IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 2, January 2026
Impact Factor: 7.67

A Review Paper on Alcohol Detection and Engine Locking System with GPS Tracking System through Mobile Application

Prof. Anuradha Gohad, Mr. Sahil Lanjewar, Mr. Manoj Madke,
Ms. Utkarsha Raut, Mr. Adarsh Sute, Mr. Prathmesh Pendhare
Department of Computer Science & Engineering (AI & ML)
Jhulelal Institute of Technology, Nagpur, Maharashtra, India.
a.gohad@gmail.com, sahillanjewar294@gmail.com, madkepappu87@gmail.com
utkarsharaut321@gmail.com, Adarshsute9@gmail.con, prathmeshpendhare24@gmail.com

Abstract: *This study aims to analyze the impact of internal factors on road accidents. The paper presents a smart vehicle safety system that integrates alcohol detection, engine locking, GPS tracking, and mobile app notifications through web APIs. The system uses an MQ-3 alcohol sensor to detect alcohol levels in the driver's breath. If the detected level exceeds a set threshold, the NodeMCU (ESP8266/ESP32) processes the data, triggers an engine lock mechanism, and uploads the vehicle's location (via GPS module) to a cloud server using a web API. A mobile application retrieves the data in real-time and displays the vehicle's location on Google Maps, while also sending push notifications. This approach eliminates the need for GSM connectivity, utilizes Wi-Fi/IoT connectivity, and offers a scalable, cost-effective road safety solution.*

Keywords*:* Alcohol detection, Engine lock, GPS, NodeMCU, IoT, Web API, Google Maps, Vehicle safety

I. INTRODUCTION

This study aims to analyze the impact of internal factors on road traffic accidents, which have become a serious global issue, leading to loss of life, injuries, and economic setbacks. According to the World Health Organization (WHO), approximately 1.3 million people die annually due to road traffic crashes, with alcohol consumption being one of the major contributing factors. Driving under the influence (DUI) impairs judgment, slows reaction time, and reduces coordination, making it extremely dangerous for both the driver and other road users. In many countries, alcohol-impaired driving accounts for 30–40% of fatal road accidents, highlighting the urgent need for technological interventions.

Traditional enforcement methods such as manual breathalyzers, police checkpoints, and surveillance cameras, though effective to some extent, are reactive measures. They depend on law enforcement personnel being physically present to check drivers, and they cannot prevent intoxicated individuals from starting a vehicle. Moreover, these manual systems are subject to human error, delayed detection, and limited coverage, especially in rural or less-patrolled areas. This creates a strong demand for automated, preventive, and real-time monitoring systems that can stop drunk driving before it causes accidents.

To address this challenge, researchers have explored sensor-based systems, particularly using MQ-series alcohol sensors that can detect ethanol concentration in the driver’s breath. Many studies have demonstrated their reliability in distinguishing between safe and unsafe alcohol levels. However, most existing systems merely detect alcohol and issue warnings, without directly preventing vehicle ignition. An anti-theft system, like shutting down an automobile's engine upon detecting intoxication, significantly decreases crashes involving intoxicated motorists.

Concurrently, improvements in IoT technology now enable continuous tracking of vehicles at all times. Devices equipped with IoT technology, like the ESP8266/ESP32-based NodeMCU module, enable smooth communication

DOI: 10.48175/IJARSCT-30809

between these systems and remote servers through RESTful API connections or integration with Firebase services. While traditional GSM networks rely on text messages for alerting purposes, Internet of Things communications provide quicker responses, worldwide reach at lower costs, and greater flexibility in terms of scale. Using Internet of Things technology, households, transportation managers, or road control officials can track vehicle movements at all times.

Another important component of modern vehicle safety systems is location tracking. By integrating GPS modules (such as NEO-6M), the exact position of the vehicle can be determined. When combined with IoT communication, this location data can be transmitted to a cloud server and accessed by mobile applications. Using Google Maps API, the mobile app can display the vehicle's position dynamically, enabling stakeholders to act quickly in case of emergency situations.

Furthermore, real-time mobile notifications improve usability. By using Firebase Cloud Messaging (FCM) or similar services, the system can instantly alert family members or registered users whenever an intoxicated driver attempts to start the vehicle. This allows not only prevention through engine lock but also awareness through live notifications and location visualization, making the system proactive and comprehensive.

