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VEHICLE THEFT DETECTION AND REMOTE ENGINE LOCKING

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Abstract: The system is used for car theft detection and remote engine locking which basically used for detecting car location and to lock engine from any location. The android phone acts as the controller from which we can control our system through blynk app. And we can also track location through GPS module. The engine will be off through from blynk app through relay.

I. INTRODUCTION

Vehicle theft is a significant global problem that puts vehicle owners at risk of financial loss and safety concerns. To mitigate this issue, security systems have been developed that can detect and prevent vehicle theft. One of these systems is the Vehicle Theft Detection and Remote Engine Locking system. The Vehicle Theft Detection and Remote Engine Locking system utilizes sensors placed at various points in the vehicle to detect attempted theft activities, such as towing or breaking in. Once the sensors detect such activities, the system notifies the vehicle owner through an app or SMS, enabling them to activate the engine locking feature remotely. This feature effectively prevents the thief from driving the vehicle away. Compared to traditional security systems, the Vehicle Theft Detection and Remote Engine Locking system is more advanced and sophisticated. Its ability to detect a wider range of potential theft scenarios and provide remote control of the vehicle offers a higher level of security and control to vehicle owners, ensuring that their vehicles are always safeguarded.

This paper aims to provide an overview of the Vehicle Theft Detection and Remote Engine Locking system, highlighting its benefits and effectiveness in preventing vehicle theft. Additionally, the study will identify potential limitations and discuss strategies to optimize the system's effectiveness.

II. LITERATURE REVIEW

[1] The system uses a camera mounted on the vehicle to capture real-time images, which are processed using OpenCV to detect any suspicious movements. Once an anomaly is detected, the system sends an alert to the vehicle owner through a mobile application, enabling them to take prompt action to prevent the theft. The paper also discusses the implementation of the proposed system and evaluates its effectiveness through experimental results. The experimental results demonstrate the system's ability to detect vehicle theft and send real-time alerts to the vehicle owner. The study provides valuable insights into the use of computer vision technology in developing an efficient vehicle theft detection and tracking system. The research findings have

practical implications for researchers and practitioners working in the field of vehicle security and can inform the development of more advanced and sophisticated systems. The research paper entitled "Automobile Anti-theft System Based on GSM and GPS Module" was presented at the 2012 Fifth International Conference on Intelligent Networks and Intelligent Systems in Tianjin, China. The paper introduces an anti-theft system for automobiles that uses GPS and GSM modules to detect and track stolen vehicles. The system is equipped with a GPS module that continuously tracks the vehicle's location and transmits the data to the owner's mobile phone using the GSM module. In case of theft, the owner can immobilize the vehicle by sending a command to the system via their mobile phone, preventing the thief from driving it away. The paper describes the implementation of the proposed system and evaluates its effectiveness in detecting and preventing vehicle theft. The results demonstrate that the system can accurately detect the location of the stolen vehicle and

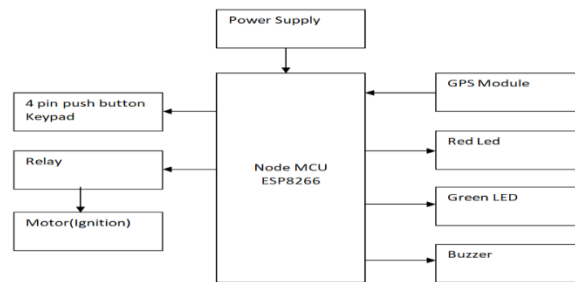
[2]. K.Lappanitchayakul presented a paper titled "Anti-theft device for car: Alert system using radio wave" at the 2019 International Conference on Intelligent Informatics and Biomedical Sciences. The paper proposes a novel anti-theft device for cars that detects unauthorized access using radio waves and sends an alert signal to the car owner's smartphone through a mobile application. The system comprises a microcontroller, a radio module, and a smartphone application. The microcontroller detects any unauthorized access to the car, while the radio module is used to transmit the alert signal to the owner's smartphone. The paper describes the implementation of the system and reports the results of the experimental analysis, demonstrating that the proposed device can effectively detect unauthorized access and send alert signals to the car owner's smartphone. Overall, this paper presents an innovative and low-cost solution for car theft prevention by utilizing radio wave technology to detect unauthorized access and alert the car owner through a smartphone application.

