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Cardless Transaction in ATM

Sonal Mahajan[1], Anagha Awale[2], Rutuja Gurav[3], Pranjal Satpute[4], Ms. Hema Karande[5], Mr. Jitendra Bakliwal[6]
[1, 2, 3, 4]*B.E. Students,* [5, 6]*Assistant Professor*
Computer Department and Electronics and Telecommunication Department Savitribai Phule Pune University
Marathwada Mitra Mandal's College of Engineering, Pune, Maharashtra, India

Abstract: ***A lot of financial transactions are carried out using automated teller machines, or ATMs. However, ATM frauds, such as card skimming and PIN theft, continue to be a major concern for both customers and financial institutions. Face detection technology has come to light as a promising solution to increase the security of ATM transactions. Face detection technology can authenticate users by precisely identifying them based on their facial features, adding yet another level of security to ATM transaction processes. This research paper provides an overview of the use of face detection technology in ATM transactions and highlights how it has the potential to improve security by reducing fraud and unauthorised access.***
Keywords: Face Recognition, ATM, Convolutional Neural Network (CNN), E-Gadgets.

I. INTRODUCTION

Our daily lives have become completely dependent on ATMs, which offer a practical way to handle financial transactions like cash withdrawals, balance inquiries, and fund transfers. Theft of card information and PINs during ATM frauds, however, continues to be a serious threat to both users and financial institutions. Traditional methods of authentication, like using a physical card and entering a PIN, are vulnerable to fraud such as shoulder surfing and skimming. In order to address these security issues, biometric authentication techniques have been introduced to increase the security of ATM transactions. These techniques include fingerprint recognition, iris scanning, and face detection. Face detection technology has drawn a lot of attention because of its non-intrusiveness and user-friendliness. In order to identify and authenticate users based on their distinctive facial features, face detection technology uses a camera to capture facial images.

This research paper aims to understand how face detection technology is used in ATM transactions and how it might improve security by reducing fraud and unauthorized access. The function of face detection technology, its benefits and drawbacks, and the difficulties of integrating it into ATMs will all be covered in this paper. The paper will also review the relevant research on face detection technology in ATM transactions and provide an overview of current systems and the way they work. It will be concluded by introducing potential directions for more research in this area along with recommendations.

Although face technology systems might differ, generally speaking, they tend to operate as follows:

1) *Step 1:* Face detection
2) *Step 2:* Face analysis
3) *Step 3:* Converting the image to data
4) *Step 4:* Finding a match

II. MOTIVATION

As technology advances, so does cybercrime in all fields, including banking. To combat these types of assaults, ATMs demand user verification for each transaction. Customers now utilize smartcards for transactions, which may be accurately lost, copied, stolen, or impersonated. Customer recognition in typical ATM systems is only reliant on smartcards, passwords, and certain bogus identity verification procedures. The biometric system allows automated authentication for any consumer by utilizing unique features and traits.

III. RELATED WORK

The current ATM system uses a card and PIN-based method to authenticate transactions. It then allows access to bank transactions. For each ATM user, the ATM system compares the entered PIN to the authorization PIN that has been previously saved. Thus, the requirement for an innovative, straightforward, and secure access technique is essential. In the current work, the user generates the PIN, which the ATM system is then able to access using a (SIM) Subscriber Identity Module in the user's mobile phone.

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Any user has the ability to capture this PIN and use it for fraud. If a match is found, the system verifies the user and gives them access to all ATM-compatible services. The user authentication procedure fails if there is a mismatch, and they are given two additional chances to enter the right PIN. The card is blocked and kept by the ATM if an incorrect PIN is entered. A few ATM systems now use fingerprint authentication, although this can also encourage fraud. Hackers can easily access the security system using the stolen fingerprint.

A. Convolutional Neural Network

Convolutional neural networks are deep feedforward neural networks with convolutional computation. They are one of the representative algorithms of deep learning. Convolutional neural network (CNN) derives high-stage semantic data from raw statistics entered layer by layer by stacking operations such as convolution, convergence, and nonlinear activation function11. The convolutional layer in convolutional neural networks educates less parameters to extract function facts for the entered records. The major advantage of the convolutional layer over the overall connection is that the community is locally associated, and the number of parameters that need to be trained is limited, which allows for the construction of a deeper and broader network form to address larger problems.

The positioning of the pooling layer is intended to reduce the size of the characteristic map. To speed up network training and reduce the number of computational facts, the convolutional neural network employs a pooling layer behind the convolution layer to reduce the quantity of information, the pooling operation can not only make the characteristic size extracted by the convolution layer smaller, lessen the number of computing records, but additionally reduce the degree of over-becoming of the network to some extent and improve community overall performance.

