# EMBEDDED SYSTEM

Report on Mini Project

# ALCOHOL SENSE ENGINE OFF

At



## Under Guidance of



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BY

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## Abstract

This paper represents our second year project in which we try to tackle the problem of loss of life and property due to drunken driving. In our project, we have used Arduino Uno3 microcontroller attached to an alcohol sensor which detects the presence of alcohol by analyzing breath of a person driving the vehicle. Engine of the vehicle is turned off and the emergency siren is blown as soon as alcohol is detected, thereby minimizing the chances of any mishaps that could have happened. Therefore, loss of life and property is avoided.

## Introduction

One major reason of deaths on Indian roads is accidents due to drunken driving. This happens because of drunk people being able to take control of vehicle even after being drunk. In our project, we propose to solve this problem by designing a system which automatically switches off the vehicle's engine
whenever alcohol of certain quantity is detected in the driver's breath. As soon as the presence of alcohol is detected, the microcontroller stops the engine of the vehicle and a siren is blown to alert nearby people to convey that something is wrong with the vehicle and a message "Alcohol Detected" is flashed on the LCD screen which is installed in the system, so that nearby people can interpret gravity of the situation and inform the concerned authorities to avoid any kind of incident.
This system when implemented in vehicles will not only avoid the deaths and property loss due to drunken driving, but will also help in reducing the total number of accidents which occur due to this. Moreover, people in other vehicles or pedestrians will be much more safe because of the vehicle being stopped right away.

## Proposed Methodology

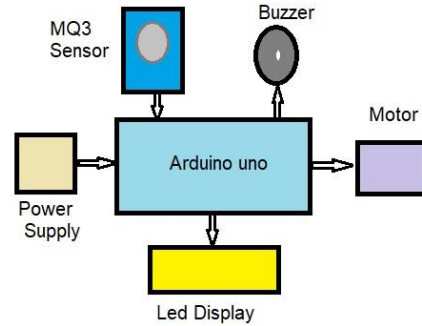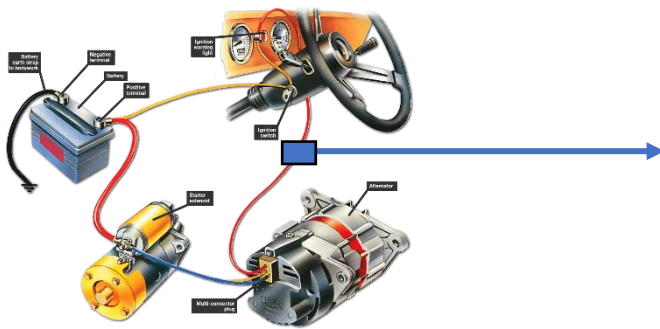Using Arduino Uno microcontroller, we propose to design a system consisting of an alcohol sensor,
MQ3, to detect the presence of alcohol by analyzing a person's breath and shutting down the vehicle's engine when a specific amount of alcohol is detected to prevent any kind of mishap or accident that may occur due to the driver taking control over the vehicle. Hence, drunken driving is controlled, thereby minimizing the loss of life and property.The system consists of an Arduino microcontroller, which acts as a controller for every component which
is used. The microcontroller is connected to an alcohol sensor, a buzzer, a LED and
is powered by a DC power supply of 5 volts. As soon as the system is ON, the serial moniter "No Alcohol
detected" and the vehicle engine gets started. As soon as the alcohol sensor detects alcohol, the LED starts to blink, the buzzer starts, the engine is switched OFF and the serial monitor displays "Alcohol Detected".

