

AUTOMATIC DRUNK AND DRIVE PREVENTION SYSTEM WITH SMS ALERT

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

AUTOMOBILE ENGINEERING



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BONAFIDE CERTIFICATE

Certified that this project report “**AUTOMATIC DRUNK AND DRIVE PREVENTION SYSTEM WITH SMS ALERT**” is the bonafide work of “**NAVEEN SUNDAR. S**” who carried out the project work under my supervision.

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ACKNOWLEDGEMENT

We express our sincere thanks to Dr. A. RAJADURAI, Dean, Anna University, M.I.T Campus, Chennai – 44 for permitting to carry out this project.

We wish to thank Prof. Dr. S. JAYARAJ, Professor and Head of the Department, Department of Automobile Engineering, M.I.T., Anna University for granting permission and encouraging us to carry out this project work.

It gives us immense pleasure to express our deep sense of gratitude to our beloved guide and faculty advisor, Mr. K. Arunachalam, Assistant Professor, Department of Automobile Engineering, M.I.T, Anna University for his encouragement and continuous guidance throughout this project.

We also thank all our faculty members and Non-teaching staffs, Department of Automobile Engineering, Lab faculty members, Anna University who has been extremely supportive during the course of the project.

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ABSTRACT:

The main objective of this project is to reduce the accidents that mainly occur due to alcohol consumption of drivers. This system employs a MQ3 Alcohol sensor which senses the alcohol level in the driver's breath and once it detects the level higher than the limit, it shows the LED output mounted on ARDUINO UNO board. The limit can be varied by varying the limit in the Arduino code. When the alcohol is detected above a limit, SIM900A GSM module sends a message to the authorized person like owners or to nearby police station.

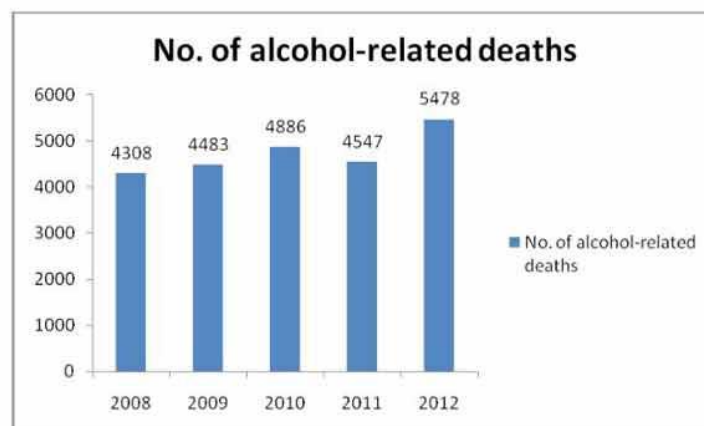
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INTRODUCTION:

This system detects the content of alcohol in the breath and thus it attempts to clamp down alcoholics. This system uses Arduino UNO board, MQ-3 gas sensor and SIM900A GSM Module. The output of the sensor is directly proportional to the content of alcohol consumed. Nowadays alcohol sensor play a significant role in our society and it has vast applications. This type of sensors in cars is a great safety factor which can be embedded in the seat of the cars. When the driver starts the ignition, sensor measures the content of the alcohol in his breath and once it detects the level above a limit, the authorized person will receive a message indicating that the driver was drunk. Thus we can reduce alcohol related road accidents and hence these kinds of detectors have a great relevance. It can also be used in schools, colleges, offices and some public places such as hospitals, libraries etc. But we designed this system in particular to the application of taxis.

Exhibit 1: Total number of alcohol –related deaths in India



Source: NCRB

NEED FOR THE PROJECT:

Alcoholism is a debilitating disorder for the individual and very costly for society. A most of alcohol research is to understand the neural underpinnings associated with the transition from alcohol use to alcohol dependence. Positive reinforcement is important in the early stages of alcohol use. Negative reinforcement can be important early in alcohol use by people self-medicating coexisting affective disorders, but its role likely increases the transition to dependence. Chronic exposure to alcohol induces changes in neural circuits that control motivational processes, including arousal, reward, and stress. These changes affect systems utilizing the signaling molecules modulating the brain's stress response. These neuron adaptations produce changes in sensitivity to alcohol's effects following repeated exposure. The project plays a role by indicating the alcoholic level of the driver to reduce the accidents normally due to alcohol consumption of drivers. Thereby to save precious life of peoples.



