

Drunk and Drive Detection with Ignition Lock Using Raspberry PI

Anil Kumar Patnik

Assistant Professor,

Department of Electronics and
Communications Engineering,
Raghu Institute of Technology,
Visakhapatnam, Andhra Pradesh
531162, India.

G. Satish

Students,

Department of Electronics and
Communications Engineering,
Raghu Institute of Technology,
Visakhapatnam, Andhra Pradesh 531162, India.

Mondi KVS Manichandu

Students,

Department of Electronics and
Communications Engineering,
Raghu Institute of Technology,
Visakhapatnam, Andhra Pradesh
531162, India.

J.S.S. Keerthi

Students,

Department of Electronics and
Communications Engineering,
Raghu Institute of Technology,
Visakhapatnam, Andhra Pradesh
531162, India.

Y. Chanukya

Students,

Department of Electronics and
Communications Engineering,
Raghu Institute of Technology,
Visakhapatnam, Andhra Pradesh 531162, India.

ABSTRACT:

Drunk and drive is a leading cause of road accidents. Detecting drunken driving requires vehicles and manually checking or scanning drivers by using breath analyzers. In this project system uses alcohol sensor with raspberry pi along with Twilio to send SMS notification and LCD display and also motor to demonstrate as vehicle motor. This configures admin numbers into the system. And if the system detects driver is drunk above permissible limit, the sensor inputs trigger the processor about the issue. Also, the system stops the motor to demonstrate as engine locking the vehicle. Thus, the system detects and prevents drunk and driving accidents automatically.

Keywords:

Raspberry pi3, Alcohol sensor mq3, Twilio, L293D Motor Driver, DC motor, LCD display (16*2)

1. INTRODUCTION

Drunken driving incidents are causing almost one third of all traffic accidents and are considered to be among the most serious of driving offences. As per national statistics, average of nearly 12,000 people die every year and nearly 9 lakhs people arrested in DWI (Driving While Impaired) incidents. Checking each and every person is not possible.

This system is basically a Embedded system which consists of both hardware and software. By using Raspberry pi it is a credit card size computer. The alcohol sensor (MQ3) for detecting alcohol concentration. In this we take digital output the message will be displayed on LCD display. We are using L293D motor driver board which is responsible for working of DC motor. Thus the vehicle will be stopped on detecting alcohol concentration and related information will go to nearby location through Twilio [1].

2. RELATED WORK

The Hardware mainly consists of Raspberry pi3, Alcohol Sensor MQ3, L293D motor driver board, Twilio, LCD display, Buzzer, Ignition lock. The software is basically a Python Language [2].

A. HARDWARE SYSTEM:

Let us discuss the functions of each hardware device used:

Cite this article as: Anil Kumar Patnik, Mondy KVS Manichandu, J.S.S. Keerthi, G. Satish & Y. Chanukya, "Drunk and Drive Detection with Ignition Lock Using Raspberry PI", International Journal & Magazine of Engineering, Technology, Management and Research, Volume 6, Issue 4, 2019, Page 1-4.

I: RASPBERRY Pi3:

Raspberry pi is a credit card sized computer that can be connected to computer or TV. It helps to learn python Language. It helps to interface with external world using digital processing sensors and weather stations. In raspberry pi there are 40pins each pin has its own description.

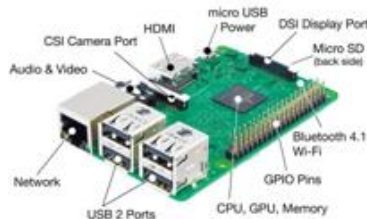


Fig 1. Raspberry pi3

The main reason behind using raspberry pi3 is its quad core processor is 64 bit ARM which enables to work 50% faster than pi2. Its memory is 1GB with 900 SDRAM. USB ports are 4 for connecting keyboard, mouse of a computer. It has a HDMI(“High Definition Multimedia Interface”) port for viewing display through a cable called HDMI to VGA(“Video Graphics Array”) cable.



Fig.2. HDMI to VGA

II. ALCOHOL SENSOR (MQ3):

Here we are using MQ3 which is called as gas sensor (or) Ethanol Alcohol sensor. It is used to measure the breath of drunken driver so it is called as breathalyzers.



Fig 3. Alcohol Sensor (MQ3)

This sensor consists of 4 pins i.e. Pin 1 is 5v power supply, Pin 2 is Dout(Digital output), Pin 3 is Aout(Analog output), Pin 4 is GND(Ground). These pins are connected to raspberry pi. Generally, raspberry pi takes Digital input so here we use Dout ie.pin 2. The main reason for using MQ3, it is low cost, it is stable and long life.

III. TWILIO:

Twilio is a cloud computing platform which is used for receiving calls and sending SMS by programically. In this 2 numbers are saved i.e. Admin number and control room number. Immediately after detecting alcohol content it sends SMS to admin and to higher authorities [3].

