

Automatic Recognizing Attendance System Using Machine Learning

Shailendra Gaur¹, Anand Vijay Rajsri², Jugal Gautam², Deepanshu Bisht²

¹Assistant Professor, Department of Information Technology, BPIT, Delhi, India

²Students, Department of Information Technology, BPIT, Delhi, India

Abstract - Uniqueness or individuality of an individual is his face. In this project face of an individual is used for the purpose of attendance making automatically. Attendance of the student is very important for every college, universities and school. Conventional methodology for taking attendance is by calling the name or roll number of the student and the attendance is recorded. Time consumption for this purpose is an important point of concern. Assume that the duration for one subject is around 60 minutes or 1 hour & to record attendance takes 5 to 10 minutes. For every tutor this is consumption of time. To stay away from these losses, an automatic process is used in this project which is based on image processing. In this project face detection and face recognition is used. Face detection is used to locate the position of face region and face recognition is used for marking the understudy's attendance. The database of all the students in the class is stored and when the face of the individual student matches with one of the faces stored in the database then the attendance is recorded.

KeyWords: Image Processing, Face Detection Method, Face Recognition Method, Machine Learning.

1. INTRODUCTION

Attendance is prime important for both the teacher and student of an educational organization. So, it is very important to keep record of the attendance. The problem arises when we think about the traditional process of taking attendance in class room. Calling name or roll number of the student for attendance is not only a problem of time consumption but also it needs energy. So, an automatic attendance system can solve all above problems. There are some automatic attendances making system which are currently used by much institution. One of such system is biometric technique. Although it is automatic and a step ahead of traditional method it fails to meet the time constraint. The student has to wait in queue for giving attendance, which is time taking. This project introduces an involuntary attendance marking system, devoid of any kind of interference with the normal teaching procedure. The system can be also implemented during exam sessions or in other teaching activities where attendance is highly essential. Image processing which deals with extracting useful information from a digital image plays a unique role in the advent of technological advancements. This system eliminates classical student identification such as calling name of the student, or checking respective identification cards of the student, which can not only interfere with the ongoing teaching process, but also can be stressful for students during examination sessions.

Facial recognition has been the earliest of the application derived from this technology, which is one of the most fool proof methods in human detection. Face is a typical multidimensional structure and needs good computational analysis for recognition. Biometrics methods have been used for the same purpose since a long time now. Although it is effective, it is still not completely reliable for purpose of detecting a person.

MOTIVATION

In the recent years, Image processing which deals with extracting useful information from a digital image plays a unique role in the advent of technological advancements. It focusses on two tasks

- Improvement of pictorial information for human interpretation
- Processing of image data for storage, transmission and representation for autonomous machine perception.

Also, people have started to use image capturing devices never as before with the advent of smart phones and closed-circuit television. Since the application of image processing is vast, extensive work and research have been carrying out in utilizing its potential to and to make new innovative applications.

Facial recognition has been the earliest of the application derived from this technology, which is one of the most fool proof methods in human detection. Face is a typical multidimensional structure and needs good computational analysis for recognition. Biometrics methods have been used for the same purpose since a long time now. Although it is effective, it is still not completely reliable for purpose of detecting a person.

2. LITERATURE SURVEY

In [1] the author proposed that different types of face detection for detecting faces in different pose. Detecting face in different pattern based on techniques. Basic pattern for detecting face is nose, eyes, hair, ears and some time it based on tone of skin. Face detection is detecting face based on location of face and presences of face in images. Different types of detecting the face techniques they are Ada-Boost Algorithm for Face Detection, Viola Jones Face Detection Algorithm, SMQT Features and SNOW Classifier Method, Local Binary Pattern (LBP). Each have advantages and disadvantages discussed in that paper.

Xiang-Yu Li [2] the author proposed that recognition face using hog features and pca algorithms. By applying Orecognition algorithm to cropped faces images from that we get similarity b/w taken image and database image. In this paper PAC algorithm used for face detection and recognition. Arun Katara [3] the author shows that face recognition of facial of different person or student. from recognition attendances is upload to database using face detection and recognition of student or workers. From this manual work is decrease by human and automatically attendance system based on faces process done.