# EQUIPMENTS USED

## 1. ARDUINO UNO

Arduino Uno is based on ATmega 328P microcontroller. It consists of 20 pins out of which 14 are digital pins and the rest 6 are PWM. It can be programmed using a computer on Arduino IDE. Arduino being open sourced, has a really good community which makes development very convenient and any kind of problems are taken care of by the community. We are using it because it is open sourced and hence very cheap as compared to conventional microcontrollers. It can handle a large number of operations making it very convenient to use.
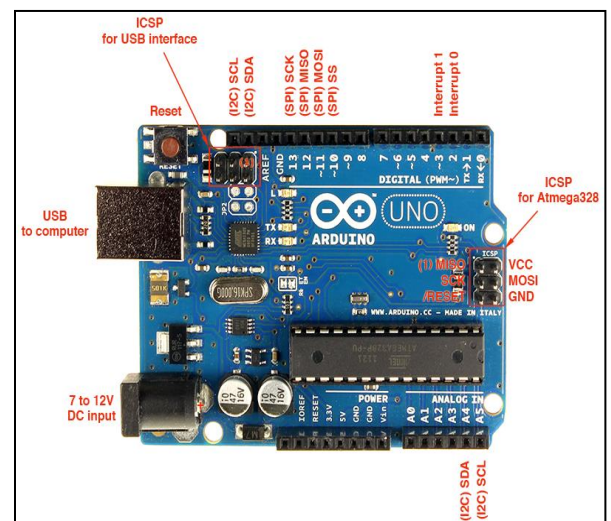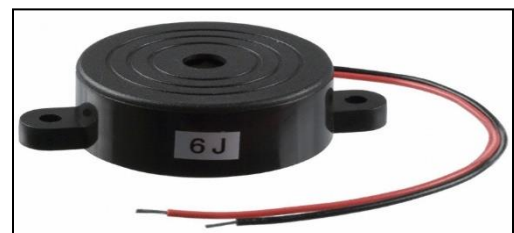


## 2. MQ3 Sensor

MQ3 alcohol gas sensor is made by using SnO2 material which has less conductivity in clean air. Whenever it comes nearby alcohol gas its starts conducting highly according to the gas concentration. So user can sense the difference of output voltage using any microcontroller and can detect the presence of Alcohol. This is low cost and a suitable sensor for many applications for alcohol detection. This sensor has a long life and good sensitivity. Some of the applications that can be made by using this sensor are Alcohol gas alarm, portable alcohol detector, gas alarms, Breathalyzer etc.
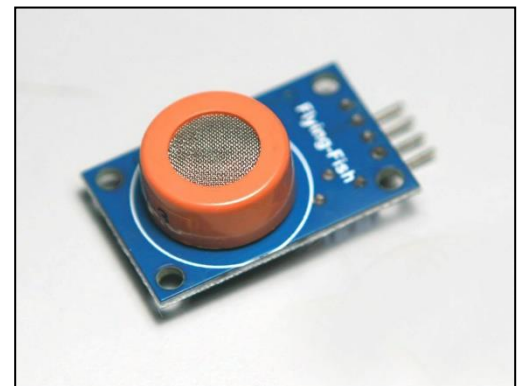


## 3. Buzzer

A buzzer is used in the system to alert the people nearby so that they can analyze the situation and take necessary action accordingly. The buzzer is connected to pin 3 of the Arduino Uno. It

gets activated whenever alcohol is detected by the MQ3 sensor. It's frequency and tone can be changed and used according to the requirements. Hence, it is an easy and cheap way to alert people and grab attention to point out that something is wrong.

4. LEDs

4 different color LEDs are used to show different level of alcohol content in breath and on LED has been used to denote the ON and OFF state of engine.
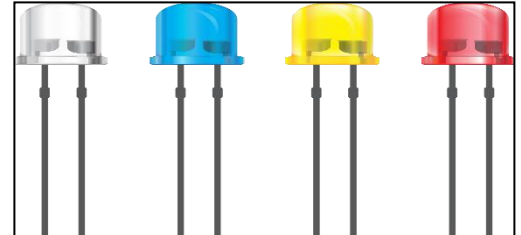
# CIRCUIT Diagram
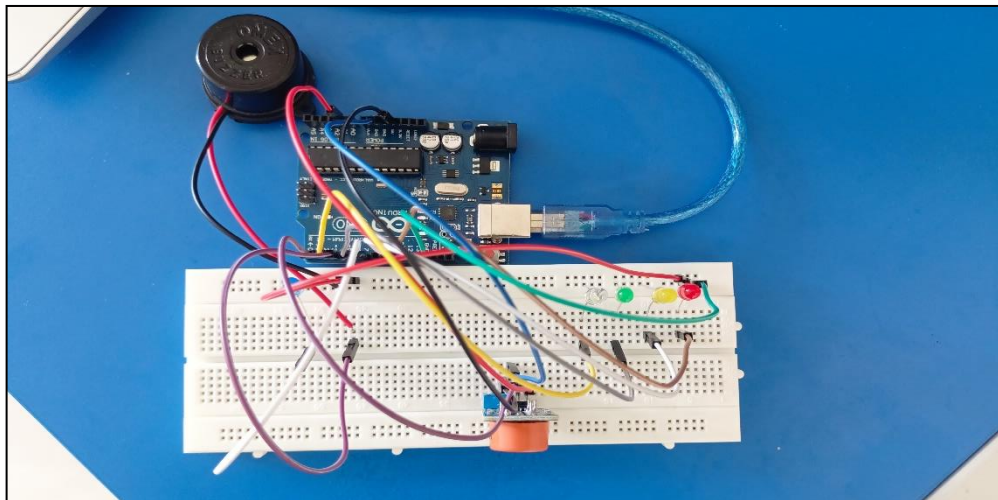


