A SURVEY PAPER ON AUTOMATED ATTENDANCE MONITORING SYSTEM USING FACE RECOGNITION

Surabhi S. Deshmukh[1], Yugandhara M. Bhoge[2]
Dept. Of Comp. Science,
D.M.I.E.T.R,Sawangi(M),Wardha.
surabhi31593deshmukh@gmail.com,yugandhara1213@gmail.com

ABSTRACT-In today's world regularity of student attendance is concerned in the administration of Educational Institutions. Overall academic performance is affected by the student's attendance because poor attendance leads students in detention list. Student's attendances are taken manually by using attendance sheet given by the faculty members in the classroom, which is a time consuming event. Furthermore, it is very difficult to verify one by one student in a large classroom whether the authenticated students are responding or not.

The proposed system describes a method for Student's Attendance System which will integrate with the face detection technology using Viola Jones Object detection and face recognition technology using PCA (Principle Component Analysis) algorithm.

This survey paper proposes the system in that various image views of students will be captured through the camera. The captured views will be mapped against training data set for authentication of student attendance. The student whose image matches the most with the trained data set is marked present for the particular lecture. As well as this paper demonstrates how face recognition can be used for an efficient attendance system to automatically record the presence of an enrolled individual within the respective venue. Also it maintains a log file to keep records of the entry of every individual with respect to subjects and also generate a report of attendance.

Keywords: Face detection, Face recognition, PCA.

INTRODUCTION

Person identification is one of the most crucial building blocks for smart interactions. Amongst the person identification methods, face recognition is identified to be the most natural ones, as the face modality is modality that uses to identify people in day by day lives. Although other methods, such as fingerprint identification [5], can provide enhanced performance, those are not appropriate for natural smart interactions due to their intrusive nature. In comparison, face recognition provides passive identification that is the person to be identified does not need to cooperate or take any specific action [1].Attendance record plays a important role in the academic achievement of institute students. Attendances of every students are being maintained by every school, college and university. Attendance. Attendance Management Falls into two categories Namely: Conventional and Automated Methods.

The manual attendance record system is not efficient and requires more time to arrange record and to calculate the average attendance of each student. Hence there is a requisite of a system that will solve the problem of student record arrangement and student average attendance calculation. Faculty has to maintain proper record for the attendance. The major problems faced by organizations are time consuming in manual.

Basically this do research is aimed for implementing a system that is capable of identifying the employees in an organization, students in institute marking their attendance. As a result face recognition is used to mark the attendance of the employees as well as student. This system provides flexibility to identify a number of employees and student at the same time separately rather than identifying one by one. The proposed system will store the absent and present student's attendance details in electronic format so that management of attendance becomes effortless. To increase the accuracy, efficiency and

reliability of the recognition, algorithms are required. Principle Component Analysis (PCA) and Haar cascade are used to address those tasks [6]. The PCA is one of the most successful techniques that had been used in image recognition and compression [2].

In this paper, we present a various technology for attendance management system are below.

1. Computerized attendance system

In 2008, Nucleus Research proposed the use of a computerized attendance system, which can eliminate human involvement, human data entry mistake, repetitive work. This system is going to enhance productivity, compact payroll error and also compact payroll inflation, compact overtime, retirement of legacy systems, Eradication of paper costs, and which can offer all the reports which is demanded. In this system, teacher staff has to take attendance manually, only these records have to be entered into the computerized system. In this also, the problem of data entry inaccuracy may occur [3].

A desktop application developed by Jain et al. [4], in which all the list of registered students in a particular classes will be displayed when the lecturer start the application. The attendance registration is done by click a check box next to the name of the students that are present, and then a mark their presence. But in this also, human contribution for attendance tracking is needed.

Another similar project was proposed, but in this case the student have to register independently using a client server socket program from their device (laptop) [7].

Registering the attendance by proxy is removed in the first and second project since the lecturer will see each and every student in the class, whereas in the latter case student snapshot is taken by the client application. Even though in both projects the time wastage is also there, but at rest it is an improvement on the manual process since attendance data can be stored safely and reports can be easily generated.

