

Student Attendance Monitoring System Via Face Detection and Recognition System

Pinal Pathak

*Department of Information Technology Engineering
Sinhgad Institute of Technology Lonavala*

D. R. Khairnar

*Department of Information Technology Engineering
Sinhgad Institute of Technology Lonavala*

M. M. Paratnale

*Department of Information Technology Engineering
Sinhgad Institute of Technology Lonavala*

P. V. Yadhav

*Department of Information Technology Engineering
Sinhgad Institute of Technology Lonavala*

P. R. Wadgaonkar

*Department of Information Technology Engineering
Sinhgad Institute of Technology Lonavala*

Abstract

In this paper we propose an automated student attendance management system for class room. This system is based on face detection and then recognized the student and for that we used specific algorithm. Automatically detect the student when student is entering in the class room and recognized that specific student and mark the attendance. We also focus on the special characteristics of human special aspects such as eye, nose. Different real time scenario is considered to evaluate the performance of various face recognize system. This paper also proposes the technique to be used to handle the technique like spoofing and avoid proxy of students. When compared to traditional or existing system this system is help to monitor student and also it is time saving system.

Keywords: RFID, Face Detection and Recognition System, FFT

I. INTRODUCTION

The most common technique of attendance is of passing the attendance on the overall classroom while lecturer is conducting lecture. There are many disadvantages of using passing attendance system. For instance, lecturers with a large class conducting the lecture and attendance sheet is passed and manual signing of that attendance by every student. It is distracting thinks and student will distract from the teaching of lecturer. Behind the teacher the attendance sheet is passed around the class some students may sign on another student's name or friends name. or by accidentally they mark attendance of another student. The first case leads to a student missing out their name, while the latter leads to a false attendance record. Another issue of the attendance record system in a hardcopy, so it will be lose by lecturer.

Also the issue of that, lecturer cannot longer keep the students overall attendance record throughout the particular year. Apart from that, a lecturer or teacher has limited access to the single copy of record of student attendance. In terms of attendance analysis, the lecturer also has to perform manual students' attendance percentage of weekly or monthly, which normally consume a lot of time. The lot of limitation established in the attendance recording system so, next solution used that is student attendance tracking system based on RFID technology.

The main idea behind the RFID system is to capture student attendance in a semi-automated way. where the students are required to show their card at the RFID reader upon entering the classroom for lecture. and RFID is capture card and identify the students and marks the attendance. But the RFID attendance system requires card for attendance so students need to carry that card every time and also for every lecture for attendance. The RFID card may be got lost. that is give the problem to student for attendance. so avoiding this issues and problems Face recognition system is invent. Face Recognize helps to recognize the student face image in more efficient and accurate in order to match with the identity stored in the database. and it also covers the limitations imposed by the RFID student attendance recording system, we propose a solution in the form of inventing a Visual student attendance system by using face detection.

As such, the agenda of our project is to implement a still-image based face recognition algorithm by using camera. improvements increase the robustness of the design to the speed of the system of camera. An RGB camera can provide us with all the necessary resources for the achieving such improvements in face recognition. These resources include various camera (internal or external), Personal Computer.

The efficiency of face recognition system can be increased fast face detection algorithm. we are used for that Viola and Jones methods and it is most efficient techniques. Our system utilized this algorithm for the detection and recognized of faces in the classroom students. Face recognition techniques is divided into two types one is Appearance based technique which use texture features, that is applied to whole face and selected region or part of students face, and second Feature based which uses geometric

features like mouth, nose, eyes, eye brows, cheeks and also relation between them. Statistical tools such as Wiener filter, Viola-jones algorithm, 3D algorithm have been used for construction of face templates. First step in biometric system is the enrolment of students using personal data like name, branch and roll no, and assign data for generating biometric card. who its system work that's shows in figure 1.

II. ENROLMENT

First step in biometric system is the enrolment of students using personal data like name, branch and roll no, and assign data for generating biometric card who its system work that's shows in figure 1. Image of student is capture and then it is used the technique of histogram equalization and noise filtering. In the second step face is detected of student in the image format and features are extracted from it. And then it compare the student image with the stored database image and compare both and recognition that specific student

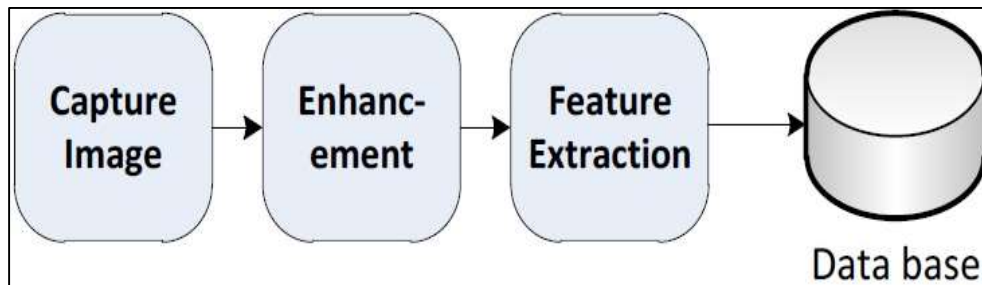


Fig. 1: Enrolment Process

III. SYSTEM DESCRIPTION

The system camera that captures the student images in that classroom. And send that images to next process that is images enhancement module. After enhancement the student image which is detected by Face detection method then Recognition modules using recognition that image from database. And then student attendance is marked in student attendance database server.

