

SENSOR BASED SMART VEHICLE ALCOHOL DETECTION WITH GSM & GPRS ENABLED E-CHALLAN

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Abstract— The point of my examination paper is to speak to the undertaking which makes human driving more secure and to beat mishaps. This venture is created by incorporating liquor sensor with Arduino board. Arduino processor ATmega328 can deal with a bigger number of capacities than customary microcontrollers. The liquor sensor utilized in this undertaking is MQ3 which to recognize the liquor content in human breath. Since sensor has fine affectability go around 2 meters, it can suit to any vehicle and can without much of a stretch be escaped the suspects. This venture is fitted inside the vehicle. The task is intended for the security of individuals sitting inside the vehicle.

Keywords:- Alcohol detection system, Vehicle controlling system, Sensor, buzzer, LCD, GSM, GPS, Arduino

1. INTRODUCTION

India had earned the questionable qualification of having more number of fatalities because of street mishaps on the planet. Street security is developing as a significant social worry the world over particularly in India. Driving drunk is now a genuine general medical issue, which is probably going to develop as one of the most critical issues in the close future [1]. The framework actualized by us targets lessening the street mishaps in the not so distant future because of tipsy driving. The framework identifies the nearness of liquor in the vehicle and promptly bolts the motor of the vehicle. Simultaneously a SMS alongside the area of the vehicle is send to three pre-chosen contacts. Thus the framework decreases the quantum of street mishaps and fatalities because of alcoholic driving in future.

II. LITERATURE REVIEW

In this paper author describes about alcohol detection by using sensor . [1]

In this paper author discuss about GSM module of message send to person about drugged driver . [2]

This paper introduces methods such as alcohol detection, GPRS module for location of accident. [3]

In this paper they show location detection and discuss how they can be implemented to avoid accidents.[4]

Instead of using Arduino in this paper they used microcontroller 16F865A [5].

In this paper author discuss about driver's behaviour, safety application & auto theft prevention system [6].

This paper discuss about the alcohol detection system for vehicle using alcohol sensor MQ3 [7].

In this paper they describe about buzzer using Arduino. Alcohol detection craving [8].

In my paper i discuss about the alcohol detection system for vehicle with Engine locking System and E-challan generation to alert police about drugged driver .

III. HARDWARE MODULES

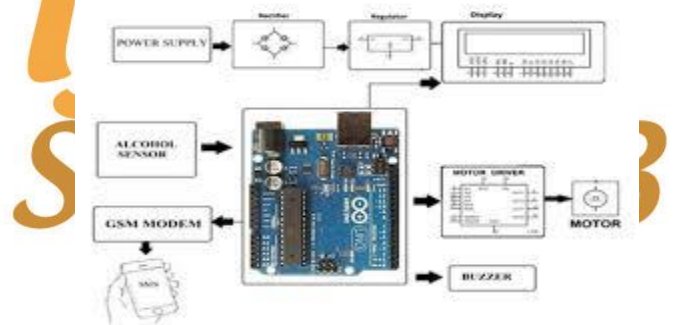


Figure . 1. Hardware module

The entire system adopted the Arduino Uno Microcontroller Board (based on ATMEGA 328), the principle of the hardware chart as shown in figure 1. The core functions modules are Arduino Uno, Alcohol Sensor module (MQ-3), GPS Module GSM , 16x2 LCD Display and DC Motor.

- 1) **ARDUINO:** The arduino board is the central unit of the system. All the components are interfaced to the board and programmed as per their functionality to operate in synchronization.
- 2) **ALCOHOL SENSOR:** It is used to sense the alcohol. The output of which is applied to the arduino board.
- 3) **GSM:** It is used to send an SMS to the contacts of the user about the location of the vehicle. It is beneficial in emergency situations.

- 4) GPS: It is used to track the location of the user which is send via SMS through GSM module.
- 5) LCD: If alcohol is detected it displays the message indicating "ALCOHOL DETECTED".
- 6) DC MOTOR: It is used as a dummy for indicating the engine locking facility whenever alcohol is detected.

A. Arduino Microcontroller Board

The arduino board is the central unit of the system. The arduino uno is the microcontroller board based on the ATmega 328. It is a programmable microcontroller for prototyping electromechanical devices.it has 14 digital inputs/output pins (of which 6 can be used as PWM output),6 analog inputs , a 16 MHz ceramic resonators the arduino differs from all preceding board is that it does not use the FTDI USB to serial driver chip Units.

