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IoT Based Driving License Detection

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ABSTRACT: This project proposes a smart and integrated Driving License Verification and Alcohol Detection System using Node MCU (ESP8266) to improve road safety and prevent unauthorized or unsafe vehicle operation. The system verifies the driver's identity using an RFID reader, which reads a digital driving license tag and checks its validity against a cloud-based database. An alcohol sensor is used to detect the presence of alcohol in the driver's breath. If the license is invalid or alcohol is detected, the Node MCU sends a signal to a relay module, which cuts off the ignition system and prevents the vehicle from starting. A DC gear motor may be used to physically lock mechanisms, adding another layer of access control. Real-time status and alerts are displayed on a 16x2 LCD screen, and a voice module provides audible warnings or guidance to the driver. The system is connected to both a web application and an Android application, allowing for remote monitoring, data logging, and alert notifications to authorities or vehicle owners. This IoT-based solution enhances traffic law enforcement, supports responsible driving, and is ideal for implementation in public transport, fleet management, and personal vehicles for safety assurance.

KEYWORDS: Node MCU, LCD16x2, Safety, IoT

I. INTRODUCTION

In today's era of increasing road traffic and accidents, ensuring that only authorized and sober individuals operate vehicles is critical for public safety. The proposed system combines driving license verification with alcohol detection using Node MCU (ESP8266) as the central control unit to create a smart, automated solution. An RFID reader is used to authenticate the driver's license by scanning a unique RFID tag linked to a cloud-based database. Simultaneously, an alcohol sensor checks for the presence of alcohol in the driver's breathe. If an invalid license is detected or alcohol is present, the system triggers a relay to disable the vehicle's ignition system and can activate a DC gear motor to physically lock critical components. A 16x2 LCD display provides real-time feedback, while a voice module issues spoken alerts to inform the driver of the system status. The integration with a web application and Android app allows remote monitoring, real-time alerts, and data logging, providing law enforcement and vehicle owners with enhanced visibility and control. This intelligent system promotes safe driving practices, prevents unauthorized access, and contributes to building smarter, safer transportation infrastructure. The system is done by interfacing Node MCU Board with number of sensors. In this project we are using Node MCU Microcontroller. When the RFID tag is swapped the motor will on and off. The alcohol sensor, to detect the drink and drive and voice module to produce a sound If the person is drunken so send the message to person and to change the driver. It is a voice interactive system. RFID reader to read the tags. The Alcohol level and license name and number will be displayed on the LCD, web application and Android application. This is an effective method to manage traffic management system. With rapid advancements in technology, the world is heading towards connectivity in all fields. Such technology that provides communication among anyone at any place or any time is Internet of Things (IoT). The IoT may is considered as the Internet of future that will enable machine-to-machine learning. The main idea behind IoT is to have self-governing connection that secures and allows exchanging of data between real world and physical devices and real time applications. The sensors and the methods we use here are easy to implement and is cost efficient. Unlike other methods our prototype does not have any wires or sensors which has to be attached to the driver's body, our system is equipped with MQ sensors, alcohol sensor which is placed inside the car near to driver seat to detect the presence of alcohol and an alarm is produced if the presence is detected. To reduce road accidents, we need to analyses the reasons behind the accidents. If we see the records, it is found that many accidents take place because of rash driving caused by the alcoholic state of drunken drivers. Driver loses their driving control once drunk. Second type of accident occurs due to fatigue condition of driver while driving a long distance at a stretch or driving at night without taking proper sleep. This paper presents very effective solutions to reduce the road accidents and other post accidental medical help. It provides eye blink monitoring system, accident site locator, alcohol detector and safe distance monitor and control system. It detects the drowsiness and provides alarm signal to the driver. Even after the alarm signal the driving condition continues the

brake mechanism of the vehicle is activated and the further movement is restricted. The system utilizes the Node MCU (ESP8266) microcontroller due to its built-in Wi-Fi capability, low cost, and ease of integration with sensors and cloud services. Each driver's license is embedded with a unique RFID tag or linked to a biometric identifier, which is read by a roadside verification device or embedded vehicle unit. The Node MCU communicates this data to **a** central database through the internet to authenticate the license in real time. The system also features LED indicators**,** buzzers, and LCD displays for immediate feedback, along with a web or mobile interface for law enforcement authorities to track, verify, and update license information remotely. This ensures quick detection of expired, suspended, or fake licenses without manual intervention. By leveraging IoT and cloud technology, this system not only streamlines the verification process but also enhances road safety, supports digital governance, and forms the foundation for a smart traffic management system**.** This system uses Node MCU with built-in Wi-Fi to read RFID or biometric data linked to a digital license database. It enables real-time verification, displaying the status via LEDs or LCDs and notifying authorities if the license is invalid or expired. The system enhances road safety, reduces human intervention, and supports smart traffic management by offering remote monitoring through a connected web or mobile interface for traffic enforcement.

