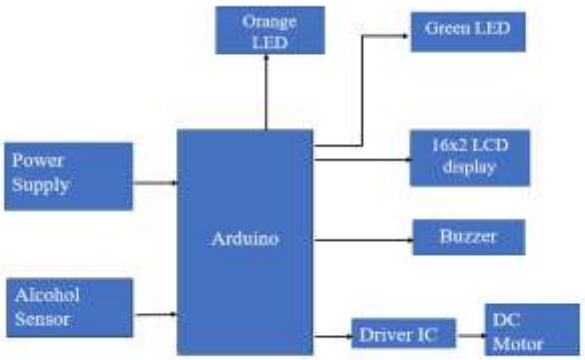
Research Paper 1

Paper Link :Paper 1

Paper Reference : International Journal for Innovative Engineering and Management System

Title : Alcohol Detection and Engine Locking System

Proposed System : This is intended with an MQ3 alcohol sensor which is controlled by Arduino Uno. MQ3 sensor is used for measuring the alcohol percentage of a driver. The power supply is given to Arduino Uno and 5V supply is given to the MQ3 sensor from Arduino. The MQ3 sensor will pass the information of alcohol concentration to the Arduino Uno.



Literature Review :

Nookala Venu (2022) developed an alcohol detection and engine locking system to reduce accidents caused by drunk driving. The system uses an Arduino Uno microcontroller and an MQ3 alcohol sensor to monitor the driver's breath and automatically shut off the vehicle's engine if alcohol levels exceed a safe threshold. This approach aims to provide a cost-effective and real-time solution to prevent drunk driving. The authors emphasize that their design is more affordable compared to previous systems that relied on expensive GPS and GSM technologies.

The literature review highlights the limitations of earlier projects, particularly those using unreliable sensors like the MQ2, which had high false alarm rates. Nookala Venu et al. (2022) instead utilize the MQ3 sensor, known for its superior accuracy in detecting alcohol vapors, making it more suitable for use in vehicles. By integrating easily available components, the system offers a practical and economical solution for broader implementation. The project ultimately aims to enhance road safety by ensuring that impaired drivers cannot operate their vehicles.

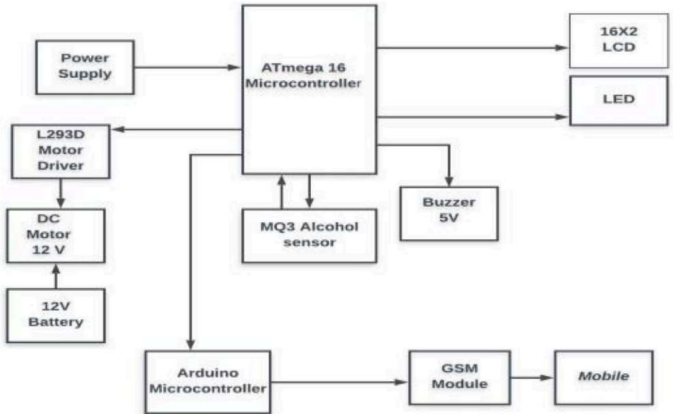
Research Paper 2

Paper Link : Paper 2

Paper Reference : International Journal of Engineering Research & Technology

Title : Automatic Engine Locking System Through Alcohol Detection

Proposed System : 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 people



Literature Review : Dr. Pavan Shukla (2020) proposed an alcohol detection and engine locking system to prevent accidents caused by drunk driving. The system employs an Arduino Uno microcontroller, an MQ3 alcohol sensor, and SIM900A to detect alcohol levels, lock the vehicle's engine, and notify authorities with the vehicle's location if the threshold is exceeded. This design offers a real-time, cost-effective solution to reduce road accidents. The authors highlight that their approach is affordable compared to earlier methods using GPS and GSM technologies, which were more expensive.

In the literature review, Dr. Shukla (2020) discusses the limitations of older systems that relied on less accurate alcohol sensors like MQ2 and more expensive microcontrollers. Their proposed use of the MQ3 sensor improves accuracy, reducing false alarms and ensuring better detection of alcohol levels. The system also includes features like a buzzer and LED indicators for alerting nearby vehicles. This design aims to significantly enhance road safety by preventing intoxicated drivers from operating their vehicles.

