



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

# IJIRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH


IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 5, May 2021

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 7.512**

 9940 572 462

 6381 907 438

 [ijirset@gmail.com](mailto:ijirset@gmail.com)

 [www.ijirset.com](http://www.ijirset.com)



# Online Attendance through Face Recognition

V.C. Sanap<sup>1</sup>, Ved Sarode<sup>2</sup>, Kiran Divekar<sup>3</sup>, Prachit Sangale<sup>4</sup>, Tanay Bhor<sup>5</sup>

Lecturer, Dept. of Computer Engineering, A.I.S.S.M.S. Polytechnic Pune, Maharashtra, India<sup>1</sup>

Student, Dept. of Computer Engineering, A.I.S.S.M.S. Polytechnic Pune, Maharashtra, India<sup>2,3,4,5</sup>

**ABSTRACT:** The project “Face Detection and Recognition Student Attendance System.” is to recognize students by their face ids registered with the computer and mark their respective attendance. To maintain the attendance record with day to day activities is a challenging task. The conventional method of calling the name of each student is time consuming and there is always a chance of proxy attendance. The following system is based on face recognition to maintain the attendance record of students. The daily attendance of students is recorded subject wise which is stored already by the administrator. As the time for corresponding subjects arrives the system automatically starts taking snaps and then apply face detection and recognition technique to the given image and the recognized students are marked as present and their attendance update with corresponding time and subject id. We have used deep learning techniques to develop this system, histogram of oriented gradient method is used to detect faces in images and deep learning method is used to compute and compare facial features of students to recognize them.

**KEYWORDS:** Face Recognition; Face Detection; Haar-Cascade classifier; Local Binary Pattern Histogram; attendance system;

## I. INTRODUCTION

The main idea behind the project in Face Detection and Recognition systems, the flow process starts by being able to detect and recognise frontal faces from an input device i.e. mobile phone. Face recognition processes images and identifies one or more faces in an image by analysing patterns and comparing them. This process uses algorithms which extracts features and compare them to a database to find a match. For the purpose of exact identification and verification of students this is the best concept. Therefore, system designed will be user friendly with a Graphical User Interface that will serve as an access to the functionalities of the system

Face recognition system consists of two categories: verification and face identification. Face verification is an 1:1 matching process, it compares face image against the template face images and whereas is an 1:N problems that compares a query face images [1]. The purpose of this system is to build a attendance system which is based on face recognition techniques. Here face of an individual will be considered for marking attendance.

Nowadays, face recognition is gaining more popularity and has been widely used. In this paper, we proposed a system which detects the faces of students from live streaming video of classroom and attendance will be marked if the detected face is found in the database. This new system will consume less time than compared to traditional methods.

## II. LITERATURE SURVEY

Yang et al (2002) classifies face detection methodologies into four major categories: Knowledge-based, Feature invariant, Template matching and appearance-based approaches. Knowledge Based Method that uses human knowledge or human coding to model facial feature based on nature of the human face such as two eyes, mouth and the nose. This is very easy to apply the rules but very difficult to detect in various Final Year Report Jireh Robert Jam K1557901 9 background depending on the pose and illumination. Low detection accuracy with small burden of calculation and short detection time. Yang et al (2002 pp.36-37), in order to investigate this method created multiple resolution hierarchy of images by averaging and subsampling as on the figure 2.4 below. Figure 2.4 Taken from Detecting Faces in Images: A Survey (Yand et al (2002 p.36). They subdivided these resolution hierarchies into three levels with level 1 being the lowest resolution which only searches for face candidate and further processed at finer resolutions. At level 2 they used the face candidate in level 1 to alongside local histogram equalization followed by edge detection. At level three, the surviving face candidate region uses a set rule responding to facial features such as mouth and eyes. They conducted their experiment on 60 images. Their system located faces on 50 of these images and 28 images gave false alarm, thus giving a success rate of 83.33% and a false alarm rate at 46.66%. Feature-Based-Methods that uses algorithms to look for structural features regardless of pose, viewpoint or lighting conditions to find



faces. Template Matching Methods; uses standard facial patterns stored for use to correlate an input image with the stored pattern to compute for detection. Appearance Base Methods; uses a set of training sets of images to learn the templates and capture the representative of facial appearance.

Authors in researches to get best facial recognition algorithm (Eigenface and Fisher face) provided by the Open CV 2.4.8 by comparing the Receiver Operating Characteristics (ROC) curve and then implemented it in the attendance system. Based on the experiments carried out in this paper, the ROC curve proved that, Eigenface achieves better result than Fisher face. System implemented using Eigenface algorithm achieved an accuracy rate of 70% to 90%. In, authors proposed a method for student attendance system in classroom using face recognition technique by combining Discrete Wavelet Transforms (DWT) and Discrete Cosine Transform (DCT).

### III. METHODOLOGY

All the students of the class must register themselves by entering the required details and then their images will be captured and stored in the dataset. During each session, faces will be detected from live streaming video of classroom. The faces detected will be compared with images present in the dataset. If match found, attendance will be marked for the respective student. At the end of each session, list of absentees will be mailed to the respective faculty handling the session. The system architecture of the proposed system is given below, divided into four stages

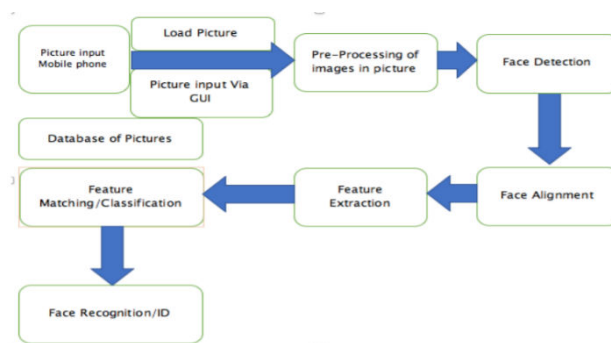


fig 1.0. Face detection methodology

#### 1.Dataset Creation

Images of students are captured using a web cam. Multiple images of single student will be acquired with varied gestures and angles. These images undergo pre-processing. The images are cropped to obtain the Region of Interest (ROI) which will be further used in recognition process. Next step is to resize the cropped images to particular pixel position. Then these images will be converted from RGB to gray scale images. And then these images will be saved as the names of respective student in a folder.