II. LITERATURE SURVEY

Alcohol detection and prevention systems have been an active area of research in intelligent transportation and road safety over the last two decades. Several approaches have been proposed, ranging from simple breath-analyzers to IoT-enabled vehicle control systems. This section reviews existing literature relevant to alcohol detection, engine locking mechanisms, GPS tracking, and IoT-based monitoring.

A. Alcohol Detection Using Sensors

Initial research concentrated on incorporating alcohol detectors within automobiles for assessing driver impairment. In 2012, Patel et al. [1] introduced a device employing an MQ-3 gas sensor interfaced with a microprocessor for detecting ethanol concentration in exhaled air as a proxy for determining driver intoxication levels via breath analysis. When the level of focus surpassed an established limit, the device emitted a beeping sound; however, it failed to hinder the operation of starting the car. Despite being successful at detecting issues, the absence of preventative measures restricted its practical use in everyday scenarios.

Later, Prashanth et al. (2014) [2]

They created a prototype that integrated alcohol detection with an automatic ignition lock. Their setup linked an MQ-3 sensor to a PIC microcontroller and utilized a relay system to turn off the fuel pump whenever alcohol was detected. Although this method added a preventive measure, the system operated independently and didn't include any features for remote monitoring.

Kumar and Reddy (2016) [3] enhanced the design by incorporating a GSM module to send SMS alerts to family members or authorities upon detection. Although GSM communication improved awareness, the dependence on SMS introduced recurring costs and limited scalability, especially when monitoring multiple vehicles simultaneously.

B. Vehicle Tracking and Location Monitoring

GPS tracking in vehicles became prominent with the work of Shinde and Kale (2013) [4], who integrated a GPS receiver with a GSM modem to track stolen vehicles. The system sent latitude and longitude coordinates via SMS. This laid the foundation for combining safety systems with location tracking. However, SMS-based communication again proved inefficient for continuous monitoring.

Raj and Iqbal (2015) [5] proposed an alcohol detection system with GPS tracking, where vehicle location was transmitted to a central server when intoxication was detected. Their approach aimed at informing authorities in real-time, but the communication relied heavily on GSM networks, which posed challenges in rural areas with weak signal strength.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 2, January 2026
Impact Factor: 7.67

C. IoT-Based Safety Systems

With the advent of IoT, researchers began exploring cloud-based solutions for vehicle safety. Sundar and Ramakrishnan (2017)

[6] designed an IoT-enabled smart helmet that detected alcohol and prevented the vehicle from starting unless the helmet was worn and alcohol-free. Data was uploaded to a cloud server using Wi-Fi, enabling real-time monitoring. However, this work was limited to two-wheeler applications. Sangeetha and Kumar (2018) [7] Presented an IoT-based alcohol detection system for cars, using an Arduino Uno, alcohol sensor, and NodeMCU for Wi-Fi communication. Alerts were sent through a web dashboard, reducing reliance on GSM. The design was cost-effective and scalable, but it didn't include a mobile app or real-time location tracking features.

D. Integrated Alcohol Detection with Engine Locking and Alerts

Some researchers attempted to combine multiple features. Borkar et al. (2019) [8] developed a system that included alcohol detection, ignition control, and SMS alerts. Their prototype used an MQ-3 sensor, Arduino, and GSM module. Despite covering detection, prevention, and notification, the system did not include GPS tracking or cloud connectivity.

Mohan et al. (2020) [9] introduced a Raspberry Pi-based solution with alcohol detection and GPS tracking, transmitting data to a cloud server. However, the cost of Raspberry Pi hardware made it less feasible for large-scale deployment in developing countries.

More recently, Gupta and Sharma (2021)

[10] presented an IoT-enabled alcohol detection system using ESP8266 and Firebase. They successfully integrated engine lock and real-time monitoring through a mobile application. Although their work demonstrated the potential of IoT, it lacked advanced visualization tools such as Google Maps integration for location tracking.

