Alcohol Detection and Monitoring System with Engine Locking

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***Abstract*—Driving under the influence of alcohol is a major cause of road accidents and fatalities. The Alcohol Detection and Monitoring System with Engine Locking is designed to prevent drunk driving by using an MQ-3 alcohol sensor to detect alcohol in the driver's breath. If the alcohol level exceeds a preset limit, the ESP32 Uno microcontroller activates a buzzer, displays a warning on a 16×2 LCD, and locks the engine or door using a motor driver IC. At the same time, the GPS module tracks the vehicle location and the GSM module sends this information to a registered mobile number for monitoring. This system helps improve road safety, prevent accidents, and supports intelligent vehicle safety systems. The system is compact, cost-effective, and reliable.**

***Index Terms*—Alcohol detection, ESP32 Uno, GSM, GPS, Engine locking, MQ-3 sensor, Road safety.**

I. INTRODUCTION

In today's world, road safety has become a serious concern due to the increasing numb-er of accidents caused by drunk driving. Every year, thousands of people lose their lives and many are injured because of alcohol impaired driving. Despite strict laws, awareness campaigns, and regular checking by traffic authorities, drunk driving cases remain high. This growing problem calls for an advanced technological solution that can automatically detect the presence of alcohol and prevent the driver from operating the vehicle. The Alcohol Detection and Monitoring System with Engine Locking is designed to address this issue by integrating modern electronics and communication technologies. The system continuously monitors the air inside the vehicle using an alcohol sensor (MQ-3), which is capable of detecting even small amounts of alcohol in the driver's breath. Once alcohol is detected beyond a certain limit, the signal is processed by the ESP32, which immediately triggers an alert through a buzzer at the same time, it locks the vehicle's engine to prevent it from starting or continuing to operate. To ensure safety and monitoring, the system is also equipped with a GSM module that sends an alert message containing the vehicle's location (obtained through the GPS module) to authorized personnel or traffic control centers. This enables quick action and record keeping of drunk driving cases.

The proposed system thus offers a simple, efficient, and reliable way to minimize road accidents caused by alcohol consumption. It not only promotes responsible driving behaviour but also supports government efforts to enforce traffic safety regulations through technology. Compact cost effective and easy to implement, this project can be further developed into a fully automated safety mechanism for all types of vehicles in the future.

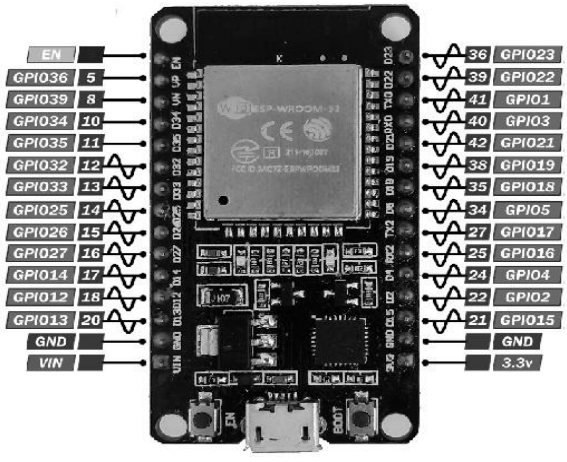
II. METHODOLOGY

Alcohol Detection Module:

The alcohol detection module is responsible for detecting alcohol vapors in the driver's breath. This module uses the MQ-3 alcohol sensor, which is highly sensitive to alcohol gases.

Working of MQ-3 Sensor:
The MQ3 sensor detects alcohol concentration in the air. When alcohol molecules are present near the sensor, its electrical conductivity increases. This change in conductivity produces an analog voltage output.
▪ The sensor sends this output signal to the ESP32 for further processing.
▪ Steps involved in alcohol detection
▪ The driver attempts to start the vehicle.
▪ The MQ-3 sensor becomes active and starts sensing the surrounding air.
▪ If alcohol vapours are present, the sensor produces a higher voltage output.
▪ The output signal is transmitted to the microcontroller.
▪ The microcontroller compares the value with a predefined threshold. If the alcohol level is within the safe limit, the vehicle is allowed to start. If the level exceeds the limit, safety actions are triggered.

