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Vehicle Theft Intimation and Control of its Engine over SMS

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ABSTRACT –

An IoT-based system utilizing GPS technology has been developed to detect vehicle theft and enable remote engine locking. In today's scenario, the number of vehicle thefts has been increasing exponentially, with criminals finding ways to bypass existing safety systems. To address this issue, the proposed system offers a solution that overcomes limitations and reduces complications, while also being cost-effective. By incorporating remote engine locking, the system provides users with the ability to control their vehicles through an Android application or an ignition keypad-based security unlocking system. Additionally, the application allows users to track the exact location of their vehicles at any time. This system proves to be highly beneficial in preventing theft and curbing reckless driving, ultimately leading to a reduction in crimes related to vehicle theft.

Keywords – Android application, GPS, Engine Locking

INTRODUCTION

In recent times, the issue of vehicle theft has gained significant attention and it is crucial to address and combat this problem. Ensuring the protection and safeguarding of automobiles is of utmost importance. Although there are various existing mechanisms in place, they do have certain limitations and can be quite expensive. Therefore, there is a need for an efficient security system to tackle this issue effectively. This particular project focuses on detecting vehicle theft by utilizing the Microcontroller as the main component for the user interface of the DC motor, as well as the GPS and GSM systems. By incorporating the ESP 8266 Wi-Fi module, the location of the vehicle can be accurately determined through the Global Positioning System (GPS) and the Global Mobile Communications System (GSM). The GPS system, which is a satellite-based navigation system, enables tracking of the vehicle and provides the location of stolen devices regardless of weather conditions.

The GPS antenna enables the device to provide the latitude and longitude coordinates. GSM, a specialized type of modem, functions similarly to a mobile phone and requires a SIM card. Its purpose is to relay information to the user and send an alert message containing the vehicle's latitude and longitude. This entire system is activated by a switch when the vehicle is parked. In the event of a vehicle theft, the DC motor initiates and the aforementioned process persists, while the information is transmitted through the Internet of Things. This system serves as a theft prevention and tracking mechanism for the client's vehicle.

The automotive industry is striving to enhance the safety features of their products by implementing cutting-edge technologies to prevent thefts, especially in the case of automobiles. Despite the introduction of various technologies in recent years to deter car theft and track stolen vehicles, a significant number of cars are still reported stolen annually worldwide. According to the

National Crime Information Center (NCIC), in 2006, 1,192,809 motor vehicles were reported stolen, resulting in losses of $7.9 billion. Numerous security and tracking systems have been developed to assist companies with a large fleet of vehicles and diverse usage requirements.

A central fleet management system is crucial for large enterprises to meet customer demands and enhance productivity. By utilizing this system, the cost and effort required by employees to fulfill road assignments can be minimized, ensuring efficient completion within a short timeframe. Additionally, the system allows for assignments to be scheduled based on the current location of vehicles, further optimizing operations.

Nevertheless, these technologies do possess certain security vulnerabilities. Specifically, they are unable to thwart vehicle theft, offer limited assistance in vehicle recovery, and fail to provide users with real-time vehicle status updates. Moreover, they do not facilitate online communication between users and their vehicles, even in the event of theft. This limitation is particularly evident in wireless data transmission.

WIFI technology has gained popularity due to its affordability, convenience, and accessibility, making it a widely used feature among all mobile network service providers.

LITERATURE SURVEY

Yelam Madan Rajendra, Jondhale Suyog Balasaheb, Kote Satyam Ravindra, Prof. Dahiphale P.D (2024) [1], The proposed system offers dual layers of security, encompassing password safeguarding for the vehicle and a remote ignition cut-off mechanism. Additionally, this system incorporates a feature

for vehicle tracking through GPS technology. To notify the owner, GSM technology is utilized. In the event of an incorrect password entry, an alert message is dispatched to the owner. Furthermore, a message is sent when the vehicle's ignition system is activated. The owner has the ability to halt the engine by responding with an SMS.

Poorna Chandran R, Pragadeeshwaran K, Ranjith K, Mani sivaraja pandi A (2023) [2], In this research paper incorporates GSM, GPS, Arduino, and fingerprint verification. It utilizes cutting-edge technologies and security measures to effectively deter vehicle theft. The Arduino microcontroller effectively oversees the different system elements, such as GPS, GSM, and fingerprint verification.

Tanmay Kadam, Prajwal Pawar, Shriraj Pokharkar, Suppriya Lohar (2023) [3], 1. The system is designed for detecting car theft and enabling remote engine locking. It is primarily utilized to pinpoint the car's location and immobilize the engine from any remote location. The Android phone serves as the controller, allowing us to manage the system via the Blynk app. Additionally, we can track the car's location using the GPS module. The engine can be shut off using the relay feature on the Blynk app.and rapid artificial intelligence.

Bhanuteja G, M. Harshitha, P. Bharathi, K. Jayashree (2023) [4], The setup comprises of a control unit based on a microcontroller that is placed in the vehicle, a fingerprint sensor, a Global Positioning System (GPS) module, a GSM module, and a mobile phone. The control unit consistently keeps track of the vehicle's condition, such as its whereabouts and ignition status. If there is an unauthorized entry or theft, the control unit promptly sends an SMS notification to the owner's mobile phone, offering up-to-the-minute details on the vehicle's location. Additionally, the system enables the owner to manage the vehicle's engine from a distance using SMS instructions.

