Multiple Face Detection Attendance System

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Abstract- *Automatic face recognition (AFR) technologies have seen dramatic improvements in performance over the past years, and such systems are now widely used for security and commercial applications. So Smart Attendance using Real Time Face Recognition is a real world solution which comes with day to day activities of handling students. The task is very difficult as the real time background subtraction in an image is still a challenge. To detect real time human face are used and a simple fast Principal Component Analysis has used to recognize the faces de-tested with a high accuracy rate. The matched faces are used to mark attendance of the student. Our system maintains the attendance records of students automatically. Manual entering of in logbooks becomes a difficult task and it also wastes the time. So we designed an efficient module that comprises of face recognition to manage the attendance records of students. Our module enrols the student's face. This enrolling is a onetime process and their face will be stored in the database. During enrolling of face we require a system since it is a onetime process. You can have your own roll number as your student id which will be unique for each student. The presence of each student will be updated in a database. The results showed improved performance over manual attendance management system. Attendance is marked after student identification.*

Keywords: Automatic Face Recognition (AFR), Real Time Face Recognition, Attendance Management System.

1. INTRODUCTION

Maintaining the attendance is very important in all the institutes for checking the performance of students. Every institute has its own method in this regard. Some are taking attendance manually using the old paper or file based approach and some have adopted methods of automatic attendance using some biometric techniques. But in these methods students have to wait till every-ones attendance is marked. Many biometric systems are available but the key authentications are the same as all the techniques. Every biometric system consists of an enrollment process in which unique features of a person are stored in the database and then there are processes of identification and verification. These two processes compare the bio-metric feature of a person with a previously stored template captured at the time of enrolment. Biometric templates can be of many types like Fingerprints, Eye Iris, Face, Hand Geometry, Signature, Gait and voice. Our system uses the face recognition approach for the automatic attendance of students' intervention.

Face recognition consists of two steps, in first step faces are detected in the image and then these detected faces are compared with the database for verification. A number of methods have been proposed for face detection i.e. Ada Boost algorithm, the Float Boost algorithm, the S-Ada Boost algorithm Support Vector Machines (SVM), and the Bayes classifier. The efficiency of face recognition algorithm can be increased with the fast face detection algorithm. In all the above methods SURF is most efficient. Our system utilized this algorithm for the detection of faces in the classroom image.

Face recognition techniques can be Divided into two types Appearance based which use texture features that is applied to whole face or some specific Regions, other is Feature based which uses geometric features like mouth, nose, eyes, eye brows, cheeks and Relation between them. Statistical tools such as Linear Discriminate Analysis (LDA), Principal Component Analysis (PCA), Kernel Methods, and Neural Networks, Eigen-faces have been used for construction of face templates.

2. LITERATURE SURVEY

This section of the literature survey eventually reveals some facts based on thoughtful analysis of many authors work as follows.

[1]. According to research journal "Attendance System Using NFC Technology with Embedded Camera on Mobile Device" (Bhise, Khichi, Korde,Lokare, 2015). The attendance system is improved by using Near Field Communication (NFC) technology and mobile application. According to the research paper, each student is given a NFC tag that has a unique ID during their enrolment into the college. Attendance of each class will then be taken by touching or moving these tags on the lecturer mobile phone. The embedded camera on the phone will then capture the student's face to send all the data to the college server to do validation and verification. The advantages of this method is where the NFC is simple to use, and the speed of connection establishment is very high. It indeed speeds up the attendance taking process a lot. However, this system couldn't automatically spot the violation when the NFC tag is not personally tagged by the original owner. Apart from that, the convenience of the system which uses the

mobile phone as the NFC reader was actually an inconvenience to the lecturer. Imagine if the lecturer had forgotten to bring their mobile phones to work, what would be the backup procedure for the attendance to be recorded? Moreover, most of the lecturer will not likely to prefer their personal smart phones to be used in this way due to privacy matter. Hence, unique information about the student like biometrics or face recognition, which is guanine for a student should be used in replacement of the NFC tag. This will ensure attendance to be taken originally by the actual student.