B. Face Recognition

To identify people from digital photographs or videos from a source, face recognition software is utilized. This study employs facial recognition technology for ATM system verification. There are two different kinds of comparisons used for facial recognition. The system matches the provided person to who they claim to be and makes a yes/no determination in this initial phase of verification. The algorithm compares the provided image to every other image in the database list of matches in the second stage to identify matches. A face recognition system uses technology to examine the distinctive characteristics of human faces, such as their form, pattern, and placement. The FRS technology is extremely sophisticated and largely depends on software. For each type of biometric in the Biometric Method, the analysis structure is set up using PCA algorithms. A picture is used to begin face recognition, which looks for people in the picture. This can be accomplished using a variety of techniques, such as movement, skin tone, facial expressions, blurred human forms, etc.

IV. PROPOSED SYSYEM

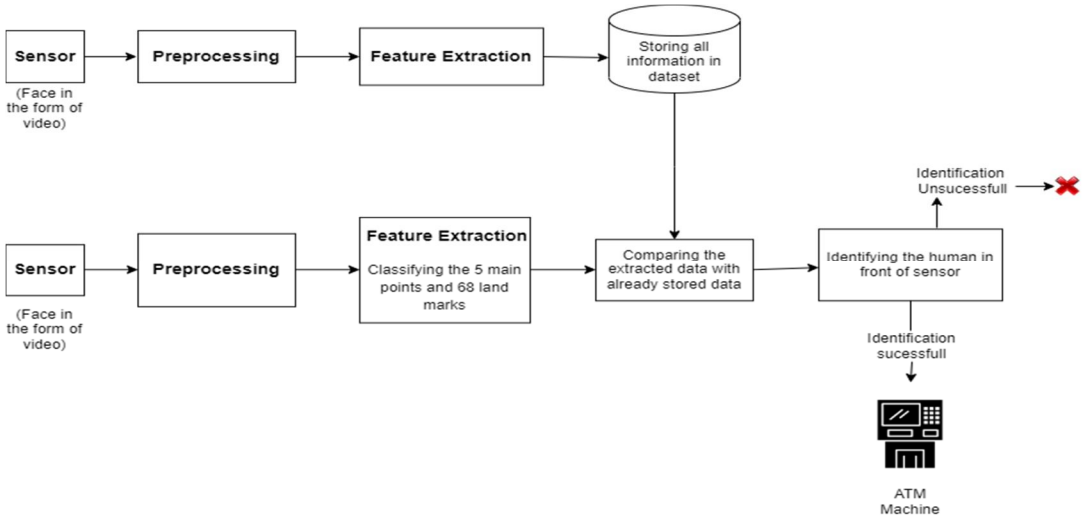


Fig. 1 System Architecture

The proposed model attempts to provide authentication for banking services with the help of already present data in the dataset which then gets compared with the help of classifier to the real time image or video. Once the comparison is successful it leads to normal services like cash withdrawal, balance enquiry etc.

1) *Pre-processing:* It is the procedure of minimizing the facial characteristics. The retrieved face picture is specified at this pre-processing stage, and it is transformed to 100x100. The most popular method of histogram normalization is known as histogram equalization. With an increase in contrast that goes beyond the picture's intensity, the image becomes increasingly clearer and more constrained. It entails computing a collection of geometrical characteristics from the image of the face we wish to recognize, such as nose width and length, mouth location, chin shape, etc. The characteristics of known people are then compared to this collection of characteristics.
2) *Feature Extraction:* In this step, with the help of DLib and second detector based on CNN feature in context of maximum margin object detector we extract five face landmarks where we identify the key points on face such as tip of the nose, corner points of the eyes, corner contour of the lips. On the left is a face that we extracted from a photograph using face detection sensor. On the right is what that image looks like after we use face landmarks estimation to detect points on face. And with the help of these 5 landmarks and DLib, 68 facial landmarks are detected.
3) *Comparison:* Once the feature extraction of face landmarks is done, then it gets compared to the already stored image in dataset. If the images comparison is successful it leads to further banking services.

V. UNIFIED MODELING LANGUAGE

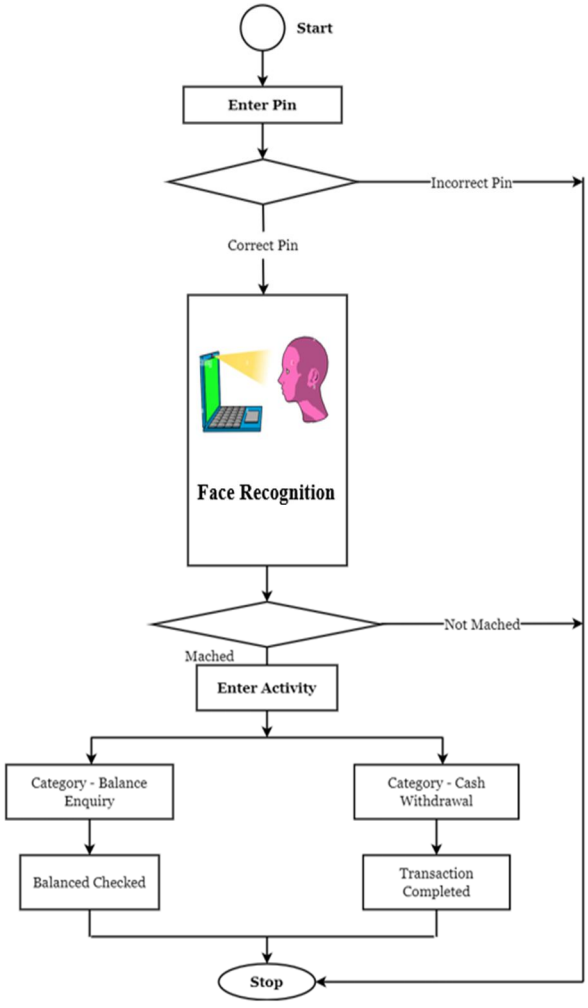


Fig.2 Unified Modeling Language (UML)

