



Biometric based Fingerprint Verification System for ATM machines

ABSTRACT



Almost everyone in today's society uses ATM machines, which allow users to transfer and withdraw money. The basis for this research is the use of a fingerprint approach in the ATM system. Fingerprint verification improves people's safety and security while also making transactions easier. Each person's fingerprints are distinct. There is no risk of losing an ATM card, and you are not required to carry one with you at all times. When comparing different ATM security technologies, fingerprint technology performs better and is safer than the others. Because of these factors, this technique provides a simple and secure method of transaction that also ensures a consistent environment across users and ATM machines. This is the most recent electronic currency transaction technology.

INTRODUCTION

Our goal is to develop a considerably better security solution using fingerprint-based ATMs. Biometrics is a technique that allows you to create highly secure data that is unique to each individual based on their physical traits. Biometric data is used to accurately identify a person by using his or her fingerprint, iris, face, speech, hand geometry, or handwriting, among other things. Passwords are frequently forgotten, leaked, hacked, or accidentally read by a third party. Tokens such as mag tape cards, physical keys, and smart cards are frequently stolen, misplaced, cloned, or gone.

A biometric system's two primary roles are identification and, as a result, verification. Fingerprint processing is now widely regarded as a fully established biometric technology that is simple to design for a higher level of protection and safety at the fingertips. It's simple to carry out, and getting a person's fingerprint registered with an identification device may require very little time and effort.

Nowadays, automatic self-banking is widely used, with consumers receiving benefaction 24 hours a day, seven days a week. The use of an ATM (Automatic Teller Machine) can provide users with adequate banknote handling. However, monetary crime has been on the rise in recent years. Many thieves obstruct the ATM depot and illegally steal the person's master card and proof of identification. When a person's credit card is lost and the password is stolen, the perpetrator extracts and takes advantage of less time, which can result in significant monetary losses for the victim. The client's way of keeping up is the genuine distinction, as it becomes the major aim in the current financial circumstances.

Existing ATM techniques normally work with the help of a mastercard and a password, however the strategy has significant flaws. Using only a master card and a word of identification to authenticate the customer's identity is insufficient. Within the last few years, the algorithms that are used for fingerprint identification have been regularly updated, and the authority has generated the four-digit code, which has given people a new method of verification. The first password processing is connected with the biometric system to verify the customer's identity and succeed the use of ATM. Devices have a positive impact on security.

RELATED WORKS



Fingerprint Image For Identification :

For identifying fingerprints, a device must capture a fingerprint then go through an algorithm for matching. Precise details of detection algorithms to bring out key stipulations of fingerprint pictures for recognition. The fully developed biometric methods and typically the unexpected enhancement of the recorded devices have given way to the introduction of fingerprinting in various applications. Biometric information parted and clear-cut from personal data.

Replace Traditional Identification Methods

They're going to not be theft and accustomed ingress personal data to resolving the bugs of established recognition ways the maker of designs a replacement ATM depot client identification system is availed for an upgraded enhancement algorithm of fingerprint image and the core of microprocessor develop the bank accounts' security as well as ATM machines. If pictures of fingerprints are poor-quality images, they end in unaccounted features, giving way to the bad performance of the fingerprint mechanism. Hence, it is significant for a fingerprint identification system to gauge the standard and viability of the recorded fingerprint pictures.

Biometric Payment

To get a better process of mechanism for fingerprint matching, in counting on the spectral details attributes two feature reduction algorithms provided the Line Discrete Fourier Transform feature reductions and the Column Principal Component Analysis.. Biometric templates may not be reverse- engineered to regenerate personal data which cannot be stolen and accustomed to ingress personal data. Fingerprint information generally reaches impressions on the last joint of the thumb and fingers, to the level that fingerprint cards usually capture parts of the lower finger areas of the fingers. In those recent technologies for operating cash processing, biometric payment mechanisms have recently grabbed more attention as an operable solution to reduce identity heist. It's visiting be of yore, present or conceptual

EXISTING ATM SYSTEM



In modern days, Everyone used to do banking like storing cash and withdrawing cash. The clients will be in line to extract cash from the bank. The clients felt like bidding one's time to withdraw money. That bank proposes an ATM (Automated teller machine) to aid the client extract cash quickly. In such an ATM, they propose CARDS (Visa, Credit, master, Debit) to the client to extract money through their usage. Major merit is fast money provided by the ATM. The customers feel joyful and they shall not throw away time to take out money being in queue. Still it has a main limitation like, physical keys and smart cards, may be theft, misplaced, duplicated, or forgotten; passwords may get distributed, unremembered, hacked or seen by some third party. Banks needed a good mechanism to manage protection for the clients to make the transaction in the banks. To get rid of issues, we have brought this fingerprint based ATM system