II.LITERATURE REVIEW

1. Binu P K, Sredhey K J "An IoT Based Safety and Security Mechanism for Passenger Vehicles" In this project the driver and passengers in the vehicle to be alert enough while they are having a ride and thus providing better security features for the passenger vehicles. Increased count in road accidents now a days are mainly because of rash driving, low vigilance level of the driver, drunken driving etc. Here we are trying to come up with a prototype which helps in real time monitoring of driver and provide necessary alerts if the situation demands. There have been several works developed before on the same topic.

2. Bhuta, Desai,Keni "Alcohol Detection and Vehicle Controlling" The system detects the presence of alcohol in the vehicle. MQ3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor. The sensor could be used to detect alcohol. The system implemented by us aims at reducing the road accidents in the near future due to drunken driving. The system detects the presence of alcohol in the vehicle and immediately locks the engine of the vehicle. MQ-3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor. The sensor could be used to detect alcohol with different concentration; it is with low cost and suitable for different application.

3. Sayanee Nanda , Harshada Joshi, Smita Khairnar "An IOT Based Smart System for Accident Prevention and Detection" The system provides an idiosyncratic prevention and detection system that dispenses the ultimate panacea for drivers which ensures safety and prevents loss of life by taking appropriate measures in right time. It also checks whether the driver is drowsy or in an unstable state which can lead to pedal mix-up and in some cases unintended acceleration or turning of the steering wheel to the wrong direction which can lead to crashing of the vehicle with other vehicles or concrete road barrier. This system also provides a mechanism by which it identifies whether the person that will be riding the bike has a valid driving license or a driving license at all by already embedded RFID on driving license.

4. P.Manikandan, V.Muneeswaran, G.Ramesh "Drunk and drive controller for vehicles" The system sensors will sense the amount of alcohol consumed by the driver and if it crosses a particular limit then the system must send a command to stop the engine and the engine will not be turned on and thus decreasing the chance of an accident. We can reduce the number of accidents.

| No.	Paper Title	Author Name	Key Points
1	An IoT Based Safety and Security Mechanism for Passenger Vehicles	Binu P K, Sredhey K J	In this project the driver and passengers in the vehicle to be alert enough while they are having a ride and thus providing better security features for the passenger vehicles. Increased count in road accidents now a days are mainly because of rash driving, low vigilance level of the driver, drunken driving etc.
2	Alcohol Detection and Vehicle Controlling	Bhuta, Desai,Keni	The system detects the presence of alcohol in the vehicle. MQ3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor. The sensor could be used to detect alcohol. The system implemented by us aims at reducing the road accidents in the near future due to drunken driving. The system detects the presence of alcohol in the vehicle and immediately locks the engine of the vehicle.
3	An IOT Based Smart System for Accident Prevention and Detection	Rejina Parvin, Sanjay Raja B, Sendhil Ram Pandian R, Shahid Ahamed J	The system provides an idiosyncratic prevention and detection system that dispenses the ultimate panacea for drivers which ensures safety and prevents loss of life by taking appropriate measures in right time. It also checks whether the driver is drowsy or in an unstable state which can lead to pedal mix-up and in some cases unintended acceleration or turning of the steering wheel to the wrong direction which can lead to crashing of the vehicle with other vehicles or concrete road barrier.
4	Drunk and drive controller for vehicles	P.Manikandan, V.Muneeswaran, G.Ramesh	The system sensors will sense the amount of alcohol consumed by the driver and if it crosses a particular limit then the system must send a command to stop the engine and the engine will not be turned on and thus decreasing the chance of an accident. We can reduce the number of accidents.