EXISTING SYSTEM

- The existing system is the external system. The driver will blow the device, thereby we can find alcohol consumed.
- The main reason for drunk driving is that the police are not able to check each and every car and even if they catch anyone, the police can be easily bribed.
- So there is a need for effective system to check drunken drivers.

PROPOSED SYSTEM

- The proposed system has to create an effective alcohol detector in vehicle, which is integrated as vehicle control system.
- The “Alcohol sensor” is used to find whether the driver was drunk or not. If the driver has consumed alcohol, the vehicle is not started and send SMS to the authorized person through GSM module.

COMPONENTS USED:

1. MQ3 GAS SENSOR
2. ARDUINO UNO BOARD
3. SIM900A GSM MODULE
4. JUMPER CABLES
5. LED

1. MQ3 GAS SENSOR

This is an alcohol sensor, which detects ethanol in the air. It is one of the straight forward gas sensors so it works almost the same way with other gas sensors. Typically, it is used as part of the breath analyzers or breath testers for the detection of ethanol in human breath.

Basically it has 6 pins, the cover and the body. Even though it has 6 pins, we can use only 4 of them. 2 of them are for heating system and other 2 are for connecting power and ground. A little tube is placed inside the sensor. This tube is a heating system that is made of aluminium oxide and tin dioxide and inside of it there are heater coils, which practically produce the heat. Two pins are connected to the heater coils and others are connected to the tube.

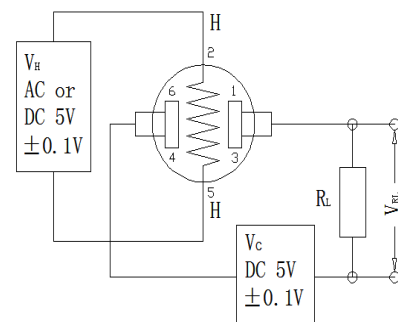
The core system is the cube. Basically, it is an Alumina tube cover by SnO_2 , which is tin dioxide and between them there is an Aurum electrode. Basically, the alumina tube and the coils are the heating system. If the coil is heated up, SnO_2 ceramics will become the semi - conductor, so there are more movable electrons, which means that it is ready to make more current flow. Then, when the alcohol molecules in the air meet the electrode that is between alumina and tin dioxide, ethanol burns into acetic acid then more current is produced. So the more alcohol molecules there are the more current we will get. Because of this current change, we get the different values from the sensor.

Sensor characteristics:

- Good sensitivity to alcohol gas
- Long life and low cost
- Simple drive circuit

Application:

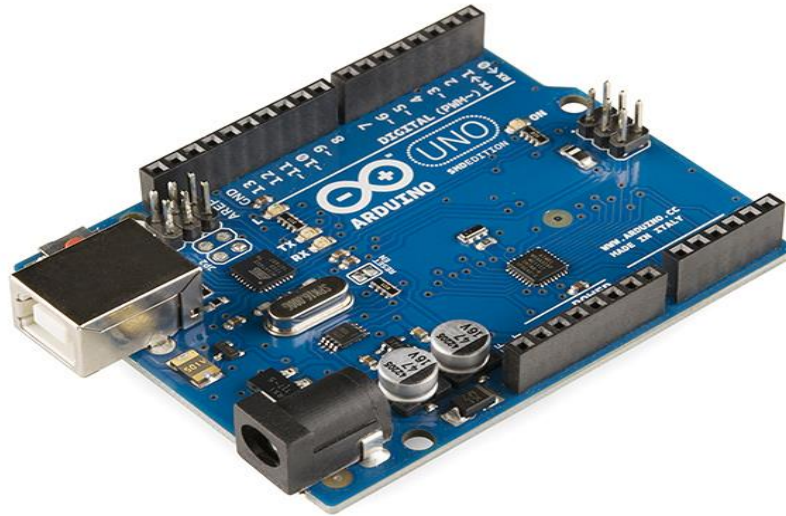
- Vehicle alcohol detector
- Portable alcohol detector



2. ARDUINO UNO BOARD:

Arduino is an open source, computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU GENERAL PUBLIC LICENCE(GPL) permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or do it yourself kits.

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (*shields*) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the processing language project.



