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Design and Implementation of Advance Accident Prevention System for Drunk and Rash Driving

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Abstract: ***There are large number of accidents that occur due to drunk driving. Almost every hour one accident occur. Life is very precious and do not lose it in silly road accidents Remember that your family is Waiting for you and how would they feel if you never came back. According to data provided by government agencies and various media houses, 150,935 people lost their lives in 2016 and 1,48,379 in 2017.These accidents were caused by drunk driving and was prominent in states like Tamil Nadu and Bihar with record number of 818 and 776 respectively. According to records of Central Records Bureau 2015, 1.5 % of total road accidents was due to drunk driving. This project deals with this problem and tries to lower down the records as low as possible. It also addresses a major issue of Car catching fire. Only 10% of total population in India owns a car and most of them cannot buy it with their regular income. They either take loan or buy from savings. Imagine how the person would feel when there newly purchased car Burned down in flames. This project tries to minimise these accidents and thus securing your life and your money.***

Keywords: Arduino, GSM, MQ3, LM35, GPS.

I. INTRODUCTION

The project is based on how to prevent accident caused by excessive heating of the engine due to which car catches fire and accident cause by drunk drivers. Actually it is a system which can be implemented into any car. The way the system work is whenever a person enters in the car, the alcohol sensor installed at steering will check or detect the alcohol content present in the breath of the person. If the content is found to be greater than the threshold value, microcontroller Arduino UNO will not let car to start. The system will also produce sound through buzzer and send SMS to the relative of the driver through GSM module with the exact coordinates of the car as detected by the GPS module, installed in the car. If the car is moving at very high speed and temperature of its car engine increases then, similar action will take place if the car engine temperature exceeds the threshold value, which will be detected by the temperature sensor installed near the engine. Microcontroller will stop the car well before it catches the fire with alarming sound. GSM module will send SMS having exact position of the car to the relative by GPS module.The main component of the system or you can say the brain and heart of a system is the microcontroller arduino Uno which controls all other sensor and component. Arduino UNO will decide to Start and Stop the car. We can do all the operation will the help of microcontroller. Through this a large number of accidents can be reduced and lots of life will be saved.

II. BLOCK DIAGRAM

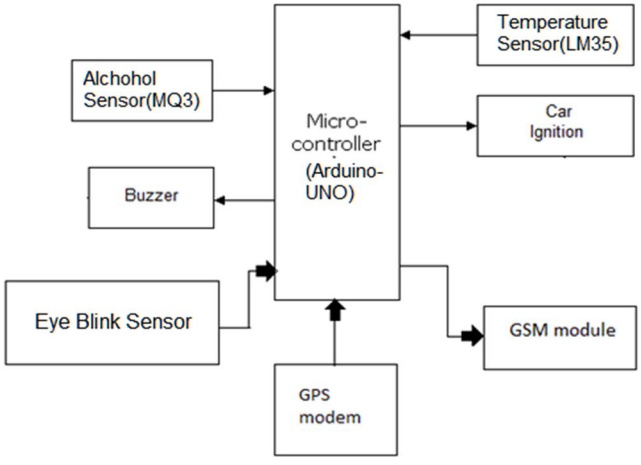

Fig 1: Block Diagram

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III. COMPONENTS

A. Arduino UNO

Arduino is single board microcontroller specially designed for students to develop various projects. It comes in different types like arduino UNO. Lily Pad Arduino, red board. Arduino mega. Arduino is open source hardware and Software Company. That provide design and specification so that different vendors can manufacture Arduino board. In this project, Arduino Uno has following specification Microcontroller - Atmega328p (8 bit AVR family microcontroller)
Operating voltage- 5V
Input Voltage -7V to 12V
Analog pins-6
Digital I/O pin-14
Flash memory 32 kB (0.5 kB for bootloader)
SRAM - 2KB
frequency (clock & speed) -16MHz

Fig 2: Arduino UNO

B. MQ3

MQ3 sensor will analyse the breath of the driver and detect the alcohol in it. It is used for the detection of an alcohol. Output of MQ3 sensor can be taken both in analog and digital form. The range of MQ3 sensor varies from 0.5 mole per litre to 10 mole per litre. Its sensitivity is very high and almost zero second response time. It can be easily interfaced with microcontroller controller Arduino UNO.

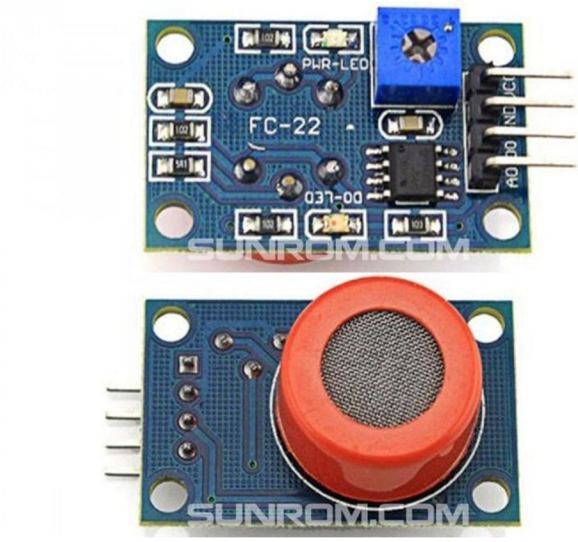

Fig 3: MQ3 Sensor

C. LM35

LM35 is used to measure the temperature of the engine. It will be installed near the car engine. Its range is -55 degree to 150 degree. The sensor generate the high output voltage and convert it into a temperature with a scale factor of 0.01 V/C. It has 3 pins and operate from 4V to 30V.

