

# Anti-theft Protection of Vehicle by GSM & GPS with Fingerprint Verification

<sup>1</sup>Arpitha. P, <sup>2</sup>Roopa Basappa Raddi, <sup>3</sup>T. Vidya, <sup>4</sup>Kiran S, <sup>5</sup>Lokesha. S.

<sup>1,2,3,4</sup>U.G Students, <sup>5</sup>Assistant Professor  
Department of Electrical & Electronics,  
S.T.J. Institute of Technology, Ranebennur, Karnataka, India

**Abstract:** Recently vehicle tracking system is getting vast popularity because of the rising number of the stolen vehicles. Vehicle theft is happening on parking and sometimes driving in unsecured places. This research work explores how to avoid this kind of stealing and provides more security to the vehicles. The implemented system contains single-board embedded system which is equipped with global system for mobile (GSM) and global positioning system (GPS) along with a microcontroller installed in the vehicle. The use of GSM and GPS technologies allows the system to track the object and provides the most up-to-date information about on-going trips. Moreover, fingerprint verification is done in the implemented system to ensure the driving of correct person. The implemented system is very simple with greater security for vehicle anti-theft protection and low cost technique compared to others.

**Keywords:** GMS; GPS; fingerprint; embedded system; vehicle anti-theft protection.

## 1. INTRODUCTION

A vehicle tracking system combines the installation of an electronic device in a vehicle or fleet of vehicle to enable the owner or third party to track the vehicle's location and collecting data in the process. Modern Vehicle Tracking system (VTS) is the technology used to determine the location of a vehicle using different methods like GSM and GPS module and other radio navigation systems operating through satellites and ground based stations. GSM and GPS based vehicle location and tracking system provides effective, real time mapping based vehicle location tracking. The system uses geographic position and time information from the Global Positioning Satellites.

After emerging of GPS system developed by The United States government, first it was only for military purpose. After opening for public, it has been used widely. Al-Bayari and Sadoun discussed in details Automatic Vehicle Location (AVL) system that works under GIS environment. A complete FPGA implementation of the vehicle position tracking system using short message services (SMS) was reported by Hapsari.

In this project work, a system has been developed based on microcontroller that consists of a GPS and GSM. A two way communication process is achieved using a GSM modem. This study also comprises of a bio-metric protection system of the vehicle and fingerprint verification of the driver of the vehicle is used to protect the vehicle from anti-theft. Fingerprint recognition or fingerprint authentication can be defined as a method of verifying a match between two human fingerprints in an automated behaviour. Fingerprints are one of many forms of biometrics used to identify individuals and verify their identity. It is known that every person has a unique fingerprint image. When driver gives his verified fingerprint image before starting the vehicle, the system will be considered as fair condition. But when vehicle's location is changed without fingerprint verification, the system will be taken as abnormal condition. Then the system will send an SMS to owner of the vehicle with an URL of 'GOOGLE MAP' having the coordinate of the current location of the vehicle. SMS will be then sent to the owner having updated location's co-ordinate every interval of 10 seconds until doing the proper fingerprint verification. Moreover, vehicle's owner can get the vehicle's location at any time by SMS.

## 2. RELATED WORK

**1. Arias Tanti Hapsari** says that design of a system that can give information of vehicle position every time theirs is a request for it. The information of vehicle position is gained from GPS and it is transmitted using short message services.

**2. M.F. Saaid, M.A. Kamaludin, M.S.A. Megat Ali,** says that detailed study to create a controllable system that can display the location of a vehicle using GPS to pin point the location and GSM as mean for communicating with the vehicle for ease of finding after a theft attempt. The result of the test concludes that the system can provide standard GPS coordinate when requested via Short Message Service (SMS).

**3. Mrinmoy Dey, Md Akteruzzaman arif** says that research work explores how to avoid stealing and provides more security to the vehicles. Moreover, fingerprint verification is done in the implemented system to ensure the driving of correct person.