3. SIM900A GSM MODULE:

The SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. SIM900 can fit almost all the space requirements in your M2M application, especially for slim and compact demand of design. This is a GSM/GPRS-compatible Quad-band cell phone, which can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMSs. Externally, it looks like a big package (0.94 inches x

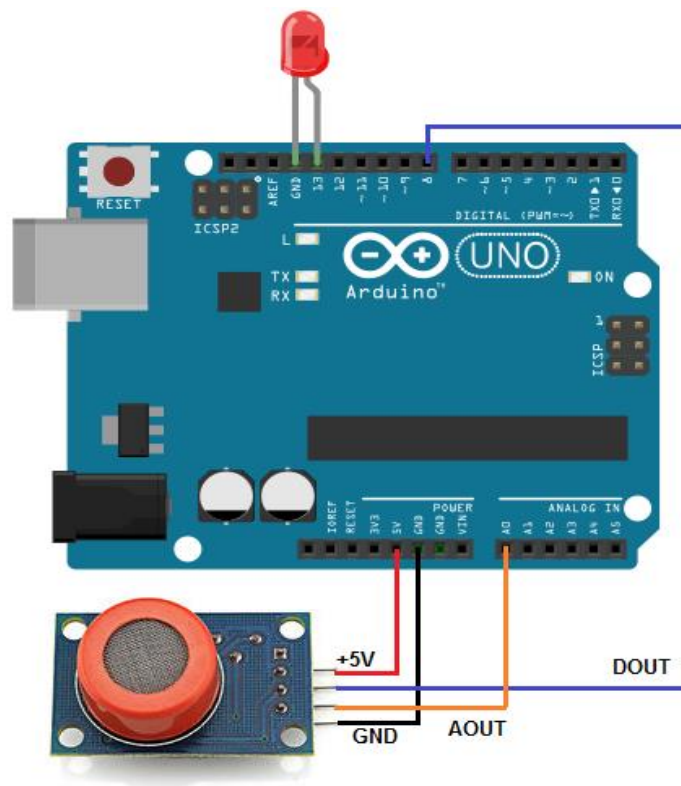
0.94 inches x 0.12 inches) with L-shaped contacts on four sides so that they can be soldered both on the side and at the bottom. Internally, the module is managed by an AMR926EJ-S processor, which controls phone communication, data communication etc.



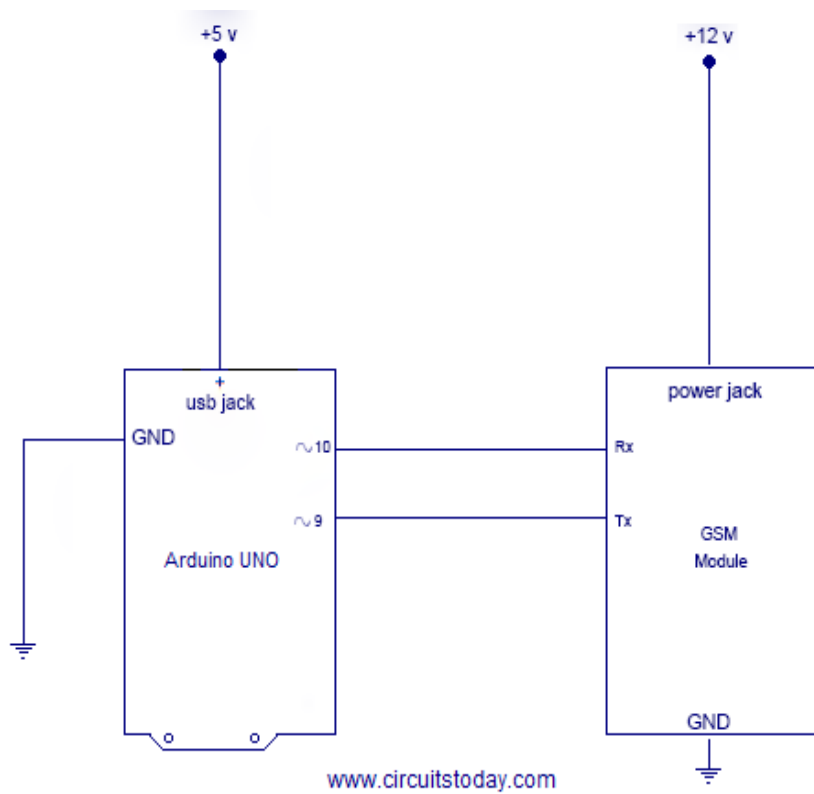
5. INTERFACING MQ-3 SENSOR WITH ARDUINO:

There 4 leads are +5V, AOUT, DOUT, and GND. The +5V and GND leads establish power for the alcohol sensor. The other 2 leads are AOUT (analog output) and DOUT (digital output). How the sensor works is the terminal AOUT gives an analog voltage output in proportion to the amount of alcohol the sensor detects. The more alcohol it detects, the greater the analog voltage it will output.