Rachel Shukla, Deepa K, N. M (2022) [5], This study suggests the implementation of RFID cards, authorized keys, Global Positioning System (GPS), and cameras as a security measure to deter vehicle theft and verify the identity of the driver. The RFID reader is linked to the vehicle, necessitating card authorization for access. GPS technology is utilized to monitor the vehicle's location. Additionally, the camera captures the driver's image and verifies their identity. In the event of theft, the camera captures the thief's picture and transmits their location and profile via SMS.

METHODOLOGY

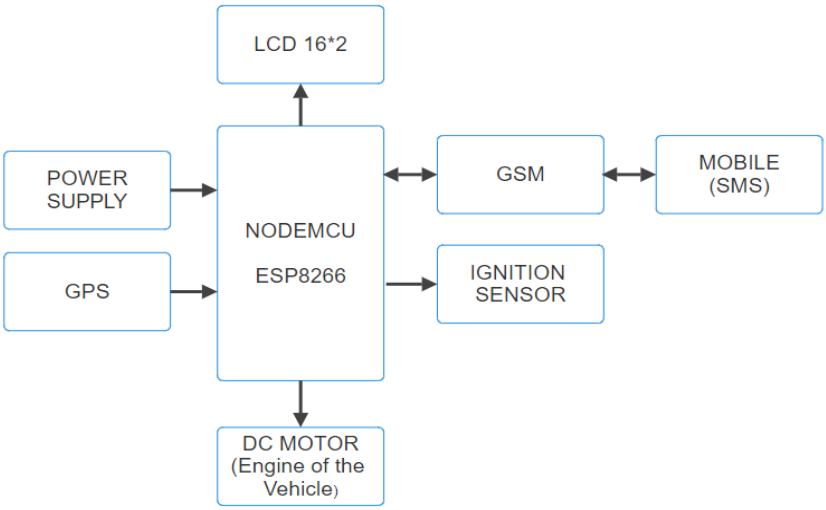

Fig 1: Block Diagram

This system utilizes the GSM module to transmit the vehicle's coordinates to a mobile phone via text message.

- The ignition sensor is designed to identify any unauthorized efforts to initiate the vehicle, such as an individual attempting to hotwire it. In the event of detecting such behavior, it will promptly notify the owner through an SMS or text message.
- The GPS continuously sends the coordinates as a string.
- The NodeMCU ESP8266 reads this string and extracts the necessary data, which is then sent to the mobile phone using the GSM module through SMS. This data is referred to as latitude and longitude.
- The NodeMCU ESP8266 reads the entire message, extracts the main message, and compares it with the predefined message in the NodeMCU ESP8266.
- The circuit is also designed to deactivate the vehicle's ignition. If the owner receives the coordinates and realizes that the vehicle has been stolen, they can send a feedback SMS to the GSM modem. The GSM modem is connected to the controller, allowing it to deactivate the vehicle's ignition. This means that the engine of the vehicle
- will be stopped based on the command given by the owner.
- The DC motor represents the vehicle's engine and is used to indicate the ON/OFF status of the vehicle.

ADVANTAGES

- The crime rate within the automotive sector has the potential to be reduced.
- The owner has the ability to respond to the SMS in order to deactivate the vehicle's ignition.
- Vehicle theft prevention can be remotely executed by an authorized individual.

- A solution that is cost-efficient.
- It is possible to oversee all operations from your phone, providing a straightforward and convenient experience.
- In the absence of internet connectivity, SMS can still be utilized to safeguard your vehicle.

APPLICATIONS

- Theft prevention system.
- Organized transportation management.
- Service management in the field.
- Utilized for delivering food.
- Monitor animals in the wilderness.
- Location tracking technology.

RESULT

The ignition sensor is responsible for detecting any unauthorized ignition of the vehicle, which may indicate potential theft. Once unauthorized access is detected, the ESP8266 microcontroller is immediately notified. Using the GSM module, the ESP8266 sends an SMS alert to the owner's phone number, informing them about the unauthorized access and providing the precise GPS location of the vehicle at that moment. To control the vehicle remotely, the owner can send SMS commands to the GSM module. These commands include actions like cutting off the engine ("ENGINE OFF") or requesting the current location of the vehicle ("LOCATION"). When a valid command is received, the ESP8266 triggers the corresponding action, such as activating the DC motor to cut off the engine or retrieving and sending GPS coordinates via SMS.

CONCLUSION

In conclusion, the vehicle theft intimation and control of its engine over SMS shows great promise in enhancing vehicle security. By combining GSM technology, GPS tracking, and a mobile application, this system is able to promptly detect and notify the vehicle owner of any intrusion attempts in real-time. Additionally, the remote engine locking feature adds an extra layer of security by allowing the engine to be disabled remotely, effectively preventing theft. The system's efficiency and effectiveness have been proven through experimental results, as it accurately detects and reports all intrusion attempts while successfully functioning as intended. This research's success underscores the potential for improving vehicle security, ultimately reducing theft and enhancing public safety. In conclusion, the Vehicle theft intimation and control of its engine over SMS provides a practical and dependable solution for vehicle security.

FUTURE SCOPE

The system has the potential for further enhancement by incorporating additional functionalities such as remote vehicle management, real-time monitoring, and automatic locking mechanisms. By leveraging cutting-edge technologies like artificial intelligence and machine learning, the system's accuracy and efficiency can be significantly improved. Moreover, integration with smart city infrastructure and emergency services enables prompt and efficient responses in case of theft. Data analysis from the system can reveal valuable patterns and trends, facilitating the development of enhanced security solutions and policies. This system not only focuses on preventing vehicle theft but also aims to bolster overall road safety and security. Given the continuous evolution of technology and the growing need for safer vehicles, this system holds great promise for future development and implementation.

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