ESP32 Processing Unit:
The Arduino Uno microcontroller acts as the main control unit of the system. It receives signals from the alcohol sensor and processes them according to the programmed instructions. The ESP32 performs the following tasks



▪ Reads analog data from the MQ-3 sensor
▪ Compares sensor values with threshold limits
▪ Controls the motor driver and door lock mechanism
▪ Activates alarm and display messages
▪ Sends commands to GSM and GPS modules The Arduino ESP32 continuously monitors the sensor output and decides whether the driver is safe to operate the vehicle.

Door Lock and Engine Control System:
The door lock system is an additional safety feature included in the project. This system prevents the driver from accessing or opera-ting the vehicle if alcohol is detected. The door locking mechanism is controlled using a motor driver IC (L293D) connected to a DC motor or actuator.

Working of the Door Lock System:
▪ The microcontroller receives data from the alcohol sensor.
▪ If alcohol is detected above the safe limit, the microcontroller sends a signal to the motor driver.
▪ The motor driver activates the DC motor.
▪The motor locks the vehicle door automatically.
▪The engine ignition system remains disabled.
This process ensures that intoxicated drivers cannot start or access the vehicle.

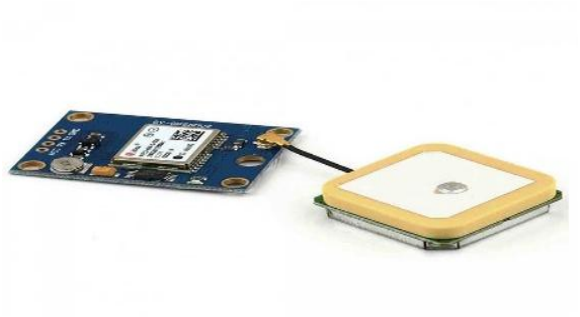
Alert and Display System:
The alert system provides warnings when alcohol is detected. It consists of a buzzer alarm and display.

Alarm System: The buzzer produces a loud sound when alcohol is detected. This serves two purposes:
▪ Alerts the driver about unsafe driving conditions
▪ Warns nearby people about the situation

Examples of display messages include:
▪ “Driver Safe – Engine Start”
▪ “Alcohol Detected”
▪ “Engine Locked”
▪ “Door Locked”
This improves user awareness and provides clear information about the system operation.
Communication & Monitoring Module:

To enhance the monitoring capability of the system, GPS and GSM modules are integrated.

GPS Module: The GPS module determines the geographical location of the vehicle using satellite signals. It provides coordinates such as latitude and longitude.



