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Prevention of Road Traffic Accidents due to Drunken Driving using IoT

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Abstract:

Most of these days, many road accidents are happening due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and it also leads their lives into a great risk for the drunken driver and for others. In this paper, a new system is being developed with IOT which auto locks vehicle engine and sends a message to the nearest police station. The input for the system is from Detection Sensors either from Alcohol Breath or any other mechanism. The controller keeps looking for the output from these sensors. If there are any traces of Alcohol, then the system will stops the Engine and sends a message. The entire idea is going to be simulated in this research process by activating the relay.

Keywords — **Non-volatile memory, drunken driving detection, arduino uno software, motor shield circuit, IOT, sensors, mobile app, Wi-Fi.**

I. INTRODUCTION

Many road accidents are happening in highways due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and also it is a great risk not only for their lives but also for the others who are travelling. This system uses a compact circuitry built around arduino software with a non-volatile memory capable of retaining the password data for over ten years. Programs are developed in embedded C. The main purpose behind this paper is to prevent road accidents due to drunk and driving.

II OVERVIEW

Now-a-days, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus drunk driving is a major reason of accidents in almost all countries all over the world. Alcohol Detector in vehicles is designed for the safety of the people who are travelling by the vehicle. This system should be fitted / installed inside the vehicle. By implementing this design a safe journey is possible and also drunken drivers can be controlled. Government must enforce laws to install such circuit in every car and must regulate all car companies to preinstall such mechanisms while manufacturing the car itself. If this is achieved the deaths due to drunken drivers can be brought to minimum level. In this type of system, future scope can be safety landing of car aside without disturbing other vehicles. India had earned the dubious distinction of having more number of fatalities due to road accidents in the world. Road safety is emerging as a major social concern around the world especially in India. Drinking and driving is already a serious public health problem, which is likely to emerge as one of the most significant problems in the near future. The system implemented aims at reducing the road accidents in the near future due to drunken driving. The system detects the presence of alcohol in the vehicle and immediately locks the engine of the vehicle. At the

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same time an SMS along with the location of the vehicle is send to three pre-selected contacts. Hence the system reduces the quantum of road accidents and fatalities due to drunk driving in future. 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, GSM module. The designed system would finish the function of communicating with the base station via GSM and control of various parameters. 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.
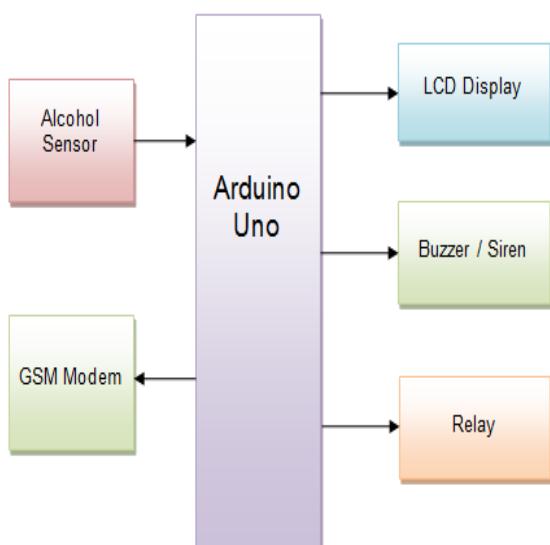

Fig 1. Block Diagram

A) MQ-3 SENSOR

Basically it has 6 pins, the cover and the body. Even though it has 6 pins, we can use only

4 of them. 2 of them are for heating system and other 2 are for connecting power and ground. A little tube is placed inside the sensor. This tube is a heating system that is made of aluminium oxide and tin dioxide and inside of it there are heater coils, which practically produce the heat. Two pins are connected to the heater coils and others are connected to the tube. The core system is the cube. Basically, it is an Alumina tube cover by SnO2, which is tin dioxide. And between them there is an Aurum electrode. Basically, the alumina tube and the coils are the heating system.

