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REAL TIME ALCOHOL DETECTION AND AUTO CUT OFF ENGINE SYSTEM

A MINOR PROJECT- II REPORT

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BONAFIDE CERTIFICATE

Certified that this **18ECP103L-Minor Project II** report **"REAL TIME ALCOHOL DETECTION AND AUTO CUT OFF ENGINE SYSTEM"** is the bonafide work **of "ABISHEK V (927622BEC003),GOWTHAM M (927622BEC060),GOWTHAM S(927622BEC061),ARULKUMARAN A (927622BEC302)"** who carried out the project work under my supervision in the academic year **2023-2024 EVEN SEMESTER**

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This report has been submitted for the **18ECP103L – Minor Project-I** final review held at M. Kumarasamy College of Engineering, Karur on _____

PROJECT COORDINATOR

INSTITUTION VISION AND MISSION

Vision

To emerge as a leader among the top institutions in the field of technical education.

Mission

M1: Produce smart technocrats with empirical knowledge who can surmount the global challenges.

M2: Create a diverse, fully -engaged, learner -centric campus environment to provide quality education to the students.

M3: Maintain mutually beneficial partnerships with our alumni, industry and professional associations

DEPARTMENT VISION, MISSION, PEO, PO AND PSO

Vision

To empower the Electronics and Communication Engineering students with emerging technologies, professionalism, innovative research and social responsibility. **Mission**

M1: Attain the academic excellence through innovative teaching learning process, research areas & laboratories and Consultancy projects.

M2: Inculcate the students in problem solving and lifelong learning ability.

M3: Provide entrepreneurial skills and leadership qualities.

M4: Render the technical knowledge and skills of faculty members.

Program Educational Objectives

PEO1: **Core Competence:** Graduates will have a successful career in academia or industry associated with Electronics and Communication Engineering

PEO2: **Professionalism:** Graduates will provide feasible solutions for the challenging problems through comprehensive research and innovation in the allied areas of Electronics and Communication Engineering.

PEO3: **Lifelong Learning:** Graduates will contribute to the social needs through lifelong learning, practicing professional ethics and leadership quality

Program Outcomes

PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes

PSO1: Applying knowledge in various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of Engineering application.

PSO2: Able to solve complex problems in Electronics and Communication Engineering with analytical and managerial skills either independently or in team using latest hardware and software tools to fulfil the industrial expectations.

Abstract	**Matching with POs,PSOs**
Rainy season,Solar Panel,LDR,Arduino Nano	**PO1, PO2, PO3, PO4, PO5, PO6,PO7, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2**

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ABSTRACT

- The purpose of this project is to develop vehicle accident prevention by method of alcohol detector in an effort to reduce traffic accident cases based on driving under the influence alcohol
- This type of system is a great safety factor which can be implanted in the steering of the car.
- When driver start the ignition system, sensor measures the concentration of alcohol in to its breath and switch off the ignition system by using IRF540N MOSFET , MQ-3 alcohol sensor and RELAY MODULE

Keywords : Accident Prevention,Influence alcohol,MQ-3 alcohol sensor and Relay Module

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CHAPTER 1

INTRODUCTION

1.1 PROJECT DETAILS

The current scenario shows that the most of the road accidents are occurring due to drunk-driving. The drivers who drink alcohol are not in an stable condition and so, rash driving occurs on highway which can be risky to the lives of the people on road, the driver inclusive. The enormity of the dangerous driving transcends boundary. The laws in India are currently prohibiting drivers to drink and drive so that the fine can stop them to drink and drive. Whatsoever, effective observation of inebriated drivers could be a challenge to the policemen and road safety officers, the rationale for this stems from the natural inability of citizenry to be present additionally as state among identical house and time. This restricted ability of enforcement agents undermines each manual effort geared toward edge drink-driving. There is therefore the need for an alcohol detection system that can function without the restriction of space and time.

