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Vehicle Automation System Using Arduino

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Abstract: ***The current exploration is to epitomize the technical work in the form of design which illustrates how mortal driving can be made safer to avoid accidents and make the roads safer to drive for the drivers & also the pedestrians. The work is developed by integrating sensors predicated on alcohol content discovery conglomerating with Microcontroller board like Arduino, ATmega328 is more versatile in handling farther functions than any other conventional microcontroller. The MQ3 module is used to find the alcohol as well as smoke speck. It has reasonable perceptivity range around two measures. It is also suitable for any kind of vehicle. The sensor has one farther unique quality that it can simply be unseen from the defendants. It's too compact to fit complete set up in the form of product in machine.***
Keywords: Arduino, Alcohol detector, Smoke detector, USB, PPM (Parts per million), MOS (Metal oxide semiconductor)

I. INTRODUCTION

The design comes into actuality due to the thick habit of drinking alcohol and also driving the vehicle which is a serious offence in the eyes of law. The issue is also a serious public health problem and can arise as an important terms in near coming days. The arrangement developed targets to lower down the trouble of driving and also reduce the mischance on road in the coming days. The work done in this area uses different operation of electronic sensors [1,2] and microcontroller. The exploration discusses the development in alcohol sensor [3] that read a change in the alcohol flyspeck present in the air. Analogous kind of detector is known as a breath analyser [4], as it used to chancing the analysis of the alcohol content present in mortal breathe. The product incorporates detector, microcontroller [5] and other electronic factors find the actuality of alcohol hard directly block the energy and hence the machine stop working. This exertion will not permit automobile motor to run the machine and thus the arrangement enables passengers to be safe.

II. LITERATURE SURVEY

In this paper author focuses on the alcohol discovery system for vehicle by using alcohol detector [6], GPS and GSM module.
This paper introduces styles similar as alcohol discovery, heart beat rate monitoring system and particular identification system and bandy how they can be enforced to avoid accidents [7]. Rather using Arduino board in this design author used microcontroller 16F877A.
The work is about motorist's gesture, safety operation & bus theft forestalment system [8]. It represents accident vehicle automatic discovery system by image processing [9]. This work describe about body area seeing, alcohol discovery pining [10].
Drink and drive is one of the major reasons of accidents now a days. Drivers under the influence of alcohol shows a clear failure of perception recognition and vehicle control. So, by this accident occurs.
Alcohol detection in vehicle system is continuously growing over years which could resolve drunken driving accidents worldwide when the alcohol is found vehicle engine will stop immediately.

III. APARATUS TABLE

Component	Quantity	Value
Arduino UNO R3	1	
Alcohol Sensor MQ3	1	
DC Motor	1	
Relay Module	1	5V
Piezo Buzzer	1	
Battery	1	9V
Breadboard	1	
Jumper Wires	As per requirement	

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Arduino IDE	1	
Switch	1	
Transistor	1	
LED	1	

IV. THEORY

A. *Block Diagram*

The Alcohol Discovery with Engine Locking contrivance permits to lessen injuries which are presumably taking region because of below the effect of alcohol using. MQ3 detector detects the presence of alcohol with inside the terrain. The detector offers affair primarily grounded completely surely absolutely at the attention of the alcohol if the alcohol is detected.
Sensor will signal the ARDUINO to channel through the relay to stop the motor.

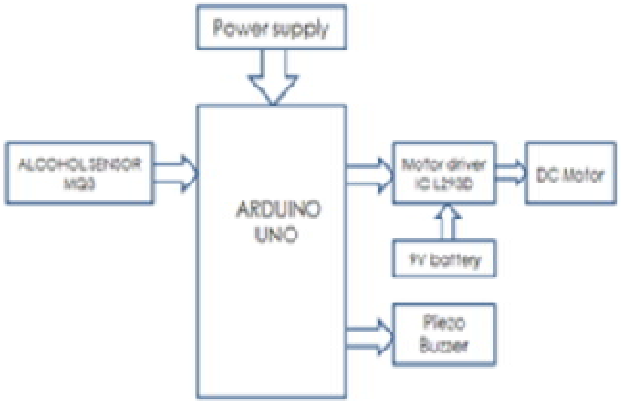


Fig 01: Block Diagram

B. *Arduino Board*

Fig. 02 shows the main part of the system is Arduino board which is microcontroller section based on ATmega328. Because the use of ATmega328 this board has different features from previous board that it does not use the FTDI USB to serial driver. This device is very cheap. It is widely available on local market. It is also so easy to use for the hardware and software purposes. It can be powered by using USB connection to PC or by DC batteries or other power sources.

