

DESIGN AND IMPLEMENTATION OF SECURED BANKING SYSTEM USING MACHINE LEARNING CLASSIFICATION ALGORITHM

Seema, Prafulla, Benaka R Shetty,
Sanketh Shrikanth Hegde , Raveendra G
School of ECE, REVA University

ABSTRACT

Potential threats from viruses, malware, adware and hackers are constant. In the last couple of years, many massive global companies were hacked and compromised. In some cases, this has led to the leakage of confidential and private information, including bank details, addresses, etc., with a strong security system in place where these things can be stopped before they are close to the data private of the company. This is not only important in terms of confidentiality, but also to avoid the expensive fines that are imposed on companies that do not successfully protect customer information.

The project is a verification system that verifies the user to access the system only when they have the correct password input. The project involves three user certificates. There are many types of passwords and passwords available.. It contains three types of logins having three different kinds of systems. First one is the access through the face recognition. Second type of authentication is to scan the finger print of the user. By using these three level authentications, there is less chance for hacking.

Also In today's scenario safer bank locker is required, as the technology is improved in the field of electronics. They have also entered the fields like industry, medicine, telecommunication and home automation. This paper introduces an intelligent bank locker system which is developed using matlab for face recognition, microcontroller with biometric scanner and GSM network technology for generating OTP. This system is typically employed to secure bank locker by recognizing the person face in the first phase. In the second phase biometric scanner is used to get the persons fingerprint if it matches and then it goes to final stage where an OTP is send to the concerned person using GSM technology. Thus by using face recognition, biometric scanner and OTP for security purpose, we can prevent the unauthorized access to the system.

Keywords : Face Recognition, biometric,OTP,matlab,GSM, security, bank locker

I. INTRODUCTION

We live in a world where personal safety and neighborhood are very important. Common security systems like passwords, voice recognition, finger-publishing, palm scanning, scanning of Iris can easily be deleted. By knowing the password we can access the system, and by force or by setting one in a state of understanding we can break the remaining security system. Thus, the proposed security system allows to handle the protection of

our document and office / home and quality solutions. The user's face tag in the first phase provides, in the second phase of the user's fingerprint taken, if it matches and then in the last step will send OTP to the user. When all three phases match then the locker will only be opened. This is the best among all methods used for security. So this makes it unique to the soul. As technology reaches a high level, security is also an important issue of concern. This cycle has not been developed by a security system for commercial use, but that should not prevent anyone from being tempted by it. The face is the easiest way to distinguish the individual identity of each other. Face recognition is a personal identification system which uses personal characteristics of a person to identify the person's identity. Face recognition mainly consists of two phases, namely face detection, where the process takes place very rapidly in humans, except under conditions where the object is located at short distance away, the next is introduction, which recognize a face as individuals. Stage is then replicated and developed as a model for facial image recognition (face recognition) is one of the much-studied biometrics technology and developed by experts. There are two types of methods that are currently popular in the developed face recognition pattern, Eigenface method and Fisherface method. Facial image recognition Eigenface method which is based on the reduction of face- dimensional space using the Principal Component Analysis (PCA) for facial features. The main purpose of the use of PCA on face recognition using Eigen faces was formed (face space) by finding the eigenvector corresponding to the largest eigenvalue of the face image. The area of face detection system with face recognition is Image processing. The software requirements for the project is matlab software.

Face recognition is the task of identifying an already detected object as a known or unknown face. Often the problem of face recognition is confused with the problem of face detection. Face Recognition on the other hand is used to decide if the "face" is known, or unknown, using for this purpose a database of faces in order to validate this input face.

1.1 FACE RECOGNITION:

DIFFERENT APPROACHES OF FACE RECOGNITION:

There are two main approaches to the face recognition problem: Geometric (feature based) and photometric (view based). As researcher interest in face recognition process continued, many different algorithms were developed, three of which have been well studied in face recognition literature.

Recognition algorithms can be divided into two approaches:

Geometric is based on geometrical relationship between facial landmarks, or in other words the spatial configuration of facial features. That means that main geometrical features of the face such as the both eyes, nose and mouth are first located and then faces are classified on the basis of various geometrical distances and angles between features. (Figure 3). Photometric stereo is used to recover the shape of an object from a number of images which is taken under different lighting conditions. And shape of recovered object is defined by a gradient map, which is made up of an array of surface normals (Zhao and Chellappa, 2006) (Figure 2).

