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Alcohol Detection and Engine Locking System

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ABSTRACT

The project represents our final 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. Alcohol sensor is installed on the steering of the car, with the end goal that when the level of liquor crosses a reasonable farthest point, where the start of vehicle will kill and the motor will stop. The Arduino always uses the alcohol sensor information to check drunk driving and works a bolt on the vehicle motor to stop the engine.

Keywords: Alcohol detection, Arduino Uno, MQ3 Sensor, Engine Locking.

I. INTRODUCTION

The current scenario shows that the most of the road accidents are occurring due to drunk-driving. The drivers who drink alcohol are not in an stable condition and so, rash driving occurs on highway which can be risky to the lives of the people on road, the driver inclusive [1]. The enormity of the dangerous driving transcends boundary. The laws in India are currently prohibiting drivers to drink and drive so that the fine can stop them to drink and drive. Whatsoever, effective observation of inebriated drivers could be a challenge to the policemen and road safety officers, the rationale for this stems from the natural inability of citizenry to be present additionally as state among identical house and time [2].

This restricted ability of Enforcement agents undermine each manual effort geared toward edge drink-driving. There is therefore the need for an alcohol detection system that can function without the restriction of space and time.1.25 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), information collected showed that several of economic vehicles drivers in Bharat admitted to drinking alcohol throughout operating days [3]. Our system, will integrate the following hardware components in the design: An LCD, the MQ-3 alcohol sensor, DC motor, Buzzer and LEDs integrated to ATmega328 microcontroller [4]. The system will be designed and simulated using Proteus VSM simulator. The software code to be burnt into the Arduino board will be written in Arduino IDE sketch. The project shall be installed inside the vehicle. Now a day's most of the peoples use cell phone for communication [5]. Controlling devices through wireless media becomes very popular. GSM technology is very powerful because it overcomes the limited range of infrared and radio remote controls [6]. We run the vehicle by using wireless communication system. In this system Control section acts as transmitter we are ejecting the control signals, then the vehicle receives acts as receiver the signals, according to the signals it will give an alarm or buzzer [7]. Thus, the proposed work will be designed for the safety of the people on the road and as well as in the vehicle[8].

2. OBJECTIVE

The Alcohol Detection with Engine Locking system helps to reduce accidents which are occurring due to drunk driving. The Chance of Loss of Life and Property due to Drunken driving Minimized. Less Accidents, more safety.

3. LITERATURE SURVEY

Project 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. [9].Wearing smart helmet to prevent any mishap

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is suggested by writer which has certain deficiencies. First 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. [10]Worrying about the drunken driving the Project 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.[11].To cope with helmet negligence and alcohol detection simultaneous the writer proposed a system which is very complicated and use of P89V57RD2 microcontroller makes it highly expensive also this system can only be equipped with 2 wheelers where as Arduino Uno microcontroller is economical as well as can be equipped with any class of vehicle making it more authentic and successful.[12]

4. Proposed System

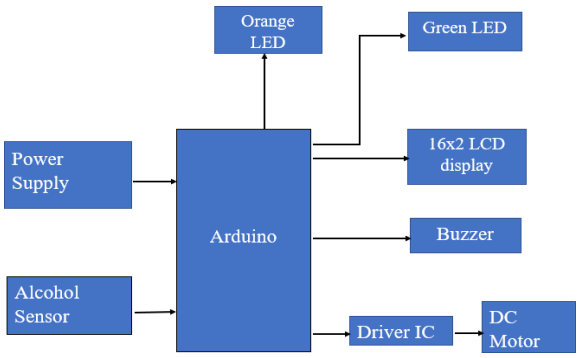


Fig:(a). System Architecture

This is intended with MQ3 alcohol sensor which is controlled by Arduino Uno. MQ3 sensor is used for measuring the alcohol percentage of a driver. The power supply is given to Arduino Uno and 5V supply is given to the MQ3 sensor from Arduino. The MQ3 sensor will pass the information of alcohol concentration to the Arduino Uno.

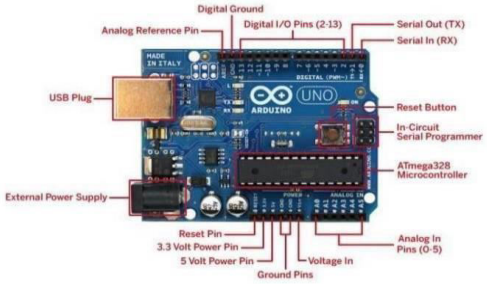
Hard Ware Requirements:

(a).Arduino UNO

R3Arduino Uno is micro-controller development board that works on Atmega-328P. The Arduino results to numerous various functions like Microcontroller area unit, computer circuit unit, primarily little computers that will run tiny easy software package programs, the area unit are enough low steam-powered which can steam powered by various batteries for years however area unit ready to measure information much quicker than a person's brain can method/suppose. Arduino Uno Rev3 SMD is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM output), 6 analog inputs, 16MHz ceramic resonator (CSTCE16M0Va USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with AC-to- DC adapter or battery to get started.

