

SURVEY PAPER ON ANTI-THEFT OF VEHICLE TRACKING

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Abstract— A the numbers of vehicle owners are increasing the number of crimes related to vehicles are also rapidly increasing one of which is vehicle theft. This asks for better security systems which can track the vehicles detect the vehicle and also for locking the vehicle. The Objective of the proposed paper is to present the work done by using a mobile application the vehicle can lock or unlocked only if the system recognises the person's face else a security alert will be sent to the registered vehicle owner. Along with locking and unlocking the system will also alert the owner if there are any damages done to the vehicle or if there is an attempt to Anti-theft of Vehicle. The work is an attempt to design an advance vehicle security system that uses GPS, GSM system and Face recognition to prevent theft and to determine the exact location of vehicle.

And finally proposed the methodology for the Anti-theft of vehicle with the best approach.

Keywords — *Global Positioning System (GPS), Global System for Mobile Communications (GSM), Microcontroller 8051, Tracking, object tracking, multi face tracking, Face recognition, MatLab.*

I. INTRODUCTION

These day's vehicle robbery cases are higher than any other time, it has gotten to be fundamental to give a vehicle a superb security with the main solid hostile to burglary gadget. Vehicle focal locking framework guarantees the best ensure to secure your vehicle from various types of burglary cases. It is a vehicle security gadget that offers fantastic insurance to your vehicle. However this framework

couldn't demonstrate to give complete security and openness to the vehicle in the event of burglary. So a more created framework makes utilization of an inserted framework focused around GSM innovation. The outlined and created framework is introduced in the vehicle. Whether one is holder of single vehicle or in excess of 1000, Vehicle Tracking System (VTS) is an answer for spot, track and secure your portable resources. It is intended for exact and on-going following and reporting of your vehicle(s), regardless of where it is placed. Combination of high-affectability GPS units in vehicle following frameworks has empowered these gadgets to work in different varieties of situations, for example, characteristic ravines, urban gulches and much under substantial foliage, the length of system scope is solid. Right now GPS vehicle following guarantees their wellbeing as voyaging. This vehicle following framework found in clients vehicle as a burglary counteractive action and salvage gadget.

Vehicle manager or Police take after the sign emitted by the following framework to place a victimized vehicle in parallel the stolen vehicle motor rate going to diminished and pushed to off.

A. GPS Technology:

The Global Positioning System (GPS) is the only fully functional Global Navigation System (GNSS). The GPS uses a constellation of between 24 and 32 Medium Earth Orbit satellites that transmit precise microwave signals that enable GPS receivers to

determine their location, speed, direction, and time. A GPS receiver receives the signals from at least three satellites to calculate distance and uses a triangulation technique to compute its two dimension (latitude and longitude) position or at least four satellites to compute its three dimension (latitude, longitude and altitude) position. Therefore GPS is a key technology for giving device its position. GPS was developed by the United States Department of Defence. Its official name is NAVSTAR-GPS. It is originally used in military services but later allowed the system available free for civilian use as a common good. Since then, GPS has become a widely used aid to navigation worldwide, and a useful tool for map-making, land surveying, commerce, and scientific uses. This device we use a GPS receiver of HOLUX GR-67 series. GPS parameters and specifications are given below.



B. GSM Technology:

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a

subscription to a mobile operator, just like a mobile phone. GSM (Global system for mobile) uses a process called circuit switching.

This method of communication allows a path to be established between two devices. Once the two devices are connected, a constant stream of digital data is relayed. GSM networks consist of three major systems the Switching System (SS), The Base Station (BSS) and the Mobile station (MS).

I. The Switching System

The Switching system is very operative system in which many crucial operations are conducted, SS systems holds five databases with in it which performs different functions. If we talk about major tasks of SS system it performs call processing and subscriber related functions. These databases from SS systems are HLR, MSC, VLR, AUC and EIR. The MSC in cooperation with Home Location register (HLR) and Visitor location register (VLR), take care of mobile calls and routing of phone calls. Authentication centre (AUC) is small unit which handles the security end of.

II. The Base Station System (BSS):

The base station system have very important role in mobile communication. BSS are basically outdoor units which consist of iron rods and are usually of high length. BSS are responsible for connecting subscribers (MS) to mobile networks. All the communication is made in Radio transmission. The Base station System is further divided in two systems. These two systems, they are BTS and BSC. BTS (Base Transceiver station) handles

communication using radio transmission with mobile station and BSC (Base station controller) creates physical link between subscriber (MS) and BTS, then manage and controls functions of it.

