

FINGERPRINT BASED ON ATM SYSTEM

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ABSTRACT

The main aim of this project to provide secure banking system, by taking fingerprints as authorized identity at ATM/banks. The purpose of the project is to provide a secured and reliable environment to the customers for their banking transactions by providing a unique identity to every user using the FINGER PRINT identification technology.

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.

Fingerprint Based ATM is a desktop application where fingerprint of the user is used as a authentication. The finger print minutiae features are different for each human being so the user can be identified uniquely. Instead of using ATM card Fingerprint based ATM is safer and secure. There is no worry of losing ATM card and no need to carry ATM card in your wallet. You just have to use your fingerprint in order to do any banking transaction. The user has to login using his fingerprint and he has to enter the pin code in order to do further transaction. The user can withdraw money from his account. User can transfer money to various accounts by mentioning account number. In order to withdraw money user has to enter the amount he want to withdraw and has to mention from which account he want to withdraw. The user must have appropriate balance in his ATM account to do transaction. User can view the balance available in his respective account. The system will provide the user to view last 5 transactions.

1. INTRODUCTION

1.1. ABOUT THE PROJECT

Biometrics is the art of science and technology of measuring and analyzing biological data. If biometrics refers to technologies that measure and analysis human body characteristics, such as DNA, fingerprinting, eye retina and irises, voice pattern, facial pattern and measurement for authentication purposes. Biometrics identifier method provides several advantages over the traditional method and current method used in our daily life. Basically concentrate on two function one is for identification and other verification. A modern ATM is typically made up of the devices like CPU to control the user interface and devices related to transaction, magnetic or chip card reader to identify the customer, Pin pad, secure crypto-processor generally within a secure cover. Display to be used by the customer for performing the transaction, function key button, record printer to provide the customer with a record of their transaction, to store the parts of the machinery requiring restricted access- vault, housing for aesthetics, sensors and indicators. In this modern era there are many people using ATM. Fast development of banking has various advantages and disadvantages. The main objective of this system is to develop an embedded system, which is used for ATM security applications. In these system, Bankers will collect the customer finger prints while opening the accounts then customer will only access ATM machine. The working of these ATM machine is when customer place finger on the finger print module it displays the name of the customer on the LCD connected to the micro controller. If the user does not have a account activated by a fingerprint initially it does not allow the user to do transactions. Nowadays, using the ATM (Automatic Teller Machine) which provides customers with the convenient banknote trading is very common. However, the financial crime case rises repeatedly in recent years; a lot of criminals tamper with the ATM terminal and steal user's credit card and password

by illegal means. Once user's bank card is lost and the password is stolen, the criminal will draw all cash in the shortest time, which will bring enormous financial losses to customer. How to carry on the valid identity to the customer becomes the focus in current financial circle. Traditional ATM systems authenticate generally by using the credit card and the password, the method has some defects. Using credit card and password cannot verify the client's identity exactly. In recent years, the algorithm that the fingerprint recognition continuously updated, which has offered new verification means for us, the original password authentication method combined with the biometric identification technology verify the clients' identity better and achieve the purpose that use of ATM machines improve the safety effectively.

OBJECTIVE

- Biometrics is a technology that helps to make your data extremely secure, unique all the users by way of their personal physical characteristics.
- Biometric information can be used to perfectly identify people by using their fingerprint, face, speech, iris, handwriting, or hand geometry and so on.
- Using biometric identifiers offers several advantages over traditional and current methods. Tokens such as magnetic stripe cards, smart cards and physical keys, passwords can be shared, forgotten, hacked or accidentally observed by a third party .
- There are two key functions offered by a biometric system. One technique is identification and the other is verification. In this project, we are concentrating on identifying and verifying a user by fingerprint recognition.

