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Vehicle Theft Control System using Fingerprint Sensor and IOT Devices

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ABSTRACT: This paper purposes a model for detecting car theft. If someone who isn't permitted tries to steal a car, both the police station and the owner will be notified of GPS location. Methods: Fingerprints stored in system memory. If Fingerprints and RFID are the same as those stored and the controller activates another ECM power circuit if hacker attempts to unlock the car in any other is to send intrusive warning messages and location of the car to the owner's mobile app via the cloud. Findings: The Intel Galileo gen2 board is used to run the system. Additionally attached to the board are a GPS, GSM, Wi-Fi module, and SD card. Installing this intelligent application will be beneficial because the engine will not run as intended without it. The system also employs sensors to prevent auto theft. The owner will be informed if someone tries to access a battery by using paperclips on the fuse. the GPS location of the vehicle and previous processes. Application: The system is effective and inexpensive.

KEYWORDS: Interposition, Optimization, Embedded, ECM, GPS, GSM, RFID, Galileo gen2 board

I. INTRODUCTION

This research suggests a model to aid in the detection of vehicle thefts. The authorised user and the police station will receive a notification with the precise position if an unauthorised individual tries to flee with the car. Fingerprints will be kept in the system's memory. If the fingerprint and Radio Frequency Identification (RFID) match with the fingerprints already stored, the controller will activate the Engine Control Module's (ECM) powering circuit, and if the thief opens the car and starts it, it will send a message of warning about the interception and use cloud technology to send the location of the car to the owner's mobile app. The system will be implemented by using Intel Galileo gen2 board [1]. It can be used as an IOT platform with Linux and Python. The GPS, GSM, WIFI and SD card is also connected to the board. Building this smart system is very helpful because this system does not get its power from the ECM. The system also associates some other sensors which will help to stopcar robbery.

If thief tries to start by using paper-clip then the owner or the authorized user will get a message along with GPS location and then he or she will take strict action. This system works well at a very low-price range and the car user can entered into his car without key and have self-start button proposed model is secure and reliable model as it usesthe IOT device to protect every car no matter what's the price of a car[2].

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II. LITERATURE SURVEY & COMPARATIVE ANALYSIS

The anti-theft control systems for cars have become highly popular. The most common components utilised to give the owner of the car the location of the vehicle are GSM and GPS. Numerous studies have been conducted to safeguard against vehicle theft. The following are a few of them:

PAPER TITLE	DETAIL/ FEATURES	RESULT	RESEARCH YEAR
Biometric Technology	It is a good technique used for recognizing individuals. Traditional means of one's identification are done by biometric that measures unique human identity through Fingerprints. Some other ways of recognition have also been used in detecting the real owner. One of the most widely utilised biometric security systems worldwide is fingerprint-based identification technology [1].	As a result, authorized used can access their vehicle via using a fingerprint sensor using embedded in their vehicle.	2014
Vehicle Theft Alert and Tracking the Location using RFID and GPS	The implementation of a car theft safety alarm and position tracking system employing GPS and RFID technology is discussed in this paper. The main motive of this paper was to introduce the mobile communication process the embedded safety system to track vehicle location. This embedded system consists of a buzzer which gave the alarm sound when the user entered password that do no match with actual stored password.[2]	An alert notification through GSM component is sent to the owner of the vehicle. The location of the vehicle is shown to owner of vehicle through which he/she can track the vehicle.	2013
Vehicular Identification and Authentication System using Zigbee	This paper works on vehicle security employing communication technologies for vehicle identification and authentication. The system allows an authorized vehicle in campus and restrict unauthorized vehicle. An automated RFID model embedded invehicle have all information about the car, its distinctive serial number, and a keypad for entering a password to verify the driver's authorization [3].	RF module uses RF reader for accessing vehicle information and the information was sent to central database server through Zigbee interface for driver and vehicle access verification. The gate side RF module received the results.	2014

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Working and Implementation of vehicle Anti- Theft system using Microcontroller	This system is designed for low-cost vehicle theft using microcontroller. This system has a wireless communication protocol between the car Owner and the device to control the security system. Radio Frequency (RF) module controls the Remote data transmission Transmitter (RDTT) with the instruction of a micro-controller. This system only has frequency of 434 MHz [4].	This system cannot be used for long distance vehicle. As a result, it's a major drawback as a distance vehicle cannot be detected.	2013
Anti-Theft Vehicle Security System.	This system Locking and Tracking are used through which owner will get exact location of vehicle and can lock the engine of the vehicle remotely and send tracking data [5].	This system fails to differentiate between user and theft due to poor authentication.	2017

Table 1.Comparative Analysis of Research Works Based on Vehicle Theft Control System.

