

Face recognition Based Multiple Bank Management System using AI

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Abstract - Internet banking is now becoming the most commonly used form of banking transactions. Confidentiality can be compromised in the process of electronic purchases. We therefore introduced a new approach to prevent theft during online transactions in order to protect information through a two-step mechanism of authentication. The primary step of authentication is OTP verification. If the OTP has been checked, the face should be recognized. The details are collected and the authorization for both true and fraudulent transactions is submitted to the bank. The new credit card scanning device has beneficial characteristics such as certain health, user-friendliness, etc. The purpose of the application is to reduce credit card fraud by knowledge of the Face System. Customers get the most accessible and highly efficient electronic banking program.

Key Words: Face recognition,AI,Banking,Security

1. INTRODUCTION

With the advancement of smart phone and internet technology most of the tasks, transactions are being done using smart phones, this is true for bank sectors also, now a days the transaction's such as making payment to various billers, fund transfer, mobile top up etc are being done using an android app, when a user has more accounts at various banks he/she may feel it difficult to remember authentication details provided by various banks for each account.

2. Literature survey

In 2011, Mobile phones have increasingly become tools that consumers use for banking, payments, budgeting and shopping. Given the rapid pace of developments in the area of mobile finance, the Federal Reserve Board began conducting annual surveys of consumers use of mobile financial service. The original survey instrument and subsequent waves of the survey were designed in consultation with a mobile financial services advisory group made up of key Federal Reserve System staff with relevant consumer research and payments backgrounds.[1]

In 2012,"Banking by the use of handheld devices" by Munish Sabharwal and Prof. Anoop Swarup, has explained that the consumers in India have used 2.5G cellular technology to access the internet using technologies like GPRS, Edge etc and the consumers have begun to realize the power of having Internet access anywhere in the world. With these technologies people are now able to access their bank accounts using their cell phones. A third of mobile phone users say that they may consider performing some kind of financial transaction through their mobile phone. But most of the users are interested in performing basic transactions such as querying for account balance and making bill payment. The

paper discusses the various ways of using mobile banking on smart phones, tablets etc & the future applications.[2]

In 2012 by Mapa Research suggests that over a third of bank have mobile device detection upon visiting the banks main website. A number of things can happen on mobile detection such as redirecting to an app store, redirection to a mobile banking specific website or providing a menu of mobile banking options for the user to choose from.[3]

The acceptance of online banking services has been rapid in many parts of the world, and in the leading e-banking countries the number of e-banking contracts has exceeded 50 percent. Investigates online banking acceptance in the light of the traditional technology acceptance model (TAM), which is leveraged into the online environment. On the basis of a focus group interview with banking professionals, TAM literature and e-banking studies, we develop a model indicating online-banking acceptance among private banking customers in Finland.[4]

Online banking is the newest and least understood delivery channel for retail banking services. Yet, few studies were reported quantifying the issues relevant to this cutting-edge technology. This paper reports the results of a quantitative study of the perceptions of banks' executive and IT managers and potential customers with regard to the drivers, development challenges, and expectations of online banking. The findings will be useful for both researchers and practitioners who seek to understand the issues relevant to online banking.[5]

3. Methodology

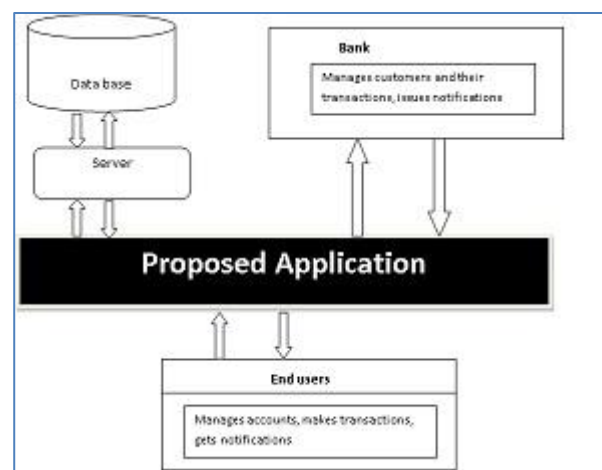


Figure 1 : architecture diagram of the proposed project

Above architecture diagram shows various functional units present in the proposed project, it has things like database web server, Bank entity where users get an account and other credentials from bank

side. End users entity where the transactions are done by the subscribers of the bank using web application.