E. Research Gaps Identified

From the reviewed literature, several gaps are evident:

1. Limited Preventive Mechanisms – Early systems focused on detection and alerts but did not prevent vehicle ignition.
2. Dependence on GSM/SMS – Many older works relied on SMS communication, which incurs costs and delays.
3. Lack of Mobile App Integration – Few systems provided user-friendly mobile notifications or interfaces.
4. No Real-Time Mapping – Although GPS tracking was included in some systems, integration with Google Maps for dynamic location monitoring was missing.
5. High Cost of Hardware – Raspberry Pi-based designs, though powerful, are expensive for mass adoption.

F. Contribution of the Proposed Work

To bridge these gaps, the proposed system integrates:

- Low-cost alcohol detection (MQ-3 sensor).
- Engine lock mechanism using a relay.
- GPS tracking with NEO-6M module.
- IoT communication via NodeMCU and REST API (eliminating GSM/SMS).
- Mobile app with Google Maps integration for real-time location visualization and push notifications.

This comprehensive approach combines prevention, monitoring, and user awareness, making it more practical and effective compared to earlier standalone or GSM-based solutions.

III. METHODOLOGY

The system suggested uses an Arduino Uno, a NodeMCU ESP8266, and the ThingSpeak IoT platform to create a real-time alcohol detection and engine lock system that also includes GPS tracking. This approach helps stop drunk driving before it happens by bringing together sensing, making decisions, sending data to the cloud, and showing information all in one setup.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 2, January 2026
Impact Factor: 7.67

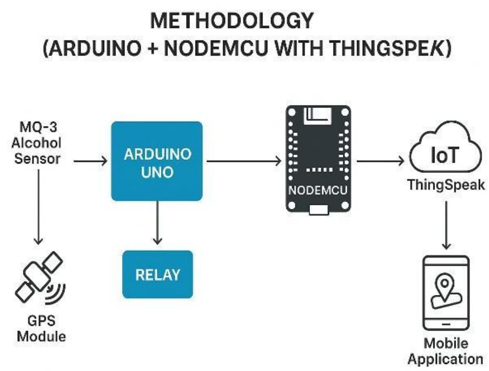

Fig-1: Block Diagram

A. System design

The system's design is made up of separate parts, and each part is responsible for doing a particular job.

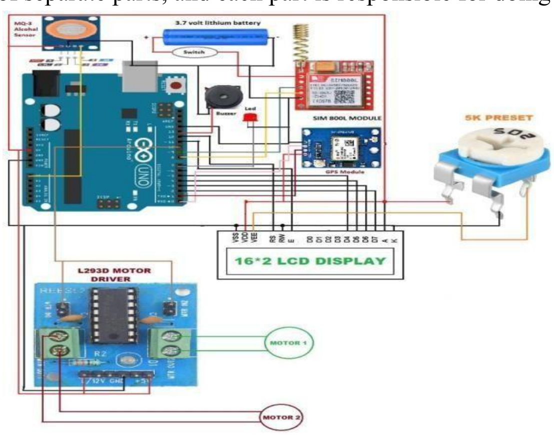

Fig- 2 : Circuit Diagram

1. Arduino Uno:

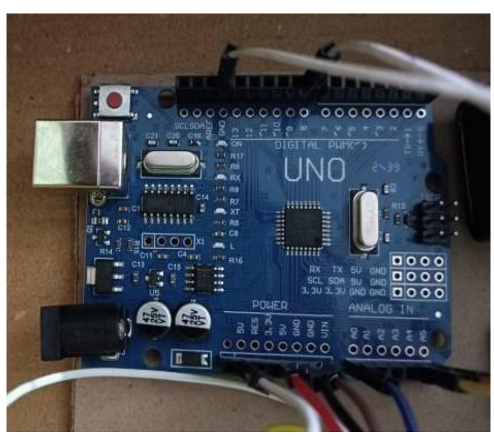

Fig- 3 : Arduino Uno

Serves as the main control unit, connecting to the MQ-3 alcohol sensor, NEO-6M GPS module, and relay module. It gathers data from the sensors, uses set thresholds to make decisions, and sends the results to the NodeMCU.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 2, January 2026
Impact Factor: 7.67

2. MQ-3 Alcohol Sensor:

Fig - 4 : MQ-3 Alcohol Sensor

This sensor detects ethanol vapors from the driver's breath. It produces an analog voltage that changes based on the amount of alcohol present. The Arduino reads this voltage to check if the driver is drinking alcohol.