Alcohol GPS Log

SrNo	DateTime	Latitude	Longitude
1	2026-03-03 16:09:24	1838.94076N	07345.45660E
2	2026-03-03 16:09:39	1838.94076N	07345.45660E
3	2026-03-03 16:10:06	1838.94076N	07345.45660E
4	2026-03-03 16:10:18	1838.94076N	07345.45660E
5	2026-03-05 14:58:54	1838.94076N	07345.45660E
6	2026-03-05 14:59:09	1838.94076N	07345.45660E
7	2026-03-05 15:00:08	1838.94076N	07345.45660E
8	2026-03-05 15:00:23	1838.94076N	07345.45660E
9	2026-03-05 15:00:38	1838.94076N	07345.45660E
10	2026-03-05 15:00:53	1838.94076N	07345.45660E
11	2026-03-05 15:01:08	1838.94076N	07345.45660E
12	2026-03-05 15:01:23	1838.94076N	07345.45660E
13	2026-03-05 15:01:38	1838.94076N	07345.45660E
14	2026-03-05 15:01:53	1838.94076N	07345.45660E
15	2026-03-05 15:02:08	1838.94076N	07345.45660E
16	2026-03-05 15:02:23	1838.94076N	07345.45660E
17	2026-03-05 15:02:38	1838.94076N	07345.45660E
18	2026-03-05 15:02:53	1838.94076N	07345.45660E
19	2026-03-05 15:03:08	1838.94076N	07345.45660E
20	2026-03-05 15:03:23	1838.94076N	07345.45660E
21	2026-03-05 15:03:38	1838.94076N	07345.45660E
22	2026-03-05 15:03:53	1838.94076N	07345.45660E
23	2026-03-05 15:04:08	1838.94076N	07345.45660E
24	2026-03-05 15:04:23	1838.94076N	07345.45660E
25	2026-03-05 15:04:38	1838.94076N	07345.45660E
26	2026-03-05 15:04:53	1838.94076N	07345.45660E
27	2026-03-05 15:05:08	1838.94076N	07345.45660E
28	2026-03-05 15:05:24	1838.94076N	07345.45660E
29	2026-03-05 15:05:38	1838.94076N	07345.45660E

These coordinates can be used to track the location of the vehicle when alcohol is detected.The GSM module allows the system to send messages through the mobile network.

When alcohol is detected:
- The system retrieves the vehicle location from the GPS module
- The GSM module sends an SMS message containing the location coordinates
- The message is sent to authorized persons or traffic authorities

This feature allows real-time monitoring and quick response in case of unsafe driving conditions.

III. POWER SUPPLY MODULE

All electronic components in the system require a stable power supply for proper operation. The power supply unit converts AC power into regulated DC voltage. The power supply system consists of the following components:
- Transformer
- Bridge rectifier
- Filter capacitor
- Voltage regulator (7805)

Working of Power Supply:
- The transformer converts high AC voltage into lower AC voltage.
- The bridge rectifier converts AC voltage into DC voltage.
- The filter capacitor removes voltage fluctuations.
- The voltage regulator provides a constant 5V output.
- This regulated voltage is supplied to the microcontroller and other electronic components

Overall System Operation:
The overall operation of the Alcohol Detection and Door Lock System can be summarized as follows:
- The driver attempts to start the vehicle.
- The alcohol sensor detects alcohol concentration in the air.
- The sensor sends the signal to the Arduino microcontroller.

- The microcontroller compares the sensor value with the predefined threshold.
- If alcohol is not detected:
- Engine is allowed to start
- Door lock remains open
- If alcohol is detected
- Engine ignition is disabled
- Door locking mechanism is activated

▪ Alarm buzzer is triggered
▪ GPS location is obtained
▪ GSM module sends alert message

This automated process ensures driver safety and prevents drunk driving.

Advantages of the Proposed Methodology-y:
The proposed methodology offers several advantages:
▪ Automatic detection of alcohol without human intervention
▪ Prevents vehicle operation when the driver is intoxicated
▪ Enhances vehicle security through door locking system
▪ Provides alerts and warning messages
▪ Enables vehicle monitoring through GPS and GSM modules

IV. SUMMARY OF METHODOLOGY

The methodology of the Alcohol Detection and Door Lock System involves integrating sensor technology, ESP32 programming, and communication modules to create a smart vehicle safety system. The system continuously monitors the driver's condition and prevents unsafe driving behaviour.
By combining alcohol detection, door locking mechanisms, alarm systems, and communication technologies, the proposed approach provides an effective solution for reducing accidents caused by drunk driving and improving road safety.