Algorithm for face recognition

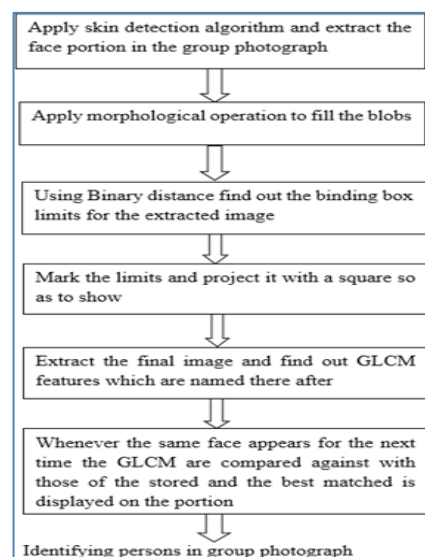


Figure 2 : Flow chart

Skin Detection Algorithm

Skin detection algorithm is applied to detect the face in a digital image. Better recognition is directly proportional to the quality of the image. There are various types of approaches which includes easy and difficult approaches to extract the face portion like edge based, geometry based, with controlled background in a given photograph. By using one of the approaches we extract face portion of the given input image. From the Figure, Input image can be composed of varieties of colours i.e., not color specific. In this approach color information is going to play a key role in extracting the images. This technique is gaining an enormous response in recent days. When image segmentation provides infected region to do analysis. There are lot of data that can be extracted from the image. Dimensionality reduction is a crucial step to be followed. So as to avoid model confusion and conflict Also it is very important to consider all necessary features and avoid any miss. Feature Extraction is one of the most crucial steps in machine learning. Extraction of essential features is very important. Features need to be selected to avoid overfitting and under- fitting. In this project, various image features are extracted such as randomness, mean, entropy, the standard deviation of the colored image.

Morphological Operations

We need to perform the morphological operations to fill the gaps in the input image. Dilation and Erosion are the main morphological operations⁸. Both operations aim to process the pixels. Dilation deals with maximum value whereas erosion deals with minimum values.

Using binary distance approach for the given input image, we get bounding box which limits detecting the boundary of an image. Using the limits, face can be tracked and it is projected in the form of a square in the given image.

Grey Level Co-occurrences Matrix for Face Detection

Extracting the face from the image takes next step to detect who the person is. GLCM is one of the earliest approaches used for texture feature extraction⁹. From the extracted faces we are going to take the properties of the face. The extracted properties after detecting are projected in the group photograph in the form of a square

4. Technology Overview

Recognizing faces in pictures might be a principal task for the Face Recognition Based Car Ignition and Security System. the use of Haar-like element has been to distinguish and perceive the essence of the verified client so on accomplish the safe climate for start and getting to the vehicle.

Face identification and acknowledgment strategy upheld highlights extraction might be an incredible basic sign of human countenances. Face is distinguished by Ada-help calculation.

Ada-Boost learning is utilized to select little number of feeble classifiers and blend them into strong classifier choosing whether an image might be face or not. Then, at that point, by utilizing Haar Classifier calculation, the choosen faces are regularly perceived by contrasting the HaarClassifier of current face to the face of recognized individuals. Haar Cascade is an AI object placement calculation to recognize objects in a picture or video.

Haar-like component has been utilized to identify and perceive the essence of the confirmed client in order to accomplish the safe climate for start and getting to the vehicle an average rectangular haar-like element can be appeared as follows:

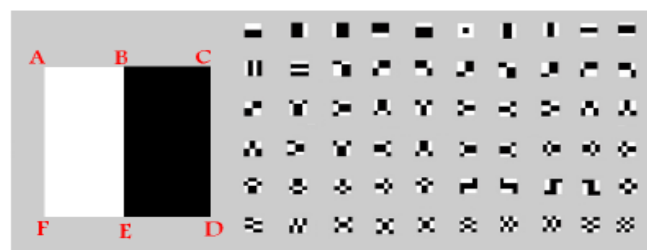


Fig.3. Haar-like Features

First it needs to detect the face and mark the rectangle for face detected along with gray scale image. Before face recognition process it must be completed with training of variety of different images and it should be store in yml file. Dynamic face is detected in web camera is verified with the trained images stored in yml file and popped up with exact matching

of image. once the face is recognized as specified individual, signal is passed to microcontroller.

5. Results and Discussion

Training the AdaBoost :

-Taken image examples $(x_1, y_1), \dots, (x_n, y_n)$ where $y_1=0,1$ for negative and positive instances.

-Load weights $w_{1,i} = \frac{1}{2m}, \frac{1}{2l}$ for $y_1 = 0,1$

where m and l are number of positive and negative examples.