III. PROPOSED SYSTEM

The primary goal of this research is to design and build a vehicle that is GSM and GPS-based. Theft System. In this paper, a model has been proposed to track vehicle location and send to the owner of the vehicle. An SMS has been passed to vehicle owner on mobile phone using GSM module. The SMS includes the latitude and longitude of the location of the car. ECM device is used to start the car which is very unique and easy way. RFID tags convey information from the tag to a reader, which subsequently sends it to an RFID computer system and used to track the vehicle with cloud technology [6].

The proposed system uses an Intel Galileo Gen 2 development board that includes an Intel Quark SOC processor. A vibration sensor is used in this system to detect the vibration acknowledged it as invalid accessto the vehicle [7].

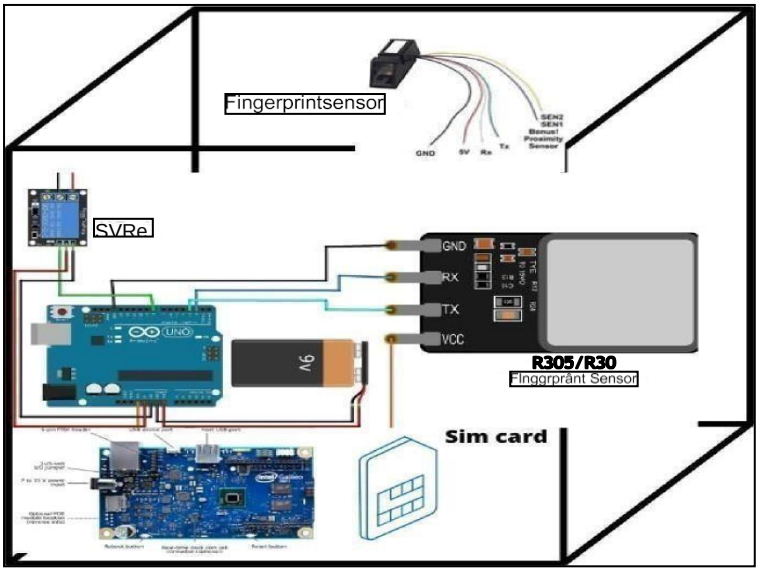

Figure 1.Component Design [11]

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IV. COMPONENTS SPECIFICATION

GPS – It is used to real-time location of a vehicle. In this paper GPS is utilised to read the vehicle's current coordinates and determine its precise location. In case of failure of GPS, the time series algorithm will used to predict the location of the location [2].

GSM – It helps in sending a SMS at mobile phone of vehicle owner. The GSM module serves as the vehicle and owner's way of communication. It transmits and receives messages from the vehicle owner's mobile device. The location of a vehicle can also be tracked using it [8]. Applications like SMS employ a GSM module to transmit and receive messages over a modem interface.

RFID – (Radio Frequency identification) used to track a vehicle using radio waves.A non-contact automatic identification method is radio frequency identification (RFID) [7]. The car security anti-theft system uses radio frequency identification technology to automatically identify target car of any other object and obtain relevant data through radio frequency signals.

Galileo Gen 2 Board – Galileo Gen 2 Board was developed by Intel and used to detect vehicle location in case of vehicle thefts. The main feature of Galileo Gen 2 is for quart SOCX 1000, first product from Intel Quart Technology with the low power [2].

Vibration Sensor - It measures the degree of vibration, compares it to the user-set threshold level, and outputs a strong pulse. The user can insert a key and activate the microcontroller by utilising a vibration sensor [10]. A vibration sensor is a tool that calculates the intensity and frequency of vibration in a certain equipment or system. The measurement is used to detect the car.

