International Journal of Science Technology and Management
Vol. No.6, Issue No. 04, April 2017
www.ijstm.com
ISSN (O) 2394 - 1537
ISSN (P) 2394 - 1529

IMAGE PROCESSING BASED ATTENDENCE MONTIORING SYSTEM

Neville Thomas[1] Pratik Bhope[2] Nikhilesh Wani[3] Shilpa. S. Kanse[4]

[1,2,3]*Rajarshi Shahu College of Engineering, Pune University, Maharasthtra*

[4]*Professor, Department of E&TC, Rajarshi Shahu College of Engineering*

*Pune University, Maharas*htra

ABSTRACT

This system uses the face recognition approach for the automatic attendance of students in the classroom environment without students' intervention. This attendance is recorded by using a camera attached in the classroom that would capture the image of students, and comparing the detected faces with the student database and the attendance is marked. The system consists of a camera that captures the images of the students sitting in the classroom and sends it to the image enhancement module. In the image enhancement module, images are enhanced so that matching can be performed easily. After enhancement, the image comes in the face detection and recognition modules. At the time of enrollment, templates of face images of individual students are stored in the face database. The faces are detected from the captured image by camera. In the recognition module the detected faces are compared against those in the stored database. If any face is recognized, the attendance is updated and can be accessed by anyone, the information will be sent to the absentees' parents using the GSM technology.

Keyword: Arduino uno, Camera, Gsm module, PC.

I.INTRODUCTION

We propose a system that takes the attendance of students those are present for their classroom for a particular lecture. Our system takes the attendance automatically using face recognition algorithm. However, it is difficult to estimate the attendance precisely using each result of face recognition independently because the face detection rate is not sufficiently high. In this paper, we propose a method for estimating the attendance precisely using all the results of face recognition obtained by observation. We constructed the lecture attendance system based on face recognition, and applied the system to classroom lecture. In this modern era of automation many scientific advancements and inventions have taken place to save labor, increase the accuracy of the present students in a classroom by avoiding proxy attendance and to ameliorate our lives. Automated Attendance System is the advancement that has taken place in the age of automation replacing traditional attendance marking activity. In the traditional system a lot of time is wasted by the lecturer in order to take the attendance of the present students. This time can be used by the lecturer and the students for some other technical activity. In the present scenario wherein automated attendance systems are generally bio-metric based, smart-card based and web based or any other identifications such as a section to login and log out the session in most of the e-learning system. But these systems are not sufficient as we are not sure whether the student was actually present or not for the session. In our system the attendance is marked only if the face captured by the camera matches to

ISSN (O) 2394 - 1537
ISSN (P) 2394 - 1529

the face stored in the database. In this paper we propose a method that can save time of the respective faculty that is in charge of the class as s/he need not waste time in taking the attendance of the class. The ability to compute the attendance percentage becomes a major task as manual computation produces errors, and also wastes a lot of time. For the stated reason, an efficient attendance management system is designed. As and when required the faculty can take a printout of a particular student wherein all his details such as the number of lectures he attended out of the total number of lectures. The faculty need not spend time in making a defaulter list of students as all the details related to the student is present in the excel sheet which is auto generated . Timely SMSs are send to the guardian of the students in order to keep them notified about their ward.

II. RELATED WORKS

Cheng, et al. [1] developed the system to manage the context of the students for the classroom lecture by using figure print scanner for all the students. Because this system uses the figure print scanner of each student, the attendance. However, when this system is circulated among students chances of this device getting damaged is more . This system can also cause disturbance in classrooms when it is circulated in the class. Our system takes images of faces which overcome the above said disadvantages.

In recent decade, a number of algorithms for face recognition have been proposed [2], but most of these works deal with only single image of a face at a time. But this system is capable of identifying the faces that are captured by the camera.

III. PROBLEM FORMULATION

3.1 Motivation

When the number of students enrolled in a certain course is huge, the lecturers tend to call a couple of students name at random which is not a fair student evaluation process. Finally, these attendance records are used by the staff to monitor the students' attendance rates. This process could be easy and effective with a small number of students but on the other hand dealing with the records of a large number of students often leads to human error.

3.2 AIM

Every time a lecture, session or laboratory starts, the lecturer or teaching Assistant delays the lecture to record students attendance. This is a lengthy process and takes a lot of time and effort, especially if it is a lecture with huge number of students. It also causes a lot of disturbance and interruption when an exam is held. Moreover, the attendance sheet is subjected to damage and loss while being passed on between different students of teaching staff. Our Aim is to design a system to overcome all these drawbacks of the conventional method.