V. DETAILED WORKING OF EACH COMPONENT

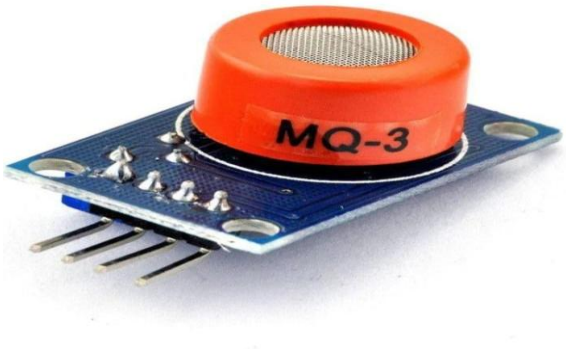
ESP32: -

The ESP32 microcontroller is used as the main control unit in the Alcohol Detection and Monitoring System with Engine Locking. It is a low-cost and low-power microcontroller developed by Espress if Systems and is widely used in embedded systems, Internet of Things (IoT), automation--n, and smart monitoring applications. The ESP32 has built-in Wi-Fi and Bluetooth capabilities, which makes it suitable for real-time monitoring and communication-based applications. In this project, the ESP32 acts as the brain of the system and controls all the operations such as reading sensor data, processing the data, controlling the engine locking mechanism, activating alert systems, and monitoring vehicle location.

In the Alcohol Detection and Monitoring System, the ESP32 reads the analog output from the MQ-3 alcohol sensor and converts it into digital values using its built-in Analog to Digital Converter (ADC). The microcontroller then compares the sensor value with a predefined threshold value stored in the program. If the alcohol level detected is below the threshold value, the ESP32 allows the engine to start by activating the relay module. If the alcohol level is above the threshold value, the ESP32 deactivates the relay module, which locks the engine and prevents the vehicle from starting. At the same time, the ESP32 activates a buzzer to provide an alert signal indicating alcohol detection. The ESP32 also communicates with the GPS module to obtain the location of the vehicle through serial communication and can send this data for monitoring using Wi-Fi connectivity. The ESP32 operates at 3.3V and has multiple GPIO pins and communication protocols such as UART, SPI, and I2C, which makes it easy to interface with sensors, relay modules, and GPS modules. Due to its built-in communication features, low power consumption, and high processing speed, the ESP32 is very suitable for automation and vehicle monitoring systems.

Therefore, the ESP32 microcontroller plays a very important role in the Alcohol Detection and Monitoring System with Engine Locking as it controls the entire system operation, processes sensor data, makes decisions based on alcohol detection, controls engine locking, activates alerts, and enables vehicle monitoring through GPS and IoT technology.

MQ-3 Gas Sensor: -



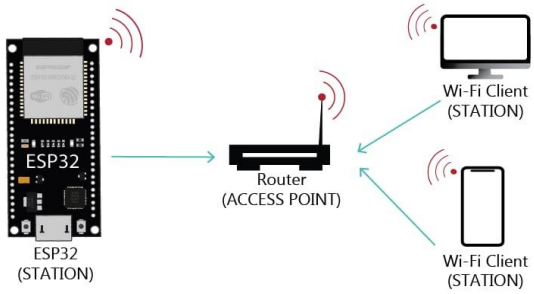
The MQ-3 Alcohol Sensor is used in the Alcohol Detection and Monitoring System with Engine Locking to detect alcohol vapors from the driver's breath. The MQ-3 sensor is a gas sensor specially designed for detecting alcohol concentration in air and is commonly used in breath analyser devices and alcohol detection systems. The sensor works on the principle of change in resistance of a sensing material when exposed to alcohol gas. When alcohol vapors come in contact with the sensor, the resistance of the sensing element changes, which results in a change in output voltage. This output voltage is then sent to the microcontroller for processing.

In this project, the MQ-3 alcohol sensor is connected to the ESP32 microcontroller. The sensor continuously senses alcohol vapors present in the air near the driver. The sensor provides an analog output which is read by the Analog to Digital Converter (ADC) of the ESP32. The ESP32 then compares the sensor value with a predefined threshold value. If the alcohol concentration is below the threshold value, the system allows the engine to start normally. If the alcohol concentration is above the threshold value, the system activates the engine locking mechanism using a relay module and also activates a buzzer to alert that alcohol has been detected. Thus, the MQ-3 sensor plays an important role in preventing drunk driving by detecting alcohol before the vehicle starts.