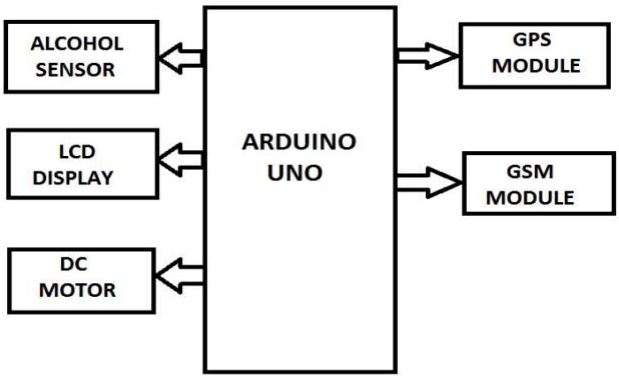
Research Paper 3

Paper Link : Paper 3

Paper Reference : International Journal of Engineering Trends and Applications

Title : Alcohol Detection and Vehicle Controlling

Proposed System : The proposed system aims to reduce road accidents caused by drunk driving using an Arduino Uno-based alcohol detection and vehicle control system. The MQ3 alcohol sensor detects the presence of alcohol, and if it exceeds the threshold, the vehicle's ignition system is automatically turned off. Simultaneously, the GPS module captures the vehicle's location, and the GSM module sends an SMS alert with the location to pre-selected contacts. The system also includes an LCD display to show messages such as "Alcohol Detected." This cost-effective and efficient design ensures real-time monitoring and accident prevention.



Literature Review : Pratiksha Bhuta et al. (2015) designed an alcohol detection and vehicle controlling system to reduce road accidents caused by drunk driving. The system utilizes an Arduino Uno microcontroller with an MQ3 alcohol sensor to detect alcohol levels, and if a threshold is crossed, the vehicle's ignition system shuts off. Additionally, a GPS module captures the vehicle's location, and a GSM module sends an emergency message to predefined contacts. This approach provides a real-time, low-cost solution to increase road safety by preventing drunk driving.

In their literature review, Bhuta et al. (2015) emphasize the advantages of their system compared to older methods, which were either more expensive or less reliable. The integration of both GPS and GSM modules enhances emergency response capabilities by sending location details. The use of a simple, cost-effective MQ3 sensor ensures accurate alcohol detection. By improving vehicle safety features, the system contributes to the development of smarter, safer automobiles.

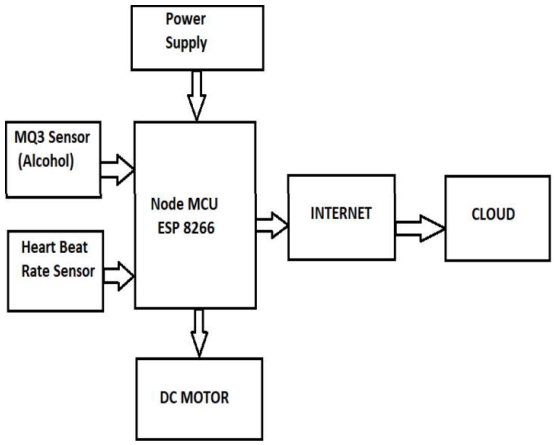
Research Paper 4

Paper Link : Paper 4

Paper Reference : International Journal of Innovative Technology and Exploring Engineering

Title : Health Monitoring with Alcohol Detection and Ignition Control System using IoT

Proposed System : In this system, an MQ3(alcohol) sensor is placed at the helmet of the driver to detect the alcohol consumption level of driver and heart beat sensor is placed at the handle-bar of the motorbike to monitor the heart beat rate. The results obtained by the sensors are analog values and it is processed by the controller with the help of wifi through the internet. The results obtained from sensors are constantly updated to the cloud using IoT. When the resultant values obtained from alcohol sensors attains the threshold limit, then the system prevents the chances of accident by stopping the vehicle ignition system and stores the alcohol consumption values to the database of the vehicle user. The heart beat rate of the driver is also continuously monitored with the help of appropriate heart beat rate detection sensors and the data are updated in the database. In case of any abnormal detections in heart beat rate of the driver, then the current status of the person is informed to their relatives through IoT.



Literature Review :Arun Francis et al. (2019) proposed a health monitoring system integrated with alcohol detection and ignition control using IoT to prevent road accidents. The system uses an MQ-3 alcohol sensor and a heartbeat sensor to monitor the driver's alcohol level and health condition. If alcohol consumption exceeds a threshold, the vehicle's ignition system is disabled, and the driver's condition is sent to relatives via IoT. This design aims to enhance road safety and prevent drunk driving incidents.

