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Multi-Level Secure Transaction using Facial Authentication on a Mobile Banking Application

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ABSTRACT

In this project we are going to develop a robust automated web application for transacting money in higher level security purpose with high facial recognition. First we have to register our personal details with our face. Haar cascade based algorithm has been applied for fast and simple face detection from the input image. The face image is then being converted into grayscale image. After that, the iris, eyebrows, nose, mouth of candidates are extracted from the intensity valleys from the detected face it will consider as datasets now our system can understand who are all authorized and unauthorized. While login our face will be recognized if we authorized we can move to authorized page else our system won't allow to login. For higher security purpose we have used face recognition module. During the transaction our face will be recognized it will allow only the authorized account holder to transact money, it doesn't allow others to transact money.

KEYWORD:

High level security, Haar cascade based algorithm, Face recognition module.

1. INTRODUCTION

Over the last decade, we have seen an increase in the use of technology in many business sectors to simplify and better engage customers. This is especially true in the banking and finance sector. Since the start of the digital revolution facial recognition has been gaining prominence over touch and type based interactions due to the convenience it offers without compromising on the security of transactions.

Despite an increase in the use of EMV cards (Europay, MasterCard, Visa) coupled with password creation policies, there has been a surge in banking fraud cases. As a result of the billions that are lost by major banking institutions, there has been a call to switch to biometric facial recognition to curb this issue. It means that banking software will rely on face scans which it then compares with similar ones that were uploaded by the bank's personnel into their system so as to verify the customer's identity. The aim is to authenticate the identity and only allow a transaction to go through if the account owner's identity is positively identified. This customer ID authentification process is known as KYC (Know Your Customer).

2. EXISTING SYSTEM

In previous days they used only single level authentication like OTP generation. It was not more secured. Secure electronic transaction (SET) It involves many levels of encryption, using many combinations of symmetric, cryptography,asymmetric cryptography and hashing. It does

not assume that each agent has his own private key so that the only problem which is remained is the distribution of the public keys, but allows cardholders to decide their asymmetric key.

2.1 DISADVANTAGE

User must have credit card. It is not cost-effective when the payment is small. None of anonymity and it is traceable. Network effect - need to install client software (an e-wallet). Cost and complexity for merchants to offer support, contrasted with the comparatively low cost and simplicity of the existing SSL based alternative. Client-side certificate distribution logistics.

3. PROPOSED SYSTEM

This uses machine learning techniques to get a high degree of accuracy from what is called "training data". Haar Cascades use the Adaboost learning algorithm which selects a small number of important features from a large set to give an efficient result of classifiers. Initially, the algorithm needs a lot of positive images (images of faces) and negative images (images without faces) to train the classifier. Then we need to extract features from it. For this, haar features shown in below image are used. They are just like our convolutional kernel. Each feature is a single value obtained by subtracting sum of pixels under white rectangle from sum of pixels under black rectangle.

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased. Any system developed must not have a high demand on the available technical resources. This will lead to high demands being placed on the client. A feasibility study evaluates the project's potential for success.

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it.

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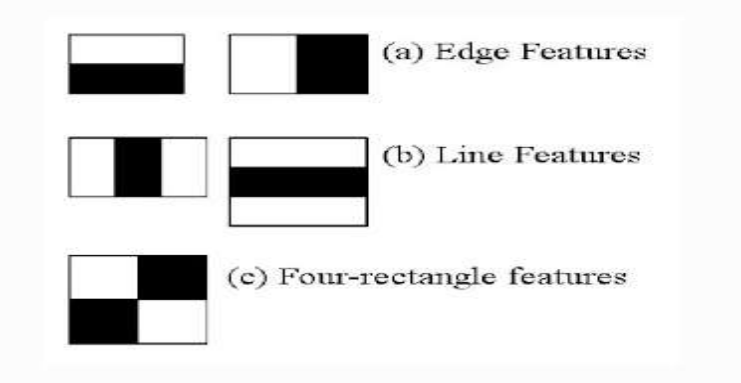