The MQ-3 sensor requires a heating element to operate properly, so it needs a few seconds to warm up before giving accurate readings. The sensor can detect alcohol concentration approximately in the range of 0.04 mg/L to 4 mg/L in air. The effective detection distance of the MQ-3 sensor is very small, typically around 2 cm to 5 cm, so the sensor is placed near the driver's seat or steering area to detect breath alcohol properly. The sensor operates at 5V supply and provides both analog and digital output. Due to its high sensitivity to alcohol, low cost, simple interfacing, and reliable performance, the MQ-3 alcohol sensor is suitable for alcohol detection and vehicle safety systems.

Therefore, the MQ-3 alcohol sensor is an important component of the Alcohol Detection and Monitoring System with Engine Locking, as it detects alcohol vapors from the driver's breath and sends the signal to the ESP32 microcontroller, which then controls the engine locking system and alert mechanism to prevent drunk driving and improve road safety.

Hotspot (WIFI): -Connects ESP32 to Internet: -



In the Alcohol Detection and Monitoring System with Engine Locking,Wi-Fi hotspot connectivity is used to connect the ESP32 to the internet for monitoring and data transmission. The ESP32 microcontroller has built-in Wi-Fi capability, which allows it to connect to a mobile hotspot or wireless network without using any external Wi-Fi module. In this project, a mobile hotspot is used to provide internet connectivity to the ESP32 so that the system can send data such as alcohol detection status and vehicle location to the monitoring platform or cloud server.

When the system is powered on, the ESP32 connects to the available Wi-Fi hotspot using the network SSID and password programmed in the system software. Once connected to the internet, the ESP32 can transmit sensor data, alert messages, and GPS location information for real-time monitoring. If alcohol is detected, the system can send a notification or update the monitoring system through the internet. This allows remote monitoring of the vehicle and improves the safety and security of the system.

The use of Wi-Fi hotspot connectivity makes the system more advanced and suitable for Internet of Things (IoT) applications. It enables real-time data

communication, remote monitoring, and data logging. The hotspot can be created using a smartphone or any Wi-Fi router. Therefore, Wi-Fi hotspot connectivity plays an important role enabling communication between the ESP32 microcontroller and the monitoring system in the Alcohol Detection and Monitoring System with Engine Locki-ng.

GPS Module

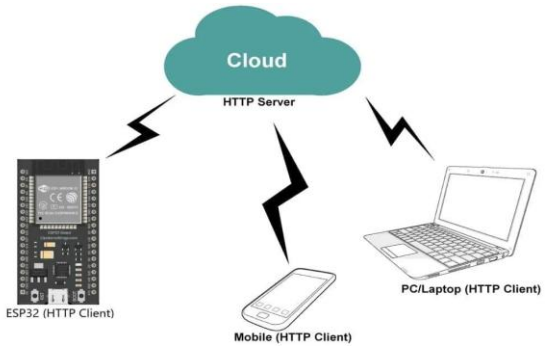
The GPS Module is used in the Alcohol Detection and Monitoring System with Engine Locking to track and monitor the location of the vehicle. PS stands for Global Positioning System, which is a satellite-based navigation system used to determine the exact location of an object on Earth in terms of latitude and longitude coordinates. In this project, the GPS module is interface with the ESP32 microcontroller to obtain the real-time location of the vehicle for monitoring purposes.

The GPS module receives signals from multiple satellites orbiting the Earth. Based on the signals received from these satellites, the GPS module calculates the position of the vehicle and provides location data such as latitude, longitude, speed, and time. This data is sent to the ESP32 microcontroller through serial communication using TX & RX pins. The ESP32 reads this data and can send the location information to a cloud platform or monitoring system through Wi-Fi connectivity. This allows real-time vehicle tracking and monitoring, especially when alcohol is detected and the engine is locked.

