Fingerprint Based Automatic Door Lock System

Tintu Pious, Sujina K, Sneha K

B Tech Students , Dept. of EEE, Mar Athanasius College of Engineering, Kerala, India

ABSTRACT: Human identification field is very significant and has undergone rapid changes with time. An important and very reliable human identification method is fingerprint identification. Fingerprint of every person is unique. So this helps in identifying a person or in improving security of a system. Finger print of a person is read by a special type of sensor. Finger print sensor can be interfaced with a microcontroller. Through keypad we can add new user and delete the existing user, also identify the user by selecting corresponding option through keypad. In this project we use a fingerprint sensor to read ones identity to automatically operate the door of the car. For this ,we use a microcontroller to enable the door opening or closing if the matching between scanned data and the already existing data is correct. Comparison is done inside the fingerprint module itself and its output is given to microcontroller. Result is displayed in a LCD display whether the user is authorized or not.LCD also helps to make troubleshooting easier. Alarming option is provided to warn about an unauthorized usage. Microcontroller used is PIC16F877.

KEYWORDS: Sensor,LCD.

I.INTRODUCTION

Biometrics refers to the automatic identification of a living person based on physiologi- cal or behavioral characteristics for authentication purpose. Among the existing biomet- ric technologies are the face recognition, fingerprint recognition, finger-geometry, hand geometry, iris recognition, vein recognition, voice recognition and signature recognition, 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 com- puter 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.

This system focuses on the use of fingerprints for door opening and closing. The fingerprint recognition software enables fingerprints of valid users of the vehicle to be enrolled in a database. Before any user can use 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 using the vehicle.A microcontroller stores the data equiv- alent of fingerprint of the master user.Comparison between this enrolled fingerprint and the fingerprint of the person who is about to use the vehicle is done by the micro- controller.If both the fingerprints are identical control circuitry of the microcontroller sends appropriate signals to the motor relays operating the door of the vehicle.If the fingerprints are not identical microcontroller sends signals to alarm circuitry to warn about an unauthorised use.

II.SYSTEM MODEL AND ASSUMPTIONS

Omidiora E O(A prototype of a fingerprint based ignition systems in vehicles) Database of the valid users is stored in the fingerprint module. when a person tries to operate the vehicle then the CPU matches the fingerprint of the person with the stored database if the match result is successful then the vehicle is ignited and otherwise not. External devices (hardware) can be controlled through the PC parallel port. The par- allel port is a simple and inexpensive tool for building computer controlled devices and projects. The user mode program is then made to communicate with the written device driver. The programming of this prototype was done in Visual Basic 6.0 Enterprise Edition.

Karthikeyan (Fingerprint based ignition system)

This paper focuses on the fingerprint security as every person has unique fingerprint. A keypad is also used to add or delete the valid user in the module. FIM3030 fingerprint module by NITGEN is used in this purpose. Microcontroller is used for controlling the whole driving unit. LCD is used as a displaying unit for showing the information about the authorized and unauthorized user. Latch 74HC373 is used which are high- speed Si-gate CMOS devices. A relay is used as a interfacing circuitry between the microcontroller output and the ignition system of the car. Because of the limitation in the initiation of the spark plug and safety reasons only a prototype is developed whose success only depends on the ignition of the car battery.

C O Folorunso (Design and development of finger print based car starting system) Fingerprint matching techniques are of two types: graph based and minutiae based. The template size of the biometric information based on minutiae is much smaller and the processing speed is higher than that of graph-based fingerprint matching.Modern vehicles uses computer controlled battery ignition system; no matter the type of mech- anism used, all ignition systems use battery, switch, coil, switching device and spark plug . However, in this modern technology dispensation, biometrics has been employed for the ignition and security process.
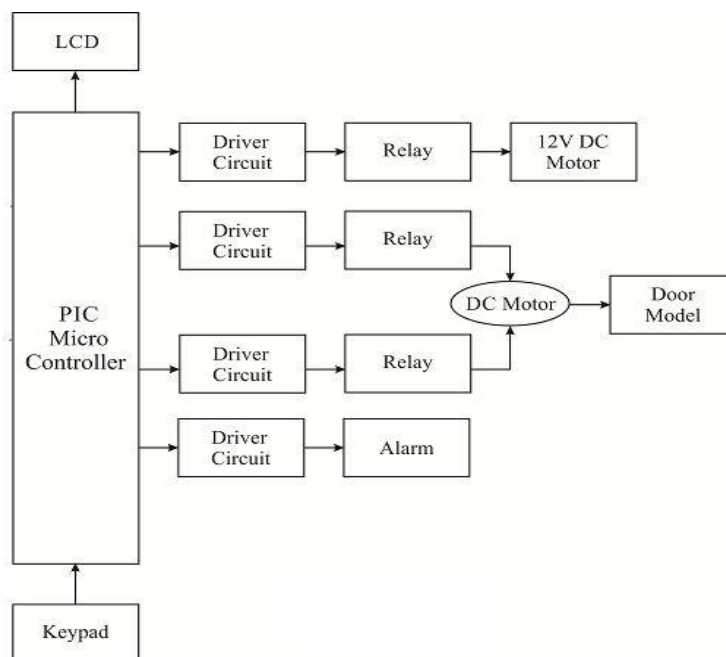
III. PROPOSED MODEL