3.3 Objctive

1] To store the faces in the database

2] To detect the faces in image.

3] To compare the detected faces with the images in database.

4] Mark the attendance of the detected faces.

5] To send the report of absence of the students to the concerned authorities.

International Journal of Science Technology and Management
Vol. No.6, Issue No. 04, April 2017
www.ijstm.com
ISSN (O) 2394 - 1537
ISSN (P) 2394 - 1529

IV.METHODOLOGY

Viola Jones Framework Algorithm

This is a Paradigmatic method for Real time Face detection. Training is slow, but detection is very fast. The task of face detection in Viola Jones algorithm uses a window as the base window size to start evaluating these features in any given image.

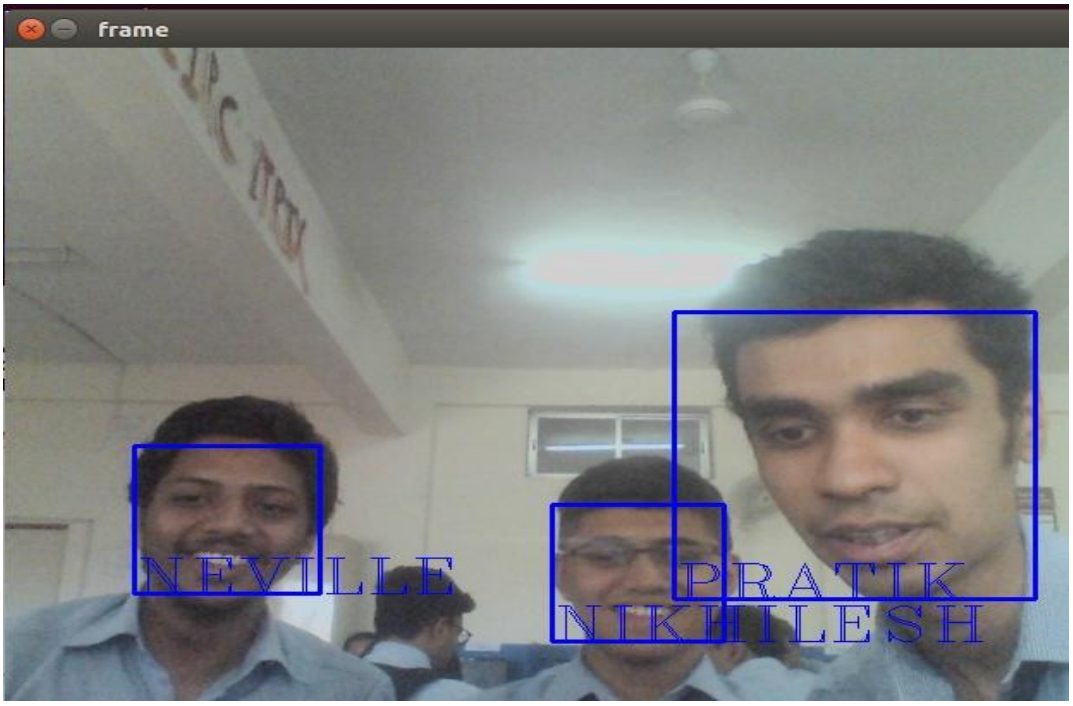

Fig.1 24 x 24 Base Window used by algorithm to crop face in given input image

Detection process has four key ideas

- The first is usage of **Haar Features** for the detection of features in the input image.
- The second is the introduction of a new image illustration called the **—Integral Image** which allows the features used by our detector to be computed very quickly.
- The third is an easy and efficient classifier which is built using the **AdaBoost learning algorithm** to select a small number of critical visual features from a very large set of potential features.
- The fourth contribution is a process for combining classifiers in a **—cascade** which allows background regions of the image to be quickly discarded while spending more computation on promising face-like regions.

4.1 HAAR FEATURES

Haar features are similar to this convolution kernel which is used to detect the presence of that feature in the given image. Each feature results in a single value which is calculated by subtracting the sum of pixels under white rectangle from the sum of pixels under black rectangle

International Journal of Science Technology and Management
Vol. No.6, Issue No. 04, April 2017
www.ijstm.com
ISSN (O) 2394 - 1537
ISSN (P) 2394 - 1529

