

CHAPTER -1

INTRODUCTION

1 INTRODUCTION

1.1 Overview of automatic class attendance

Maintaining attendance is very important in all learning institutes for checking the performance of students. In most learning institutions, student attendances are manually taken by the use of attendance sheets issued by the department heads as part of regulation. The students sign in these sheets which are then filled or manually logged in to a computer for future analysis. This method is tedious, time consuming and inaccurate as some students often sign for their absent colleagues. This method also makes it difficult to track the attendance of individual student in a large classroom environment. In this project, it is proposed the design and use of a face detection and recognition system to automatically detect students attending a lecture in a classroom and mark their attendance by recognizing their faces.

While other biometric methods of identification (such as iris scans or fingerprints) can be more accurate, students usually have to queue for long at the time they enter the class room. Face recognition is chosen owing to its non-intrusive nature and familiarity as people primarily recognize the other people based on their facial features. This (facial) biometric system contains an enrollment process in which the unique features of a persons' face will be stored in the database and then the processing of identification and verification will takes place. In these, the detected face in an image (obtained from the camera) will be compared with the previously stored faces captured at the time of enrollment.

1.1.1 Motivation

The main motivation for us to go for this project was the slow and inefficient traditional manual attendance system. This made us to think why not make it automated fast and much efficient. Also such face detection techniques are in use by department like crime investigation where they use cc TV footages and detect the faces from the crime scene and compare those with criminal database to recognize them. Also face book, it uses an algorithm called deep face whose accuracy to recognize is 97.25% which is as close as what humans have that is 97.53%.

1.2 Problem definition

The traditional manual methods of monitoring student attendance in lectures are tedious as the signed attendance sheets have to be manually logged in to a computer system for analysis. This is tedious, time consuming and prone to inaccuracies as some students in the department often sign for their absent colleagues, rendering this method ineffective in tracking the students class attendance.

At present attendance marking involves manual attendance on paper sheet by professors and teachers. But it is very time consuming process and chances of proxy is also one problem that arises in such type of attendance marking. Also there are attendance marking system such as RFID , biometrics etc. But these systems are currently not so much popular in schools and classrooms for students as they have their own advantages and disadvantages.

The problem with this approach in which manually taking and maintains the attendance records is that it is very inconvenient task. Traditionally student attendances are taken manually by using attendance sheet given by the faculty members in class, which is a time consuming event. Moreover, it is very difficult to verify one by one student in a large classroom environment with distributed branches whether the authenticated students are actually responding or not. The ability to compute the attendance percentage becomes a major task

as manual computation produces errors, and also wastes a lot of time. This method could easily allow for impersonation and the attendance sheet could be stolen or lost.

An automatic attendance management system using biometrics would provide needed solution. The results showed improved performance over manual attendance management system. Biometric- based techniques have emerged as the most promising option for recognizing individuals in recent years since, instead of authenticating people and granting them access to physical and virtual domains based on passwords, PINs, smart cards, plastic cards, tokens, keys and so forth, these methods examine an individual physiological and/or behavioural characteristics in order to determine and/or ascertain his identity.

Biometric based technologies include identification based on physiological characteristics (such as face, fingerprints, finger geometry, hand geometry, hand veins, palm, iris, retina, ear and voice) and behavioural traits (such as gait, signature and keystroke dynamics). Almost all these technologies require some voluntary action by the user, i.e., the user needs to place his hand on a hand-rest for fingerprinting or hand geometry detection and has to stand in a fixed position in front of a camera for iris or retina identification. Face recognition appears to offer several advantages over other biometric methods.

Goals and Objectives

The overall objective is to develop an automated class attendance management system comprising of a desktop application working in conjunction with a mobile application to perform the following tasks:

- To detect faces in real time.
- To recognize the detected faces by the use of a suitable algorithm.
- To update the class attendance register after a successful match.

1.3 Characteristics of the proposed system

User Friendly:- The proposed system is user friendly because the retrieval and storing data is fast and data is maintained efficiently. Moreover the graphical user interface provided in the proposed system, which provides user to deal with the system very easily.

Reports are easily generated: reports can be easily generated,so user can generate the report as per the requirement (monthly) or in the middle of the session. User can give the notice to the irregular students regular candidate.

Paper work: The proposed system requires very less paper work. All the data is fed into the computer immediately and reports can be generated through computers. Moreover works become very easy.

Computer operator control: Computer operator can have control over the data, hence no chance of errors. Moreover storing and retrieving of information will be quick.

1.4 Scope and Applications

This project performs well in the area of face detection and recognition but there is a room to improve the algorithm performance in case of large number of students and also in case of faces captured in a dark environment the proposed system can be extended in the future to cover this aspect. The proposed system can be enhanced further in terms of achieving more efficiency by ease of analysis of patterns in the data.

This project serves to automate the prevalent traditional tedious and time wasting methods of marking student attendance in classrooms. The use of automatic attendance through face detection and recognition will increase the effectiveness of attendance monitoring and management. This method could also be extended for use in examination halls to curb cases of impersonation as the system will be able to single out the imposters who won't have been captured during the enrollment process. Applications of face recognition are

widely used spreading in areas such as criminal identification, security systems, image and film processing.

1.5 Competitive advantages of the project

- Administrative work sets reduced and also stationary cost that every institute or organization will opt for both, time and money saving purpose.
- Many companies opt video based attendance system.
- This system is cost efficient, no extra hardware required and need a webcam itself. Which is easily deployable.