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Facial Recognition and OTP based ATM Machine Security System

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Abstract* — we *are in digitization era, where each and every process which was carried out manually is been digitized in some or the other way. And same goes with the Automated teller machine (ATM). Most of people prefer Automated teller machine (ATM) for money withdrawal or any other banking related operations rather than visiting the branch of Banks. Uses of Automated teller machine (ATM) machines have increased drastically and same time the security concerns have arises. Currently we have the PINs for Automated teller machine (ATM) cards to protect it from any unauthorized access to it. As per research it has been observe that Automated teller machine (ATM) pins are been hacked in many ways like accidently disclosing of PIN's to someone, stolen of it, etc. The present Automated teller machine (ATM) security authentication technique is dependent on pin-based verification. So in order to avoid such kind of security concern we have came up with system wherein we will secure the Automated teller machine (ATM) machine by 2 ways of security. Initial authentication will be face detection and recognition using web camera if the primary users tries to access the Automated teller machine (ATM) machine. And second is the OTP based authentication incase primary users want someone on behalf of him/her want to access the Automated teller machine (ATM) machine.

Keywords: ***Face Detection, Security, PIN, Automated teller machine (ATM), hacking, Camera, OTP, Virtual Keypad.***

I. INTRODUCTION

Currently an automatic teller machine (ATM) is been used everywhere in world and by most of population. It has seamless benefits of its own. Like using an automatic teller machine (ATM), users can access their bank deposit or credit accounts in order to make a variety of financial transactions, mostly cash withdrawals and balance checking, as well as transferring credits to intended recipient. Due to all these it has become the integral part of our lives. Same time chances of attack on it have increase nowadays. It's been already taken care by automatic teller machine (ATM) security team to authenticate on every step during performing any transaction, but that does not protect the automatic teller machine (ATM) system from unauthorized user at certain extent. Currently the automatic teller machine (ATM) system is primarily dependent on pin-based technique. Automatic teller machine (ATM) security always keep eye on vulnerability on system and tries to improve the security level of it. so that customer can carry banking transactions hassle free and without any fear of siphoning of amount from their account and the same frauds works with similar speed to crack the innovated security feature so that they can have access over the Automated teller machine to exploit the accounts of bank customers.

II. LITERATURE SURVEY

1. Security System ATM Machine with One-Time Pass code on M-banking Application
Author: Rendy Munadi, Arif Indra Irawan, Yuman Fariz Romiadi

Description:
Security at ATMs has an important role in preventing attacks on bank customers. This system still uses magnetic cards and static PINs as the part of security system. This security holes in many cases causes customers to lose the amount from their accounts. The paper shows the evaluation of security system prototype and flaws in it. Proposed dynamic PIN to improve the security of ATMs. To evaluate quality of prototype, quality and quantitative test was conducted.

2. A FACE DETECTION BASED ATM SECURITY SYSTEM USING EMBEDDED LINUX PLATFORM

Author: Jignesh J. Patoliya, Miral M. Desai

Description:
In this paper they have proposed 'Smart ATM security system based on embedded Linux platform'. Implementation of System is based on credit card size Raspberry Pi board with extended capability of open source Computer Vision software which is used for Image processing operation. High security mechanism is provided by the actions such as pre system captures the human face and check whether the human face is detected properly or not. If system fails to detect the face properly, it warns the user to adjust him/her properly to detect the face. In case the face is not detected as expected then system will lock the door of the ATM cabin for security purpose and raise the alert alarm.

3. IMPROVING ATM SECURITY VIA FACE RECOGNITION

Author: K John Peter, G. Gimini Sahaya Glory, S. Arguman, G. Nagarajan

Description:
This paper proposes the idea behind the face recognition system used in computer applications in the from automatically identifying or verifying a person from digital image or any video frame. ATM System uses the technique for verification is face recognition. In Order to detect face, it has two types of comparisons. In Initial verification process system compare the details of individual who's data is provided and give the result in the form of decision like yes or no. The second one is identification this is where the system compares the given individual to all the other available records of individuals in the database and gives a ranked list of matches

III. PROPOSED SYSTEM

Our proposed work is based on intelligence security system which will ensure the ATM users to use the system without any hesitation and with confident. System consists of two main modules. Initial module is Bank Administration which takes care of basic banking activities like new customer registration to bank, maintain their transaction data, profile update, deactivating the account if necessary. Second module consist ATM system where user gets two options to get him/her self authenticated. First option is self user who can click on "Detect Face" and get authenticated. Area of work here is basically focuses on Design of system that mainly works on Face detection technique using LRR algorithm. Once the user clicks on Detect face the system captures the live photo and compares it with the profile picture stored in bank database. If it's found valid then user is allowed to perform further operations else system will decline the transaction after couple of warnings. Next option for authentication is Guest User, wherein he can use the service of ATM on behalf of primary user by just asking him/her to share the live OTP sent on mail.