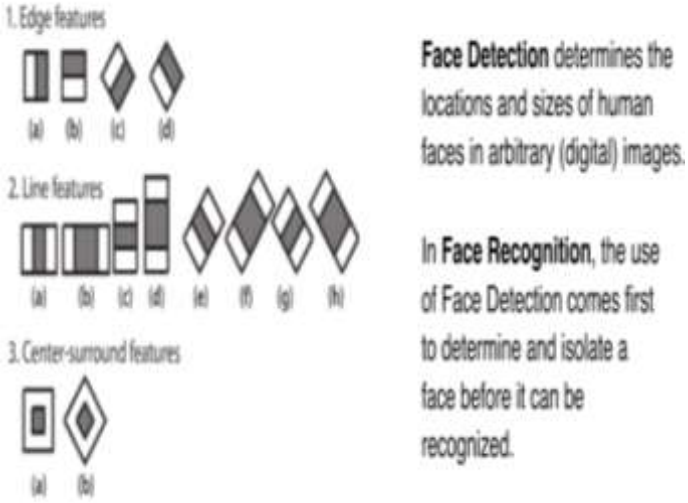

3.1 BENEFITS

The key advantage of a Haar-like feature over most other features is its calculation speed. Haar Cascade is a machine learning object detection algorithm used to identify objects in an image or video. Haar Cascades use the Adaboost learning algorithm which selects a small number of important features from a large set to give an efficient result of classifiers.

4. DOMAIN DESCRIPTIONS

Data mining is looking for hidden, valid, and potentially useful patterns in huge data sets. Data Mining is all about discovering unsuspected/ previously unknown relationships amongst the data. It is a multi-disciplinary skill that uses machine learning, statistics, AI and database technology. The insights derived via Data Mining can be used for marketing, fraud detection, and scientific discovery, etc. Data mining is also called as Knowledge discovery, Knowledge extraction, data/pattern analysis, information harvesting, etc.

5. PROJECT DESCRIPTIONS

Facial recognition is one of numerous ways banks can decrease friction in their customers' experience and increase efficiency and accessibility. This project make Identity Verification and Account Withdrawals Allowing customers to make withdrawals from their bank accounts. The biometric facial-recognition software helps minimize fraud where online hackers unlawfully use passwords and other data to steal from banking institutions. The software verifies a person's identity before processing any transaction.our goal is to provide an extremely frictionless, personalized experience with a focus on security.

6 METHODOLOGY

6.1 Classification:
This analysis is used to retrieve important and relevant information about data, and metadata. This data mining method helps to classify data in different classes.

6.2 Clustering:
Clustering analysis is a data mining technique to identify data that are like each other. This process helps to understand the differences and similarities between the data.

6.3 Regression:
Regression analysis is the data mining method of identifying and analyzing the relationship between variables. It is used to identify the likelihood of a specific variable, given the presence of other variables.

6.4 Association Rules:
This data mining technique helps to find the association between two or more Items. It discovers a hidden pattern in the data set.

6.5 Outer detection:
This type of data mining technique refers to observation of data items in the dataset which do not match an expected pattern or expected behavior. This technique can be used in a variety of domains, such as intrusion, detection, fraud or fault detection, etc. Outer detection is also called Outlier Analysis or Outlier mining.

6.6 Sequential Patterns:
This data mining technique helps to discover or identify similar patterns or trends in transaction data for certain period.

6.7 Prediction:
Prediction has used a combination of the other data mining techniques like trends, sequential patterns, clustering, classification, etc. It analyzes past events or instances in a right sequence for predicting a future event.

