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Multi Level Safe Security System for ATM Using Face Recognition and GSM Module

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Abstract

Recently cash withdrawals of unauthorized persons by knowing an individual's pin number are increasing. We proposed a system to provide the solution for this type of theft by hybridizing face recognition module, one time passwordmodule, LDR& motion detector modulewith IOT. In our system at first stage face recognition has been implied to authenticate entry of person image with bank database of the system. If the authentication result is true, then user is allowed to reach ATM machine. Else the system gets mobile number and ATM pin of corresponding account holder through UI, if the credentials matches then OTP will be sent to database registered mobile number. If authenticated with correct OTP. Then user is allowed to access the ATM. If user trying to mishandle the ATM or if user blind the CCTV camera, then vibration sensors and the LDR detects it respectively and send alert message to police station through internet and doors get automatically locked. So, theproposed system provides a three stage protect for ATM instruments.

Keywords*: Face detectors, OTP system, Internet of Things, Vibration detection sensors, LDR*

I.INTRODUCTION

Computerized teller machines are utilized to perform business and individual monetary exchanges. Recently, ATMs are focuses for misrepresentation, thefts, and other security breaks. Beforehand, the main inspiration driving ATMs was to pass on money, and to charge a relating monetary equilibrium holder. Nonetheless, ATMs are getting more convoluted, which they currently serve various capacities, hence turning into a high need focus for burglars. Thus, we need a greatest degree of safety to forestall dangers of ATM. In numerous areas cash exchange assumes an indispensable part. Presently all bank exercises and exchanges are done through web, E-Banking. Yet the ATM cards are utilized by customary individuals for exchanges. Along these lines, ATM machine security is crucial for cash exchanges.

II.BASIC IDEA ON ATM

In beyond couple of years the financial innovation has fostered a great deal which has made the bank exercises to be effortlessly done. Today most of the cash exchanges, taking care of telephone and power bills are done in android telephones through web banking.In any case, in some country regions individuals uses ATM to perform bank exercises, for example, cash withdrawal, cash move. ATM gives them an approach to them to perform monetary exchange.Secret phrase (PIN) is one of the ATM security frameworks which gives assurance to card holders monetary data from unapproved individual's entrance. If the PIN entered by the individual matches with the approved PIN of the client, the exchange should be possible. However, currently the robbery in ATM's is expanding. Unethical programmers can get the card holders card subtleties and PIN effectively by complex breaking frameworks.

III.RELATED WORKS

One of the innovations in biometric identification is face acknowledgment system which is utilized in ID of hoodlums and other non-military personnel application.Unauthorizedaccess to ATM can be prevented by utilizing face recognition system. Some of available methodologies has been reviewedand summary of the reviews as follows.

Murugesan M et.al. [2] has propose a system which will capture the picture of the individual by image grabber fixed at entrance of the system. The system will verify by comparing the captured picture with database. If some unauthorized individuals try to access the card holder's ATM, this security breach information with access control will be sent to the card holder's registered mobile number along with the picture of unauthorized person. If the card holder accepts the access of that unauthorized person, then the individual in ATM can do the transaction.

Mohsin Karovaliyaa et.al [3] have proposed a system with tree stage system, at stage one the ATM card information is first collected from swiping device. At second stage camera takes the picture of the customer and compares with thestored database. If face and ATM information matches correctly,then at third stage OTP will be generated and it is sent to the registered mobile number. Correct OTP should be entered by the user for accessing ATM machine.

S Sasipriyaet.al [4] have proposed an ATM security system using face recognition for authentication purpose. The image of individualwill be compared with database image. If any unauthorized person is trying to access the ATM, then an alert message is sent to the corresponding user,

Narmatha.K et.al [5] have proposed security system for ATM Machines from unauthorized accesses by utilizing iris Scanner, Aadhar card, Face detection, and the vibration scanner.At ATM spot, the individual has to place their Aadhar in front of QR scanner and then the individualiris scanning has been done for authenticating purpose. If matched with the data stored in the database, ATM access will be provided to the induvial.But if the user causes any harm to the machine, vibration sensor will detect it and send information to the branch manager and the police station through Internet of Things (IOT).

Sruthi. M et.al[6] have proposed asystem sends a one-time password (OTP) to the user's mobile number next of ATM password for more secure transaction process in ATM.

