Arm Based Vehicle Theft Identification system

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Abstract - **Vehicle security is a high concern now every day. Vehicle fingerprint recognition system guarantees the best ensure to secure your vehicle from various types of theft cases. Biometric identification of person is gives fast and easy access to use, trust worthy and economical over traditional knowledge based and token methods. This our proposed system attempt to design a vehicle security system that uses fingerprint recognition system with GPS, GSM system to prevent theft and to determine the exact location we kind find easily and stop the ignitions to protect the theft of vehicle including other various security mechanisms.**

keywords - **ARM Microcontroller,Global Positioning System(GPS),Global System for Mobile Communication(GSM), Biometric fingerprint recognitions. ..**

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I. INTRODUCTION

In recent days more number of vehicle theft is increasing by day to day. In present world where the technology is very fastly growing so now security is high concern at present vehicle usage is basically necessary for every vehicle. Simultaneously vehicle protection from anti-theft because worldwide in one day theft happen in every 5 min. Theft is now a days major criminal activities so the most vehicle manufactures company are try to provide more improved features for the security of vehicle. Main aim of this paper is provide high security and allow only authenticated user to start the vehicle. It is very easy to use and with high security and fast access using fingerprint recognition technology. Along with GPS and GSM system. the vehicle security system is built on embedded platform using ARM 7 Microcontoller which control many operations faster rather than any other controller and cost of this is less and also it enhance the security. If theft attempt to unlock the vehicle suing a duplicated key, metal sensor sense it and send the SMS to owner. Fingerprint recognition system is provided at the engine ignition . GPS technology is used to track vehicle. Thus this system designed to provide high security to the vehicle at all level.

II. OVERVIEW

According to international Interpol in a single year theft cases reveled that 10.2 million vehicles theft happen in 2018-19 from 90 countries. Because of this insurance companies phase the problem of this insurance companies phase the problem later they start finding the solution for this.

III. PROPOSED SYSTEM

Existing system contain the alarm system it has some disadvantages like
1.   Many of vehicle has similar kind of sound.
2.   Alarms can be easily disabled on the theft attempt.so it is not proper solution.

Alarms can be mitigated in crowded area. Along with this they use the GPS and GSM system for communication purpose.

Most of the People thinks that vehicle theft can be happens only in big towns/cities or in seedy areas but in present days it can happens anywhere anytime. vehicle theft is not the earliest   crime behaviour it happening from many years. Vehicle central locking system gives the more safety to protect our vehicle from theft situation, it is a vehicle security device that help to protect our vehicle from theft. To lock and unlock doors by pressing the buttons is easy to driver/vehicle user by using central locking security system. Mainly two type vehicle unlock system used mostly automatic central locking system and manual locking system. So in our paper we made high developed and easy, faster system by using fingerprint recognition, GSM & GPS system. Proposed system include biometric fingerprint technology which enhance the security of the vehicle.it allow only authenticated users only.(we can use 5 sample fingerprint store in system for authentication) and including IR sensor for motion detection and to provide high security we add GPS and GSM for tracking the vehicle and for SMS alert to avoid the fuel theft from the vehicle we included fuel sensor is sense and send a SMS to the owner of the vehicle if fuel is theft, along we provide metal detection is used to sense metal key and immediately send SMS to owner if it is authorized key then it unlock the vehicle with the permission of the owner. One of the main advantage this system is very low cost as compare to other security system which is available in market. This can easily implemented in any type of vehicle to provide high security to the vehicle.

