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Anti-Theft Vehicle Locking System

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Abstract: ***As an advancement in automobile industry, real time vehicle safety technology has arrived a long way. Vehicles become very essential part of human life hence vehicle's safety is priority for its owner. Nowadays vehicle theft can happen anytime from anywhere such as common parking areas and some of the instable places. This paper is aimed for a novel Anti-Theft Vehicle Locking System. Here, with high-speed reliable area network, a sensor-based mechanism is interfaced with Engine Control Module (ECM). In order to prevent vehicle from theft fuel flow sensor observes ignition of engine and attached GSM sends an alert message to owner. In case of stolen, real-time vehicle tracking with global positioning system enables owner to control the engine with mobile phone so vehicle will not work any longer. This system functionality makes vehicle locking technique more efficient and provides a complete security from theft.***

Keywords: Engine Control Module, Flow Sensor, Global Positioning System (GPS), Global System for Mobile Communication (GSM), Locking System, Passive Infrared Sensor (PIR).

I. INTRODUCTION

This project introduces a new Anti-Theft Vehicle Locking System aimed at increasing the security of vehicles and deterring theft. As car theft is increasing worldwide, our system utilizes advanced technology to present an efficient solution. The system integrates GPS tracking and a mobile application through which car owners can track and control their vehicle's security in real-time.

When unauthorized access is detected, the system notifies and sends instant alerts to the owner's phone. The GPS module offers location tracking, enabling easy recovery of hijacked vehicles. The RFID feature also offers keyless entry, offering convenience without sacrificing security. The system is user-friendly and can be modified to suit various vehicle types, making it a convenient option for consumers.

The Anti-Theft Vehicle Locking System has immense potential to reduce cases of theft and provide vehicle owners with peace of mind. This project not only addresses a significant safety concern but also demonstrates how technology can be applied in everyday security solutions.

Anti-theft systems enable operations to function smoothly by deterring theft. They reduce lost time when recovering stolen vehicles and lower the effort required for processing theft cases. The systems are applied to detect theft and secure vehicles. With the introduction of new technologies such as GPS tracking, engine immobilizers, and alarm systems, these systems render it much harder for thieves to get into cars and steal them.

Anti-theft devices help businesses to operate more efficiently by inhibiting theft. Anti-theft devices minimize lost time when recovering stolen vehicles and make it easier to process theft cases. Anti-theft devices are meant to sense theft and secure vehicles. With emerging technologies like GPS tracking, engine immobilizers, and alarm systems, the devices make it much harder for thieves to break in and steal vehicles.

GPS tracking systems give fleet managers the opportunity to know where their vehicles are at any given time. The systems enable faster rapid response in the event of a stolen vehicle. Moreover, anti-theft systems such as immobilizers prevent the engine from being started when the correct key is not used, offering greater security. Moreover, vehicle alarm systems alert the driver and individuals around if an attempt is made to enter the vehicle.

II. PROPOSED SYSTEM

The purpose of this project is to alert the owner of the vehicle about theft by using wireless technology. An additional point of interest of this venture is that the owner can send back the SMS which will cripple the ignition of the vehicle. In this proposed framework if somebody tries to steal the vehicle, owner will get the message through GSM modem which is connected to microcontroller through switch mechanism. The proprietor gets the SMS that his vehicle is stolen. He can then send back a SMS to the GSM modem to 'stop the motor'.

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The GSM modem interfaced to the microcontroller, gets the message, the yield of which enacts a component that cripples the ignition of the vehicle by using flow sensor which results in stopping of the vehicle. This suggested framework recognizes the message and via GPS Bus sends the message to the entire Vehicle Network. The precise location of the vehicle will be sent to the owner within matter of time.

III. METHODOLOGY

A. *Hardware Setup*

The Hardware Setup consists of primarily Arduino-UNO and GPS Tracker with real time location detecting system. Arduino is utilized to offer security in the form of keyless entry functionalities, i.e., RFID or keypad, to render the vehicle openable by only authorized individuals. Arduino features motion sensors to track unwanted movement and activate alarms and alerts. GPS tracking also offers real-time vehicle location tracking, and access attempts are logged with data logging. This combined system provides owners of the vehicles a sense of security and active protection against theft.