[3] The paper titled "Hardware Design for IoT-Based Vehicle Tracking and Theft Detection System" was presented at the 2021 International Symposium on Electronics and Smart Devices held in Bandung, Indonesia. The authors of the paper are P. V. Crisgar, P. R. Wijaya, M. D. F. Pakpahan, E. Y. Syamsuddin, and M. O. Hasanuddin. The paper discusses the design and implementation of a hardware system for an IoT-based vehicle tracking and theft detection system. The proposed system consists of various hardware components such as GPS modules, accelerometers, GSM modules, and a microcontroller. The GPS module is used for tracking the location of the vehicle, while the accelerometer is used for detecting any sudden movements of the vehicle. The GSM module is used for sending notifications to the owner's phone in case of a theft, and the microcontroller is used for processing the data collected from the various sensors. The authors conducted a series of tests to evaluate the performance of the proposed system, and the results showed that the system was effective in tracking the vehicle's location and detecting any attempted theft. They also conducted a comparison with other similar systems available in the market, and the proposed system was found to be more reliable and efficient. Overall, the paper provides a valuable contribution to the field of IoT-based vehicle security systems, and the proposed hardware design can be further improved and customized for various applications.

[4] The research paper titled "Low-Cost Compact Theft-Detection System using MPU-6050 and Blynk IoT Platform" by A. Karnik et al. was presented at the 2020 IEEE Bombay Section Signature Conference in Mumbai, India. The paper proposes a low-cost and compact system for theft detection that uses the MPU-6050 sensor and the Blynk IoT platform. The paper presents a literature survey on existing theft detection systems and highlights the limitations of these systems, including their high cost and large size. The authors propose a system that integrates the MPU-6050 sensor, which is a low-cost and compact sensor capable of detecting motion and orientation, with the Blynk IoT platform, which provides a cloud-based platform for remote monitoring and control. The paper describes the design and implementation of the proposed system and presents the experimental results of its performance. The experimental results demonstrate that the proposed system can effectively detect unauthorized access to the target object and send an alert message to the user's smartphone. Overall, the proposed system represents a significant improvement over existing theft detection systems in terms of cost and size. It could be a valuable addition to existing security systems, particularly in low-resource environments where cost and size are major constraints.

III. METHODOLOGY

Block diagram for the vehicle theft detection and remote engine locking project using the provided components:



The proposed system for vehicle theft detection and tracking with remote engine locking uses the Internet of Things (IoT) technology and Blynk app. The system consists of several components, including an Arduino board, GPS module, GSM module, and a relay module.

The system operates by detecting unauthorized access to the vehicle through the use of sensors placed inside the car. When the system detects an unauthorized access, it immediately sends a notification to the car owner's mobile phone via the Blynk app. The notification includes the current location of the vehicle, which is obtained through the GPS module.

The car owner can use the Blynk app to remotely lock the engine of the vehicle to prevent further unauthorized access. The app also provides the car owner with real-time updates on the location of the vehicle.

The experimental results of the system show that it is effective in detecting unauthorized access and tracking the location of the vehicle. The remote engine locking system can also be controlled efficiently through the Blynk app. The proposed system provides an efficient solution for car theft prevention and tracking.

I. HARDWARE REQUIREMENT

Following is the required component for this proposed system that is as:

- A) NodeMCU ESP8266
- B) NEO-6 M GPS module
- C) Motor
- D) Buzzer
- E) Relay
- F) Push Button
- G) Blynk App
- H) Battery

A) NodeMCU ESP8266 :-

The ESP8266 is a cost-effective microcontroller unit (MCU) that features integrated Wi-Fi capabilities. It can be utilized either as a standalone MCU or as an add-on to another host MCU like Arduino, to provide IoT development platforms with Wi-Fi network functionalities. The device comes equipped with a 32-bit 80MHz processor, 16 GPIO pins that can enable up to 4 PWM, as well as built-in interfaces for analog-to-digital converter, SPI, and I2C, among others. With a working voltage range of 2.5V-3.6V and an average working

current of 80mA, it is suitable for battery-powered applications. Its compact size, built-in Wi-Fi connectivity, and low cost make the ESP8266 a popular choice for prototyping, DIY projects, and commercial products.

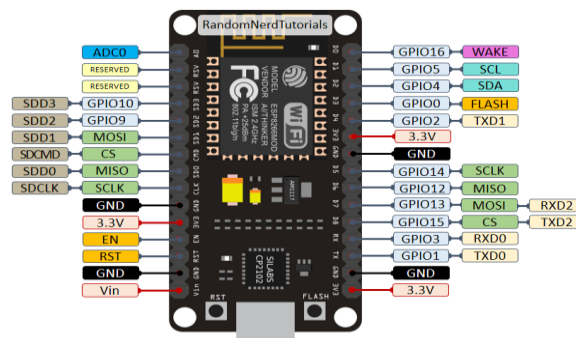


Fig. 2. NodeMCU ESP8266

B) NEO-6 M GPS module :-

The Global Positioning System (GPS) is a satellite-based system developed by the United States that offers dependable positioning, navigation, and timing services for users globally, regardless of the weather conditions or time of day. The system comprises three major components: a constellation of satellites orbiting the earth between 24 and 32, four ground-based control and monitoring stations, and a GPS receiver owned by the user. The GPS satellites emit signals into space, which are then received and processed by GPS receivers to determine a three-dimensional position, including latitude, longitude, and altitude, as well as the current time. Overall, GPS is a reliable and essential tool for various applications, including transportation, surveying, and outdoor activities.