Popular recognition algorithms include:

1. Principal Component Analysis using Eigenfaces, (PCA)
2. Linear Discriminate Analysis,
3. Elastic Bunch Graph Matching using Fisherface algorithm,

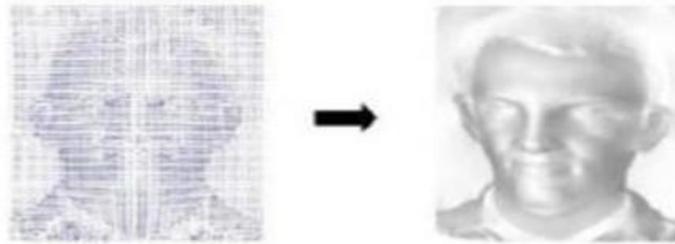


Fig1: Photometric stereo image

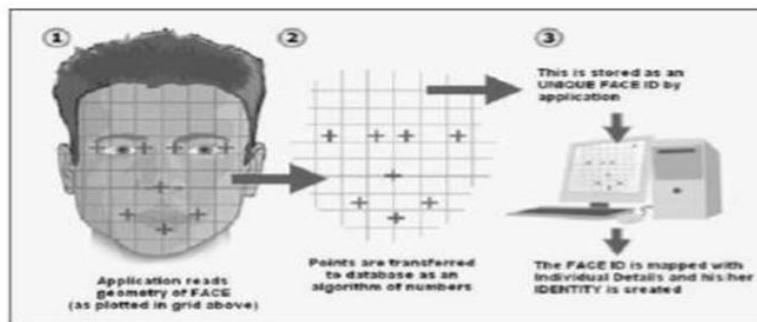


Fig2: Geometric Facial recognition.

1.2 FACE DETECTION:

Face detection involves separating image windows into two classes; one containing faces (turning the background (clutter).It is difficult because of the common presence of surfaces, they can vary according to age, skin color and facial expression. The problem is more complicated with different lighting conditions, image features and geometry, as well as the possibility of isolation and hide. The best surface detector manages to detect the presence of any surface under any type of lamp lighting, on any background. The task of identifying the surface can be divided into two stages..The first step is a classification which takes some arbitrary image as input and outputs a binary value of yes or no, indicating whether there are any faces present in the image. The second one is face localization task thattakes an image as input and output the location of any face or faces within the image as some bounding box with (x, y, width, height).

Face detection system can be divided into the following steps:-

Pre-Processing to reduce the difference in surfaces, images are processed before being fed on the web. All good examples of face-to-face images are available for connecting to the front faces so that they can only look at the front view. All fired photos are provided for lighting through normal rules. The classification of neural networks is implemented to create images like surfaces or abnormal for training on these models. We use the implementation of the neural network and Matlab neural web toolbox for this function. Different network

settings are tested and adjusted results. Localized neural networking is used to search for images in the image and if the image is now placing them into a focus box. Different features of the face whose work has been done on: - Position Orientation Scale Brightness.

