IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁜ Vol. 9, Issue 5, May 2022

DOI: 10.17148/IARJSET.2022.9504

Vehicle Accident Prevention System Embedded with Alcohol Detector

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Abstract: This project's major goal is "Drunk Driving Detection." Number of accidents occur nowadays because of the driver's or the person who drives the vehicles. As a result, drunk driving is a major reason of accidents in almost every country throughout the world. The Alcohol Detector in Car project is intended to confirm the safety of those who sit inside the car. The Alcohol Detection with Car Controlling project assists in controlling the vehicle if the driver has drunk alcohol. Inside the car, an alcohol breath analyser project should be installed. In another example, if the driver is not dunked when he is starting the vehicle and the engine is started, but driver starts drinking while driving, the sensor detects alcohol in his/her breath and the engine is stopped after some time, preventing the car from accelerating any further and allowing the driver to guide it to the roadside. To showcase the principle, we use an Arduino family microcontroller like Arduino uno interfaced with an alcohol sensor, an LCD display, and a dc motor in this system. So, in this case, the alcohol sensor is utilized to continuously monitor the user's breath and provide data to the microcontroller. When a high alcohol signal from the alcohol sensor is detected, the microcontroller shows an alcohol detection note on the LCD display and stops the small dc motor to illustrate engine lockup. To start the engine, the system requires a push button. If alcohol is discovered while starting the engine, it do not start at all. If alcohol is detected after the engine has started, the system locks the engine.

Keywords*:* Arduino UNO, MQ3 sensor, Relay, Buzzer, GPS Module, GSM module.

I. INTRODUCTION

Street safety is the becoming a major social issue across the world, mainly in India. Drink and drive are currently a true general common issue that is likely to grow as one of the most essential issues. The key motivation for this challenge is "drunk driving detection." Because the number of incidents caused by the driver's or the individual driving the car is increasing. As a result, drunken driving is a significant cause of mishaps in all nations all over the world. As a result, the framework reduces the number of streets mishappens and fatalities caused by intoxicated driving in the future. Since the Drunk Driving Detection and Car Ignition Locking Using Arduino plans to remedy that using automated, simple, non-invasive liquor wellbeing checks in vehicles, drunk driving is the cause of most deaths. When the level of alcohol in the car reaches a permissible breaking point, an alcohol sensor is installed on the steering wheel, and the vehicle's ignition and motor are turned off. Even though driving while inebriated is prohibited and penalized in almost every country, many people/youths continue to disobey the rules and feel compelled to drink and drive.

The main goal of this Project and alcohol detection system is to create a system that can reduce the number of accidents caused by driver's non-careless behaviour. The project starts with the detection of alcohol intoxication using an alcohol sensor (MQ-3) that acts as a Breathalyzer and estimates the blood alcohol content. Breath alcohol concentration is a measure of the amount of alcohol in a person's body. MQ-3 is connected to the Arduino board through an interfacing. Buzzer, and relay are all external components. Arduino monitor the amount of alcohol in the air.
From the corresponding values, calculates alcohol concentration in percentage. If the estimated percent exceeds a certain threshold, The driver is notified with an alarm via an alarm and the relay if the threshold is exceeded.

II. METHODOLOGY

The fig 1 describes the block diagram of the components used to the driver’s alcohol detection. Arduino UNO is the major component that controls the model's overall functions. The alcohol sensor detects alcohol based on human breath, which means that if the driver has drunk alcohol, the sensor's green LED will blink, and an analogue signal will be sends to the Microcontroller. The alcohol sensor will record both analogue and digital measurements, but because a threshold must be specified, we will use analogue readings. In this paper, a real time driver's monitoring system is proposed to detect the alcohol intake. The Arduino UNO is the central component of the concept, and it is responsible for all the system's functions. The Arduino UNO determines whether the alcohol content is above or below the threshold based on digital data from an external ADC. The driver's condition is determined by its output. When the driver is identified as being Out of control, the buzzer turns ON, Red light LED starts glowing, and a message is delivered to the designated person. The relay's primary function is to turn off the engine's power supply if the driver is found to be unawares. To

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begin, as soon as the driver enters in the car and turns on the car engine, the alcohol sensor detects the driver's alcohol level; if the alcohol concentration is above the threshold, the car's power supply is instantly turned off via a relay, preventing the driver from turning on the car. If the MQ-3 sensor detects no alcohol concentration at first, the engine fires up and the car begins to drive. When the vehicle is turned on and any alcohol content is discovered in the middle of the journey the driver is warned through a buzzer. The vehicle's speed steadily decreases until it comes to a complete halt. The message alert is delivered to the authorised user via the Twilio application when this procedure takes place. This is done to notify the authorised user of the driver's current state.