In [4] authors have considered a system based on real time face recognition which is fast & which needs improvisation of images in various lighting environments.

3. Work Flow

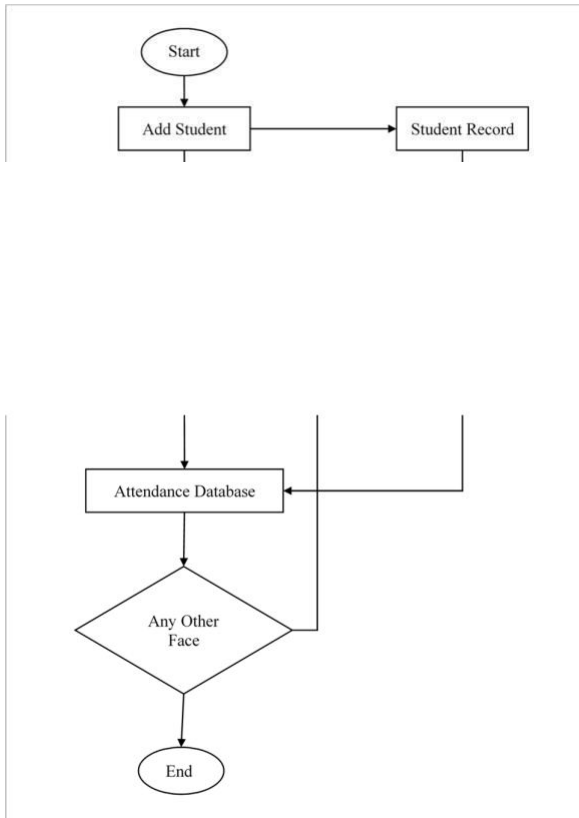


Figure 1: Architectural Flow Chart

3.1 Training data

For the database, we need to capture the image from the webcam or the external camera. To do so, in Python, we need to install the drivers from the math works website based on the type of camera we are using. Next, we need at least 500 to 1000 captures of each person for getting higher percentage of accuracy and meet the purpose we are doing in this project. We can store the data in the form of separate folders distinguishing each person from others.

3.2 Image Capture

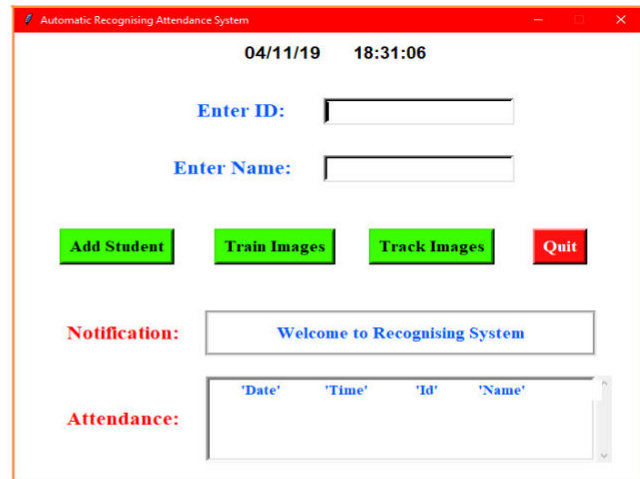
We need some HD camera in order to get results. We can capture the images from the video stream or by capturing each and every image from the webcam manually. Doing the frame capture from the stream of video will give us results in less time but we won't be able to capture the face properly in case we lose light or something and if the face is not captured properly.

3.3 Face detection

For face detecting, we can do it using the object cascading class and we use the b-box method. The detection of the face using the object cascading is bought from the most popular facial recognition model Viola Jones. In here, there are several objects are present. These are there in the form of small blocks containing them. They are taken through an image and are moved through each and every block of the image and are checked for overlapping through them. First, we will convert the image from the red blue green to gray scale image.

The faces from the image captured is to be collected. The captured faces are cropped into small images of resolution 112x92. It would be around 11 KB of size.