Conversely, the less alcohol it detects, the less analog voltage it will output. If the analog voltage reaches a certain threshold, it will send the digital pin DOUT high. Once this DOUT pin goes high, the Arduino will detect this and will trigger the LED to turn on, signaling that the alcohol threshold has been reached and is now over the limit. How you can change this threshold level is by adjusting the potentiometer to either raise or lower the level.



6. INTERFACING ARDUINO WITH SIM900A GSMMODULE:



7. ARDUINO CODE FOR MQ-3 SENSOR AND SIM900A GSM :

```
#include <SoftwareSerial.h>
SoftwareSerial mySerial(9, 10);
const int AOUTpin=0;
const int DOUTpin=8;
const int ledPin=13;
```

```
int limit;
int value;
```

```
void setup() {
  Serial.begin(115200);
  pinMode(DOUTpin, INPUT);
```

```

pinMode(ledPin, OUTPUT);
mySerial.begin(9600);
Serial.begin(9600);
delay(100);

}

void loop()
{
value= analogRead(AOUTpin);
limit= digitalRead(DOUTpin);
Serial.print("Alcohol value: ");
Serial.println(value);
Serial.print("Limit: ");
Serial.print(limit);
delay(100);
if (value > 400){
digitalWrite(ledPin, HIGH);
SendMessage();
}
else{
digitalWrite(ledPin, LOW);
}
}

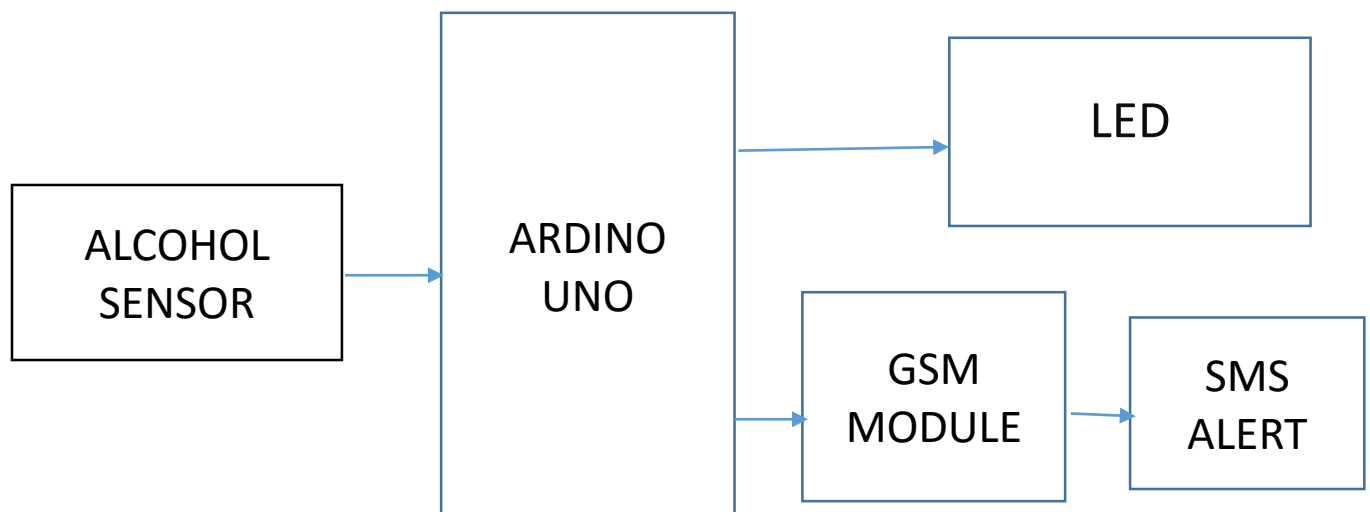
void SendMessage()
{
mySerial.println("AT+CMGF=1");
delay(1000);
mySerial.println("AT+CMGS=\"+919087063595\"\\r");
delay(1000);
mySerial.println("your driver has drunk while driving");
delay(100);
mySerial.println((char)26);
delay(1000);
}

