

Alcohol Detection System in Automobiles

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ABSTRACT—In this prototyped project, an attempt will be made to develop a locking system for cars so it would not start without an alcohol checking mechanism. The system will be the advantage of a pre-existing Alcohol sensor. In the united states of America alone and during 2014 nearly “9,957 people died of alcohol-impaired-driving” that is one alcohol-impaired-driving fatality every 52 minutes. alcohol detectors are not proposed in any of the vehicles, hence there is a chance for anyone to drink and drive. Traffic police uses alcohol detectors to avoid drunk and drive system. The list goes on and on for other countries too, therefore, it is necessary to enhance and improvise new techniques. This project pushes towards public safety in general and roads safety in particular. Alcohol Detector in Car project is designed for the safety of the people seating inside the car. Alcohol Detection with Vehicle Controlling project helps to control the accidents in case the driver has consumed the alcohol

Keywords—*Alcohol detection system; Vehicle control; MQ3 sensor; camera; advanced fingerprint sensor;*

1. INTRODUCTION:

Roads safety has always been at the center of attention. The signboards, direction arrows, and lanes have made following rules much easier and served as an excellent guide, nevertheless, uncontrollable factors such as drunken drivers exit, and thus accidents still happen. In the united states of America alone and during 2014 nearly “9,957 people died of alcohol-impaired-driving” that is one alcohol-impaired-driving fatality every 52 minutes. The list goes on and on for other countries too, therefore, it is necessary to enhance and improvise new techniques. This project pushes towards public safety in general and roads safety in particular. The idea is characterized by being deliberately dependent on personal contribution. The system should make a significant leap in terms of public awareness in addition to the reduction of accidents caused by drunken drivers. The second

part is the controlling unit; it has the necessary functions to read the alcohol sensor’s output, furthermore, the microcontroller will act accordingly in response to the detected alcohol percentage by controlling the DC motors (either stop or run) and visually indicating its status[5]. Last but not least, the third part; the Motor driver shield, this part, in particular, is to simulate a[1] hypothetical scenario of motor control. The shield itself is meant for driving DC motors since they need more current, which compensated via an onboard chip with an external power feed

II. PROCEDURE FOR PROPOSED SYSTEM

A lot of different methods were proposed to solve the problem of drunken driving detection, but we didn’t have proper measurements for this. Therefore, we needed a method to combine several

factors and personalize it for testing people, other than the regular approach. These considered...

- Heart rate
- Alcohol content
- Facial expressions
- Eye dilation
- Acceleration and normal motion of the car

When the driver touches the start/stop button, the detection system is powered and activated. Nowadays, our cars are becoming smarter and a replacement feature is being developed to safeguard against drunk driving. The touch-based technology reads blood alcohol below the skin surface [10]. Touch sensors are placed within the car ignition button or the gearshift shine. A beam of sunshine onto a finger, this touch-based system uses infrared ray's spectroscopy to detect the extent of alcohol within the blood. Alcohol tends to absorb[3] specific wavelengths of light, and by measuring the intensity of lights, we'll be able to precisely pinpoint the driver's level of blood alcohol. If the blood alcohol concentration rises above the legal limit, the system counts as '1', if not '0'. Simultaneously the system moves to other sensors i.e. breath-based system (using MQ-3 alcohol sensor), Heartbeat sensor, identity verification system. When the reading of the sensors is above the given limit, it takes it as '1'. Else it takes it as '0'. If the system matches three of the sensors automatically turns the ignition is off. For the protection measures of the driving force, we are interfacing with GSM and GPS modules, with help of those modules message alerts are sent to the relations, cops. Using a GPS module, it gives the exact location of the vehicle with its latitude and longitude to the family and cops.

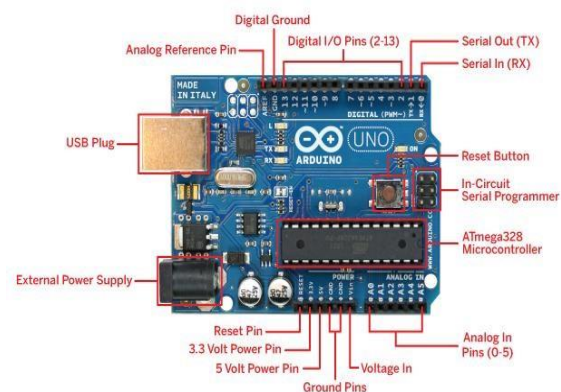
A. Arduino Microcontroller Board

The Arduino board is the central unit of the system.