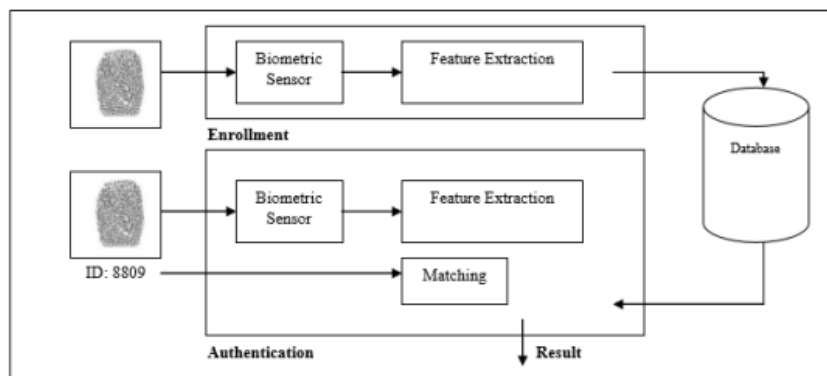


Fig.1.1: System Architecture

1.2 MODULES

1.2.1. Enrollment (Signup)

The process by which a user's biometric data is initially acquired, accessed, processed, and stored in the form of a template for ongoing use in a biometric system is called enrollment. Subsequent verification and identification attempts are conducted against the template(s) generated during enrollment.

1.2.2. PRESENTATION:

Presentation is a process by which user provides biometric data to an acquisition device-the hardware used to collect biometric data. Depending on the biometric system, presentation may require looking in the direction of a camera, placing a finger on a platen, or reciting pass phrase.

1.2.3. BIOMETRIC:

Raw biometric data cannot be used to perform biometric matches.

Instead, biometric data provided by the user during enrollment and verification is used to generate biometric templates, and in almost every system is discarded thereafter.

Thus Biometric systems do not store biometric data-systems use data for template creation. Enrollment requires the creation of an identifier such as a username or ID. This identifier is normally generated by the user or administrator during entry of personal data.

1.2.4. FEATURE EXTRACTION:



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The automated process of locating and encoding distinctive characteristics from biometric data in order to generate a template as called feature extraction.

The feature extraction process includes filtering and optimization of images and data in order to accurately locate features.

2. LITERATURE SURVEY

A literature survey or literature review is the study of references and old algorithms that we have read for designing the proposed methods. It also helps in reporting summarization of all the old references papers, and their drawbacks. The detailed literature survey for the project helps in comparing and contrasting various methods, algorithms in various ways that have implemented in the research.

Joseph B. Awotunde, Tolorunloju R. James, Suhurat I. Abdulkadir, Fatimoh T. Adewunmi-Owolabi

- Title: "Fingerprint Authentication System: Toward Enhancing ATM Security" Publication: International Journal of Applied Information Systems, Volume 7, Number 7, August 2014.
- Summary: This project proposes integrating fingerprint authentication into existing ATM systems to address issues like password loss and ATM fraud. A prototype was developed to demonstrate the system's effectiveness in enhancing ATM security.

Sangeetha Thirumoorthy, M. Kumaraguru, S. Akshay, M. Kanishka

- Title: "Biometric based Fingerprint Verification System for ATM machines" Publication: Journal of Physics: Conference Series, Volume 1916, May 2021.
- Summary: This study explores the implementation of fingerprint verification in ATM systems to enhance transaction security. The authors argue that fingerprint technology offers a more secure and user-friendly alternative to traditional ATM cards.

John Mashurano, Wang Liqiang

- Title: "ATM Systems Authentication Based on Fingerprint Using ARM Cortex-M3"
- Publication: International Journal of Engineering Research & Technology (IJERT), Volume 2, Issue 3, March 2013.
- Summary: This project discusses the design of an ATM authentication system utilizing fingerprint recognition and the ARM Cortex-M3 processor. The proposed system aims to improve customer authentication and reduce fraud associated with traditional ATM cards.

Sri Sachidananda S. Joshi, Bhavana Desai, J. L. Kalyan

- Title: "An Approach to Authentication of Fingerprints in ATM"
- Publication: International Journal of Science and Research (IJSR), Volume 2, Number 2, February 2013.
- Summary: The authors propose a fingerprint-based authentication system for ATMs to replace traditional card and PIN methods. The system aims to enhance security by ensuring that only authorized users can access their accounts.

Shivam Kumar Rajput, Aniket R. Patne, Amit Varma, Girish Vishe

- Title: "Enhanced Fingerprint Recognition and OTP to Improve ATM Security"
- Publication: International Journal of Advance Research, Ideas and Innovations in Technology (IJARIIT), Volume 5, Issue 2, April 2019.
- Summary: This project suggests enhancing ATM security by combining fingerprint recognition with a One-Time Password (OTP) system. The approach aims to provide a dual layer of security, reducing the risk of unauthorized access.

