Alcohol Sensing And Automatic Engine Locking System

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Abstract: The main purpose behind this project is "DRUNK DRIVING DETECTION". Now a day's many accidents happening because of the alcohol consumption of the driver or the person who is driving the car. The drunk driving is a major reason of accident in almost all countries all over the world. Alcohol detection in car project is designed for the safety of the people seating inside the car. This project should be installed inside the vehicle.

In this project we have developed an automatic engine locking system. The input for the system is alcoholic breath. The controller waits for the output from alcohol sensor. Here a stimulating process activated using a dc motor through the freewheeling diode & complete process is under the supervision of an intelligent Atmega 328microcontroller. Even through efficient set up requirements have been adopted for the traditional methods, where in this process this could be a better idea of interesting the complete state of the art design into the system. Most of traditional systems are likely to be more dependent on the operator & it may fail due to various factors like battery life, power consumption as well as the unavoidable external disturbances. Thus drunk driving is a major reason of accidents in almost all countries all over the world. Alcohol detector in car project is designed for the safety of the people seating inside the car. If there are many traces of alcohol above the set limit then the engine will be locked by the system and at the same time the buzzer will on so, that we can avoids accidents.

KEYWORDS: Arduino UNO, MQ3 Alcohol Sensor, DC motor, LCD Display, Buzzer.

I. INTRODUCTION

We hear lot of accidents due to drunk driving and it will not be in stable condition. So rash driving is the in convenience for other road death for the drunk driver and not for others. In this system uses a compact arduino uno board. Programs are developed in embedded C
Our project is based on prevention of drunk & driving. So in our project we use a MQ3 sensor, a DC motor, An Arduino board & a LCD display. Here Arduino is used for the programming and interfacing purpose; LCD display is used to show the percentage of the alcohol present in alcoholic breath of the person, MQ3 sensor is used to detect the alcohol molecules. This sensor is placed on the steering of the car. When a driver tries to drive the car in over drunken condition, the MQ3 sensor senses the presence of alcohol and when the percentage level is above the stated value a signal will be send to Arduino. According to that signal the engine will stop working. In this project we have set the percentage level of alcohol is 40%.

II. HARDWARE REQUIREMENTS

- Power Supply
- Arduino UNO
- MQ3 Alcohol Sensor
- DC Motor
- Buzzer
- LCD display
- Transistor

III. SOFTWARE REQUIREMENTS

- Arduino IDE
- Embedded C Programming

IV. HARDWARE DESCRIPTION

- **Arduino UNO board** -It is an open source electronic platform based on easy to use hardware and software. It is used for sending receiving and processing the signal and it helps to rotate the servo motor and shows the display on the screen.
  Features:
  - Microcontroller ATmega328
  - Operating Voltage 5V
  - Input Voltage 7-12V
  - (Recommended)
  - Input Voltage (limits) 6-20V
  - Digital I/O Pins 14 (of which 6 provide PWM output)
  - Analog Input Pins 6
  - DC Current per I/O Pin 40 mA
  - DC Current for 3.3V Pin 50 mA
  - Flash Memory 32 KB (ATmega328) of which 0.5 KB used by boot loader
  - SRAM 2 KB (ATmega328)
  - EEPROM 1 KB (ATmega328)
  - Clock Speed 16 MHz

Figure 1

- **DC Motor** –
  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 is established. In our project DC motor is using as engine starter which would be connected to crank of the engine
  The speed of a dc motor is directly proportional to the supply voltage, so if we reduce the supply voltage, the motor will at half speed. The speed controller work by varying the average voltage sent to the motor. This voltage is depending upon the alcohol sensor (mq3). That means when the alcohol sensor sensed the alcohol percentage less than 40%, the motor will run. But if the sensor sensed the alcohol percentage above 40%, the motor will stop.

Figure 2

- **Buzzer/Alarm –**
  A buzzer is a mechanical, electromechanical, magnetic, electromagnetic, electro-acoustic or piezoelectric audio signalling device. A piezo electric buzzer can be driven by an oscillating electronic circuit or other audio signal source. A click, beep or ring can indicate that a button has been pressed. A conventional Piezo bell works between 3 – 12 volts DC.

Figure 3

- **MQ3 Sensor** –
  The Analog Gas Sensor-Mq3 Is Suitable for Alcohol Detecting the Sensor Can be used as a Breath Analyzer. It Has A High Sensitivity To Alcohol & Small Sensitivity To Benzene. The Alcohol Module Is Used To Sense The Alcohol. The Analog Output Of Which Is Applied To The Arduino Board. Resistance Value Of Mq3 Is Different Components.

Figure 4

- **Jumper Wires** –
  A jumper wire (also known as jumper, jumper wire, jumper cable, DuPont wire, or DuPont cable – named for one manufacturer of them) is an electrical wire or group of them in a cable with a connector or pin at each end (or sometimes without them simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

Figure 5

- **Arduino Data Port Cable** -An Arduino serial port cable is used to burn the programming instructions in the Arduino board from computer.