Fig. 3. NEO-6 M GPS module

C) Blynk App :-

To detect vehicle theft, Blynk App can be utilized by connecting it with a GPS module and a GSM module. The GPS module provides the location data of the vehicle, which is sent to the Blynk cloud server when the vehicle is started. The Blynk App can be used to access the cloud server to track the location of the vehicle. In case of any unauthorized access or deviation from the usual location, the Blynk App can send an alert to the owner through SMS or email, which can help in taking necessary measures. Moreover, the Blynk App can be used to remotely control various vehicle functions, including locking/unlocking the doors, starting/stopping the engine, and controlling other devices. This feature can prove helpful in disabling the vehicle in case of theft or unauthorized access.

Overall, Blynk App can play a vital role in detecting and preventing vehicle theft by offering real-time location tracking and remote control of the vehicle.

Relay :-

A relay can play a vital role in vehicle theft detection by acting as a switch to cut off the power supply to the fuel pump or starter motor. It can also be utilized to remotely lock the engine of the vehicle. The relay can be controlled through a signal from a GPS tracker or GSM module, which sends a command to cut off the power supply and lock the engine remotely.

The Blynk App can be used to control the relay and remotely lock the engine of the vehicle. Additionally, the app can receive alerts in real-time in case of any unauthorized access attempts, tampering with the relay or bypassing the system.

Furthermore, the relay can be programmed to cut off the power supply to the fuel pump or starter motor when the vehicle is started without permission. This can prevent the vehicle from starting and add an extra layer of security against theft.

Overall, a relay can significantly aid in vehicle theft detection and remote engine locking by providing an additional security layer to the vehicle's ignition system. When utilized with a GPS tracker or GSM module and the Blynk App, it can help prevent theft and deliver real-time alerts in case of any unauthorized access.



Fig. 4. Relay

D) Buzzer :-

A buzzer can be employed in vehicle theft detection and remote engine locking by producing an audible alert when an unauthorized access attempt is made. The buzzer can be installed in the vehicle and connected to a relay that can be controlled using a signal from a GPS tracker or GSM module.

When an unauthorized person tries to start the vehicle, the GPS tracker or GSM module sends a signal to the relay, which triggers the buzzer. The loud buzzing sound can warn the owner and anyone nearby about the attempted theft.

The Blynk App can be used to monitor the status of the buzzer and receive real-time alerts if someone tries to tamper with the buzzer or bypass the security system.

Additionally, the buzzer can be integrated with other security components such as a relay, to establish a comprehensive anti-theft system for the vehicle. When used in conjunction with a GPS tracker or GSM module, the buzzer can provide an extra layer of protection against theft.

V. EXPERIMENTAL SETUP

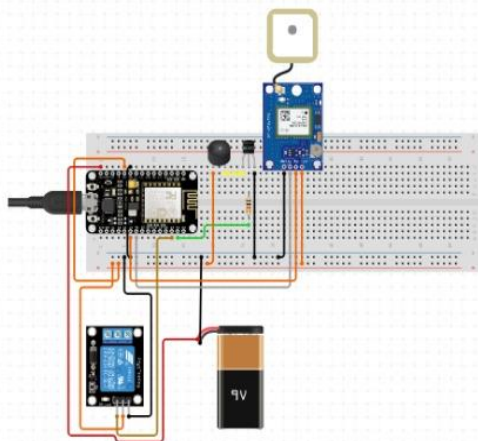


Fig. 6. Experimental Setup

VII. CONCLUSION

In conclusion, the Vehicle Theft Detection and Tracking Notification with Remote Engine Locking System Using IoT presents a promising solution for enhancing vehicle security. The combination of IoT technology, GPS tracking, and a mobile application enables the system to detect and report intrusion attempts to the vehicle owner's mobile application in real-time, allowing for prompt action to be taken. The remote engine locking feature provides an

additional layer of security by allowing the vehicle's engine to be disabled remotely, effectively preventing theft.

Experimental results from the research demonstrate the system's efficiency and effectiveness. The proposed system accurately detects and reports all intrusion attempts, and the remote engine locking feature works as intended.

