BIOMETRIC PRINTER SECURITY SYSTEM

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ABSTRACT

Nowadays security is playing a key role in our day-to-day life .we are securing our personal things like mobile phones, personal computers and etc. In order to secure our personal things we go for a biometric security system. Biometric security systems are recognizing particular person's physical or behavioral characteristics like fingerprint, face, iris, voice, signature, and hand etc. Compare to other biometric equipments, finger print security system is more safety and very effective.So, we use finger print scanner to provide security for printer.

KEYWORDS

Printer,Micro controller, Fingerprint, Security, Biometrics.

INTRODUCTION

Security is important to keep our personal things safe. Most of the security systems are easy breakable. Compare to others the fingerprint security is simple and economical. In this project, the fingerprint is used to provide security for the printer. By, providing security to the printer only, particular members can able to take the print. The fingerprint scanner already, stores the particular user figure print identifications. Then, we can access the printer with safety. This project is a combination of embedded system. The fingerprint scanner scans the person's fingerprint identity and sends the information to the controller. The controller is connected to the computer and printer. The printer's power supply is controlled by ARDUINO micro controller. Finally the printer is turned-on by fingerprint recognition and prints are taken out. Also, the controller counts the number of printstaken out.

1.1. PASSWORD LOCK

The digital lock is a lock which is individually installed at the locker system. It is a micro controller based locker. The

Locksystem gets open only when the right password is entered on the digital display. The whole system is not much expensive. So, it can be installed in every locker.

The password lock is authenticate the person and act as a medium to the system. This lockconsists of LCD screen, keyboard and a micro controller. The keyboard consists of 12 keys from 0 to *. The minimum password to the lock is with at least 6 characters. The LCD screen is used as a display. But, this type of security is breakable and become ineffective today.

Fig 1.1.Password lock

International Journal of Advanced Research in Basic Engineering Sciences and Technology (IJARBEST)
Vol.3, Special Issue.24, March 2017

1.2. BIOMETRICS

Biometrics refers to the metrics related to human characteristics. Biometric identifiers are distinctive, measurable characteristics usedto label and describe individuals. Biometrics can be defined as identifying and recognizing the particular person with physiological or behavioral characteristics. Examples are fingerprint, face recognition, DNA, palm print, signature, IRIS recognition and retina.

Fig 1.2. Biometrics devices

1.3. SIGNATURE IDENTIFICATION

The signature identification is a behavioral biometric. It can be operated in two different ways they are static and dynamic. The static identification is the biometric system recognizes the signature analyzing its shape. The dynamic identification acquires the signature in real time. Advantages are, Unique for every individual and user himself can decide the identity, lesser false acceptance rate, relatively cheap technology, No expert training required.Signature verification is a technique used by banks and intelligence agencies. [5] discussed about a system, GSM based AMR has low infrastructure cost and it reduces man power. The system is fully automatic, hence the probability of error is reduced. The data is highly secured and it not only solve the problem of traditional meter reading system but also provides additional features such as power disconnection, reconnection and the concept of power management.

Fig 1.3. Signature identification

1.4. IDENTIFICATION NUMBER

The identification numbers are used in national and international levels.The national identification number or national insurance is used by governments of many counties as a means of tracking their citizens, permanent residents, and temporary residents. Even every individual companies gives the own identification numbers. Advantages are everyone has own individual number to access the lock. There is no need for unique pressure like signature recognition. This method is Very simple and easy way of identification.

Fig 1.4 Identification number

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International Journal of Advanced Research in Basic Engineering Sciences and Technology (IJARBEST)
Vol.3, Special Issue.24, March 2017

1.5. VOICE RECOGNITION

The voice recognition is based on the acoustics features of speech that can be found to the different of individuals. Advantages are Easy to use and require no special training or equipment to the control action. Disadvantages are noise pollution makes the error of the security.

Fig1.5. Voice recognition

1.6. FACE RECOGNITION

The face recognition uses the visual physical structure of the face and analyses it to the security. Face recognition system is relatively high cost. Advantages are easy to integrate with other security system like CCTV. But development work still needs to be done to improve its performance. Disadvantages are the changes that occur to the human face over time - aging, facial hair, skin tone, glasses, and etc.This changes make inaccuracy to the recognition system.

