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Development of Anti-Theft Security System Using IOT

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ABSTRACT:

GSM technology is utilized in an Internet of Things (IOT) based car theft detection and remote Shut down of the system to assist users in identifying the vehicle when it is in stolen mode and to facilitate the controlling mechanism approach. The incidence of car thefts is increasing significantly in the current situation. Every day, criminals are growing more sophisticated, and they've advanced to the point where there are programs available to the mechanism for car safety that is in place now. Car theft has grown to be a serious problem that has to be investigated and avoided. The extension for managing the systems that remotely locks the car's engine and deters theft is part of the suggested technique.

Key Words: IOT, Vehicle detection, Anti-theft, Remote Engine Locking System, Android Application.

INTRODUCTION:

As per the 2018 census, there are 135.26 crore people living in India. In the same year, there were 30.92 million automobiles registered in India. Of the 44,158 car theft instances that were reported in 2018, just 19.6% of them were successfully resolved. The annual rate of car theft rises between 10% and 12%. The increase in population is closely correlated with the increase in number of automobiles. This has also significantly raised the risk of car theft. A stolen car can be utilized in several illegal acts in addition to causing financial harm to the owner. This might result in uncomfortable circumstances and danger for the car's owner.

This project “An IOT based vehicle theft detection and remote engine locking system” helps the user to track the location (with latitude and longitude) of vehicle at any given point of time with the help of an android app that will be installed in their phones. It makes use of GPS trackers that are installed in the vehicle to detect the location of the vehicle. Vehicle can be accessed either by ignition key or by the android application. Usually user makes use of the android app to start, stop and lock the vehicle. An alarm message will be delivered to both the guardian and the user when the car is started with the ignition key in the ignition position. The user must notify the guardian in advance that he is the one using the car. If not, the Android app will be used by the guardian to lock the engine.

PROBLEM STATEMENT:

The owner of the car cannot monitor or secure their vehicle once it has been stolen, according to the project's problem statement. It is quite unlikely that they will get their car back. When there is no proof, it is quite difficult to follow the car. This means that the engine will be remotely locked and the system will use an Android application to track and monitor the position of the car. One of the greatest tracking solutions for vehicle losses is the vehicle tracking system. Typically, GPS tracking employs a method that helps determine the precise location. Therefore, we are using Android-based smartphones and GPS to improve this system.

PROPOSED SYSTEM:

In the proposed system, detection of vehicle start, tracking the vehicles location using GPS is being implemented and also remotely locking the engine which is implemented using an android application that will be present with user’s phone. In the system the GPS tracks location of vehicle. Here both the ignition key as well as the start button in the app must be used to start/stop the vehicle. SMS alert is sent to user upon vehicle start. Then owner using the lock option in android app to lock the vehicle permanently. This will help the user from preventing the theft of the vehicle. The android app mainly used to start/stop the vehicle, engine locking function and also to monitor the movement of the vehicle at any given time with its latitude and longitude.

Fig 1: PROPOSED MODAL

MAIN COMPONENTS

FIG 2: ARDUINO UNO

FIG 3: GSM MODULE

FIG 4: RELAY MODULE

FIG 5: SWITCH KEYPAD

FIG 6: GPS MODULE

FIG 7: BATTERIES

Methodology:

