M.KUMARASAMY
COLLEGE OF ENGINEERING
NAAC Accredited Autonomous Institution
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ISO 9001:2015 Certified Institution
Thalavapalayam, Karur – 639 113.

A Minor Project Reporton

VEHICLE CONTROL SYSTEM FOR DRUNK AND DRIVE

Submitted by

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KUMARASAMY COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to Anna University, Chennai)

THALAVAPALAYAM, KARUR-6369113.

MAY 2025

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BONAFIDE CERTIFICATE

Certified that this Report titled **"VEHICLE CONTROL SYSTEM FOR DRUNK AND DRIVE"** is the bonafide work of **MOHAMMED MUZZAMIL J (927622BEE068), PRAVEEN S (927622BEE083**), **SANCHITHA K S (927622BEE092), SATHYA DEVI S**

(927622BEE120) who carried out the work during the academic year (2024-2025) under my supervision. Certifiedfurther that to the best of my knowledge the work reported herein does not form part of anyother project report.

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Submitted for Minor Project IV (18EEP302L) viva-voce Examination held at M.Kumarasamy College of Engineering, Karur-639113 on ……..

DECLARATION

We affirm that the Minor Project IV report title **"VEHICLE CONTROL SYSTEM FOR DRUNK AND DRIVE"** being submitted in partial fulfillment for the award of **Bachelor of Engineering in Electrical and Electronics Engineering** is the original work carried out by us.

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VISION AND MISSION OF THE INSTITUTION

VISION

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

MISSION

- ✓ Produce smart technocrats with empirical knowledge who can surmount the global Challenges.
- ✓ Create a diverse, fully-engaged, learner - centric campus environment to provide Quality education to the students.
- ✓ Maintain mutually beneficial partnerships with our alumni, industry, and Professional associations.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISION

To produce smart and dynamic professionals with profound theoretical and practicalknowledge comparable with the best in the field.

MISSION

- ✓ Produce hi-tech professionals in the field of Electrical and Electronics Engineering by inculcating core knowledge.
- ✓ Produce highly competent professionals with thrust on research.
- ✓ Provide personalized training to the students for enriching their skills.

PROGRAMME EDUCATIONAL OBJECTIVES(PEOs)

- ✓ **PEO1:** Graduates will have flourishing career in the core areas of Electrical Engineering and also allied disciplines.
- ✓ **PEO2:** Graduates will pursue higher studies and succeed in academic/research careers
- ✓ **PEO3:** Graduates will be a successful entrepreneur in creating jobs related to Electrical and Electronics Engineering /allied disciplines.
- ✓ **PEO4:** Graduates will practice ethics and have habit of continuous learning for their success in the chosen career.

PROGRAMME OUTCOMES(POs)

After the successful completion of the B.E. Electrical and Electronics Engineering degree program, the students will be able to:

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: 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.

PO3: 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.

PO4: 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.

PO5: 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.

PO6:The Engineer and Society: Apply reasoning in formed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: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.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multi-disciplinary settings.

PO10: 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 clearinstructions.

PO11: 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 leaderin a team, to manage projects and in multi-disciplinary environments.

PO12: 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(PSOs)

The following are the Program Specific Outcomes of Engineering Students:

- **PSO1:** Apply the basic concepts of mathematics and science to analyse and design circuits,controls, Electrical machines and drives to solve complex problems.

- **PSO2:** Apply relevant models, resources and emerging tools and techniques to provide solutions to power and energy related issues & challenges.

- **PSO3:** Design, Develop and implement methods and concepts to facilitate solutionsfor electrical and electronics engineering related real-world problems.

Abstract (Key Words)	**Mapping of POs and PSOs**
Arduino UNO , Alcohol Sensor, Buzzer, LCD Display, Relay Module	PO1, PO2, PO3, PO4, PO5, PO6, PO7,PO8, PO9, PO10, PO11, PO12 PSO1, PSO2, PSO3.

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We gratefully remember our beloved **Founder Chairman, (Late) Thiru. M. Kumarasamy,** whose vision and legacy laid the foundation for our education and inspired us to successfully complete this project.

