

Vehicle security system using Biometric finger print using GSM and SMS Alerts

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Abstract— Security is of high concern now a days. Vehicle fingerprint recognition system guarantees the best ensure to secure your vehicle from various types of burglary cases. Biometric identification of a person is fast, easy-to-use, precise, trustworthy and economical over traditional knowledge-based and token-based methods.

This proposed work is an attempt to design an advance vehicle security system that uses Fingerprint Recognition along GPS and GSM system to prevent theft and to determine the exact location of vehicle including other various security mechanisms.

Index Terms— Cloud Computing, multiple users, dynamic secret key, ranked keyword search

I. INTRODUCTION

In this present world where the technology is growing day by day. And lot of research is going on enhance the existing technology. Now a days security is high concern at present vehicle usage is basically necessary for every one. Simultaneously protecting the vehicle from the theft and also other type of bulgry activities. Previously security system contain some sensor, alarm system and cost of sensor is also high. If vehicle is stolen no alternative methods be available to help the owner of the vehicle to find vehicle back.

The main aim of our paper is to provide the high security to the vehicle. And allow only authenticated users. It also user friendly, fast access, fingerprint reorganization technology. Along with GPS and GSM system. The prototype model for vehicle security system is built on embedded platform using ARM microcontroller which control the all the operations. Cost of this is less and also it enhance the security. If theft attempt to unlock the vehicle using a duplicated key, metal sensor sense it and send a SMS to owner. Fingerprint recognition system is provided at the engine ignition. By using the GPS technology vehicle tracking is very easy. Thus the our system provide high security at all the level.

II. LITERATURE SURVEY

According to international Interpol statistic revealed that 4.2 million vehicle stolen in 2008 from 149 countries. Because of this Insurance companies phase the problems. Later they start finding the solution for this.

A. Existing system

Existing system contain the alarm system it has some disadvantages like

1. Most of vehicle has similar kind of sound.
2. Alarms can be easily disabled on the theft attempt.
3. Alarms can be mitigated in crowded area. Along with this they use the GPS and GSM system for communication purpose.

B. Proposed system

Presently proposed system include biometric fingerprint technology which enhance the security of the vehicle. It allow only authenticated user (it hold the 5 sample finger print) and along with this we include IR sensor for motion detection. And ultrasonic sensor for detection of elevation it detects if any elevation occur. To provide high security we added GPS and GSM for tracking and SMS alert to avoid the fuel theft from the vehicle we introduce the fuel sensor it sense and send a SMS to the owner of the vehicle if fuel is theft. Along with this we provide metal sensor for key detection it sense the metal key and immediately send a SMS to the owner if it is authorized key then it unlock the vehicle with the permission of the owner.

One of the main advantage of this is low cost when compare to other security system which are available in the market. This can be implemented in any type of the vehicle to provide the high security to the vehicle. However the theft is intelligent he can't break our security system he may fail in any one of the attempts above mentioned

III. SOFTWARE AND HARDWARE REQUIREMENTS

Hardware Requirements

- Arm 7 microcontroller
- Power supply unit

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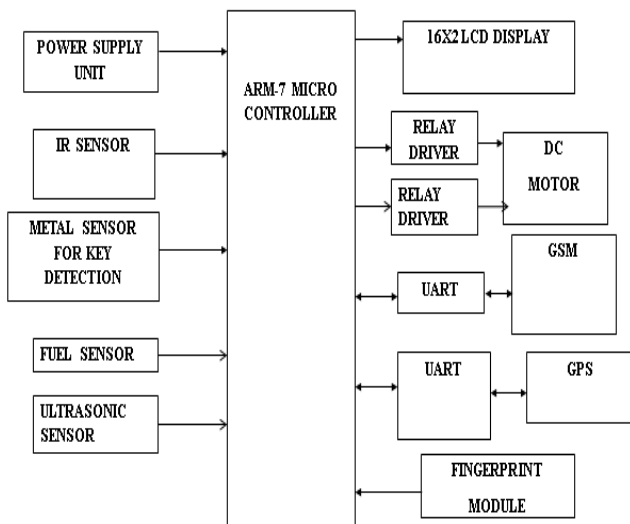
- Metal Sensor
- LCD Display Unit
- IR Sensor
- Relay Driver
- GPS
- GSM
- Fingerprint Module
- Ultrasonic sensor

Software Requirements

- Keil uVision 4
- Flash Magic
- Express PCB

Here we are writing the code in Embedded C language and using the Flash Magic software in order to dump the code into the hardware for interfacing purpose. We have used the Express PCB software for designing circuits

IV. BLOCK DIAGRAM



V. HARDWARE COMPONENTS

• LCD PIN DESCRIPTION

The LCD we are using in this project is 16x2 display which means they can display 16 characters per line and there are 2 such lines.