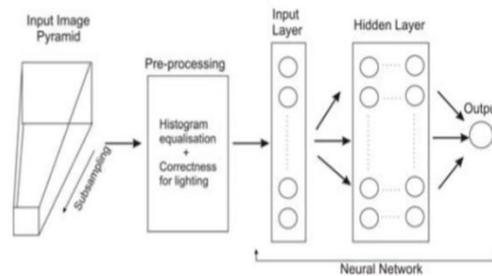


Fig: Face detection algorithm

Fig3: Face Detection algorithm

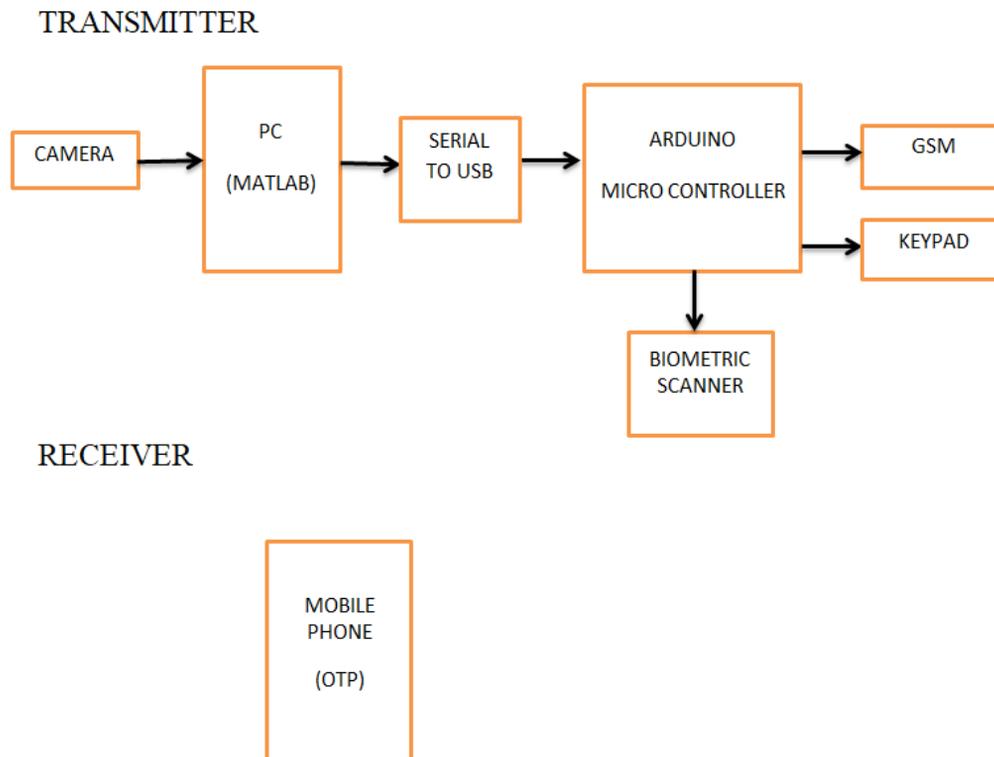
1.3 Bio Metric Scanner:

The Fingerprint technique is one of the safest way to detect and identify the Authorized person, We know that fingerprint is unique for even identical twins. By using this method we can make pretty sure about security needs. To add the fingerprint verification in microcontroller projects we can use this all in one optical fingerprint sensor-scanner (R305), It performs fingerprint detection and verification super simple.

1.4 GSM:

A GSM Module is basically a GSM Modem (like SIM 900) which connected to a PCB with different types of output taken from the board – TTL Output (for Arduino, 8051 and other microcontrollers) and RS232 Output to interface directly with the PC (personal computer). The board will also have pins (i/p and o/p) to attach mic and speaker, to take out +5V or other values of power and ground connections. These types of provisions vary with different modules. Lots of varieties of GSM modem and GSM Modules are available in the market for our use. In our project connecting a gsm modem or module to arduino and hence sending and receiving sms using arduino – its always good to choose an arduino compatible GSM Module – which is a GSM module with TTL Output provisions.

II. DESIGN



BLOCK DIAGRAM:

Fig4: System level block diagram

III. ALGORITHM

Develop a Robust and Effective multi-layer Authentication layer for various security systems

Design a 1st level security system based on facial recognition of the user.

Design a 2nd level authentication system based on Finger Print

Design a 3rd level authentication system based on OTP.

Detect the persons face from the live video relay using the Viola-Jones detection algorithm.

Identify the Facial Features using The Principal Component Analysis (PCA) or Kanade–Lucas–Tomasi feature tracker(KLT) algorithm.

To Perform Facial Authentication using Machine learning and correlation.

To integrate both Facial and Controller bases authentication.

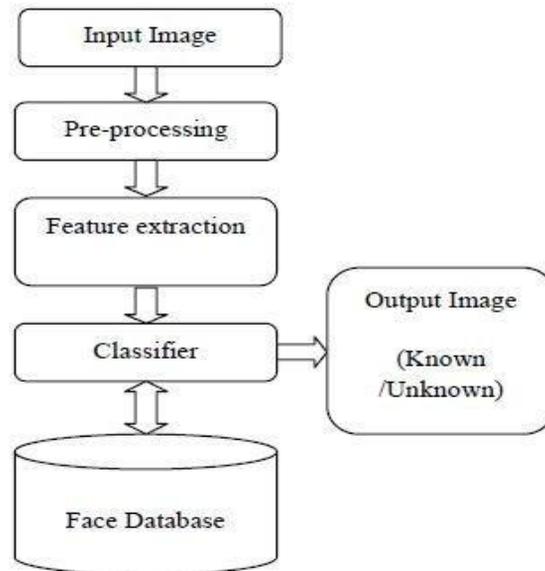


Fig 5:Flow for Face authentication

IV.RESULT

This section consists of results expected and snapshots of MATLAB face recognition and hardware setup. Following are the expected results such as after facial recognition, if authenticated moving to biometric authentication. The Biometric information must be compared with the data stored. If the data matches then the access is granted or else intruder, if biometric is authenticated moving to GSM. Interfacing of hardware and software must be done. If anyone of face recognition or biometric fails then the intruder message will be sent to GSM.

