International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2017 IJSRCSEIT | Volume 2 | Issue 2 | ISSN : 2456-3307

Collective Face Recognition System

Brijesh Patel, Trusha Mokadam, Shivani Kemse, Sainath Gundety

Padmabhushan Vasantdada Patil Pratishthan's College of Engineering Chunabatti, Near Everard Nagar, Mumbai, Maharashtra, India

ABSTRACT

Facial recognition systems are built on computer programs in order to analyse images of human faces for the purpose of identifying them. The programs take a facial image, detects the face extracts crops the image and stores it in the file called a "template." Using templates, the software then compares that image with another image and produces a score that measures how similar the images are to each other. Typical sources of images for use in facial recognition include video camera signals and preexisting photos such as those in driver's databases. Facial recognition systems are computer-based security systems that are able to automatically detect and identify human faces. These systems depend on a recognition algorithm, such as Haar cascades. The first step for a facial recognition system is to recognize a human face and extract it for the rest of the scene. Next, the system measures nodal points on the face, such as the distance between the eyes, the shape of the cheekbones and other distinguishable features. Object Detection using Haar feature-based cascade classifiers is an effective object detection method proposed . It is a machine learning based approach where a cascade function is trained from a lot of positive and negative images. It is then used to detect objects in other images. Experimental results suggest that the proposed Haar cascade approach provides a better representation and achieves lower error rates in face recognition.

Keywords : Haar Cascade Approach, Face Recognition System, Object Detection, Haar Cascade, HCA, PCA, LDA

I. INTRODUCTION

A smart environment is one that is able to identify people, interpret their actions, and react appropriately. Thus, one of the most important building blocks of smart environments is a person identification system. Face recognition devices are ideal for such systems, since they have recently become fast, cheap, unobtrusive, and, when combined with voice-recognition, are very robust against changes in the environment. Moreover, since humans primarily recognize each other by their faces and voices, they feel comfortable interacting with an environment that does the same.

Facial recognition systems are built on computer programs that analyse images of human faces for the purpose of identifying them. The programs take a facial image, measure characteristics such as the distance between the eyes, the length of the nose, and the angle of the jaw, and create a unique file called a "template." Using templates, the software then compares that image with another image and produces a score that measures how similar the images are to each other. Typical sources of images for use in facial recognition include video camera signals and pre-existing photos such as those in driver's license databases.

Facial recognition systems are computer-based security systems that are able to automatically detect and identify human faces. These systems depend on a recognition algorithm, such as Haar cascades. The first step for a facial recognition system is to recognize a human face and extract it for the rest of the scene. Next, the system measures nodal points on the face, such as the distance between the eyes, the shape of the cheekbones and other distinguishable features.

Objective

We propose an appearance-based face recognition method called the Haar feature based cascade approach. By using Haar cascade Algorithm (HCA), the face images are mapped into a face subspace for analysis. Different from Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) which effectively see only the Euclidean structure of face space, HCA finds an embedding that preserves local information, and obtains a face subspace that best detects the essential face manifold structure.

Facial recognition systems are computer-based security systems that are able to automatically detect and identify human faces. These systems depend on a recognition algorithm, such as Haar cascades. The first step for a facial recognition system is to recognize a human face and extract it for the rest of the scene. Next, the system measures nodal points on the face, such as the distance between the eyes, the shape of the cheekbones and other distinguishable features.

