check whether the LCD lights up. If yes, proceed.

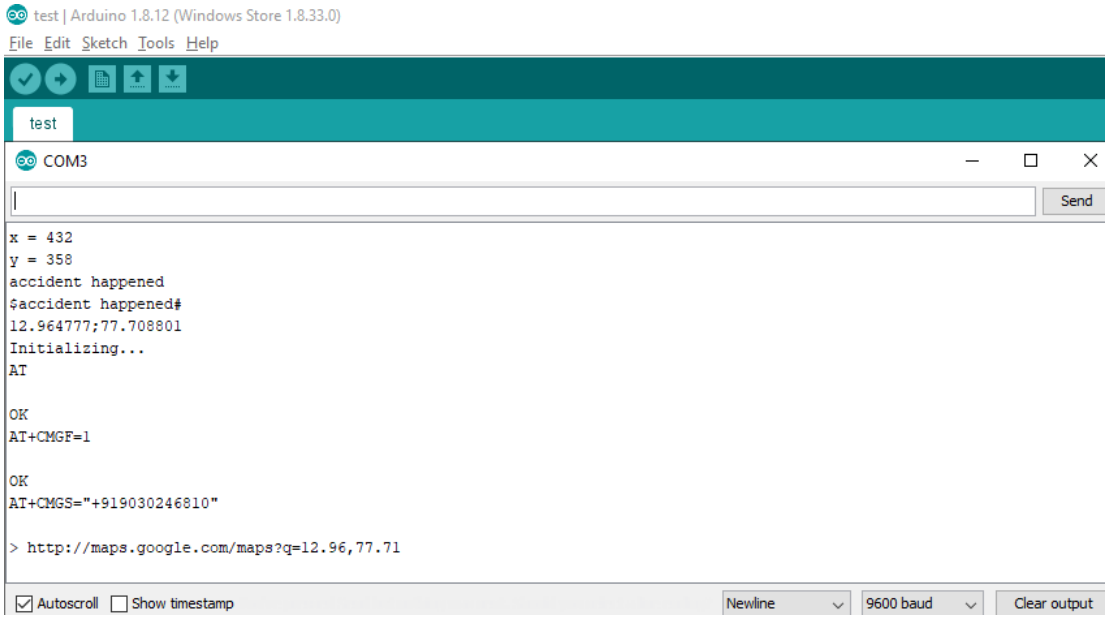


Fig 16: Testing of accident detection

7.5 Displaying on MQ3 Sensor

To test and display readings from an MQ-3 gas sensor, you'll typically connect the sensor to a microcontroller like Arduino, and then display the sensor's output (either digital or analog) on a display or serial monitor. The MQ-3 is highly sensitive to alcohol, so it's often used in breathalyzers or alcohol detection systems.

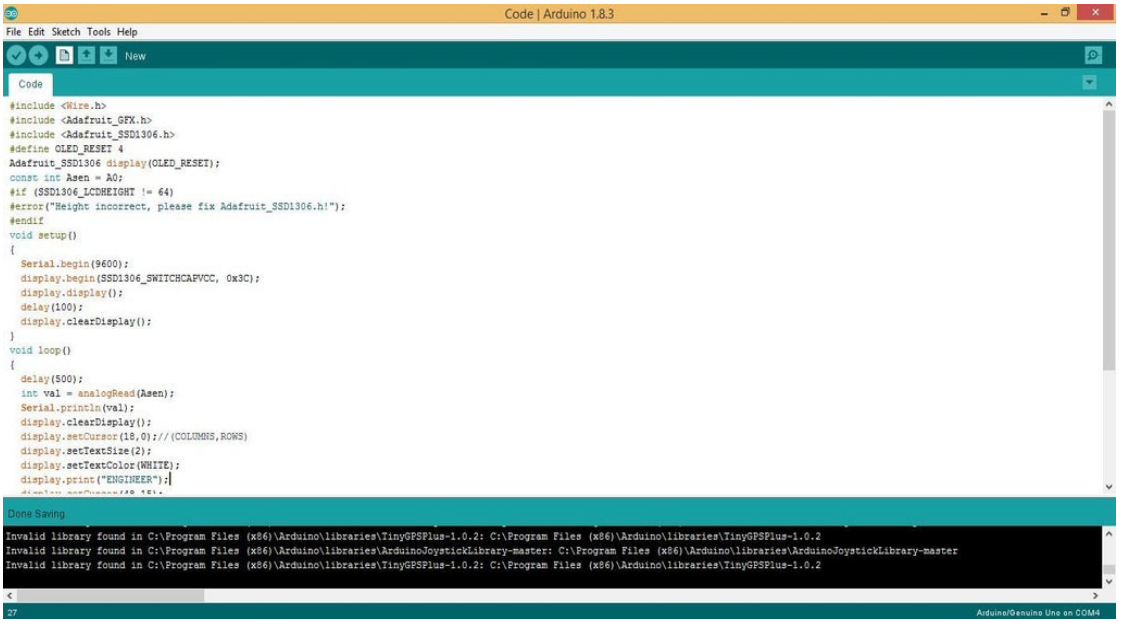


Fig 17: Testing of Aclohol detection

CHAPTER 8

CONCLUSION AND FUTURE SCOPE

8.1 Conclusion

A system to detect an event of accident has been developed. The proposed system deals with accident alerting and detection. It reads the exact latitude and longitude of the vehicle involved in the accident and sends this information to nearest emergency service provider. Arduino helps in transferring the message to different devices in the system. Accelerometer monitors the accident happening direction and gyroscope is used to determine rollover of the vehicle. The information is transferred to the registered number through GSM module. Using GPS, the location can be sent through tracking system to cover the geographical coordinates over the area

The technologies that are utilized in the system that is being suggested are more than capable of ensuring that the intoxicated driver will make a full recovery. In each and every endeavor, there is the potential for improvement. There are several adjustments that need to be performed in order to make this process more efficient. There is a possibility that in the future, this system will be improved by being made smaller. The alcohol system is made more user-friendly through the process of miniaturization, which in turn enhances the likelihood that drivers may accept intoxicating substances. It is of the utmost importance to position the alcohol sensor in such a way that it can be readily and correctly measured the amount of alcohol consumed by the driver, regardless of whether or not the driver is there to provide help.

8.2Future Scope

The future scope of this system can have some improvisation using a wireless webcam can be added in this for capturing the images which will help in providing driver`s assistance. This can also be bettered by locking all the brakes automatically in case of accident. Mostly in accidents, it becomes serious as the drivers lose control and fails to stop the vehicle. In such cases, the vibration sensor will be triggered because of the vibrations received and also processed by the processor.

. The investigation of alcohol detection with the use of Arduino is a fascinating field. In the development of an alcohol detection system, this technology demonstrates a great deal of potential as a prospective application. This technology has the potential to reduce the number of accidents that are caused by drivers who are under the influence of alcohol or drugs, hence reducing the number of incidents that would otherwise occur.

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