



FACE DETECTION BASED ATTENDANCE SYSTEM

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ABSTRACT

Automatic face recognition (AFR) technologies have seen dramatic improvements in performance over the past years, and such systems are now widely used for security and commercial applications. An automated system for human face recognition in a real time background which can be useful for a college to mark the attendance of their students. So using Real Time Face Recognition is a real world solution which comes with day to day activities of handling various activities. The task is very difficult as the real time background subtraction in an image is still a challenge. To detect real time human face are used and a simple fast Principal Component Analysis has used to recognize the faces detected with a high accuracy rate. The matched face is used to detect accurate user .Our system maintains the collection of user facial features as datasets and use them for verification. information they.

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want easily. Communication is one of the main fields highly changed by Internet.

INTRODUCTION

1.1 Introduction

Maintaining the attendance is very important in all the institutes for checking the performance of employees (4). Every institute has its own method in this regard. Some are taking attendance manually using the old paper or file-based approach and some have adopted methods of automatic attendance using some biometric techniques. But in these methods employees have to wait for long time in making a queue at time they enter the office. Many biometric systems are available but the key authentications are same is all the techniques. Every biometric system consists of enrolment process in which unique features of a person is stored in the database and then there are

processes of identification and verification. These two processes compare the biometric feature of a person with previously stored template captured at the time of enrolment. Biometric templates can be of many types like Fingerprints, Eye Iris, Face, Hand Geometry, Signature, Gait and voice. Our system uses the face recognition approach for the automatic attendance of employees in the office room environment without employees' intervention (2). Face recognition consists of two steps, in first step faces are detected in the image and then these detected faces are compared with the database for verification. A number of methods have been proposed for face detection i.e. Ada Boost algorithm, the Float Boost algorithm, the S-Ada Boost algorithm Support Vector Machines (SVM), and the Bayes classifier. The efficiency of face recognition algorithm can be increased with the fast face detection algorithm. In all the above methods SURF is most efficient. Our system utilized this algorithm for the detection of faces in the office room image. Face recognition techniques can be Divided into two types Appearance based which use texture features that is applied to whole face or some specific Regions, other is Feature

- 3 based which uses geometric features like mouth, nose, eyes, eye brows, cheeks and

Relation between them. Statistical tools such as Linear Discriminant Analysis (LDA), Principal Component Analysis (PCA), Kernel Methods, and Neural Networks, Eigen-faces have been used for construction of face templates. Illumination invariant algorithm is utilized for removing the lighting effect inside the office room..

2. LITERATURE SURVEY

Xiaoguang Lu [1] proposed a number of algorithms which are divided approaches based on model and appearance. Three linear subspace analysis are described in the methods based on appearance. Also for face recognition non-linear manifold analysis is explained. S.T.Gandhe [2], presents the face recognition approach to identify the person using different experimentation. This system provides the authentication to the system by face as a biometric. This system suggested different applications like identification system, access control and document control. Anil Kumar Sao et al. [3] proposed template matching algorithm for face recognition. This approach addresses the pose problem in face recognition. First the faces are representing in edge view. Then template matching is applied over the image. Edginess based approach represent the image in 1 dimension. The person identification is performed based on the

matching score. Sujata G. Bhele [4] presents face detection systems reviews. This paper is mostly focused on the soft computing methods like SVM, ANN etc. to detect the face. These approaches may give better results. This paper discussed the different features extraction algorithms like PCA, LDA and ICA. In this paper some problems are also mentioned which reduce accuracy like image quality, pose variations and illumination changes. Riddhi Patel [5] proposed a summary of face recognition & discusses the method and its working. It also compares different techniques of face recognition. It highlights the techniques that gives good efficiency for illumination changes and different environmental conditions..

3. OVERVIEW OF THE SYSTEM

3.1 Existing System

- User authentication process was manually using the old paper or file-based approach and some have adopted methods of automatic attendance using some biometric techniques.

SVM is an impeccable technique to discover the hyperplane between two diverse specific classes in higher dimension component space that is utilized for grouping. It is one of the algorithms of machine learning. SVM has two stages

given as training & testing. Most classification undertakings, in any case, are not that straightforward. More perplexing structures are required so as to make an ideal partition. The information lie in a two dimensional space, a straight line can isolate the classes as shown in fig.3.