The authors also highlight the importance of monitoring the driver's heartbeat to prevent accidents due to sudden health issues. The system continuously updates the sensor data to the cloud, allowing for future access and analysis. By utilizing NodeMCU, the system connects to the internet for real-time data transmission and storage. The proposed system is efficient and could be expanded by incorporating GPS and GSM for location tracking in the future.

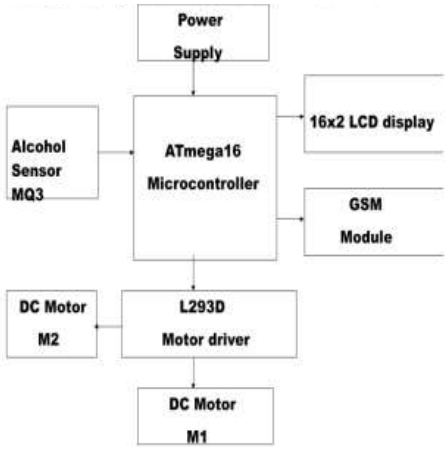
Research Paper 5

Paper Link : Paper 5

Paper Reference : International Journal of Engineering Research and Applications

Title : Alcohol Detection and Automatic Drunken Drive Avoiding System

Proposed System : The proposed system uses an AVR-ATmega16 microcontroller to manage an alcohol detection and engine locking mechanism. When power is supplied, the MQ3 alcohol sensor detects alcohol levels and sends an analog signal to the microcontroller's ADC, which converts it to a digital value. The microcontroller then displays "ALCOHOL DETECTED" on an LCD. If alcohol is detected, the microcontroller signals the L293D motor driver to reduce the engine speed gradually and eventually stop the vehicle. Additionally, a GSM modem sends an alert message to a predefined contact number.



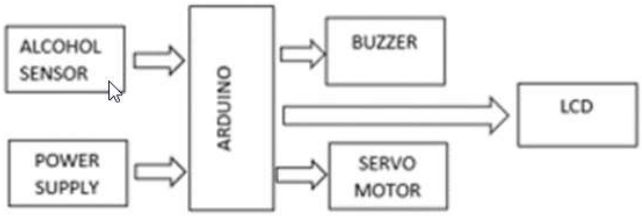
Literature Review :

Drunk driving poses a significant public safety issue, contributing to thousands of traffic fatalities each year despite existing laws aimed at preventing it. To address this problem, an innovative embedded system has been developed that utilizes an MQ3 alcohol sensor, an AVR ATmega 16 microcontroller, and a GSM module. This system detects alcohol consumption in drivers, halts the vehicle to prevent accidents, and alerts authorities via SMS. By integrating these technologies, the proposed system aims to enhance road safety and reduce alcohol-related incidents. The authors advocate for regulatory measures to mandate the installation of such systems in vehicles, potentially lowering the risks associated with drunk driving.

Research Paper 6

Paper Link : Paper 6

Paper Reference: Journal of Engineering Technology Vol. 10(1): 103-109, 2022
Title: Alcohol Detection Using Arduino with Motor Locking
Proposed System: The proposed system integrates an alcohol detection sensor with a motor locking mechanism to prevent drunk drivers from operating vehicles. The MQ-3 alcohol sensor detects alcohol levels in the driver's breath. If the alcohol concentration exceeds the set threshold, the system automatically locks the vehicle's engine and activates a buzzer. This system aims to reduce road accidents by preventing drunk drivers from starting the vehicle. It is based on an Arduino Mega microcontroller and uses a liquid crystal display (LCD) to show alcohol detection results.



Literature Review: Hamamy and Danial (2022) designed an alcohol detection system using Arduino to lock the motor when the driver is intoxicated. Their system employs an MQ-3 sensor that detects alcohol concentration, and if a threshold is crossed, the vehicle's engine is locked, and a buzzer alerts the driver. This method aims to minimize accidents caused by drunk driving by preventing intoxicated individuals from operating vehicles.

The authors point out that drunk driving accidents are a growing issue in Malaysia, with incidents increasing year by year. Prior to this technology, there was no system available to automatically lock the vehicle's engine when alcohol was detected. Their system provides a cost-effective, efficient solution that can significantly improve road safety.

