# Juni Khyat (UGC Care Group I Listed Journal)

#### ISSN: 2278-4632 Vol-13, Issue-04, March 2023

### IMPLEMENTATION OF ARDUINO BASED ALCOHOLSENSE ENGINE LOCK & GPS

DR.S.SRI JAYA LAKSHMI Associate professor, <u>srijayakhitec@gmail.com</u> P. SWETHA PRIYA, M.PAVAN SAI, K.RAVI KUMAR, P. RAVI PRAKASH<sup>5</sup>, P.LIKITHA UG Students,

Dept. of Electronics and Communication Engg. Kallam Haranadha Reddy Institute of Technology, Guntur (A.P), India

Abstract- Drunk driving is one of the major reasons behind road accidents worldwide. In all of the road accident cases worldwide drivers have been observed to have excess alcohol content in their blood. So we here design a smart alcohol detector system using Arduino coupled with gsm and gps for location transmission. The system allows for automatic sensing of alcohol in breath, we also use a motor to demonstrate as a vehicle. We further use a GPS module with GSM to send an SMS message to the concerned person in case alcohol is detected and stop the vehicle motor. The system consists of an Arduino Nano board along with an Mq-3 alcohol sensor for detection and a GSM/GPS Module for notification.

*Keywords:* Arduino NANO, MQ-3 Sensor, GSM MODULE, GPS MODULE, Buzzer, DC Motor, LCD.

#### 1. INTRODUCTION

These days, majority of road accidents are caused by drink driving. Drunken drivers are in an unstable condition and so, rash decision are made on highway which condition endangers the lives of road users, the driver inclusive. However, effective monitoring of drunk and drivers is the challenging to the policeman and the road safety officers. Many research officer's efforts have been directed to the design of efficient system that will monitor drunk driving. This project developed a prototype alcohol detection and engine locking system by using Arduino Nano microcontroller interface with an alcohol sensor along with an lcd screen and a DC motor to demonstrate the concept. India had earned distinction in having more number of casualties due to road accidents around the world. Road safety is appearing as a big social concern around the world especially in India.

Drinking and driving is a serious issue which probably would emerge as one of the most significant problems in the near future. The system proposed by us focus at minimizing number of road accidents in the near future because of drunk driving. The system detects the alcohol level present in the air inside the vehicle.

At low level it sends an SMS to the preregistered contacts while at high level it locks the engine immediately and at the same time sends SMS along with the location to three pre-selected contacts.

Hence the system will reduce the number of road accidents and casualties due to drunk driving in future. INDIA the world's second most populated country.

#### 2. PROBLEM STATEMENT

Previously, there was no technology to lock the engine of the vehicle after sensing the alcohol consumption by the driver , which was considered to main cause of the road accidents. There was manual checking after particular distance on the roads or the highways but still these checks were not sufficient to stop the happening of the mishaps. So, to avoid these problems, this project implementation of Arduino based alcohol sense engine lock & GPS.

### 3. LITERATURE SURVEY

- A. The writer has put forward a technique which utilizes GPS and GSM to ascertain alcohol but this technique is very expensive, but the expenses can be cut off to a great extent. In this project a siren is being used which is highly economical, and can keep people in close proximity vigilant. [1]
- **B.** Wearing smart helmet to prevent any mishap is suggested by writer which have certain deficiencies. Firstly restrictions on the use of helmets to only 2 wheelers. Secondly,microcontrollers are software based mega system in comparison to the economical siren that are open source hardware. [2]
- **C.** Composite health monitoring and sensors based on infrared are utilized to ascertain alcohol as talked about by writer but the chance of false alarm can't be avoided in this system, because minute change in some situations can result in false alarm but in our project use of required technology makes it more authentic. **[3]**
- D. To prevent the mishap of drunken driving writer have used PIC16F877A microcontroller which is an outdated system and expensive one also which restrains its use to only certain class of society whereas we are using Arduino and Uno microcontroller which is advanced as well as economical. [4]
- E. Worrying about the drunken driving the writer suggests the system to overcome the issue but using mQ2 alcohol sensor has come flames .MQ2 alcohol sensor is not authentic and raises the chance of false alarm while we have used MQ3 which is highly authentic. [5]

# 4.EXISTING SYSTEM

There are many works carried out on the drivers drowsiness detected. A large number of road accidents takes place due to the fatigue of drivers due to alcohol consumption. An embedded system with UNO and open CV is developed.

Where the Alcoholic drivers are detected in real time using the drivers drowsiness and intoxication, since large number of road accidents takes place due to alcohol drinking. In the computer vision concept is used which has an alcohol gas sensors combined with the Raspberry pi micro-controller and accidents and possibly prevent drunken-driving. The theft of the vehicle is also a major concern today, so if any theft happing in the vehicle embedded systems .