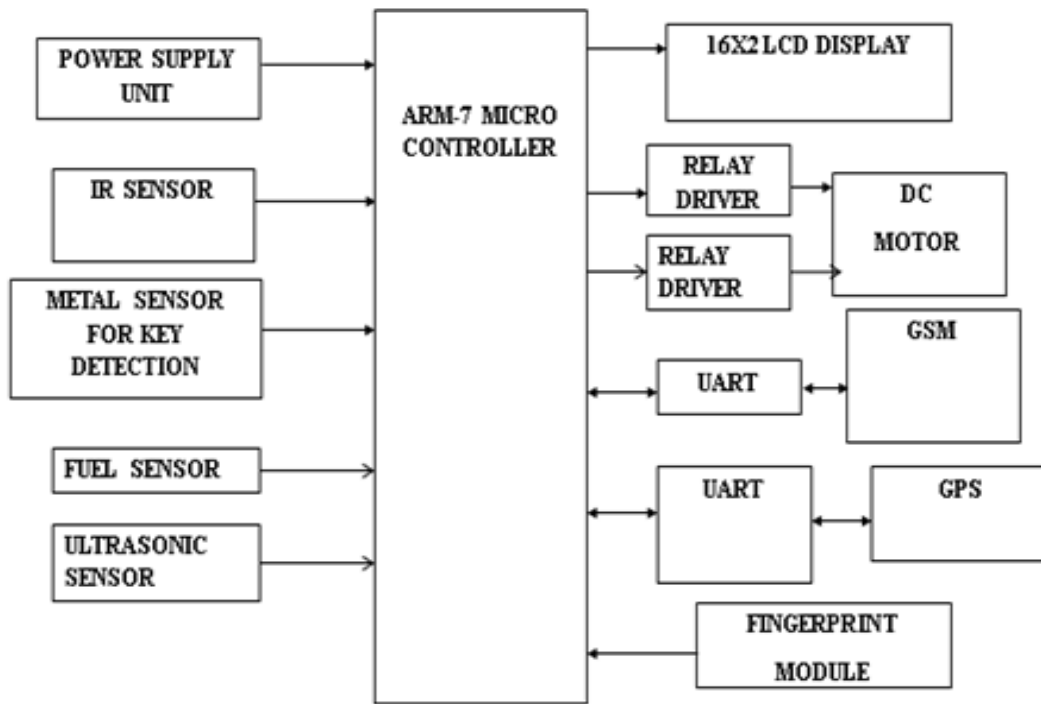## IV. SOFTWARE AND HARDWARE REQUIREMENTS

HARDWARE REQUIREMENTS

➢   ARM 7 microcontroller
➢   Power supply unit

- ➢ Metal sensor
- ➢ Lcd Display 16*2 unit
- ➢ IR Sensor
- ➢ Relay Driver
- ➢ GPS
- ➢ GSM
- ➢ Fingerprint Module