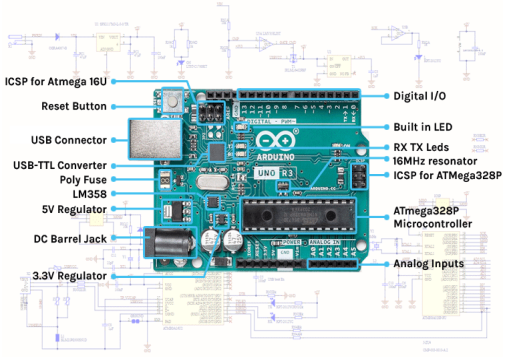


Fig 02: ARDUINO UNO

C. *Alcohol Sensor (MQ3)*

This sensor is based on MOS. It is used for alcohol and smoke sensing. It is highly sensitive to alcohol and also has less sensitivity for the gases or smoke. This can be varied by using SnO2 which has greater sensitivity for alcohol. As the concentration of the alcohol is more the resistiveness of sensor will vary so the output voltage will also change. So it is used to detect the presence of alcohol within a range of 2 meters. Fig.03. shows the picture of this kind of sensor. For the above reasons this sensor is very useful component for such type of system that senses air from breathe.

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Fig 03: MQ3 Sensor

D. Buzzer

Buzzer is used to alarm the presence of the alcohol. As shown in fig. 04 the buzzer uses piezoelectric demitasse type buzzers with small diaphragm attached to it. Piezoelectric demitasse will start wobbling when voltage is applied and hence the sound will induce. This type of buzzer consumes low power and can be fluently integrated into other circuits. As this is placed externally hence it can be used as musical tone oscillator also.



Fig 04: Buzzer

E. Relay Modules

A power relay module is an electrical switch. It is operated by an electromagnet which is activated by a separate low-power signal from another control device especially a micro controller. After activation, the electromagnet pulls to either open or close an electrical circuit.

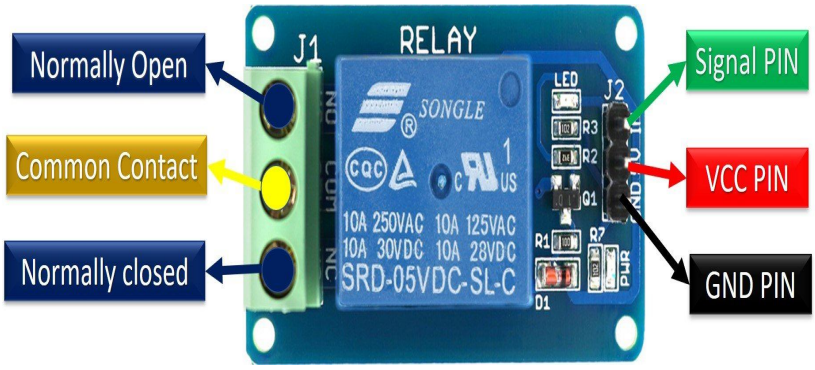


Fig 05: Single Channel Relay Module

F. Dc Motors

A direct current (DC) motor is an electric machine. It generally converts electrical energy into mechanical energy. DC motors take electrical power through direct current, and convert this energy into mechanical rotation.