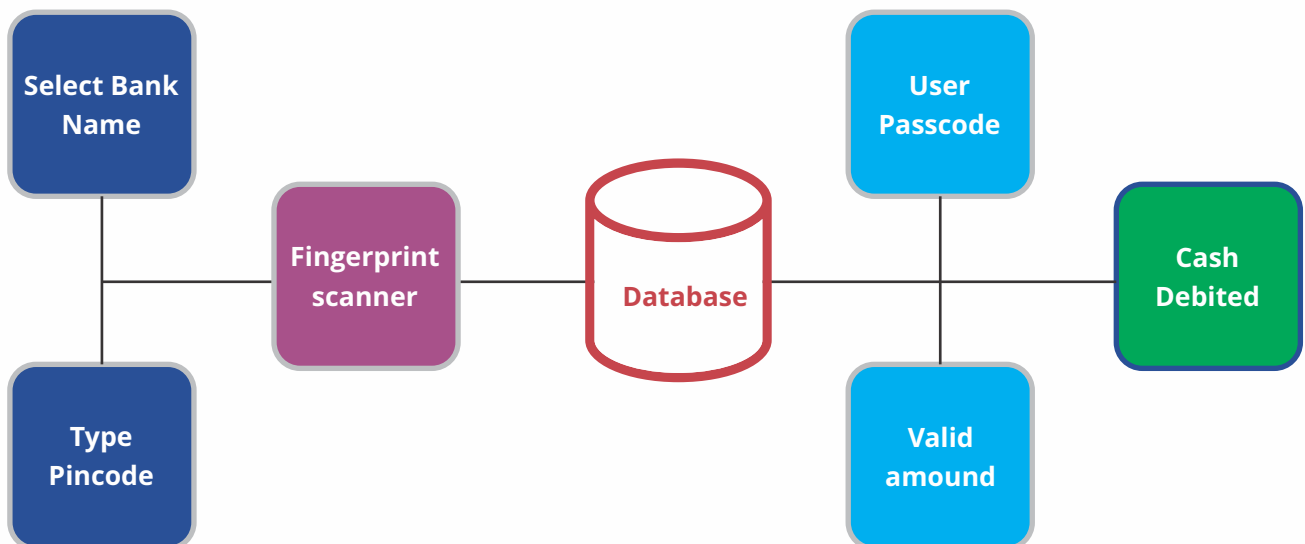


Figure 1. Diagram for Fingerprint based ATM

BIOMETRIC ATM SYSTEM



The introduced mechanism to increase safety and protection by integrating a fingerprint system. The merit of finger scanning technology is accuracy. By using this system multiple limitations are reduced fastly. They do not have the need to take an ATM card in wallets and no thought of losing the card. CARD can be theft, password can be distributed or, hacking all clients are satisfied by our system because of fast and good service. At first, Fingerprint is converted into encrypted string values that are collected in the EC2 database. Every user's fingerprint is stored as a encrypted string. Which means every encrypted string is unique. All the encrypted strings are stored in a secured server, When a user withdraws his money he places his finger print, then that unique encrypted string is decrypted by private key and unique string is being searched in the server and the authentication process takes place.