The Indian Ministry of Statistics reported thousands of road accidents in 2016. Though the report declared speed violation is the foremost reason for these accidents, it will safely be inferred that almost all of the cases are because of drivers unstable condition caused by drivers becoming drunk before they drive. The investigation done by the Planet Health Organization in 2008 shows that concerning 50%-60% of traffic accidents square measure associated with drink-driving. Moreover, WHO information on road traffic deaths disclosed

million traffic deaths were recorded globally in 2013 with the low- and middle-income countries having higher fatality rates per a 100K population (24.1% and 18.4% respectively), information collected showed that several of economic vehicles drivers in Bharat admitted to drinking alcohol throughout operating days.

This shows that almost all drivers, particularly business and serious duty trucks drivers interact in drink- driving, which may result in accident. Bharat sets a legal limit of 30mg/100mL blood alcohol concentration (BAC), any level higher than that's same to be ineligible. The BAC depicts the amount of alcohol in an exceedingly sure volume of blood. It's measured as either grams of alcohol per metric capacity unit of blood or milliliters of blood, (mg/ml, utilized in a lot of of Europe). For BAC level from 0.4 to 0.6, drivers feel dazed/confused or otherwise disoriented, and it's typically not safe for a driver to drive a vehicle beneath such condition. Also, BAC level for 0.7 to 0.8 makes a drivers mental, physical and sensory functions to be severely impaired. At this stage, a driver is inactive and incapable of driving. BAC level of 0.2 to 0.3 continues to be not safe however the motive force still. So, there is need of such system which can reduce the number of road accidents caused due to drunk driving.

1.2 DESCRIPTION

The Alcohol Detection with Engine Locking system helps to reduce accidents which are occurring due to drunk driving. MQ-3 sensor detects the presence of alcohol in the surroundings.

The sensor provides output on the basis of the concentration of the alcohol, if the alcohol concentration is higher the conductivity of MQ-3 sensor increases which in turn gives the reading to ARDUINO.

If the reading is greater than the threshold level, ARDUINO will stop the DC motor. The red LED will also blink if the distance is less than the safe distance to give indication to other vehicles that the vehicle in front of them is unsafe.

Now, with the help of SIM900A the message will be sent to the civil forces that the particular vehicle is unsafe and can be a threat to other .

LITERATURE SURVEY

The writer has put forward a technique which utilizes GPS and GSM to ascertain alcohol but this technique is very expensive, but the expenses can be cut off to a great extent. In this project a siren is being used which is highly economical, and can keep people in close proximity vigilant.

Wearing smart helmet to prevent any mishap is suggested by writer which have certain deficiencies. Firstly restrictions on the use of helmets to only 2 wheelers. Secondly, microcontrollers are software based mega system in comparison to the economical siren that are open source hardware. Composite health monitoring and sensors based on infrared are utilized to ascertain alcohol as talked about by writer but the chance of false alarm can't be avoided in this system, because minute change in some situations can result in false alarm but in our project use of required technology makes it more authentic.

To prevent the mishap of drunken driving writer have used PIC16F877A microcontroller which is an outdated system and expensive one also which restrains its use to only certain class of society whereas we are using Arduino and Uno microcontroller which is advanced as well as economical.

Worrying about the drunken driving the writer suggests the system to overcome the issue but using mQ2 alcohol sensor has come flames .MQ2 alcohol sensor is not authentic and raises the chance of false alarm while we have used MQ3 which is highly authentic.

To cope with helmet negligence and alcohol detection simultaneous the writer proposed a system which is very complicated and use of P89V57RD2 microcontroller makes it highly expensive also this system can only be equipped with 2 wheelers