**3. PROPOSED WORK**

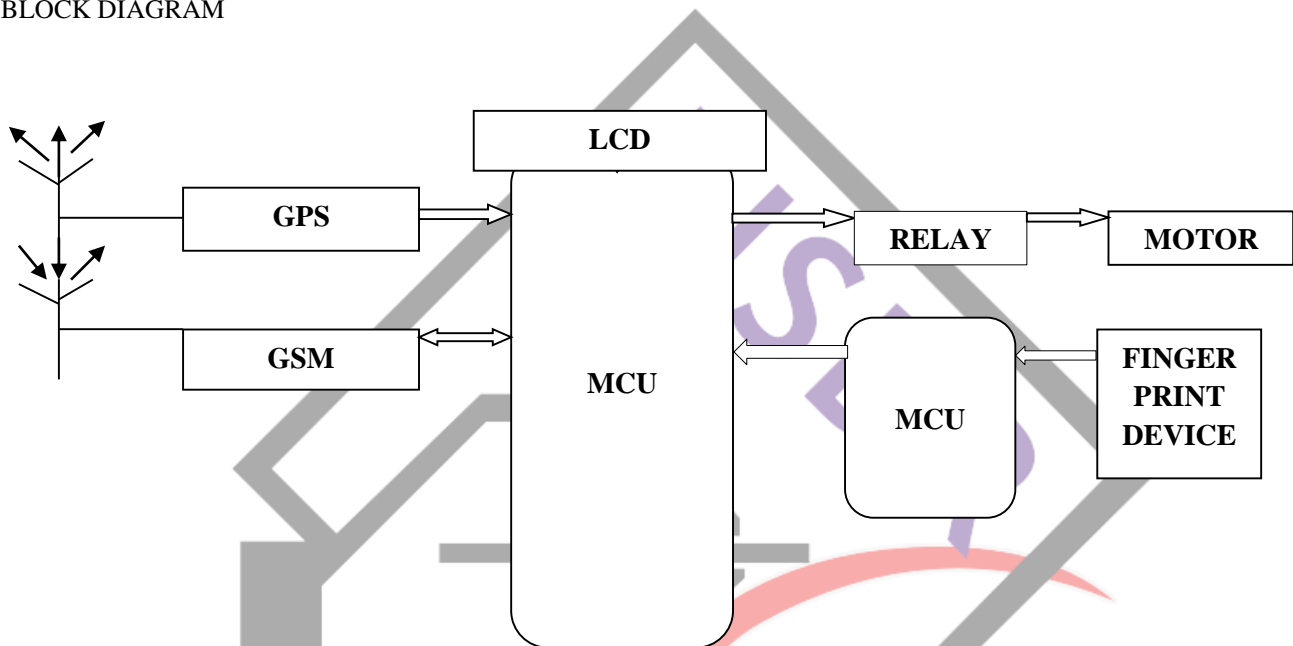
This research work explores how to avoid this kind of stealing and provides more security to the vehicles. The implemented system contains single-board embedded system which is equipped with global system for mobile (GSM) and global positioning system (GPS) along with a microcontroller installed in the vehicle. The use of GSM and GPS technologies allows the system to track the object and provides the most up-to date information about on-going trips. Moreover, fingerprint verification is done in the implemented system to ensure the driving of correct person. The implemented system is very simple with greater security for vehicle anti-theft protection and low cost technique compared to others.

**4. PROBLEM STATEMENT**

Recently vehicle tracking system is getting vast popularity because of the rising number of the stolen vehicles. Vehicle theft is happening on parking and sometimes driving in unsecured places. Today’s vehicles are available with ignition system with key approach. This all above overcome with biometric.

**5. METHODOLOGIES**

**BLOCK DIAGRAM**



**5.1 Liquid Crystal Display (LCD):**

We have incorporated the LCD display into the cell phone based voting machine module so as to facilitate error detection & control, and to indicate the function being performed by it at that moment.

**5.2 Voltage Regulators:**

We have used L7805CV, and LM317T. L7805CV to regulate the voltage being supplied to the most of the hardware devices used and LM317T (present in the GSM module) to regulate the voltage being supplied to the GSM Modem.

**5.3 Relay:**

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.

**5.4 MCU:**

We have used the SST89e516rd2 microcontroller for our application. Here a microcontroller code is written which is used to control the direction of the robot i.e. by controlling the movement of the wheel.

**5.5 GSM MODEM:**

It is the Transceiver of the cell phone based voting machine module. We have used a SIM300 V7.03 Modem, which is supported by the rest of the GSM module.

**5.6 Motor:**

The movement system is an important part of the robot. Therefore two DC motors are used to provide support for the robot movement.