FIG 8: BLOCK DIAGRAM

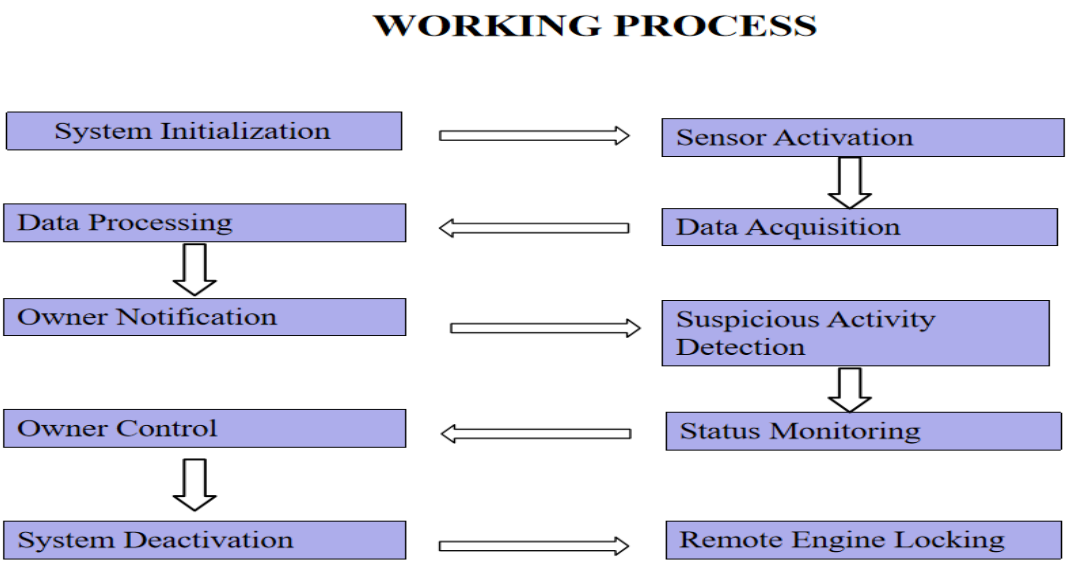

FIG: 9 WORKING PROCESS

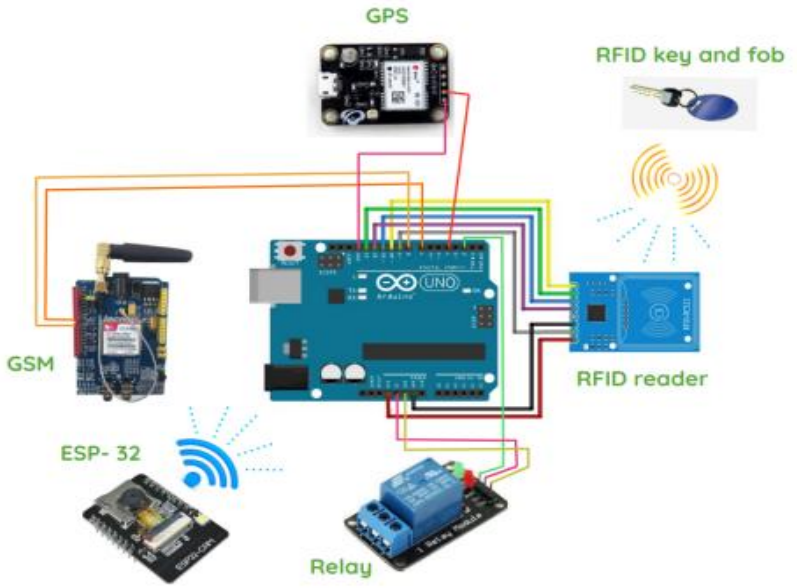

FIG 10: CIRCUIT DIAGRAM

System Initialization

Upon vehicle ignition, the IOT-based anti-theft security system initializes.

The system undergoes a self-check to ensure all components are operational.

Sensor Activation

Motion sensors, door sensors, and other relevant sensors are activated.

Sensors continuously monitor the vehicle's surroundings for any suspicious activity or unauthorized access attempts.

Data Acquisition

Sensor data is collected in real-time.

Motion sensors detect movement around the vehicle.

Door sensors monitor the opening and closing of doors.
GPS module tracks the vehicle's location.

Data Processing

The collected sensor data is processed by the central control unit.
Real-time analysis is performed to detect anomalies or potential theft incidents.
Machine learning algorithms may be utilized to identify patterns indicative of theft attempts.

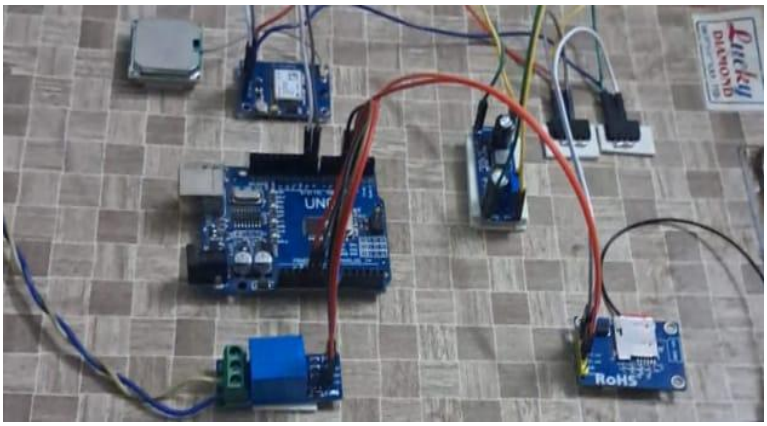

FIG: 11 CONNECTION SETUP

Suspicious Activity Detection

If suspicious activity is detected (e.g., unauthorized entry, attempted hot-wiring), the system proceeds to the next step.

Owner Notification

Simultaneously, the vehicle owner is notified of the potential theft incident.
Notifications are sent via SMS, email, or push notifications to the owner's smartphone or designated device.
The notification includes details of the suspicious activity and the vehicle's current location.
Remote Engine Locking
Upon confirmation of a theft attempt, the owner has the option to remotely lock the vehicle's engine.
Through a mobile app or web interface, the owner sends a command to the central control unit to initiate engine locking.
The engine locking mechanism disables the vehicle's ignition system, preventing the engine from starting.

