**PROJECT REPORT**

**SMART ANTI-THEFT VEHICLE SYSTEM**

*Submitted in partial fulfillment of requirements for the degree of*

**Bachelor of Technology (B. Tech)**

in

**Computer Science and Engineering**

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**CERTIFICATE**

This is to certify that the project report entitled as Creating a real time object detection app using Watson, submitted to the Department of Computer Science and Engineering, Kaziranga University, in partial fulfillment for the award of the degree of **Bachelor of Technology** in Computer Science and Engineering, is a record of bona fide work carried out by **Girish Kumar**, Enroll no. ET16BTHCS010, **Nikita Dey,** Enroll no. ET16BTHCS016, **Bidisha Barman**, Enroll no. ET16BTHCS018, **Domum Karlo,** Enroll no. ET16BTHCS021,**Mrigankasekhar Hazarika,** Enroll no. ET16BTHCS024 and **Landi Chobing,** Enroll no. ET17BTHCS073Lunder the supervision of Internal Mentor **Mr. Sajal Saha**, and **Mr. Pranab Kumar.**

All help received by them from various sources have been duly acknowledged.

No part of this report has been submitted elsewhere for award of any other degree.

**DECLARATION**

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. We understand that any violation of the above will be cause for disciplinary action by the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed. Project or Project code is not copied or downloaded from Internet or any other resources.

(Signature)s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Date: \_\_\_\_\_\_\_\_\_\_

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**ABSTRACT**

In todays world vehicles form an important asset to us, without which our life would be incomplete. But when it comes to the security of our vehicles we are very helpless. It is of a great concern, especially in metropolitan cities, where this incidents occur each and everyday. So, in this paper we have focused on the security of vehicles. The setup consists of a mix of software and hardware. In software, we have used Apache, NMEA Parser and Linux debian, and in hardware a Raspberry Pi 3 model, a SIM900A GSM module, and a GPS Reciever. The whole system will allow you to connect with your vehicle from anywhere and anytime and confirm its security. A vehicle is usualy most expensive and important asset next to a home. So this system enables you to keep this asset at your fingertips using wireless technology. Think of it as a wireless leash to your car.

**INTRODUCTION**

The Internet of Things (IoT) is the physical network of things or objects—devices, buildings, vehicles, and other items— embedded with electronics, software, sensors, and network connectivity that enables these things or objects to collect and exchange data. An anti -theft system is any device or method used to prevent or deter the unauthorized appropriation of items that is considered valuable. Internet of Things is expected to produce high degree of human to machine communication along with machine to machine communication. The primary objective of this project is to reduce human work. Automation has always been a prime factor for security system. Our aim in the project is to design and implement a security system. System that offers controllability through a hand-held mobile phone by means of IoT.

The latest trend of Vehicles theft involves vehicles being towed away. There are many ways to prevent the vehicles theft like using Global Positioning System(gps) where the location of vehicle can be traced.

So, we have thought of developing this system that can easily help the particular person to track in a near real time manner his or her vehicle if being stole. Also one will get direct notification either in the form of message or mail if in any case the vehicle is being used by any other person.

**PROBLEM STATEMENT**

Vehicle theft is one of the major problems faced by civil society today. Very few vehicles were recovered although if the vehicle are being recovered either it might be in a malformation manner or the parts are being replaced. Current system uses key and remote to lock the vehicle. At main locations CCTV cameras are present which are used to locate the stolen vehicle. But at many places CCTV cameras are not present. Through this application the user can control, monitor and track periodically from a remote location.

**OBJECTIVE**

The main intention of this project is to design and develop a hardware based anti- theft vehicle tracking system that enable to find out the location of the stolen vehicle and inform to the concerned authority through an SMS. The system is a robust system that can be used in any kind of automated system that uses 12V. This GSM based vehicle theft control system retrieves the location of a vehicle in terms of its longitude and latitude. These data is fed to the raspberry pi to a GSM module. The raspberry pi retrieves the location details from the GPS and sends an SMS to the concerned authority over GSM module on periodic intervals which is set by the user. An LCD display is connected to the raspberry pi for crossing the data received before being sent over GSM.

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**SOCIETAL IMPACT**

This system is designed for the users in land construction and transport business, provides real-time information such as location, of the user in easy-to-read format. This system may also be useful for communication process among the two points. Currently this system ensures the safety of the vehicle, it can also be used by the client as a theft prevention and rescue device.

