Develop a Fingerprint Based System for ATM Machine

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Statement of Purpose

People employ all forms of technology to improve their quality of life in the current day. ATMs are one of the technological developments. To withdraw cash, people utilize ATM machines. But in order to withdraw money from an account, a person needs an ATM card. The purpose of this research is to create a biometric or fingerprint-based ATM machine. It's a replacement for an ATM card. Since getting an ATM card after creating a bank account takes at least 3 to 7 working days. This method may be useful to the people in addition to being necessary for safety and security concerns. Robbing or stealing money is now a common issue. Because of the carelessness of the user or cardholder of the bank account, some users experience fraud activities. Day by day, this type of fraud is constantly growing. The removal of card holding is a further reason for the development of fingerprint-based ATM systems. Another common issue facing cardholders is they misplaced their card's pin number, and the ATM card was automatically blocked. A system based on fingerprints may be the answer to all of these issues. The machine will read the user's fingerprint using a mechanism that uses fingerprint recognition to determine whether or not the user has been validated. The ATM system will accept the user's transaction or withdrawal operation after verifying the user. Computer science engineers are attempting to develop this system. Because of the system's ability to stop cybercrimes, card holding issues, and other issues. For any technology, a fingerprint-based system is the safest, simplest, and quickest option. This paper primarily focuses on the advantages of a fingerprint-based ATM system and an alternate method of utilizing an ATM card.

Research Proposal

Introduction

One of the most secure systems nowadays is a fingerprint-based security system. It provides as a person's unique method of identification. There are several applications for a security system that uses fingerprints. Physical keys, smart cards, ATM cards, or other items that might be misplaced, stolen, or replicated, are frequently lost by users. A fingerprint-based system can use a person's individual fingerprint to identify and confirm them.

A popular security system is one which uses fingerprints. Any highly secure system can use it. It can identify any individual person. However, a fingerprint identification device is required for the fingers. If a person's fingerprint is already saved, the fingerprint recognition device may be able to identify them when they place their finger on it.
If the person's fingertips are already saved in the system, a fingerprint scanner scans them. If it discovers a match with the previously saved fingers, it will let the user to go to the system's next stage. However, an alert will be set off if it doesn't locate a match with the previously saved fingers. For example, an ATM will start its card retention process if a user dials incorrect pin digits at least three times. The cardholder won't be able to remove the card from the machine after that. An authorized individual will have exactly three opportunities to access his or her account for the transaction or to withdraw money if a fingerprint-based system can be developed or implemented for an ATM machine. A person will need to provide their documents while visiting a bank to open a bank account. And if they need to provide their fingerprints, the bank's database will automatically record that information. So. It will detect a match with the previously saved fingers when the user approaches an ATM booth and places his or her

fingertips on the scanner. The fingerprint security measure him/her as another individual and will not provide the authorization of the account if it detects a simple minority of the existing fingerprint and pre-stored fingerprint.

Literature Review

Problem Definition

Criminal activity involving ATM rubbering is a frequent problem. In addition, certain online scams have been reported that attempt to steal money from users' accounts. Criminals misuse ATMs and steal money using the user's card and pin code. Even those people are still being detained at gunpoint. in order for them to remove the money for the criminals. ATMs using fingerprint-based security systems will be able to reduce criminal activity to zero percent.

ATM Machines of Present and Future

To make a transaction and withdraw money from an ATM, we require an ATM card. Every ATM card is a representation of a unique bank account. For a money transaction, a specific person must input their card and pin number. It takes some time, and it takes a lot of time if there is a large wait at the ATM machine. because people today don't want to wait in a queue. The card insert method used by ATMs exposes people to illegal activity. In the future, there will be a lot less crime if a system based on fingerprints is built. Additionally, the quickest and simplest method is any fingerprint-based security system.

Hardware Module and Software Design

A fingerprint scanner module that is connected to a microcontroller and a microcontroller that is connected to an LCD that displays the user interface and an alarm system in the event that an unauthorized person tries to access an account will be used to implement or develop the proposed security for ATM machines. Finally, a power source will be required to run the entire ATM machine.

The software design phase is the most challenging. A user interface's code is included in software design. Second, a code to identify the individual by their distinctive fingers, The fingerprint scanner module's third and final code. This reads the user's fingers, generates a picture of the fingerprint scanning process, and searches the bank's database for previously saved fingerprints using a fingerprint matching template. An OTP will immediately be generated and sent to the registered cellphone number if the code validates the fingerprint recognition and the user (If the programmer wants to add this extra security measure, then OTP confirmation is optional procedure of the user). After that, the user may access his or her account to complete the purchase.

Research Objectives

The main objective of this research is to implement or develop a fingerprint-based system in ATM machine as the alternative of input or dialing pin number of a user bank account.
The major objective of this research is to install or create a fingerprint-based system for ATMs as a replacement for keying in or calling a user's bank account pin number.

