Proceedings of
INTERNATIONAL CONFERENCE ON COMPUTING, COMMUNICATION AND ENERGY SYSTEMS
(ICCCES-16)
In Association with IET, UK & Sponsored by TEQIP-II
29th -30th, Jan. 2016

Paper ID:CSEIT17

SMART ATTENDANCE MANAGEMENT SYSTEM USING IT

Shailesh Kalkar
Kumar Bide
Ashwini Pujari
Pragati T.Sawant
Assistant Professor
Rajarambapu Institute of Technology, Rajaramnager Maharashtra, India

Abstract— Recently face recognition is attracting much attention in the society of network, multimedia and information access. Areas such as network security, content indexing or retrieval, and video compression benefits from face recognition technology because people are the center of attention in a lot of streams. In this system, we are using face recognition for taking attendance in the class. Student attendance in the classroom is very important task and if taken manually waste a lot of time. This research aims at providing a system to automatically record the student attendance during lecture hours in a hall or room using facial recognition technology instead of the traditional manual methods. The objective behind this research is to thoroughly study the field if pattern recognition (facial recognition) which is very important and is used in various applications like identification and detection. We are using algorithms like haar-classifier for detection and recognition of faces. Also, the system consists of automatic sms generation, with the help of which we can send sms to students and parents regarding attendance or any event in the institute.

Index Terms— Attendance, Face, Detection, Recognition, Report, SMS

I. INTRODUCTION

Attendance Management System using Face Recognition (AMSFR) is a system which marks the attendance of the students based on the image captured of the whole class. Earlier, pen and paper, biometric systems are used for recording the attendance of students in a class. But as these methods causes wastage of time for more number of students in the class.

But now we are working on maintaining the attendance of all the students at a time without any efforts of teacher. In this system we have used face detection which will detect the faces in the image and face recognition which recognition which will recognize student in the image. Then student attendance is marked through system. This will be a time saving process which will reduce stress of teachers to maintain attendance. And this saved time can be utilized for study purpose.

II. BACKGROUND AND HISTORY

This literature survey gives general idea about how to effectively manage attendance of the class. These papers give brief information about various strategies that can be used to apply smart attendance management system in the class.

Naveed Khan Balcoh, M. Haroon Yousaf have proposed [1] system which uses certain image processing mechanism to effectively manage attendance of the students.Firstly,they have captured image through camera and performed certain certain steps like image acquisition, histogram normalization, noise removal, skin classification, face detection, face recognition, attendance. In this, they have used histogram normalization for zooming of the constrast.For the removal of noises and smoothing of the image,they have used low pass filter,median filter. Then finallythey have marked attendance of students by using face database and attendance database. In the face recognition, they have cropped the detected faces and then compare with the database. Then, student faces are verified one by one with the face database using Eigen face method.

Ajinkya Patil, Mrudang Shukla have proposed [2] system in which instead of using face detection and face recognition mechanism,they used mechanism to distinguish faces from non faces in the image, which is very important for accurate attendance management.Also,Raspberry pi module is used in their system. A camera is connected to the Raspberry pi module which capture the image of the whole class. Operating system is installed on the Raspberry module. After that, Student database is collected in which student name,rollno,images is stored.Also,Raspberry pi module is installed in the system at the front side of the class.For detection of faces,they have used Viola Jones algorithm and for the recognition of faces they have used hybrid algorithm from Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA).Firstly, they have captured image through camera and then they had converted RGB image into grey scale image for the further processes. Then various image processing methods are used which are used in the above proposed system.

Mrunmayee Shirodkar, Varun Sinha have proposed [3] system in which they have broadly classified the system into two categeories that is face detection in which image is captured through high definition camera which is helpful to deal with issues like illumination,rotation and scaling.In the second categeory i.e face recognition,they have used local binary pattern(LBP).As the image consists of number of pixels.A 3*3 matrix is created in the image and there exist 9 pixels in each of matrix.Original LBP operator labels the pixels in the image.In the image,pixel positions are marked as either 0 or 1 and hence binary matrix is obtained.This matrix is then converted into decimal matrix.Once the decimal value for each pixel is obtained then the histogram is obtained.Then featureextraction step is performed. Finally, attendance of students is marked using the face database.

K.Senthamil Selvi, P.Chitrakala have proposed [4] system in which they divided the system into two classes. In first class, face detection is done through various algorithm like Ada boost, Float boost algorithm, Bayes classifier.In second class, face recognition is done through appearance based methods like texture features of faces in the image, feature based techniques which are based on mouth, nose, eyes, eyebrows, face etc.

Nirmalya Kar,Mrinal Kanti Debbarma have proposed [5] system in which they have detected and extracted faces and saved information of faces in a file having extension of .xml for any kind of reference. In learn and train image module,they have calculated eigen vector and eigen value for the image.Also,PCA algorithm is applied in this module.Finally,they have recognized and matched face images with existing face information which is in xml format.

Jomon Joseph,K.P.Zacharia have proposed [6] system which consists of MATLAB section in which face recognition is done.For the extraction of faces from image captured by the camera,for camera settings,for accessing of camera they have used MATLAB image processing and acquisition toolbox. Rest modules are similar as in the above mentioned system.