**REQUIREMENTS GATHERING**

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement Specification | | | |
| Hardware Requirements | | Software Requirements |  |
| Name | Quantity | Name |  |
| GPS Reciever | 1 | Apache Server |  |
| SIM900A GSM Module | 1 | NMEA Parser |  |
| Raspberry Pi 3 | 1 | Adafruit |  |
| Bread Board | 1 | Linux Debian |  |
| 12V Battery | 1 |  |  |
| Motorized Fan | 1 |  |  |

**REQUIREMENTS**

**GPS Reciever**

This module has an external antenna and built-in EEPROM. It requires a power supply of 3V to 5V and a default baud rate of 9600 bps. It works with NMEA sentences. Neo 7N has the data logging feature, which enables continuous storage of position, velocity and time information to an internal 16Mbit SQI FLASH memory. The GPS module receives data from the GPS satellites and calculates the module’s geographical location. Once the module is powered, National Marine Electronics Association (NMEA) sentence is sent out of a serial transmit pin at default baud rate (9600bps).

**GSM Module**

SIM900A GSM module produced from SIMCOM is used in this system. It works on the frequencies of 900 and 1800 MHz where SIM900A can search these two bands automatically. The frequency bands can also be set by AT command. The baud rate is configurable from 1200-115200 bps through AT command. The baud rate of 9600 bps is used for the GSM module in the theft detection device. Using the internal TCP/IP stack, this module can be connected to the Internet via GPRS (General Packet Radio Service). SIM900A is an ultra-compact and reliable wireless module. This is a complete GSM/GPRS module in a SMT type and designed with very powerful single-chip processor integrating AMR926EJ-S core and is very cost effective.

**Raspberry Pi 3**

The Raspberry Pi is a low cost, credit card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It’s capable of doing everything one expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word processing and playing games.

**SOFTWARE REQUIREMENTS**

**Apache Server**

The Apache HTTP server, colloquially called Apache is a free and open source cross platform web server software, released under the terms of Apache license 2.0. Apache is developed and maintained by an open community of developers under the auspices of the Apache software foundation.

In our project we have used Apache server for making the virtual lock and unlock keys which can be only controlled by the authorised user using his/her mobile phone.

**NMEA Parser**

GPS NMEA Parser is a library to read GPS sentences and parse them into user friendly form. It is written in ANSI C99 and is a platform independent, easy to use. It has built-in support for four GPS statements:

* GPGGA or GNGGA: GPS fix data
* GPGSA or GNGSA: GPS active satellites and dillusion of position
* GPGSV or GNGSV: List of satellites in view zone
* GPRMC or GNRMC: Recommended minimum specific GPS/Transit data

Low level layer is separated from application layer thus allows you to add custom communication with GPS device. It works with Operating Systems and with different communication interfaces.

Here we used NMEA Parser for parsing the GPS data from the GPS Module into readable form and extract the latitude and longitude of the current location.

**Adafruit**

Adafruit is a cloud service. You can connect it over the internet. It’s meant primarily for storing and retrieving data. It can display your data in real time, online. It is used for making the project internet connected: Control motors, read sensor data etc. Connect projects to web services like Twitter, RSS feed, Weather service etc. Connect the project to internet enabled devices.

**LITERATURE REVIEW**

In today’s world vehicles form an important asset to us, without which our life would be incomplete. The Vehicle Theft Protection Program was launched in late June 2007 by NICB, a not for profit organization dedicated to stopping vehicle theft. As part of the program, the organizations commissioned a national survey of 1,000 adults to determine areas where consumers needed the most education regarding vehicle theft protection. The on-line survey revealed that 67 percent of motorcycle owners who responded are at a high risk for theft.

Following are the categories of vehicle theft

Theft of an unattended vehicle without a key: The removal of a parked vehicle either by breaking and entry, followed by hotwiring or other tampering methods to start the vehicle, or else towing. In London, the police say that 50% of the annual 20,000 car thefts are now from high tech OBD (Onboard Diagnostic Port) key cloning kits (available online) and bypass immobilizer simulators.

Opportunistic theft: The removal of a vehicle that the owner or operator has left unattended with the keys visibly present, sometimes idling. Alternatively, some cars offered for sale are stolen during a "test drive". A "test drive" may also provide a potential thief with insight into where the vehicle keys are stored, so that the thief may return later to steal the vehicle.

Carjacking: Refers to the taking of a vehicle by force or threat of force from its owner or operator. In most places, this is the most serious form of vehicle theft, since assault also occurs and the method of taking over the vehicle is essentially a robbery, a more serious form of theft.

Fraudulent theft: Illegal acquisition of a vehicle from a seller through fraudulent transfer of funds that the seller will ultimately not receive or through the use of a loan obtained under false pretenses. Many vehicles stolen via fraud are resold quickly thereafter. Using this approach, the thief can quietly evade detection and continue stealing vehicles in different jurisdictions. Car rental and Car dealership companies are also defrauded by car thieves into renting, selling, financing, or leasing them cars with fake identification, checks, and credit cards.