Fig :(c). Arduino Uno

(b). MQ3 SENSOR



The MQ-3 sensor is made of Tin Dioxide (SnO2) delicate layer. It is sorted out in such a structure to give high affectability to liquor and low affectability to Benzene. It has an immediate drive circuit to give lively reaction, quality, and longer lifetime It is having a clear interface type. On the sensor, port pins 1, 2, 3 and 4 tends to the yield, GND and VCC independently. The particular of the sensor is depicted in table underneath.

Software Requirements

(c) Arduino IDE

Downloading Arduino IDE software and then power up Arduino Board. and Launching Arduino IDE.

The Arduino integrated development environment is a cross platform Application, that is written in Java programming language and C/C++.

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5. IMPLEMENTATION OF PROJECT

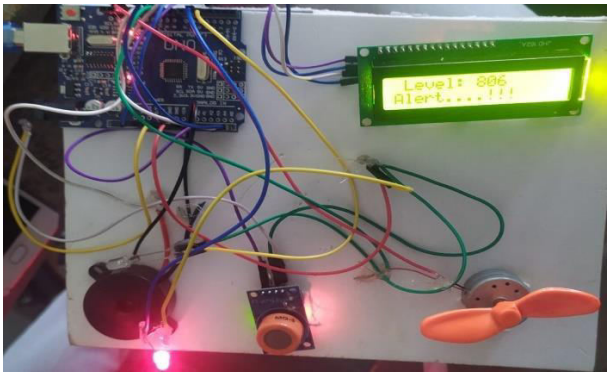
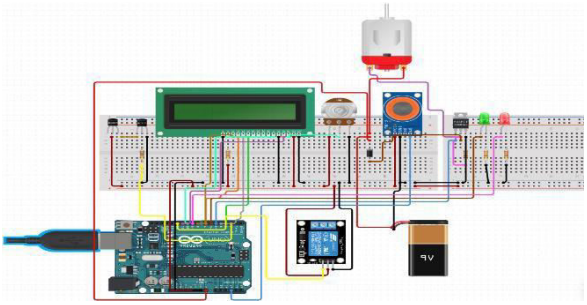


Fig :(d). Schematic Diagram



The detected analogue voltage values are read by the microcontroller; the Arduino Uno board contains 8 channels, 10-bit device that changes an analogue voltage on a pin to a digital number.

The system will link input voltages from 0-5V with values from 0-1023V to generate 5Vs for every 1024 units. The system will process the analogue signal and convert it to digital value of 0 or 1. Also, the analogue values from the alcohol sensor will be scaled to percentage, and this percentage is equivalent to the analogue voltage values in ppm (part per million).The first condition is the intoxication stage; the second condition is the slightly drunk stage and the last stage is drunkenness stage. Each stage will be a condition to perform a task based on the level of alcohol. In the intoxication stage, the LED indicator will be activated only, the alarm will be OFF and the car engine will be ON. In stage two, the alarm and the green LED indicator will be ON, as well as the car engine.

Finally, the driver is mentally and physically inactive in stage three, so the engine will be OFF while the alarm and red LED will be ON. Therefore, once the system detects alcohol in stage three the car will be stopped and the driver can park by the roadside.

6. RESULTS

If alcoholic person tries command on vehicle the alcoholic sensor determines the existing of alcohol and shut down the vehicle engine and sound alarm by which the nearby people will exchange the seat. Peoples are aware of situation by the help of "LCD screen" present in the vehicles and hence take required action, can avoid any kind of loss of life by using this system. All equipments are totally tested and connected as required thereby giving us the needed result.

Fig: (e). Alcohol is not detected

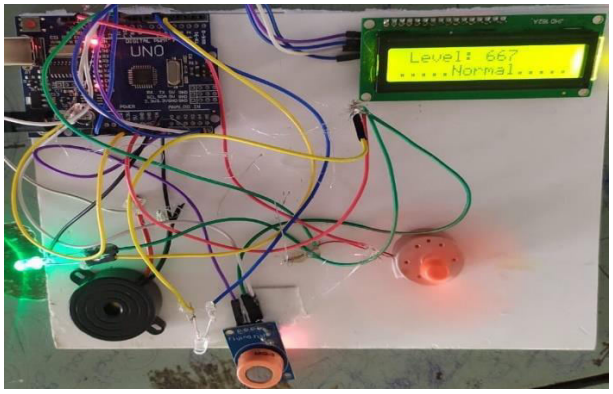


Fig: (f). Alcohol is detected

The figure (e) shows that initially no alcohol is detected hence the motor is in ON condition, green LED glows and the buzzer is in off state.

The figure (f) shows that whenever the alcohol is detected in the breath of the person driving the vehicle automatically the motor is in OFF condition, green LED OFF, red LED glows and the buzzer is in ON state gives indication alcohol is detected.

7. CONCLUSION

We have given an incredibly capable way to deal and to develop a smart system for vehicles to diminish number of disasters caused in light of alcoholic driving. As the creating insight among people is that vehicle security is dynamically critical. Future degree of this structure is to control the setbacks caused due to alcohol use. This system improves the security of individual and in this manner giving the convincing progression in the vehicle business regarding decrease setbacks caused in light of driving.

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Conflict of interest

The authors declare that there is no conflict of interest in this paper.

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