[2].The second research journals "Face Recognition Based Attendance Marking System" (Senthamil Selvi, Chitrakala, Antony Jenitha, 2014) is based on the identification of face recognition to solve the previous attendance system's issues. This system uses camera to capture the images of the Student to do face detection and recognition. The captured image is compared one by one with the face database to search for the worker's face where attendance will be marked when a result is found in the face database. The main advantage of this system is where attendance is marked on the server which is highly secure where no one can mark the attendance of other. Moreover, in this proposed system, the face detection algorithm is improved by using the skin classification technique to increase the accuracy of the detection process. Although more efforts are invested in the accuracy of the face detection algorithm, the system is yet not portable. This system requires a standalone computer which will need a constant power supply that makes it not portable. This type of system is only suitable for marking staff's attendance as they only need to report their presence once a day, unlike students which require to report their attendance at every class on a particular day, it will be inconvenient if the attendance marking system is not portable. Thus, to solve this issue, the whole attendance management system can be developed on an embedded design so that it can be work similarly with just batteries that makes it portable.

[3]. The third research journal "Fingerprint Based Attendance System Using Microcontroller and LabView" (Kumar Yadav, Singh, Pujari, Mishra, 2015) proposed a solution of using fingerprint to mark the attendance. This system is using 2 microcontrollers to deal with the fingerprint recognition process. Firstly, the fingerprint pattern will be obtained through a fingerprint sensor, then the information will be transmitted to microcontroller 1. Next microcontroller 1 will pass the information to microcontroller 2 to do the checking with the database that resides in it. After finding a student's match, the details are sent to the PC through serial communication to be displayed. This design is good as it accelerates development while maintaining design flexibility and simplifies testing. But again, this system is attached to a PC which make it not portable. Other than that, the database information cannot be accessible easily. Meaning that, for the parents whom are interested in knowing their child's attendance cannot easily or conveniently access the information. Therefore, to provide accessibility of the student's information to the legitimate concerned party, the information can be uploaded to a web server for easy access. While the authentication for the appropriate access can be enforced through a login screen.

[4]. According to the forth research journal "RFID based Student Attendance System" (Hussain, Dugar, Deka, Hannan, 2014), the proposed solution is almost similar to the first research journal where RFID technology is used to improve the older attendance system. In this system, a tag and a reader is again used as a method of tracking the attendance of the students. The difference between the first journals with this is where attendance's information can be accessed through a web portal. It provides more convenient for information retrieval Again, this system is imperfect in the sense that, firstly, it is not portable, as the RFID reader can only work when it is connected to a PC. Secondly, the RFID tag is not a guanine information that can uniquely identify a student, thus, resulting in the inaccuracy of the collected attendance information.

[5]. "Face Recognition based Attendance System using Machine Learning Algorithms" by Radhika C. Damale, the author says identification of a person by facial features Known as facial recognition. A face feature can be used for various computer-based vision algorithms such as face recognition, emotion detection and multiple camera surveillance applications. Face recognition system is attracting scholars towards it. In this, different methods such as SVM, MLP and CNN are discussed. DNN is used to "face detection". For SVM and MLP approaches, the features like PCA and LDA extracted using extraction algorithms. In CNN approach, images fed directly to CNN Module as a feature. The approach shows Good detection accuracy percentage for CNN based approaches. SVM, MLP and CNN achieve test accuracy of 87%, 86.5% and 98% on self- generated databases respectively.

[6] In the paper" Class Attendance framework the on-Face Recognition" composed by Priyanka Wagh. To distinguish the understudies sitting on the last columns conveniently, the histogram leveling of picture should be finished. The picture will be passed for individual's face discovery. The productivity of Ada-Boost calculation is best of all these. In this way, this will paper utilizes this calculation for identifying countenances of understudies by utilizing the Haar highlight classifiers and course ideas of Ada-Boost calculation .Every understudy's face is trimmed and the different highlights are removed from them like separation between eyes, nose, blueprint of face, and so forth utilizing these countenances as Eigen includes, the understudy is perceived and by contrasting them and the face database and their

participation are stamped. A database of faces should be made with the end goal of examination.

3. PROPOSED MODEL

By analysing all the facts through the above section, this research article comes to a conclusion of implementing this system for Attendance system.