3. ANALYSIS

3.1. EXISTING SYSTEM

We are using ATM's in our country for all our banking activities. An automated teller machine (ATM) is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, transfer funds, or obtaining account information, at any time and without the need for direct interaction with bank staff. On most modern ATMs, customers are identified by inserting a plastic ATM card (or some other acceptable payment card) into the ATM, with authentication being by the customer entering a personal identification number (PIN), which must match the PIN stored in the chip on the card (if the card is so equipped), or in the issuing financial institution's database.

3.1.1 Limitations in Existing System

- Existing music player plays the songs randomly which are present in the music folder.
- There is no emotion tracing or identification of the human facial emotions and play the song.
- Music is recommended based on what type of songs user plays every time.
- If the user listens sad songs then the same kind of pitch songs are always recommended to the user.
- Music pitch is always monitored based on the user login id and always recommends same kind of music irrespective of human facial emotions.
- Existing system has recommendation system but not classification system based on real time input.
- Always same kind of songs is played.
- User need to manually search songs based on his mood.
- Very old methodology.

3.2. PROPOSED SYSTEM

We are using ATM's in our country for all our banking activities. An automated teller machine (ATM) is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, transfer funds or obtaining account information, at any time and without the need for direct interaction with bank staff. In our proposed system we are introducing finger print sensor in which when a user scans their finger ,if that user is valid or not. A biometric authentication system seems to be an excellent solution to authentication problems; however biometric authentication has some weaknesses. Biometrics is a rapidly evolving technology that is being widely used in forensics, such as criminal identification and prison security, and that has the potential to be used in a large range of civilian application areas. Biometrics can be used to prevent unauthorized access to ATMs, cellular phones, smart cards, desktop PCs, workstations, and computer networks. In automobiles, biometrics can replace keys with keyless entry devices. There are two main objectives of this project, as follows: - 1. To integrate the fingerprinting in access control for ATM system. 2. To purpose a framework for the ATM system using fingerprint verification.

3.2.1. Features of the Proposed System

- Strong Authentication
- Our System replaces card system with physiological characteristics.
- Hidden cost of ATM Card Management can be avoided.
- It's ideal for rural masses
- Useful for senior system because no need to any pin or verification certification and memorize passwords
- Due to bio metric system no one is able to access the other systems.