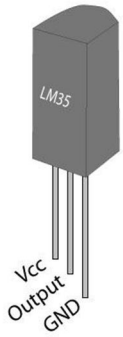

Fig 4: LM35 Sensor

D. GSM Module

Global system for mobile communication is known as GSM which was developed in 2G with CDMA. It describes protocols for 2G communication system. GSM module is a piece of hardware that can be interfaced with microcontroller boards like Arduino. In this project SIM900 GSM module is used.

The specification of GSM module is that it has the PCB size of 71.4mm*66mm*1.6mm,

Power supply of 5 volt. Its communication protocol is UART. It supports Quad Bands of frequencies- 850/900/1000 MHz and Dual Band of 900/1900 MHz. Operation temperature ranges from -45C to +85C.

Fig 5: GSM Module

IV. ADVANTAGES

A. Number of road accidents due to drink and drive will be reduced
B. Overheating of engine can be prevented
C. It can also works as an Anti-Theft system due to presence of GPS
D. Life Safety during Driving will be improved.

V. CONCLUSION

The purpose of this project is to reduce the number of road accidents occurring due to the drunk driving and Rash Driving. This is done with the help of MQ3 and LM35 sensor. Its installation cost is almost negligible in comparison to cost of vehicle and lots of lives will be saved. With the help of GPS, it can also works as anti theft system as exact coordinates of the vehicle can be detected. And immediate help can be send to the location.

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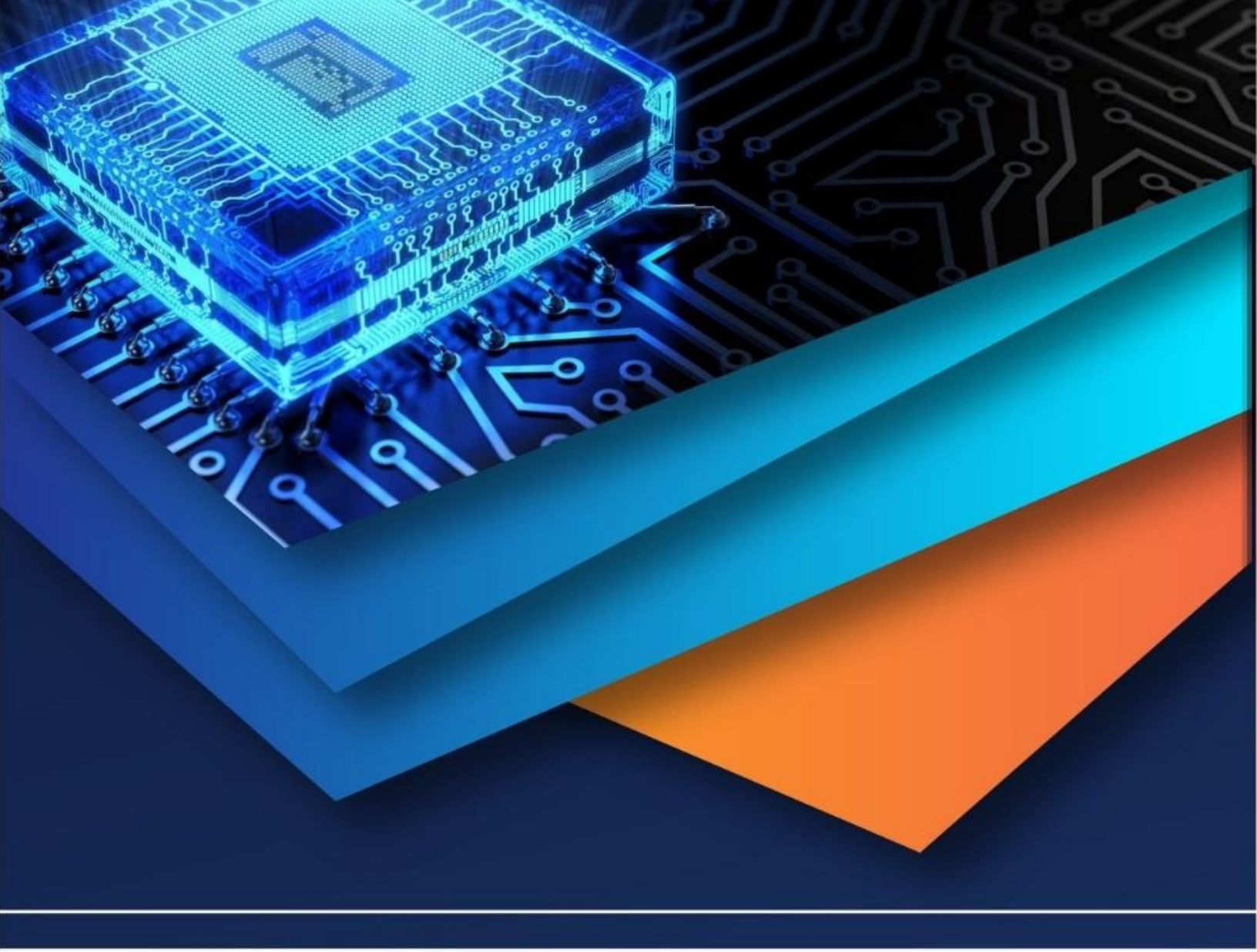

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