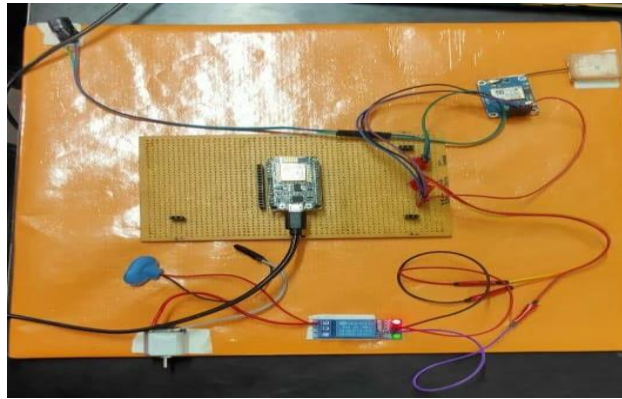
The success of this research highlights the potential of IoT technology for enhancing vehicle security, which can reduce vehicle theft and improve public safety. Overall, the Vehicle Theft Detection and Tracking Notification with Remote Engine Locking System Using IoT offers a practical and reliable solution for vehicle security.

VIII. REFERENCES

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RESULTS

1)Actual Representation of Project

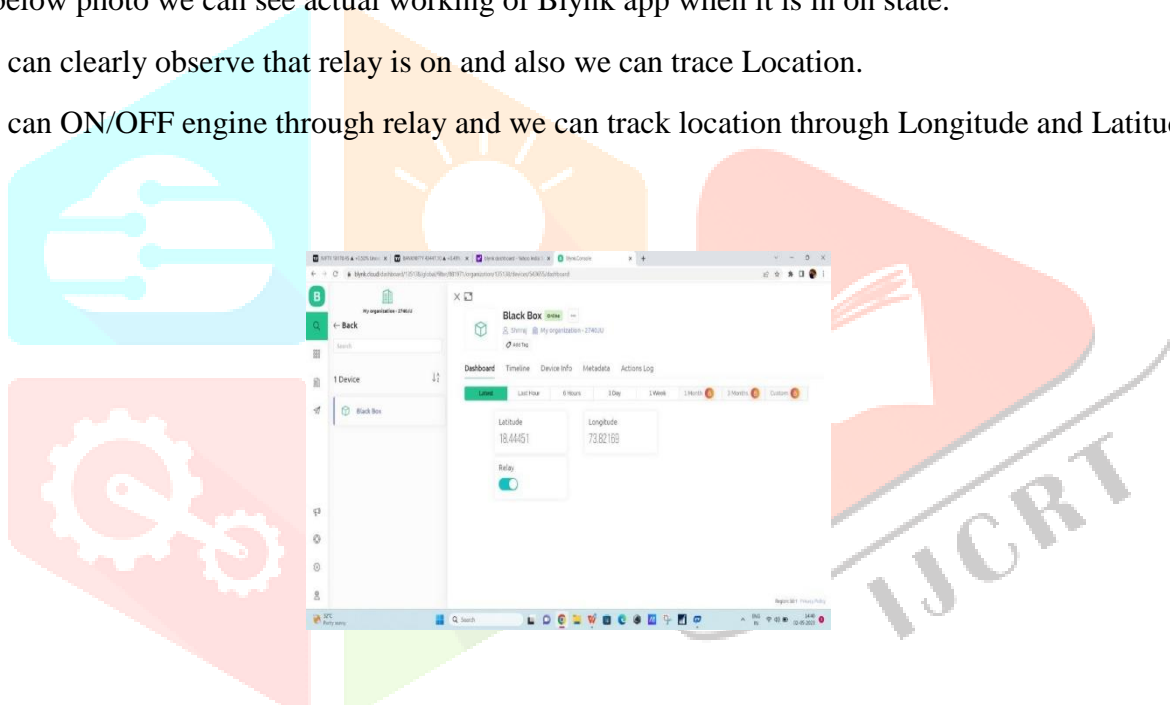


2.Actual view of Blynk app

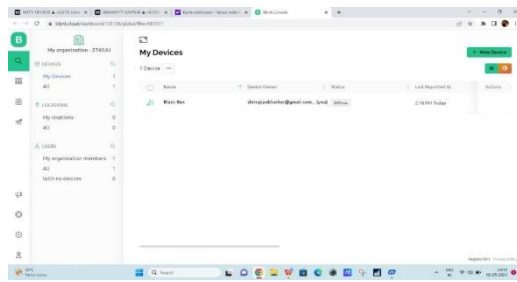
1)In below photo we can see actual working of Blynk app when it is in on state.

2)We can clearly observe that relay is on and also we can trace Location.

3)We can ON/OFF engine through relay and we can track location through Longitude and Latitude.



3. When Blynk app is offline



4. Graphs representation in Blynk lot