IV. L293D MOTOR DRIVER:

It is a motor driver which allows DC motor on either direction. This works on the principle of H-bridge circuit which can rotate the motor independently. Generally it’s a 16 pin IC.



Fig 4. L293D Motor Driver

In this there are 2 ports for connection DC motor. It has supply voltage of 4.5V-36V. Logic table for motor driver is:

Pin 1	Pin 2	Pin 7	Function
High	High	Low	Turn Anti-clockwise
High	Low	High	Turn Clockwise
High	High	High	Stop
High	Low	Low	Stop
Low	X	X	Stop

V: DC Motor:

Here we are using 9V DC motor. The DC motor converts direct current electrical energy into mechanical energy. In our project DC motor (or) Engine starts when the driver enters into car. Immediately if he driver exceeds the alcohol limit then the motor stops.



Fig 5.DC Motor

VI: LCD Display (16*2):

An LCD screen is an electronic display module. A 16*2 LCD means it can display 16 characters per line and there are 2 such lines. LCD has 2 registers; Command and Data. A command is an instruction given to LCD to do a predefined task like, initializing and clearing the screen. Data register stores the data to be displayed on LCD. In our project LCD displays the message which is being sent to admin and higher authority. Immediately after exceeding the limit the is message is displayed on the screen. The pins 1,2,4,6,11,12,13,14 are connected to Raspberry pi.



Fig 6. LCD (16*2) Display

3.BLOCK DIAGRAM OF PROPOSED SYSTEM:

In this we are connecting various Hardware components to Raspberry pi. There are 40 GPIO (General Purpose Input and Output) pins are present in raspberry pi. Below Fig 7 shows the block diagram representation of our proposed system is shown below in fig7 [4].

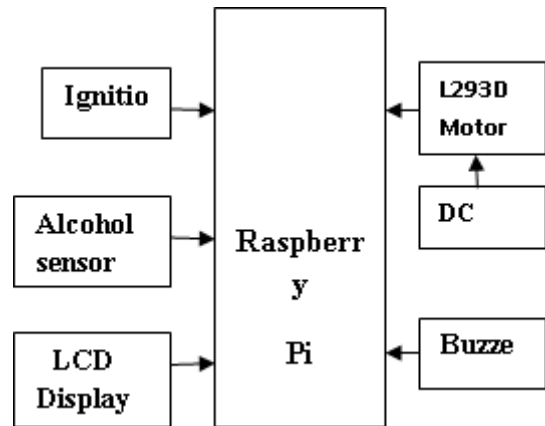


Fig7: Block Diagram

WORKING:

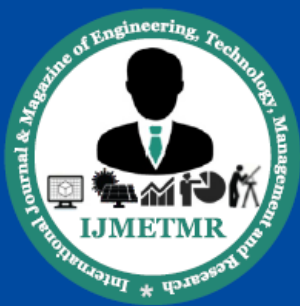
Initially for Raspberry pi Power supply is given through USB cable (or) by Mobile charger. First Raspbian OS is installed in raspberry pi, then the components are connected and we have to write the code for different hardware components. After executing the codes, the circuit works. Initially the engine gets started immediately when drunken driver enters into vehicle. Sensor measures the alcohol content if he exceeds the limit then Twilio sends SMS to driver and higher authorities and the SMS is displayed on the screen i.e. LCD and gives buzzer. Then the vehicle stops [5].

CONCLUSIONS:

This device is implemented to check the drunken drivers. This works efficiently and reduce burden on policemen. The reason behind for designing this system is to reduce accidents and it will be reduced by this system. Government should install this system to every vehicle and it has to be installed during the manufacturing of vehicle. This reduces the drunk and drive cases to minimum level. Future scope of this system is that the car is parked in a safe place without causing any disturbance for other vehicles.

REFERENCES:

[1]. Ms.Shruthi S.Gujarathi, Mr.Gaurav Ahirrao "Alcohol Detection and Automatic Drunken Drive Avoiding System" in IJERA on April 2014.



[2]. Rajesh Kumar Jakkar, Roop Pahuja, Raj Kumar Saini, Bhagirath Sahu, Natwar “Drunk and Drive Detection and Alert system for vehicles” in American journal of Traffic and Transportation Engineering on August 10, 2017.

[3]. A.A. Daundkar, S.A. DhaigudePatil, Shweta P.Bidgar “Mobile Phone Based Drunk and Drive Detection” in IJRCS on March 2016.

[4]. Piyush Vinay Phalak, Shashank Kowekar “Smart Phone and Sensor Based Drunk Driving Prevention System” in International Journal for Emerging Science And Technology on September 2015.

[5]. SrinivasuBatchu and S. Praveen Kumar “Driver Drowsiness Detection to reduce the Major Road Accidents in Automotive vehicles” in International Research Journal of Engineering and Technology (IRJET), pp.345-349, on 2015.