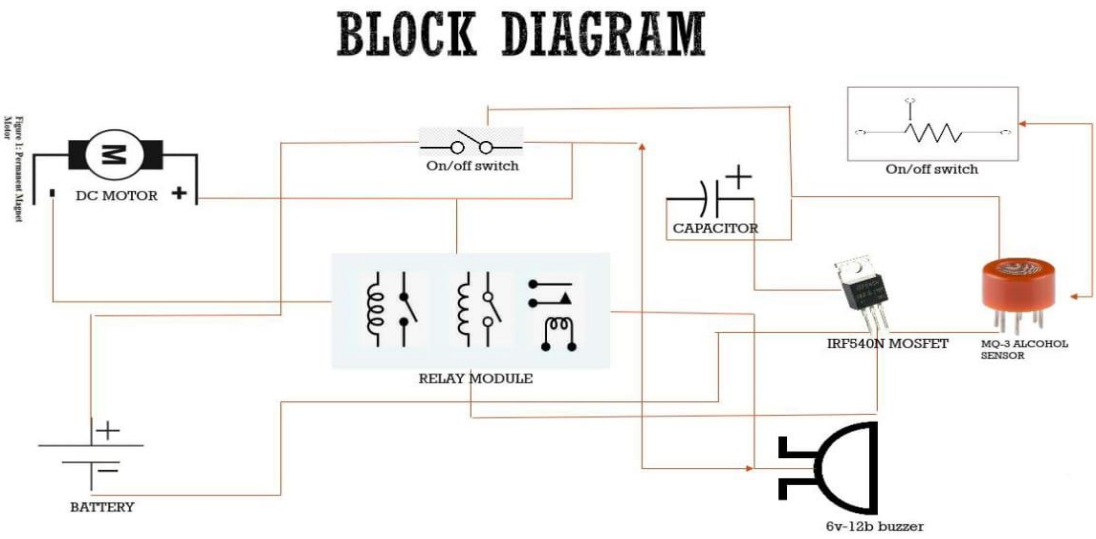
WORKING

COMPONENTS USED:

Hardware Components :

- **MQ-3 ALCOHOL SENSOR**
- **RELAY MODULE**
- **DC MOTOR**
- **BUZZER**
- **9V BATTERY**

EXISTING SYSTEM



WORKING PRINCIPLE

- When a driver enters the vehicle and attempts to start the engine, the real-time alcohol detection system is activated.
- If the alcohol level detected is within legal limits, the engine is allowed to start, and the vehicle can be operated as usual.
- However, if the alcohol level exceeds the legal limit or if alcohol is detected in the driver's system, the auto cut-off engine system is triggered.
- The driver is then notified of the alcohol detection, and the vehicle remains immobilized until it is safe for operation.

KEY COMPONENTS:

IRF54ON MOSFET

- Unlike transistor, MOSFETs are voltage controlled devices. Meaning, they can be turned on or turned off by supplying the required Gate threshold voltage (VGS). IRF540N is an N-channel

MOSFET, so the Drain and Source pins will be left open when there is no voltage applied to the gate pin. When a gate voltage is applied these pins gets closed.

- The below circuit shows how this MOSFET behaves when the Gate voltage is applied (5V) and not applied (0V). Since this an N-Channel MOSFET the load that has to be switched (in this case a motor) should always be connected above the drain pin.