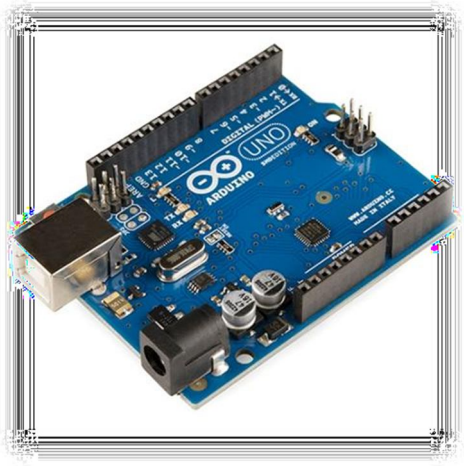


Fig 1. Arduino-UNO

A GPS tracker within an anti-car theft car locking system significantly enhances security as it provides real-time tracking. When stolen, the tracker provides the owner or the police with an immediate means to track the location of the car, which enhances recovery. Through the combination of GPS and an alarm system, the tracker also provides for notifying the owner's phone upon detection of unauthorized movement, further enhancing security and peace of mind



Fig 2. GPS Tracker

B. *Software Components*

The main software components integrated into the system are:

1) Web Dashboard: Web interface for advanced tracking and management whereby users can view location history, set up geofencing alerts and control multiple devices.

2) GPS Tracking Software: The core software that processes GPS signals, calculates the device's location, and sends this information to the mobile app or web dashboard.

3) Backend Server: A cloud server that stores user information, location history, and device settings enabling communication between GPS trackers and user interfaces.

4) Alerts and Notifications System: A program that provides real-time notification for events such as geofencing violation, battery low, or unauthorized movement and pushes alerts to users.

5) API Integration: Application Programming Interfaces (APIs) enable other services or applications to interface with the GPS tracker in an effort to provide more advanced features, including integration with smart home systems.

C. Workflow

1) Monitoring

- GPS Tracking: The GPS module continuously tracks the vehicle's location.
- Sensors: Track vehicle lock status and alert against unauthorized access.

2) Alarm Activation

- Unauthorized Access: When sensors detect tampering (such as a lock opened without a key or a car touched by an unauthorized person), the Arduino activates the alarm (such as a buzzer or lights).
- GSM Notification: It provides an SMS alert to the owner with location information.

3) Disarming the System

- Manual Override: The owner can turn off the system using a keypad or a mobile app.
- Command Verification: Arduino verifies correct codes or SMS commands prior to disarming

4) Activation

- User Interaction: The car is locked via the driver's phone application or text message.
- Signal Relay: The Arduino turns on the relay to lock the engine. Tracking During Theft:
- GPS Data: Continuously update where the car is and broadcast this using GSM.
- User Commands: The owner can enter text commands to request the current location.

5) Response to Theft

- Emergency Notification: In the event of car theft, the owner can utilize the GPS information to notify the police of the vehicle's location.
- Continuous Tracking: The system keeps on sending location updates until the vehicle is found.