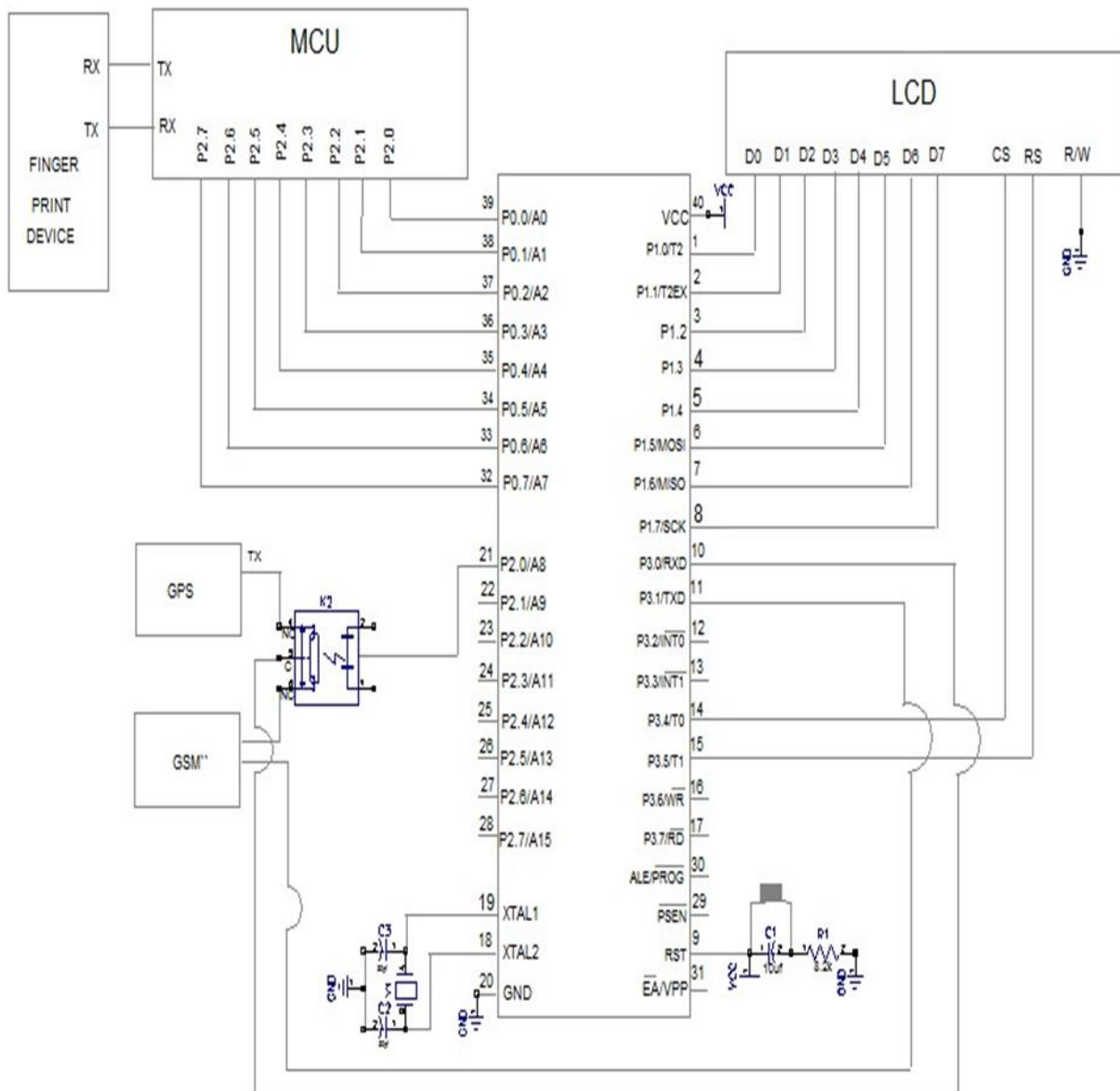
**5.7 Fingerprint Device:**

This is a finger print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person.