-For $t=1, \dots, T$:

1) Normalize the weights, $w_{t,i} \leftarrow \frac{w_{t,i}}{\sum_{j=1}^n w_{t,j}}$

2) Choose the best weak classifier based on weighted error:

$$\varepsilon_t = \min_{f,p,\theta} \sum_i w_{t,i} |h(x_i, f, p, \theta) - y_i|$$

3) Describe $h_t(x, f_t, p_t, \theta_t)$ where f_t, p_t and θ_t are the reducers of ε_t .

4) Upgrade the weights:

$$w_{t+1,i} = w_{t,i} \beta^{1-e_i}$$

Where e_i is zero if instance x_i is classified precisely

and $e_i = 1$ otherwise, and $\beta_t = \frac{\varepsilon_t}{1-\varepsilon_t}$

-The final strong classifier is:

$$c(x) = \begin{cases} 1 & \text{if } \sum_{t=1}^T \alpha_t h_t(x) \geq \frac{1}{2} \sum_{t=1}^T \alpha_t \\ 0 & \text{otherwise} \end{cases}$$

$$\text{Where } x\alpha_t = \log \frac{1}{\beta_t}$$

Training the Haar cascade:

- The Maximum acceptable false positive rate per layer is set to f , and the Minimum acceptable detection rate per layer is set to d .
- User takes target overall false positive rate, F_{target} .
- P = collection of positive examples.
- Q = collection of negative examples.
- $F_0 = 1.0$; $D_0 = 1.0$
- $i = 0$
- While $F_i > F_{target}$
 - $i \leftarrow i + 1$
 - $n_i = 0$; F_{i-1}
 - While $F_i > f \times F_{i-1}$
 - $n_i \leftarrow n_i + 1$
 - Use P and Q to educate classifier with n_i capabilities using AdaBoost
 - Evaluate contemporary cascaded classifier on Validation set to decide F_i and D_i
 - $Q \leftarrow \emptyset$
- If $F_i > F_{target}$ then examine the current cascaded detector against set non-face images and place any fake detections into the set Q .



Figure 4: Reading users image via web cam

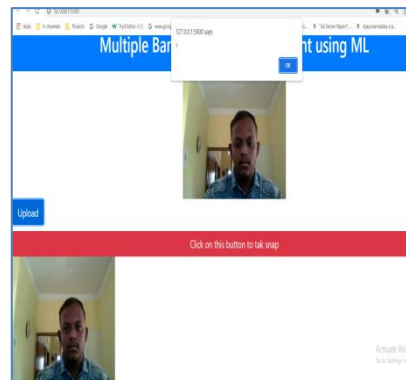


Figure 5 : Verifying image using AI and displaying result

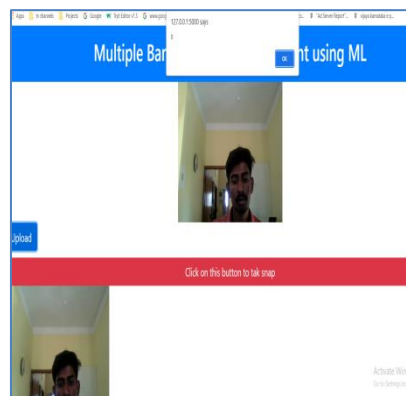
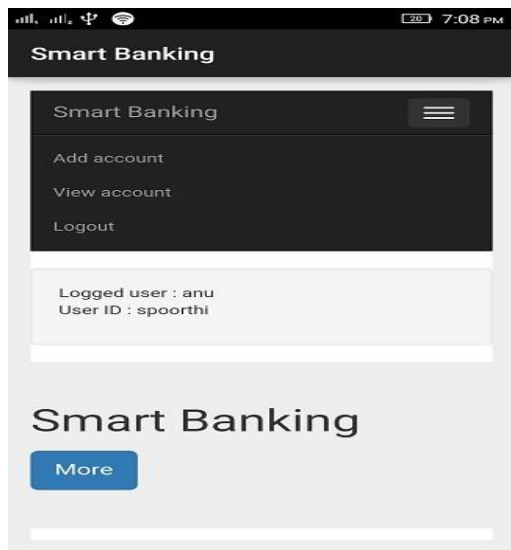


Figure 6: Showing Failed message for the users whose face fails to match



[5]

www.sciencedirect.com/science/article/pii/S2582393020100011

Figure 6: System showing home page for successful login

5. CONCLUSION

Proposed system allows users to manage the various bank account details using one platform and face is used as authorization key, it provides more privileges to end users than the existing app, users find it useful to manage the various accounts

Advantages

- User friendly
- Saves time
- Maintenance of various accounts is made easy

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