GPS & GSM Based Vehicle Tracking and Security System Using Android

Jayshree Dhaduk¹, Divya Vanani², Aniket Bhogle³, Jayshree Vanmali⁴

¹B.E Student, Dept. of Information Technology Engg., UCOE Mumbai
²,³,⁴Faculty, Dept. of Information Technology Engg., UCOE Mumbai

Abstract - The main aim is to design a user-friendly speech system such that any person can use and operate their car to open and lock the car. An efficient automotive security system is implemented for anti-theft using an embedded system occupied with a Global Positioning System (GPS) and a Global System of Mobile (GSM). In this project we are using the speech-processing unit along with PC. The speech processor initially has to be trained with the known commands of the user. When the same are repeated these commands are compared to the stored one and accordingly generates the signal. These signals are fed to the Parallel port and to the lock. The lock is connected to the stepper motor. The client interacts through this system with vehicles and determines their current locations and status using Google Earth. The user can track the position of targeted vehicles on Google Earth. The GPS coordinates are corrected using a discrete filter. To secure the vehicle, the user of a group of users can turn off any vehicle of the fleet if any intruders try to run it by blocking the gas feeding line. This system is very safe and efficient to report emergency situations as crash reporting or engine failure. When the user gives a specific command the PC and the Lock accordingly drives the stepper motor either in clockwise or anticlockwise direction. This technique is very interactive and is very easy to operate to person to lock and close the car door.

Keyword - Anti-theft, User-friendly, Interactive, Tracking, Micro-controller-Atmega 32, GSM, GPS

I. INTRODUCTION

This system enable user to efficiently use the application to lock and open their car. Since the various project is used to lock the car and open the car such as remote sensing, mobile application such as android based, I phone based application used. But this project used the voice to lock the car and open along with this we can track the location of the car if the car is lost. Now a day’s various cost effective materials is protect using the human voice. So, we introduce this project to protect the car from unauthorized person to access using the human voice.

The system has two main units; the first is security unit which is embedded in the vehicle. This unit consists of: a GSM modem, GPS receiver, control relay, current sensor and Microcontroller. The current sensor will send an analog signal to the microcontroller when the car is running. The microcontroller will send SMS directly to the owner to confirm that. NC control relay contacts are connected with the hot line that powers the fuel pump and ECM. The microcontroller can send a signal to the relay to cut off the power, when received SMS contains code from owner mobile to stop it. The GPS Receiver retrieves the location information from satellites in the form of latitude and longitude readings in real-time.

The Microcontroller processes the GPS information and transmits it to the user using GSM modem by SMS every 10 minutes when the user asked that from the system by sending SMS contains code. The Microcontroller also reads engine parameters from vehicle data port (OBD-II) and sends them to the second module in the same SMS. The second module is a recipient GSM modem that is connected to a PC or a laptop. The modem receives the SMS that includes GPS coordinates and engine parameters.
In this project, we use the human voice as input to lock the car and same voice is used for the unlocking. Because of that the unauthorized person will not get the access to the car. Our main purposed is to protect the car form the unauthorized person. A secure lock system and the first of its kind, is seen as the ultimate in security systems. Voice lock is a secure lock mechanism in which the unlocking is made possible only on successful authentication of the voice of a registered user of the system.

Figure 1.1: Vehicle security

II. EXISTING SYSTEM

The Integrated vehicle tracking and accident alarm system is a multi functionality embedded system which provides emergency services for vehicle along with security. This embedded system requests for emergency services whenever the vehicle met with accident, and system avoids unnecessary emergency requests incase of safe condition of passengers at that situation. This system makes use of an inductive proximity sensor, which senses the key during insertion and makes system to request the user for unique password. If the user fails to enter the unique password in three trials, the information of vehicle, location is sent using GSM to the user and police. This makes to track the vehicle, the fuel injector of the car is deactivated so that the user cannot start the car and burglar is locked inside the vehicle itself using interlocking system until the owner sends command to the system from mobile. Owner can completely control his vehicle using his mobile through specified text messages. Whenever the vehicle met with the accident, the accident circuit makes the system to respond by stops the engine, blowing the accident alarm in vehicle, if everyone in vehicle is fine then has to stop the emergency alarm using the switch within the specified time to avoid unnecessary emergency calling. If nobody attends the switch within the span, a message is sent to police and emergency service using GSM about the information of vehicle, accident location using GPS.

III. PROPOSED SYSTEM

Currently almost of the public having an own vehicle, theft is happening on parking and sometimes driving insecurity places. The safe of vehicles is extremely essential for public vehicles. Vehicle tracking and locking system installed in the vehicle, to track the place and locking engine motor. The place of the vehicle identified using Global Positioning system (GPS) and Global system mobile communication (GSM). These systems constantly watch a moving Vehicle and report the status on demand. When the theft identified, the responsible person send SMS to the microcontroller, then microcontroller issue the control signals to stop the engine motor. Authorized person need to send the password to controller to restart the vehicle and open the door. This is more secured, reliable and low cost.

