

# Face Recognition in E-Attendance

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**Abstract**— The difficulty of taking attendance each and each period by the is extremely time consuming and tiring also Attendance management in any institution may be a very lengthy process and very time consuming. Furthermore, biometrics attendance system is also available but these methods too are time consuming and students have to form a queue for scanning their thumb. The Attendance will be recorded using camera, which will capture images of students and the attendance notification will be sent via E-mail.

**Keywords:** Student and Employee Attendance, Face Recognition, Face Detection, E-attendance

## I. INTRODUCTION

Nowadays, attendance is a extremely important task to maintain the record of in any institution.

Traditionally, the attendance is taken manually by using attendance sheet is extremely time consuming. We observed that the technique was very time consuming and even have a lot of demerits some of them observed by us like wastage of paper, interruption as well wastage of time etc. Implementation of this system has got to be administered on accordance of some techniques named as face detection and face recognition. This attendance system will be used to help the teacher to take student's attendance in modern way. The system figure out by some techniques like the image are captured by web camera of laptop which is then processed towards the detection as detected face image is obtained face recognition has got to be done which is split into further parts namely face alignment, pre-processing, feature extraction, face matching where the image is converted into Gray scale image and therefore the result has got to be seen[1] [2]

## II. LITERATURE SURVEY

Here are the Details about the referred paper, author is given below:

In "Identification of human faces" by A.J. Gold Stein, L. D. Harmon, and A.B. Lesk used 21 different facial marks like hair colour and lip thickness for processing the image recognition. the matter was, it had to be manually computed the measurements and site. How well can human faces be identified by humans and by computers, using subjectively judged "feature" descriptions like long ears, wide-set eyes, etc.? The Three classes of experiments that are been reported: 1) Gathering, analysis, and assessment of face-feature data for 255 faces. 2) Computer identification-studies. 3) Human identification-studies. a group of twenty-two features was evolved from an initially larger set to supply relevant, distinctive, relatively independent measures which may be judged reliably. Computer studies and a mathematical model established limits of performance of an individual attempting to isolate a face from a population using feature descriptions. The model predicts that under certain conditions approximately 6 of a person's features are required to isolate him from a population of 255. Human experiments under

similar conditions showed unique identification occurred with a mean of about 7 features. The model predicts that for a population of  $4 \times 10^6$ , only 14 feature-descriptions are required. These studies form a foundation for continuing research on real-time man-machine interaction for compute classification and identification of multidimensional vectors specified by noisy components[3].

In "Face Recognition supported Principal Component Analysis" by Ali Javed's paper was a search work of face recognition system by using PCA which is eigenvector based multivariate analyses. the aim of the proposed research work is to develop a computing system which will recognize an individual by comparing the characteristics of face to those of known individuals. the most focus is on frontal two-dimensional images that are taken during a controlled environment i.e., the illumination and therefore the background are going to be constant. All the opposite methods of person's identification and verification like iris scan or finger print scan require top quality and costly equipment's but in face recognition we only require a traditional camera giving us a 2-D frontal image of the person that are going to be used for the method of the person's recognition[4]. Principal Component Analysis technique has been utilized in the proposed system of face recognition. the aim is to match the results of the technique under the various conditions and to seek out the foremost efficient approach for developing a face recognition system[4].

In "Face Recognition for E-Attendance for Student and Staff" by Tantak, A., Sudrik, A., Kale, A., Mehetre, R. and Pophale they developed a system that was going to work by techniques such as the image is captured by web camera of laptop which is then processed towards the detection as the detected face image is obtained then face recognition has to be done which is divided into further parts namely face alignment, pre-processing, feature extraction, face matching where the image is converted into gray scale image and the result has to be seen This has been done by using PCA algorithm[3][1][2].

## III. PROPOSED SYSTEM

In the traditional attendance systems the attendance of the students get marked for the entire day. Even, if a student is present for short period of time even then he/she is going to be marked as present for whole day. We propose a system for automatic attendance which marks the attendance for students in every lecture within the classroom with face recognition. We have created the database of faces of every of the student. Image will be Captured with the help of Web Camera of Laptop[5] . The image of student is then sent for further processing. Then the detected face images are been compared with the pictures within the database for recognition process[3]. The database contains the record of all of the students in each class. If image detected match with database image then the student is marked as present[3]. The entire

student attendance record is automated and is maintained in an Excel File. The Attendance are then going to be calculated daily and whole report will be sent to student on mail account.

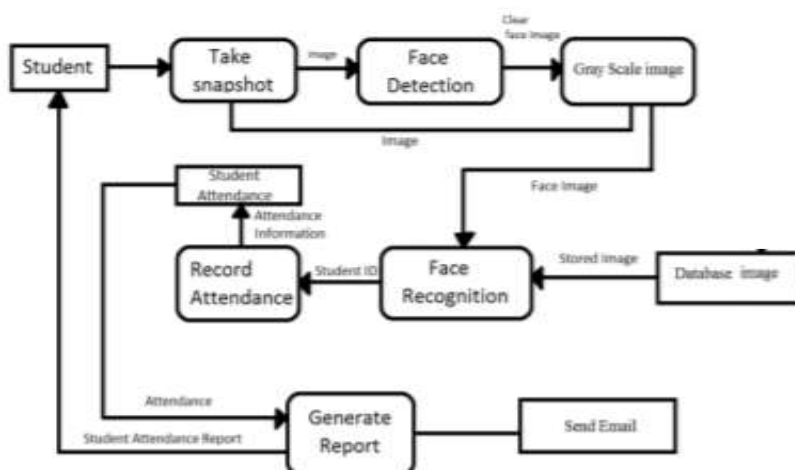


Fig. 1:

The First and the most important step of Face recognition is Face detection. The system performs the face detection on all images the taken by the camera[3]. In the first phase, the program creates a database and stores all the pre-processed images during this database creation and eventually system creates a database and therefore the system then perform all the operations on the database. The Steps that are being involved in this System are:

- 1) Detecting faces
- 2) Recognition
- 3) Updating the record in Excel file
- 4) Managing the data with excel
- 5) Notifying the students regarding attendance statistics through email

**A. Detection:**

Detection is being performed with OpenCV and Haar cascades. Face detection using Haar cascades is a machine learning approach in which a cascade function is trained with a group of input file.

**B. Recognition:**

Recognition is performed with LBPH recogniser, Local Binary Pattern (LBP) is a simple and a very efficient texture operator which performs the labelling of the pixels of a picture by thresholding every pixel. LBPH is one among the simplest face recognition algorithms. We have Gray Scale images which are being recognised and it can be represented through local features in the images. It is robust against monotonic Gray scale transformations which is provided by OpenCV library (Open-Source Computer Vision Library).

Generation of the Reports is done with the help of gui CRUD operations which is performed in excel files that includes the insertion, deletion and updating of the records.

Notifying students about attendance statistics via email: After recognition the calculation of attendance takes place it is then sent on the respective students mail id that is already stored in the excel files as a database of email with roll number.

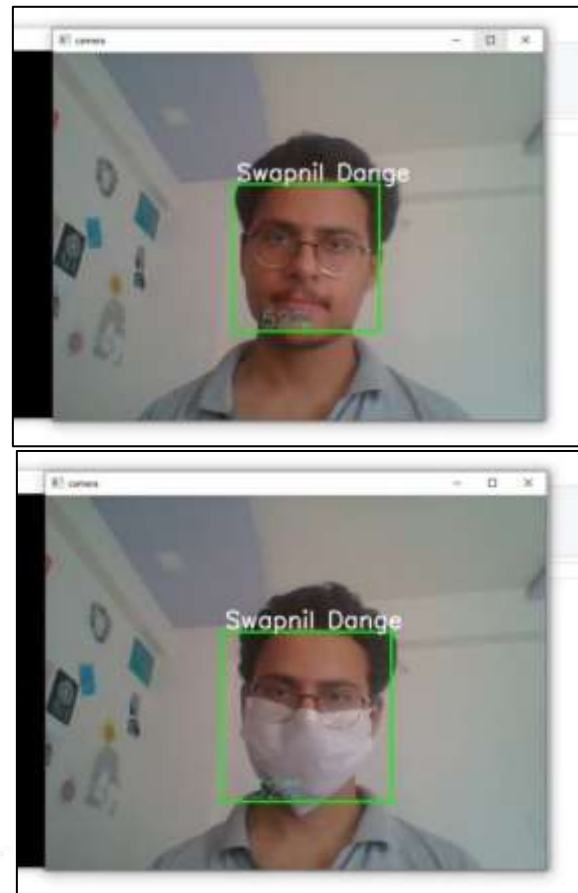
**IV. IMPLEMENTATION RESULTS**

Images are taken with the camera and stored within the database that are in gray scale when a coloured face image is given as input the image is to be first converted to gray scale image as gray scale images are easier to apply computational techniques in image processing.

A Gray scale face image is scaled for a specific pixel size as 243×320 as many input images are often are of various sizes whenever we take an input face for recognition. All the pictures in our database are of same size i.e., 243×320[3]. There are a total of 30 images that are being taken to create a data set from all the views that is left, right, front.

Based on this dataset the images are recognised by the LBPH recognizer that comes under a particular frame that is 243×320. We will observe that standard expressions are recognized as faces efficiently because countenance aren't changed much there in case and in other cases where facial features are changed efficiency is reduced in recognition[3].





In the recognition phase, the image is compared with the images present in database. If a positive match is found then insertion/updating is performed in the excel which creates a new name with the status i.e., present which is represented as 0. And if no face found no insertion/updating takes place which is denoted by 1.

Excel sheet of Attendees is shown in figure 2

	A	B	C	D	E	F	G	H	I	J	K	L
1	Name	Roll no	Status									
2	Swapnil Dange	44	0									
3	Sneha Dange	42	1									
4	Rahul Singh	35	0									
5												
6												

Fig. 2:

## V. CONCLUSION

In this paper, we have implemented the face recognition system using Local Binary pattern Algorithm. The system successfully recognized the human faces and worked well with different faces with different facial expressions[3]. The face recognition system that is created is used for automatic attendance updating system based on face recognition.

This automatic attendance system can be used in different institutions to take attendance of different individuals on the basis of their face images.

The program takes the attendance of each person by capturing images by web camera of laptop. Then image will

go for further processing. The system automatically updates the attendance of the individuals and mark present/absent for them in an excel sheet and sends a notification to the respective individual which makes it very easy and convenient. Thus, from the results performed on the database, we found that the attendance system based on face recognition performs satisfactorily. Hence, we can conclude that the algorithm demonstrates performs better with respect to speed, low false positive rate and high accuracy[3].

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