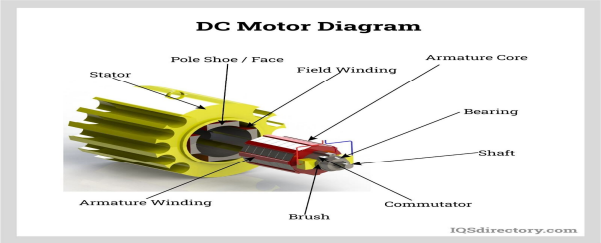


Fig 06: DC Motor

V. FLOW CHART

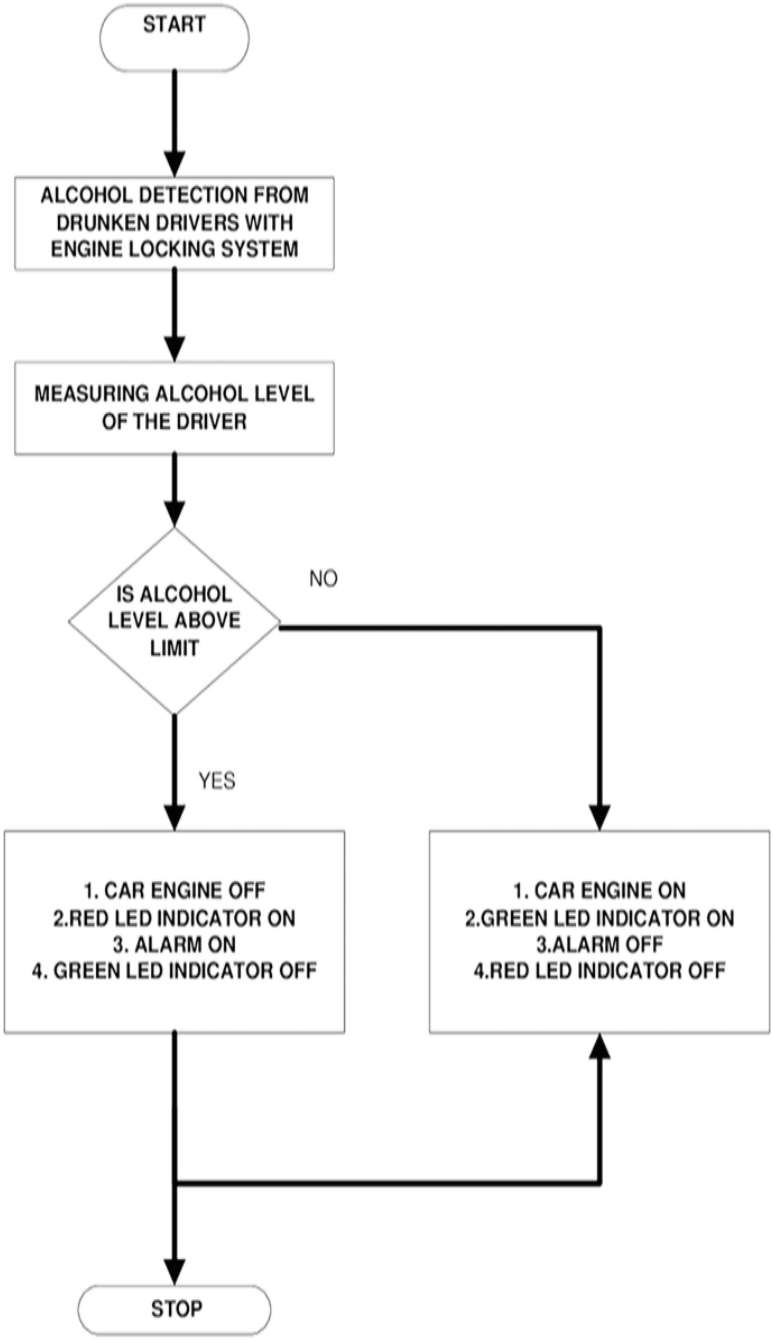


Fig 07: Flow Chart of Alcohol Sensing and Engine Locking

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VI. SCHEMATIC DIAGRAM