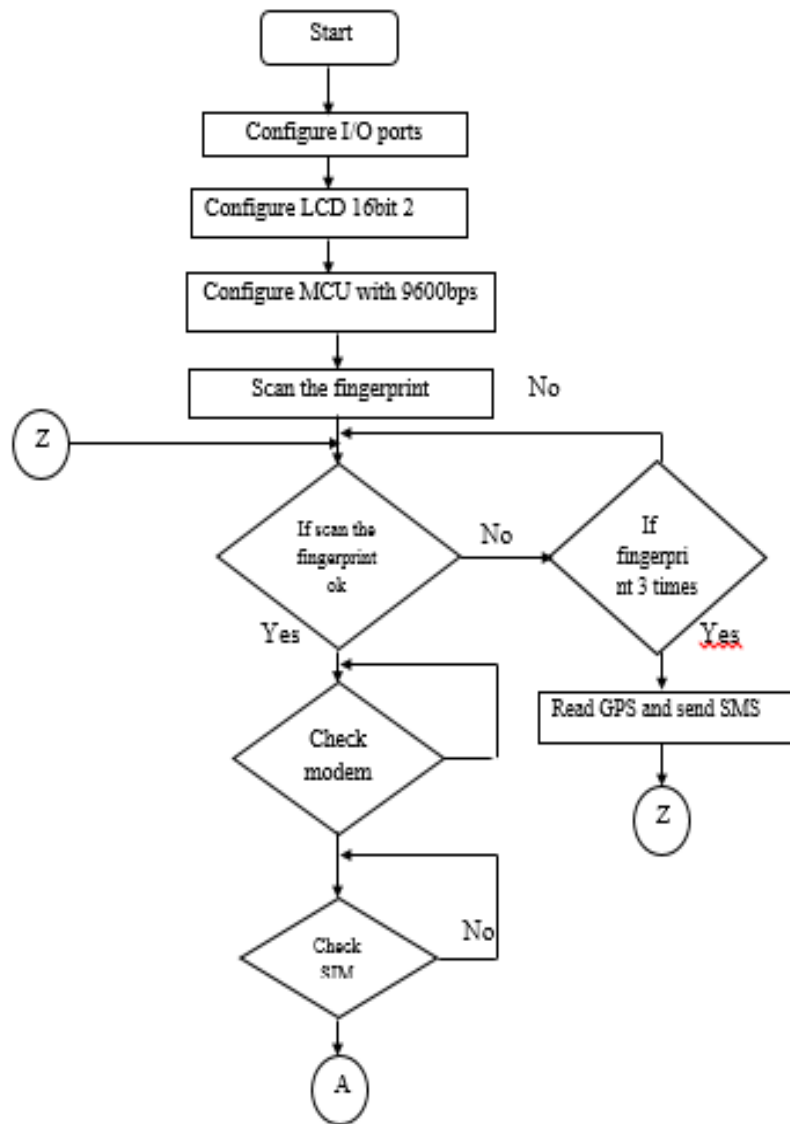
**5.8 Power Supply:**

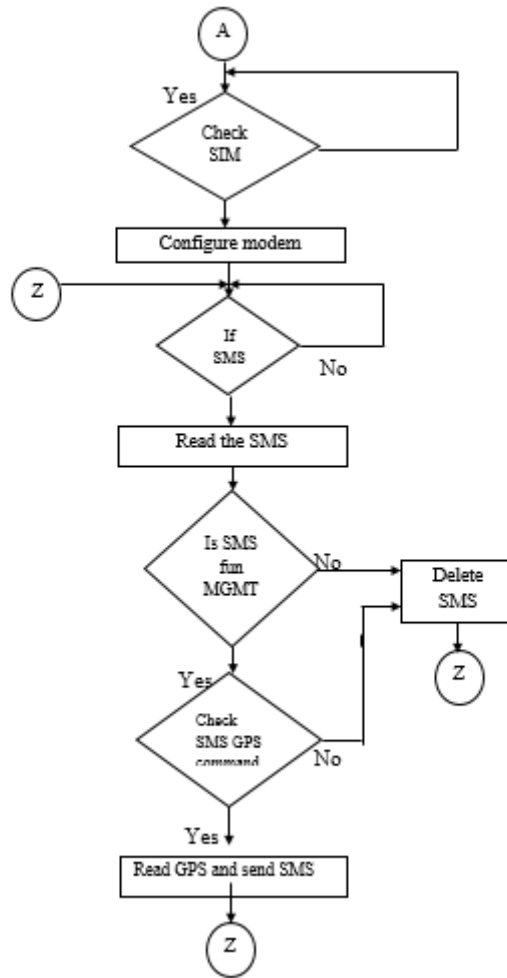
Power supply unit supplies power to an entire unit. 12V DC battery is used as a power supply unit. The 7805 voltage regulator is used to convert 12V to 5V

**6. CIRCUIT DIAGRAM**



7. FLOW CHART





### 8. RESULT AND DISCUSSION

OUTCOME OF THE PROJECT:

LCD display the words of input which means Also fingerprint system is ON condition the system is in ON condition.