7. SYSTEM DESIGN
SYSTEM ARCITECTURE

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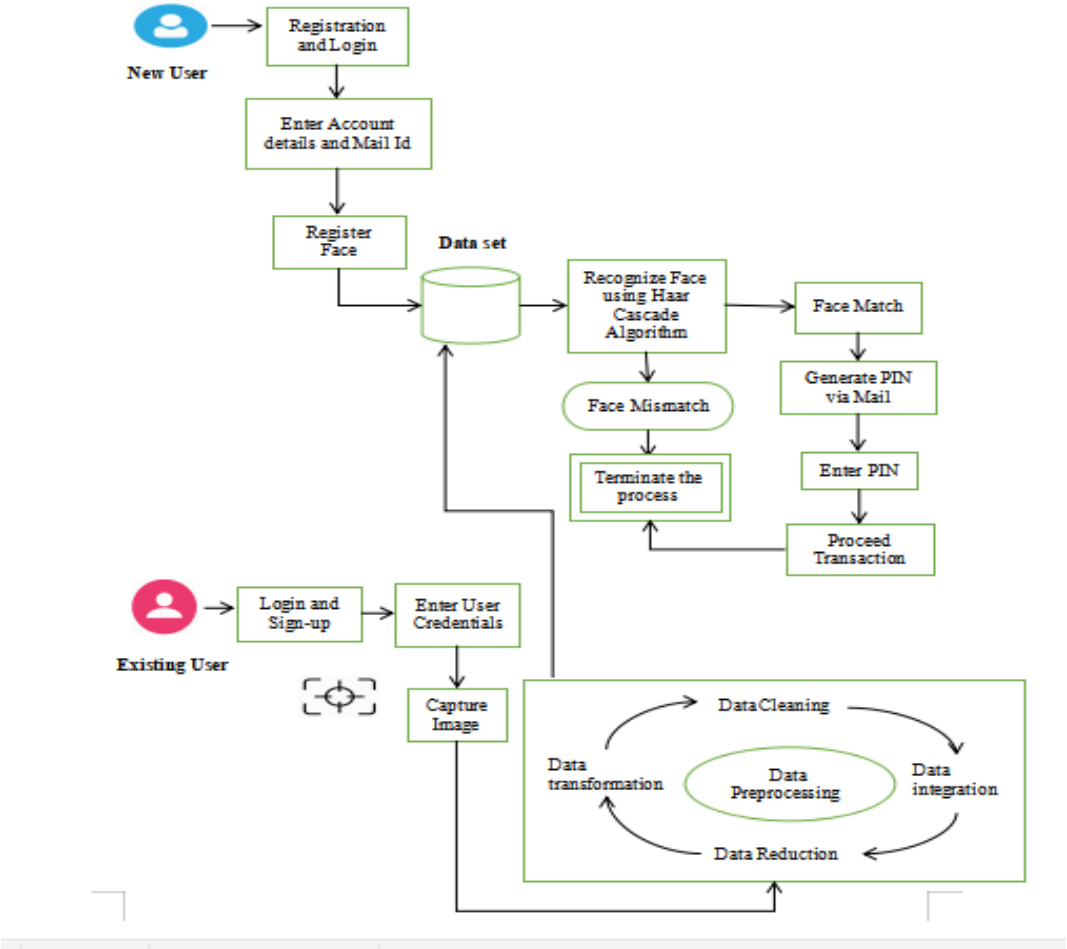

Fig.no.1 Block Diagram

8 MODULES

8.1 DATA PREPROCESSING

It is a technique that is used to convert the raw data into a clean data set. In other words, whenever the data is gathered from different sources it is collected in raw format which is not feasible for the analysis.

8.2 FEATURE EXTRACTION

It is the process of transforming the raw pixel values from an image, to a more meaningful and useful information that can be used in other techniques, such as point matching or machine learning.

8.3 FACE RECOGNITION

Face recognition technology: Ideal for access control, financial transactions and ATM machines. The face key recognition technology performs the following tasks:

a. Locates a moving object within the camera view.

b. Determines if the moving object is face.

c. Compares live faces with samples from database.

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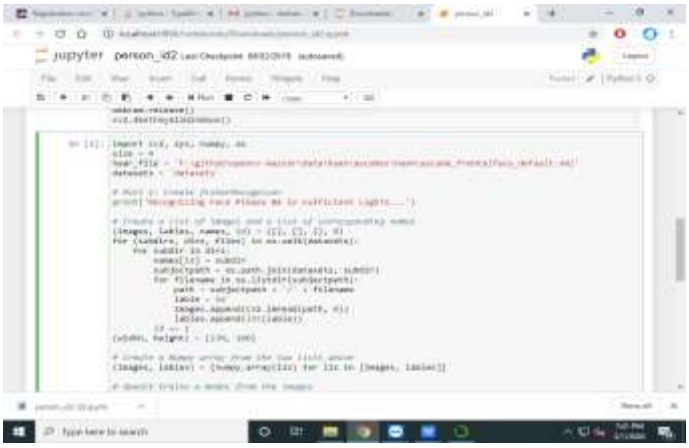

Fig.no.2 Face Recognition

8.4 REGISTER

Registration module user enters their details for registration into the system.

Fig.no.3 Register

8.5 TRANSACTION

In this phase the transaction is proceed when the face is matched with the registered user otherwise the transaction is terminated.

