Drunk Driving Prevention

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Abstract- **Drunk driving could be a major problem that continues to reason for thousands of deaths every year. Too several lives are lost due to drunk driving. A death from drunk driving doesn't solely have an effect on the victim however it affects everybody around them like family and friends. There are several solutions to stop drunk driving; however they'll solely work if we tend to place them into play.**

Index Terms- ATMEGA328P, Motor driver (L293D), MQ3 Alcohol Sensor, Piezo buzzer

I. INTRODUCTION

Now-a-days a major problem facing in this country is unnatural death of people in accidents due to drunken driving and rash driving. Drunken drivers are in an unstable condition and so wrong decisions are made on the roads which endanger the lives of road users, the driver inclusive. At present police uses screening device to detect the alcohol intake of the driver, since an automatic detection methodology using sensors could detect and drunk and drive in an efficient way. The next important cause for more number of fatalities is rash driving which can be reduced by collecting the data with the speed and location and thereby analyzing those using Data Mining Techniques. Further the notification is given to the RTO or traffic authority. In case of repeated violation of speed limit, results in blocking of his or her license. Current system to control the rash driving could only lock the speed of the vehicle at a fixed value irrespective of the location. Our team develops multiple preventive features against drunk-driving, as part of a series of preventive measures. The main aim of this paper is to reduce such accidents due to drunken driving especially in a country like India, according to transport research wing (India) survey accidents have been increased by 2.5 % from 2014 to 2015.

The concept car is designed to detect the driver's condition, to prevent the driver free from manual operation. If the system detects that the driver has drunk, warnings are issued to the driver to stop the car. The concept is to detect the driver's condition, to set the driver free from manual operation. If the system identifies that there is a possibility the driver has drunk, alerts are issued to the driver to stop the car. Drunken drivers are in an unstable condition and so, rash decisions are made on the highway which endangers the lives of road users. The manual detection device that law enforcement officers use, do analyze the breath and detect the alcohol consumption and penalize the defaulting drivers but then it becomes increasingly impossible for the traffic-police to control and monitor the vehicle movement given the size of modern-day traffic. Many research efforts have been made to the design of efficient systems that will identify drink-driving. [1]Altaf proposed an alcohol detection and motor locking system. They used AT89S51 controller IC, MQ-3 alcohol sensor, and an LCD to notify the occupiers of a car. The AT89S51 controller has an on-board flash memory which allows fast development and reprogramming in a matter of seconds. [2]Kousikan Sundaraj employed an infra-red (IR) alcohol detection system to provide continuous monitoring of a driver's BAC. An IR source LED-894 was used to direct IR energy through an IR sensor (TSOP 1736) mounted on the steering wheel. The activation of the relay circuit is made possible by the use of interface of IC-4538B and BC547 transistor. [3]Pratiksha adopted the Arduino ATMEGA328 control. It therefore becomes crucial for government-authorities to take advantage of the growing-technology to prevent such accidents and possibly prevent drunken-driving.

II. METHODOLOGY

A hi-sensitivity alcohol sensor is built into the transmission shift knob, which is able to detect the presence of alcohol in the perspiration of the driver's palm as he or she attempts to start driving. When the alcohol-level detected is above the pre-determined threshold, the system automatically locks the transmission, immobilizing the car. A voice notification is also issued via the car navigation system. Additional alcohol detection sensors are also included into the driver's and passenger seats of the vehicle to detect the presence of alcohol in the air inside the vehicle with high precision. When alcohol is detected, the system issues both a voice notification as warning and a message alert on the navigation system monitor. Alcohol breath odour is the most frequently cited observation by US police officers in alcohol related traffic offenses. Usually the strength of the odour is categorized as slight, moderate or strong. Despite the frequent reliance on this clue in officers' investigation of drivers, little objective evidence is available on the probability of successfully detecting, identifying or measuring alcohol odour. When we think of alcohol testing we usually imagine someone blowing into a mouthpiece mounted on a breath analyzer device. This method of alcohol testing is referred to as "direct" or "common" testing. However, there are many screening times that call for using breath test devices able to conducting a "passive" test. This type of alcohol testing does not require an individual to blow directly into a mouthpiece, but towards the device, which allows the operator to quickly screen for the presence of alcohol.