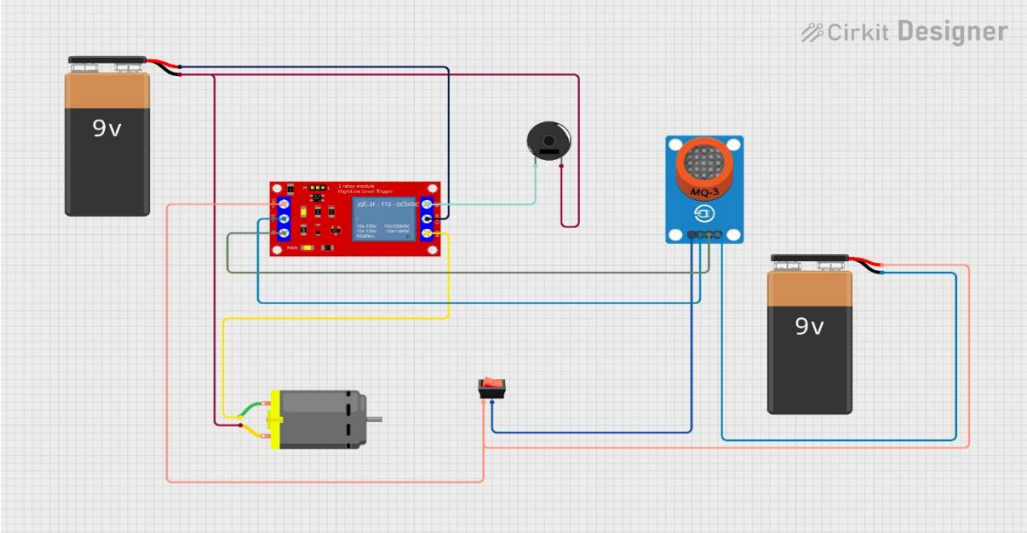
MQ-3 SENSOR

- Technically referred to as an MQ3 sensor, the alcohol sensor finds ethanol in the air.
- When a drunken individual breaths close to an alcohol sensor, the sensor detects the ethanol in his breath and outputs information dependent on the amount of alcohol in his breath. More LEDs would light up if the alcohol percentage was higher.
- It is capable of detecting 25-500ppm alcohol gas concentration in the air.

RELAY MODULE

- The primary function of a relay module is to act as a switch for controlling the flow of electricity to a load.
- This capability allows relay modules to isolate the control circuit from the high-power load circuit, providing a safe and efficient means of controlling various devices.

PROPOSED SYSTEM



WORKING PRINCIPLE

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- However, if the alcohol level exceeds the legal limit or if alcohol is detected in the driver's system, the auto cut-off engine system is triggered.
- The driver is then notified of the alcohol detection, and the vehicle remains immobilized until it is safe for operation.

MQ3 SENSOR

The MQ-3 sensor is used to detect the presence of alcohol level in the surrounding and give reading to Arduino which determines whether the consumption level is in limit or not.

magnetic field which in turn rotates the coil with the force experienced.

SIM900A

GAS SENSOR MODULE

This is a smaller and solid remote module structure. The SIM900A is an entire group Dual-band GSM/GPRS strategy in a SMT module which can be installed in the client applications. The SIM is embedded in the SIM900A module and the message will individual that the vehicle is not safe.be sent to the cops or any specific LED.

An LED is a semiconductor light source which discharges centrality and oozes light the degree that photons when electrons join with electron openings. The shade of the light (standing out from the centrality of the photons) is compelled by the vitality required for electrons to cross the vitality band hole of the semiconductor and reach to conduction bands from the valence bands thus penetrating through energy gap.

The alarm unit used is a buzzer which indicates when alcohol is detected. The buzzer is activated when an oscillating signal is passed through the coil of the buzzer and it fluctuates the disk present in the buzzer at a particular frequency which is equal to the driving signal. The buzzer indicates that vehicle in front of us is unsafe.

DC Motor

The DC motor is connected to the L293D which in turn is connected to Arduino and is given 5V supply. DC motor works on the principle of Lorentz Law. When an electric current is passed through the motor, the coil carrying the current produces

RELAY MODULE

The primary function of a relay module is to act as a switch for controlling the flow of electricity to a load.

This capability allows relay modules to isolate the control circuit from the high-power load circuit, providing a safe and efficient means of controlling various devices.

CONCLUSION

We have given an incredibly capable way to deal and to develop a smart system for vehicles to diminish number of disasters caused in light of alcoholic driving. As the creating insight among people is that vehicle security is dynamically critical. Future degree of this structure is to control the setbacks caused due to alcohol use. This system improves the security of individual and in this manner giving the convincing progression in the vehicle business regarding decrease setbacks caused in light of driving.

RESULT

If alcoholic person tries command on vehicle the alcoholic sensor determines the existing of alcohol and shut down the vehicle engine and sound alarm by which the nearby people will exchange the seat.

Peoples are aware of situation by the help of LCD screen present in the vehicles and hence take required action. We can avoided any kind of loss of life by using this system.

All equipments are totally tested and connected as required thereby giving us the much needed result as shown in the image below.

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