Fig.no.4 Transaction

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9 USE CASE DIAGRAMS

9.1 CLASS DIAGRAM

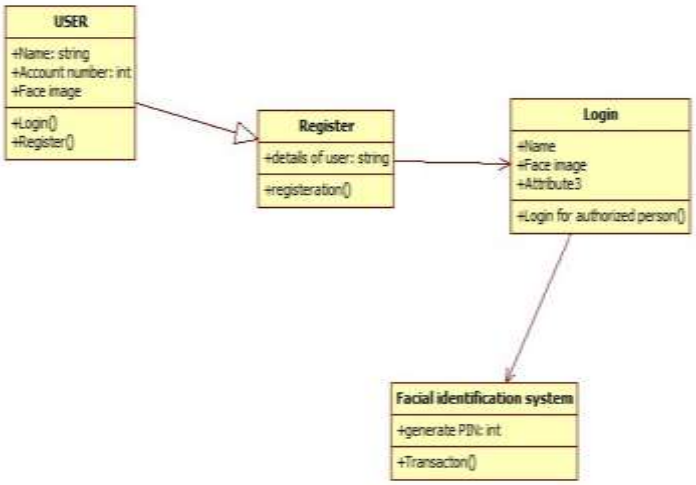

Fig.no.5 Class Diagram

9.2 ACTIVITY DIAGRAM

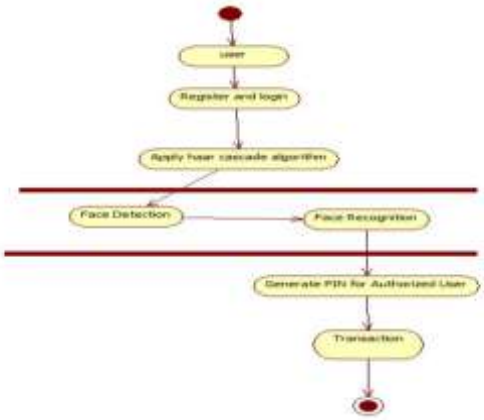

Fig.no.6 Activity Diagram

9.3 SEQUENCE DIAGRAM

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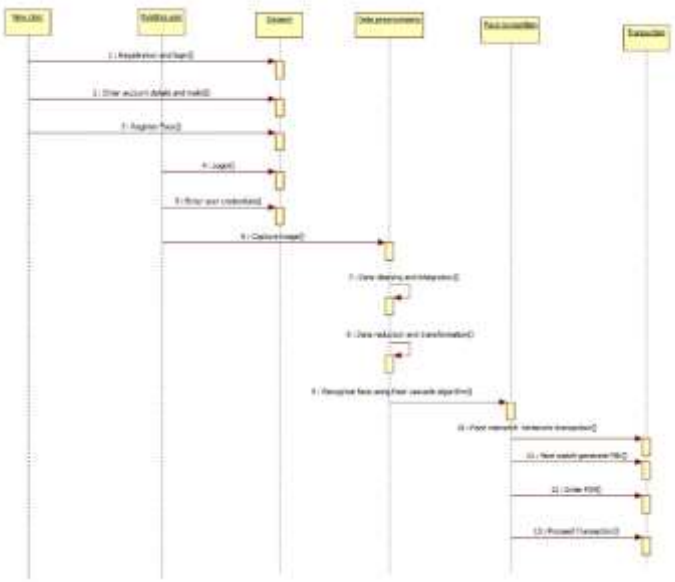

Fig.no.7 SequenceDiagram

10. RESULTS

In this study, we introduced a facial recognition system to provide a secured and reliable bank transaction. The introduction of the deep for facial authentication had proven to be effective in maximizing security level when performing banking transactions. It is expected that the security level of mobile banking to increase with the employment networks for face authentication.

11. CONCLUSIONS AND FUTURE WORK

Realized a reliable, real-time face recognition system on machine learning. According to the new technical era, some advancement has taken place and some techniques of facial recognition have achieved popularity. We are using Haar cascade algorithm for face recognition .Capture module deals with the configuration of video interface and performs the real-time video capture.

Face Detection module analyses each captured frame and extracts valid faces from each frame. Face Identification deals with face recognition and verification of the detected face. In Future any fraudulent access by the fake user is eliminated with the help of radio frequency identification card.

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