Fig 1.6. Face recognition

1.7. FINGERPRINT

Fingerprint scanner refers to the automated method of verifying a match between two humans. The fingerprints are one of many forms of biometrics used to identify the individuals and verify their identity. The fingerprint processing has three primary functions: enrollment, searching, and verification. Optical fingerprint imaging involves capturing a digital image of the print using visible light. The fingerprint scanner issued to security the device and lock. Advantages are very hard to break the security of the system.

Fig 1.7.Fingerprint scan

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PROPOSED METHODOLOGY

2.1. BLOCK OF THE PROPOSED SYSTEM

The block diagram mainly consistsof ARDUINO micro controller, finger print module, driver circuit, power supply, and printer scanning and printing unit. When the fingerprint module is interfaced to microcontroller it will be in user mode. In this mode, stored finger ids will be verified with the scanned finger id. When coming to our application the id of the person's fingerprint that is authorized to open the printer will be stored in the module with a unique id. To prove that the persons are authorized to open the printer they need to scan their fingerprint id. The scanner is interfaced to ARDUINO microcontroller; this controller will be controlling the scanning process.After the scanning has been completed, user has to open the printer with help of keypad. Immediately the printer will be opened. After the work has been completed if key is pressed again with help of keypad the printer will be closed again.
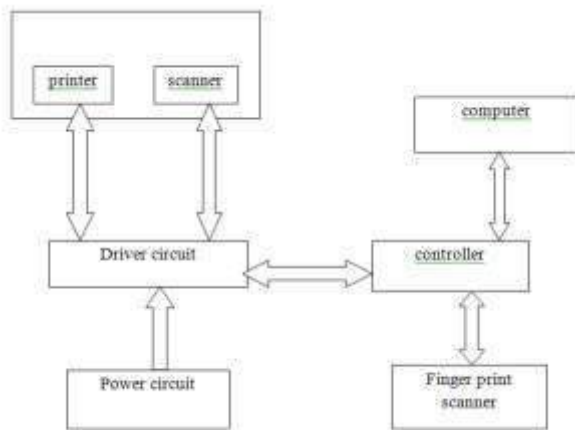

Fig 2.1 Block diagram

If an unauthorized person tries to scan his fingerprint id then the file shows error.

Option for changing the ids is also available. The micro controller counts the number of prints to be taken by the particular id. The bidirectional connection between controller and driver circuit count the print taken out from the system.

2.2 .HARDWARE DESIGN

The printer interfaced with the fingerprint sensor and controlled by micro controller. The fingerprint module communicate with ARDUINO using serial communication protocol, but since ARDUINO has only one hardware serial port that we need to use for the pc communication, we use ARDUINO soft serial to communicate with fingerprint, using A4 and A5. The ARDUINO micro controller's driver circuit connects the printer and as well power supply unit (+5v). The fingerprint scanner powered by computer with help of USB port. The fingerprint scans the person's id and sends the information to computer by using USB port. The micro controller opens the printing option to the system. Then, the printer will be operated and prints are taken out. The micro controller synchronizes the entire device at the same time. The printer has two units;these two units are separately synchronized with driver circuit. Then, the printer scans the input and sends the prints out. Also, the micro controller counts the number of printouts taken by the particular person's id.

2.3.SOFTWARE DESIGN

The micro controller is programmed by the "EMBEDDED C" language. The program controls the computer and as well as printer. The controller software is designed to control both the identification and counts of the printoutstaken from the printer. The software is a multitasking program for counter and to verify the id.

Fig 2.2.Laptop and fingerprint interface

RESULTS

International Journal of Advanced Research in Basic Engineering Sciences and Technology (IJARBEST)
Vol.3, Special Issue.24, March 2017

The fingerprint provides the security to the printer and the micro controller count the number of printout to be taken.

CONCLUSION

A step by step approach in designing the microcontroller based system for securing the transactions of the user and providing the security for the PRINTER system and even more for the PASSPORT verification using a finger print scanner has been followed.

The result obtained in providing the security is quite reliable and economical. The system has successfully overcome some of the aspects existing with the present technologies, by the use of finger print Biometric as the authentication Technology.

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