SOFTWARE REQUIREMENT

- ➢ Keil u vision 4
- ➢ Flash magic
- ➢ Express pcb

V. ʙLOCK DIAGRAM

VI. FLOWCHART
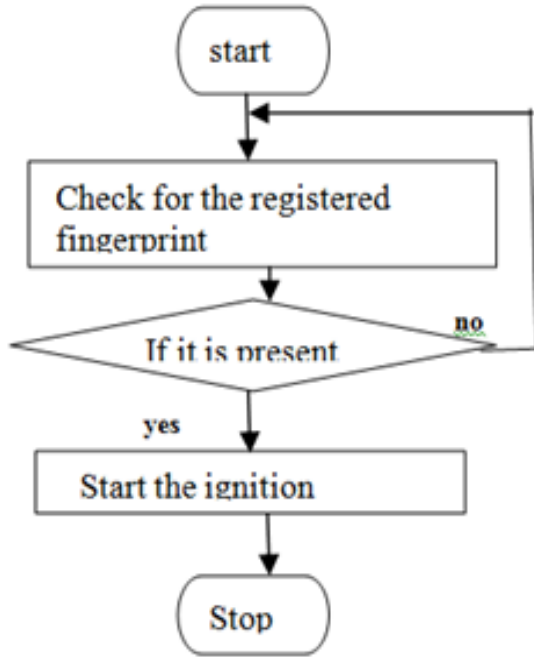
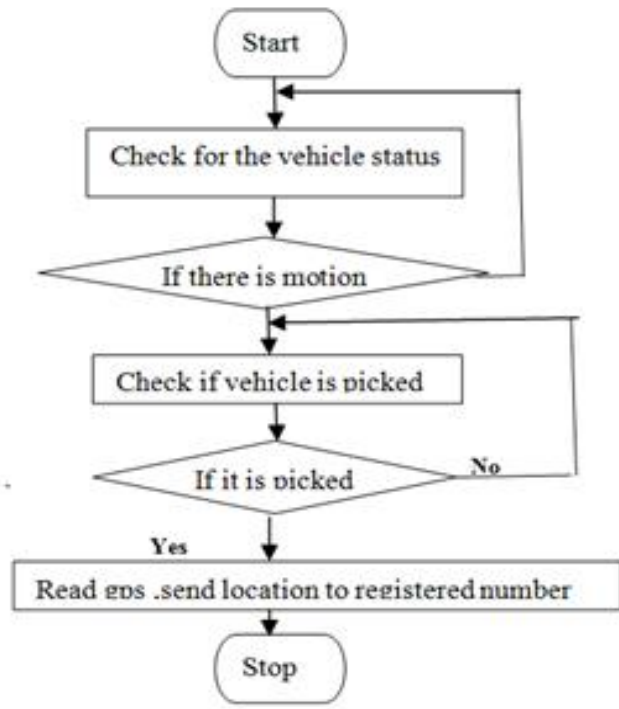Fig.1 When user keep fingerprint on biometric.   Fig.2 when any motion sense detected near vehicle(IR
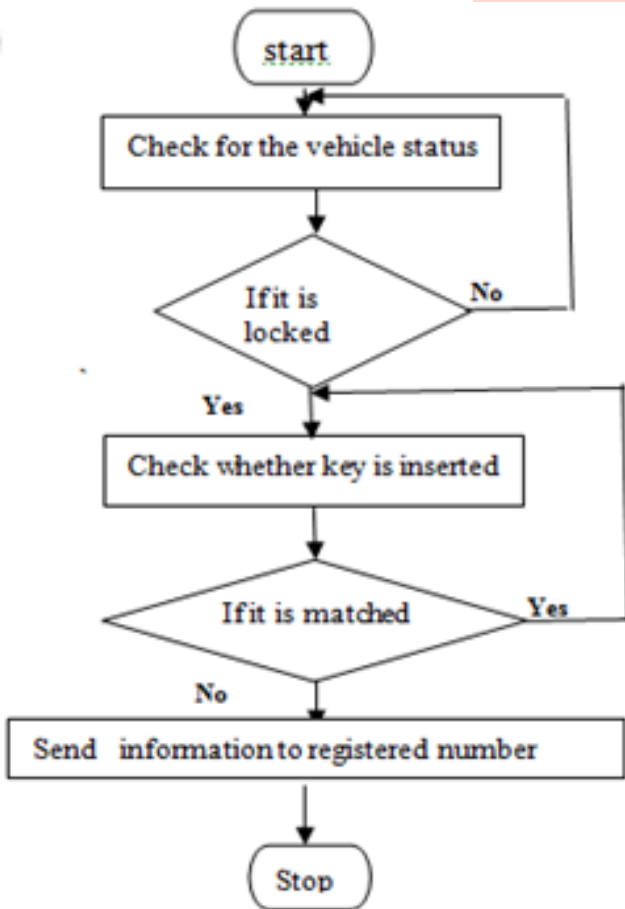sensor)

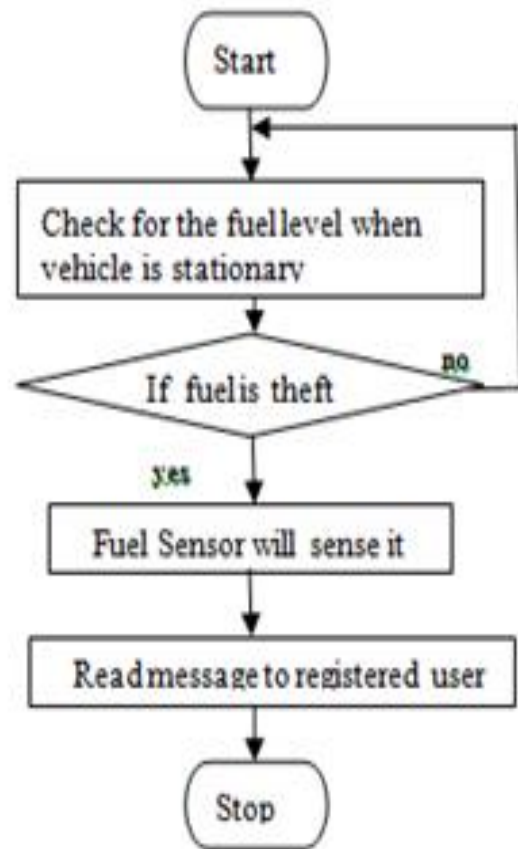Fig.3 When metal is(key) inserted in vehicle (Metal sensor)   Fig.4 when fuel is theft(fuel sensor)

VII. HARDWARE COMPONENT

1. **LCD PIN DESCRIPITION**

To display the message we are using the LCD display in this project is 16x2 display. This 16x2 display can shows 16 characters per line on 2 lines.

