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Vehicle Ignition Locking System Using Fingerprint with Gsm Module

Asst. Prof. Venkatesh Munagala Jagadeesh Gade Vinay Reddy Mekka
Anudeep Kurganti Sravan Kumar Kunchala
Department of ECE
VVIT, Nambur
Guntur, Andhra Pradesh, India
gadejagadeesh15@gmail.com

Abstract **- Biometric systems have overtime served as robust security mechanisms in various domains. Fingerprints are the oldest and most widely used form of biometric identification. A critical step in exploring its advantages is to adopt it for use as a form of security in already existing systems, such as vehicles. This research work focuses on the use of fingerprints for vehicle ignition, as opposed to the conventional method of using keys. The prototype system could be divided into the following modules: fingerprint analysis software module that accepts fingerprints images; hardware interface module and the ignition system module. The fingerprint recognition software enables fingerprints of valid users of the vehicle to be enrolled in a database. Before any user can ignite the vehicle, his/her fingerprint image is matched against the fingerprints in the database while users with no match in the database are prevented from igniting the vehicle. Control for the ignition system of the vehicle is achieved by sending appropriate signals to the parallel port of the computer and subsequently to the interface control circuit. The developed prototype serves as an impetus to drive future research, geared towards developing a more robust and embedded real-time fingerprint based ignition systems in vehicles.**

Keywords- **Fingerprints, Biometrics, Ignition, Interface, Vehicles, GSM Module, LCD**

I. INTRODUCTION

Biometrics refers to the automatic identification of a living person based on physiological or behavioral characteristics for authentication purpose. Biometric method requires the physical presence of the person to be identified. This emphasizes its preference over the traditional method of identifying 'what you have' such as, the use of password, a smartcard etc. Also, it potentially prevents unauthorized Admittance to access control systems or fraudulent use of ATMs, Time & Attendance Systems, cellular phones, smart cards, desktop PCs, Workstations, vehicles and computer networks.

Biometric recognition systems offer greater security and convenience than traditional methods of personal recognition. Fingerprint recognition represents the oldest method of biometric identification which is dated back to 2200 BC. The use of fingerprints as a personal code has a long tradition and was already used by the Chinese and the Japanese. All human beings have unique, immutable fingerprints.

A fingerprint is made of a series of ridges and furrows/valleys on the surface of the finger. The uniqueness of a fingerprint can be determined by the pattern of ridge and furrows as well as the minutiae points. Minutiae points are local ridge characteristics that occur at either a ridge bifurcation or a ridge ending. Fingerprint images are rarely of perfect quality. They may be degraded and corrupted with elements of noise due to many factors including variations in skin and impression conditions. This degradation can result in a significant number of spurious minutiae being created and genuine minutiae being ignored. Thus, it is necessary to employ image enhancement techniques prior to minutiae extraction to obtain a more reliable estimate of minutiae location. The prices of fingerprint recognition systems compared to other biometric systems are quite low and the user acceptance is very high. The strength of fingerprint identification is that it can be deployed in a varied range of environments. Also, it is a proven core technology and, the ability of enrolling multiple fingers can increase the system accuracy and the flexibility dramatically.

There is a present demand for robust security systems in vehicles. Therefore, the usefulness of designing and implementing a biometric security system using fingerprint technology, to prevent unauthorized vehicle ignition cannot be overemphasized. Biometric GSM

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system and owners can receive SMS notification of about vehicle when unauthorized person access.

The fingerprint has a lot of advantages, such as unique, permanent, good anti-fake and easy to use. So it is recognized increasingly by people. Fig. shows the general architecture of a biometric system. Biometrics systems work by recording and comparing biometric characteristics. When an individual first uses a biometric system, their identifying features are enrolled as a reference for future comparison. This reference may be stored in a central database or on a card (or both) depending on the needs of the application.

II. PRESENT VEHICLE IGNITIONLOCKING SYSTEM USING KEY

Under present scenario, vehicles are either cars or lorry to start using key or self. Everyone access the vehicle known or unknown person. Sometimes vehicle thefting occurs and security is less. These are avoid we propose the vehicle ignition locking system using fingerprint with GSM module.