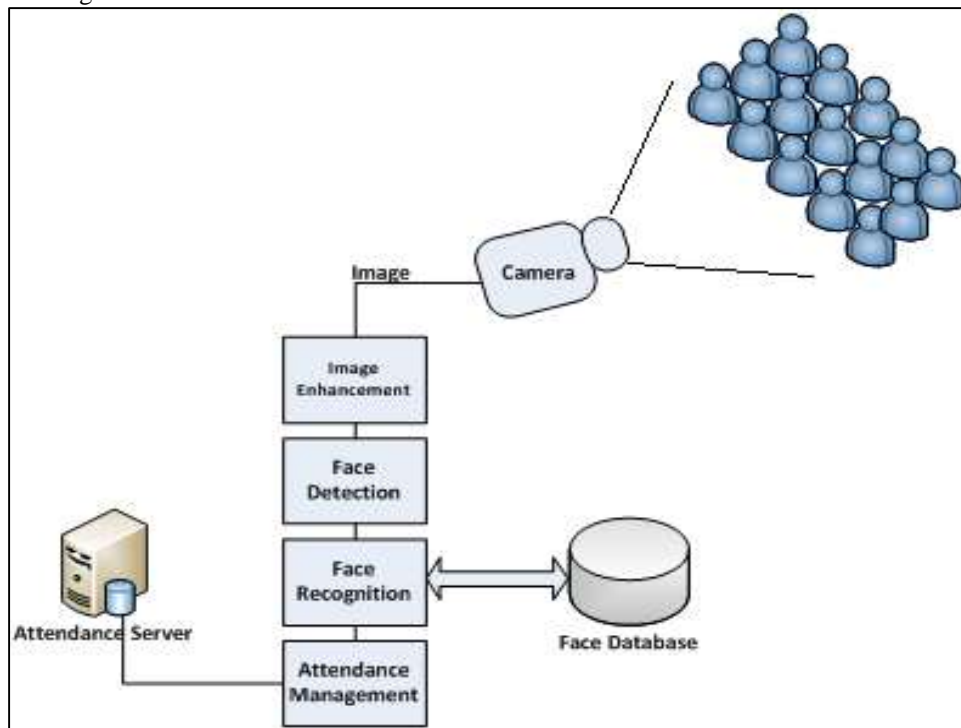


Fig. 2: Experimental setup

That all step by step shows in the Figure2. during registration face individual student faces are stored in the database. all the faces of students are detected from the database and by using specific algorithm they compare students on by one. This system uses a rules and protocols for attendance Teachers come in the class and just press a start button the attendance process in on and camera is detecting all the student face and recognized student and then marks the attendance. If student is not present then is mark absent of that student in database.

Camera takes the images from database continuously to detecting and recognize all the students in the classroom. For the avoiding false detection in the system. We used the skin classification technique by using this technique it increases the efficiency and accuracy of the detection process of system. In the skin classification technique first skin is divides and only skin pixel remains and all the remaining pixel in the images that set as black this technique is increase the accuracy and efficiency of face detection process.

Two databases are displayed in the Figure 2. One is for collection of student face database and other feature stored at the time of registration process. and second attendance database contains information about student attendance.

IV. SYSTEM ALGORITHM

The System contains the steps are as follows

- Image acquisition
- Noise removal
- Histogram normalization
- Face detection
- Face recognition
- Skin classification
- Attendance

In the first step student face image is captured from the camera.

There are light effects in the captured student image because of different lighting effects and also some noise which is to be necessary to remove for going next step. Histogram Normalization is used for remove the illumination effects from the image. and also median filter is used in the system for reducing the noise in the face image. FFT and low pass filter this technique are used for noise removal and smoothing of the images but median filter gives good results. Detail description of each step which is in the processes.