3. Relay Module:

Fig-5 : Relay Module

Attached to the vehicle's ignition system, it controls the flow of electricity according to the Arduino's instructions. This feature locks the engine automatically when alcohol is detected.

4. NEO-6M GPS Module:

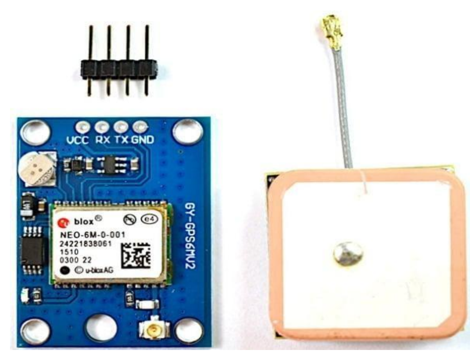

Fig-6 : NEO-6M GPS Module

Provides real-time vehicle location including latitude, longitude, and timestamp. The Arduino reads GPS data through UART communication and forwards it to NodeMCU for cloud upload.

5. NodeMCU ESP8266:

Fig-7 : NodeMCU ESP8266

Handles Wi-Fi connectivity and ThingSpeak cloud communication. It receives processed data from Arduino and uploads it to designated fields on ThingSpeak for monitoring and visualization.

6. ThingSpeak IoT Cloud:

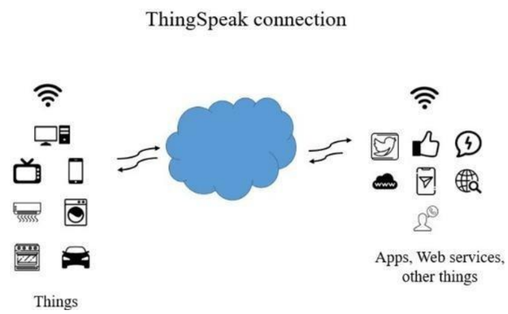

Fig-8 : ThingSpeak IoT Cloud

Stores alcohol detection status, engine status, and GPS data. It provides APIs, real-time charts, and automated notifications through Thing Speak React and Thing HTTP services.

7. Mobile Application (Android/iOS)

Serves as the user interface. It displays real-time vehicle location on Google Maps, engine status, alcohol detection alerts, and historical logs of previous events.

B. Alcohol Detection Module

The MQ-3 sensor is important for detecting alcohol levels:

- It keeps checking the amount of ethanol vapors in the driver's breath and gives an analog signal ranging from 0 to 1023.
- The Arduino Uno takes this signal and compares it to a set safety level.
- How it decides:
- If the level is below the safety limit, the engine can start (relay turns on).
- If the level is above the safety limit, the engine won't start (relay turns off), the GPS records the location, and an alert is sent to the mobile app through ThingSpeak.

This setup stops drunk drivers from starting their car, instead of just dealing with it after the fact.

C. Engine Control Module

The relay module functions as an electronic switch for the ignition system:

- During normal operation, when the relay is on, electricity flows, allowing the engine to start.
- If alcohol is detected, the relay turns off, cutting off the electricity, which stops the engine from starting.

By connecting the alcohol sensor to the relay, the system can take action before the engine starts, making it much safer than older methods.

D. GPS Integration

- The NEO-6M GPS module keeps sending real-time location details to the Arduino through the UART connection.
- The data received includes the latitude, longitude, and the current time.
- This information is then passed on to the NodeMCU and sent to ThingSpeak, allowing the vehicle's position to be tracked in real time.

GPS integration is important for emergency help, managing a group of vehicles, and showing the location on a mobile app.

E. IoT Communication (NodeMCU + Thing Speak)

The communication process involves:

1. Arduino transmits alcohol status, engine status, and GPS coordinates to NodeMCU over Serial/UART communication.
2. NodeMCU connects to Wi-Fi and updates ThingSpeak fields:
   - Field 1: Alcohol Status (0 = Safe, 1 = Detected)
   - Field 2: Engine Status (0 = Unlocked, 1 = Locked)
   - Field 3: Latitude
   - Field 4: Longitude
3. ThingSpeak generates real-time graphs, provides REST API endpoints, and triggers notifications using Thing Speak React + Thing HTTP whenever alcohol is detected.