In this project, when alcohol is detected by the MQ-3 sensor, the system not only locks the engine but also records or sends the location of the vehicle using the GPS module. This feature is useful for monitoring-g the vehicle and identifying its location in case of emergency or misuse. The GPS module operates on low power and provides accurate location information, making it suitable for vehicle tracking and IoT-based monitoring systems.

Therefore, the GPS module plays an important role in the Alcohol Detection and Monitoring System with Engine Locking by providing real-time location tracking, which helps in monitoring the vehicle and improving safety and security.

Cloud Server (Data Display & Storage)



The Cloud Server is used in the Alcohol Detection and Monitoring System with Engine Locking for storing, displaying, and monitoring system data over the internet. The cloud server allows the system to store important data such as alcohol detection status, vehicle location, alert messages, and system status in an online database. This data can be accessed from anywhere using a mobile phone, laptop, or computer through an internet connection.

In this project, the ESP32 microcontroller is connected to the internet using a Wi-Fi hotspot and sends data to the cloud server. The data sent to the cloud may include alcohol sensor readings, engine status (ON/OFF), GPS location coordinates, and alert. The cloud server receives this data, stores it in a database, and displays it on a dashboard or monitoring interface. This helps the user or vehicle owner to monitor the vehicle remotely in real time. The cloud server also helps in maintaining records of alcohol detection events and vehicle locations for future reference and analysis. This feature is useful for safety monitoring, fleet management, and accident prevention systems. By using cloud technology, the system becomes an Internet of Things (IoT) based smart monitoring system where data can be accessed and monitored from anywhere in the world.

Therefore, the cloud server plays an important role in the Alcohol Detection and Monitoring System with Engine Locking by storing system data, displaying

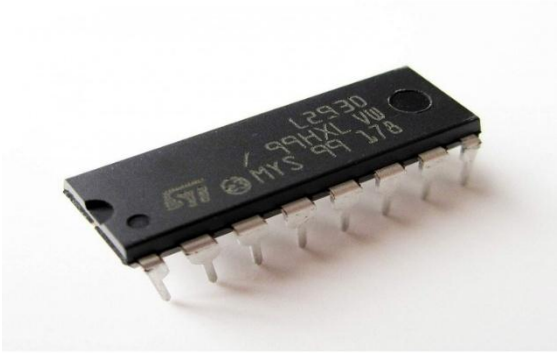
monitor-Ing information, and enabling remote access and real-time vehicle monitoring through the internet.

BUZZER

The Buzzer is used in the Alcohol Detection and Monitoring System with Engine Locking as an alert or warning device. A buzzer is an electronic audio signalling device that produces sound when electrical power is applied to it. In this project, the buzzer is used to alert when alcohol is detected by the MQ-3 alcohol sensor or when the engine is locked due to alcohol detection. The buzzer provides an immediate audio indication that the system has detected alcohol and the vehicle ignition system has been disabled.

In this system, the buzzer is connected to the ESP32 microcontroller. When the MQ-3 sensor detects alcohol above the threshold level, the ESP32 sends a signal to the buzzer through a digital output pin, which activates the buzzer and produces a warning sound. The buzzer operates at low voltage, consumes very little power, and is easy to interface with the ESP32.Therefore, the buzzer acts as an important alert mechanism in the system by providing an audible warning signal when alcohol is detected and the engine locking system is activated.

L293D IC: -



The L293D Motor Driver IC is used in the Alcohol Detection and Monitoring System with Engine Locking to control the direction and operation of the DC motor used to represent the vehicle engine in the prototype model. The L293D is a motor driver integrated circuit that allows a ESP32 to control the direction and rotation of a DC motor. Since a microcontroller like the ESP32 cannot supply enough current to drive a motor directly, the L293D motor driver IC is used as an interface between the microcontroller and the motor.