4.SYSTEM ARCHITECTURE

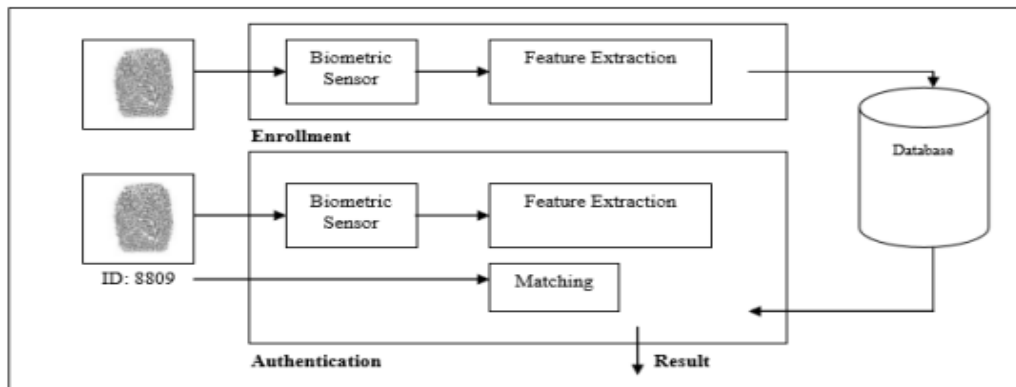
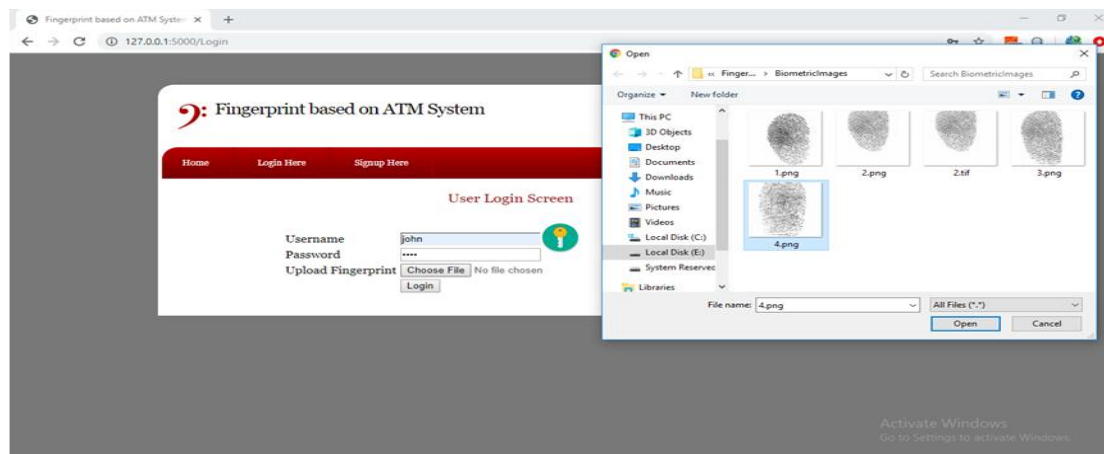
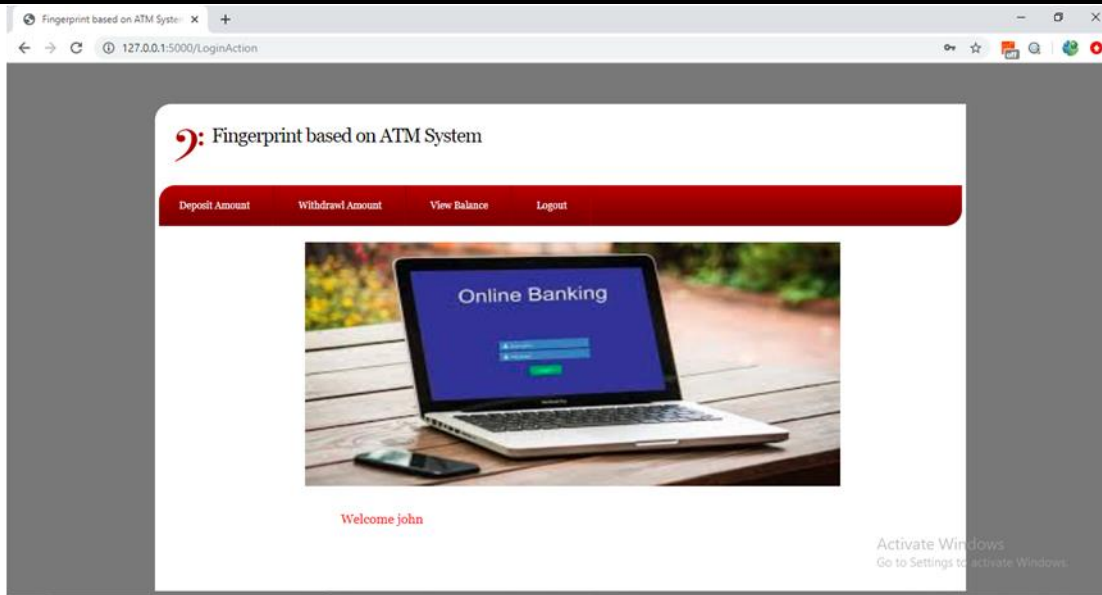