Figure 3.1: Block schematic

The figure 3.1 shows the block diagram of fingerprint based automatic car door lock system. The core part of our project is the microcontroller PIC16F877.It has a oscillator frequency of 20 MHz .It has RISC architecture.A fingerprint sensor R303A is interfaced to the microcontroller.Two motors are used.One motor is used for operating the door of the vehicle and the other one is meant for the engine part.LCD is interfaced for display.It helps to make troubleshooting easier.An alarm circuitry is provided to warn about an unauthorized use.A keypad is provided to select the mode for the fingerprint sensor.Hardware model is shown in the Figure 4.2 and the components are also shown.

PIC MICROCONTROLLER

The microcontroller that has been used for this project is from PIC series. PIC micro- controller is the first RISC based microcontroller fabricated in CMOS (complimentary metal oxide semiconductor) that uses separate bus for instruction and data allowing simultaneous access of program and data memory. The main advantage of CMOS and RISC combination is low power consumption resulting in a very small chip size with a small pin count. The main advantage of CMOS is that it has immunity to noise than other fabrication techniques.Various microcontrollers offer different kinds of memories.
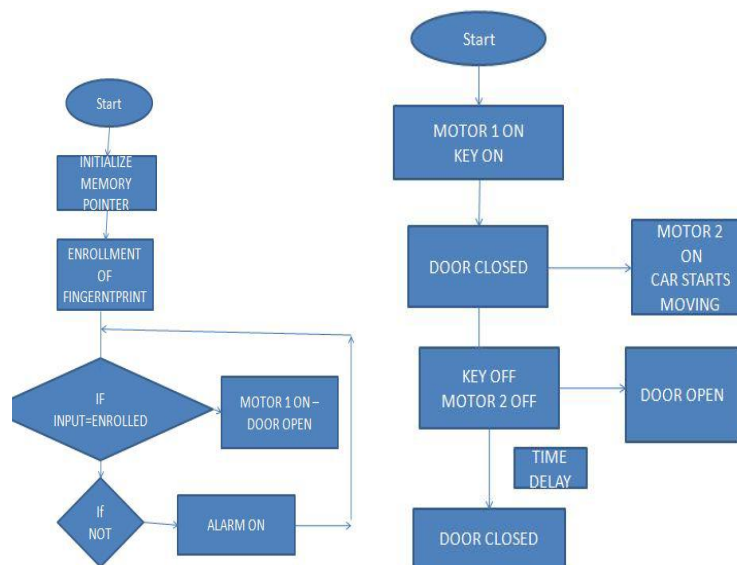
FINGERPRINT SENSOR

Fingerprint processing includes two parts: fingerprint enrollment and fingerprint match- ing (the matching can be 1:1 or 1:N). When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library. For matching, system will compare the live finger with specific template designated in the Module; for 1:N match- ing, or searching, system will search the whole finger library for the matching finger.

IV.RESULT AND DISCUSSION

First of all user is asked to enroll his fingerprint .After enrollment the user's identification is done .If the person is authorised ,the door automatically opens. After igniting the vehicle, the door automatically closes. When destination is reached ,after a keypress, the door automatically opens. After a set time delay ,the door automatically closes.

This system focuses on the use of fingerprints for door opening and closing. The fingerprint recognition software enables fingerprints of valid users of the vehicle to be enrolled in a database. Before any user can use 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 using the vehicle. A microcontroller stores the data equiv- alent of fingerprint of the master user. Comparison between this enrolled fingerprint and the fingerprint of the person who is about to use the vehicle is done by the microcontroller. If both the fingerprints are identical control circuitry of the microcontroller sends appropriate signals to the motor relays operating the door of the vehicle

V. CONCLUSION

Fingerprint identification enhances the security of a vehicle and makes it possible only for some selected people to use the car. Thus by implementing this relatively cheap and easily available system on a car, one can ensure much greater security and exclusivity than that offered by a conventional lock and key.It can be deduced that the use of biometric security systems offers a much better and foolproof means of restricting the use of vehicles by unauthorized users.The developed prototype serves as an impetus to drive future research, geared towards developing a more robust and embedded real-time fingerprint based automatic door lock systems in vehicles.

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