For finalizing objective of our project work we have reviewed following research papers:

* **Debajyoti Mukhopadhyay , Tahesin Attar, Prajakta Chavan, Vidhi Patel and Megha Gupta [1]**

has showed their paper that illustrates a model in which the GSM is used for sending messages where the user can control the engine/ignition and turn it off if needed. The system also employs a password through keypad (with maximum3 chances) which controls the opening of a safety locker door as well as wearing of a seat belt. If there is a window intruder, the IR module/sensor detects the intruder, or any obstacle and it sends a signal to the micro controller. The controller is connected to a Bluetooth module and to an alarm system. The System transmits an alert signal to the dashboard (which is nothing but a mobile handset) which sends an alert signal to the user’s mobile phone. The prototype also provides a solution to the problem like Towing. Thus, the system uses Bluetooth module and controller to control

the security system from the user’s mobile phone by means of any device with a potential Internet connection.

* **Hemant Kuruva, Girish Shiva and Prasanna Raju S. [2]** the authors main goal of the proposed work was to develop a new technique to locate, track, and remotely control a lost vehicle through a smartphone application, which is further used to switch the ignition on/off and also scream the siren to alert the surroundings. Apart from these functions, the smartphone application features a virtual LCD which displays location coordinates and the speed of the vehicle.
* **V.Krishnaveni, A.Priyanga, V.Vidya, and G. GaneshKumar [3]** in this project they have designed an advanced electronic security system by using small PIR and IR sensors built around the Node MCU controller. PIR sensor sense the presence of intruder & Controller reads the signal from sensors and if intruder is detected, it compares the detected image with predefined images in the database then it turns on the buzzer as well as making a notification to predefined number. At the same time the video of intruder can also be monitored and make them anesthetic.
* **Saw Nang Paing1, May Zin Oo1, Mazliza Othman2 and Nobuo Funabiki[5]** This system has the following features: (1) the vehicle theft is detected using an Arduino-connected GPS module, (2) the alarm message is sent to the mobile phone of the vehicle owner as an SMS message on GSM, (3) the conditions of GPS/GSM modules are always monitored where the alarm is sent to the owner if they are not live, and (4) the location data of the vehicle is periodically stored in the IoT cloud platform called ThingSpeak. We implement this system and confirm the correctness of the implemented functions through trial applications.

**SCHEDULING OF PROJECT**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Task | Jun  19 | Jul  19 | Aug  19 | Sep  19 | Oct  19 | Nov  19 | Dec  19 | Jan  19 | Feb  19 | Mar  19 | Apr  19 |
| Gathering Requirements |  |  |  |  |  |  |  |  |  |  |  |
| Meeting & Review |  |  |  |  |  |  |  |  |  |  |  |
| Project Planning |  |  |  |  |  |  |  |  |  |  |  |
| Coding |  |  |  |  |  |  |  |  |  |  |  |
| Testing |  |  |  |  |  |  |  |  |  |  |  |
| Implementation |  |  |  |  |  |  |  |  |  |  |  |
| Support & Maintenance |  |  |  |  |  |  |  |  |  |  |  |