Status Monitoring

FIG: 12 STATUS MONITORING

The system continues to monitor the vehicle's status and surroundings.
Once the threat has been neutralized or the situation has been resolved, the system returns to its standby mode.
Continuous monitoring ensures ongoing protection against theft and unauthorized access.

Owner Control

The vehicle owner retains control over the security system through the mobile app or web interface.
They can remotely arm/disarm the system, receive status updates, and access historical data/logs.
Owner control enhances flexibility and convenience while maintaining robust security measures.

System Deactivation

When the vehicle is safely parked and the owner is present, the security system can be deactivated.
Deactivation prevents false alarms and unnecessary notifications during routine use of the vehicle.

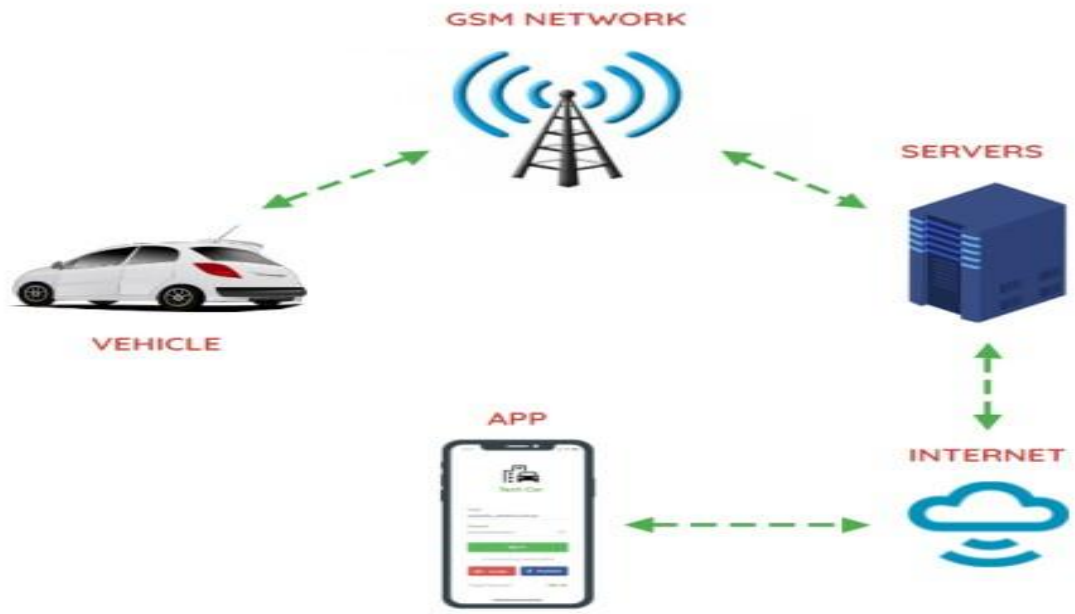

Fig. 13. Diagram of GSM Module Operation

Fig. 14. Vehicle Status Alert

Fig. 15. Locking of the Vehicle.

Conclusions:

The primary goal of our project is to prioritize the safety and security of vehicles in an ever-evolving landscape where security systems have become an indispensable necessity. With the rise in car theft incidents, our proposed system offers an affordable yet effective solution to ensure the protection of vehicles and their owners. By leveraging modern technology, we aim to enhance safety measures and detect theft efficiently, all while keeping costs low and accessibility high.

At the core of our project lies the objective of preventing vehicle theft by implementing a robust security system. Through the integration of GPS and GSM modules, coupled with a user-friendly mobile application, we empower vehicle owners to remotely lock their engines and monitor their vehicles' whereabouts in real-time. This proactive approach not only acts as a deterrent to potential thieves but also increases the chances of recovering stolen vehicles. Furthermore, our system goes beyond just theft prevention by incorporating a rash driving detection mechanism. By utilizing sensors and algorithms, we can detect instances of reckless driving and provide timely alerts to the vehicle owner through the application. This feature not only promotes safe driving habits but also enhances overall road safety for both the driver and other road users. In essence, our proposed system aims to provide comprehensive protection for vehicles and their owners at a minimal cost. By offering advanced security features such as engine locking and rash driving detection, we strive to safeguard vehicles from potential threats while also promoting responsible driving behaviour. Additionally, our emphasis on affordability ensures that our system remains accessible to a wide range of users, regardless of their financial constraints.

Ultimately, our project represents a commitment to innovation and safety in the automotive industry. By harnessing the power of technology, we seek to address the pressing issue of vehicle theft and contribute to a safer and more secure environment for all motorists. With our low-cost theft detection system, we hope to provide peace of mind to vehicle owners and help mitigate the risks associated with car theft in today's society.

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