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Alcohol Detection to Lock Engine and Incident Reporting

Odde Navya[1], Jeldi Mounika[2], Kodishala Varun[3], Mrs. N. Anupama Rani[4]
[1, 2, 3]*B.Tech IV year*, [4]*Assistant Professor, Electronics and CommunicationEngineering, Sreenidhi Institute of Scienceand Technology, Ghatkesar, Hyderabad*

***Abstract:** Most of the road accidents are occurring due to drunk-driving. We hear about a lot of accidents these days that are caused by drunk driving. Drunk drivers are not in a stable state, and as a result, rash driving occurs on the roadways, endangering the lives of everyone on the road, including the driver. Thousands of traffic accidentswere reported by the Indian Ministry of Statistics in 2016.*

Our project presents the design and implementation of "Alcohol Detection to Lock Engine and incident reporting" using alcoholsensor, arduino UNO, GSM Module. The system will continuously monitor level of alcohol concentration using MQ-3 alcohol sensor and thus turn off the engine of vehicle if the alcohol concentration is above threshold level. The LCD display is used to display the stat us of the vehicle.

This model will send the message ofwhereabouts of the vehicle through GSM module thus reporting the incident .the project provides an efficient solution to control road accidents due to drunk driving.

Keywords: Arduino UNO, MQ-3, GSM Module Buzzer, LED, SERVO Motor.

I. INTRODUCTION

The magnitude of the harm caused by dangerous driving knows no bounds. The extent of the devastation inflicted by careless driving is immeasurable. Drivers in India are now prohibited from drinking and driving, therefore the fee will dissuade them from doing so.

Despite the fact that speeding is the top cause of these accidents, it's safe to believe that the vast majority of them are caused by the driver's unstable state, which is caused by the driver becoming drunk before driving. According to a study conducted by the World Health Organization in 2008, around 50 percent to 60 percent of road accidents are caused bydrunk driving.

Moreover, World Health Organization info on road traffic deaths disclosed one.25 million traffic deaths were recorded globally in 2013 with the low- and middle-income countries having higher fatality rates per a 100K population (24.1% and 18.4%respectively), info collected showed that many of economic vehicles drivers in Asian nation admitted to drinking alcohol throughout in operation days.

II. LITERATURE SURVEY

A. Now-a-days, mobile phone is used mostly by all people with internet usage are, so these mobile phone also provide correspondence platform as they are equipped with 2G or 3G network. There are lots of cause for mischance of car such as drunkenness of driver, drowsiness of driver, unconsciousness of driver, and numerous time what happens driver is not responsible for mishap but rather their (car) neighboring car behavior also have made and part to uphold mischance. There are some system that have been implemented to maintain a strategic distance from mischance but that do not give proper solution toimplement in car to avoid various accidents that they are normally being happen.[1]

B. IoT is an emerging technology which has the potential to solve many social problems which the society is facing today, one such problem is Driving under Influence or Drunken Driving. IoT can help reduce the rate of accidents due to DUI by preventing reckless drivers from operating a motor vehicle under the influence of the alcohol, by embedding sensors into the vehicle we can monitor the driver and determine whether if he is drunk or not even before the driver starts the car.[2]

C. Introduces methods such as alcohol detection, heart beat rate observing system and personal recognizable proof system and discuss how they can be implemented to maintain a strategic distance from accident.[3]

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III. PROPOSED SYSTEM:

The MQ3 alcohol sensor detects the presence ofalcohol in the environment in this proposedsystem. The sensor produces an output based on the alcohol content; as the alcohol concentration rises, the conductivity of the MQ-3 sensor rises, providing a reading to the Arduino.if the reading greater than threshold level, arduino will stop the SERVO motor.an LCD display isused to displaythe status of the motor. like, when the alcohol isnot detected ,theLCD will display as no alcohol and vehicle is ON and if the alcohol is detected theLCD will display as Alcohol is detected andvehicle stopped .Then the microcontroller sendsSMS to the handheld mobile phone with the helpof a GSM modem.Thus reducing theroad accidents.The aim is to automate and make a system that provides a reliable and efficient way to detect alcohol Level and reduce road accidents.It should be flexible enough so that the vehicle can be monitored accordingly.