Rathishala Rajendran et.al [7] have proposed a system uses fingerprint of the customerto compare with the stored database. If the fingerprint gets matches, an OTP is generated and send to the registered mobile number of the customer. Only OTP authenticated correctly the transaction can be done.
Considering above reviews, we have proposed a security system with multistage of hybrid security protocol system using face recognition system, IOT and OTP features.

IV . PROPOSED SYSTEM AND IT'SIMPLEMENTATION

The proposed system provides multilevel of maximum security in ATMs by utilizing face recognition systems,OTP module, Internet of Things, vibration detection sensors and LDR based resources.

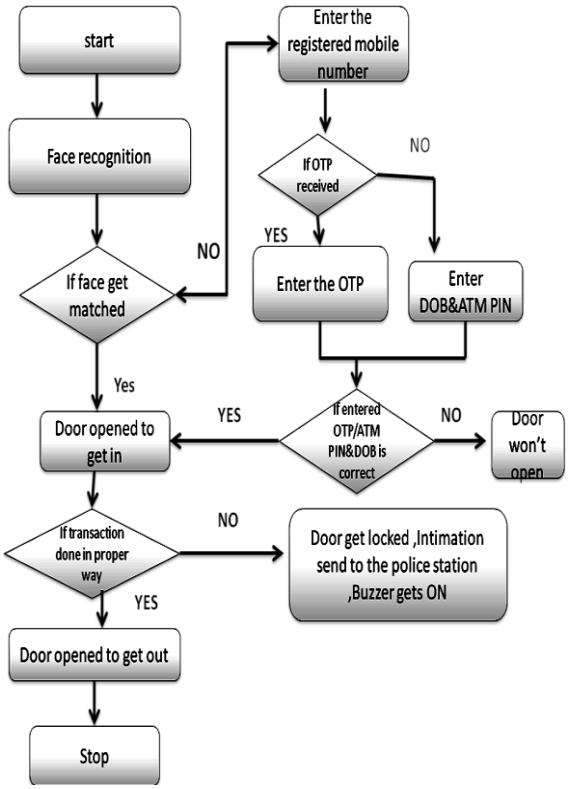

Figure 1:The systematic flow of proposed System

The above diagram shows the systematic flow of proposed work. The system consists of four different security stage.

Stage1: thecustomer face is captured using image grabber from entry side of ATM. The captured image is compared with the bank's database. Only if the captures image gets authenticated the entry will get announced else the individual is not permitted to step into the ATM.Sometimes there may be authorized persons are not compared properly because of any environmental conditions like light etc. To overcome this false authentication, we added second stage as OTP based security system

Stage 2: If stage 1 fails then, the individualis requested to enter the registered mobile number which is registered in the bank database. An OTP is spawned and initiated to the registered mobile number. If the OTP is appearedcorrectly the user is permitted inside the ATM.

Stage 3: If individual in rural areas may not have network coverage to receive OTP in such case, we are providing an option to enter account holder date of birth in following format DDMMYY with ATM password after 60 seconds from entering registered mobile number. If the details get authenticated from bank side the individual can be allowed to access ATM.

Stage 4: If the operating induvial does the transacted properly after accessing ATM, the individual leave the place of ATMconfinementeasily. Other case, if the operating induvial attempts to damage the ATM machine or attempts to blindthe CCTV camera with objects ortries to blind using LED light caps or any other light source on the CCTV camera the corresponding the LDR sensor above the CCTV camerawill be activated. Simultaneously the vibration sensor like piezoelectric accelerometers senses vibration on machine. If the operating induvial makes several unnecessary pulsations in ATM machine, the pulses are detected by this sensor. Immediately make motorized outer shutter of the ATM will be lifted down automatically followed by glass door locking, then initializing the process of sendingwarning message to the nearby police station and branch manager can been done through IOT module. Since the outer shutter is automatically locked the security is maximum and the robber can't escape.