# Applications

1. This system can be implemented in vehicles to avoid accidents due to drunken driving.
2. It can also be used by various organizations or authorities to monitor its employees and keep a check on them.

# Advantages

1. The chance of loss of life and property due to drunken driving is minimized.
2. Simple implementation leads to accurate results.
3. Can be implemented on various types of vehicles.
4. Less accidents, more safety.

# Future Upgradation

Use of GSM module with its enhance the security related to its, whenever alcohol detected then it automatically sent an message to nearest police station and the person who has been

registered in it for emergency contact. Though it also remove police checking for drunken driver and for making CHALAN.

## Result

Whenever 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 alarm thereby alerting the nearby people. The LCD screen present in the vehicle will display "Alcohol Detected" so that people are aware of the situation and hence can take the necessary action that may be required. Therefore, by using this system on a vehicle, any kind of loss of life or damage to property can be avoided. Working is verified by physical model. All the components have been tested and connected as required thereby providing us with the desired result as shown in the below image.
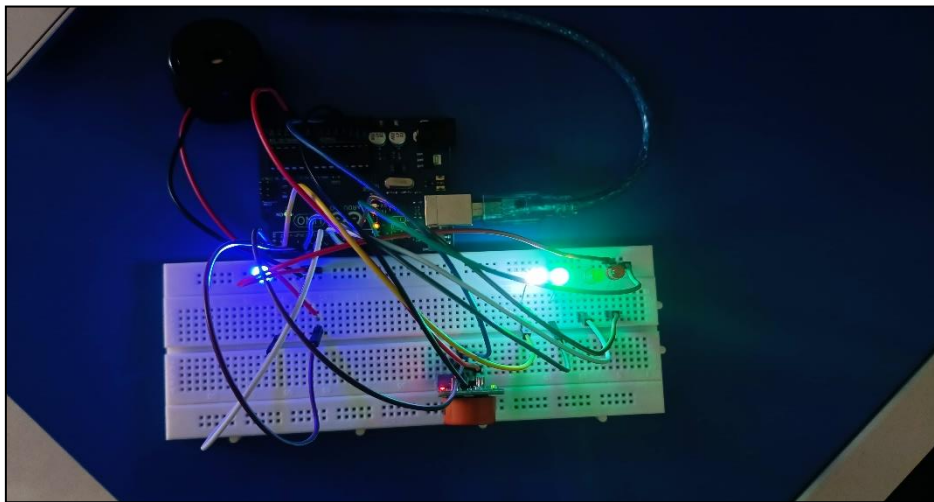


## Conclusion

In this project, we have developed an efficient system to tackle the menace of drunken driving. Our main aim is to minimize the loss of lives and property which happen due to drunken driving. This system once implemented on a large scale will prove to be really helpful by shutting down the vehicle's engine and alerting the nearby people before any mishap takes place. The sensor used in the project is very accurate and can be configured according to the requirements thereby increasing the efficiency.

## References

- Alcohol Detection with engine Locking System" by UG students, Dept. of M.E. , MET institute of technology, Nashik
  2021
- "Alcohol Detection and Vehicle engine Locking" System by UG students of College of Engineering, Pune
  2018
- Automatic Engine Locking System through Alcohol detection" by UG students of RKGIT Ghaziabad.
  2020

- "Alcohol ignition interlocks' are devices that require a driver to take a breath test before starting a car. If the test is failed, the device locks the ignition so the engine will not start. Such devices, when fitted in the cars of repeat drink-driving offenders, have been shown to be effective as a deterrent. The high technology required for these devices means that although they are effective, their use is limited"

The above para is taken from "what can be done to prevent alcohol impaired drivers" in Road Safety- Alcohol report of WHO .