This IoT-based approach provides cost-effective, scalable, and real-time monitoring capabilities.

F. Mobile Application Integration

The mobile app acts as the user interface for guardians or vehicle owners:

- Retrieves data from ThingSpeak using API keys.
- Displays real-time engine status (“Locked” or “Unlocked”).
- Plots vehicle location dynamically using Google Maps API.
- Sends push notifications in case alcohol is detected.
- Maintains history logs for previous events with timestamp and location.

This ensures that the system is user-friendly, informative, and accountable.

IV. IMPLEMENTATION

The Alcohol Detection and Engine Lock System with GPS Tracking and Mobile Notification uses a mix of hardware and software components. It includes an Arduino Uno, a NodeMCU ESP8266, and the ThingSpeak IoT platform. The Arduino Uno serves as the main controller for the alcohol sensor, GPS module, and the engine lock system. The NodeMCU is responsible for handling the IoT communication. The MQ-3 alcohol sensor is connected to the Arduino to detect alcohol vapors in the driver’s breath. The sensor continuously sends data, and if it detects alcohol levels above a certain limit, the Arduino triggers a relay to cut off the ignition, locking the engine. Meanwhile, the NEO-6M GPS module sends real-time position data, which is sent to the NodeMCU via serial communication.

The NodeMCU connects to a Wi-Fi network and uses an API key to send the data from the Arduino to the ThingSpeak cloud.

A specific ThingSpeak channel is created to store four types of information: alcohol detection status, engine lock status, latitude, and longitude. ThingSpeak allows for real-time data viewing and can trigger events when needed. By using React and Thing HTTP services, it’s set up to send mobile alerts whenever alcohol is detected, ensuring that guardians or fleet managers get instant updates.

On the mobile side, an app is developed that fetches the latest data from ThingSpeak through its API.

The app shows whether the driver is under the influence or safe, along with the current engine status. The GPS coordinates are displayed on Google Maps, allowing real-time vehicle tracking. The app also keeps a history log with past alcohol detection events, including the time and location of each incident. The entire system was tested in various conditions to ensure accuracy in sensor responses, quick engine lock action, precise GPS tracking, and reliable cloud integration. The MQ-3 sensor was calibrated to avoid false alarms from other substances like smoke or perfume. The relay successfully interrupted the ignition circuit when alcohol levels were too high. GPS tracking provided accurate vehicle locations with a margin of error between 2 to 5 meters. The ThingSpeak integration consistently sent notifications and displayed real-time data reliably.

V. RESULTS AND DISCUSSION

The Alcohol Detection and Engine Lock System, which includes GPS Tracking and Mobile Notifications, was tested in real-world situations and showed good results. The MQ-3 alcohol sensor was able to tell the difference between clean air, alcohol vapors, and other common substances that might interfere. If the readings were below the set limit, the car's ignition worked as usual. But if alcohol levels went over the limit, the relay turned off, stopping the engine from starting. The GPS module helped by tracking the vehicle's location accurately, within 2 to 5 meters in open areas. Data was sent from the NodeMCU to the Thing Speak cloud, where the status of the alcohol sensor, engine activity, and location updates were shown in real time. The mobile app also sent timely notifications and showed the live location of the vehicle, making it easy to monitor.

Overall, the system was found to be reliable and efficient in its main functions: detecting alcohol, locking the engine, tracking location, sending data to the cloud, and sending alerts to a mobile device.

Some issues were noticed, though. The MQ-3 sensor sometimes reacted to things like perfumes or smoke, which could cause false alarms. This might need careful calibration to fix. Also, GPS accuracy dropped in places with poor satellite signals, such as tunnels or busy city areas. Even with these issues, the system still has strong potential as a tool for road safety. By stopping drunk driving and allowing real-time tracking of vehicles, it offers a good way to improve safety for drivers and passengers.

VI. APPLICATIONS

The Alcohol Detection and Engine Locking System with GPS Tracking via a mobile app can be used in various areas, from personal safety tools to monitoring big fleets. Its adaptable design, affordable hardware, and smart IoT features make it suitable for use in private, business, and government settings.