The L293D IC works on the principle of an H-bridge circuit, which allows the motor to rotate in both forward and reverse direction-ns. The ESP32 sends control signals to the input pins of the L293D IC, and based on these signals, the motor rotates in a particular direction or stops. In this project, the motor represents the vehicle engine, and the L293D IC helps to start or stop the motor depending on alcohol detection. If no alcohol is detected, the ESP32 sends signals to the L293D IC to allow the motor to run. If alcohol is detected, the ESP32 stops sending signals, and the motor stops, representing engine locking. Therefore, the L293D motor driver IC plays an important role in controlling motor operation and implementing the engine locking mechanism-m in the system.

DC MOTOR

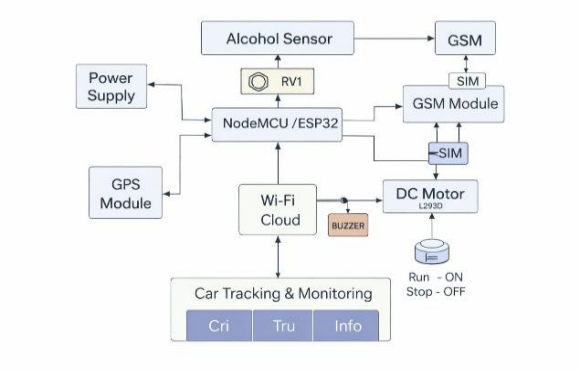
The DC Motor is used in the Alcohol Detection and Monitoring System with Engine Locking to represent the vehicle engine in the prototype model. A DC motor is an electrical motor that converts direct current electrical energy into mechanical rotational motion. In this project, the DC motor is used to simulate the operation of a vehicle engine. When the system allows the engine to start, the DC motor rotates, and when alcohol is detected, the system stops the motor, representing engine locking.

In this system, the DC motor is connected to the L293D Motor Driver IC motor driver IC, which is

controlled by the ESP32 microcontroller. The ESP32 sends control signals to the L293D motor driver, which then controls the motor operation such as start, stop, and direction control. If no alcohol is detected by the MQ-3 sensor, the ESP32 allows the motor to run, indicating that the engine is in ON condition. If alcohol is detected above the threshold level, the ESP32 stops the motor through the motor driver IC, indicating that the engine is locked. Therefore, the DC motor is used as an engine model in this project to demonstrate the engine locking mechanism when alcohol is detected.

VI. OVERALL ARCHITECTURE OF THE SYSTEM

(Block Diagram)



The overall system architecture of the Alcohol Detection and Monitoring System with Engine Locking consists of various components such as the alcohol sensor, microcontroller, GPS module, GSM module, cloud server, motor driver, DC motor, buzzer, and power supply. The main controller of the system is the ESP32, which controls all system operations and process-es the data from different modules.

In this system, the MQ-3 Alcohol Sensor detects alcohol from the driver's breath and sends the signal to the ESP32. The ESP32 then checks the alcohol level and controls the motor through the motor driver to represent engine ON or OFF condition. If alcohol is detected, the engine is stopped and the buzzer is activated as an alert. The GPS Module is used to track the vehicle location, and the data is sent to the cloud server through Wi-Fi for monitoring. The GSM module is used to send alert messages using a SIM card.Thus, the system integral-es alcohol detection, engine locking vehicle tracking, alert system, and cloud monitoring into a single safety system.

Real Life Implementation

The Alcohol Detection and Monitoring System with Engine Locking can be implemented in real vehicles to prevent drunk driving and improve road safety. The MQ-3 Alcohol Sensor is installed near the driver's seat or steering wheel to detect alcohol from the driver's breath. The sensor is connected to the ESP32, which processes the sensor data and decides whether the engine should start or not. If alcohol is detected above the threshold level, the system automatically stops the engine ignition and activates a buzzer alert.

The system also uses a GPS module and cloud server to track and monitor the vehicle location in real time. In actual vehicles, the system would be connected directly to the ignition system instead of a DC motor. This system can be used in cars, buses, trucks, and commercial vehicles to reduce accidents caused by drunk driving and improve vehicle safety.