IV. HARDWARE AND SOFTWAREDESCRIPTION

A. Hardware Components

The components that we require for designingthe system are of few sensors and controllers like:

1) Arduino UNO-ATMega328P

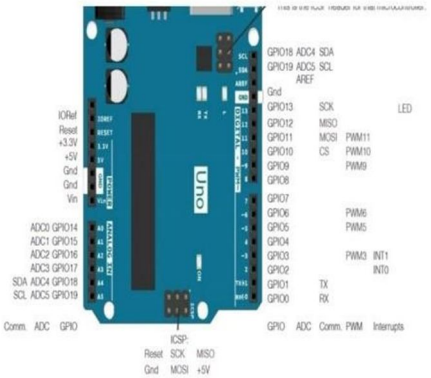


Fig.1.Arduino Uno

The Arduino Uno is a microcontroller development board based on the Atmega-328P microcontroller.The arduino performs a variety of roles, including microcontrollers, computer circuit units, and mostly small computers that run simple software package programmes. The arduino is sufficiently low-powered and can be powered by various batteries for years, yet it is capable of measuring data far faster than a person's brain can process/suppose. The Board is an Italian group that designs and sells circuit sheets that make microcontrollers simple to use; they call these circuit sheets Arduino, and there are many different types of Arduino, they can be used in a variety of ways and have a variety of uses. For example, we had simple Arduino sheets that looked like Arduino-uno and were conservative/very beneficial for each work.

2) MQ-3 Alcohol Sensor



Fig.2.MQ-3 Sensor

The MQ-3 detector is created of Tin oxide (SnO2) delicate layer. it's sorted come in such a structure to grant high affectability to liquor and low affectability to benzol. it's a right away drive circuit to grant spirited reaction, quality, and longer period of time.
Features: operating at 5 volts LEDs for output and power are simple to utilise.Adjustable output sensitivity Digital output 0V or 5V Analog output 0V to 5VLow cost, quick response,long life, and good sensitivity to alcohol gas Both digital and analogue outputs are available.LED Indicator on Board

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3) Servomotor



Fig.3.Servo Motor

A servomotor (also known as a servo motor) is a simple electric motor that is controlledby servo mechanism.
When a motor is used as a controlled device and is connected to a servo mechanism, it is referred to as a DC Servo Motor. A controlled motor that is powered by AC is referred to as an AC Servo Motor.
A servo motor is a linear or rotary actuator that provides for exact control of position, acceleration,and velocity in linear or angular directions. It is made comprised of a motor and a position feedback sensor.It also necessitates a complex controller, which is frequently a separate module created exclusively for servo motors.

4) SIM900A GSM Module: GSM (Global System for Mobile Communication) digital cellular technology is used to transmit mobile data and voice services. In 1970, Bell Laboratories used a mobile radio system to accomplish this concept. It is the name of the standards group that was formed in 1982 in order to develop a general European mobile telephone standard.



Fig.4.SIM900A GSM Module

SIM900A GSM Module is the smallest and cheapest module for GPRS/GSM communication. It is common with Arduino and microcontroller in most of embedded application. The module uses GPRS/GSM technology to communicate with a mobile sim card. It operates on the 900 and 1800 MHz frequency bands and allows users to make and receive phone calls as well as SMS messages. Developers can create customised applications using the keypad and display interface. In addition,it includes two modes: command mode and data mode. GPRS/GSM and various protocols/frequencies are used in each country. Developers can use command mode to adjust the default settings to meet their needs.

a) Applications

The module is the most effective tool for creatinggraphics for voice and SMS applications.
The module is used in some IoT applications,mainly in emergency situations.

SIM900A is also used in the location tracing system.SIM900A is a mobile communication device.

5) Buzzer



Fig.5.buzzer

Transducers require external circuitry but provide a wider range of audio frequencies than buzzers configured as indicators. Buzzers configured as indicators require only a dc voltage to run but are confined to a single audio frequency of operation.