```

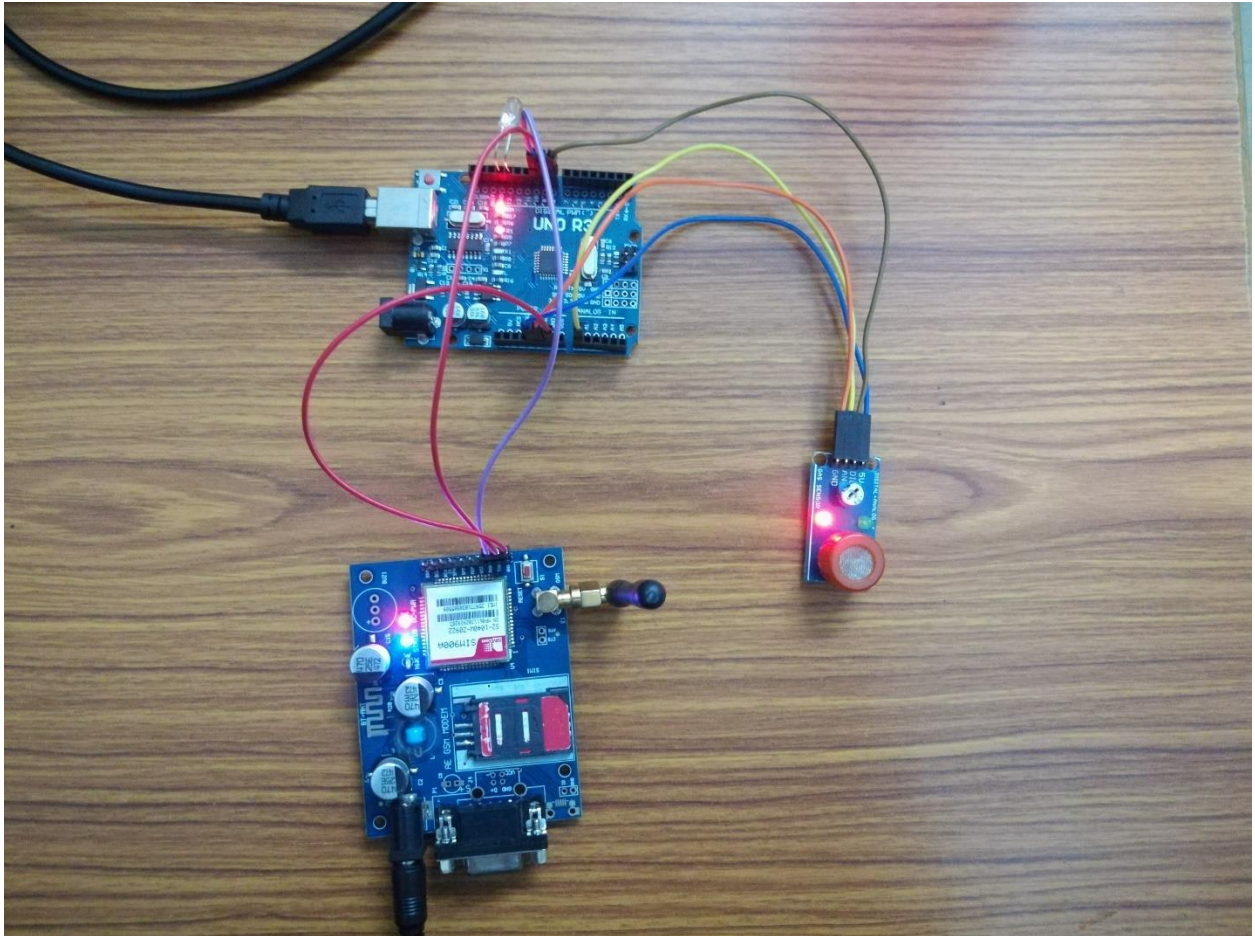

8. COST REPORT:

S.NO	COMPONENTS	QUANTITY IN NOS	PRICE RS
1	Mq-3 alcohol sensor	1	160
2	Arduino UNO	1	400
3	SIM900A GSM Module	1	800
4	Others (LED, Jumper cables)	—	50
		Total	1410

9. BLOCK DIAGRAM AND WORKING:



10. WORKING IMAGE OF THE PROJECT:



11. CONCLUSION:

- The technology can immensely decrease the rate of drunk and driving cases which often leads to accidental deaths.
- By capitalizing on recent technological advancements that won't let the car to be driven, if the driver has consumed alcohol.

12. REFERENCES:

<https://www.sparkfun.com/products/8880>

[https://www.dfrobot.com/wiki/index.php/Analog_Gas_Sensor\(MQ3\)_ \(SKU:SEN0128\)](https://www.dfrobot.com/wiki/index.php/Analog_Gas_Sensor(MQ3)_ (SKU:SEN0128))

www.sunrom.com/p/alcohol-sensor-module-mq3

