

VIP Bank Customers Identification Using Face Recognition

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Abstract : Insurance, funds, bonds, stocks, gold, commercial, and other exclusive businesses are becoming progressively essential to a bank. This money related organizations, which mainly originate from VIPs, are the primary source of profit for banks; hence, drawing in and keeping such individuals by giving the best administration have turned into the fundamental focal point of numerous banks. Banks have been presenting a wide range of top-notch administrations, like private banking, VIP rooms, and other expert attendant services. Many important banks have a great deal of involvement in how to successfully showcase items; however, the act of recognizing and inviting VIPs still stays in a crucial phase of inactive pausing. Being able to Detect VIPs at the earliest possible time and thus providing more personalized services has become an essential aspect of VIP marketing and services. To Flabbergasted this problem, this paper proposes a VIP Customer Face Recognition System, which is a useful service method for improving service quality for VIPs. Camera at the entrance captures and analyzes the faces of people coming towards the door of the bank and Cracks to find a match from a list of VIP face images. Once a VIP is recognized, the system can send information about the VIP to the corresponding account manager or staff members through text or image Notification, on-screen alerts. Then the relevant staff member or manager to meet up with the VIP as quickly as possible. Such personalized service will improve VIPs loyalty to the bank and lead to more potential business.

IndexTerms – VIP Bank customer , Face recognition , Notification

I. INTRODUCTION

Human beings from ancient times to the current have been grateful to recognize each other by names, nicknames, etc., but it is the face that gives each person their own identity because through studies the face it is one of the things that is impossible to forget, that is why, through new technologies and algorithms, several proper functionalities have been Employed with respect to face recognition. Face recognition is an expanding form of bio- metrics used to distinguish and authenticate people in a broad scope of businesses. With the far-reaching utilization and acknowledgment in migration frameworks, and verified identity card systems, biometrics is presently venturing into business applications (for example banking, retail and so forth.)

When it comes to the VIP identification in the bank, providing the best services at first is one of the aspects to be looked upon. Nowadays many banks compete against one another; they have to deliver abundant services for their customers; otherwise, people will Shift to another, better, bank. Bank employees can positively impact a bank's brand image by providing personal service, communicating proactively and having a customer-driven focus with important customers, hear most of the bank's employees failed to identify and deliver better services to the VIP customers even though have better facilities and ideas. Face recognition is excellent applicable for this motive considering that it can additionally be used to display surveillance. The recommended VIP face recognition will send notification only if the person entering the bank image matches with images that are already in the trained database.

This paper is prepared as follows: A short description of the literature survey is given in phase II. In phase III and IV, the Methodology and System-structure are explained. The general layout details in V and Lastly Conclusion and destiny enhancement are mentioned in Section V.

II. LITERATURE SURVEY

2.1 Face detection

Paul Viola proposed an effective face detection algorithm [1]. This author presents the standards of the necessary photo, effective AdaBoost classifier and cascading of classifiers consequently dropping the calculations and ensuing in an efficient and fast detection algorithm. AdaBoost is a machine learning based technique that is highly accurate prediction based upon the relatively weak predictions or rules. The AdaBoost algorithm consists of too many weak classifiers which are cascaded to form a strong positive classifier, the frontal face is detected based upon the features which are given to classifiers such as eyes edges and nose, etc. This is robust to many features such as angle and especially light.

2.2 Face Recognition

Face recognition is one of the Supreme Applicable applications of image analysis. Various face recognition techniques are appearance based and feature-based approaches.

According to (Dass, Rani, & Kumar, 2012)[2], appearance-based (or holistic Identical) Strategies utilize the entire face region as the new input to a recognition system. The face recognition problem is first transmuted into a face space examination issue, and after that, few surely understood measurable strategies are connected to it. They are very inclined to the constraints brought about by facial varieties, for example, enlightenment, 3D stances, and expressions. The maximum typically used recognition algorithms namely Eigenfaces, Fisherfaces, Local Binary Pattern(LBP).