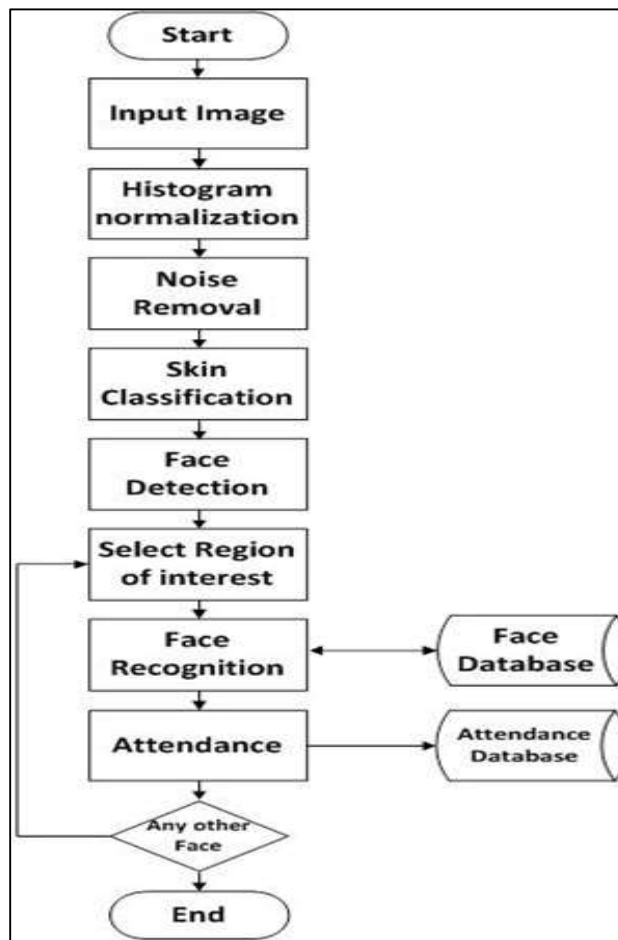


Fig. 3: Software Algorithm

V. IMAGE ACQUISITION

Image is capture from camera that is located in the class room. And that camera is connected to the computer. camera is capturing Image and that image is send to the computer for the further process. Images is capture and that student face image is send in quick to computer.

A. Histogram Normalization:

Reducing brightness and darkness from capture image for good result. So for that RGB images should converted into the gray scale image for better result. for enhancement show in the figure 3.



Fig. 4: Gray Image of Class

Histogram normalization is good technique for contrast enhancement in the for spatial. Figure 4 shows the histogram normalized image of the input image.

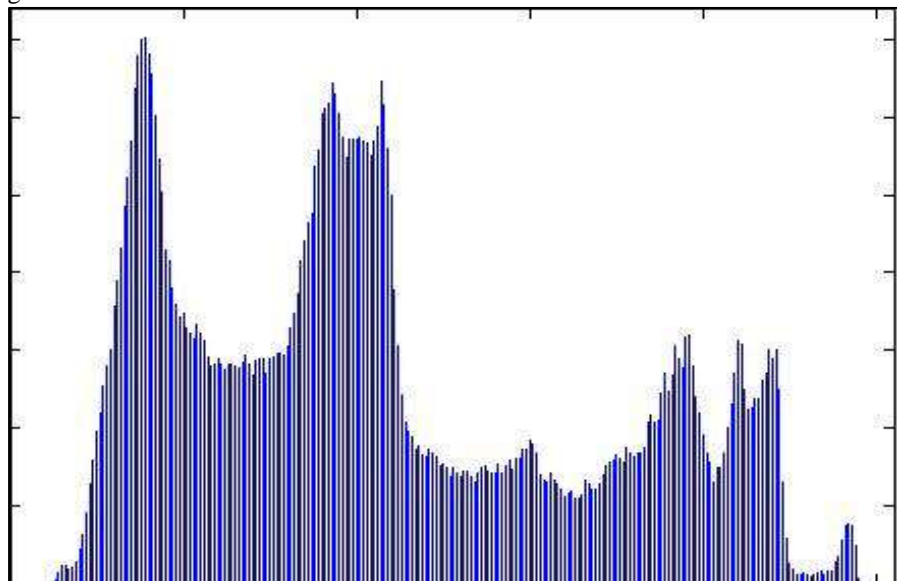


Fig. 5: Histogram of Input Image

B. Noise Filtering:

When image is capture then many source of noise are exist in that image. There are many techniques for removing the noise from the images. Low pass filtering in the frequency domain may be good technique for noise removing but it also removes the important data of student.so in our system median filtering techniques used for removing noise in the image.

C. Skin Classification:

Skin classification is used for increase the efficiency of face detection algorithm. Voila and Jones algorithm are used in our system for the face detection of student. and it is also increases the accuracy if the skin is classified before the scanning procedure of face images. Many time in the image closely related to the skin becomes white and all other are skin are black. So that binary image uses the shareholding of skin colours.