A.Micro-controller

The Selecting the Micro-controller is a very important task, as this controller will act as the brain of your robot. Most of the do yourself projects are made around Arduino and Raspberry pi but doesn't have to be the same type. There is no specific Micro-controller that you can work on. It all depends upon the requirement and cost. Micro-controller selection totally depends upon the needs and requirements of the product we like to make: At first technical requirements are identified like number of I/O pins needed, number/type of communication protocols, flash size, any special features required etc. Then list of controllers are chosen as per the technical requirements needed for the project. This list contains controllers from different manufacturers available in our area. Many application specific controllers are available and choose as per our needs. Then a controller is finalized based upon price range, availability and support from manufacturer are also checked. The Atmel 8-bit AVR RISC-based micro-controller combines 32 kB ISP flash memory with read-while-write capabilities, 23 general purpose I/O lines, 2 kB SRAM, 1 kB EEPROM is available , 32 general purpose working registers is available, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2- wire serial interface, SPI serial port, 6-channel 10-bit analog to digital converter (8-channels in TQFP and QFN packages) is used, programmable watchdog timer with internal oscillator is available, and five software select able power saving modes. The device operates between 1.8- 5.5 volts. The device achieves throughput approaching of 1 MIPS per MHZ frequency

Fig.1. Atmega328 pin out diagram (source: www.engineeringprojects.com)

B.Motor driver (L293D)

A motor driver is an intermediate module between Arduino and the Motor used to control. This is because Arduino micro-controller will not be able to supply the current required for the motor to work as per requirements and can just supply 40mA from Arduino micro-controller , hence drawing more current will damage the controller permanently making it no use. So we trigger the motor driver which in turn controls the motor to work as per the requirements. We will be using L293D Motor Driver IC which will be able to supply up to 1A current, hence this driver will get the information from Arduino and make the motor work as desired direction.

C.MQ3 Alcohol Sensor

MQ3 alcohol gas sensor is made by using SnO2 material which has less conductivity in clean air environment. Whenever it comes nearby alcohol gas rich air its starts conducting highly according to the gas concentration in the area where it is employed. So user can sense the difference of output voltage using any micro-controller based circuit and can detect the presence of Alcohol in the area. This is very low cost and a suitable sensor for many applications for alcohol detection activates. This sensor has a long life span and good sensitivity range. Some of the applications that can be made by using this sensor are Alcohol gas alarm system, portable alcohol detector unit, gas alarms system, Breathalyzer unit etc.

Fig.2.MQ3 sensor module

D.Buzzer

MQ3 Piezo buzzer is an electronic device commonly used to produce different sound signal. Light weight, simple construction type and low price make it usable in various applications like car/truck reversing indicator sound, computers busser, calling bells etc. Piezo buzzer is based on the inverse principle of Piezo electricity technique discovered in 1880 by Jacques and Pierre Curie. It is the phenomena of generating electricity (in small quantity) when mechanical pressure is applied to certain materials and the vice versa is also true. Such materials are generally called Piezo electric materials. Piezo electric materials are either naturally available or manmade type. Piezo ceramic is class of manmade type material, which poses Piezo electric effect and is widely used to make disc, the heart of Piezo buzzer. When subjected to an alternating electric (ac signal) field they stretch or compress rapidly, in accordance with the frequency of the signal given by thereby producing sound.

Fig.3.Piezo buzzer

The fig.4 shows a very type of commonly used Piezo buzzer also called Piezo transducer operating at DC voltage signals. Encapsulated in a cylindrical plastic coating cover, it has a hole on the top face at center for sound to propagate easily. A yellow like metallic disc which plays an important role in the producing sound can be seen through the hole.

E.BO Gear Motor 150 RPM

This is a standard very low cost, low voltage durable Dual Shaft Plastic Gear BO Motor that running at 150 RPM. It is most suitable for light weight robots running on voltages range between 5V-9V. Out of its two shafts one shaft can be connected to wheel of robot, while the other can be connected to an encoder respectively.