2. Biometric based attendance system

Managing student attendance during lecture periods has become a difficult challenge. The capability to compute the attendance percentage becomes a major task as manual computation produces wrong results, and also wastes a lot of time. For the stated reason, an attendance management system using biometrics is designed. This system takes attendance automatically with the help of a finger print device and the attendance of the particular student is marked in a database. Attendance of student is marked after student identification.
The disadvantages of the biometric attendance system are numerous however criminals have been known to remove fingers to open biometric locks, Biometrics requires bundle of data to be kept on a person, these systems are not always efficient as human beings feature change over time if they are ill; eyes inflated, voice hoarse or your fingers are rough from laboring, for example it may be more difficult for the system to identify you accurately. Each time you use Biometrics you are being tracked by a database bringing up a range of privacy issues. The biometric system contains the hardware complexity hence the cost and technical complexity of such systems also get increases.

For attendance, the student places his/ her finger over the fingerprint device and the student's matriculation number is sent to the database as having attended that particular lecture. At the last part of the semester, reports are generate to specify the students that are eligible for exams and percentage of times the student attended lecture[9]. A simple architecture is shown below.

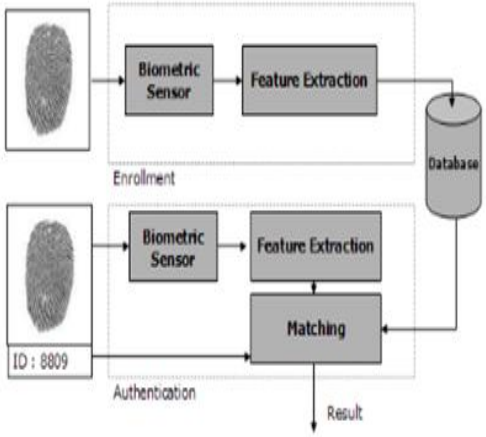

Fig 1. Architecture of Biometric (Fingerprint) Based Attendance system

The finger print of those people working in Chemical industries is often affected. Therefore these companies cannot use biometric system. It is found that with age, the voice of a person differs. Also when the person has infection or throat infection the voice changes or if there are too much noise in the environment this method may not authenticate correctly. Thus this method will not correctly mark the proper entry for that person. For people affected with diabetes, the eyes get affect resultant in differences and thus creates problem to authenticate correctly. Biometrics is an unreliable and expensive security solution.

3. RFID based attendance system

Radio Frequency Identification (RFID) is an automatic identification method, relying on storing and remotely retrieve data using devices called RFID tags or transponders. This system based on RFID for attendance management for schools as well as colleges. Main objective of this project is to take the attendance of students otherwise employees. The system can send SMS and email alert to parents or guardians of the students automatically. The student register at the gate by touching RFID device with their RFID tag and send the data to BISAM server in the schools or in an institutes. The server will process the attendance data and send an SMS to the parents or guardians of the absentee of student through BISAM SMS gateway server. The system also has Time Manager Software for managing employees attendance or student attendance and HR related functionalities. The problem in this research is there is verification is not done. So that proxy attendance may be marked.

In RFID reader was designed with m_controller, transceiver chip, serial communication IC, LCD, USB interface, power supply module, etc as components. When a staff touches the reader with their card the data is sent to PC manager application which will validate the data and extract information like staff ID and access time into the database. Again same problem as above system is being faced by this research.

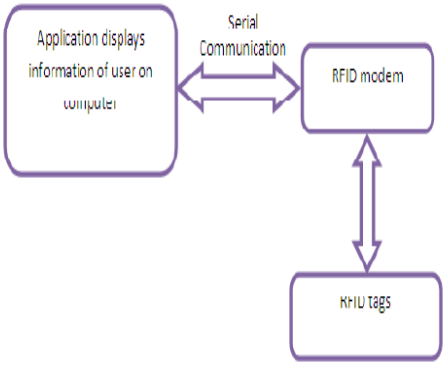

Fig2. RFID based attendance system.

While in [12], when a student touch the reader it sends the data to the microcontroller for comparison with the ID stored in the microcontrollers memory; if ID exist the name, ID, attendance will be displayed on the LCD then transfer the data to PC via RS323 port [12]. Also [13] proposed another system based on RFID where the RFID terminal read the student ID, date and time; and store it into a database in an online server. Problem in this research is there is verification is not done. So that proxy attendance may be marked.

4. Bluetooth based attendance system

In2003, Vishal Bhalla et al. [14], have proposed the system which can take attendance using Bluetooth. In this project, attendance is being taken using instructor's mobile phone. Application software is install in instructor's mobile telephone enables it to query student's mobile telephone via Bluetooth connection and through transport of student's mobile telephone Media Access Control (MAC) addresses to the instructor's mobile telephone, student presence can be confirmed. The difficulty in this proposed system is student's phone is mandatory for attendance. In case of students' absent if his mobile is given to his friend then also attendance is marked. So presence of student is not necessary only phone should be in coverage area.