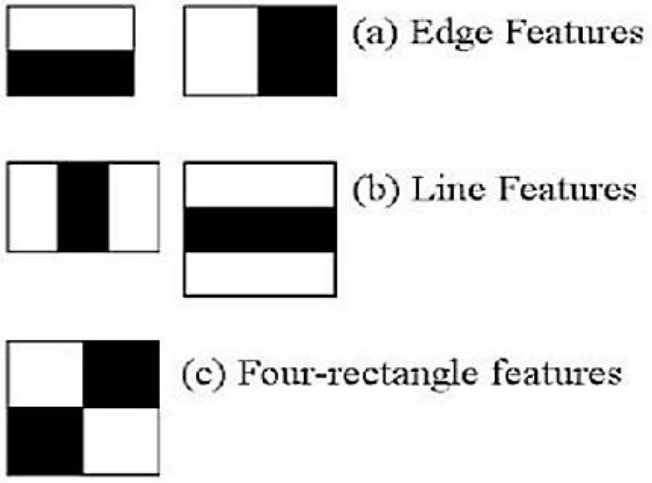
II. METHODS AND MATERIAL

Approach

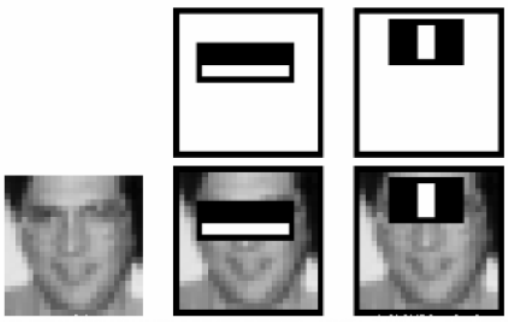
Many face recognition techniques have been developed over the past few decades. One of the most successful and well-studied techniques to face recognition is the appearance-based method. When using appearance-based methods, we usually represent an image of size n *m pixels by a vector in an n *m-dimensional space. In practice, however, these n*m dimensional spaces are too large to allow robust and fast face recognition. A common way to attempt to resolve this problem is to use dimensionality reduction techniques.

Haar Cascading Algorithm:

One of the most effective method for recognition is haar based cascading algorithm. In this the cascade is trained with lot of positive and negative images i.e. it means it follows an machine learning approach ,here we need to capture lot of images so that we can extract features from it , Each feature is a single value obtained by subtracting sum of pixels under white rectangle from sum of pixels under black rectangle. images are shown below



For each and every calculation we need to first calculate the sum of pixels under white and black rectangles. In order to simplify this the term introduced where the integral image, it simplifies the calculation by just involving the four pixels. The next improvement for this is adaboost here we apply features to training image it then finds the threshold that will classify the image which would be later helpful It selects the minimum error rate value to match the image .Again and again the same procedure is repeated.



OpenCV:

OpenCV is an open source computer vision library. With the help of OpenCV it is very easy to utilize and modify the code.

OpenCV has about 2500 algorithms*;* it has C++, C, Python, Java and MATLAB interfaces and supports Windows, Linux, Android and Mac OS. OpenCV offers a good face detection and recognition module (by Philipp Wagner). It contains algorithms which can

be used to perform some cool stuff. In this guide I will roughly explain how face detection and recognition work; and build a demo application using OpenCV which will detect and recognize faces.

III. RESULTS AND DISCUSSION

PROPOSED SYSTEM:

In the below flow, first the image is captured ,the image is traced through camera. Then it is followed by the face alignment, ten the features are extracted through the face extraction phase and the the features are matched and the information the is the details of the people which have already enrolled is displayed.

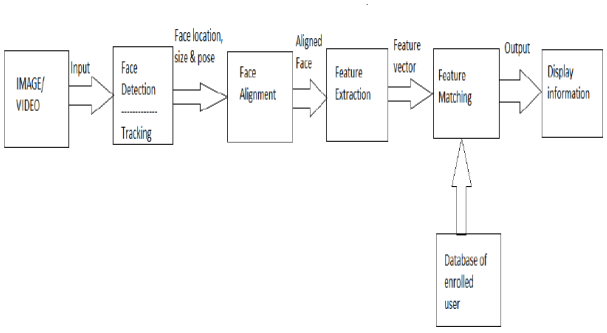


Figure 1: Flow of System

1. FACE DETECTION: whenever the system comes in contact with the images or the video it starts searching for the face in the image and videos. If the face is in view then it detects it.
2. ALIGNMENT: Once the face is detected the system starts searching for the face and crops it.
3. NORMALIZATION: here, the light is to be set proper in order to properly store the the image in perfect circumstances.
4. REPRESENTATION: The image is represented in unique code that is the image is stored in matrix form.
5. FACE FEATURE EXTRACTION: face feature extraction is performed in order to extracts the features in order to distinguish the different faces.

6. MATCHING: The detected face is matched with stored cropped image.

UML Diagrams FOR THE SYSTEM

i) *Data Flow diagram*

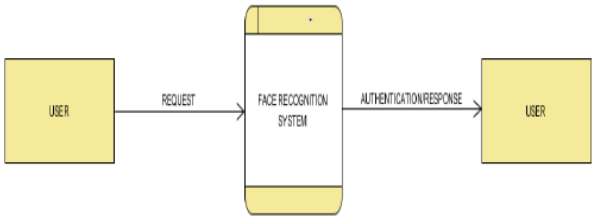


Figure 3 : LEVEL-0

Above is the level-0 Data flow diagram which is often called as context diagram, which gives the simple representation of whole system. The user first interacts with the face recognition system which in return provides the data i.e. details of user or whether the person needs to register.