III. Mobile Station (Subscriber):

MS consist of a mobile unit and a smart card which is also referred as a subscriber Identity Module (SIM) card. This card fitted with the GSM Modem and gives the user more personal mobility. The equipment itself is identified by a unique number known as the International Mobile Equipment Identity (IMEI). The GSM modem used in this device is SUNROM SIM 900D. The parameters and specification of our GSM modem is given below.



C. Microcontroller:

The microcontroller is the heart of this device. It is the interface between the GSM module and the GPS receiver. A microcontroller is a small computer on a single integrated circuit containing a processor core, data memory, Analog to Digital converter and programmable input/output peripherals. In this

device the microcontroller is programmed in such a way that it stimulates the GSM modem in message forwarding when a request is send by the user. Microcontrollers are much smaller and simplified so that they can include all the functions required on a single chip. Having the microcontroller is of great use, as it has low design cost and add intelligence to the system.

II. LITERATURE SURVEY

Anti-Theft Tracking System for Mobile-Vehicles

2017 [1] In this paper is basically giving an idea for tracking the vehicles using a mobile application having GPS (Global Positioning System) and GSM (Global System for Mobile Communication) both. The chip must be a combination of GPS and GSM through which the owner gets updates of location in his/her mobile application. By the help of application the owner can switch his vehicle off when some unwanted movement occurs.

Smart Anti-Theft Vehicle System based on

Internet of Things (IoT) 2017 [2] In this paper is for monitoring the movement of any equipped vehicle from anywhere in real time. At the implementation of this system, Global Positioning System (GPS), Global System for Mobile Communication (GSM)/General Packet Radio Service (GPRS) and Microcontrollers are used to enable users for monitoring their vehicles in a convenient manner. This system provides the access to check the movement and control (emergency stop by closing the fuel line) vehicles remotely by using

mobile application. The hardware prototype of the proposed system and the user application for monitoring and controlling vehicles.

Vehicle Theft Detection and Remote Locking

2018 [3] In this paper proposes a reliable and economic method of vehicle theft detection and remote locking using Arduino UNO, IR sensors, Global Positioning System (GPS) and Global system for mobile communication (GSM). This design monitors the vehicle continuously and reports to the user in the case of any theft and also stops the vehicle through a switch mechanism. An algorithm is also presented that helps to locate the co-ordinates of the vehicle in real time and also locks it if the user demands.

Anti-Theft Vehicle Tracking System Using GPS and Location Prediction 2018 [4]

[4] The objective of this paper is to develop an application for tracking vehicles, which will help the cab owners to track their car all the time and to predict the location of the vehicle in the case of a failing GPS. Time series prediction algorithm is used to predict the location of the vehicle if GPS is in off mode. The vehicle tracking system installed will update the GPS coordinates of the vehicle continued to the cloud, and this data can be used for predicting the location of the vehicle in case of emergency. This system can also be used to generate the bills after finishing the freight in the form of an SMS based on the distance travelled, which can be calculated from the latitude and longitude data. The GPS data can be

mapped to the Google maps to track the location in real time.

Tracking Vehicle and Faces: Towards Socialistic Assessment of Human Behaviour 2018 [5] In this paper, they tried to detect and track face of multiple people on two different datasets with different height of camera. Point feature is extracted and compared it in the successive frames to track face of multiple persons. Every face is bounded by rectangular shape with unique identity. They also counted total number of faces in the frame sequences. Results on both vehicle and face datasets show promising results and the proposed methodology can accurately track the trajectories.

A Smart real-time tracking system using GSM/GPRS technologies 2019 [6] In this paper introduced an embedded system that designed and implemented for vehicle tracking based on an android application, the main contribution of this paper is to reduce the data that sent from the embedded system in the vehicle to the cloud server via picking only necessary data for vehicle tracking from Global Position System GPS and decreasing the number of Hypertext Transfer Protocol HTTP request that transmitted to the cloud server by construing the transmission of information with the movement of vehicles. This system is divided into three parts: embedded system that is attached with the vehicle, cloud/server part which has the database of every single move every car did, and the monitoring part which is the main user interface so they can monitor the vehicle.

A Personal Use Vehicle Anti-Theft Tracking System Using IoT Platform 2019 [7] In this paper, we propose a personal use VAT system using IoT platform that can be easily introduced due to the very low cost. 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*.
- Vehicle Theft Tracking, Detecting and Locking System Using Open CV 2019 [8]** In this paper face recognition and detection in real time by using Open cv python module. Vehicle locking and detecting system is installed in the vehicle. By using mobile application to recognize the face and compares face within their data to checked whether, that user is an automated owner or not. If the conditions is true, unlock the vehicle. Otherwise the vehicle has been locked. If any person trying to break or damage the device, it will automatically sending the message and call to the responsible person.