3.4 Front end



To do so, we need to give name and his/her registered number to store.

4.1 Register the Person

Now we to get the pictures of the persons from the webcam or any other cams available like we used Logitech webcam here. Select the cam from which we need to take the image and start the camera. The camera is plotted in the axes and we can capture and save the images in the folder created automatically with the registered number.

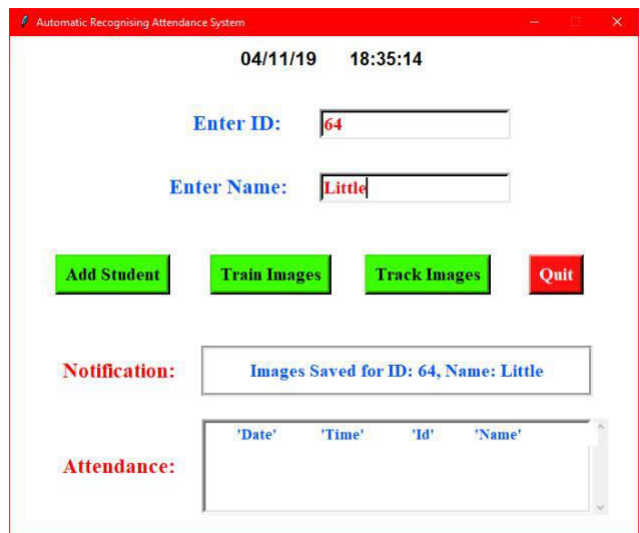


Figure 3: Register the Person into the Database

After this the data is stored in the database. Now let us capture a picture from the webcam and see the results.

4.2 Capture and Save the Images

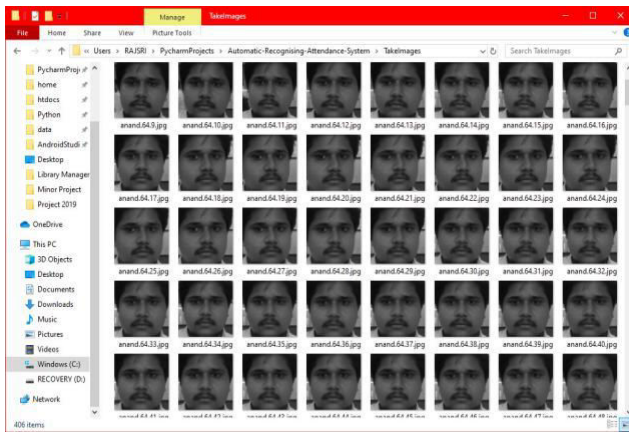


Figure 4: Capture and Save the Images in Database

Found images are given their names and not found ones are as the image in the middle.

4.3 Recognizing Image

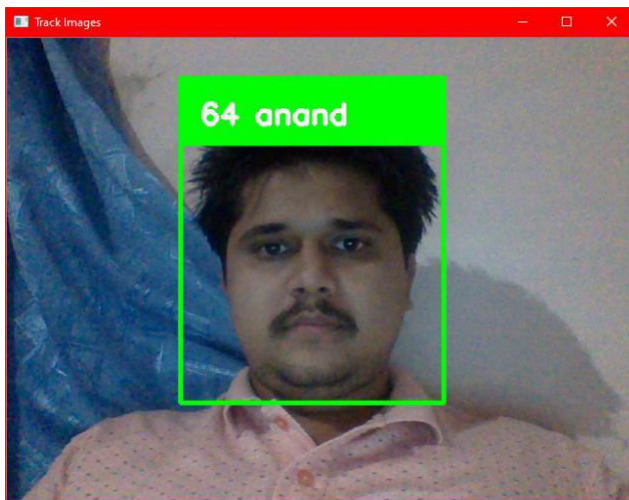


Figure 5: Recognizing Image and Show

If we click on the View Attendance, the attendance is viewed after capturing.