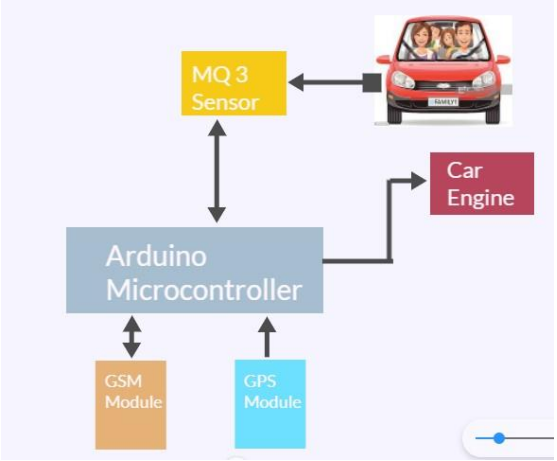
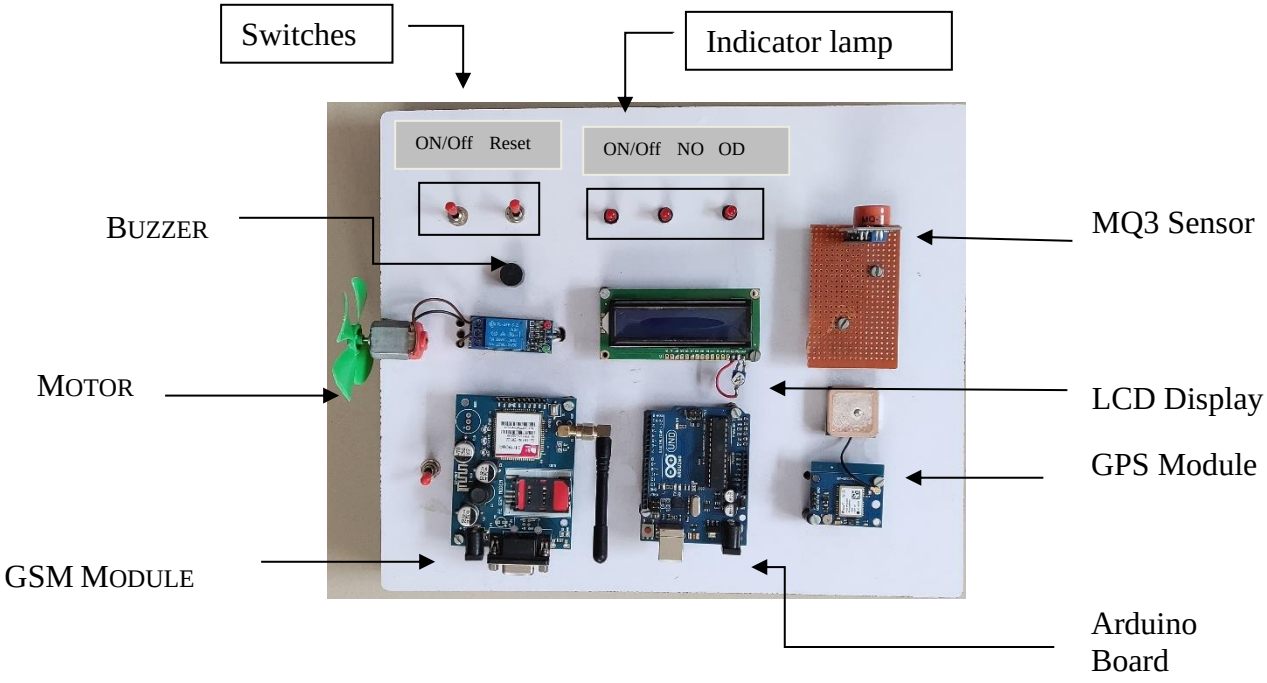


Fig 1

III. CASE STUDY

As shown in fig 2, In block diagram of project its clearly seen that how project works. In given algorithm first driver or any person who is trying to start car first diver give the car ignition, then Alcohol sensor i.e.MQ3 check alcohol level in car. If alcohol level is below the Threshold value which is set by car owner or person who maintain the safety then car is stars without any interruption,

If alcohol level is car is above the threshold value, then 1st start buzzer and making beep sound then after some time red led starts glowing. This is the one part of hardware working and other hand GSM module Available in system is send SMS to Owner Also we used GPS to detect the actual position of car in terms of latitude and longitude.



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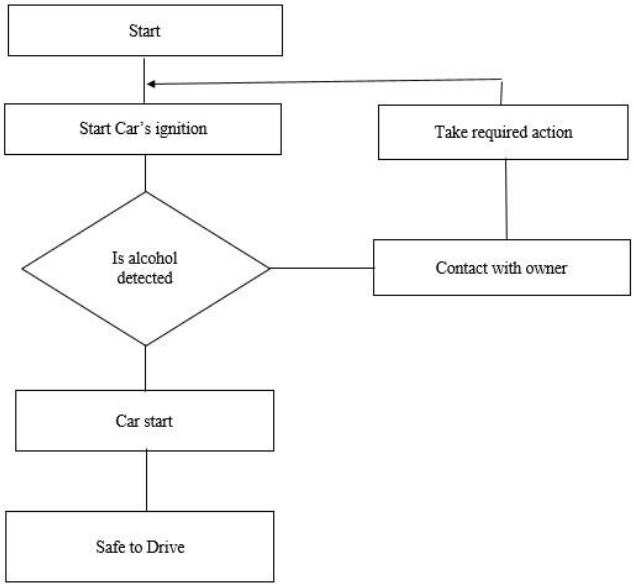