III.METHODOLOGY OF PROPOSED SURVEY
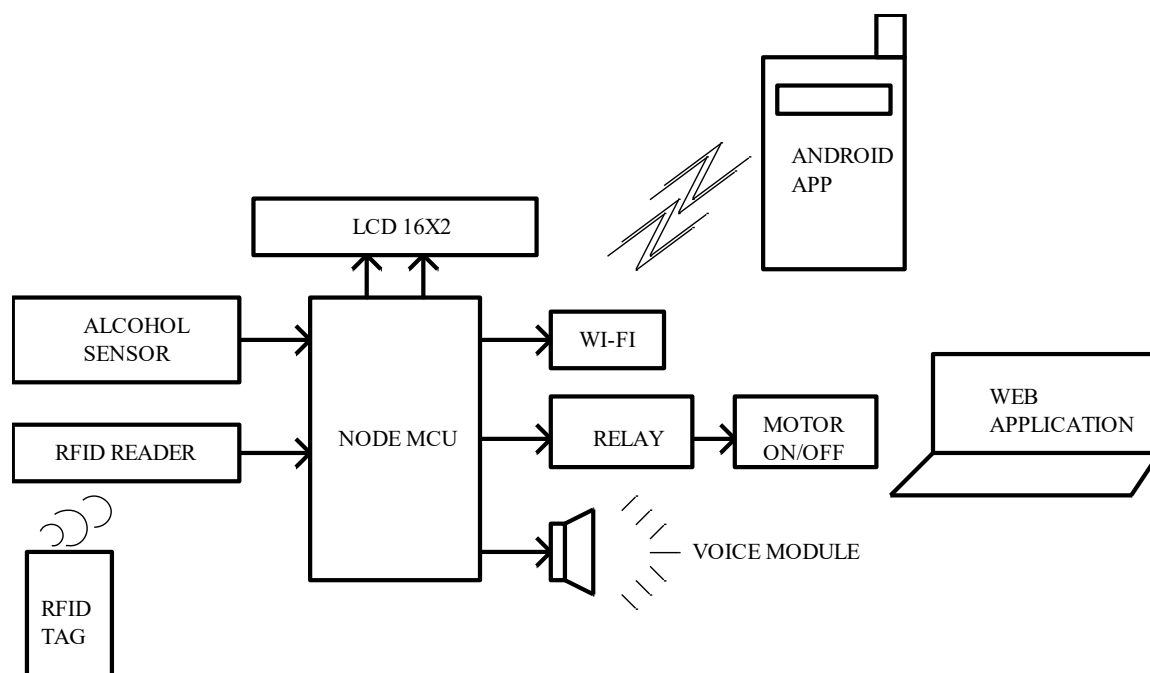
Fig 1: A Complete system design

The system begins with an RFID Reader that scans the driver's license card embedded with an RFID tag. This data is processed by Node MCU and cross-verified with an online database through Wi-Fi connectivity. Simultaneously, an alcohol sensor (such as MQ-3) checks the driver's breathe for any traces of alcohol. If the RFID authentication fails or alcohol is detected above a threshold, the Node MCU sends a signal to the relay module, which cuts off the ignition system to prevent the vehicle from starting. Additionally, a DC gear motor may be activated to lock or unlock physical components such as steering or gear control. A 16x2 LCD display shows system messages such as "License Verified", "Alcohol Detected", or "Access Denied", while a voice module delivers corresponding audio alerts for user awareness. The system is integrated with an Android application and web application, enabling real-time data monitoring, alert notifications, and access logs. This entire setup ensures vehicle operation only by authorized and sober drivers, enhancing safety through IoT-based automation and control. The system is done by interfacing Node MCU Board with number of sensors. In this project we are using Node MCU Microcontroller. When the RFID tag is swapped the motor will on and off. The alcohol sensor, to detect the drink and drive and voice module to produce a sound If the person is drunken so send the message to person and to change the driver. It is a voice interactive system. RFID reader to read the tags. The Alcohol level and license name and number will be displayed on the LCD, web application and Android application. The Node MCU interface with Microcontroller. Through Wi-Fi, the reading will be taken on the android app and web application. Alcohol level, License name, notification through mobile application and display on LCD. This system is implemented Alcohol sensor, RFID Reader, RFID Tag, Relay module, motor, Voice module, Node MCU as it has inbuilt Wi-Fi module all the data is transferred to the cloud through Wi-Fi and analysis is done in mobile application and web applications.

IV.CONCLUSION AND FUTURE WORK

The system prevents accidents by monitoring various conditions detection of drunken driving case and many more. Adding Alcohol detection in the same system this prototype can be used alcohol detection system. To avoid accidents using expression reading and using MQ sensors to identify any gas leakages and to identify whether the driver is alcoholic and to give real time alarm about the situation. This paper introduces a prototype that will help a normal passenger vehicle to achieve the same security features that a high-end vehicle or premium vehicle has, thus provide better security features to the normal passenger vehicles in the most cost-effective manner. The integrated Driving License Verification and Alcohol Detection System provides a smart and reliable solution to enhance road safety and enforce responsible driving behaviour. By combining RFID-based license authentication with alcohol detection, the system ensures that only authorized and sober individuals can start and operate a vehicle. The use of Node MCU enables seamless connectivity with a web application and Android app, allowing for real-time monitoring, alerts, and data logging. The inclusion of components such as the relay, DC gear motor, LCD 16x2, and voice module contributes to automated vehicle access control, user feedback, and emergency response. This system offers a practical and scalable approach for public transport, fleet management, and personal vehicles, promoting safer roads through the integration of IoT, automation, and intelligent control technologies.

This paper introduces a prototype that will help a normal passenger vehicle to achieve the same security features that a high-end vehicle or premium vehicle has, thus provide better security features to the normal passenger vehicles in the most cost-effective manner.

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