Then scan the fingerprint

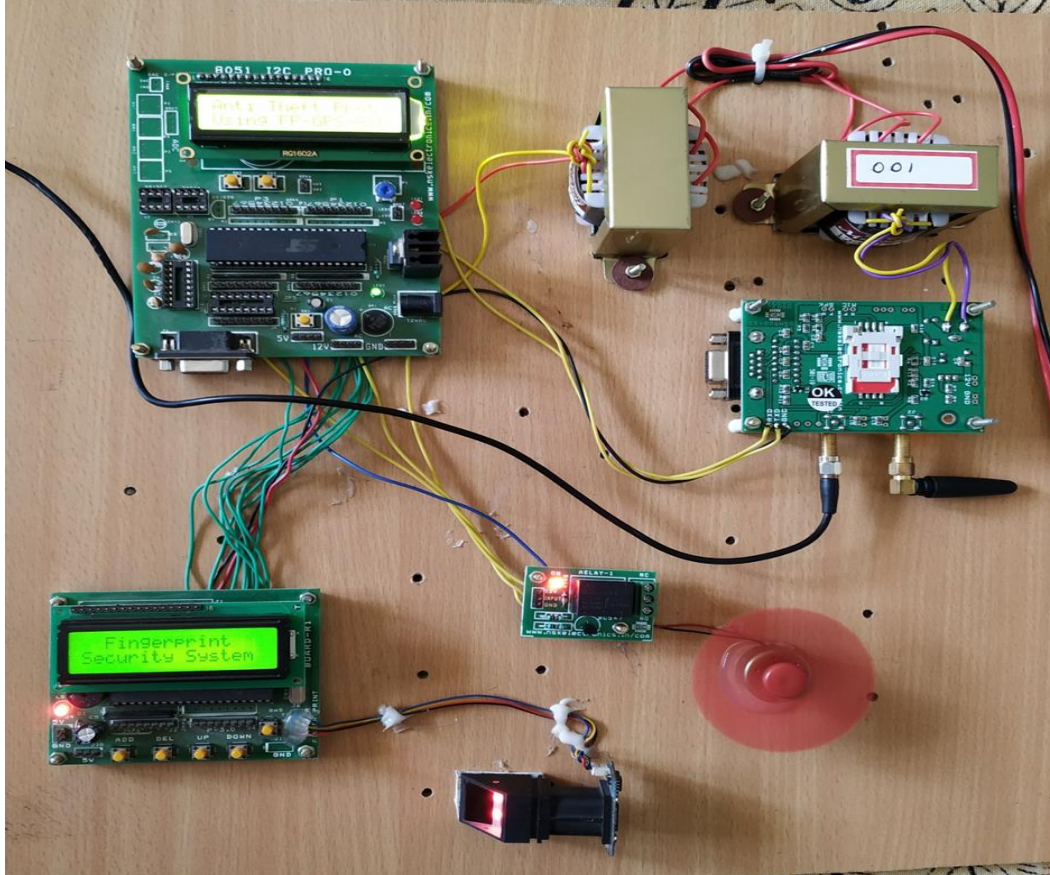
vehicle is started and SMS will be sent



## 9. DISCUSSION

When fingerprint module is interfaced to the microcontroller. It will be user module in this mode stored images will be verified with the scanned images when coming to our application the image of person's fingerprint that are authorized to start the vehicles will be stored in the module with a unique ID. To prove that the persons are authorized to start the vehicles they need to scan their fingerprint images. The scanner is interfaced to 8051 microcontroller this controller will be controlling the scanning processes.

## 10. EXPERIMENTAL SETUP



## 11. CONCLUSION AND FUTURE SCOPE

### CONCLUSION

In this research work, vehicle location can be tracked and prevention of it from theft with fingerprint verification is done with minimum cost in quasi real-time mode. Fingerprint technology is very effective security check technology and also in lower cost to avoid stealing of vehicles. In future, smart-phone (i.e. android, windows) application can be made and interfacing a dedicated smart-phone installed in vehicle with fingerprint device can be done to get real-time vehicle tracking with interactive mapping.

### FUTURE SCOPE

In this project we detect the location of theft vehicles using Google earth and also we control the vehicles using start and stop SMS.

### REFERENCES

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