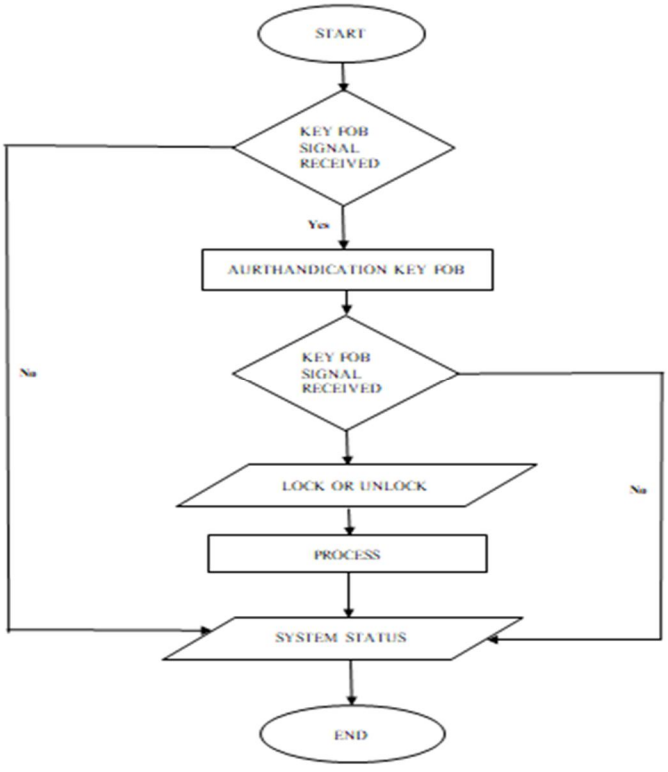


Fig 3. Workflow Diagram

IV. EXPERIMENTED RESULT

This part provides the details regarding the outcomes of the given system. The deployment and implementation of Vehicle Locking System is efficiently carried out.

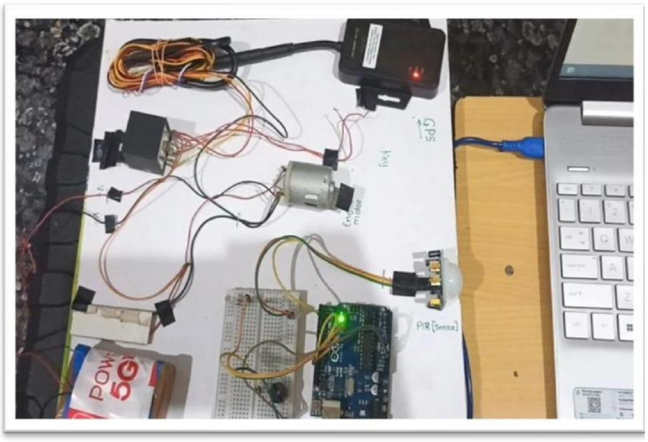


Fig 4. Hardware Setup

Figure 4 shows the hardware part of the project. On ignition ON, the fuel is detected by the flow sensor and the internal GSM module will send a mobile message to the owner's phone number as shown in Figure 5.

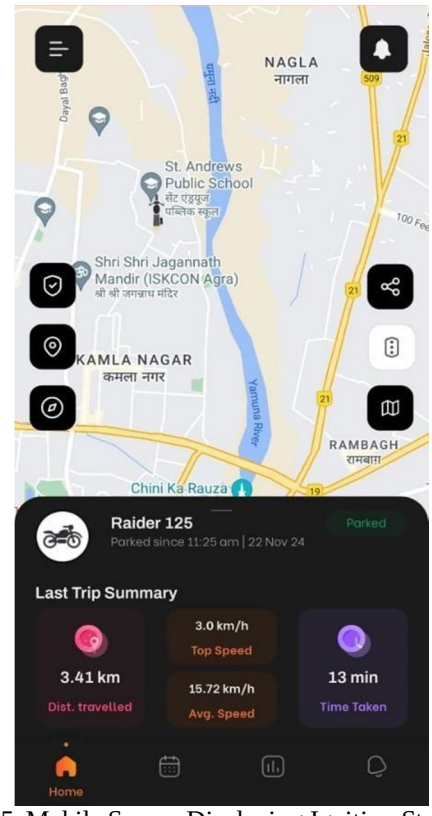


Fig 5. Mobile Screen Displaying Ignition State

Whenever owner wants to stop the engine and want to retrieve the exact location of the vehicle, interrupt will be given via SMS.GSM module will receive this message and instantly relay connected to flow sensor will be ON and stops the fuel flow. At the same time, location of the vehicle will be sent back to the owner of the car. Figure6. shows the mobile screen of the owner.