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6) 16x2LCDMODULE



Fig.6.lcd display

LCD modules are commonly used in most deep- seated activities due to their low cost, accessibility, and developer friendliness. In our daily lives, most individuals would have brushed up against these screens, whether at PCOs or mini-computers. On top of that, the aesthetics and pin outs have been well depicted, allowing us to become piece technical.In spite of the fact that it has sixteen columns and two rows, the 16x2 alphanumeric display is recognised as such. There are several combinations available, such as 8x1, 8x2, 10x2, 16x1, and so on, but the 16x2 alphanumeric display is the most widely used.This means it will have a total of (16x2=32) thirty- two characters, each of which will be made up of 5x8 element Dots. We now believe that each character has (5x8=40) forty pixels, and that thirty-two characters will have (32x40) 1280 pixels. Furthermore, the Position of the Pixels must be communicated to the alphanumeric display. As a result, agitating The alcohol detecting system, together with the engine everything with an MCU will be a difficult task, thus an interface IC such as the HD44780 is used, which is located on the back of the alphanumeric display Module itself. This IC's functionality is to interact with the MCU's commands and knowledgeto highlight critical information on ouralphanumeric display screen.

a) Specifications

Operating Voltage is four.7V to 5.3V
LCD display module, which means will showalphabets and numbers.
Consists of 2 rows and every row will print sixteencharacters.

B. Software Requirements

1) ArduinoIDE

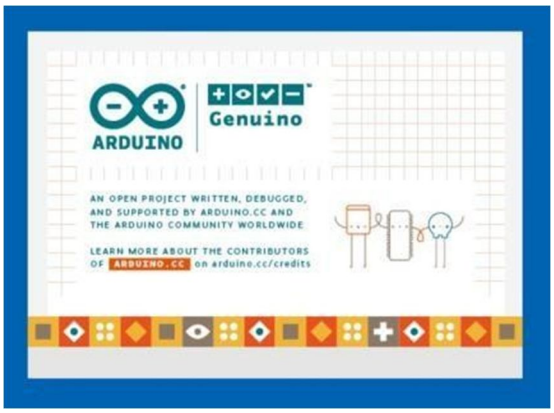


Fig.1.ArduinoIDE

It is an ASCII text file that will be used to programme the Arduino board. The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, and Linux) created by Arduino. It's used to write and transfer data to Arduino viable sheets, as well as other vender improvement sheets with the support of outsider centres.

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V. WORKING

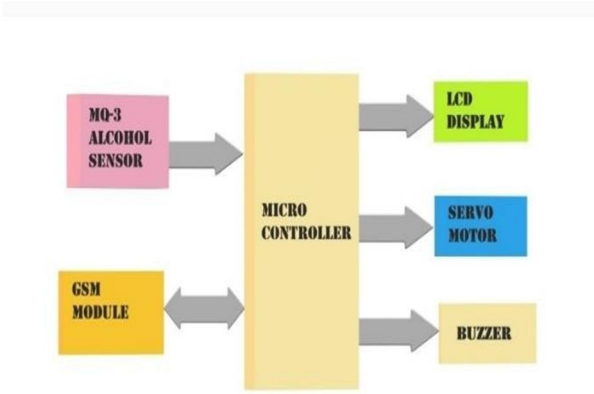


Fig 8.block diagram

Locking system and incident reporting, helps to decrease accidents caused by drunk driving. We have used servo motor in our prototype to demonstrate the engine locking. In absence of alcohol, servo motor position is set to 0 degrees which demonstrates that the fuel pump is open. In the presence of alcohol the servo motor is set to 180 degrees demonstrating that the fuel pump is closed which in turn locks engine of the vehicle in real time.The presence of alcohol in the environment is detected by the MQ-3 sensor. The sensor outputs based on the alcohol content; if the alcohol concentration is higher, the conductivity of the MQ-3 sensor increases, giving the reading to Arduino. If the reading exceeds the threshold level, the arduino will turn the servo motor to 180 degrees from 0degrees. We have used servo motor in our prototype to demonstrate the engine locking. Then the GSM module will make an alert call to the registered user to report the vehicle status. When alcohol is detected, the buzzer is also engaged. The buzzer warns us that the vehicle in front of us is dangerous. An LCD display is used to show the vehicle's status, such as whether it is safe or not.

VI. RESULTS&DISCUSSION

We used an Arduino uno board to connect a MQ3 alcohol sensor, a servo motor, a GSM module, an LCD display, and a buzzer.The alcohol sensor detects the presence of alcohol in the environment and provides analogue input to the Arduino. We put our prototype to the test by setting a 700 ppm threshold.

