International Journal of Latest Trends in Engineering and Technology
Special Issue April-2018, pp. 146-150
e-ISSN:2278-621X

A MODIFIED ALGORITHM FOR ATTENDANCE MANAGEMENT SYSTEM USING FACE RECOGNITION

Akila K[1], S.Ramanathan[2], B.Sathyaseelan[3], S.Srinath[4], R.R.V.Sivaraju[5]

Abstract - This paper is about the automatic attendance management system .Attendance automation has become one of the most important needs in educational institutions and workplaces across the world, since it saves time and accurate too. Face recognition system needs least human cooperation and is viable too.. In this paper we are going to describe the attendance without human interference. In this method the camera is fixed in the classroom and it will capture the image, the faces are detected and then it is recognized with the database and finally the attendance is marked. The data collected can be used by the system further for attendance score calculation and other managerial decisions. Thus the system reduces the manual collection of attendance and the time taken for report generation.
Keywords - Attendance Management, Face Recognition, Face Detection.

1. INTRODUCTION

Maintaining the attendance of the students is a tedious process for any institute. Each institute has adopted their own method of taking attendance i.e. calling the names or by passing the sheets. Several very popular automatic attendance systems currently in use are RFID, IRIS, FINGERPRINT etc. However, making queue is essential in these cases thus requires more time and it is intrusive in nature. Any damage to RFID card can make inappropriate attendance. In RFID, the users were provided with a tag as the pass key and a tag reader was used to read the presence. But, the tag reader was time consuming. Also, there were chances of misusing the cards (one person could have two cards at once and mark attendance for the missing person too).

In order to overcome, the drawbacks of RFID, the biometric identification was introduced. The biometric includes various types like, thumb impression, face pattern, iris pattern, etc., the thumb pattern for each person is unique and it was easy way to make use of it as an identifier entity. But, then if there was any bruise in the fingers, then the pattern would mismatch.

So, the face recognition turned out to be the most suitable Apart from this deploying these systems on large scale is not cost efficient. In order to have a system both time and cost efficient with no human intervention, facial recognition is the suitable solution also face is people's preliminary scheme of person identification. With the rapid development in the fields of image processing such as pattern recognition, facial recognition and signature recognition the efficiency of this system is keep on increasing. This system is attempting to provide an automated attendance system that carries out the face recognition task through an image stream to record the attendance in lectures or sections and keeping the database of attendance. Thus intrusive nature is absent in this system and makes the system effective.

2. RELATED WORKS

A number of Papers were published in this regard,previously.Each had its own Methodology,pros and cons.The Commonly used techniques were RFID,Fingerprint,GPS,etc.The accuracy of these methods were very low. When it comes to RFID ,any damage in it could cause issues to the process of marking attendance. Fingerprint method also had in cases where the student had a small bruise thumb. Also it is very difficult to trace the presence of a student using global positioning system. All these involved the formation of long queues. They were time consuming as well. Some of theprevious works along with their advantages and disadvantages are given in the below table.

TITLE OF PAPER	YEAR OF PUBLICATION	PROS	CONS
Face Detection And Recognition For Automatic Attendance System	2016	Up-to-date, easy to access scheduling, Real-time status tracking	System Costs, System Outages, User Experience

[1] Assistant Professor, Department of CSE, R.M.K.College of Engineering and Technology, Puduvoyal, Tiruvallur, Tamil Nadu, India - 601206.
[2] Department of CSE, R.M.K.College of Engineering and Technology, Puduvoyal, Tiruvallur, Tamil Nadu, India - 601206.
[3] Department of CSE, R.M.K.College of Engineering and Technology, Puduvoyal, Tiruvallur, Tamil Nadu, India - 601206.
[4] Department of CSE, R.M.K.College of Engineering and Technology, Puduvoyal, Tiruvallur, Tamil Nadu, India - 601206.
[5] Department of CSE,, R.M.K.College of Engineering and Technology, Puduvoyal, Tiruvallur, Tamil Nadu, India - 601206.

Automated Attendance Management System using Face Recognition	2015	Up-to-date, easy to access scheduling, Real-time status tracking	System Costs, System Outages, User Experience

3. PROPOSED SYSTEM

This is a paradigmatic scheme for real time face detection and recognition. The system consists of a camera, installed in the classroom capturing the video frames followed by the detection of multiple faces. These faces are cropped and converted to grayscale causing reduction in the number of bits to be processed. These faces are then compared with the database faces and display the result and mark the attendance.

The speed with which features may be evaluated does not adequately compensate for their number, however. For example, in a standard 24x24 pixel sub-window, there are a total of M= 162,336 possible features, and it would be prohibitively expensive to evaluate them all when testing an image. Thus, the object detection framework employs a variant of the learning algorithm AdaBoostto both select the best features and to train classifiers that use them. This algorithm constructs a "strong" classifier as a linear combination of weighted simple "weak" classifiers.

3.1 Haar Features

All human faces share some similar properties. These regularities may be matched using Haar Features.