**CIRCUIT DIAGRAM**

Raspberry pi 3

POWER SUPPLY

DISPLAY

KEY

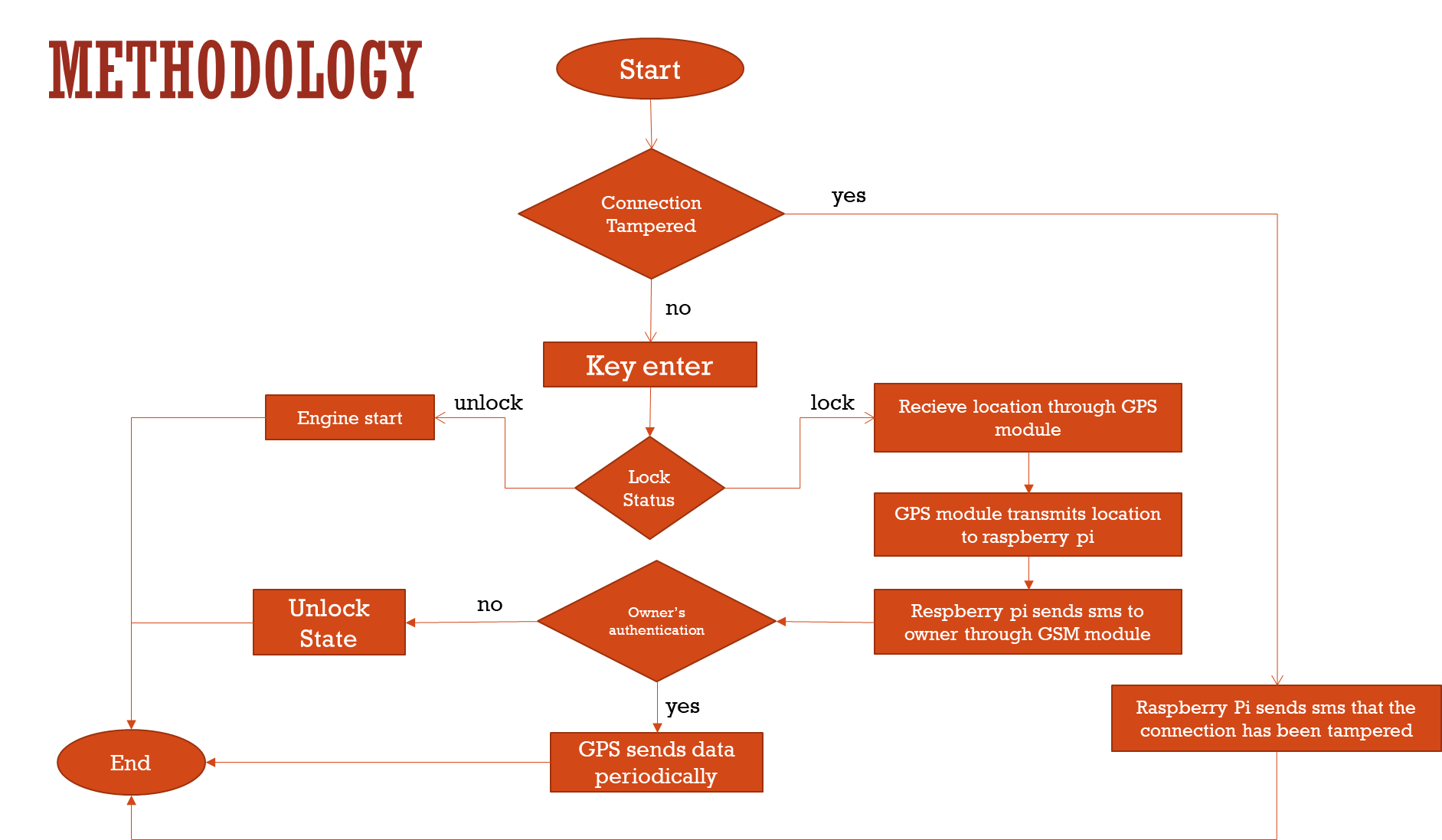
MOTOR DRIVER

DC MOTOR

GPS MODULE

GSM MODULE

**WORKING FLOWCHART**



**APPLICATIONS**

This project can be used in cars, buses and any other public and private transport vehicles. With some further developments it can also be implemented in bikes and various other vehicles. You can buy a car with factory-fitted alarm system and our system can function alongside it. This system is very cost-effective and easy to as the owner or user just needs to send a text message to control his/her vehicle.

Here, the global positioning system(GPS) is mainly used to locate the vehicles and also to stop the vehicles, if stolen. The location information is sent in the form of message containing the latitude and longitude information to the owner of the vehicle over a GSM module connected to a Raspberry Pi and the location can also be traced using internet through Google Maps.

Our anti-theft system is always functioning, even if the car’s engine is turned off. As soon as the engine is started, our system immediately checks whether the car is locked or unlocked. The system won’t take any action of the vehicle is being operated by the user. But if the vehicle is being stolen, then the GPS based tracking system keeps track of the location of the vehicle based on mobile phone text messaging system. The system is able to provide real time text alerts for the location of the vehicle. After a certain interval of time, the GSM module will inform the owner by messaging its location in the form of latitude and longitude. The owner or user can control ad stop the vehicle by simply sending the message stop to GSM module of the anti-theft system. After receiving the message the ignition system or the starter relay will turn off which switches off the engine.

**REFERENCE**

[1] An Attempt to Develop an IOT based Vehicle Security System,

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2018 IEEE International Symposium on Smart Electronic Systems (iSES) (Formerly iNiS)

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India ISSN: 2278 – 7798

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Volume 5, Issue 12, December 2016

[3] An Advanced IOT based Antitheft Security System with Video Monitoring Facility

V.Krishnaveni, A.Priyanga , V.Vidya ,G. GaneshKumar

SSRG International Journal of Computer Science and Engineering (SSRG-IJCSE) - Special Issue ICRTETM March 2019

[5] A Personal Use Vehicle Anti-Theft Tracking System Using IoT Platform

Saw Nang Paing1, May Zin Oo1, Mazliza Othman2 and Nobuo Funabiki

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