Sub Objective:

a) Is to be used as a backup mechanism for entering an ATM user bank account's pin number.
b) To avoid card retention issues brought on by calling the erroneous account pin number.
c) To lessen or stop criminal conduct involving the theft or robbery of funds from an account.

Research Questions

The main research question of this research, how this system can bring benefit to the users.

Sub Research Question:

a) What is the alternative system of dialing pin number in ATM machines?
b) Why fingerprint-based system is needed to be used in ATM machines?
c) Can this system prevent criminal activities?

Proposed Methodology

The main purpose of this research is to implement or develop a fingerprint-based system for ATM machines. It will not only improve the security for ATM machines but also for the people. Besides this will improve the overall banking transaction security.

In this methodology, we will come an alternative solution of ATM card banking transaction, how to improve the security level, how to decrease or prevent the criminal activities and how this new system can be beneficial for the people. From the help of research papers of other authors and google, we can come to a conclusion that fingerprint-based system for ATM machines can take the banking transaction security system to the next level.

Reference

[1] Koli, S., Patil, M., & Thakare, S. ATM USING FINGERPRINT.

[2] Sangeetha, T., Kumaraguru, M., Akshay, S., & Kanishka, M. (2021, May). Biometric based fingerprint verification system for atm machines. In Journal of Physics: Conference Series (Vol. 1916, No. 1, p. 012033). IOP Publishing.

[3] Muley, A., & Kute, V. (2018, January). Prospective solution to bank card system using fingerprint. In 2018 2nd International Conference on Inventive Systems and Control (ICISC) (pp. 898-902). IEEE.

[4] Rajput, S. K., Patne, A. R., Varma, A., & Vishe, G. (2019). Enhanced fingerprint recognition and OTP to improve ATM Security.

[5] Nawaya, J. J., Jemimah, N., & Oye, N. D. (2019). Designing a Biometric (Finger) Using Multispectral Imaging Biometric Authentication Measures for Enhancing ATM Security in Nigeria. Department of Computer Science MAUTECH-Yola International Journal of Computer Science and Mobile Computing.

[6] Joy, A. (2021). A systematic review comparing different security measures adopted in automated teller machine. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(13), 388-393.

[7] Eldo, H. S. (2019). Fingerprint based security system for ATM. International Research Journal of Engineering and Technology, 6, 850-854

[8] Rumman, M. R. H., Sarker, A., Islam, M. M., Hoque, M. I., Kuri, R., Bhuyan, M. B. A., & Bhuiyan, N. A. T. (2020). ATM Shield: Analysis of Multitier Security Issues of ATM in the Context of Bangladesh. *Journal of Experimental Sciences*, *11*, 22-27.

[9] Sandhiya, R., & Prabavathy, P. (2021). A CASE STUDY ON SMART TECHNOLOGY USING IN ATM. *THE OPPORTUNITIES OF UNCERTAINTIES: FLEXIBILITY AND ADAPTATION NEEDED IN CURRENT CLIMATE*, 110.

[10] Baraskar, V. P. (2018). FINGER PRINT BASED BIOMETRIC AUTHENTICATION SYSTEM FOR ATM SYSTEM. *Asian Journal For Convergence In Technology (AJCT) ISSN-2350-1146*.

[11] Manish, C. M., Chirag, N., Praveen, H. R., Darshan, M. J., & Vali, D. K. (2020). Card-Less ATM Transaction using Biometric and Face Recognition–A Review. *International Journal for Research in Applied Science & Engineering Technology*, *8*, 1493-1498.

[12] Jaiswal, A., Kapadia, N., Wadia, A., Goyal, A., & Vengurlekar, P. (2020). Security for Building and ATM Machine.

[13] Thiruthanigesan, K. ENHANCING ATM SECURITY USING FINGERPRINT.

[14] Padmavathi, M., Rajeshkumar, B., & Kishore, R. G. Bio-Matric Intelligent ATM System. *International Journal on Future Revolution in Computer Science & Communication Engineering*, *ISSN*, 2454- 4248.

[15] Alsolami, F. (2019). BioPay: Your fingerprint is your credit card. *International Journal of Advanced Computer Science and Applications*, *10*(1), 521-525.

[16] Nancy, A. N., & Kavipriya, S. Combinational Security Lock System for ATM using Finger Print Identification.

[17] Das, P. D., & Manchekar, L. (2019). SAFE TRANSACTION FROM AUTOMATIC TELLER MACHINE USING BIOMETRIC METHODS. *Advance and Innovative Research*, 330.

[18] HARINE, M., PADMAVATHI, K., & KUMAR, M. L. V. (2020). FINGERPRINT AND IRIS BIOMETRIC CONTROLLED SMART BANKING MACHINE EMBEDDED WITH GSM TECHNOLOGY FOR OTP.