A few properties common to human faces:

- The eye region is darker than the upper-cheeks.
- The nose bridge region is brighter than the eyes. Composition of properties forming matchable facial features:
- Location and size: eyes, mouth, bridge of nose
- Value: oriented gradients of pixel intensities

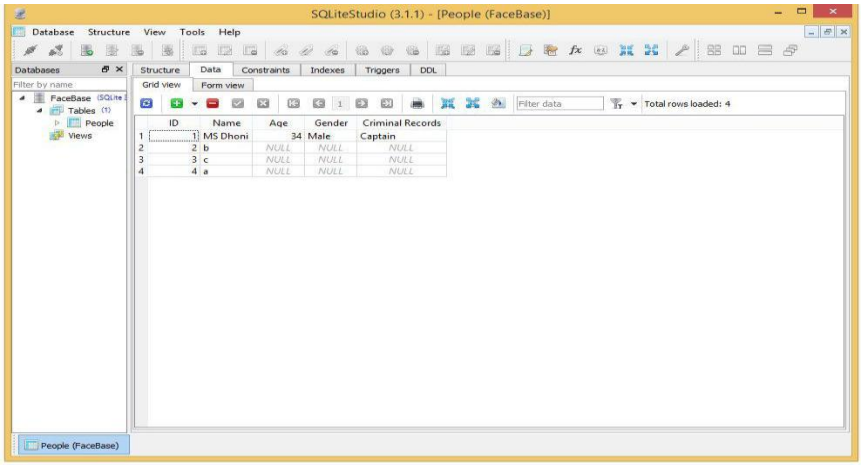
The four features matched by this algorithm are then sought in the image of a face (shown at right).

Rectangle features:

- Value = Σ (pixels in black area) - Σ (pixels in white area)
- Three types: two-, three-, four-rectangles, Viola & Jones used two-rectangle features
- For example: the difference in brightness between the white &black rectangles over a specific area
- Each feature is related to a special location in the sub-window

3.2 Data Gathering

This used to get all the details of the person including image, with the help of a window. We can get the input of a person name and other details which would like to make an entry. Once the data entry has been finished. The image scanner will automatically open. The window Searches for the image of a human. Once image has been gathered it automatically stores the data into jpeg format in the folder which we mentioned. The similar data also has been stored in the database.



Training

Which transforms the single image to multiple dimensions? The image captured is converted into grayscale image and stored. When the trainer program runs this image has been converted into multiple pixels of images over the folder.

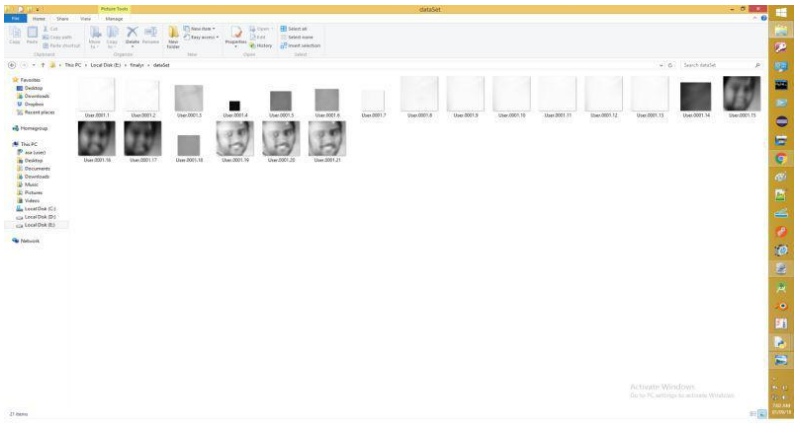
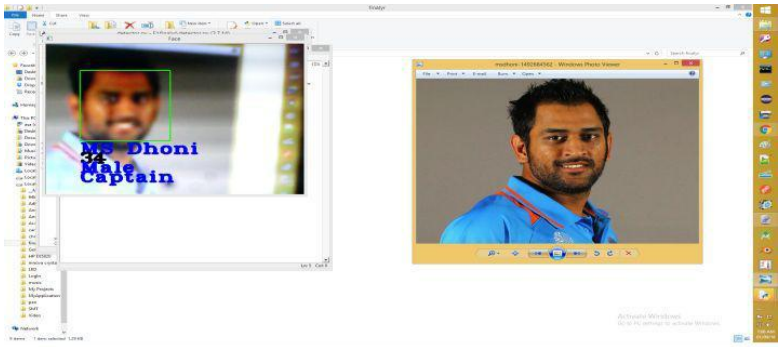


Image Tracker

Image tracker searches for the image over the frame in the camera. When the camera detects the Human face it crops that into a particular size of frame and compares the each pixel position appropriately to the value stored in the image folder. When comparison finishes the overall data from the database for the appropriate person is displayed and also stored in the database.