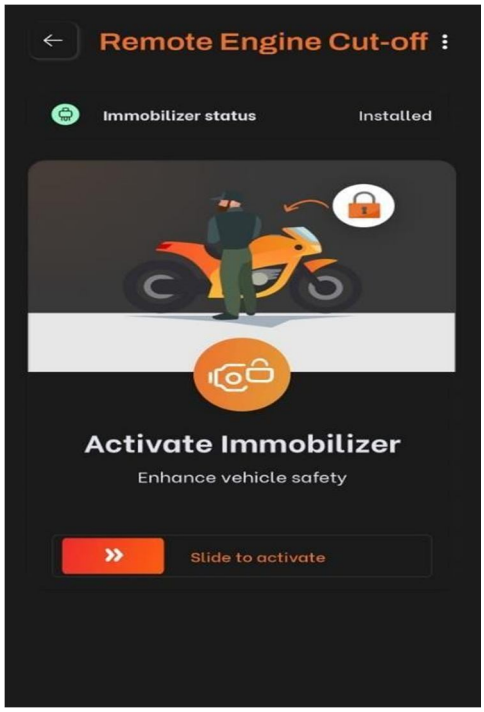


Fig 6. Screen Displaying the message to turn on/off

V. CONCLUSION

Developing a car locking system that protects against theft with the aid of Arduino and other technologies highly enhances the safety of cars and makes the owners secure. By utilizing features such as keyless entry, motion sensing, GPS tracking, and alarm systems, this project not only protects against theft but also provides real-time monitoring and notification.

The system gives automobile owners greater control and safeguarding of their vehicles. It shows how technology can aid safety and security in daily life. The project proved that the utilization of Arduino-UNO and a GPS Tracker is viable and efficient to employ in a car theft locking system. Salient findings of the project are:

1) Enhanced Security: Installing keyless entry and motion detection greatly minimizes the chances of unwanted entry, making it a secure place for car owners.

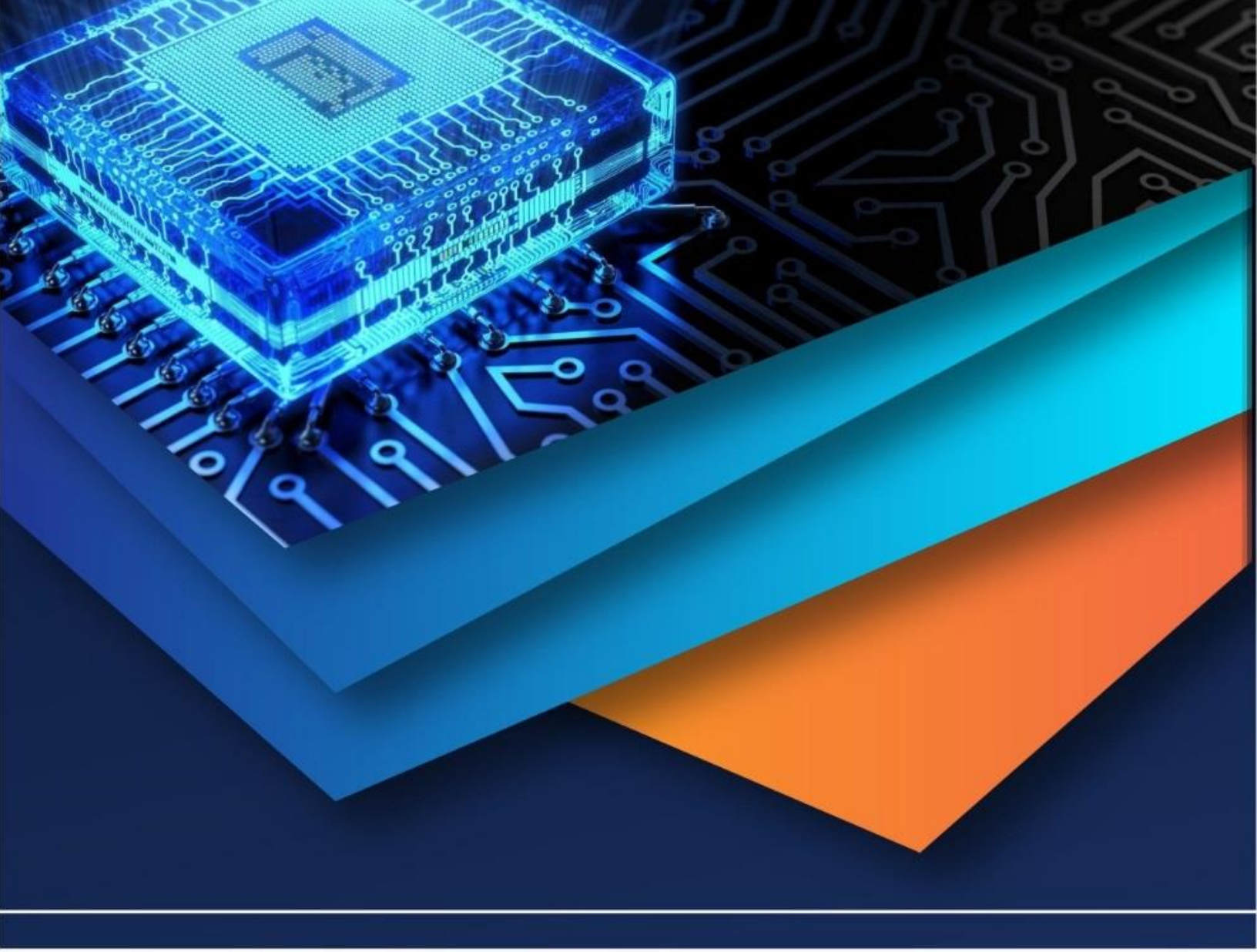
2) Real-Time Monitoring: GPS tracking enables real-time location reporting, which simplifies the recovery of stolen goods.