#### 2. Face Detection

Face detection here is performed using Haar-Cascade Classifier with OpenCV. Haar Cascade algorithm needs to be trained to detect human faces before it can be used for face detection. This is called feature extraction. The haar cascade training data used is an xml file haar\_cascade\_frontalface\_default. The haar features will be used for feature extraction. Here we are using detect Multi Scale module from OpenCV. This is required to create a rectangle around the faces in an image. It has got three parameters to consider- scale Factor, min Neighbours, min Size. Scale Factor is used to indicate how much an image must be reduced in each image scale. Min Neighbours specifies how many neighbours each candidate rectangle must have. Higher values usually detects less faces but detects high quality in image. minSize specifies the minimum object size. By default it is (30,30).The parameters used in this system is scaleFactor and min Neighbours with the values 1.3 and 5 respectively.

#### 3. Face Recognition

Face recognition process can be divided into three steps prepare training data, train face recognizer, prediction. Here training data will be the images present in the dataset. They will be assigned with a integer label of the student it belongs to. These images are then used for face recognition. Face recognizer used in this system is Local Binary Pattern Histogram. Initially, the list of local binary patterns (LBP) of entire face is obtained. These LBPs are converted into decimal number and then histograms of all those decimal values are made. At the end, one histogram

will be formed for each images in the training data. Later, during recognition process histogram of the face to be recognized is calculated.

#### 4. Attendance Updation

After face recognition process, the recognized faces will be marked as present in the excel sheet and the rest will be marked as absent and the list of absentees will be mailed to the respective faculties. Faculties will be updated with monthly attendance sheet at the end of every month.

### IV. RESULTS

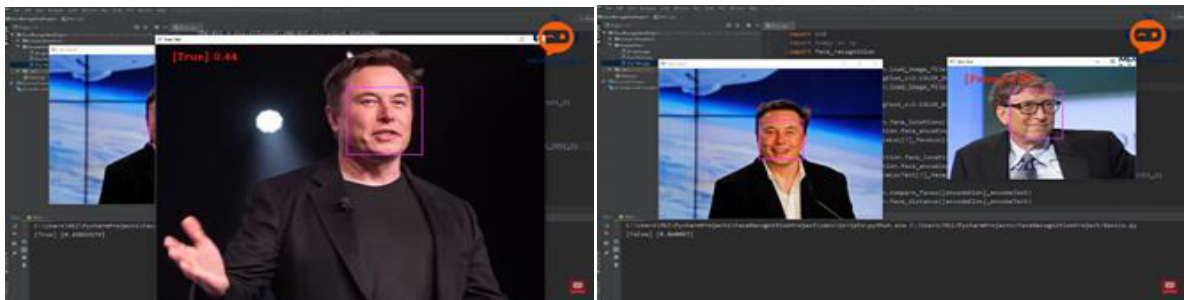


fig 1.1 Images showing verified and unverified results

The users can interact with the system using a GUI. Here users will be mainly provided with three different options such as, student registration, faculty registration, and mark attendance. The students are supposed to enter all the required details in the student registration form. After clicking on register button, the web cam starts automatically and window as shown in Fig.3. pops up and starts detecting the faces in the frame. Then it automatically starts clicking photos until 60 samples are collected or CTRL+Q is pressed. These images then will be pre-processed and stored in training images folder.

This is important because the list of absentees will be ultimately mailed to the respective faculties. In every session, respective faculty must enter their course code. Then after submitting the course code, the camera will start automatically. The Fig.4. shows the face recognition window where two registered students are recognized and if in case they were not registered it would have shown 'unknown'. By pressing CTRL+Q, the window will be closed and attendance will be updated in the excel sheet and names of absentees will be mailed to the respective faculty.

### V. CONCLUSION

The entire project has been developed from the requirements to a complete system alongside evaluation and testing. The system developed have achieved its aim and objectives. The client was happy with the overall performance of the system. However, though some challenges were encountered during implementation, they were addressed and implemented.

### REFERENCES

- [1] [https://www.researchgate.net/publication/326261079\\_Face\\_detection\\_system\\_for\\_attendance\\_of\\_class\\_students](https://www.researchgate.net/publication/326261079_Face_detection_system_for_attendance_of_class_students)
- [2] Hapani, Smit, et al. "Automated Attendance System Using Image Processing." 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA). IEEE, 2018.
- [3] Akbar, Md Sajid, et al. "Face Recognition and RFID Verified Attendance System." 2018 International Conference on Computing, Electronics & Communications Engineering (iCCECE). IEEE, 2018.
- [4] Okokpujie, Kennedy O., et al. "Design and implementation of a student attendance system using iris biometric recognition." 2017 International Conference on Computational Science and Computational Intelligence (CSCI). IEEE, 2017.
- [5] Rathod, Hemant kumar, et al. "Automated attendance system using machine learning approach." 2017 International Conference on Nascent Technologies in Engineering (ICNTE). IEEE, 2017



**INNO**  **SPACE**  
SJIF Scientific Journal Impact Factor

**Impact Factor:**  
**7.512**

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
**INDIA**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 **9940 572 462**  **6381 907 438**  **ijirset@gmail.com**



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details