For higher measurements, for instance in a 3-D space, a plane can be built to isolate the samples. For ndimensional space, a hyper-plane can be developed [6]. The original information space can simply be mapped to some higher-dimensional component space where the sample set is distinguishable. The

information can be efficiently classified by anticipating in higher measurements like 2D, 3D utilizing different hyper-planes. For non-linear data separation polynomials in higher orders are used called as kernel function. SVM has various kernel functions like linear, quadratic, radial basis function (RBF), sigmoid, etc. [11]. On the examples x & x_j RBF is applied as in eq.1 that shows feature vectors in the space of input

Disadvantages:

- But in these existing methods have to wait for long time in making a queue at time they enter the office. Many biometric systems are available but the key authentications are same is all the techniques.

- Every biometric system consists of enrolment process in which unique features of a person is stored in the database and then there are processes of identification and verification..

- **3.2 Proposed System:**

The system consists of a camera that captures the images of the users and sends it to the image enhancement module. After enhancement the image comes in the Face Detection and Recognition modules and then the user face is recognized with existing dataset. This is shown in the experimental setup in Figure. At the time of enrolment, templates of face images of individual users are stored in the Face dataset. Here all the faces are detected from the input image and the algorithm compares them one by one with the face dataset.

Advantages:

- In this way a lot of time is saved and this is highly secure process and effective way of user authentication is performed.
- Attendance is maintained on the excel sheet so anyone can access it for purposes like administration, employees themselves.

.3.3 System Modules

User module:

In this module user will open camera and track images of every student to whom he want to take

attendance through this application. For each tracking process it will take 300 images and then user should close training process. Once the process is done data will be stored in a folder 0,1, 2.etc for each user new folder is created.

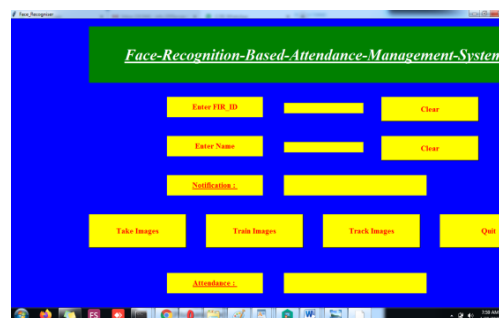
Training Process:

Once taking images process is done images from folder and for each image training process is done using OpenCV and yml file is stored in folder. This yml file is used for testing new images.

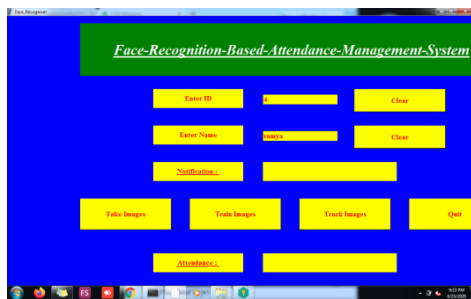
Detection Process:

In this process when user opens camera it will track live images of user and convert user image to gray color and check with face recognition model and then boxes are drawn on each face and features are verified with trained model and output is displayed with student name and id.

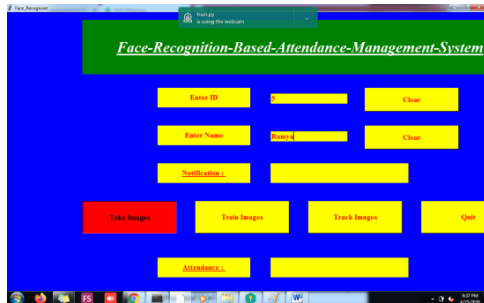
4. RESULTS



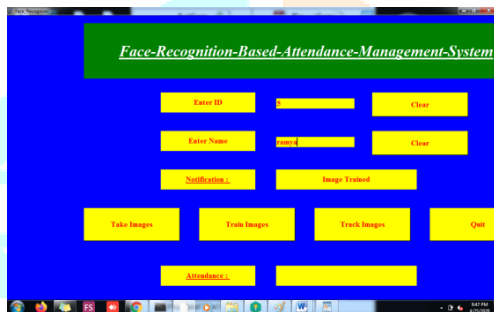
Main page



Training phase



Testing phase



Detection phase

5. CONCLUSION

Automated Attendance System has been envisioned for the purpose of reducing the errors that occur in the traditional (manual) attendance taking system. The aim is to automate and make a system that is useful to the organization such as an institute. The efficient and accurate method of attendance in the office environment that can replace the old manual methods. This method is secure enough, reliable and available for use. No need for specialized

hardware for installing the system in the office. It can be constructed using a camera and computer.

Future Enhancements:

In future, for robust attendance system good quality webcam should be used and instead of displaying name of a person in the image, excel sheet for the present students can be made. Also faces of more number of persons in different environments can be used for classification to increase accuracy.

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