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CHAPTER 1
ABSTRACT

Driving under the influence of alcohol remains a major cause of road accidents and fatalities worldwide. This project proposes an intelligent Vehicle Control System for Drunk and Drive Prevention aimed at enhancing road safety by preventing intoxicated individuals from operating vehicles. The system employs an alcohol sensor (e.g., MQ-3) to detect the presence and concentration of alcohol in the driver's breath. If the alcohol level exceeds a predefined legal limit, the system automatically disables the vehicle's ignition system, effectively preventing the engine from starting. Additionally, the system can be integrated with a GSM module to send an alert message to a registered contact, such as a family member or law enforcement agency. This solution is cost-effective, easily deployable in modern vehicles, and provides a proactive approach to minimizing drunk driving incidents. The overall objective is to safeguard lives by enforcing responsible driving behavior through technological intervention. Drunk driving is a serious and persistent issue that contributes significantly to road accidents, injuries, and fatalities worldwide. Despite awareness campaigns and strict regulations, many drivers continue to operate vehicles under the influence of alcohol, posing a severe threat to public safety. To address this challenge, this project presents a Vehicle Control System for Drunk and Drive Prevention, which uses embedded technology to detect alcohol consumption in drivers and prevent them from starting or operating a vehicle if intoxicated.

CHAPTER 2 LITERATURE REVIEW

Paper 1: Microcontroller-Based Alcohol Detection and Vehicle Control System

Inference: Kumar and colleagues developed a basic alcohol detection system using the MQ3 gas sensor and an Arduino microcontroller. The sensor measured alcohol concentration from the driver's breath, and the microcontroller compared the value with a preset threshold. If the value exceeded the threshold, the system disabled the vehicle's ignition. This project proved the effectiveness of using simple, low-cost sensors and embedded systems to automate the prevention of drunk driving.

Paper 2: Alcohol Detection System with Automatic Ignition Locking and GSM Alert

Inference: This study expanded on earlier work by integrating a GSM module into the alcohol detection system. When alcohol was detected, the system not only blocked the engine start but also sent an SMS alert to a predefined number (e.g., parents or police). This research demonstrated how combining communication technology with detection sensors could significantly improve driver accountability and emergency response.

Paper 3: Smart Vehicle Ignition Using Biometric and Alcohol Sensing

Inference: Shah and Joshi introduced a two-tier security system where the driver had to pass biometric fingerprint authentication and an alcohol test before the vehicle could start. The use of fingerprint verification helped ensure that only registered, authorized drivers could access the vehicle, thereby improving system reliability. This work showed how multimodal security systems can prevent both unauthorized and intoxicated driving.

Paper 4: Real-Time Drowsiness and Alcohol Detection Using Image Processing and Sensors

Inference: This paper explored the integration of image processing with sensor technology to detect both alcohol impairment and drowsiness in drivers. Using a webcam and OpenCV, the system tracked eye blink rate, head tilt, and facial expressions along with breath alcohol detection. The system would raise alerts and disable the ignition if signs of impairment were observed. This research highlighted the potential of AI-enhanced driver monitoring systems to improve road safety beyond alcohol detection.

Paper 5: IoT-Enabled Smart Vehicle Control System for Drunk Driving Prevention

Inference: Singh and Mehta proposed a modern, cloud-based solution where alcohol detection data was sent to an IoT server for monitoring by fleet managers or law enforcement. The system included a mobile app for real-time alerts and location tracking of the driver. This project demonstrated how Internet of Things (IoT) technology can scale drunk driving prevention efforts across larger systems such as public transport and commercial fleets.