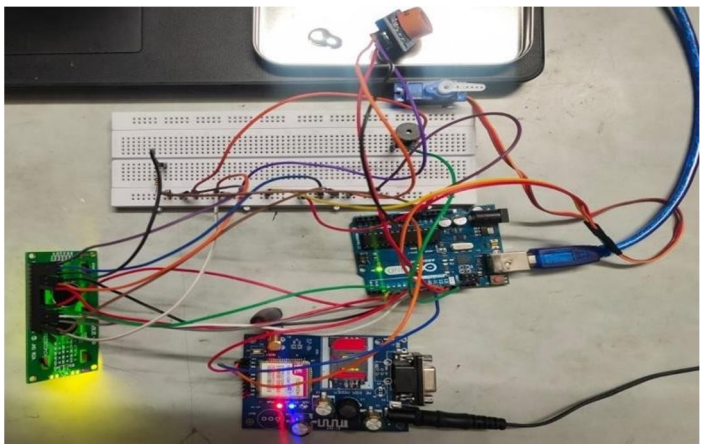


Fig .1.output1

In the figure shown above the machine indicated that there is no alcohol detected because it has not crossed the threshold level. Hence the servo motor will remain in its initial position that is 0 degrees.

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Fig .2.output2

As there is no alcohol ,the message “NO ALCOHOL” will be displayed in the LCD screen as shown in the above figure.

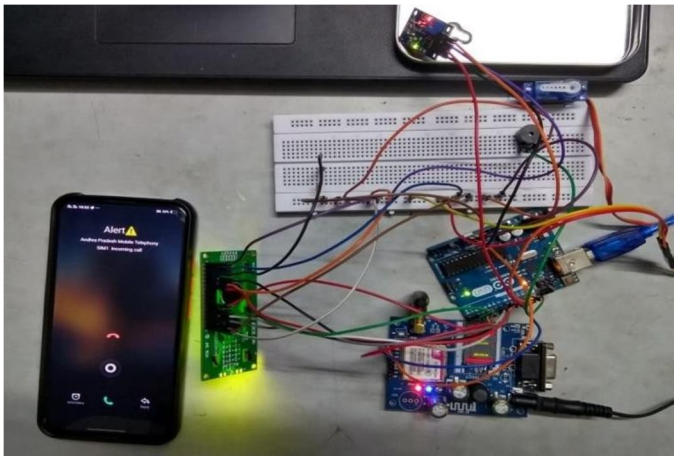


Fig.3.output3

In the figure shown above the machine indicated that there is alcohol detected because it has crossedthe threshold level reset and hence the servo motor will turn to 180 degrees from initial position. And the GSM module made the alert call to the registered user to report the incident. The message as “ALCOHOL DETECTED” is displayed on the LCD screen.

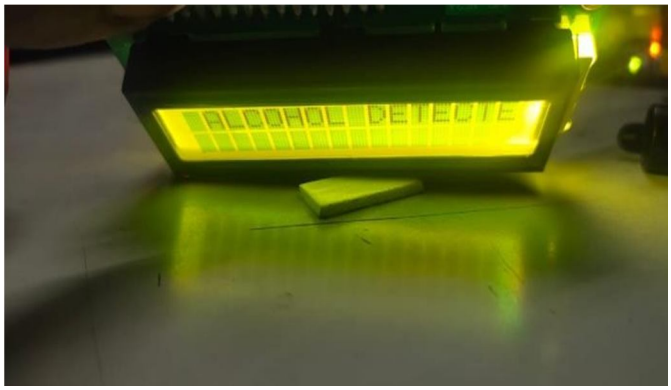


Fig.4.output4

As the alcohol level crossed threshold level the message as “ALCOHOL DETECTED” is displayed on the LCD screen as shown in the figure above.

VII. ADVANTAGES

Very less cost
It is an Automated operationLow power requirement
It provides an automatic safety and secure systemfor cars and other vehicles.