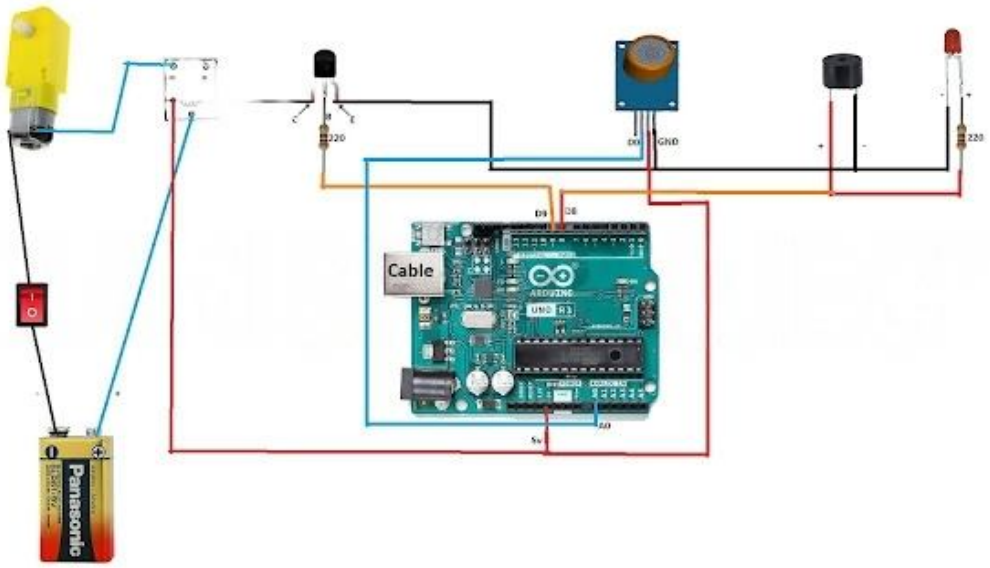


Fig 08: Schematic diagram of Alcohol Sensing and Engine Locking System

VII. HARDWARE SETUP

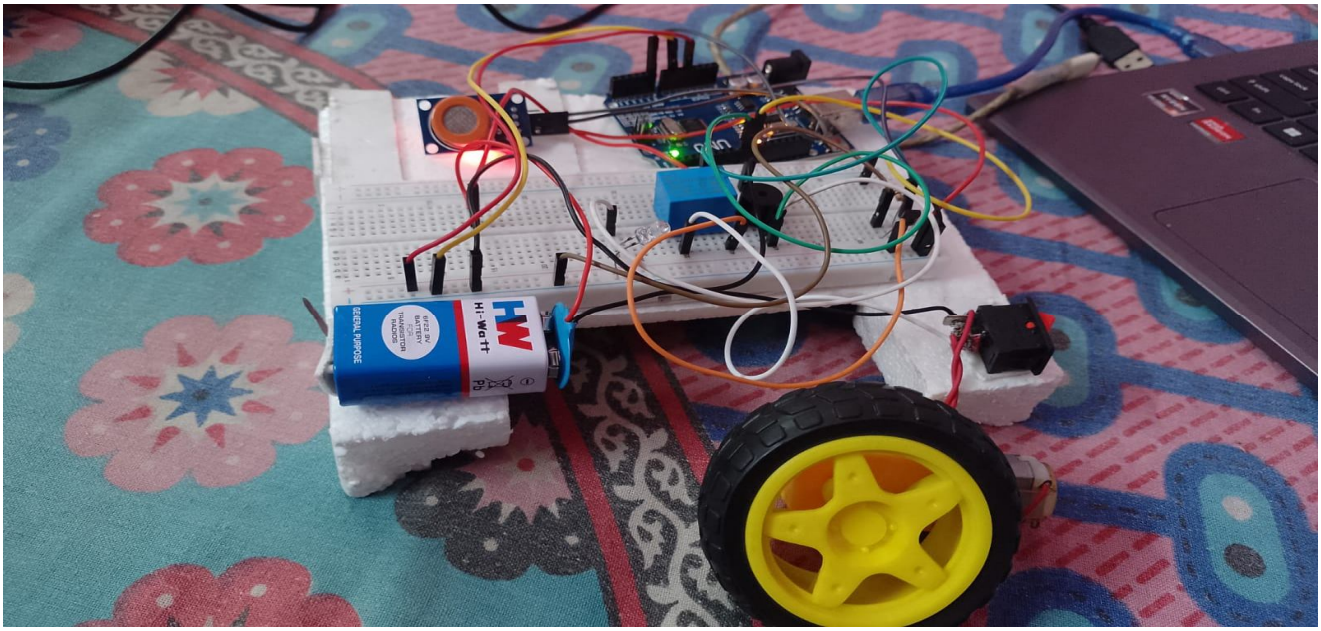


Fig 09: Alcohol Sensing and Engine Locking System Model (Hardware setup)

