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Recognizing Fingerprints in ATM

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Abstract: The main theme of this system to propose a application which is helpful for the society in order to reduce the frauds in ATM machine. When users open a new account in bank for his transaction the bankers will collect all information regarding to the account holders like name, phone number and also fingerprints to enroll. When user wants to do transactions in ATM machines, first process is user has to give fingerprints on the fingerprint module then automatically 4 digit number will be generated to the authorized customer phone number through GSM modem which is connected to the microcontroller. The 4-digit number is received by authorized customer, then has to give input to the ATM machine. After giving input, the ATM machine will verify whether it is valid or not if it is valid further transaction can be continued if not ATM machine shows invalid alert message.

Keywords: ATM, fingerprint biometric, PIN, security.

I. INTRODUCTION

Fingerprint biometric is a technology which is based on the ability to recognize fingerprint images first, this can be applied for banking/ credits, mobile phone security, time and attendance, transaction/ check deposit ATM, computer /network security, business & residential access control to secure your data easily. Today many ATM frauds are increased to hack the passwords, money, etc., and also using of PIN or passwords for ATM is not secure because passwords can be shared with family, friends, forgetting passwords or hacking of passwords by third party so in order reduce these problems we can make implement this fingerprint biometric technology.

1.1 Modules

Fingerprint biometric authentication technology is divided into two modules:

i. Verification.
ii. Identification.

Before verifying and identifying fingerprints first customer has to ENROLLEMENT the fingerprints which are considered as sample that is processed by computer and stored in database for further comparison as shown in figure1.

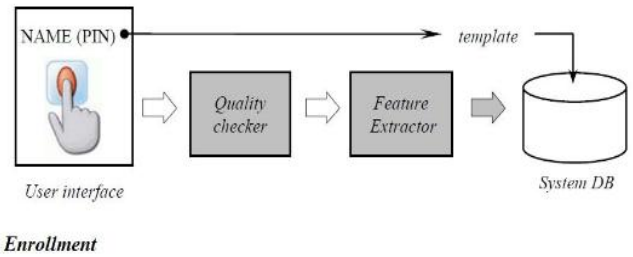

Figure 1: Enrollment of fingerprints

Verification module: In this module, first customer has to verify fingerprint images by giving input to biometric sensor to authenticate a person's claimed identity from their previously enrolled pattern which is stored in the database as shown in figure2. This is also known as one to one matching.

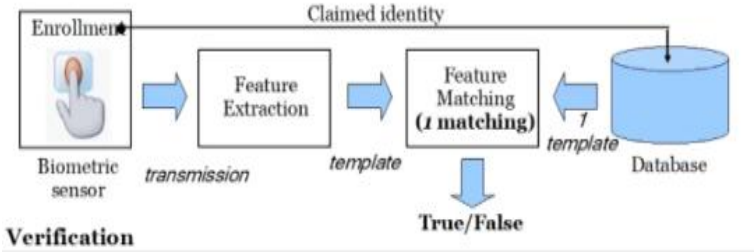

Figure 2: verification of fingerprints.

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Identification module: In this module, customer has to give input as fingerprint to sensor to identify fingerprints, this fingerprints will be transmitted for feature extraction to match with **N** number of template which is stored in database if the fingerprint matches customer can continue further transactions. This module is also known as one too many matching.

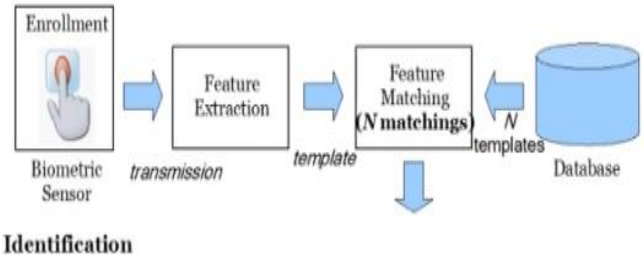

Figure 3: Identifying fingerprints.

II. WHY WE HAVE TO USE FINGERPRINT?

There are number of biometric technologies such as iris, face reorganization, palm reorganization, voice, and signature. But when we do survey and analysis of fingerprint with other biometric technologies, the result was higher for fingerprint technology. In 2012 IBG conducted on comparative analysis of fingerprints with the other technologies the result is represented below:

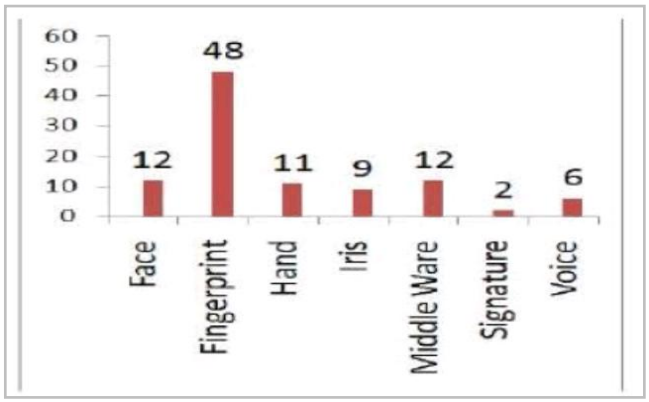

Figure 4: comparative survey of fingerprint with other biometric.

III. LITERATURE SURVEY

3.1 Mr. Mahesh A. Patil

The main objective of this system is to develop a system, which is used for ATM security applications. In these systems, Bankers will collect the customer finger prints and mobile number while opening the accounts then customer only access ATM machine. The working of these ATM machine is when customer place finger on the finger print module when it access automatically generates every time different 4-digit Code as a message to the mobile of the authorized customer through GSM modem connected to the microcontroller. The code received by the customer should be entered by pressing the keys on the screen. After entering it checks whether it is a Valid one or not and allows the customer further access.