Eigen face Technique

The Eigenface technique is one of the most used processes for face recognition. The Principal Component Analysis (PCA) is a technique effectively applied to achieve dimensionality decline. Face recognition and detection mostly use Principal Component. (Patel & Yagnik, 2013) Eigenface is an applied method for face identification. The execution of an Eigenface recognition conspire has turned out to be simple due to the simplicity of its algorithms. The correctness of Eigenfaces rests on numerous things. [3] The Eigenface method finds a line to make devil-like faces that characterize the more significant part of the difference in a picture dataset. This technique is based on a proof hypothesis strategy that deteriorates face pictures into a minor arrangement of highlight pictures called "Eigenfaces," which are in fact the principal components of the first training set. The Difficult of Eigenface is, it is reflective for lightening environments and the baground location of the Head. The disadvantage is an output of the eigenvalues and eigenvectors are time consuming

Principal component analysis (PCA)

According to (Antony, 2016)[4], the PCA algorithm converts each two-dimensional picture into a single-dimensional vector. This vector formerly goes through several steps such as Detect Face in pictures, Normalize Facial landmarks, Extract Facial characters and then Recognize Face pictures. (Antony, 2016) Furtherly stated that the technique chooses the characteristics of the face, which vary the most from the rest of the picture. In the stages of decomposition, a huge amount of data is discarded as not containing important information since 90total variance in the face is included in 5-10components. This implies the data expected to distinguish an individual is a small amount of the data displayed in the picture.

2.3 Bank Churn

As per the literature survey, investing resources into client maintenance is regularly more productive than procuring new clients [5]. Masand et al. Define an automated system for modeling mobile patron behavior on a huge scale [6]. Mavri and Ioannou examine predictors of churn conduct in Greek banking services [7]. Keaveney and Parthasarathy examine the degree to which decided on developmental, attitudinal, and Population elements are greater-effective in distinguish between continuers and switchers [8]. Wang Wei-jun builds a forecast version with factors to be able to affect traders churn [9].

III. METHODOLOGY

The methodology going to use two types of datasets one is text dataset, and one more is the image dataset.

3.1 IMPORT OR CREATE DATASET

A. Text Dataset

The data set incorporates clients who have satisfied their credits, Who have been late and placed into the collection without paying back their funding and pursuits, and who've paid off handiest once they had been located in a set. The economic items is a bullet loan that clients should repay all in their mortgage quantities in just one time by the end of the term, in preference to an installment time table. Of path, they could pay off earlier than their pay agenda.

From this dataset, we are going to consider a customer as a VIP, who has got more loan and pay to the bank at regular intervals of time, including customer with a Black gold card, Platinum Card, Gold card and Silver Card customers.

B. Image Dataset

After classifying VIP Customers from the dataset, we need to collect the images of those VIP Customer images and create a database that contains the face images of VIP customer to be recognized.

3.2 FACE DETECTION

Viola-Jones Detection Algorithm

The first and major requirement of a face recognition gadget is to come across the face efficiently. Viola Jones, face detection algorithm, is utilized in our proposed technique. It is speedy and efficient especially due to the advent of 3 principal standards namely an inherent picture, a classifier that is primarily based on the AdaBoost set of rules and cascading of classifiers[5]. With the fundamental image concept, the square functions can be Figured fast. The perception of a classifier primarily depends on the AdaBoost algorithm brands the classifier Effective. By cascading the classifiers, the challenge is made to decrease the computation by trying to remove most of the Denials in the starting degrees.

3.3 FACE RECOGNITION

Local Binary Pattern Histogram (LBPH)

When the image detected its features are extracted using the Local Binary Pattern algorithm.

STEPS : Steps of the algorithm as follows.

- **Step 1:** Convert the given color picture into Gray picture or image
- **Step 2:** Consider the converted Gray picture and divide the picture into cells (like 16 x 16 pixels) such that it should be in the same size in height and width in the form of m x m.
- **Step 3:** Select 3 x 3 pixels and compare the pixel to each of its 8 neighbors, namely left- top, left-middle, left-bottom, right-top, etc. Follow the pixels along a clockwise direction.
- **Step 4:** If the center pixel value (in this example 90) is greater than the neighbors pixel value, set it as 0 or else set to 1 which results to 8 digit binary number.
- **Step 5:** convert the 8 digit Binary number into a Decimal number for convenience. Repeat steps 3 and 4 till all the pixels converted.
- **Step 6:** Finally by taking converted all decimal numbers plot the histogram by taking Grid X and Grid Y. then concatenate those histograms to get final results.

The picture captured by a camera at each time follows the above steps and system Compare each captured Histogram with a trained Histogram if it is matched then we call it is face is recognized if it fails to match then we can say the face is not recognized or Unknown.