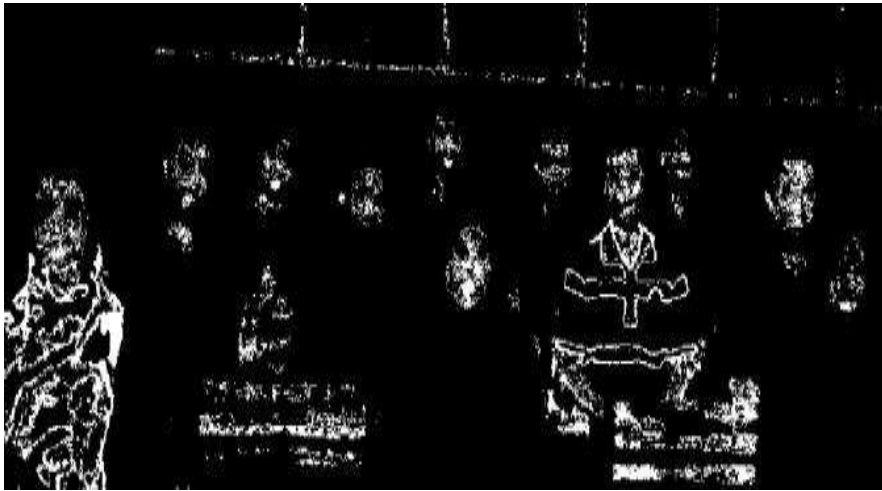


Fig. 6:

D. Face Detection:

Here faces detection is shown in the figure. by marking square on the faces of students that indicating the detecting of the face of student. and the process of skin classification and detection is from the face detection algorithm. Initially face detection algorithm was tested on various images position and lighting condition. And then face detection algorithm is used for the real time face detection video.



Fig. 7:

Then algorithm is trained for the images of faces and that's used in classroom student face detection of one or multiple face detection. After the detection of faces of student next step is cropping of each detected face image. And for that used the technique of threading for the speed of detection algorithm. each cropped image is separated thread for the recognition process.

E. Face Recognition:

Face detection is a technology to determines the size of a human face in a numeric representation of image. It detects facial expression and rest all in the image is like background and is minimizes from the image. Face-detection focuses on the detection of front part human faces, and also solve the multi-view face detection problem. Face recognition is a technique to identify a human face from a still image or moving images with a given database of face images. The various techniques used to detect the face in the image are as follows

1) Face Detection as A Design-Classification Task:

In this face detection is a binary design classification task. That is the same region of a given part of an image is transformed into features, after on the basis of classification example it decides whether that particular region is part of image or not.

2) Controlled Background:

In this technique the checks the background is fixed. Minimize the background and only the faces will be left, it can only assumes the images which only have the human front face.

VI. CONCLUSION

Student attendance system using face recognition was designed and implemented. It was tested with different face image. This study represents a facial detection and recognition model with different windows working in parallel and independently. If face recognition is to compete as a viable biometric for authentication, then a further order of improvement in recognition rate is necessary. Under controlled condition, when lighting and pose can be restricted, this may be possible. We hope this system provides the capacity to gain an accurate and deep understanding the field of face recognition to achieve development of field. Future work focuses on verifying performance of an algorithm against general images and robustness of an algorithm necessary to study the required modifications of an image. If recognition is to compete as a feasible biometric for authentication, then it is necessary for further improvement of recognition. In controlled conditions, when pose can have restricted this may be possible. It is most likely that next or future improvements will repeat on making better use of video techniques and 3D face models. Face as a biometric modality is acceptable for the general public, and face recognition technique is opportunity to meet the demands of a wide range of applications. This project saves time, energy and hence it is time consuming. We hope that this system will be able to shift the pattern of students lecture attendance monitoring in face to face classroom and provide a new, accurate, and less complicated way of taking student attendance in Higher Institutions.

REFERENCES

- [1] Gatsheni, B.N., R.B. Kuriakose, and F. Aghdasi. Automating a student class attendance register using radio frequency identification in South Africa. in *Mechatronics, ICM2007 4th IEEE International Conference on*. 2007.
- [2] K. Cheng, L. Xiang, T. Hirota and K. Ushijima, "Effective Teaching for Large Classes with Rental PCs by Web System WTS," in *Proc. Data Engineering Workshop 2005 (DEWS2005)*, 2005, 1D-d3 (in Japanese).
- [3] K. Cheng, L. Xiang, T. Hirota and K. Ushijima, "Effective Teaching for Large Classes with Rental PCs by Web System WTS," in *Proc. Data Engineering Workshop 2005 (DEWS2005)*, 2005, 1D-d3
- [4] P. Sinha, B. Balas, Y. Ostrovsky, and R. Russell, "Face Recognition by Humans: Nineteen Results All Computer Vision Researchers Should Know About," in *Proceedings of the IEEE*, vol. 94, Issue 11, 2006.