

# Advance Security System for ATM Machine

Nachimuthu S, Kirandeeep D, Manojkumar T, Mythily C, Narmadha V  
*Department of Electronics and Communication Engineering,  
Velalar College of Engineering and Technology,  
Thindal-638012, Tamil Nadu, India*

**Abstract-Because to its accessibility and all-around user friendliness, ATMs have grown quite popular with the general people. ATMs can now be found in a lot of places with frequent or heavy consumer traffic. As an illustration, ATMs are generally found in a variety of settings, including restaurants, supermarkets, convenience stores, malls, schools, petrol stations, hotels, work locations, banking centers, airports, entertainment venues, and transit facilities. Consumers often have access to ATMs on a continuous basis, allowing them to conduct banking operations and/or financial transactions at any hour of the day or any day of the week. This proposal relies on facial recognition technology as well as a tiered security mechanism to execute the overall concept.**

## I. INTRODUCTION

A bank account can be accessed using an automatic teller machine (ATM) from any location without the assistance of bank staff. With the use of an ATM, the user is able to conduct a number of banking tasks, including cash withdrawal and money transfers.

An ATM is an automatic teller machine. In order to identify authorized users and prevent fraudulent transactions, a typical ATM machine operates when a consumer inserts an ATM card and is prompted to enter a PIN. Only when both get matched can the user perform withdrawals and transactions. Yet, PIN can be quickly found by scanning methods or by approaching a person closely. Then, in most cases, ATM fraud is committed by inserting bogus cards into the machine's slots because the real cards cannot be scanned when they are there. As a result, the machine requests the PIN. Swindlers can thus simply steal money from the user.

An ATM is an automatic teller machine. In order to identify authorized users and prevent fraudulent transactions, a typical ATM machine operates when a consumer inserts an ATM card and is prompted to enter a PIN. Only when both get matched can the user perform withdrawals and transactions. Yet, PIN can be quickly found by scanning methods or by approaching a person closely. Then, in most cases, ATM fraud is committed by inserting bogus cards into the machine's slots because the real cards cannot be scanned when they are there. As a result, the machine requests the PIN. Swindlers can thus simply steal money from the user.

## II. LITERATURE SURVEY

Anjalin Joy; Caren Babu; D Abraham Chandy proposed "Enhanced Security Mechanism for ATM Machines". The project proposes the idea of an image base added security for ATM machines using Raspberry pi that will eliminate the unauthorized usage of ATM cards by person other than the owner [1]. Soundari D V; Aravindh R; Edwin Raj K; Abishek S proposed "Enhanced Security Feature of ATM's Through Facial Recognition". This System revolutionized the way of transactions. There were no long lines of queue in front of the bank for a simple withdrawal of money.[8]. Rahul patil; Sagar salunke; Rajesh Lomte; Madhura abhor proposed "Efficient Cash Withdrawal from ATM machine Using QR code Technology". This project provide more secure transaction and it will reduce the waiting time ATM queue [9]

## III. PROPOSED SYSTEM

A biometric system called face recognition is used to recognize or authenticate a person from a digital image. The usage of face recognition systems in security is common. A biometric system called face recognition is used to recognize or authenticate a person from a digital image. The usage of face recognition systems in security is common. A face in a picture should be automatically recognized by a face recognition system. With the use of a new computer vision framework, our work aims to accomplish facial detection using an embedded ATM camera.

The ATM security system makes use of both hardware and software processes. The image processing software employs the Python programming language. If the image is not matched, the OTP is sent to the mobile phone via the camera after processing with a Python library. The account number must be entered first, and then the CNN algorithm will be used to capture the user's live image.

The image from the database will be compared. Allow the process to continue if the image matches. Send the OTP to the registration phone number if the image is not a match. Request the OTP from the user. The process can continue if the OTP matched. Check whether the three attempts were successful if the OTP wasn't matched. If NO, request the OTP; if YES, proceed to the home page. A buzzer will activate and an SMS will be sent to the appropriate individuals if someone attempts to break the ATM.

|   | <b>Traditional ATM Systems</b>  | <b>Proposed System</b>  |
|---|---|---|
| <b>Method Used</b>                      | ATM card and ATM PIN  | Account Number, Face Recognition, OTP   |
| <b>Features</b>                         | Transaction are allowed when both card and pin are matched            | Transaction are allowed only after face recognition or with OTP   |
| <b>Differences in security features</b> | Increased number of electronic scams by card cloning or PIN capturing | Electronic scams will not occur even with card cloning and PIN capturing. Transaction will be allowed only after face recognition |

TABLE 1 DIFFERENCE BETWEEN TRADITIONALAT

#### IV. SYSTEM ARCHITECTURE

*Module 1: Microcontroller Arduino:* The open-source Arduino platform is built on simple to use hardware and software. The GSM and BUZZER module will be controlled by an Arduino Uno. IDL for Arduino is used to programmer the Arduino controller.