An ARM based face recognition system is developed with open CV library using the ARM based microcontroller and USB camera to detect continuous image. The image captured is compared with the existing database and the output is sent to the GPS and sent the information regarding the person to the authorises in charge using GSM. They used a vehicle based control in the school zone and controls the speed of the vehicle in brides, hospital areas and many other important areas.

Though there are many works carried out they concentre only on a specific feature and the accuracy level should be improved. The manual detection device that cops use, do analyze the breath and detect the alcohol consumption and penalize the defaulting drivers but then it becomes increasingly impossible for the traffic-cops to control, measure and monitor the vehicle movement given the size of modern-day traffic. It therefore becomes imperative for government authorities to take advantage of the growing technology to prevent should be notified to the police or the vehicle owner.



Fig.1: Existing system

### **5.PROPOSED SYSTEM**

If The Alcohol Detection with Engine Locking system helps to reduce accidents which are occurring due to drunk driving. MQ-3 sensor detects the presence of alcohol in the surroundings. The sensor provides output on the basis of the concentration of the alcohol, if the alcohol concentration is higher the conductivity of MQ-3 sensor increases which in turn gives the reading to

ARDUINO NANO. The reading is greater than the threshold level, ARDUINO NANO will stop the DC motor. The red LED will also blink if the distance is less than the safe distance to give indication to other vehicles that the vehicle in front of them is unsafe. Now, with the help of SIM900A the message will be sent to the civil forces that the particular vehicle is unsafe and can be a threat to other people.





Despite the size, Arduino Nano packs in more or less the same features as UNO. If you compare UNO and Nano, then Nano lacks the DC Power Jack and contains a mini-B type USB connector.



Fig.3: Arduino NANO

Other than that Nano is very similar to UNO in terms of functionality. The Nano board is designed in such a way that the pins are breadboard friendly so that you can easily

## Page | 34

### Copyright @ 2023 Author

### Juni Khyat (UGC Care Group I Listed Journal)

mount it on one for your DIY projects. Overall, the Arduino Nano is a very good alternative to the mighty Arduino UNO and is available at a lower price. Personally speaking, I suggest Arduino Nano over UNO as it is cheaper, breadboard friendly, small in size and has couple of more pins (digital and analog IO) than UNO.

#### 5.2MQ-3 SENSOR:-

MQ3 Gas Sensor is another one of MQ family of gas sensors which is used to detect the alcohol content from 0.05 mg/L to 10 mg/L.



#### Fig.4:MQ-3 Sensor

It has a sensing element made of Tin Dioxide (SnO<sub>2</sub>) which has lower conductivity in clean air but when it comes in contact with alcohol gases the conductivity increases in proportion to the concentration of alcohol present. Thus, this Alcohol Sensor is a low cost solution to measure the alcohol level, also it is resistant to the disturbances caused by the gasoline, vapour and smoke. The sensor has Analog output corresponding to the concentration of the Alcohol gas present or you can also get Digital Output for a concentration using particular the onboard potentiometer. This module can be used as a portable alcohol detector, Gas level over limit alarm, Breathalyser etc.

#### 5.3GSM MODULE:-

SIM900A Modem is built with Dual Band GSM based SIM900A modem from SIMCOM. It works on frequencies 900MHz.

SIM900A can search these two bands automatically. The frequency bands can also be set by AT Commands.



#### Fig.5: GSM Module

The baud rate is configurable from 1200-115200 through AT command. SIM900A is an ultra-compact and wireless module. The Modem is coming interface, which allows you connect PC as well as microcontroller with RS232 Chip (MAX232). It is suitable for SMS, Voice as well as DATA transfer application in M2M interface. The onboard Regulated Power supply allows you to connect wide range unregulated power supply. Using this modem, you can make audio calls, SMS, Read SMS, attend the incoming calls and

## ISSN: 2278-4632 Vol-13, Issue-04, March 2023

etc. Through simple AT commands. This is a complete GSM module in a SMT type and made with a very powerful single chip, allowing you to benefit from small dimensions.

#### 5.4 GPS MODULE:-

Give your next Arduino project ability to sense locations with NEO-6M GPS Module that can track up to 22 satellites and identifies locations anywhere in the world. It may serve as a great launch pad for anyone looking to get into the world of GPS.



Fig.6: GPS Module

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.

#### 5.5 D.C MOTOR :-

This 12 Volt Metal Gears DC Motor 100 RPM can be used in all-terrain robots and a variety of robotic applications. These motors have a 3 mm threaded drill hole in the middle of the shaft thus making it simple to connect it to the wheels or any other mechanical assembly.