A. Personal Vehicles - For families, the system acts like a guardian of safety. It prevents young or vulnerable drivers from starting the car under the influence and gives guardians peace of mind through real-time alerts and travel history logs. This not only avoids accidents but also promotes responsible driving habits at home.

B. Public Transportation - Public transport carries hundreds of passengers every day, making safety a priority. By ensuring bus, taxi, or ride-share drivers are sober before operating, the system builds trust and reliability among passengers. Ride-sharing companies can also use it as a safety feature to improve reputation.

C. Fleet Management & Logistics - For businesses, driver safety is linked to both profitability and compliance. Fleet managers can monitor alcohol levels, track routes, and maintain detailed logs. This reduces accident risks, cuts insurance costs, and keeps delivery timelines intact, while also holding drivers accountable.

D. Law Enforcement & Government - Authorities can use this system as a policy-driven tool to strengthen road safety. Automated alcohol detection, GPS logs, and digital records help enforce laws more effectively. Governments could even mandate installation in public and commercial vehicles to prevent DUI at scale.

E. Insurance Sector - Insurers can benefit from objective driving data. Clean travel and alcohol-free histories may earn drivers discounted premiums, while logged records help verify claims and reduce fraud. This shifts insurance from reactive payouts to preventive safety.

F. Emergency & Health Applications - The system can also save lives in emergencies. If intoxication is detected with erratic driving, alerts can be sent to emergency responders with GPS coordinates. Future upgrades may integrate with wearables to detect fatigue, drowsiness, or health risks, making it a comprehensive driver wellness tool.

VII. LIMITATIONS

The Alcohol Detection and Engine Locking System, which includes GPS tracking and a mobile app, has the potential to make driving safer. However, it also has some real-world challenges. The alcohol sensors might not always work correctly because things like temperature, humidity, and other chemicals can affect them. This can lead to incorrect readings, which might lock the engine when it shouldn't or miss alcohol altogether. Also, false alarms can happen if things like hand sanitizers or people nearby are using alcohol.

The system’s GPS tracking depends heavily on signal quality, which can weaken in tunnels, basements, or crowded urban areas. Similarly, delays in sensor response or mobile alerts may reduce its effectiveness in critical situations.

Continuous operation of sensors and GPS increases power consumption, and hardware components can degrade over time due to vehicle conditions.

Another challenge is that determined users may try to bypass or tamper with the system, making it less reliable without proper tamper-proof mechanisms. Cost and maintenance are also important concerns, especially in developing regions where affordability and regular calibration may limit large-scale adoption.

Finally, legal and ethical concerns such as privacy issues with constant GPS monitoring, accountability in case of false engine locks, and integration difficulties with advanced modern vehicles remain unresolved. These limitations highlight the need for improved sensor technology, secure hardware, and user-friendly designs before large-scale deployment can be successful.

VIII. CONCLUSIONS

The Alcohol Detection and Engine Lock System with GPS Tracking and Mobile Notification shows a dependable and useful way to stop drunk driving and improve road safety. This system uses an MQ-3 alcohol sensor connected to an Arduino Uno to detect alcohol levels and control the engine. If the driver is under the influence, the vehicle can't start or be driven. Adding a NEO-6M GPS module helps track the vehicle's location in real time, which is helpful for parents, companies managing fleets, or police. Using NodeMCU and the ThingSpeak IoT platform makes it easy to send data, store it in the cloud, and send alerts to mobile devices. Testing the system proved it works well under normal conditions, with accurate alcohol detection, quick engine lock, and timely notifications. Overall, this project shows how combining embedded systems with IoT can create an affordable, efficient, and scalable solution for road safety.

IX. FUTURE SCOPE

The Alcohol Detection and Engine Locking System, which includes GPS tracking and a mobile app, has promising potential, but there are opportunities for it to become more intelligent, dependable, and easy for people to use widely.

Upgraded sensors like infrared or semiconductor-based detectors could replace current MQ sensors to reduce false readings and work better in real-world conditions. The system can also be linked with biometrics such as fingerprints or facial recognition to ensure that alcohol detection is tied to the actual driver, preventing misuse.