3) \tUser-Friendly Interface: Web dashboards and mobile apps simplify the user experience and access to vehicle status and control features.

4) Alert Systems: Intruder signals and tampering prompts allow the owner to respond timely and react decisively.

REFERENCES

[1] Ambade Shruti Dinkar and Shaikh SA. Design and Implementation of Vehicle Tracking System Using GPS. Journal of Information Engineering and Applications. ISSN 2224-5758. 2011; 1(3):7406-09.
[2] Huaqun Guo, Jun Jie Ang and Yong dong Wu. Extracting Controller Area Network Data for Reliable Car Communications. I Proc. IEEE. 2009. p. 1027-32.
[3] Huaqun Guo, Lek Heng Ngoh, Yongdong Wu, Lian HwaHiow, Choon HweeK wek, Feng Tao and Jun Jie Ang. Embedded Info- Security Solutions for Vehicular Network. I Proc. CHINACOM'08, Hanghzhon. China. August 25-27 2008.
[4] Saurabh Chakola, Vivek Kapur. ARM Hardware Platform for Vehicular Monitoring and Tracking. IEEE. 2013. DOI 10.1109/CSNT.2013.162.
[5] Vikram Kulkarni and Viswa Prakash Babu. Embedded smart car security system on face detection. IJCCT. 3(1):112-16.
[6] Albert Alexe, Ezhilarasie R. Cloud Computing Based Vehicle Tracking Information Systems IJCST. March 2011; 2(1): 49-52.
[7] Sadagopan VK, Rajendran U and Francis A.J. Anti-theft Control System design using Embedded System. IEEE International Conference on Vehicular Electronics and Safety (ICVES). p. 1-5. 201
[8] Arun Sasi, Lakshmi R Nair. Vehicle Anti- Theft System based on an Embedded Platform. IJRET: International Journal of Research in Engineering and Technology. Sept 2013; 2(9):58185.
[9] Feng Huang, Shanyu Tang, Senior Member. IEEE and Jian Yuan. Vehicle Location Based System. IEEE June. Transactions on no information forensics and security. 2011; 6(2).



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