Working

Once the device is turned on by attaching a battery or giving other sources of power supply, the Arduino sketch starts running. It loads the required Arduino libraries. The Arduino starts detecting analog voltage from the sensor and converts it to a digital value using inbuilt Analog to Digital converter. Now if the detected level of alcohol is normal green led is on and red led is off and if alcohol level is above allowed limit the red led on and green led off and we have to turn off the engine or the dc motor.

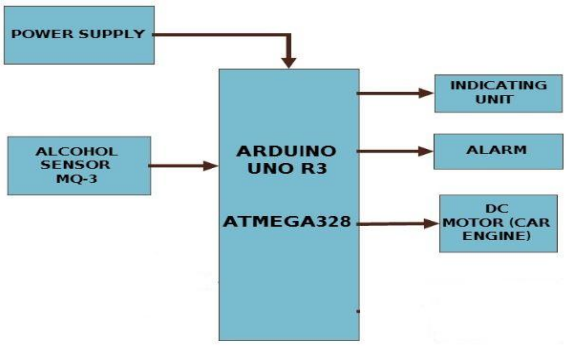

Fig.4.Block Diagram

SOFTWARE USED

The open-source Arduino Software (IDE) makes it very much easy to write code and upload it to the board. It is supported on Windows, Mac OS X, and Linux. The environment is written in Java programming language and based on Processing and other open-source software. This software can be used with any of the Arduino boards available

Fig.5.Arduino software

III.RESULTS

When drunken driver enters the car the MQ3 sensor detects the presence of alcohol in air. Buzzer, motor, capacitors all are connected together using wires. I India the legal limit of alcohol level is 0.03%. The sensed level depends on sensitivity of the alcohol sensor. Alcohol sensor senses the levels of alcohol in the human breathe. This value is sent to the micro controller. The sensed value is converted into analogous value inside the micro controller. If the compared value is less than the threshold value the system not operates. The alcohol sensor takes at least three seconds to sense the value. If the sensed level is less than or equal to the threshold value control is given to the attached motor and car starts. If the sensed value is greater than the minimum level the control signal s to the motor will not operates the car. Buzzer connected to the vehicle emits a buzzing sound if the sensed value violates the set value. As soon as the driver enters the vehicle and give key to ignite the engine the MQ3 sensor gets activated and detects the alcohol level through air and if it is measured to be greater than the minimum level vehicle doesn't starts. When he/she takes alcohol on moving vehicle, sensor detects alcohol content in the surrounding air, motor slowdowns and gets stationed at a location. The MQ3 sensor detects the alcohol level of the driver alone and not of the fellow passengers inside the vehicle. As a reason the position of the sensor should be at exact position suitably top above the steering wheel for efficient sensing of the alcohol sensor. The remaining module of the system can be placed anywhere depending on the comfort ability and convenience of the manufacturer or designer.

IV.CONCLUSION

Self-driving car technology is still decades away from completely removing the need for an unimpaired driver.so the project is of great important in the present world and the project is cost effective and every effective.

In order to make detection of alcohol effective following methods can be added to this alcohol sensor detection method

Facial monitoring system: In this camera is mounted on the vehicle facing the driver to monitor the driver's face. The system is calibrated to monitor the driver's state of consciousness through the blinking of the eyes. Drunken person eyes blink more in a minute than normal persons. When the system detects signs of drowsy, a voice and message alert is triggered. Also, a seat-belt mechanism is activated which tightens around the driver to gain his or her immediate attention.

Touch based: The system analyses alcohol found beneath the skin's surface. Measurement is by emitting an infrared light on the driver's skin. A portion of the light is reflected back to the skin's surface, where it is collected by the sensor. This reflected light have information about the skin's unique chemical properties, including the concentration of alcohol. The system will be able to take multiple readings in less than a second

Driving behavior: This mechanism constantly monitoring the operational behavior of the vehicle and can identify signs of inattentiveness or distraction in the driver. When the system detects such behavior alerts can be issued

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