FIG 1: Conversion of image from color to Grayscale

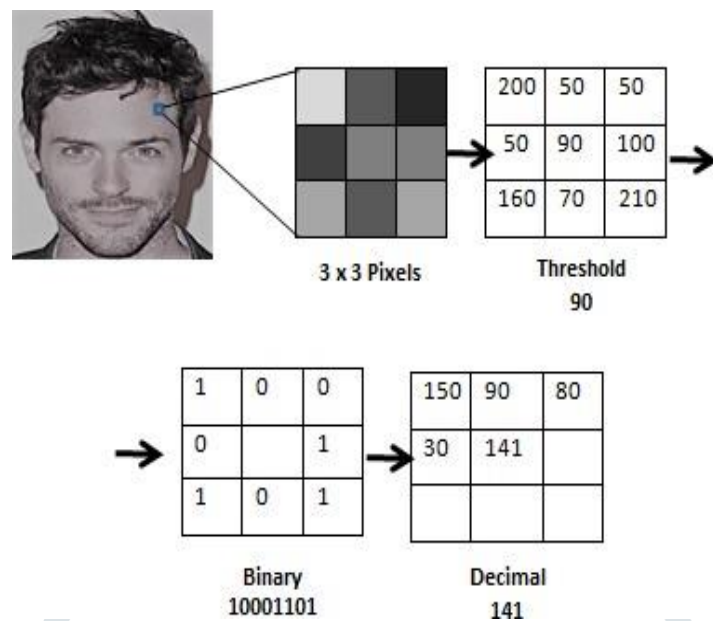


FIG 2: Conversion of Gray image to binary

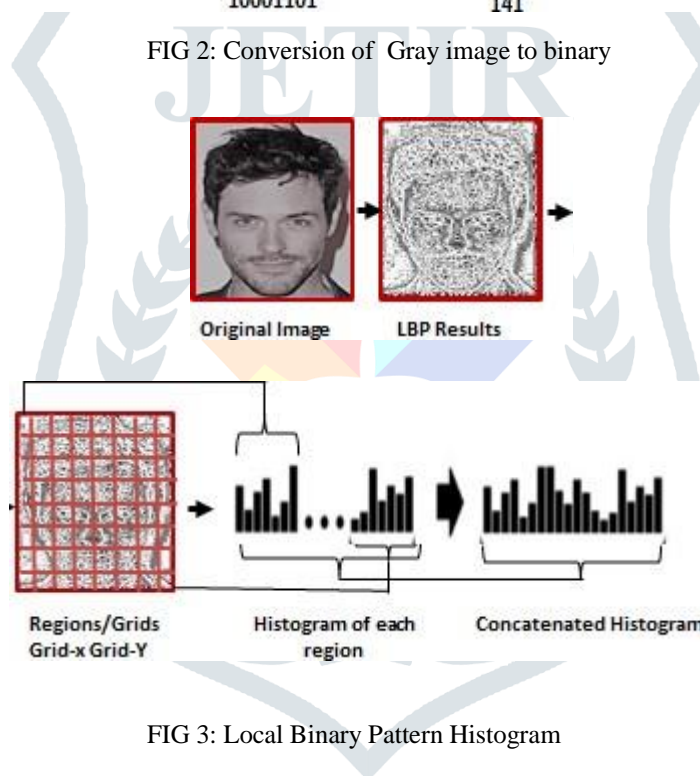


FIG 3: Local Binary Pattern Histogram

IV. ARCHITECTURE

Fig 4: Explains the architecture of face recognition primarily built for VIP identity gadgets. The camera will capture the picture of the persons or Customer coming towards the bank entrance. Then this picture is matched with the pictures inside the database. The Notification about them to the respected Bank Staff members will be sent only if the picture matches the picture inside the database. If the face of the person does not match with a picture inside the database, the system will not send any Notification to the respected staff members of the Bank; Notification may be sent to mobile or a particular desktop.