Fig 2 Algorithm

Simulation Results:

Above figure shows the output of our project in terms of binary/logical coding
If alcohol is not detected by MQ3 sensor means (logic 0) then by default car is in running condition so logic became high (logic 1) and red-light LED indicator is dark, so logic is low (logic 0) and vice versa.
when alcohol is detected by system If alcohol is detected by MQ3 sensor means (logic 1) then by default car is stopped so logic became Low (logic 0) and red-light LED indicator is dark, so logic is High (logic 1)

Fig 3 Simulation Result

Input (logical)	Motor Output	LED output
Logic 0 When alcohol is not detected by system	**Logic 1** Motor is rotating	**Logic 0** LED is not glow
Logic 1 When alcohol is detected by system	**Logic 0** Motor stops rotating	**Logic 1** LED is starts glowing

IV. RESULT

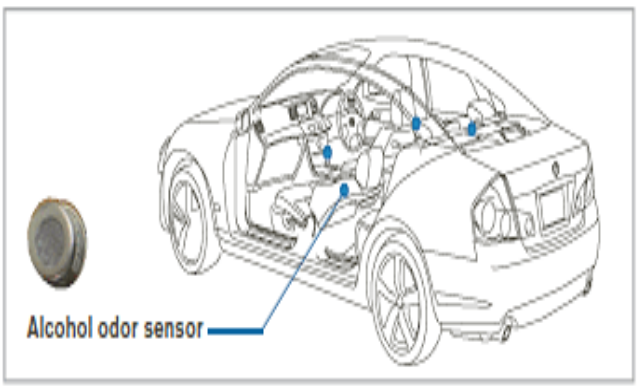

Fig 4 Position of sensor

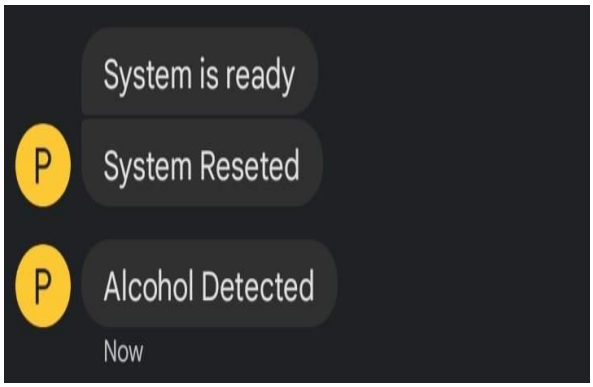

fig 5 SMS sending output

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Fig 6 Actual Output

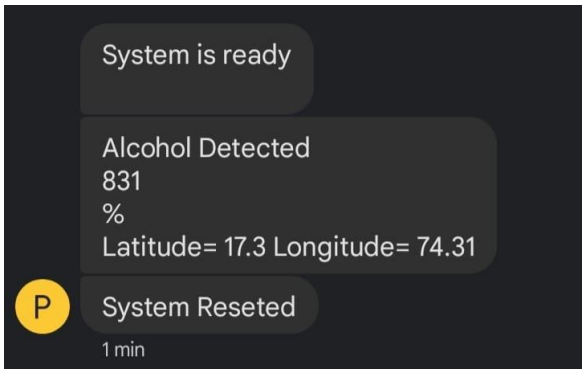

fig 7 SMS sending output

A highly Sensitive alcohol sensor is built into the gear knob and front of drivers face which is exactly above the steering of the car which can detect the availability of alcohol in the respiration of the driver's body as driver trying to start driving. When the alcohol-level detected is above the set value of threshold, the system automatically locks the transmission and stop the car. A "drunk-driving" buzzer alert is also provided and the car navigation system also available.
Additional alcohol sensors are also placed near to the driver's and passenger seats to detect the availability of alcohol in the air inside the vehicle. When alcohol is detected, the system gives voice alert as well as message alert.

V. CONCLUSION

The project's system implemented in this project can be treated as breath analyser for alcohol detection. To prevent "Drunk and Drive" cases this system is of great importance. This system turns OFF the vehicle engine as soon as alcohol is detected. The system does not start until a master reset is activated by the administrator of the vehicle. This would significantly improve the road safety as well as safety of driver.

VI. FUTURE SCOPE

The concept presented through this project work can be extended further for vehicle control through cloud as well as for developing autonomous vehicle. The autonomous vehicle may be shifted between manual and auto mode by doing the breath analysis.

For reducing the mis operation of system, we can be able to add a greater number of sensing devices like we can be able to place one camera to top of the steering to detect the drivers eye blinking to check sleepiness of driver.

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