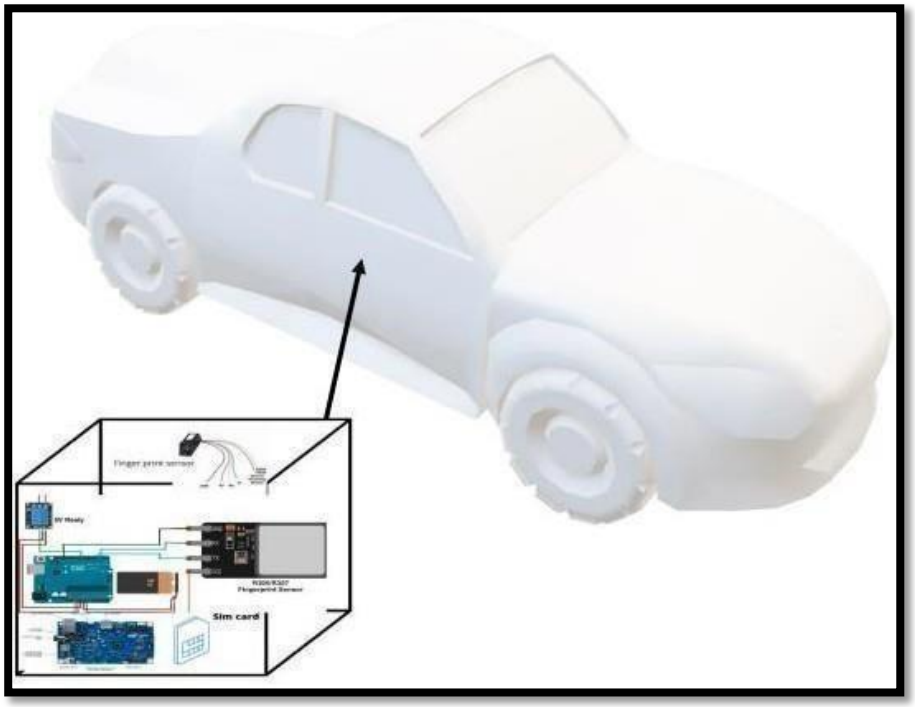

Figure 2.Placement of Component in the vehicle [12]

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V. PROCESS

In this a fingerprint sensor is stored at RFID in car when someone try to open the car it scan the fingerprint and matches with stored fingerprints if it matches the door will open otherwise it give alert message at owner mobile of unauthorized access [7] .A camera is set at front mirror of Driver seat , it capture the image of the person sitting at driver seat if an unauthorized person try to start the car it sent the Alert message at Owner phone and then owner of the vehicle can turnof the engine only from his phone[9] .

Figure 3.GPS for tracking location of the vehicle [13]

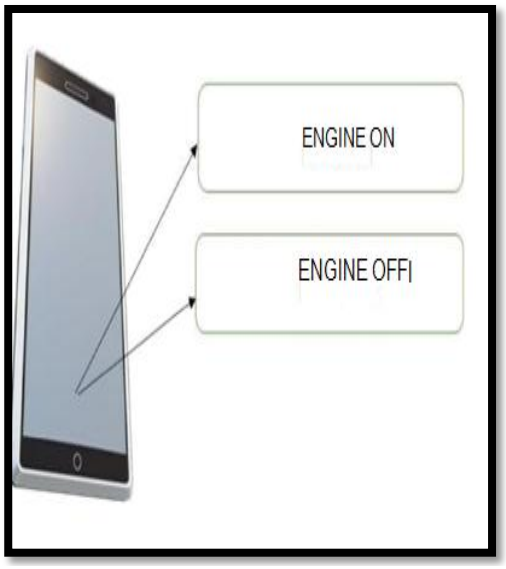

Figure 4.Owner control on Engine

A camera is set at front mirror of Driver seat , it capture the image of the person sitting at driver seat if an unauthorized person try to start the car it sent the Alert message at Owner phone and then owner of the vehicle can turnof the engine only from his phone[9] .