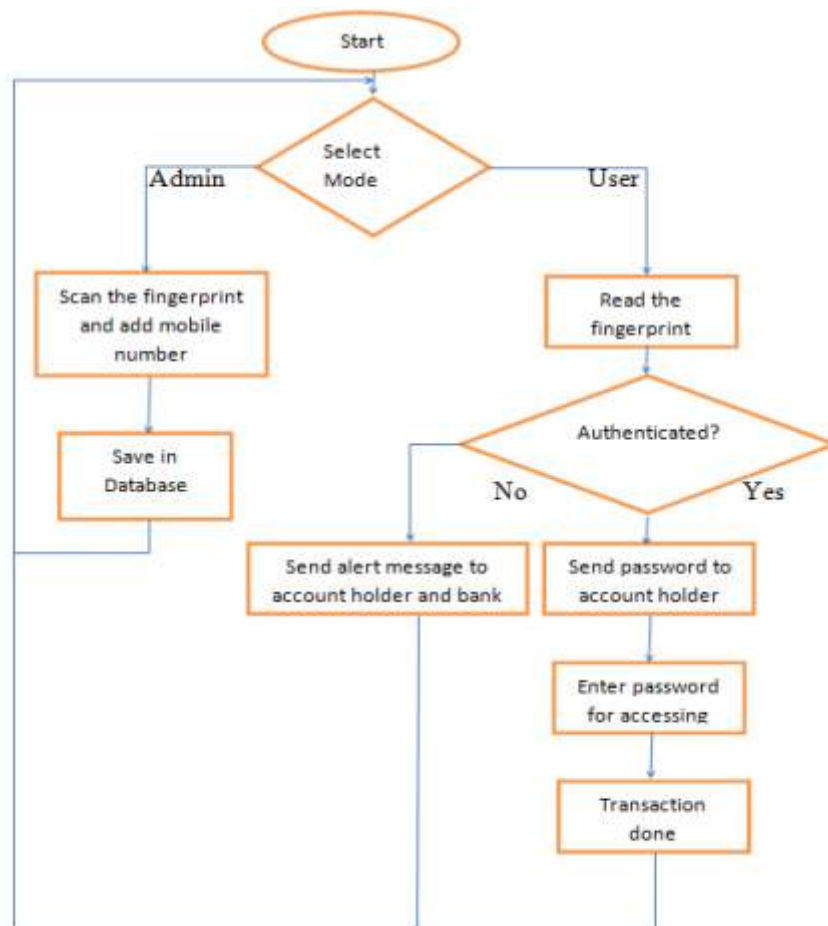


Figure 2. Flowchart for ATM fingerprint

OBJECTIVES

The objective is to use current, ATM machine validation and confirmation techniques to achieve a successful and secure trade. The main purpose of this project is to create a distinctive mark as an approved character and to design a more secure ATM system. In this case, the ATM machine fills in as the client inserts his or her finger on the ATM's biometric scanner, and if the finger coordinate is identified, the ATM machine displays the client's name. If that Fingerprint coordinate is not discovered by coincidence, no trade is possible. In the past, if a client had his or her verified unique mark linked to the one bank with which he or she had opened a record, he or she would need to look for that bank's ATM if a crisis or other such event occurred. However, with our business, the client can access his or her financial balance through any ATM, which supports our novel method of cash withdrawal. This is accomplished with the help of banks cooperating with one another to aid clients in withdrawing cash without having to look via their individual ATM.

PROCESS

Unique mark confirmation is to check the realness of one individual by his finger impression and Fingerprint and PIN code distinguishing proof is by coordinating the data of the client, for example, pin code and unique mark coordinating. Essentially we can clarify total Fingerprint based ATM framework in two stages:

- ◆ Enrollment Phase
- ◆ Authentication phase

Enrollment phase

In the robust fingerprint application, upto 4-10 fingers have to be registered. This makes the mechanism to give protection threshold and also be capable of going with usual life issues like wet dry, skewed finger placement, dirty, cut or worn fingers. The biometric reference information is stored for enrollment and collected in a database or in a data portable carrier that the Enrollment is significant as the once captured reference information will usually be available over the lifetime of the user or their biometric hardware system.

Enroll Multiple Finger enrollment

It is highly recommended to enroll many fingers. In everyday life harms can occur which turn a recorded fingerprint presently impractical while small cuts do not bring any change to a robust sized sensor mechanism.

Authentication Phase

In this phase users shall make transactions by using one's fingers. A person shall place one finger on the Biometric scanner and that person's finger scan shall be matched through a database in which all authenticated user's fingerprints are collected. If any person wants to do any banking he/she just places their finger on a scanner and gets their cash in a short span. If a person's fingerprint cannot match by database as some incidental cuts on his/her fingers then he/she shall avail his/her other finger and we shall also give a 4-pin code option, people shall also avail this option with their conveniences. Feature extraction: This process from a fingerprint picture is usually divided into three. Feature shall be availed to divide into leading pattern types such as whorl or loop.

WITHDRWAL PROCESS

- ◆ User need to enter the corresponding bank ATM.
- ◆ Scan the fingerprint value and pass along with the bank ATM Information.
- ◆ Check whether the user is valid or not.
- ◆ If the user is valid then it moves to the transaction page else it moves back to the index page.
- ◆ If the user enters the valid Pin password and valid amount the amount will be debited or else it shows the error message.

EQUIPMENT



Fingerprint sensor

For the development of the ATM, Fingerprint Module consists of optical fingerprint sensor, high-performance fingerprint alignment algorithm, high-speed DSP processor, high-capacity FLASH chips and other hardware and software compositions, simple structures, stable performances, with fingerprint entry, fingerprint matching, image processing, search and template storage and other functions.



Hardware

Small credit-card sized computer. RPi3 is faster than Arduino. 8.3. server and Fingerprint processing Host server.



Software Role

The authentication process is done by a few complex steps for all users. First the basic details from the ATM card is fetched to make it fast and easy for the software to search the desired string(to verify the fingerprint). Then the verification takes place within a few seconds and the money can be withdrawn.

BENEFITS

The advantages of increasing ATM security by using fingerprints are that those with little literacy will be able to use it without difficulty. Nobody should use or use an ATM card if it has been misplaced; it will be blocked immediately, and no one will be able to hack the pin code. The 4digit pin code could be easily guessed by hackers. Felonies committed in ATMs have become a major issue that affects both customers and bank employees. Many people are hesitant to use ATMs because of the challenges they have. The fingerprint mechanism is a well-accepted and completely established biometric method that is always simple to use and provides a higher level of security at people's fingers. Every biometrics system is gaining a lot of attention and success these days.

CONCLUSION

The execution of ATM protection by availing fingerprint also has the traditional verifying methods that were inputting the client's fingerprints, that is sent by the administrator and checked correctly. The protection feature was improved highly for the firmness and solidity of the client's identity. The complete system was constructed on a fingerprint system that makes the mechanism safe, dependable and effortless to avail. This shall be the most favourable technology in electronic or digital money transactions.

REFERENCES

- ◆ India leading ATM kiosk manufacturer based out at Goa has taken our optical fingerprint sensor for integration in its ATM Kiosk.
- ◆ Our optical fingerprint sensor has been chosen by India's premier ATM kiosk maker, situated in Goa, for incorporation into its ATM kiosks.

MANTRA

www.mantratec.com



sales@mantratec.com



+91-79-49068001

Copyrights 2021 Mantra Softech (India) Pvt Ltd. All Rights Reserved.