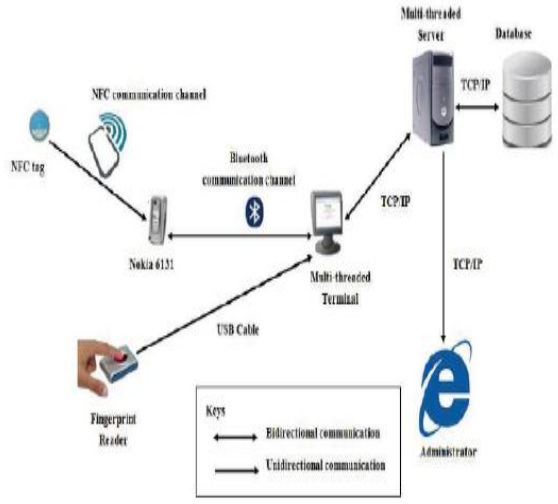

Fig 3. Bluetooth based attendance system.

PROPOSED SYSTEM

This system will overcome the problem occurred in conventional method of attendance system and most important it describe the automated attendance system which maintained the record of student presence or absence in each lecture. This automated attendance system will consist of four module

1. Detection

2. Recognition

3. Dashboard

4. Synchronization.

For capturing the images it require camera.

In this system, admin first registered the student's details along with their photo from different views. Camera start monitoring the student as per the frontal view and when the face of the student get detected it proceed for face recognition. Camera monitored the incoming and outgoing entry of the student. Mark the attendance of the student as per their presence in particular lecture. In this system, server will maintained the record student attendance.

Face detection and face recognition done by using Viola Jones and PCA algorithm respectively. The key idea of the PCA method is to transform the face images into a small set of characteristics feature images, called eigenface, which are the principal components of the initial training set of the face images. PCA yields projection directions that maximize the total scatter across all classes, i.e., across all face images. Detecting human face require that Haar classifier cascades first be trained. Order to train the classifiers, PCA algorithm and Haar feature algorithms must be implemented.

The core basis for Haar classifier object detection is the Haar-like features [8]. These features, rather than using the intensity values of a pixel, use the change in difference values between adjacent rectangular groups of pixels. "**Haarcascade.xml**" file will used in this system. It produced the best results from testing. However it may prefer one of the alternatives as many of these only detect

faces in certain conditions i.e. facing the camera. This can help improve the accuracy of the recognizer and require less training data set[10].

Through this system each lecturer as well as student get the attendance of each lecture by using their login id. At the end of every lecture attendance report send to that particular lecturer. Finally at the end of month percentage wise attendance report is generated of every subject as well as month wise and also show the number of detained student. Thus the purpose of this paper is to save the time and maintained the correct attendance of the authenticated student. Also reduces the paper work and proxy problem.

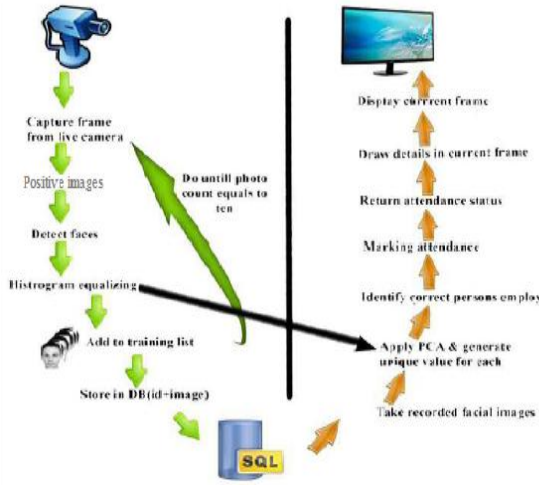

Fig 4. Architecture of proposed system

CONCLUSION:

This paper presents an analysis of different technologies which are used for taking attendance system. Traditionally students attendance is taken by professor and it will take too much time of lecture. More proxy attendance can be recorded in manual system. This can be replace with computerized system. In proposed system attendance will marked using Face Recognition. And it will verify the student which will eliminate the proxy attendance. This system can be implemented for better results regarding the management of attendance. This system will save time, decrease the amount of work the administration has to do.

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