CHAPTER 3 PROPOSED METHODOLOGY

3.1 BLOCK DIAGRAM

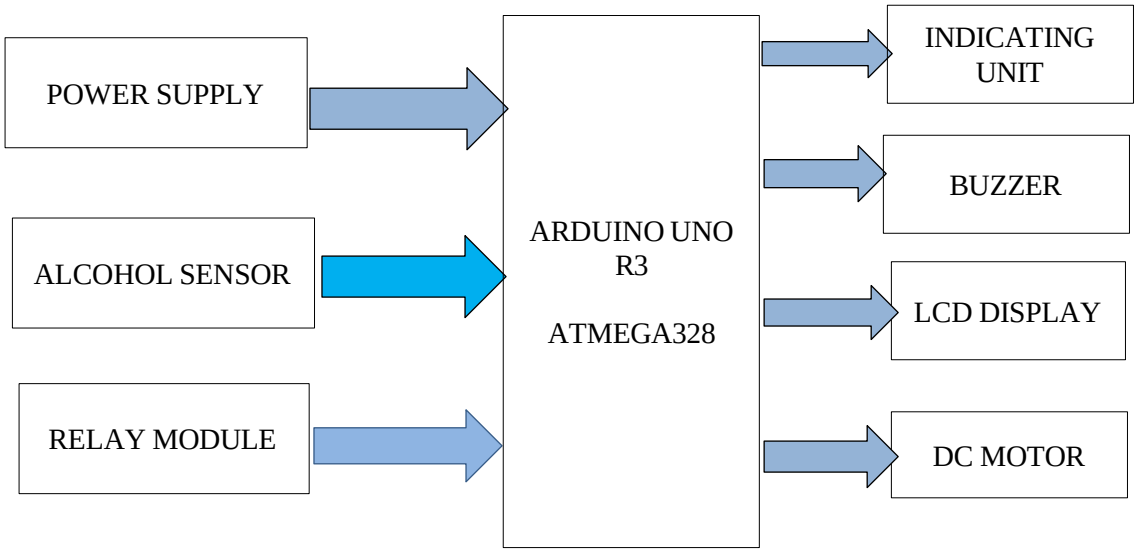

Fig 3.1 Block Diagram

3.2 DESCRIPTION

The Vehicle Control System for Drunk and Drive is an embedded safety solution designed to prevent individuals under the influence of alcohol from operating a vehicle. Drunk driving is one of the leading causes of road accidents globally, resulting in thousands of fatalities and injuries every year. This project aims to provide a practical, low-cost, and effective solution to reduce such incidents by integrating an alcohol detection mechanism with the vehicle's ignition system. The project's key components include an MQ-3 alcohol sensor, Arduino Uno microcontroller, relay module, LCD display, and optional elements such as a buzzer. The MQ-3 sensor is capable of detecting alcohol vapors from the driver's breath. When the driver attempts to start the vehicle, the system first checks their breath through the sensor. The sensor's analog output is fed into the Arduino, which reads and compares the value against a set threshold. If the alcohol level is within safe limits, the microcontroller sends a signal to activate a relay that allows the ignition system to engage. If the alcohol level is above the limit, the Arduino deactivates the relay, effectively blocking the engine from starting. he microcontroller processes this input and compares the detected alcohol level with the threshold value. If the reading is below the threshold, the system allows the ignition circuit to function normally, enabling the driver to start the vehicle. However, if the reading is above the limit, the microcontroller immediately cuts off the ignition relay, preventing the engine from starting. This ensures that an intoxicated person cannot drive, thereby proactively avoiding a potential accident.

CHAPTER 4 RESULT AND DISCUSSION

4.1 HARDWARE COMPONENTS DESCRIPTION

4.1.1 ALCOHOL SENSOR:

An alcohol sensor is a device that detects and measures the concentration of alcohol (typically ethanol) in the air, breath, or liquid. These sensors are commonly used in breathalyzers, industrial safety systems and vehicle ignition interlocks.

Fig 4.1.1 ANGLE SENSOR

4.1.2 ARDINO UNO:

The Arduino Uno is a popular open-source microcontroller board based on the ATmega328P microcontroller. It is widely used for electronics projects and prototyping due to its simplicity, affordability and large community support.

Fig 4.1.2 ARDINO UNO

4.1.3 LCD DISPLAY:

An LCD display (Liquid Crystal Display) is a flat-panel display technology commonly used in electronic devices to visually present information such as text, numbers or graphics.

Fig 4.1.3 LCD DISPLAY

4.1.4 RELAY MODULE :

A relay module is an electronic device that allows a low-power control circuit (like an Arduino or Raspberry Pi) to switch a higher-power electrical device (such as a lamp, motor or fan) on or off.