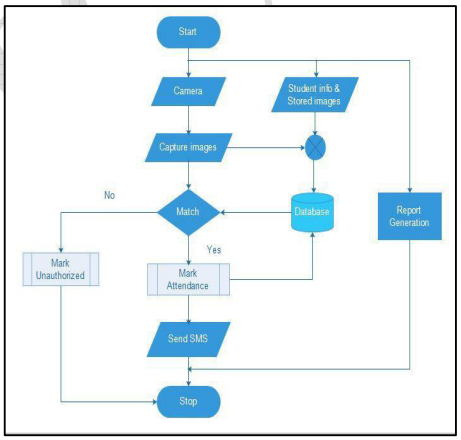
III.PROBLEM DESCRIPTION

There are different tasks that need to be done by the faculty like maintaining attendance of students etc. These works were done on paper manually.

The system is defined as follows:

Capture the still images of all students sitting in the class at one or more click so that more students should get captured in the image. Maintain the database of students containing their photo, roll no, gender etc. for recognizing the authorized or unauthorized student. Apply Face Detection and Face Recognition algorithms. If the captured images after applying face detection algorithms get matched with the particular image in the database, then only the system should mark the attendance of aparticular student. Report generation of the student's attendance is done. Send sms to student/parent. Also, for the confirmation purpose an sms will sent to the student as well as parents regarding attendance. This system is used to mark the attendance of only registered students of a particular institute.

IV.PROPOSED SYSTEM AND METHODOLOGY



In the proposed system, we are giving to capture the image or images of the whole class. That image, we will give as an input to the system.

If more than one image is given as input to the system, then system will detect and recognize faces from first image and then rest of the faces are detected from the other images.

The system will not reconsider the faces which were considered in previous images, if more images of class are given as input to the system. The system will have GUI for various modules like student registration, face detection and recognition, attendance, report sending through sms which will be accessible only to the admin. We have used C sharp language for the coding purpose.We have used inbuilt library for haar classifier cascade for few modules.Also,we have used Visual Studio as IDE.So, the admin will perform certain operations through GUI.Once their faces will be recognized then their attendance will be marked.

V.SYSTEM REQUIREMENT

Hardware Requirements

- One standalone PC or laptop should be installed in the admin room on which system will be deployed.
- HD camera should be positioned in the class room at proper position.
- More hard disk space will required for image database of large number of students.

Software Requirements

- Visual Studio IDE (for C#)
- MS SQL server 2008 or higher
- Windows XP or higher

Expenditure

This system cost mainly depends upon the cost of hardwares.However, software requirements can be completed without money.

Equipment	cost
PC or laptop	Rs 30,000/-
Camera	Rs 8000/- or more

VI.RESULTS AND DISCUSSION

This system will mark attendance of students once their faces are detected and recognized by the system. Once the attendance is marked then report will be generated by system which will then be sent to parents, students for giving information regarding attendance through sms.

In Face detection module, admin can browse image or images captured by the camera for giving input to the system through browse button in the GUI and can detect the faces in the image with the help of detect button in the GUI. If admin clicks on detect button, then the system will detect faces in the image through haar classifier which is already present in face detection library we have used in the system. In this module, face recognition is also included. It is important to identify a particular student within the class based on information stored in the database and to mark his/her attendance.

View attendance module to view the attendance of a class or a particular student for a specific date or between ranges of dates. The report module is for generating the report of

individual student or whole class between specific dates. Also admin can view the details of students those who are already registered or remove student from the registered entry in the database. In sms sending module, particular student's attendance report will be sent to the particular student and parent through sms.

VII. FUTURE SCOPE

In future work, we can use detection & recognition system to recognize suspect at public places like bus stations, railway stations. This will be helpful for the police, Central Bureau of Investigation. It can also be used for maintaining attendance of prisoners in jail.We can also use this proposed system for marking attendance using videos instead of images.

VIII. CONCLUSION

This paper gives idea about the approach of AMSFR. Our proposed system will be definitely beneficial for the students and faculties of a particular institute. This system will be able to manage attendance in an effective manner. This system not only marks but keeps track of attendance of students and provides sms facility for the students and parents so that they can verify the attendance.

REFERENCES

[1] Naveed Khan Balcoh, M. Haroon Yousaf, Waqar Ahmad and M. Iram Baig," Algorithm for Efficient Attendance Management: Face Recognition based approach", in IJCSI International Journal of Computer Science Issues,Vol 9,Issues 4,No 1,July 2012.

[2] Ajinkya Patil, Mrudang Shukla," Implementation of classroom attendance system based on face recognition in class", in International Journal of Advances in Engineering & Technology,July,2014.

[3] Mrunmayee Shirodkar,Varun Sinha,Urvi Jain,Bhushan Nemade, "Automated Attendance Management System using Face Recognition" in International Conference and workshop on Emerging Trends in Technology,2015.

[4] K.Senthamil Selvi,P.Chitrakala,A.Antony Jenitha, "Face Recognition based Attendance Marking System" in "International Journal of Computer Science and Mobile Computing",Vol.3 Issue 2,Feb-2014.

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

[6] Jomon Joseph,K.P.Zacharia,"Automatic Attendance Management System using Face Recognition" in International Journal of Science and Research