• FINGERPRINT MODULE

A fingerprint sensor has 2 basic jobs:

It needs to get an image of your finger and it needs to determine whether the pattern of ridges and valleys in this image matches the pattern of ridges and valleys in pre-scanned images. The Sensor can perform three functions as mentioned below:

Add (enroll), Empty database or Search database and return ID to stored fingerprint

• METAL SENSOR

Sensors are solely for the detection of metal objects. They basically comprise an oscillator whose windings constitute the sensing face. When a metal object is placed within the magnetic field generated by the sensor, the resulting currents induced form an additional load and the oscillation ceases.

- ❖ Oscillator
- ❖ Output Driver
- ❖ Output Stage

• ULTRASONIC SENSOR

An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back.

Ultrasonic ranging module : HC-SR04

• INFRARED SENSOR

IR Receiver Modules : TSOP38..

Specifications

- ▶ Very low supply current
- ▶ Photo detector and preamplifier in one package
- ▶ Internal filter for PCM frequency
- ▶ Supply voltage: 2.5 V to 5.5 V
- ▶ Improved immunity against ambient light
- ▶ Insensitive to supply voltage ripple and noise

• GSM

- ▶ We are using SIM300 module. It's a tri-band which operates in three frequencies: 900MHz, 1800MHz, 1900MHz.
- ▶ With a tiny configuration of 40mm x 33mm x 2.85 mm.
- ▶ The SIM300 is designed with a power-saving technique, the current consumption as low as 2.5mA.
- ▶ Power Supply is 3.4V - 4.5V.

• GPS

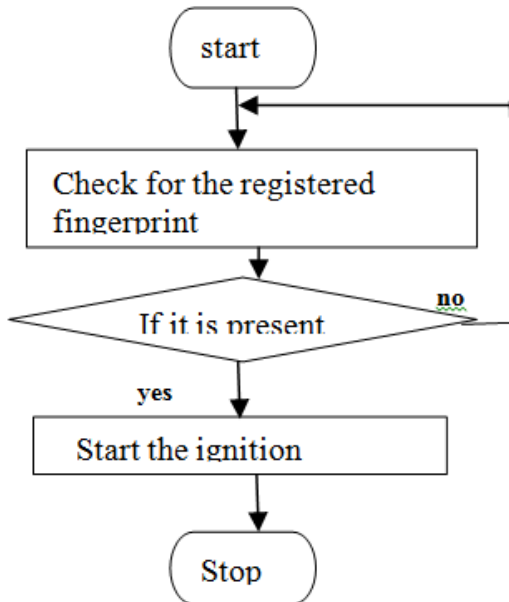
- ▶ It is optimized for applications required for good performance, low cost, max flexibility.
- ▶ Acquisition sensitivity of -140dBm and tracking sensitivity of -162dBm.
- ▶ Supply voltage is 3.8V-5.0V.
- ▶ Pin configuration

- ❖ G : Ground
- ❖ R: Serial port input
- ❖ T: Serial port output
- ❖ V: supply voltage 3.3 to 5V

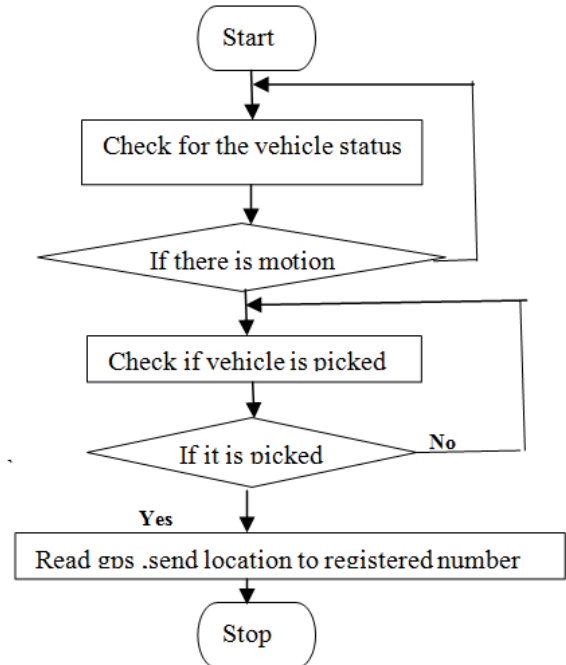
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VI. FLOW CHART