2. FINGERPRINT MODULE
A fingerprint sensor has two basic functions:
It get an fingerprint of your finger and it needs to determine whether the sample of ridges and valleys in this image matches the sample of ridges and valleys in pre-scanned fingerprint. The Sensor used for three functions as below mentioned 1.Add (enroll) ,2.Empty database or Search database and 3.Return ID to stored fingerprint.

3. METAL SENSOR
Metal Sensors are used for the detection of metal objects. They basically comprise an oscillator whose windings constitute the sensing face. When a metal object is placed such as metal key 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

4. INFRARDED SENSOR IR Receiver Modules : TSOP38

Specifications
- ➢ Supply current is very Low
- ➢ For PCM frequency preamplifier and Photo detector in one package Internal filter
- ➢ Input power : 2.5 V to 5.5 V
- ➢ Improved immunity against ambient light
- ➢ Insensitive to supply voltage ripple and noise

5. GSM

- ➢ We are using SIM300 module It's is 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 power saving technique, the current consumption to as low as 2.5mA PWM unit.

6. GPS

- ➢ It is used for applications which required good performance, low cost, maximum 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

7. ARM 7 (LPC 2148):

ARM 7 LPC2148 is a 32-bit microcontroller. This microcontroller has high performance and very low power consumption. The architecture of ARM processor is based on RISC (Reduced Instruction Set Computer) principles. The Reduced instruction set and related decode mechanism are simpler than those of CISC(Complex instruction set computer). This gives response in quick results and real-time interrupt results becomes impressive from a little and price effective core. . It is mainly used in portable devices because it consume low power and better performance features.

ARM FEATURES
1. ARM 7 microcontroller with 16/32 bits comes in a tiny LQFP64 package.
2. On-chip static RAM of 8 to 40 kB and on-chip flash memory of 32 to 512 kB with 12b bit wide interface/accelerator which enables a high-speed 60 MHz operation.
3. In System Programming/In Application Programming (ISP/IAP) is possible through an on-chip boot loader software.
4. The operating voltage range of CPU is 3 to 3.6V with 5V tolerant I/O pads.
5. idle and power down Power saving mode.
6. 21 external interrupt pins are available.
7. A maximum clock frequency of 60 MHz is available for CPU from a programmable on-chip PLL with 100 µs settling time.

8. A total of 45 fast general purpose I/O pins which are tolerant up to 5V are available.

VIII. ADVANTAGE'S
1. We can easily control the vehicle theft
2. Easy to access and installation.
3. It can helps to reduce the vehicle theft.

VIII. CONCLUSION AND FUTURE WORK

Fingerprint is unique for every person and allows only selected users to access the vehicle, the expected result by implementing this model on the vehicle is that only the authorized person will be able to ignite the vehicle. Another person with a key without authentication will not be able to start the vehicle . There will be matching of the person's data with the stored data and only in the case of matched data the vehicle will start otherwise not. Thus by system implementation relatively minimum cost and easily available system on a vehicle one of the trusted with high security. Which combine fingerprint (patterns of ridges and valleys) with GSM and GPS with this proposed system. This system allows one or more persons to control the function of device and the authenticity provided by the fingerprint sensor to reduce the failure and correction time. The ARM microcontroller model implemented in such type of various application. This system not only provides switching function of vehicle also provide the exact location of the vehicle. Therefore It can be easy to detect the theft of the vehicle. It gives complete knowledge of designing microcontroller based system and developing embedded software. In future cloud computing technology can be include in this system so every activity performed in the vehicle can be easily monitored by the user. Because of this no need to store all the log-in details in the system storage.

X. REFERENCE

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