III. PROPOSED VEHICLE IGNITION LOCKING SYSTEM USING FINGERPRINT

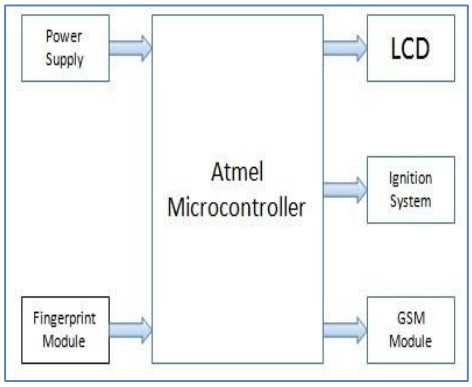

Fig.1 block diagram of whole system.

Rather than using the conventional method to start the vehicle a new method is used to start the vehicle. Fingerprint of the owner of the vehicle can start the vehicle. Rather than using the key of the car to start the vehicle fingerprint is used to ignite, since fingers can't be duplicated. The AVR microcontroller is used which is the centre of the user authentication and the vehicle ignition. The fingerprint sensor take in the fingerprint of the user which turns sends the signals to the microcontroller.

The microcontroller than matches the scanned fingerprint with the ones that are stored in its data base. Once the fingerprint is matched the microcontroller then sends the desired signal to the vehicle after which the user can start the vehicle. Fingerprints can be added or deleted as per the user convenience. Since the microcontroller has a little bit of flash memory available, the fingerprints can be stored in it. Three buttons are present which a GSM module is also used which also plays an important role.

Whenever a non- authorised person tries to scan his fingerprint, a message is sent to all the registered users. Since the vehicle will not start without the fingerprint. The vehicle needs to have fingerprints saved off all the uses who are going drive vehicle. An LCD display is also used which would display the status whether the fingerprints are being added, deleted or a successful authentication. Below figure consists of major components are LCD, GSM Module, sensors andalso power supply is major factor in all hardware components work as +5V D.C and the supply that we get in the car is a +12V DC. To control power supply using IC.

IV. SYSTEM DESCRIPTION

1. Hardware

1.1 Fingerprint Sensor- It is used to store fingerprint templates in microcontroller that are help comparing between register or not.

Fig.2 fingerprint sensor.

1.2 Lcd Display- Liquid crystal display is useful for register of persons, delete, match or mismatch identify easily.

Fig.3 LCD Display.

1.3 Gsm Module- It Sends Data When Unregister Person Is Access To Register Phone Number In A Module. It Provides Security.

Fig. 4 GSM Module.

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V. EXPERIMENTAL RESULTS

The below Fig. is that, the circuit is in initial state.

Fig.5 LCD at initial stage The following

Fig. shows that when we give a command to ENROLL by just pressing of enroll switch it will display the following one, and will be in wait state for the Fingerprint.

Fig.6 LCD after pressing Enroll button.

If No Fingerprint Detected then the circuit will display the following command.

Fig.7 LCD conveying about the wait state of the circuit.

If a fingerprint is inserted on the FP module it will ENROLL the fingerprint as like this.

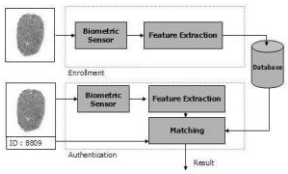

Fig.8 LCD displaying Successful Enrollment.

If the fingerprint is not match send SMS through GSM module to owner as figure is send at time.

Fig.9 Unauthorized access at time display.

IV.CONCLUSION

Thus the developed system provides fingerprint acquisition module in computer. It can realize automatically such functions as information acquisition of fingerprint, processing, wireless transmission and fingerprint matching. A fingerprint acquisition module and a wireless alarm module were designed by using the fingerprint sensor and GSM module respectively. The whole system was implemented wireless alarm through messages and internet in the GSM web. In order to achieve the simple and high real-time system, it realized low-cost and high-performance wireless fingerprint. To design and develop a low cost and easily mountable advanced fingerprint system using wireless technology for industries, colleges, hospitals, government offices etc..

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