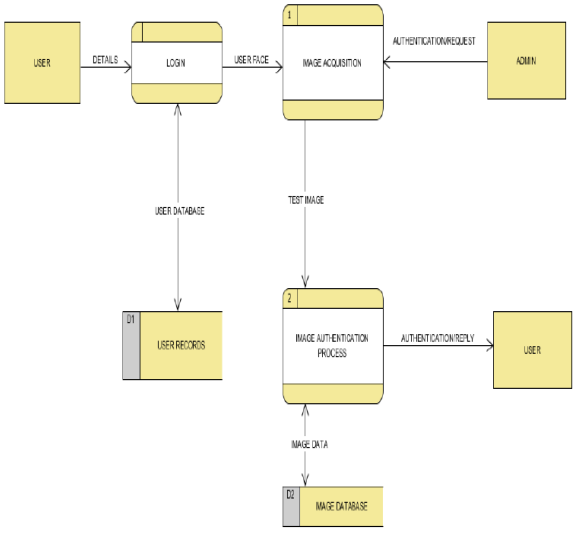
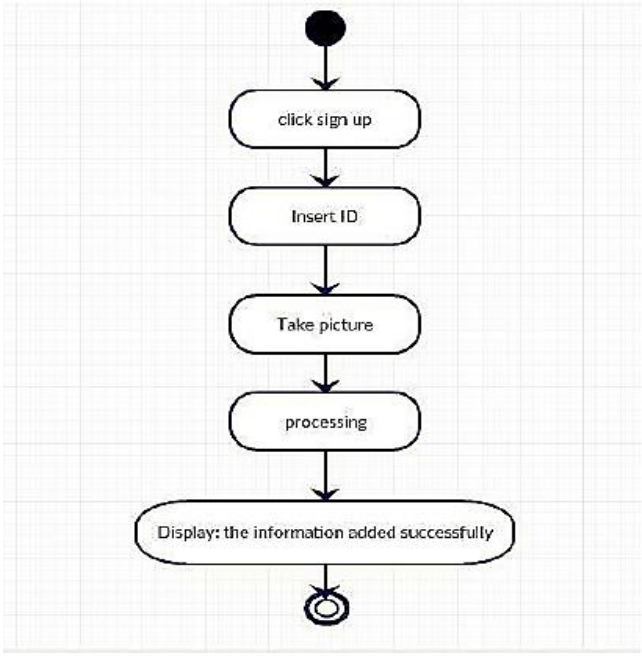


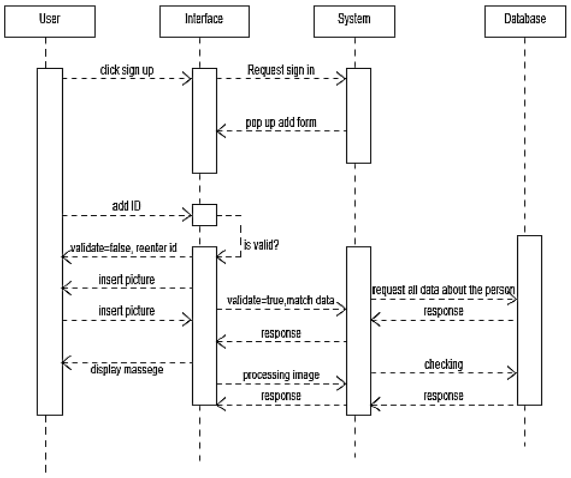
Figure 2 : Level-1

The above is the level-1 data flow diagram which highlights the main carried out by the system. It contains entities such as user, admin and databases along with processes such as login, image acquisition, image authentication means matching

ii) Activity diagram



iii) Sequence Diagram



IV.CONCLUSION

In this, we have implemented the face detection part in which the system first captures the user face after which it saved in the database and again when the user visits the page. This software project uses some basic java to interact and get the output of local camera. It may be a webcam or any other attached camera. We use these to get the camera video input to our system. We then use the video data to manipulate and recognize faces in real time. Face detection is a computer technology being used in a variety of applications that identifies human faces in digital images.

V. REFERENCES

1. International Journal of Computer Techniques - Volume 3 issue 1, Jan- Feb 2016 Published by - "Kavi Dilip Pandya". Available at: http://www.ijctjournal.org/Vol3IssueNo.1.htm
2. International Journal of Computer Science Information technologies -2014 Published by - Shaily pandey and Sandeep sharma. Available at: http://www.ijert.org/view-pdf/13812/an-optimistic-approach-for-implementing-viola-jones-face-detection-algorithm-in-database-system-and-in-real-time.
3. Face Recognition: A Literature Survey Published by- W. ZHAO, R. CHELLAPPA, P. J. PHILLIPS, & A. ROSENFELD. Available at: https://pdfs.semanticscholar.org/3cf9/976818b297504499e5598e3dd0e922c8f392.pdf.