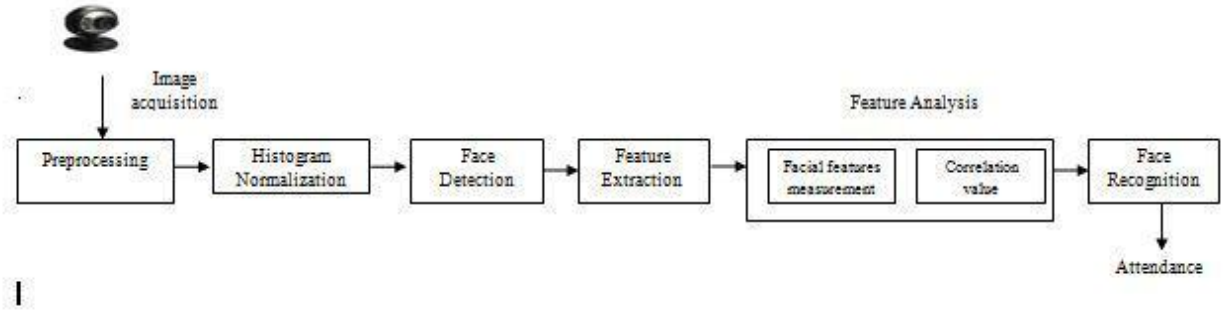


Fig 1. Architecture Diagram

4. RESULTS AND DISCUSSION

The face recognition system was tested using a set of face images taken by web camera. All the training and testing images are grayscale images of size 120x128. There are 15 persons in the face image database, each having distinct pictures taken under different conditions (illumination and head scale). as shown in Figure 2.

4.1 Recognition with varying illumination:

Each training image has two corresponding test images—one with low and the other with bright light. The experiment results are shown in Table 1.

Table 1: Recognition with varying illuminance

Number of test images	15
Number of true-positive identifications	12
Number of false-positive identifications	3
Number of false-negative identifications	0

Fig. 2 varying illumination

4.2 Recognition with varying focus:

Each training image has two corresponding test images—one with a closer to the camera and the other with some minimum distance away from the camera as shown in Figure 3. The experiment results are shown in Table 2 .

Table 2: Recognition with varying focus

Number of test images	10
Number of true-positive identifications	6
Number of false-positive identifications	4
Number of false-negative identifications	0

Fig. 2 varying focus

5. CONCLUSION & FUTURE ENHANCEMENT

Using this method we can replace all the old methods. Efficient and automatic attendance management is introduced in paper. This method requires only simple hardware for installation. The management of attendance in this method is simpler and the attendance is taken more accurately. The efficiency is obtained in this method is up to 85%. The system can be enhanced in future by updating internal marks for each of the students along with their attendance marks and the collected data can be hence uploaded in the respective portals. A complete database of the students will maintain in a secured way. Also the push messages could be sent to the parents once the attendance of their ward is marked absent.

6. REFERENCES

[1] Nirmalya Kar, Mrinal Kanti Debbarma, Ashim Saha, and Dwijen Rudra Pal," Study of Implementing Automated Attendance System Using Face Recognition Technique",in proc. International Journal of Computer and Communication Engineering, Vol. 1, No. 2, July 2012.

[2] Ajinkya Patil and Mrudang Shukla," Implementation of Classroom Attendance System Based on Face Recognition in Class", in proc . International Journal of Advances in Engineering & Technology, July, 2014.

[3] Jomon Joseph and K. P. Zacharia, "Automatic Attendance Management System Using Face Recognition", in proc. International Journal of Science and Research (IJSR).

[4] Shih, P. and C. Liu (2004). Face Detection Using Discriminating Feature Analysis and Support Vector Machine in Video, in: Proc. 17th Intl. Conf. Pattern Recognition, IEEE Computer Society Washington, DC, USA.

[5] Rohit Chavan,Baburao phad,Sankalp Sawant and Vinayak Futak,"Attendance Management System using face recognition",in International journal for innovative Research in science and technology,Vol. 1,issue 11,April 2015.

[6] Naveed Khan Balcoh, M. Haroon Yousaf,Waqar Ahmad and M. Iraam Balg,"Algorithm for efficient attendance management:face recognition based approach",in IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 4, No 1, July 2012.

[7] Mrunmayee Shirodkar,Varun Sinha,Urvi Jain and Bhushan Nemade,"Automated Attendance Management System using Face recognition",in International Conference and Workshop on Emerging Trends in Technology.

[8] Shreya Nallawar,Neha Giri,Neeraj Deshbhratar,Shamal Sane,Trupati Gautre and Avinash Bansod,"modern Technique of lecture Attendance Using Face Recognition",in International Journal of advance Foundation and Research In Science & Engineering,Vol. 1,Issue 8,January 2015.

[9] Quratulain Shafi, Javaria Khan, Nosheen Munir and Naveed Khan Baloch, Fingerprint Verification over the Network and its Application in Attendance Management International Conference on Electronics and Information Engineering 2010

[10] Mr. A. R. Gadekar,Mayuri K. Chandak,Bharat S. Budhalani,Sarang S. Chawale,"Automated Employee Face Recognition system",in IORD Journal of Science & Technology,Vol. 1,Issue 3,Mar-Apr 2014.