4.4 Attendance Marking

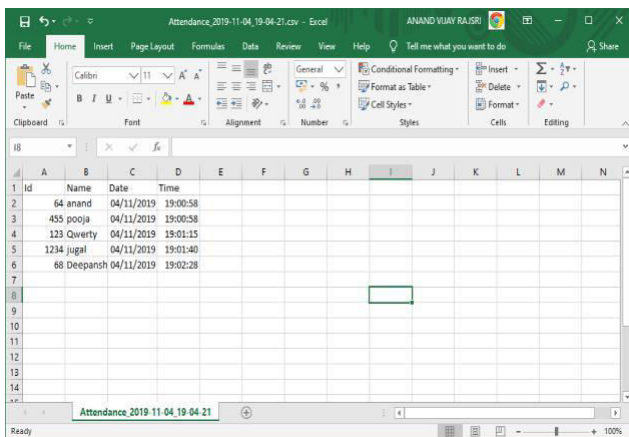


Figure 6: Attendance Marking in File System

5. CONCLUSION

The face detection and recognition algorithms were studied thoroughly taking number of the test from different varying condition images. For face detection combination of RGB and Recognition algorithm is used. For face recognition principal component analysis method is used. Attendance of the student are marked using the recognized face of every individual student and the data is stored in an attendance sheet. The attendance of every student marked automatically by recognizing their face with the face present in the data base.

REFERENCES

- [1] A Study of Various Face Detection Methods, Ms.Varsha Gupta, Mr. Dipesh Sharma, ijarcce vol.3 <https://www.ijarcce.com/upload/2014/may/IJARCCCE7G%20%20a%20varsha%20A%20Study%20of%20V%20arious%20F%20ace.pdf>
- [2] Face Recognition Based on HOG and Fast PCA Algorithm Xiang-Yu Li (&) and Zhen-Xian Lin
- [3] Attendance System Using Face Recognition and Class monitoring System, Arun Kataru, Mr. Sudesh, V.Kolhe http://www.ijritcc.org/download/browse/Volume5_Issues/February_y_17_Volume_5_Issue_2/1489565866_15-03-2017.pdf
- [4] Adam Schmidt, Andrzej Kasinski, "The Performance of the Haar Cascade Classifiers Applied to the Face and Eyes Detection", Computer Recognition Systems 2
- [5] Attendance System based on Face Recognition Volume: 05 Issue: 04, Apr-2018 Venkata Kalyan Polamarasetty, Muralidhar Reddy Reddem, Dheeraj Ravi, Mahith Sai Madala <https://www.irjet.net/archives/V5/i4/IRJET-V5I41022.pdf>
- [6] Automated Student Attendance Registering System Using Face Recognition by HIMANSHU MALLIK http://ethesis.nitrkl.ac.in/7301/1/AUTOMATED_Mallik_2015.pdf
- [7] N.Sudhakar Reddy, M.V.Sumanth, S.Suresh Babu, "A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques", Journal of Emerging Technologies and Innovative Research (JETIR), Volume 5, Issue 12, Dec 2018.
- [8] Prajakta Lad, Sonali More, Simran Parkhe, Priyanka Nikam, Dipalee Chaudhari, "Student Attendance System Using Iris Detection", IJARIE-ISSN(O)-2395-4396, Vol-3 Issue-2 2017.
- [9] Samuel Lukas, Aditya Rama Mitra, Ririn Ikana Desanti, Dion Krisnadi, "Student Attendance System in Classroom Using Face Recognition Technique", Conference Paper DOI: 10.1109/ICTC.2016.7763360, Oct 2016.
- [10] K.Senthamil Selvi, P.Chitrakala, A.Antony Jenitha, "Face Recognition Based Attendance Marking System", IJCSMC, Vol. 3, Issue. 2, February 2014.
- [11] Paul Viola and Michael J. Jones, "Robust Real-Time Face Detection," International Journal of Computer Vision, vol. 57, no. 2, pp. 137-154, May 2004.
- [12] N.Sudhakar Reddy, M.V.Sumanth, S.Suresh Babu, "A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques", Journal of Emerging Technologies and Innovative Research (JETIR), Volume 5, Issue 12, Dec 2018.