Fig : System Architecture

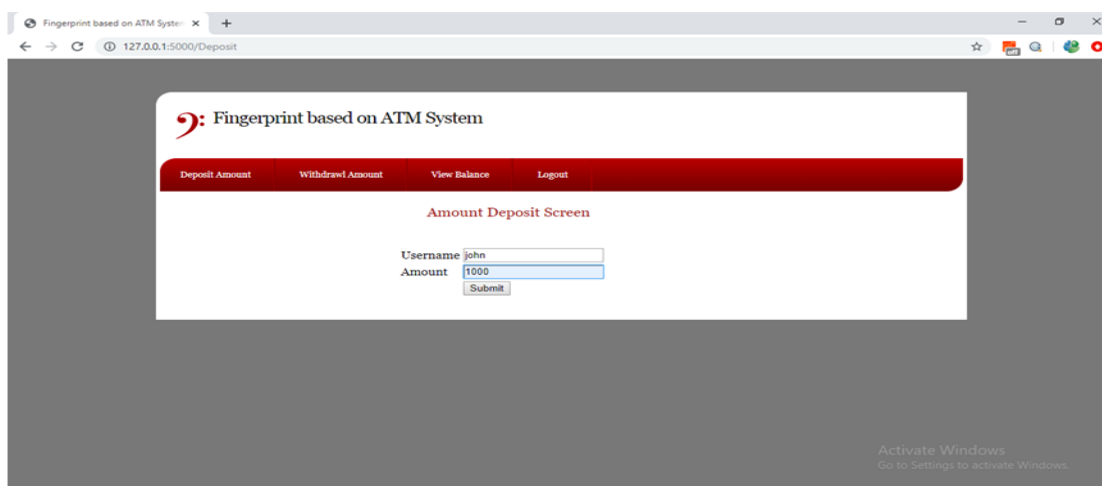
5. SAMPLE SCREENS



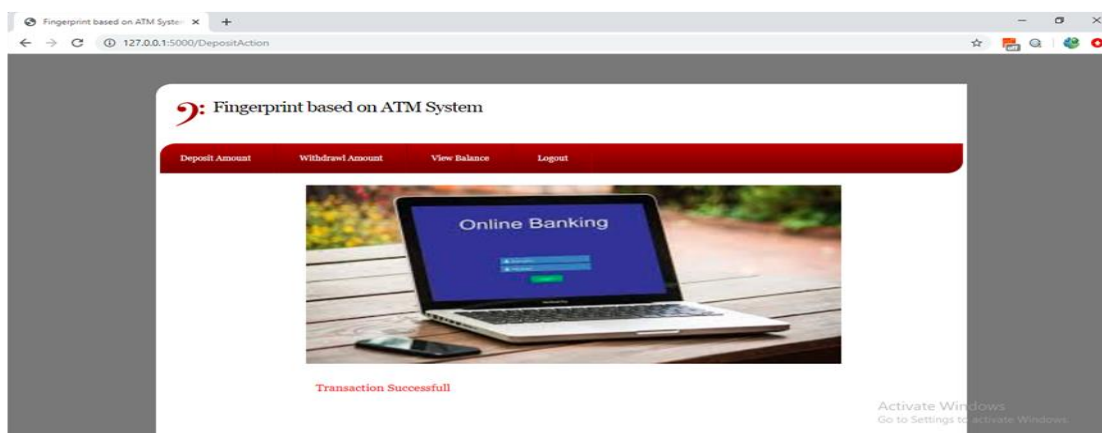
Screen : CNN Accuracy



Screen :Upload Random Picture



Screen : Detection of Face



Screen : Detection of Emotion

CONCLUSION

In today's modern world, autonomous systems play an important role in our day to day life. As the social computerization and automation have drastically increased, it can be seen evidently where the number of ATM centers increases rapidly. Most civilians use ATM's regularly. A good example can be a financial transaction, ease of money exchange etc. So there exists an important factor called security. The security features were enhanced largely for the stability and reliability of owner recognition. The whole system was built on the fingerprint technology which makes the system safer, reliable and easy to use. As we know that fingerprint are the most acceptable biometrics all over the world in identifying a person. Some government in the world are still implementing fingerprints technique to identify their citizens and the criminal from the scene of crimes in forensic work. A lot of criminal's tamper with the ATM terminal and steal customers' card details by illegal means. Once users' bank card is lost and the password is stolen, the users' account is vulnerable to attack. Traditional ATM systems authenticate generally by using a card (credit, debit, or smart) and a password or PIN which no doubt has some defects. The prevailing techniques of user authentication, which involves the use of either passwords and user IDs (identifiers), or identification cards and PINs (personal identification numbers), suffer from several limitations.

FUTURE SCOPE

AI-based fraud detection to identify unusual transaction patterns. Adaptive learning for improved fingerprint recognition accuracy. Centralized biometric database for seamless ATM access across multiple banks.

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