VIII. RESULTS

The results of the alcohol detection system with engine locking system are highly promising. Through rigorous testing and calibration, the system has demonstrated accurate and reliable detection of alcohol levels in a driver's breath. When alcohol is detected above the set threshold, the system promptly locks the engine, preventing the individual from operating the vehicle. This immediate response effectively reduces the risk of drunk driving incidents and potential accidents. The successful implementation of this system showcases its potential to contribute to road safety by discouraging impaired driving and promoting responsible behaviour behind the wheel.

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IX. APPLICATIONS AND ADVANTAGES

The alcohol detection system with engine locking system has various applications and advantages. Firstly, it can be employed in commercial fleets, such as taxis or delivery vehicles, ensuring that drivers adhere to sobriety standards and enhancing customer safety. Secondly, it can be integrated into personal vehicles, providing individuals with an additional layer of protection against impaired driving. The advantages include preventing accidents caused by drunk driving, reducing insurance costs for vehicle owners, and promoting responsible behaviour on the roads. Moreover, this technology can potentially save lives, minimize legal liabilities, and contribute to the overall improvement of road safety and public health.

X. CONCLUSIONS

In conclusion, the alcohol detection system with engine locking system presents a proactive solution to combat drunk driving and enhance road safety. By integrating advanced sensors and technology, it effectively detects alcohol levels in a driver's breath and automatically locks the engine if alcohol is detected above a specified threshold. This system acts as a deterrent, discouraging individuals from driving under the influence and minimizing the risk of alcohol-related accidents. With its potential to save lives and reduce societal costs, this system showcases the power of technology in promoting responsible driving behaviour and creating safer road environments.