Execution

The execution of the Alcohol Detection and Monitoring System with Engine Locking starts when power is supplied to the system. The MQ-3 Alcohol Sensor detects alcohol from the driver's breath and sends the signal to the ESP32. The ESP32 checks the alcohol level and if alcohol is detected above the threshold level, the system stops the engine and activates the buzzer alert. If alcohol is not detected, the engine runs normally. The GPS module sends vehicle location data to the cloud server for monitoring.

Impact

The Alcohol Detection and Monitoring System with Engine Locking has a significant impact on road safety and accident prevention. The system helps in reducing accidents caused by drunk driving by automatically preventing the vehicle from starting when alcohol is detected. By using the MQ-3 Alcohol Sensor and ESP32, the system continuously monitors the driver's alcohol level and ensures that the vehicle cannot be operated under the influence of alcohol. This improves driver safety, passenger safety, and overall road safety. The system also provides vehicle tracking and monitoring using GPS and cloud technology, which helps in emergency situations and vehicle security. It can be used in cars, school buses, transport vehicles, and commercial vehicles to improve transportation safety and monitoring. Over-all, the system has a positive impact on society by reducing road accidents,

improving vehicle safety, enabling real-time monitoring, and promoting responsible driving.

Advantages of Alcohol Detection and Monitoring System with Engine Locking

1)Prevents Drunk Driving: The system detects alcohol before the vehicle starts and prevents the engine from starting if alcohol is detected.
2)Automatic Engine Locking: The engine locking mechanism works automatically without human intervention, which improv-es safety.
3)Improves Road Safety: The system helps in reducing road accidents caused by drunk driving.
4)Real-Time Monitoring: Using GPS and cloud server, the vehicle location and system status can be monitored in real time.
5)Alert System: The buzzer and message alerts inform the driver or vehicle owner when alcohol is detected.
6)Vehicle Tracking: The system allows tracking of the vehicle location using GPS technology.
7)Low-Cost System: The system uses low-cost components and can be easily implemented in vehicles.
8)Easy Installation: The system can be easily installed in vehicles without major modifications.
9)Useful for Commercial Vehicles: The system is useful for buses, trucks, school buses, and transport vehicles for safety monitoring.
10)Supports IoT Monitoring: The system can send data to cloud server through internet for remote monitoring.

VII. FUTURE SCOPE

Future improvements that can be made in the Alcohol Detection and Monitoring System with Engine Locking are: -

1)The system can be connected directly to the vehicle ignition system instead of a DC motor.
2)A mobile application can be developed for real-time vehicle monitoring and alerts.
3)Face recognition or fingerprint sensor can be added for driver identification.
4)More accurate alcohol sensors can be used to improve detection accuracy.
5)Emergency alert system can be added to send location to family or authorities.
6)Cloud data storage can be improved for maintaining driver and vehicle records.
7)The system can be integrated with smart vehicles and smart transportation systems.
8)Camera module can be added for driver monitoring and safety.
9)GSM module can be used for SMS alerts without internet.
10)The system can be implemented in commercial vehicles, school buses, and transport systems.

VIII. CONCLUSION

The Alcohol Detection and Monitoring System with Engine Locking is designed to prevent drunk driving and improve road safety by automatically detecting alcohol and stopping the vehicle engine. The system uses the MQ-3 Alcohol Sensor to detect alcohol and the ESP32 to control the engine locking mechanism, alert system, and vehicle monitoring.

When alcohol is detected above the threshold level, the system automatically locks the engine and activates the buzzer alert, and the vehicle location can be monitored using GPS and cloud technology. The system was successfully implemented and tested, and it helps in reducing accidents caused by drunk driving and improves vehicle safety. Thus, this system is a low cost, reliable, and effective solution for vehicle safety and monitoring.

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