Figure 6

- **LCD Display** -LCD (LIQUID CRYSTAL DISPLAY) screen is an electronic display module & finds a wide range of applications a 16*2 LCD display is very basic module & is very commonly used in various devices & circuits. These modules are preferred over seven segments & other multi segment LEDs.

The Reasons being LCDs are economical, easily program & have no limitation of displaying special & even custom characters (unlike in seven segments). In this the LCD display is used to show the percentage of alcohol that the sensor has sensed.

Figure 7

V. WORKING OF THE PROJECT

Dc motor:- Normally dc motor is in running condition . At that time green led glows & the % of alcohol is less than 40. But when the % of alcohol will increase above 40, then the motor will stop and red led will glow.

MQ3 Sensor: - We used Ethyl alcohol to demonstrate our project. In this project the MQ 3 sensor is used as an alcohol sensor. It senses the % of ethanol molecule. When the % of ethanol will increase above the stated value, then it gives a signal to Arduino.

Arduino board: - It is an embedded system which we used for controlling the whole section. According to the signal of MQ3 sensor it controls the working of dc motor. It also controls the LCD display module.

Darlington pair:- Here Darlington pair is used to increase the current rating to run the dc motor.

Freewheeling diode: - We used freewheeling diode across the dc motor to reduce the inductive effect.

LCD display: - Here we used LCD display to show the percentage of alcohol.