In this project, the method of vehicle tracking and locking system used to track the theft vehicle by using GPS and GSM technology. This system puts into sleeping mode while the vehicle handled by the owner or authorized person otherwise goes to active mode, the mode of operation changed by in person or remotely. If any interruption occurred in any side of the door, then the IR sensor senses the signals and SMS sends to the microcontroller. The controller issues the message about the place of
the vehicle to the car owner or authorized person. When send SMS to the controller, issues the control signals to the engine motor. Engine motor speeds are gradually decreases and come to the off place. After that all the doors locked. To open the door or restart the engine, authorized person needs to enter the passwords. In this method, tracking of vehicle place easy and doors locked automatically, thereby thief cannot get away from the car.

### IV. SCOPE OF THE PROJECT

The scope of this project is to study and design the GPS/GSM Vehicle Tracking system that can give an output of the information such as time, position, and speed from the GPS receiver. The users will also be able to send command to the GPS receiver using the GSM technology. The project can be divided into two big part, the first part, the GPS and the AVR microcontroller pairing. The second part, the GPS-Microcontroller and the GSM integration. For the first part, focus will be on the GPS system and how to pair it to the microcontroller. The study on the how GPS works will be conduct to understand its operation and command set (NMEA) that will be used. The AVR Microcontroller is also an important device to understand as it is a to control the operation of the GPS receiver. The microcontroller using C programming language to operate. The second part will be the GPS-Microcontroller and the GSM integration. The study on GSM technology will be conduct in this phase. It is important in order to transmit the data from the GPS receiver to the computer using the GSM technology. The correct GSM command set will be essential to make sure the data is on the right path and transmitted correctly.

### V. METHODOLOGY

#### 5.1 BLOCK DIAGRAM

![Figure 5.1: Block Diagram.](image)

#### 5.2 COMPONENTS

- **HARDWARE COMPONENTS**

  - **ATMEGA128:**
    The high-performance, low-power Atmel 8-bit AVR RISC-based microcontroller combines 128KB of programmable flash memory, 4KB SRAM, a 4KB EEPROM, an 8-channel 10-bit A/D converter,
and a JTAG interface for on-chip debugging. The device supports throughput of 16 MIPS at 16 MHz and operates between 4.5-5.5 volts.
By executing instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed.

Figure 5.2: ATMEGA128.

- **GPS Technology:**
GPS or Global Positioning System is a network of orbiting satellites that send precise details of their position in space back to earth. The signals are obtained by GPS receivers, such as navigation devices and are used to calculate the exact position, speed and time at the vehicles location.
GPS is well-known for its military uses and was first developed by the US to aid in its global intelligence efforts at the height of the Cold War. Ever since the early 1980s, however, the GPS has been freely available to anyone with a GPS receiver. Airlines, shipping companies, trucking firms, and drivers everywhere use the GPS system to track vehicles, follow the best route to get them from A to B in the shortest possible time.

Figure 5.3: GPS module

- **GSM Modem:**
A GSM modem, 3G modem or SIM box is basically a GSM phone without keyboard, speaker, battery and display. The terms SIM box, GSM gateway or GSM router are mostly used for devices that route phone calls through the GSM network and the term GSM modem or 3G modem for devices specialized in wireless data transmission. However for GSM modem software they often are interchangeable.
A GSM modem provides the SMS software with a secure gateway to the GSM network, with only two limitations. The amount of SMS message that can be sent and/or received is limited to 12-30 messages per minute, depending on the GSM modem and network, and it is not possible to send SMS messages with alternative numeric or alphanumeric sender id’s.
VI. CONCLUSION

Tracking framework or system is getting to be progressively vital in expansive urban areas and it is more secured than different frameworks. It has continuous ability, rises with a specific end goal to fortify the relations among individuals, vehicle and street by assembling present day data advances or technologies and ready to structures a real time accurate, compelling exhaustive transportation framework. Updating this setup is simple which makes it open to future a prerequisite which likewise makes it more efficient. The proposed work is cost-effective, reliable and has the function of preventing theft and providing accurate tracking system. A smart anti-theft system is one of the essential systems that homogenize both GPS and GSM systems. It is fundamental because of the huge numbers of uses of both GSM and GPS frameworks and the wide use of them by a great many individuals all through the world. This framework intended for clients in area development and transport business, provides real-time information such as location, speed and expected arrival time of the user is moving vehicles in a concise and easy-to-read format. This framework might likewise valuable for correspondence process among the two focuses

REFERENCES