*Module 2: GSM (Global System for Mobile Communication):* GSM is used to transmit and receive data over mobile devices. Moreover, it fits within the category of second-generation mobile communication. Here by using GSM when thief tries to break the ATM machine it will send the allow to the official persons.

*Module 3: Vibration sensor:* The amounts of vibration are detected using vibration sensors. It makes use of the piezoelectric phenomenon, which happens when certain kinds of crystals are stretched and a voltage is produced across them. Here, a vibration sensor is utilized to determine whether or not an ATM has been damaged.

*Module 4: Buzzer module:* The Buzzer module is produces a single tone sound when signal goes to high. Therefore sound frequency is fixed. Here whenever the vibration sensor gets high buzzer will be turn on.

*Module 5: Python:* A versatile programming language is Python. Both object-oriented and structured-oriented programming are supported by Python. The whole software configuration in this case is implemented using Python.

*Module 6: twilit API:* A cloud-based communication platform is Twilit. It will offer a virtual phone number for data transmission. If the image does not match, OTP is sent to the mobile number via Twilio in this case.

#### V. METHODOLOGY

In the contemporary world, using an ATM machine by card does not offer more security. The ATM machine will be upgraded with a layered security system as a result of this project. These tool, such as face recognition in conjunction with OTP, will be helpful in preventing ATM-related fraud attempts. This ensures that if one technique fails, another will still work. Lastly, using an ATM to commit fraud is impossible. The account number must be entered first, and then the CNN algorithm will be used to capture the user's live image. The image from the

database will be compared. Allow the process to continue if the image matches. Send the OTP to the registration phone number if the image is not a match. Request that user enter OTP the process can continue if the OTP matched. Check whether the three attempts were successful if the OTP wasn't matched. If NO, request the OTP; if YES, proceed to the home page. A buzzer will activate and an SMS will be sent to the appropriate people informing them of an attempted ATM break-in. The system's operation is broken down into three phases.

*V.1: Face recognition:* The web camera will capture an image of the user after the account number is supplied. Convolution Neural Network (CNN) is used to assess whether a person is authorised to be there based on a database-stored image.

Deep learning is used to train the stored images, and web cam is used for this process. If both images are successful, processing will be possible; if not, the video will move to the OTP stage.

*V.2: OTP verification:* If the second stage image does not match, an OTP will be sent to the mobile number via the Twilio API. If the user selects the right option, processing will be permitted. After three failed checks, the system will return to the home page.

*V.3: Breakage:* A buzzer will sound and a vibration sensor will send a message to an official person through GSM if someone attempts to break into an ATM.

## VI. BLOCK DIAGRAM

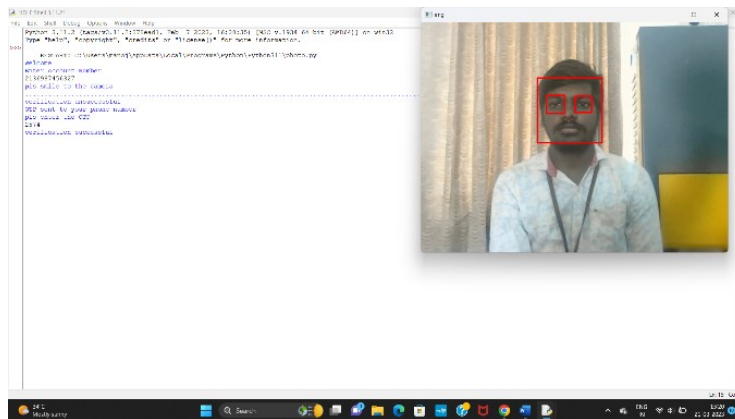
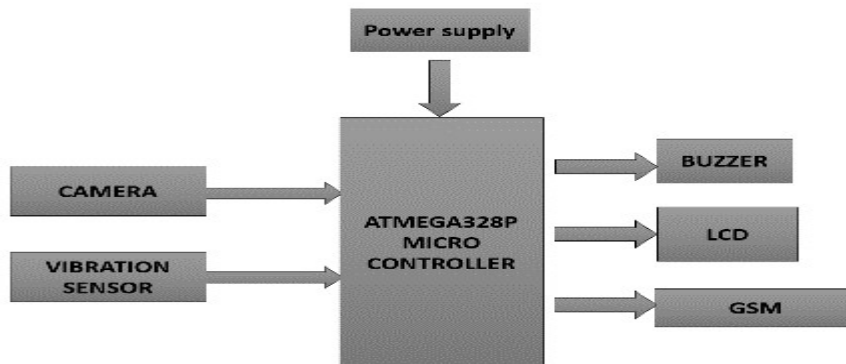