By adding AI and machine learning, the system could analyze driving patterns and sensor data more intelligently, reducing false alarms. With IoT and cloud connectivity, authorities or family members could monitor driver safety and vehicle location in real time.

Additional features like emergency alerts to police or relatives, geofencing to restrict vehicle movement, and energy-efficient compact designs would make the system more practical. Over time, government regulations and standardization could lead to mandatory use in public transport and commercial fleets. Finally, the mobile app can evolve with features such as driver behaviour tracking, parental controls, and even integration with wearable devices for continuous health monitoring. Together, these advancements could transform the system from a prototype into a global safety standard, making roads significantly safer.

REFERENCES

[1] H. Patel and A. Patel, "Alcohol detection and alert system in vehicles," International Journal of Emerging Technology, vol. 3, no. 2, pp. 112–115, 2012.

[2] M. Prashanth, S. Kumar, and N. Gowda, "Automatic vehicle engine locking system through alcohol detection," Proc. Int. Conf. on Computing and Control, pp. 45–48, 2014.

[3] R. Kumar and A. Reddy, "Alcohol detection for car locking system," IOSR Journal of Electronics and Communication Engineering, vol. 11, no. 5, pp. 1–6, 2016.

[4] V. Shinde and S. Kale, "GPS and GSM based vehicle tracking system," International Journal of Engineering Research and Applications, vol. 3, no. 3, pp. 62–65, 2013.

[5] M. Raj and A. Iqbal, "Intelligent alcohol detection system for car safety," Journal of Information Systems and Technology, vol. 7, no. 4, pp. 110–115, 2015.

[6] A. Sundar and S. Ramakrishnan, "IoT based smart helmet for accident prevention," International Journal of Pure and Applied Mathematics, vol. 117, no. 17, pp. 331–338, 2017.
[7] P. Sangeetha and G. Kumar, "IoT based alcohol detection system for vehicle safety," International Conference on Innovations in Information, Embedded and Communication Systems, pp. 234–238, 2018.
[8] R. Borkar, M. Kale, and P. Pawar, "Alcohol detection with ignition lock and GSM alert system," International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering, vol. 7, no. 3, pp. 121–124, 2019.
[9] S. Mohan, K. Kumar, and P. Thomas, "IoT enabled alcohol detection and vehicle safety system," International Journal of Advanced Research in Computer and Communication Engineering, vol. 9, no. 2, pp. 56–61, 2020.
[10] R. Gupta and A. Sharma, "IoT based alcohol detection with real-time monitoring," IEEE Int. Conf. on Smart Systems and IoT, pp. 89–94, 2021.
[11] B. R. Chandra, M. P. Akshaya, B. Sravani, Y. S. Ashritha and B. K. Pavithra, "Internet of Things (IOT) Based Digital Helmet Design and Deployment," 2023 7th International Conference on Trends in Electronics and Informatics (ICOEI), Tirunelveli, India, 2023, Pp.397404, Doi:10.1109/ICOEI56765.2023.10125 847.
[12] Shaunak Roy, Soham Saha, Ahona Dutta. "A Robust Vehicular Control System with Collision Detection and Avoidance Mechanism Using SVM Classification", 2023 IEEE World Conference on Applied Intelligence and Computing (AIC), 2023.
[13] Hrudaya, Jinna, Bukka Vinoothna, And D. Krishna. "Practical Implementation of Image Processing Based Vehicle Speed Monitoring System." 2021 6th International Conference on Communication and Electronics Systems (ICCES). IEEE, 2021.
[14] Dr. Nookala, Venu and M, Vamshi and V, Akhil And K, Deepika And K, Prashanth And M, Raffiudhin, Alcohol Detection And Engine Locking System (July 2022). International Journal from Innovative Engineering And Management Research (IJIEMR) 2022.
[15] The author, Neha N, B Suhas Krishna prasad, and Shruthi M L J, wrote the paper titled "Realtime Alcohol Detection and Response System with Arduino and MQ-3 Sensor Integration," which was presented at the 2023 7th International Conference on I-SMAC (IOT in Social, Mobile, Analytics and Cloud) and published in the 2023 Journal of Management & Entrepreneurship with ISSN 2229-5348.