Fig 4.1.4 RELAY MODULE

4.2 HARDWARE KIT

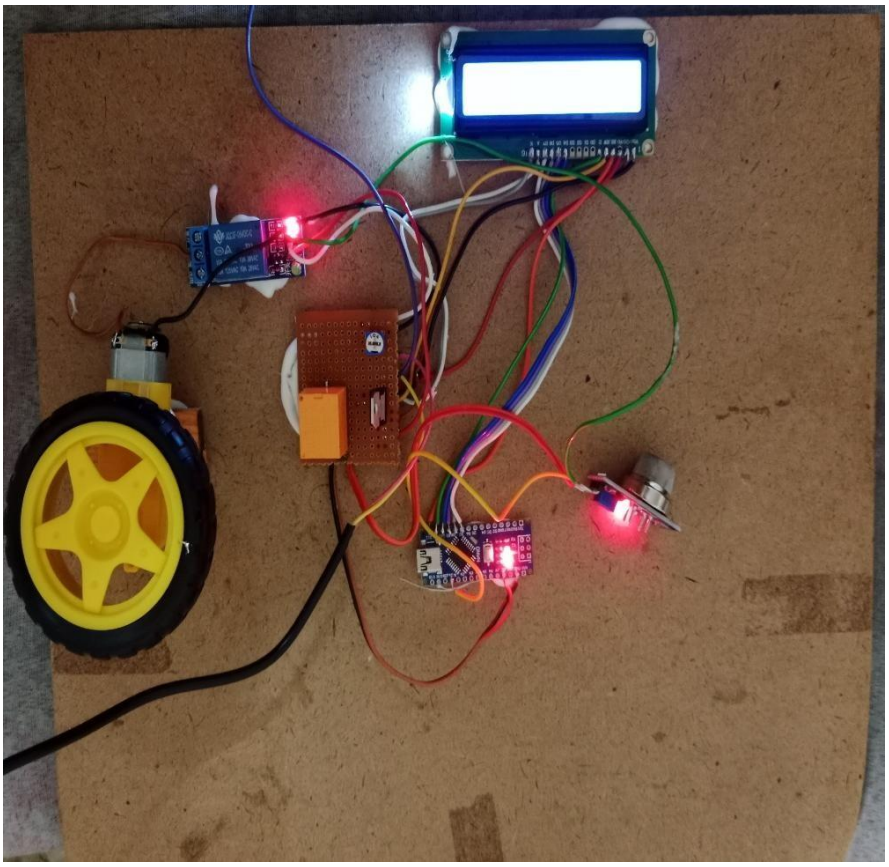

Fig 4.2 Hardware Kit

4.3 WORKING PRINCIPLE

The Vehicle Control System for Drunk and Drive Prevention is an innovative safety mechanism designed to minimize road accidents caused by intoxicated driving. The core objective of this project is to detect the presence of alcohol in a driver's breath and prevent the vehicle from starting if the driver is found to be under the influence of alcohol. This system primarily utilizes an MQ-3 alcohol sensor, which is highly sensitive to alcohol vapors. The sensor is strategically placed on the steering wheel or near the driver's seat, where it can analyze the driver's breath upon ignition. If the sensor detects an alcohol concentration above a predefined threshold, it sends a signal to the microcontroller (such as an Arduino Uno), which then activates a relay module to disable the vehicle's ignition system. Simultaneously, a buzzer and a red LED are activated to alert the driver, and a message is displayed on an LCD screen indicating the detection of alcohol. If no alcohol is detected, a green LED lights up and the relay allows the ignition system to function normally, enabling the vehicle to start. For enhanced functionality.

This system can be further upgraded by adding features like fingerprint authentication for driver verification, Bluetooth connectivity for remote monitoring, or SD card logging to record events. This project not only showcases an effective use of embedded systems and sensors but also serves as a practical solution to promote road safety.. Overall, it's a cost-effective, easy-to-implement solution with strong potential for real-world application in traffic safety systems.

CHAPTER 5

CONCLUSION

The Vehicle Control System for Drunk and Drive Prevention project successfully demonstrates how embedded systems and sensor technology can be applied to enhance road safety and reduce alcohol-related accidents. By integrating an MQ-3 alcohol sensor with a microcontroller (Arduino), the system effectively detects the presence of alcohol in the driver's breath before the vehicle is started. If alcohol is detected above a certain threshold, the system takes immediate action by disabling the ignition system through a relay, alerting the driver with a buzzer and visual indicators (LEDs), and displaying a warning message on the LCD screen. This proactive approach prevents intoxicated individuals from operating the vehicle, thereby minimizing the risk of accidents. In conclusion, the Vehicle Control System for Drunk and Drive is a practical, cost-effective, and scalable solution to a persistent global problem. It not only protects the driver but also ensures the safety of passengers, pedestrians, and other road users. While the current prototype proves the feasibility of the concept, its real-world implementation could revolutionize the automotive industry by embedding safety at the core of vehicle operations. Future developments and collaboration with automobile manufacturers and policymakers could make such systems standard in all vehicles, leading to safer roads and more responsible driving behavior

PROTJECT – TOTAL COST

S. NO	COMPONENT DESCRIPTION	QUANTITY	COST
01	**ALCOHOL SENSOR**	1	60
02	**ARDINO UNO**	1	150
03	**RELAY MODULE**	1	340
04	**LCD DISPLAY**	1	170
05	**BUZZER**	1	10
		TOTAL	730

Table Project-Total cost

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