To enhance the system's effectiveness, Hamamy and Danial recommend integrating additional features such as facial recognition or fingerprint sensors to prevent tampering. They also suggest future upgrades, including adding GPS and GSM technology to track the vehicle's location and alert emergency contacts or authorities when needed. Their approach offers a reliable solution to address the challenges of drunk driving and enhances overall road safety.

Research Paper 7

Paper Link : Paper 7

Paper Reference:
P.Sree Lekha, Dr. P.Venkata Prasad. “Alcohol Detection with Automatic Engine Locking System.” *International Journal of Advances in Engineering and Management (IJAEM)*, Vol. 3, Issue 6, June 2021, pp. 331-340, DOI: 10.35629/5252-0306331340.

Title:
Alcohol Detection with Automatic Engine Locking System

Proposed System:
The proposed system is an alcohol detection and automatic engine locking system designed using an Arduino Uno microcontroller, MQ3 alcohol sensor, LCD screen, and a DC motor. The system monitors the driver’s breath using the MQ3 sensor, placed on the steering wheel, to measure Blood Alcohol Content (BAC). If the sensor detects alcohol levels exceeding a certain threshold, it prevents the vehicle from starting. If alcohol is detected while driving, the system automatically stops the engine, ensuring the vehicle cannot accelerate further. The system aims to reduce accidents caused by drunk driving by controlling vehicle ignition based on alcohol levels detected.

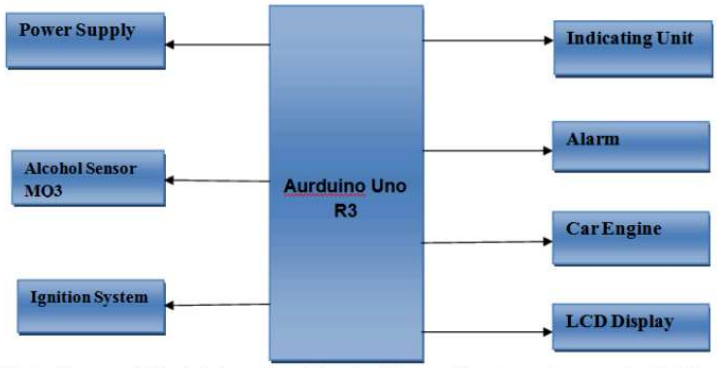


Fig. 1: Block diagram of Alcohol detection of drunk drivers with automatic car engine locking system.

Literature Review:
The problem of alcohol-impaired driving has resulted in significant fatalities, with over 10,497 deaths in 2016 in the U.S. alone. Young drivers (ages 21-34) and motorcyclists are disproportionately affected, and individuals with prior DWI convictions are at a higher risk of involvement in fatal crashes. The global increase in alcohol consumption, particularly in countries like India, where consumption doubled between 2005 and 2016, emphasizes the need for preventive measures. Existing systems for alcohol detection focus on utilizing sensors such as the MQ3, which shows high sensitivity to alcohol and low sensitivity to other substances like Benzene. These systems provide efficient real-time monitoring of drivers' breath alcohol levels and are designed to either warn the driver or completely disable the vehicle in severe cases.

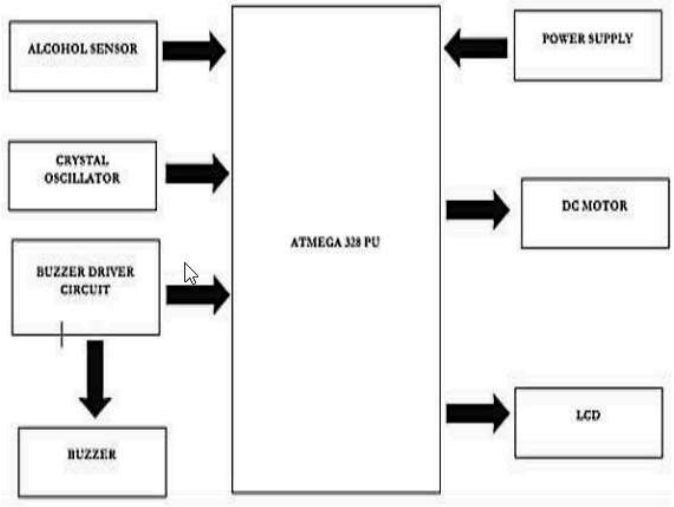
Research Paper 8

Paper Link : Paper 8

Paper Reference:
Ighalo Joshua, Uzairue Stanley, Ochonogor Charles, Amaize Peter, Kennedy Okokpujie. "Development of Alcohol Triggered Vehicle Engine Lock System." *International Journal of Robotics and Automation*, Vol. 8, No. 1, March 2019, pp. 68-76. DOI: 10.11591/ijra.v8i1.pp68-76.