Following are the results obtained from MATLAB and snapshots of hardware setup.

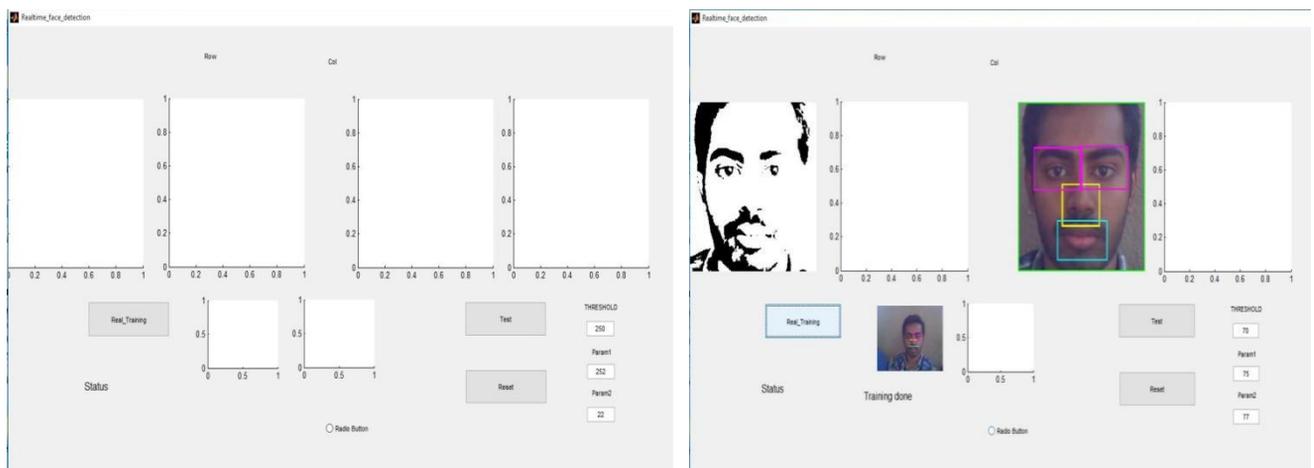


Fig6: MATLAB Results

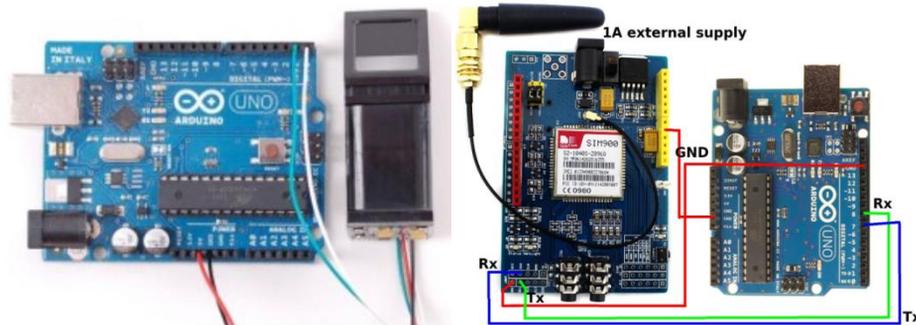


Fig7:Controller-Biometric-GSM interface

V. CONCLUSION

In this paper the various techniques have been discussed by examining and identifying a person verification based on various variables like face, biometric and OTP. The proposed system has a camera, PC (MATLAB), Arduino contractor, Biometri Scanner, GSM Technology and Mobile for safe banking. In the first face of the user is identified and detected. When you recognize the right person, then it goes to the second phase. In the second phase it examines the person concerned / finger / RFID and check if it is a match or not. In the third phase sends an OTP to the person's phone number via GSM technology, when the user logs into the OTP only then the lock will be opened.

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