Fig.7.DC Motor

These motors are simple DC Motors featuring metal gears for the shaft for obtaining the optimal performance characteristics. They are known as center Shaft DC Geared Motors because their shaft extends through the center of their gearbox assembly.

#### 5.6 BUZZER:-

An audio signalling device like a beeper or buzzer may be electromechanical or piezoelectric or mechanical type. The main function of this is to convert the signal from audio to sound. Generally, it is powered through DC voltage and used in timers, alarm devices, printer alarms, computers, etc generate different sounds like alarm, music, bell.



# 5.7 LCD DISPLAY:-

An electronic device that is used to display data and the message is known as LCD  $16\times2$ . As the name suggests, it includes 16 Columns & 2 Rows so it can display 32 characters ( $16\times2=32$ ) in total & every character will be made with  $5\times8$  (40) Pixel Dots. So the total pixels within this LCD can be calculated as  $32 \times 40$  otherwise 1280 pixels. 16X2 displays mostly depend on multi-segment LEDs.



#### Fig.9: LCD

There are different types of displays available in the market with different combinations such as  $8\times2$ ,  $8\times1$ ,  $16\times1$ , and  $10\times2$ , however, the LCD  $16\times2$  is broadly used in devices, DIY circuits, electronic projects due to less cost, programmable friendly & simple to access.

### 6. RESULT AND DISCUSSIONS:-



fig.10: MODEL

A drunk person tries to take control of vehicle, the alcohol sensor will detect the presence of alcohol and if presence of alcohol is detected by the sensor, it will shut down the vehicle's engine and sound an buzzer there by alerting the near by people.



Upon integrating the GPS and GSM module the location of the drunk driver vehicle which is sent via text message is shown in below figures together with Google map location of the coordinates.



Fig.12:Google Map Integration

### 7.APPLICATIONS AND ADVANTAGES:-

- The alcohol detection with engine locking system can be implemented in any 4-wheelers.
- The Government can keep track of drunken driving cases.It can provide quick and accurate results.
- Chance of loss of life and property is minimized.
- Warning the nearest authority using GSM module will provide accurate information for a specific vehicle located using a GPS tracker

### 8.CONCLUSION:-

The system runs perfect in detecting the presence of alcohol in the presence of alcohol in the driver's breath that does a further action which is tracking the location of the car and sending its position in latitude and longitude via text message to authorized persons development in automobile industry regrading accident prevention technology. Being small in volume, this alcohol detection system will be feasible and easy to implement.

## 9.ACKNOWLEDMENTS: -

We would like to express our sincere gratitude to our project supervisor for providing us with guidance and valuable insights throughout the project. We would also like to acknowledge the support of our friends, and faculty who contributed their time and effort in helping us with the project. Additionally, we would like to thank the manufacturers of the SIM900A GSM module, Arduino NANO, and NEO 6M GPS module for providing us with high-quality components that enabled us to build the system. Finally, we are grateful

# Copyright @ 2023 Author

### Juni Khyat (UGC Care Group I Listed Journal)

to the IEEE community for providing us with a platform to share our research and contribute to the field of women's safety.

#### **10.REFERENCES:-**

- L. A. Navarro, M. A. Diño, E. Joson, R. Anacan and R. D. Cruz, "Design of Alcohol Detection System for Car Users thru Iris Recognition Pattern Using Wavelet Transform," 2016 7th International Conference on Intelligent Systems, Modelling and Simulation (ISMS), Bangkok, 2016, pp. 15-19.
- 2. Cahalan,D., I. Cisin, and Crossley, American Drinking Practices: A National Study of Driving Behaviour and Attitudes. 1969, Rutgers University Press: New Brunswick, NJ. MUGILA.G, MUTHULAKSHMI. M,SANTHIYA.K.
- Dhivya M and Kathiravan S, Dept. of ECE, Kalaignar Karunanidhi Institute of Technology-Driver Authentication and Accident Avoidance System for Vehicles [Smart Computing Review, vol. 5, no. 1, February 2015].
- 4. Babor , AUDIT: The alcohol use disorders identification Test: Guidelines for use in primary health care. 1992, Geneva, Switzerland: World Health Organization.
- 5. Lee, Assessing the Feasibility of Vehicle-Based Sensors To Detect Alcohol Impairment. 2010, National Highway Traffic Safety Administration: Washington, DC.
- 6. <u>http://www.arduino.cc/</u>
- 7. A.ISuge,H.Takigawa,H.Osuga,H.Soma

,K.Morisaki, Accident Vehicle Automatic Detection System By Image Processing Technology, ©IEEE 1994 Vehicle Navigation & ISC.