VI. CONCLUSION

The adoption of the ATM as an electronic banking channel has positively impacted the banking industry worldwide because it is very effective and convenient for bank customers. The advent of ATM fraud has however been a menace for many banks all over the world and many banks now aim to eradicate fraud costs to the bank. The proposed system can provide a practical and workable solution that addresses the requirements of the regulatory authority of the banks. The adopted technology of the proposed system is also cheaper to deploy than the face detection authentication technique because it utilizes the components of the existing system. In general, it will positively impact the banking industry and the society by reducing the rising levels of crimes that are associated with ATM transactions.

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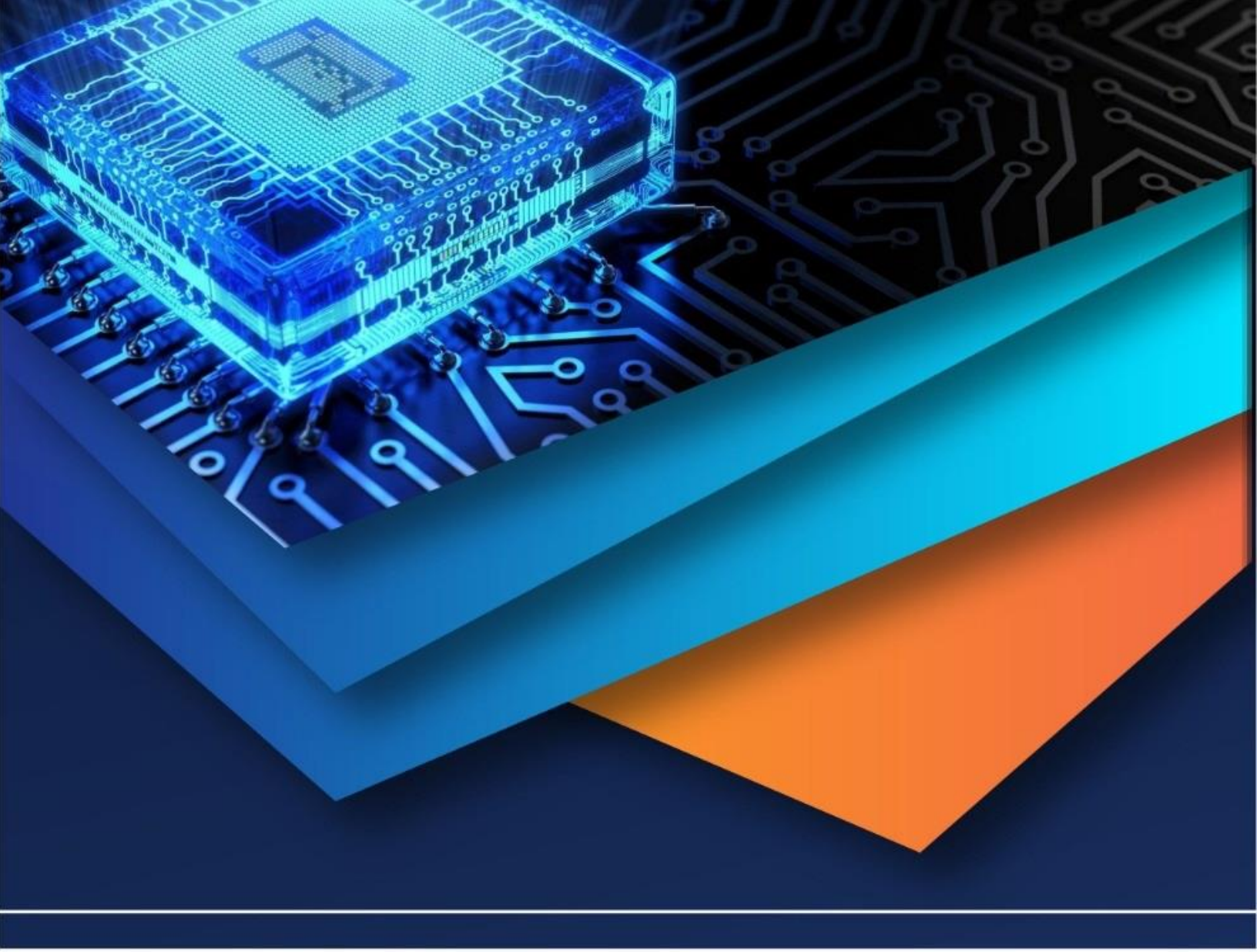
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