Title:
Development of Alcohol Triggered Vehicle Engine Lock System.

Proposed System:
The proposed system is an alcohol-triggered vehicle engine lock designed to prevent drunk driving by immobilizing the vehicle if alcohol is detected above a preset threshold. The system consists of an alcohol sensor (MQ3), a microcontroller (ATmega328), a DC motor representing the vehicle engine, and an LCD for displaying alerts. When alcohol is detected beyond the limit, the system triggers an alarm and prevents the engine from starting, enhancing road safety.



Literature Review:
Previous alcohol detection systems were primarily basic circuits lacking portability and real-time intervention. Some recent solutions used GSM technology to alert drivers via text messages but did not prevent driving. Several earlier designs relied on AC power, making them impractical for vehicle use, and lacked features like alarms or mechanisms to disable the ignition. The use of components such as the LM358 op-amp limited flexibility in adjusting alcohol thresholds. Although advancements with microcontrollers allowed for real-time threshold adjustments based on driver body chemistry, these systems did not fully prevent impaired drivers from operating vehicles.

Research Paper 9

Paper Link : Paper 9

Paper Reference:
Niranjani, V., Prabhu, C., Nithesh, P., Nithish, M., & Mohamad Riyas, S. "Drink and Drive Detection with Ignition Lock System." *International Journal of Research in Engineering, Science and Management*, Volume 2, Issue 3, March 2019, pp. 340-343. ISSN (Online): 2581-5792.

Title:
Drink and Drive Detection with Ignition Lock System.

Proposed System:
The proposed system aims to enhance road safety by preventing intoxicated driving through an automated locking mechanism. Utilizing an Arduino board paired with an alcohol sensor, GSM module, and an LCD display, the system detects alcohol levels and locks the vehicle's ignition if the detected levels exceed a predefined limit. In addition, it sends an SMS notification to the designated contacts and displays relevant alerts on the LCD.

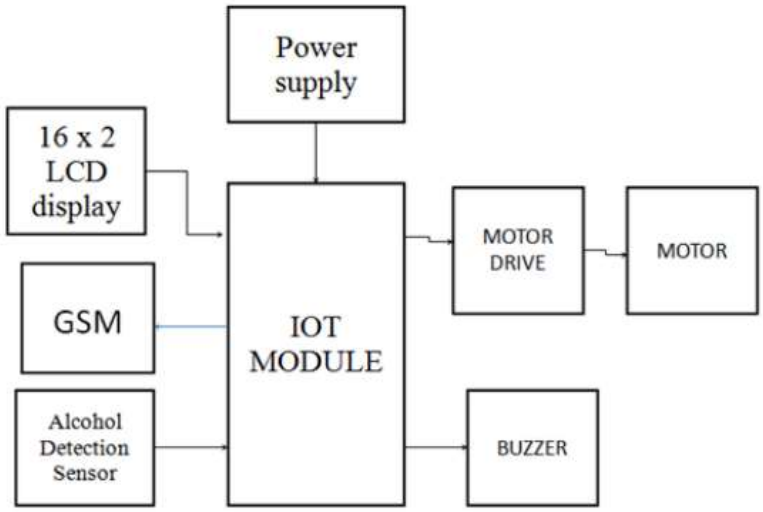


Fig. 1. Block diagram

Literature Review:
There are three primary methods for detecting alcohol consumption in drivers: the Breathalyzer, Intoxilyzer, and Alco Sensor. Current systems typically employ a combination of sensors and microcontrollers to assess alcohol levels, but many lack automatic intervention features. The reviewed systems often do not provide a mechanism to immobilize the vehicle, leaving a gap in effectively preventing impaired driving. Previous works primarily focused on detection rather than comprehensive safety measures, underscoring the need for systems that not only identify intoxication but also enforce immediate vehicle control to enhance safety on the roads.