- Sensors (Gyroscopes, GPS Locators, accelerometers)
- Actuators (LEDS or electrical motors)

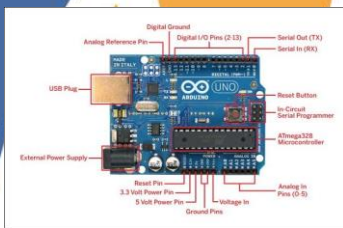


Figure 2. Arduino board

B. Alcohol Sensor MQ-3

MQ3 is suitable for detecting alcohol, this sensor can be used in a Breathalyzer. It has a high sensitivity to alcohol and small sensitivity to Benzene. The sensitivity can be adjusted by the potentiometer. Sensitive material of MQ-3 gas sensor is SnO₂, which with lower conductivity in clean air. When the target alcohol gas exist, the sensor's conductivity is higher along with the gas concentration rising, use of simple electro circuit, Convert change of conductivity to correspond output signal of gas concentration. The equations are an exception to the prescribed specifications of this template. You will need to determine whether or not your equation should be typed using either the Times New Roman or the Symbol font (please no other font). To create multileveled equations, it may be necessary to treat the equation as a graphic and insert it into the text after your paper is styled.[6]

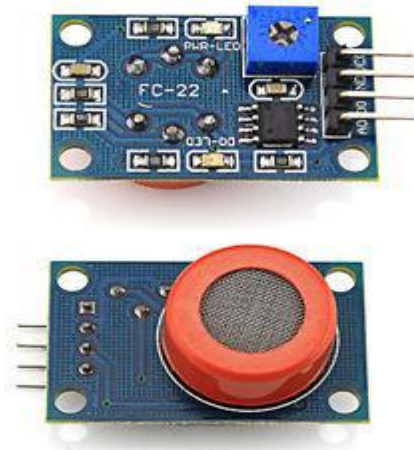


Figure 3 . MQ3 Alcohol Sensor.

C. Liquid Crystal Display

Liquid crystal display screen is the electronic display module and find a wide ranges of applications. A 16*2 LCD display is very basic module and it is very commonly use in various devices and circuit.

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

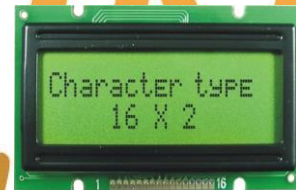


Figure 4. LCD Display

D. BUZZER

Features:

1. The PS series are high performance buzzers that employ uni-morph piezoelectric elements and are designed for easy incorporation into various circuits.
2. They feature extremely low power consumption in comparison to electromagnetic units.
3. Because these buzzers are designed for external excitation, the same part can serve as both a musical tone oscillator and a buzzer.
4. They can be used with automated inserters, moisture resistant models are also available.



Figure 5. Alarm

E. GSM MODULE

A GSM module or a GPRS module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM or GPRS system.

It is a digital cellular technology used for transmitting mobile voice and data services. ... GSM makes use of narrowband Time Division Multiple Access (TDMA) technique for transmitting signals. GSM was developed using digital technology.

A GSM modem can also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port or USB port on your computer.[4]



Figure 6. GSM Module

F. GPRS MODULE

General Packet Radio Service (GPRS) is a parcel arranged versatile information standard on the 2G and 3G cell correspondence system's worldwide framework for portable interchanges (GSM). GPRS was set up by European Telecommunications Standards Institute (ETSI) in light of the prior CDPD and I-mode bundle exchanged cell advancements. It is presently kept up by the third Generation Partnership Project (3GPP).[3]

In 2G frameworks, GPRS gives information paces of 56–114 kbit/sec.[3] 2G cell innovation joined with GPRS is some of the time depicted as 2.5G, that is, an innovation between the second (2G) and third (3G) ages of portable telephony.



Figure 7. GPRS Module

G. DC MOTOR

This DC or direct current motor works on the principal, when a current carrying conductor is placed in a magnetic field; it experiences a torque and has a tendency to move. This is known as motoring action.

If the direction of current in the wire is reversed, the direction of rotation also reverses. When magnetic field and electric field interact they produce a mechanical force, and based on that the working principle of dc motor established.[8]

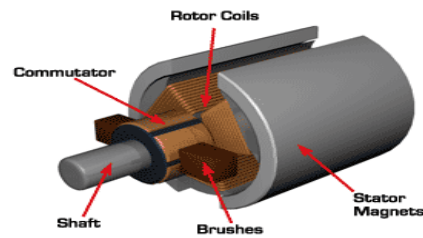


Figure 8. DC Motor

IV. IMPLEMENTATIONS

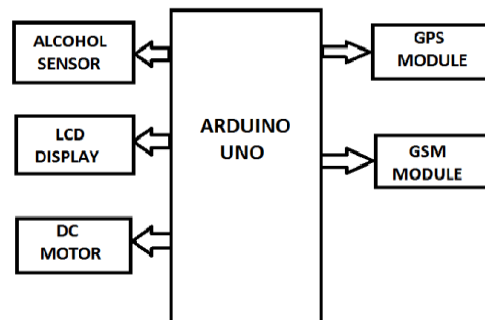


Figure 9. Flow Chart.