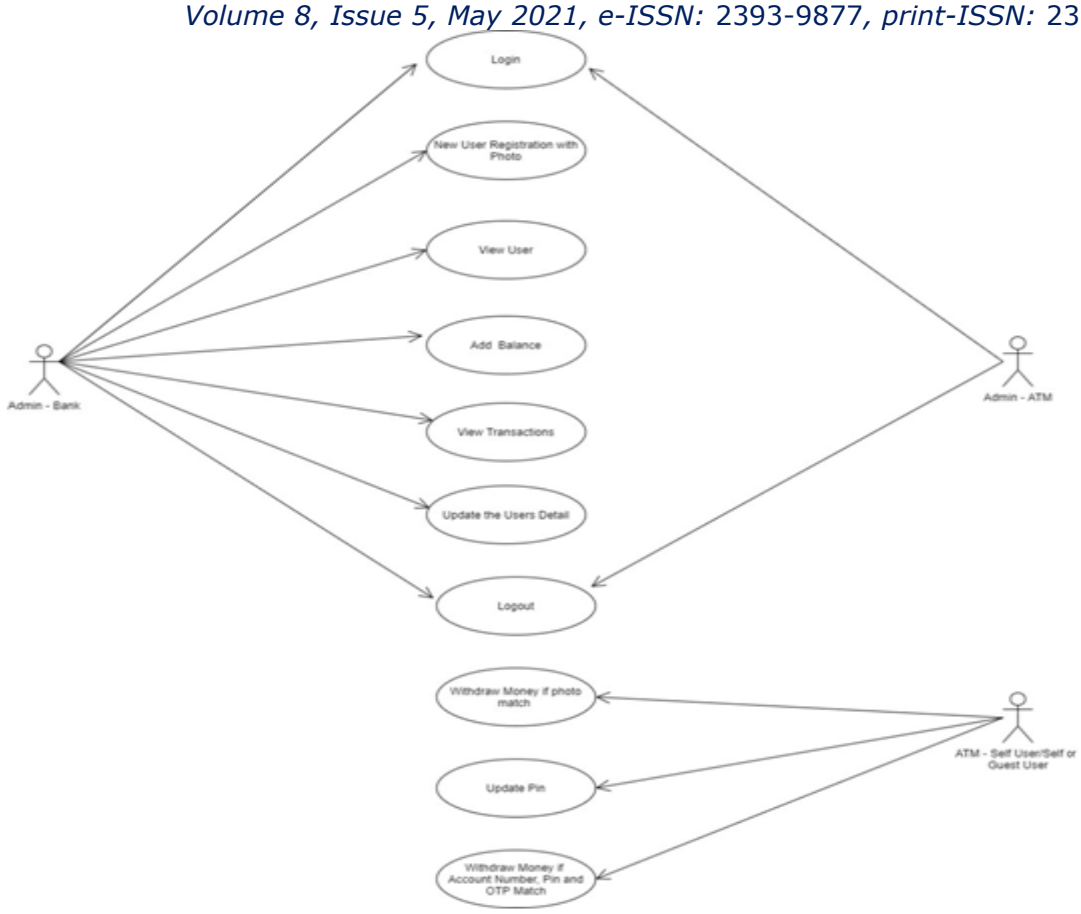

Figure 1: System Architecture

MATHEMATICAL MODEL

Step 1: let' U be the user of system who logins to the system.
U=f U1, U2Un g.

Step 2: Let say S as System that will authenticate the user U by face detection or sending the OTP to user mail and verify the user.

Step 3: User U will perform some banking-related activities like cash withdraw or perform some activities like profile update.

Step 4: Our Proposed system will compare the image stored in database with the live face image captured from the ATM camera with the use of the LRR algorithm if it does not match with the image stored, system will give a warning message and after a couple of warning it will decline the transaction.

Step 5: The system also provides the alternate option to login into the system i.e. using guest login, where the user login using OTP

IV. APPLICATIONS

1. System is specially built for Bank and ATM machines

V. GOALS AND OBJECTIVES

1. In the terms of accuracy & Efficiency, our proposed system is more accurate as compared to the traditional system.
2. ATM machine security using OTP and facial recognition features, which detects fraud and avoid unwanted fraud.
3. Our goal is to build a robust system, which has 2 options to authenticate users like self user and the guest user.

VI. CONCLUSION

Our proposed system ATM model is more reliable in terms of providing security by using a face recognition system. Our system aims to provide 2 modes of login. Where in self mode is for the authorized or a primary person of account, who wishes to self login using the facial detection method. So face detection is performed based on the LRR algorithm. Comparison of the face takes place with the Image stored in the database whiles the registration process. And the second mode is the guest mode, which is available as in backup if in the worst case face does not match with the stored image in the database or any other exceptional conditions. Then the user has the second option with OTP and password. So we have successfully implemented the ATM security system using the face detection technique.

VII.REFERENCES

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