Advantages of the proposed model is

- It has maximum level of security
- The security system works even individual does not have access of mobile network
- Unauthorized person can't escape from ATM spot
- Only authorized people can access the ATM

V.BLOCK DIAGRAM

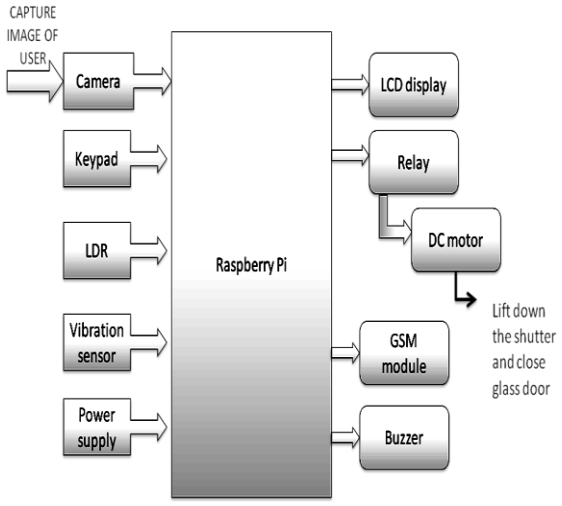

Figure 2.Proposed System Block diagram

The block diagram of the proposed system has been shown in figure 3. The proposed block diagram contains raspberry pi with following modules[8-16].

a) Raspberry PI

It is a little PC almost the dimension of a deck of cards. It utilizes what's known as a framework on a chip, which coordinates the CPU and GPU during a solitary microcircuit, with the Random-Access Memory (RAM), Universal Serial Bus (USB) ports, and different parts bonded onto the board for an across-the-board bundle. This is the heart of the proposed system. All the programming and decision making as taking place in RASPBERRY PI.

b) CameraModule

To take superior quality video, just as stills photos camera module can be utilized. The camera module, likewise, alluded to as CCM (minimized Camera Module), has been generally used in video conferencing, Security System and continuous observing as a video information input gadget. The module has been used for capturing the user face who trying to access ATM

c) Vibration Detection Sensors

It is a piezoelectric accelerometer that sense vibration. If the client makes any undesirable vibrations in ATM machine, the vibrations are identified by this sensor and makes the entryway naturally locked, send implication to the police headquarters through GSM module and the bell caution begins to signal to alarm the encompassing.

d) LDRModule

If the burglarattempts to visor the CCTV camera using LED light caps or any other light source,then the LDR module attached to the CCTV camera identifies the light and send intimation to the police station through GSM module.

e) Keypad

This module has been used for clients to enter data on a Raspberry Pi. It has 16-button keypad that holds the numeric from zero to nine also as a combination of additional buttons. The keyboard has a layout of four rows and four columns. It is used to enter the OTP/DOB &ATM PIN in our proposed system.

f) OTP Module

If their face authorization has not matched with the face of original card account holder, the system demands to enter the registered mobile number to system and delivers a OTP of 6-digit number to the registered mobile number as someone is trying to use your card. If authentication has been done using the OTP, then the individual is allowed to access the ATM.

We use a GSM module to send SMS as individuals in rural areas may not have network coverage remote areas and villages. After two minutes of OTP generation If the user not entered OTP, system request ATM PIN and Account holder data of birth in DDMMYY format, if the induvial entered correctly the user is allowed to enter the ATM. If PIN or date of birth is enrolledincorrectly the user is not allowed to enter the ATM.

g) Relay & DC Motor

Case 1: when multiple pulses detected in short duration through vibration sensor. Case 2: when burglar trying to blind the CCTV is detected by LDR. In both cases RASPBERRY PI enables relay of the DC motor shutter of ATM fordown lifting and glass doors get automatically closed.

h) Buzzer

Alarm provides warning of an intruder, by making a loud alarm to alert the nearby of the intruder's entry. Piezoelectric Sounders / Buzzers are sound components produced by incorporating a piezoelectric vibration plate on a plastic case (resonator). If any malpractices done by the burglar is detected by the sensors the buzzer starts to intimate the surrounding.

VI.CONCLUSION

This paper proposed a multi level security system for transactions in ATM.This system ensures encrypted transactions all 365 days. The proposed system is highly secure system which allows the user to do transaction under the card holders knowledge.Money transaction in ATM is secured by adding the face recognition, one time password with GSM module, vibration sensor and LDR module. Face recognition is a means for identification and authentication of account owners at the Automated Teller Machines gives the solution for the illegal transactions.In this paper, we have tried to provide a solution for the fraudulent transactions through ATM by face recognition and other sensors-based solution. Thus, without authentication of card holder illegal transaction does not happen.

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