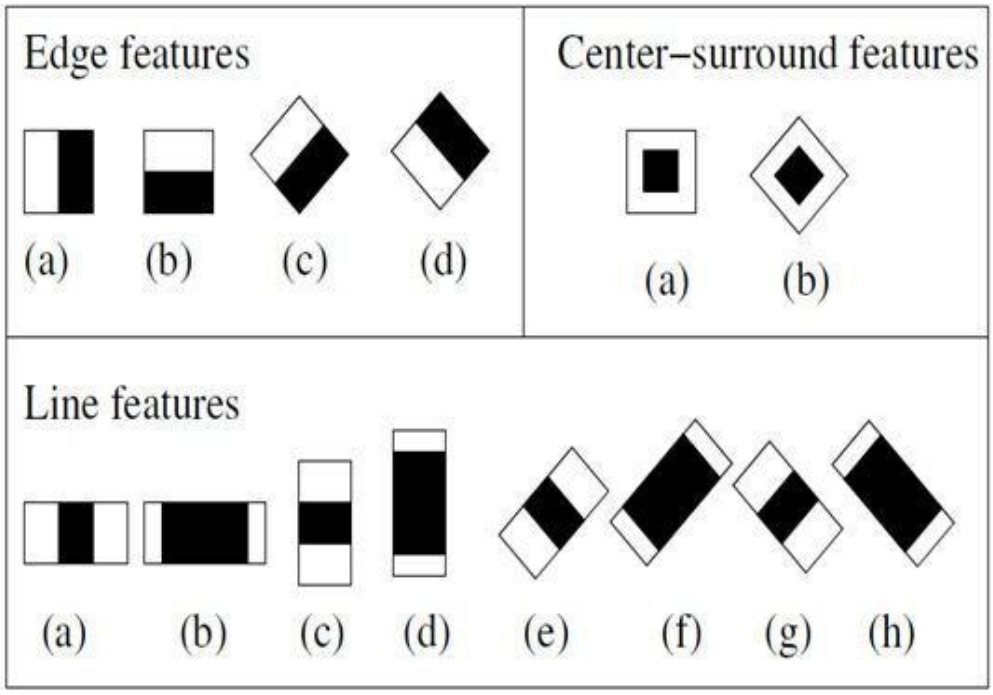

Fig.2 Different types of Haar Features

Considering all possible parameters of the Haar features like position, scale and type we end up calculating about 160000+ features in this window.

fig3: Haar features

4.2 ADABOOST

It is used both to select the features and train the classifier. Weak learner is a single rectangle feature that best separates positive and negative examples; so weak classifier is a threshold single feature. Initially, give equal weight to each training example. Iterative procedure to find the best weak learner for the current weighted training set and raise the weights of training examples misclassified by current weak learner. Compute final classifier as linear combination of all weak learners.

4.3 CASCADING

The classifier used is cascaded classifier. It composes of different stages wherein each stage contains a strong classifier. The duty of each stage is to ensure that the given sub-window is definitely not a face or it may be a

ISSN (O) 2394 - 1537
ISSN (P) 2394 - 1529

face. When the sub-window is identified to be a non-face by a given stage then it is immediately discarded. On the other hand if the sub-window classifies that there are chances of that it might be a face then it is passed to the next stage in the cascade. Thus we can conclude that more the number of stages in a sub-window more is the chances of identifying the face correctly.

V.CONCLUTION AND FUTURE SCOPE

In today's classroom environment it has become a necessity to install automatic attendance system. Most of the existing system are time consuming. Our aim is to solve the issue by face recognition. Since we implement a modular approach we can improve different modules until we reach an acceptable detection and identification rate. The system can be enhanced in such a way that the accuracy, detection rate and recognition rate can be increased so that more number of students can be detected and recognized for those who are present in the class. This method can further can be extended in offices wherein we can maintain a report of the hours the employee is in the office. This method is an alternative to the present RFID cards. In huge MNCs people need to move from one room to another room in order to attend various meetings. In case of emergencies we can use face recognition algorithm to track where the employee is present and approach him directly instead of having a regular visit to his cabin to check whether he has come or not. This idea can also be implemented in colleges.

VI. RESULTS

Distance of object for correct recognition	5 feet
Training time	5sec
Detection Rate	95%
Recognition	85%

Table 1: Observation of the project

REFERENCES

[1]. 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).

[2]. W. Zhao, R. Chellappa, P. J. Phillips, and A. Rosenfeld, "Face recognition: A literature survey," ACM Computing Surveys, 2003, vol. 35, no. 4, pp. 399-458.

[3]. Paul Viola, Michael J.Jones, ―Robust Real-Time Face Detection‖ International Journal of Computer Vision Volume 57 Issue 2, pp. 137 – 154, May 2014\

[4]. T. A. P. K. K. L. P. M. L. M. P. A. W. G. D. P. J. G..Roshan-Tharanga, S. M. S. C. Samarakoon, ―Smart attendance using real time face recognition,‖ 2013.