VI. EXPERIMENTAL ANALYSIS

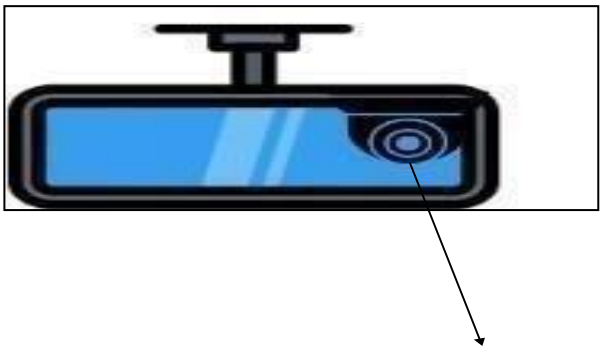

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Figure 5.Driver's Face Detection through Web Cam

VII. PICTORIAL REPRESENTATION OF THE SYSTEM

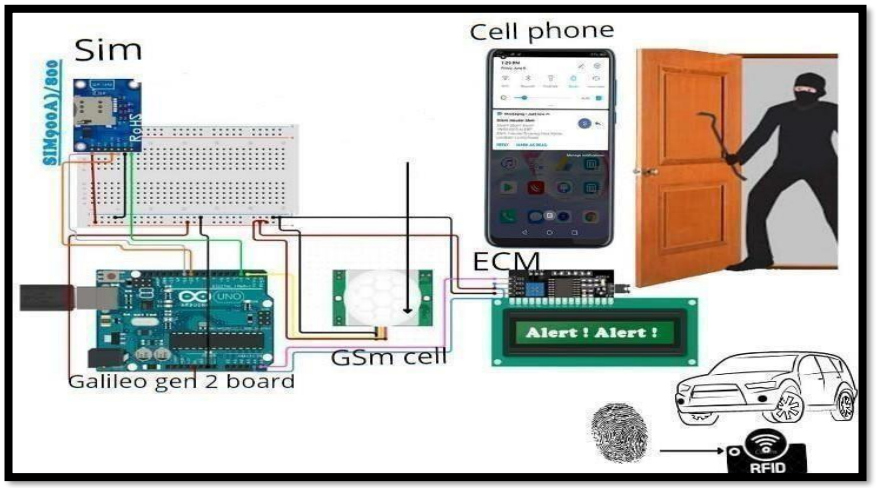

Figure 6.System Design [3]

VIII. COST ANALYSIS OF THE SYSTEM:

S no	Item (Device Cost)	Cost(estimate)
1.	Fingerprint Sensor	2000-3000
2.	GPS	1500
3.	GSM	1200
4.	RFID	250
5.	Galileo gen2 board	7000-10000
6.	Vibrate Sensor	500
7.	SIM card	100
8.	ECM	15000
9.	Garmin Dash Camera Mini 2	10000
	TOTAL	41550 (APPROX)

Table 2.Cost Analysis

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IX. CONCLUSION

The Research paper titled “Vehicle theft control system using fingerprint and IOT devices" a prototype for car anti-theft gadgets. The study aims to establish a theft deterrent with a tracking device and alarm message**.** Fingerprint used in this is a powerful security innovation and exact location tracking using IOT devices and a theft device can be easily tracked. This system includes GPS and GSM which is used to track the location of the Vehicle and a Galileo Gen2 board which contain SIM card to give alert messages. One of the Improvements done based on previous research is that implementation of Garmin Dash Camera Mini 2 in front of driver seat. It will capture the image and match with stored image if not it gives alert message at owner mobile phone as well as at nearest police station. In this Research all the possible ways are implemented to prevent vehicles from being Theft and in Future if any such implementation can be done to monitor all the activity performed on the devices.

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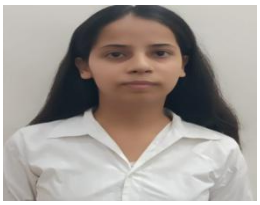	**Aprajita Shahi** is a final year student of Master of Computer Application(M.C.A) from Jagan Institute of Management Studies(JIMS).She has completed her Bachelors in computer application in information Technology from Sri Guru Tegh Bahadur Institute of Management and Information Technology(SGTBIMIT). She is a good programmer and have a good hand in. programming languages like C, Java and Python. She wants to become a Software Engineer.