If the coil is heated up, SnO2 ceramics will become the semi - conductor, so there are more movable electrons, which means that it is ready to make more current flow. Then, when the alcohol molecules in the air meet the electrode that is between alumina and tin dioxide, ethanol burns into acetic acid then more current is produced. So the more alcohol molecules there are the more current we will get. Because of this current change, we get the different values from the sensor.
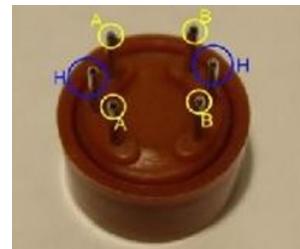
Fig 2: MQ-3 Sensor

B) 9V BATTERY

Rechargeable battery, storage battery, secondary cell or accumulator is a type of electrical battery which can be charged,discharged into a load and recharged many times USES: Common example are lithium-helium battery.

C) DC MOTOR

A motor is a electrical machine which converts electrical energy into mechanical energy. The principle of working of a DC motor is that "whenever a current carrying conductor is placed in a uniform magnetic field, it experiences a

mechanical force ".The end of the wire winding are connected to a commutator.The commutator allows each coil to be energized in turn and connects the rotating coils with the external power supply through brushes.

D) ADAFRUIT MOTOR SHIELD (L293D)

Arduino is the great starting point for electronic and the motor shield can drive up to 4 DC Motors bi-directionally. They can drive forward and backward.The speed can be varied at 0.5% increments using high quality built in PWM.To connect motor simply solder two wires to the terminals and connect M1,M2,M3 and M4.#include<AFmotor .h> is the library used , create the object and motor 1 and 2 are used for high speed.

E) ARDUINO UNO

Arduino UNO R3 is a open source micro controller board based onthe ATmega 328 chip. This board has 14 digital input/output pins,6 analog input pins , Onboard 16 MHZ ceramic resonator , Port for USB connection , Onboard DC power jack , An ICSP header and a micro controller reset button.

F) BUZZER OR BEEPER

A Buzzer or beeper is an audio signaling device.It may be A mechanical,electromechanicalmagnetic, electromagnetic,electro – acoustic or piezoelectric audio signaling device. A piezoelectric 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.

G) JUMPER WIRE

A jumper wire is a conducting wire. It is used to transfer electrical signals between two points in a circuit. The wires can either be used to modify circuits or to diagnose problems within circuit. In

electronics and particularly computing, a jumper is a short length of a conductor used to close, open or bypass part of an electronic circuit. They are typically used to setup or configure printed circuit boards,such as the mother boards of a computers.

III. EXPERIMENTAL RESULTS

The "IOT based prevention of road traffic accidents due to drunk and drive system is a real time model that can automatically lock the engine when a drunken driver tries to drive a car. By fitting this alcohol sensor into the car, we can safe guard the life of the driver and also the remaining passengers. It is very simple application. The life time of the project is high. It has low or zero maintenance cost and of course low power consumption.
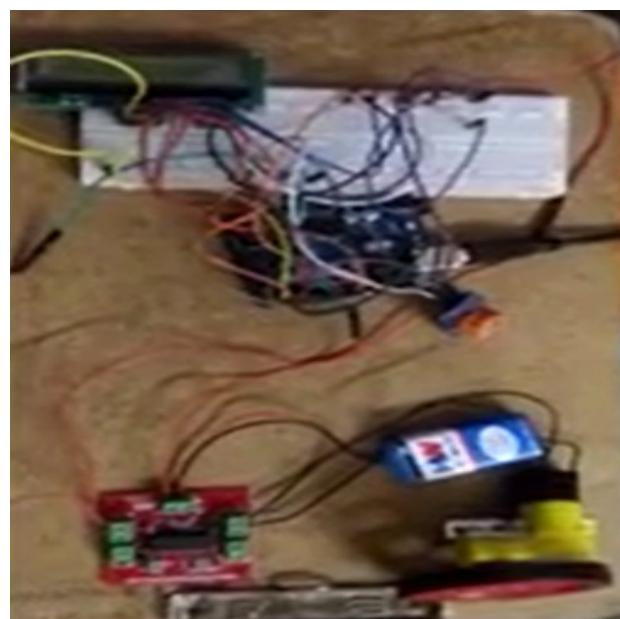

Fig 9: Smart Parking System

IV. CONCLUSION

In this paper, we have developed a real time model that can automatically lock the engine when a drunken driver tries to drive a car. By fitting this alcohol sensor into the car, we can safe guard the life of the driver and also the remaining passengers. It is very simple application. The life time of the project is high. It has low or zero maintenance cost and of course low power consumption.

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