Fig.1. Block Diagram





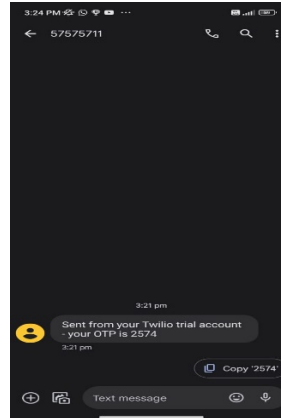


Fig.4. OTP received

## REFERENCES

- [1] Anjalini Joy, Caren Babu, D Abraham Chandy, Enhanced Security Mechanism for ATM Machines, ICACCS, 2021.
- [2] Hazra, S., 2019, March. Smart ATM Service. In 2019 Devices for Integrated Circuit (DevIC) (pp. 226-230). IEEE.
- [3] Nawaya, J.J., Jemimah, N. and Oye, N.D., 2019. Designing a Biometric (Finger) Using Multispectral Imaging Biometric Authentication Measures for Enhancing ATM Security in Nigeria.
- [4] Sankhwar, S. and Pandey, D., 2016, February. A safeguard against ATM fraud. In 2016 IEEE 6th International Conference on Advanced Computing (IACC) (pp. 701-705). IEEE.
- [5] V. Gokula Krishnan., G.N. Kirran, K.P. Deepkarasan, J. Kishore Kumar, 2020." Face Detection Based Atm Safety System In lot Using Secure Transaction", International Research Journal of Engineering and Technology.
- [6] Kande Archana, Dr A. Govardhan. "To enhance the security for ATM with help of sensor and controllers",IEEE.DOI10.1109/ICECDS.2017.8389590
- [7] Apurva Taralekar.2017 "One touch multibanking transaction on atm system using biometric and gsm authentication".IEEE.DOI10.1109/BID.2017.8336574
- [8] Soundari D V; Aravindh R; Edwin Raj K; Abishek S proposed"Enhanced Security Feature of ATM's Through Facial Recognition". This System revolutionized the way of transactions. There were no long lines of queue in front of the bank for a simple withdrawal of money.
- [9] Rahul patil; Sagar salunke; Rajesh Lomte; Madhura kalbhor proposed"Efficient Cash Withdrawal from ATM machine Using QRcode Technology". This project provide more secure transaction and it will reduce the waiting time ATM queue
- [10] C.Nagarajan and M.Madheswaran - 'Experimental verification and stability state space analysis of CLL-T Series Parallel Resonant Converter' - Journal of ELECTRICAL ENGINEERING, Vol.63 (6), pp.365-372, Dec.2012.
- [11] C.Nagarajan and M.Madheswaran - 'Performance Analysis of LCL-T Resonant Converter with Fuzzy/PID Using State Space Analysis'- Springer, Electrical Engineering, Vol.93 (3), pp.167-178, September 2011.
- [12] C.Nagarajan and M.Madheswaran - 'Stability Analysis of Series Parallel Resonant Converter with Fuzzy Logic Controller Using State Space Techniques'- Taylor & Francis, Electric Power Components and Systems, Vol.39 (8), pp.780-793, May 2011.
- [13] Nagarajan and M.Madheswaran - 'Experimental Study and steady state stability analysis of CLL-T Series Parallel Resonant Converter with Fuzzy controller using State Space Analysis'- Iranian Journal of Electrical & Electronic Engineering, Vol.8 (3), pp.259-267, September 2012.
- [14] G.Neelakrishnan, P.Iraianbu, T.Abishek, G.Rajesh, S.Vignesh, "IOT Based Monitoring in Agricultural" International Journal of Innovative Research in Science, Engineering and Technology, March 2020, Volume 9, Issue 3, pp:814-819