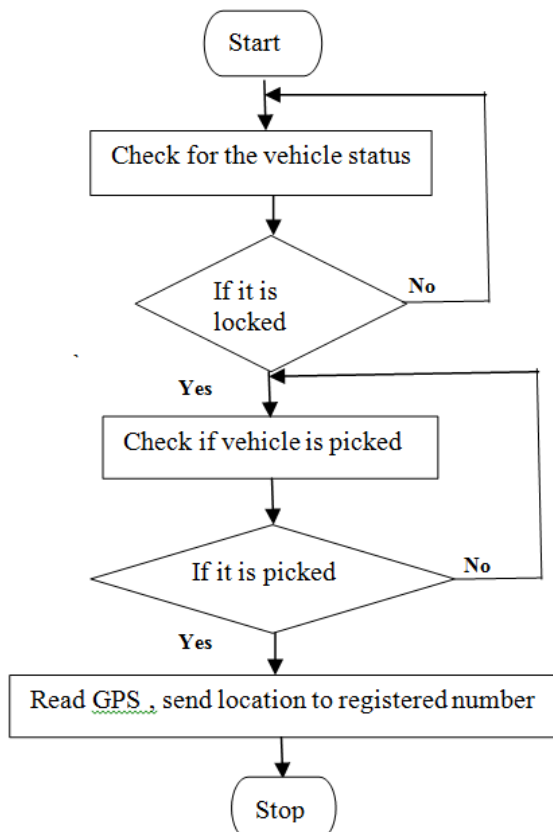
Case1: When user gives his fingerprint



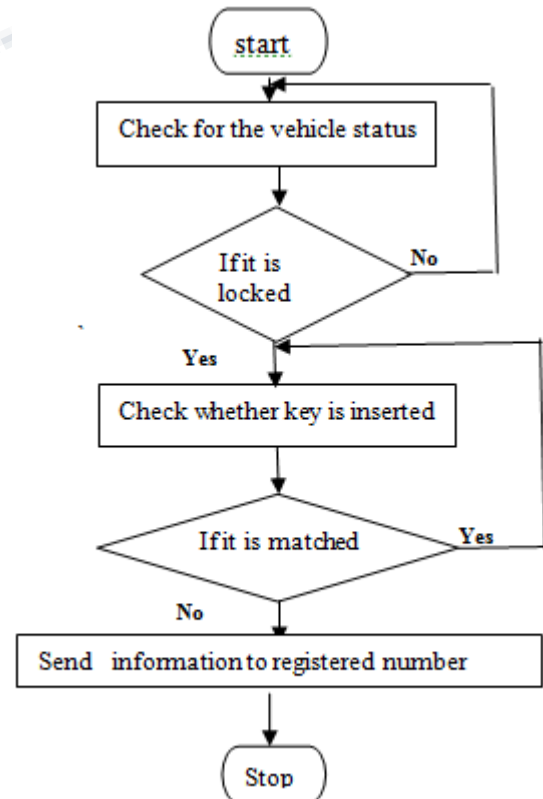
Case2: When there is any motion near vehicle (IR Sensor)



Case2: When vehicle is elevated (Ultrasonic Sensor)

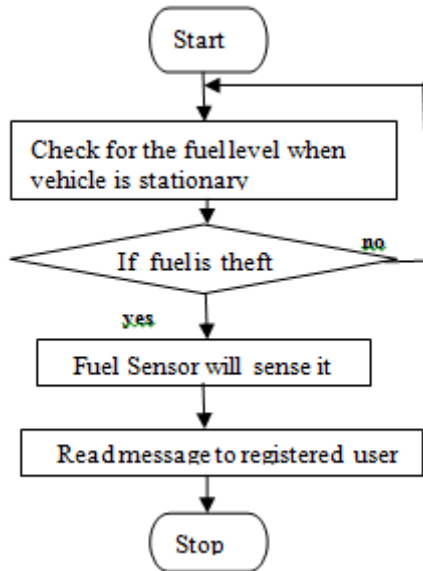


Case3: When metal key is inserted in vehicle (Metal Sensor)



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Case4: When fuel is theft(Fuel Sensor)



VII CONCLUSION

Fingerprint is unique for every person and allows only selected users to access the vehicle, the expected result by implementing this model on the car is that only the authorized person will be able to ignite the car. Not every person with a key will be able to start the car. There will be matching of the person's data with the stored one and only in the case of match the car will start otherwise not. Thus by implementing this relatively cheap and easily available system on a vehicle one can ensure much greater security and exclusivity than that offered by a conventional lock and key.

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