1) Introduction: The Arduino Uno is a microcontroller board based on the ATmega328. It is a programmable microcontroller for prototyping electromechanical devices. You can connect Digital and Analog electronic signals: □ Sensors (Gyroscopes, GPS Locators, accelerometers) Actuators (LEDs or electrical motors)

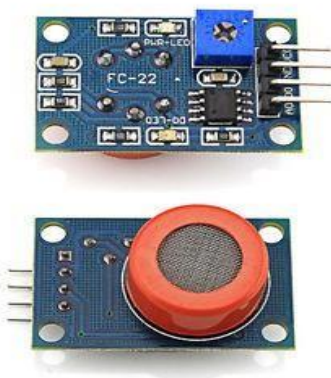
It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button as shown in figure 2. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB to-serial converter



B. Alcohol Sensor MQ-3

The analog gas sensor - 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. The sensitive material of the MQ-3 gas [2] sensor is SnO₂, which with lower conductivity in clean air. When the target alcohol gas exists, 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.[7]



Alcohol Sensor

MQ-3 gas sensor has a high sensitivity to Alcohol and has good resistance to disturb gasoline, smoke, and vapor. The sensor could be used to detect alcohol with different concentrations; it is with low cost and suitable for different applications.

- 1) **Sensitivity Adjustment:** The resistance value of MQ-3 is different to various kinds and various concentration gases. So, when using these components, sensitivity adjustment is very necessary. It is recommended to calibrate the detector for 0.4mg/L (approximately 200ppm) of Alcohol concentration in air and use-value of Load resistance that (RL) about 200 K Ω (100K Ω to 470

K Ω). When accurately measuring, the proper alarm point for the gas detector has to be determined after considering the temperature and humidity influence.

2) **Character configuration:**

- Good sensitivity to alcohol gas
- Simple drive circuit
- Long life and low cost
- High sensitivity to alcohol and small towards benzene long life.

3) **Specifications:**

- Power supply needs: 5V
- Interface type: Analog
- Pin Definition: 1-Output 2-GND 3-VCC
- High sensitivity to alcohol and small sensitivity to Benzene
- Fast response and High sensitivity
- Stable and long life
- Simple drive circuit with size: 40x20mm

LITERATURE REVIEW

Several approaches have been proposed related to this issue in many papers. Of these, some specific papers have been analyzed in the following paragraphs. Vijay Savania et al proposed a system using an alcohol sensor placed in the vehicle along with the ultrasonic sensor used for car accident prevention. The resulting information. MS Malathi et al proposed a software environment indicating the alcohol sensor placed on the steering wheel detects the alcohol level and also a seat-belt detector is introduced for the safety of the driver during accidents by locking the seat-belt slot due to which the ignition can never be started. Dada Emmanuel proposed a prototype to detect alcohol

and an engine locking mechanism by using an Arduino-Uno microcontroller interfaced with an alcohol sensor along with an LCD screen and a DC motor. In case alcohol is detected the engine is stopped, hence needs to be parked instantly. Aryan Mathur et al proposed a system embedded on the steering wheel of the four-wheeler to detect the alcohol level of the driver, the respective output is sent via a signal to the piezoelectric shaft and key casting is locked/unlocked. RF receiver receives the signals from the transmitters placed on the accident-prone sites and the driver is alerted regarding the respective zones. Prof. Dr. D.G.Jha, et al proposed a model which aims at preventing the user from driving when drunk and reduces the number of accidents occurring due to drunken driving. In case, if the driver is intoxicated before but consumes the alcohol in motion, the sensor continues measuring and when the level crosses the limit, the vehicle starts slowing down and is stationed.

3) **CONCLUSION:** In this paper, we proposed a method to sense the presence of alcohol from the touch of the driver as drunk and driving accidents are one of the major problems faced in society. Due to the growing public knowledge advances regarding the importance of public safety, it is gaining more acceptance than in the past. This paper provides an efficient solution to develop an intelligent system for vehicles with multi-stage testing to avoid accidents by shutting down the operation of vehicles. The system is designed and implemented successfully via the use of the Arduino Uno ATMEGA328 microcontroller and MQ-3 sensor. The whole system has the advantage of small volume and more reliability. The sensors are very accurate and can be configured according to the requirements thereby increasing the efficiency. Due to various features implemented here, it will be impossible for drunk people to start their vehicles and bring any harm to innocent lives and property. This system brings innovation to the existing

technology in the vehicles, reduces the rate of accidents taking place, and improves the safety features, hence providing an effective development in the automobile industry. Thus, by implementing this proposed system we can have a much safer world, free of drunk and driving.

LITERATURE SUPPORT

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