Proposed Solution

In this paper, a mobile application is used for recognising if the person attempting to use the vehicle is registered or not with the help of a face recognizing sensor. The face of the attempting person is compared with the trained images if it doesn't belong then the vehicle remains locked else the owner or the registered fellow vehicle user gets the access to the vehicle.

If there is an attempt to theft that is if the image sent to the system doesn't match with the trained images then the vehicle owner can be alerted.

If the owner is trying to access the vehicle the proposed system will first prompt for face recognition and once it matches with the trained image dataset .the system prompts for second security check which is security code. Only after both requirements match the vehicle will be unlocked.

Methodology

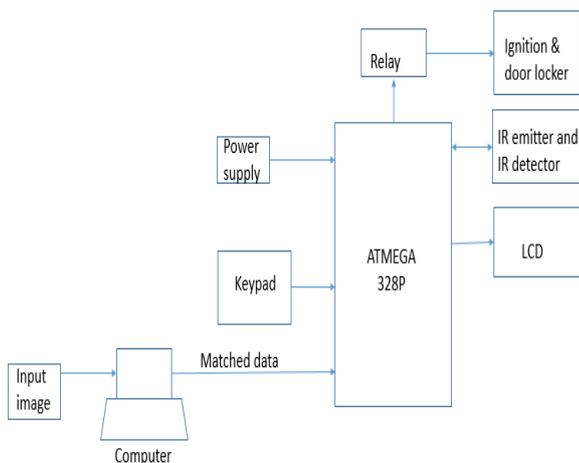


Fig 1: System Methodology

In this system the input is an image which is captured using a camera which captures the face of the person trying to unlock the vehicle. This image will be compared with the dataset and preferred action will be performed.

Personal computer: The image captured will be compared with the dataset provided by the programmer .if the image matches with the dataset then the user will be prompted to enter a password.

Keypad: the password entered should match with the actual password only then the user will get to unlock the vehicle. A keypad is used for typing in the password.

Relay: A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals.

Ignition and door locker: An electronic locker can be used to unlock and lock the vehicle as per the requirement

IR emitter and decoder: are used for controlling and sensing objects without contact.

Lcd display: is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. This can be used to display any message.

FEATURES

The higher level of integration within the hardware target, the tools provides more benefit. In our

project less time to give the result, but the cost is greater. The factors consider choosing a debugging tool is expensive, but it can use easily. This features can provides only during the debugging process. The computer programs running to the independent hardware used to software simulator.

System Flow

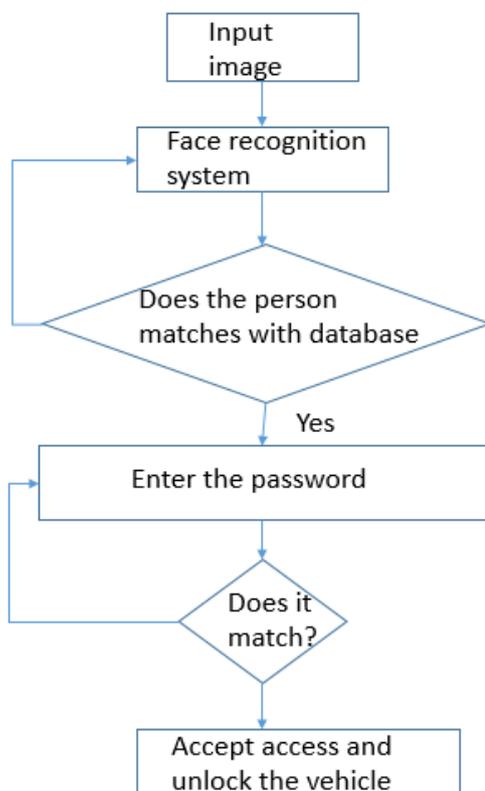


Fig 2: System flow diagram

The System design includes

Step 1: The input is provided by the camera located on the computer. It takes all the inputs provided by the owner or person.

Step 2: Face recognition System, it will identifies the input image by recognition the face of the person or owner. It identifies the face of the person and takes the input.

Step 3: It check the input image, does it matches with database then proses the next step. Otherwise it again goes back to step2.

Step 4: After recognition of the image it allow user to enter the password.

Step 5: The entered password is matched with the given password then it process the next step. If the password does not match then it allow the user to re-enter again.

Step 6: After the password match it allows the owner to accept access of vehicle and unlock the vehicle.

Advantages

- ✓ Since face recognition is used as the input less chances of fault
- ✓ A double entry requirement ensures better security.
- ✓ Owner will be alerted if there is any attempt to theft.

CONCLUSION

An efficient and cost effective method is proposed for preventing vehicle theft. The system works on double requirements ensuring better security. The system is trained with image datasets which uses face recognition, unlocks the vehicle only if the password and face matches with the data else the owner will be alerted.

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