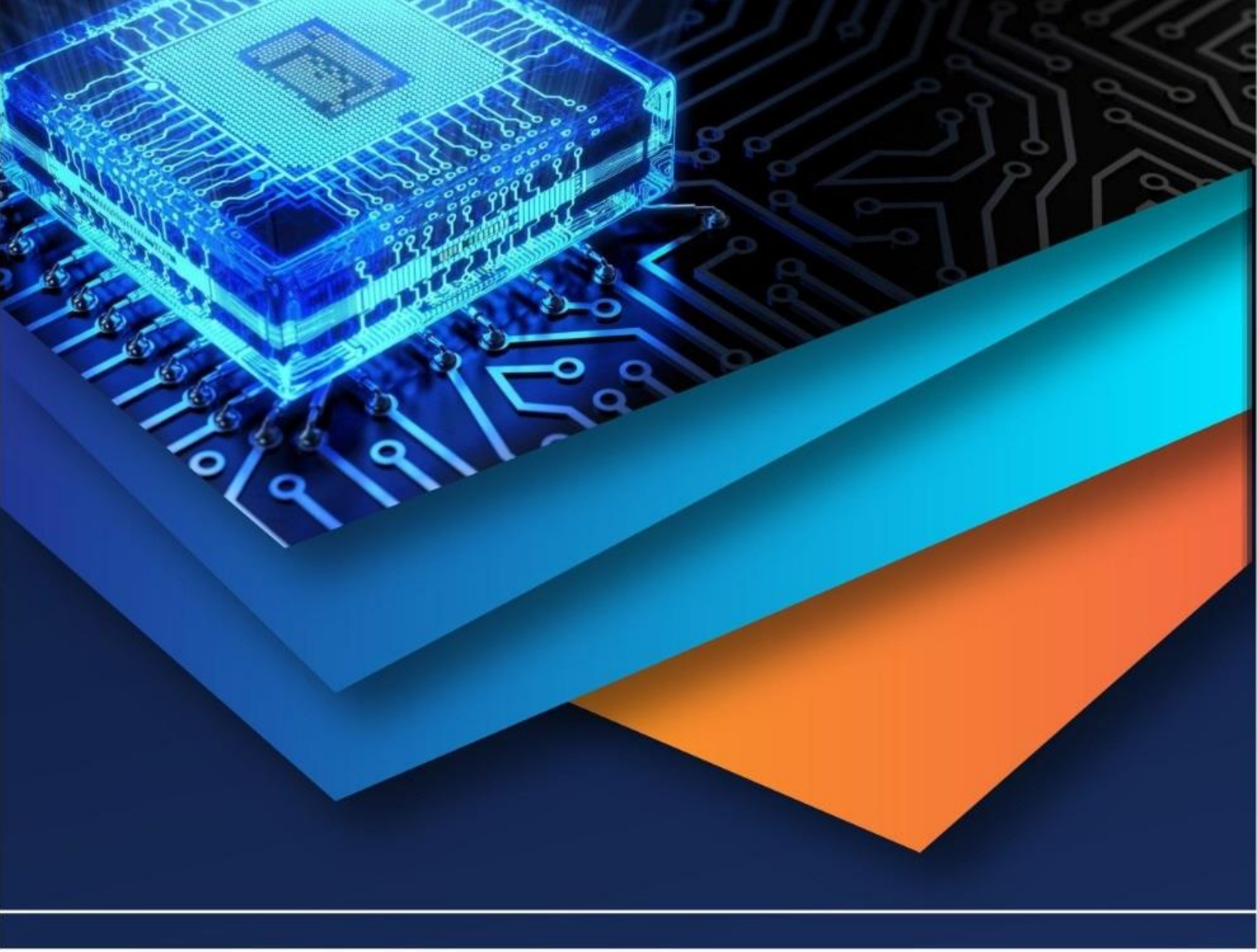
XI. ACKNOWLEDGMENT

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REFERENCES

[1] Lea Angelica Navarro, Mark Anthony Diño, Exechiel Joson, Rommel Anacan, Roberto Dela Cruz Electronics Engineering Department, Technological Institute of the Philippines- Manila
[2] Manila, Philippines-Design of Alcohol Detection System for Car Users thru Iris Recognition Pattern Using Wavelet Transform[2016 7th International Conference on Intelligent Systems, Modelling and Simulation]
[3] Cahalan, D., I. Cisin, and Crossley, American Drinking Practices: A National Study of Driving Behaviour and Attitudes. 1969, Rutgers University Press: New Brunswick, NJ.
[4] A. ISuge, H.Takigawa, H.Osuga, H.Soma, K.Morisaki, AccidentVehicle Automatic Detection System By Image Processing Technology , ©IEEE 1994 Vehiclee Navigation & information Systems Conference
[5] Paul Baskett , Yi Shang , Michael V. Patterson Timothy Trull , Towards A System for Body-Area Sensing and Detection of Alcohol Craving and Mood Dvsregulation , © 2013 IEEE
[6] Texas Instruments (2015), Understanding the I 2C Bus Online], available at: http://www.ti.com /lit /an / slva 704 / slva704.pdf.
[7] Tsxperts (2018, Mar), Arduino™ Compatible Compiler for LabVIEW [Online], available at: https://www.tsxperts.com/arduino -compatible compiler - for - labview/ .
[8] Umar, A., Hahn, Y -B. (2010), Metal Oxide Nanostructures and Their Applications , vol. 3, American Scientific Publishers, pp. 33 .
[9] Watson P. E. (1989), Total body water and blood alcohol levels: updating the fundamentals , Human Metabolism of Alcohol, vol. 1, pp. 41 -58 .
[10] Zhao X., Zhang X., and Rong J. (2014), Study of the Effects of Alcohol on Drivers and Driving Performance on Straight Road , Mathematical Problems in Engineering, vol. 2014, pp. 1 -9.

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