INTRODUCE E-CHALLAN SYSTEM

E-challan is an electronic format of the challan. An e-challan can also be defined as a specific format used for depositing or remitting the contribution or statutory payment at a bank or treasury.

In our project what we do is that the message is sent to police of drunked driver and location also forwarded to police . After that the challan is generated of the locked vehicle and the drunked person who is inside the car. The whole process should be in online form.

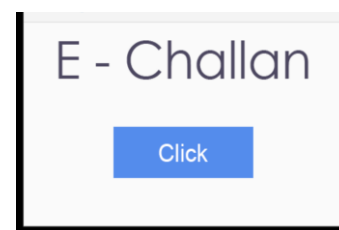


Figure 10. Shows challan generation.

ADVANTAGES

1. To forestall mishap because of alcoholic and driving.
2. Simple and proficient to test the liquor content in the body.
3. Snappy and precise outcomes.
4. Accommodating for police and gives and programmed wellbeing frameworks for autos and different vehicles too.

APPLICATIONS

1. "Liquor identifier venture" can be utilized in the different vehicles for distinguishing whether the driver as expended liquor or not.
2. This project can also be used in various companies or organizations to detect alcohol consumptions of employees.

VI. EXPERIMENTAL WORK

6.1 Alcohol Sensor Testing

The test is conducted to check the working of the breath based alcohol sensor as the distance of sensor from source varies. Since the sensor is used to sense breath alcohol concentration at a certain fixed distance from driver, its performance under different sensing distance is ascertained

An experiment was set up in a small room to test variation in alcohol sensor output as the distance of sensor from drunk person with certain level of breath alcohol concentration varied. The test was conducted for very less distance of 15cm and distance of 35cm (average distance of car vehicle driver from steering wheel) of alcohol sensor from drunk person and sensor response i.e. changes in ADC count of sensor with time is monitored on the serial panel on PC.[7]

6.2. Live Drunk Driver Test

In order to test the real-time working performance of the prototype model of the drunk-drive situation detection system, the location is checked from where the alert message is come and rescue the people who is drunk from given location as shown . [3]



Figure 11. Shows location test of drunken driver.

6.3. GSM Message Testing

A message has arrived from the drunken driver side of "alcohol alert" i.e. the person has take the alcohol and went for a drive but densor detected and locked the entire system.[4]

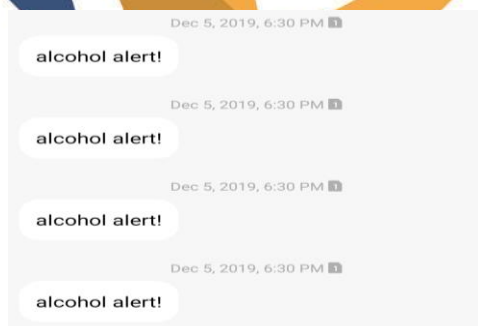


Figure 12. Message in inbox

V. RESULTS

By implementing this system a safe 4 wheeler journey is possible which would decrease the injuries throughout accidents caused from the alcohol and additionally reduce the accident rate due to drunken driving.

I have a tendency to introduce advanced sensors techniques and radio frequency wireless communications are included in this project to make it a good one. My system efficiently

checks the driver is drunk or not before start the vehicle if yes, Engine is automatically locked & message sent to family of drunked person and our alert system will alert police for his/her carelessness and a challan is generated of that vehicle by the police.



Figure 13. Smart vehicle system



Figure14. Lcd display shows engine locking.

VII. CONCLUSION

I have given an extremely viable answer for build up an insightful framework for vehicles for liquor recognition whose center is Arduino.

Since sensor has fine affectability extend around 2 meters, it can suit to any vehicle and can undoubtedly be avoided the suspects. The entire framework has too a favorable position of little volume and greater dependability.

As the developing open observation is that vehicle wellbeing is more significant, propels in open security is picking up acknowledgment than before. Future extent of this framework is to control the mishaps causes because of liquor utilization. This framework improves the security of individual. What's more, thus giving the powerful improvement in the vehicle industry in regards to lessen the mishaps cause due to liquor.

VIII . ACKNOWLEDGEMENT

As I present my Research on "ALCOHOL DETECTION AND SMART VEHICLE CONTROLLING", I take this opportunity to offer my sincere thanks to all those without whose guidance this project might have remained a dream for me .

I have been fortunate enough to my guide who gave me the freedom, support and the whole hearted co-ordination for the completion of my research.

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