VI. BLOCK DIAGRAM

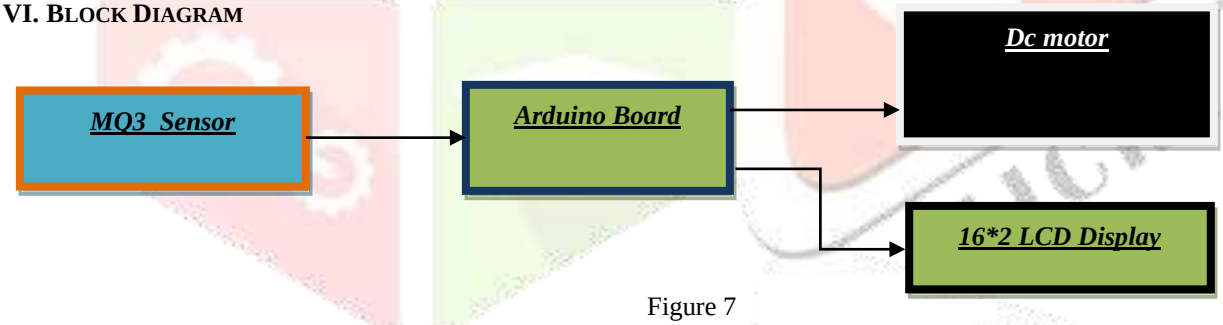

Figure 7

VII. CIRCUIT DIAGRAM

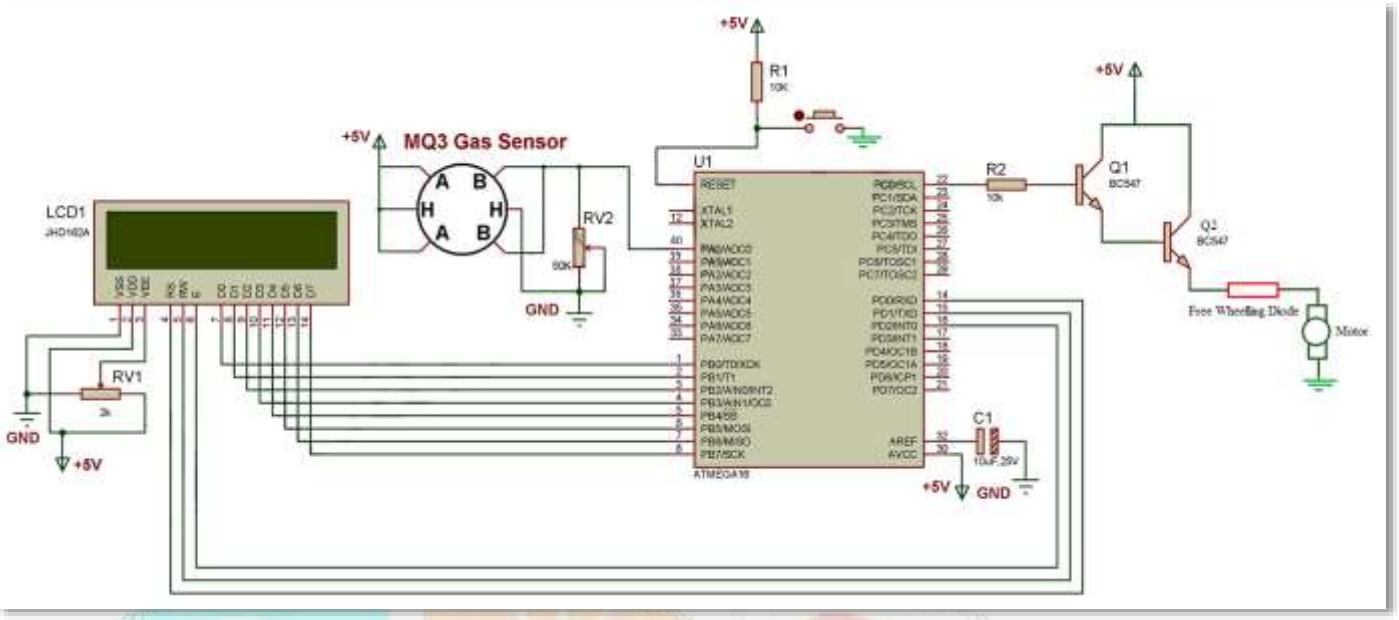

Figure 8

VIII. FLOW CHART

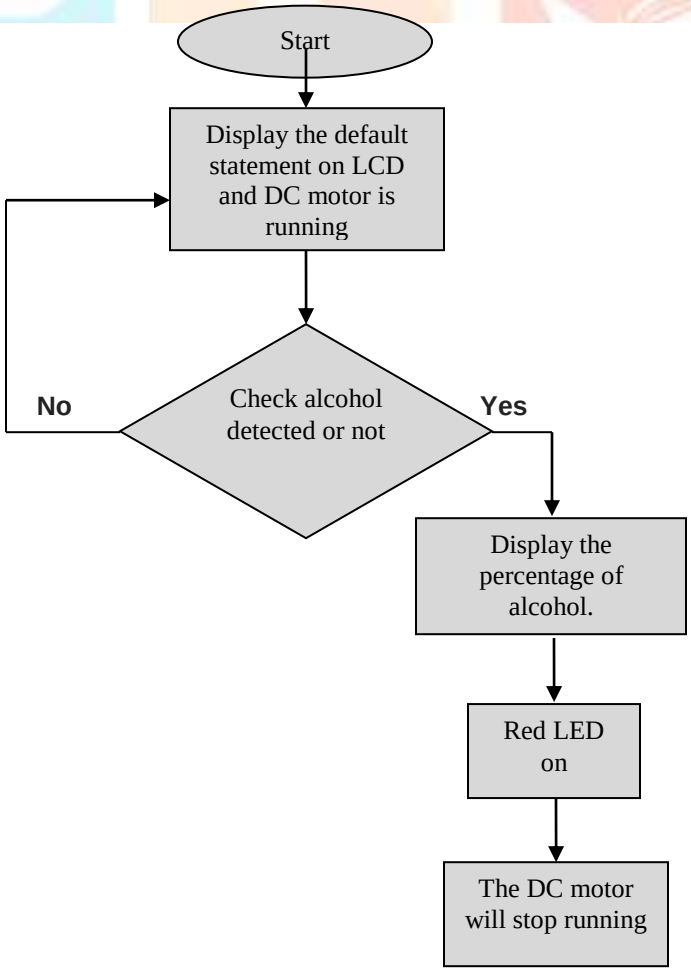

Figure 9

PROGRAM CODE:

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
int value;
int redLed = 8;
int greenLed = 13;
int buzzer = 10;
int smokeA0 = A0;
// Your threshold value
int sensorThres = 400;

void setup()
{
lcd.begin(16, 2);
pinMode(redLed, OUTPUT);
pinMode(greenLed, OUTPUT);
pinMode(buzzer, OUTPUT);
pinMode(smokeA0, INPUT );
Serial.begin(9600);
}
void loop()
{
 value=analogRead (smokeA0);
  lcd.setCursor(1, 0);
 lcd.print(value/10);
  lcd.print("% Alcohol");
int analogSensor =
analogRead(smokeA0);
Serial.println(analogSensor);
  // Checks if it has reached the
threshold value
if (analogSensor>sensorThres)
  {
digitalWrite(redLed, HIGH);
digitalWrite(greenLed, LOW);
noTone(buzzer);
  }
else
  {
digitalWrite(redLed, LOW);
digitalWrite(greenLed, HIGH);
tone(buzzer, 1000, 200);

  }
delay(0);
}
```

VIII. FUTURE ENHANCEMENT:

- We can implement Heart Rate Pulse Variability to find accurately identify the driving behavior of drivers and to assist them.
- We can implement GPS technology to find out the location of the vehicle.

IX. CONCLUSION

An effective solution is provided to develop the intelligent system for vehicles which will monitor various parameters of vehicle in-between constant time period and will send this data to the base unit as explained in this paper, by using hardware platform who's Core is Arduino, Alcohol sensor mq3. The whole Control system has the advantage of small volume and high reliability. Future scope of this system is to control the accidents and providing useful details about the accidental vehicle, thereby reducing the rate of accidents taking place due to drunken driving. This system brings innovation to the existing technology in the vehicles and also improves the safety features, hence proving to be an effective development in the automobile industry.

X. ACKNOWLEDGEMENT

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XI. REFERENCES

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