3.2 Vaibhav R. Pandit

Identification and verification of a person today is a common thing; which may include door-lock system, safe box and vehicle control or even at accessing bank accounts via ATM, etc which is necessary for securing personal information. The conventional methods like ID card verification or signature does not provide perfection and reliability. The systems employed at these places must be fast enough and robust too. Use of the ATM (Automatic Teller Machine) which provides customers with the convenient banknote trading is facing a new challenge to carry on the valid identity to the customer. Since, in conventional identification methods with ATM, criminal cases are increasing making financial losses to customers. Authors design a simple fingerprint recognition system using LPC2148 as a core controller. The system uses FIM3030 fingerprint scanner to capture fingerprints with its DSP processor and optical sensor. This system can be employed at any application with enhanced security because of the uniqueness of fingerprints. It is convenient due to its low power requirement and portability.

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IV. WORKING

4.1 Software design:

This software design is implemented in sequence order:
Fingerprint Biometrics systems work by recording and comparing biometric characteristics. To implement fingerprint biometric technology first system collects the sample fingerprint of the person who **LOGGS IN**, this fingerprint is extracted and template is created for unique features which is stored in database. Further this template is compared with an enrolled sample then decides whether the new sample matches or not by keeping reference of old (enrollment) Database. Fingerprint reorganization is very uniqueness and it is very easy to secure cards and economic information's.

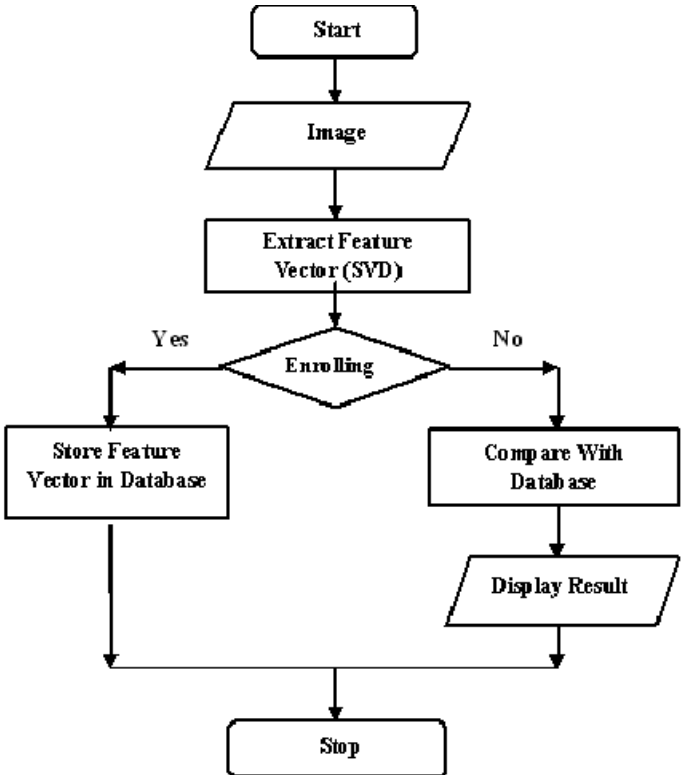

Figure 5: flow chart of software.

A fingerprint consists of rides and valleys, distinguish by minutiae as shown figure

Figure 6: fingerprint.

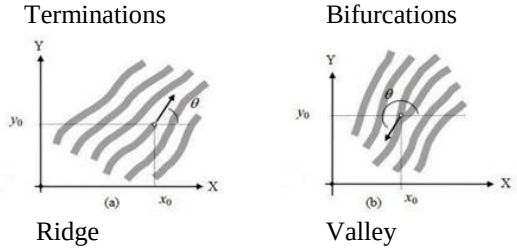

Figure 7: fingerprint.

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There are two types of minutiae called termination, which is immediate ending of a ridge and Second type called bifurcation, which is the point on the ridge from which two branches derive.

Ridge end/ Termination: as shown in above figure the location where a ridge comes to the end.
Ridge branch/ Bifurcation: These are divided into two separate ridges.

V. BENEFITS OF USING FINGERPRINTS:

- Fingerprint biometric technology is user-friendly systems and also saves time.
- Frauds can be reducing by using this technology.
- This technology provides better security and authenticity.
- No need to remember password.
- Increases accuracy.
- This technology provides greater customer convenience rather than carrying credit cards or tokens.

VI. APPLICATION OF FINGERPRINT BIOMETRIC:

- Fingerprint technology can be used in Banking/credit.
- Fingerprint biometric technology can be used easily.
- It is standardized.
- Applicable for computer/ network security.
- Used for mobile phone security.
- Used in business and residential access control
- Used in law enforcement
- Used for automobile security/ access control
- Used for military ID
- Used in hotel access control
- Used for time and attendance.

VII. DISADVANTAGES OF FINGERPRINT BIOMETRIC:

- Time delay in waiting while identifying fingerprints.
- Sometimes fingerprints are unreadable because of wet, dry and dirty hands.
- Huge machines and labors are required.

VIII. CONCLUSION

The main reason of introducing fingerprint technology is to provide biometric security through authentication in ATM application, which reduces threatening in ATM machines, and also to increase the security of ATM and reliability characteristics than traditional methods of personal recognition. The fingerprint authentication technology is safe, easy to use and fingerprints images cannot be duplicated, which is also very useful to the society.

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