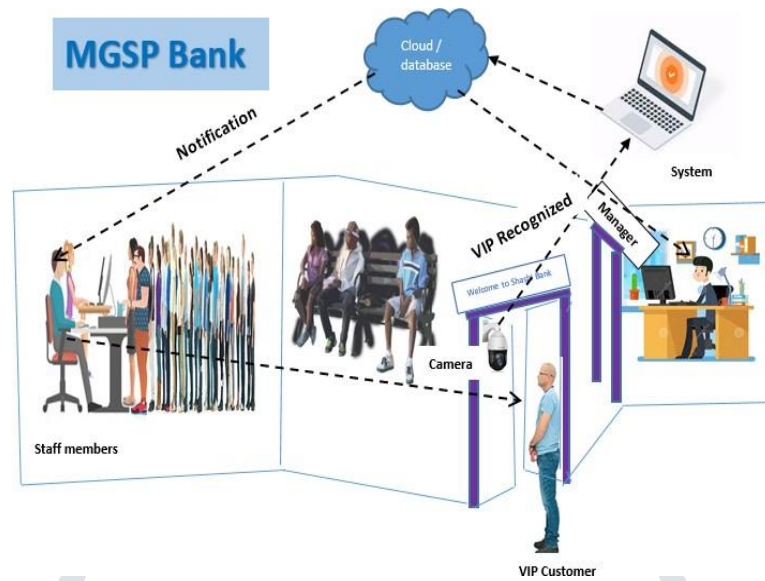


FIG 4: Architecture

V. OVERALL DESIGN

Various Stages of Face recognition is explained in Fig 5:.

- Create a database that contains the pictures of a VIP customer face to be trained and face to be recognized.
- Second stage Feature of the picture is extracted, and these features are used to train the system about its usage.
- The third stage when the image captured by the camera as an input, first it will check face features using the algorithm.
- The fourth stage if the system finds any face with it then it is going to extract the features of the face and submit to the recognizer or classifier.
- In the Final stage based on the input feature of image and trainer image is recognized by the recognizer.

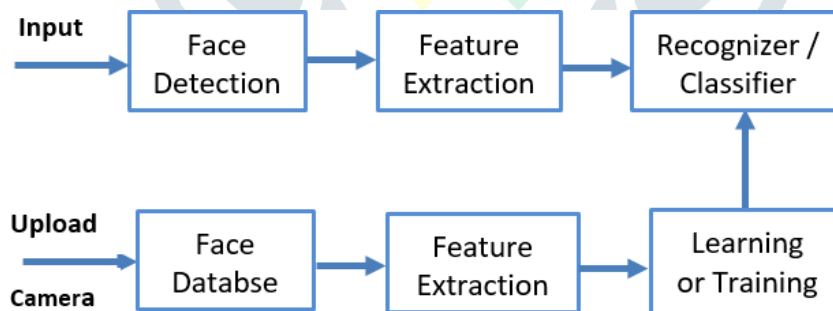


FIG 5: Face Recognition Work Flow

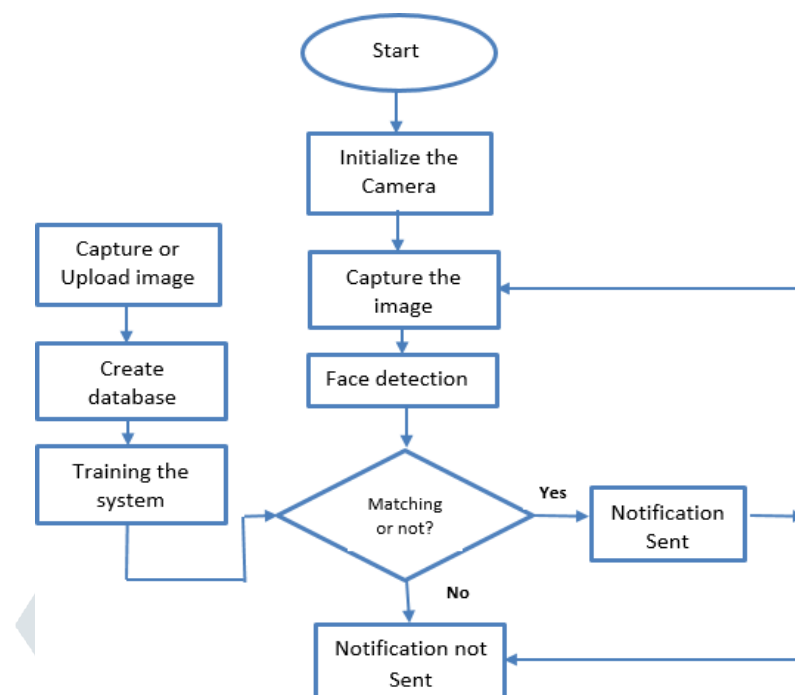


FIG 6: Flowchart

The face recognition flowchart is explained in Fig. 6. In the beginning, pictures of the customer to be recognized are captured, and the database is created. Whenever the system starts, the camera is set, and pictures are captured, and face detection is completed. The detected face is as matched with the pictures which are inside the database.

VI. CONCLUSION

The anticipated system detects and identifies specific faces and increases the chances for bank people to provide the best services to the required customers. Hence using the face recognition for VIP customer identification in Bank is an excellent way to provide the services to VIP customers; as this approach has huge advantages currently this approach is under implementation.

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