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VIII. CONCLUSION

We have provided an exceptionally capable technique to deal with and construct a smart system for vehicles in order to reduce the number of accidents caused by drunk driving. Vehicle security is dynamically vital, as people are beginning to realise. The goal of the next level of this structure is to control the consequences of alcohol abuse.This device enhances individual security, demonstrating a significant advancement in the automobile industry in terms of reducing setbacks caused by driving.This device enhances individual security, demonstrating a significant advancement in the automobile industry in terms of reducing setbacks caused by driving.

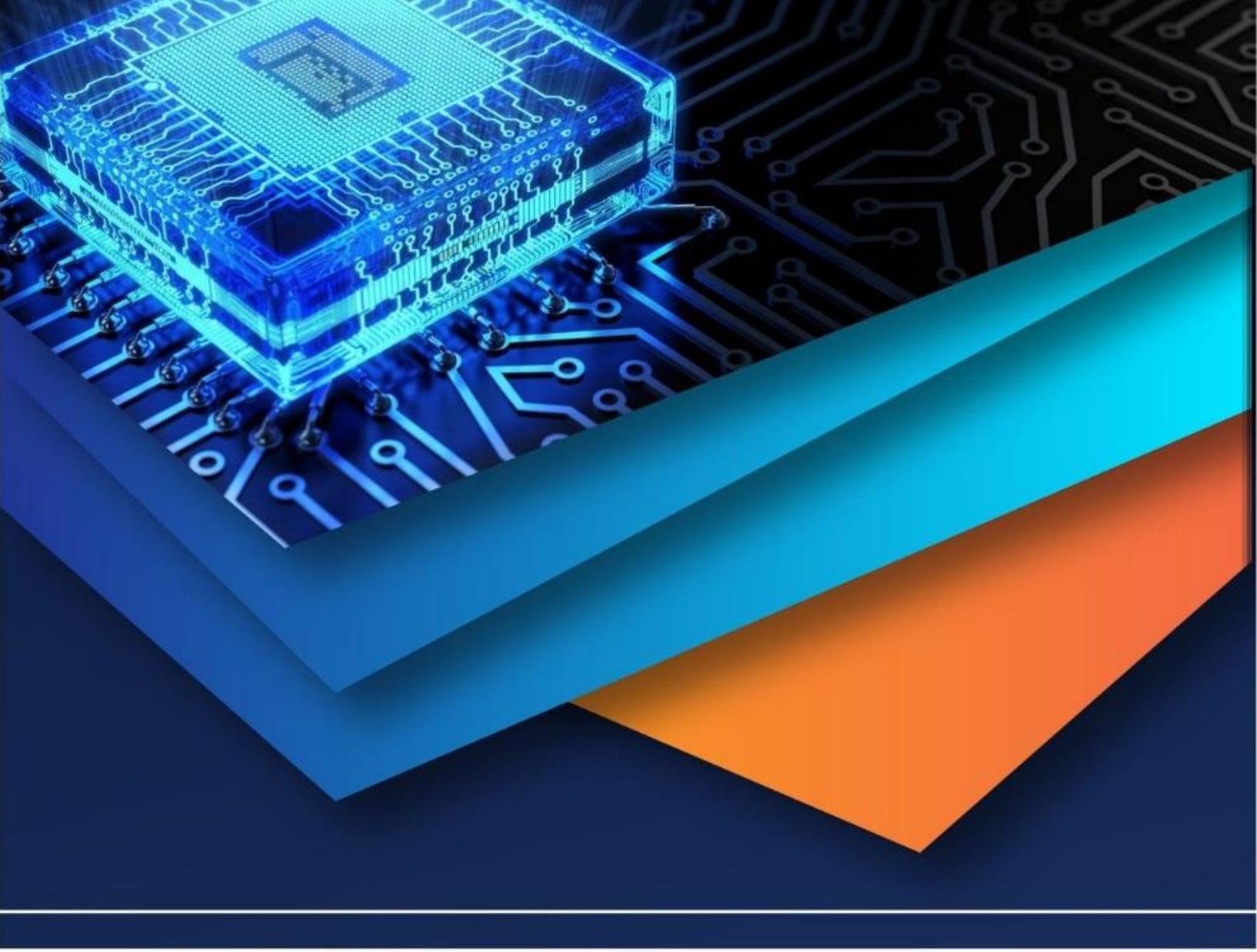
IX. ACKNOWLEDMENT

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