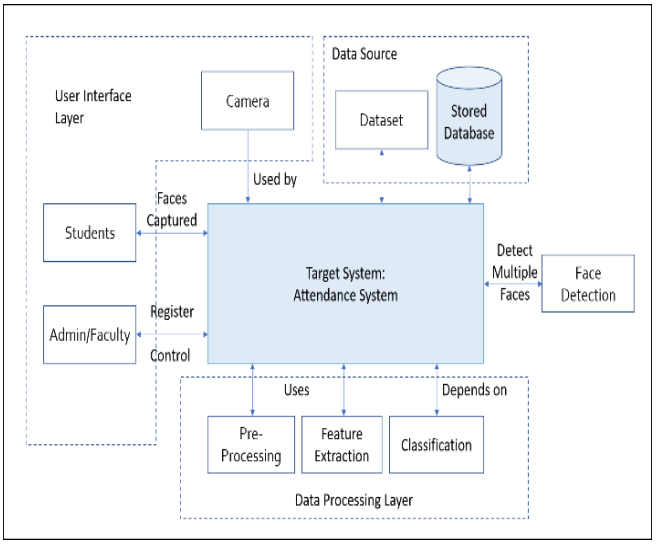

Fig -1: System Design.

Step 1: Taking the image.

Step 2: Detecting the total faces in the image.

Step3: Cropping the image into total faces.

Step4: Applying pre-processing algorithms.

Step 5: Classification of faces as known and unknown faces.

Module for registration/Data feeding into system.

Step 1: classifying the system as User and Admin.

Step 2: Admin feeding details.

Step 3: Admin requesting for system resource.

Step 4: Capture image for database.

Step 5: Training the Dataset and storing into database.

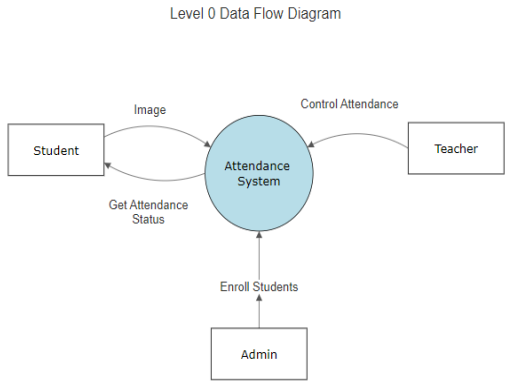

Fig-2: Level 0 DFD

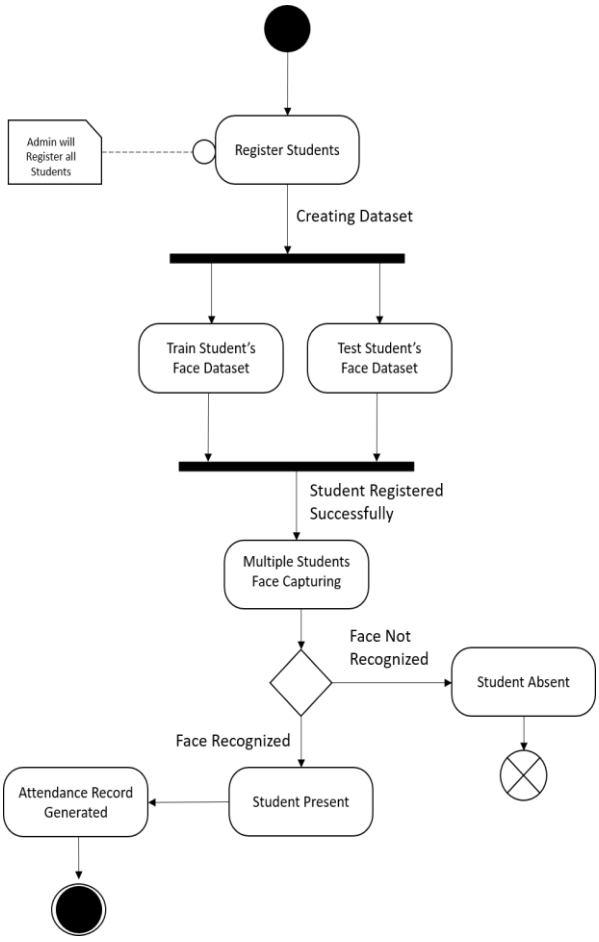

Fig-3:Activity Diagram

4. CONCLUSION

Automated Attendance System has been envisioned for the purpose of reducing the errors that occur in the traditional (manual) attendance taking system. The aim is to automate and make a system that is useful to the organization such as an institute. The efficient and

accurate method of attendance in the office environment that can replace the old manual methods. This method is secure enough, reliable and available for use. No need for specialized hardware for installing the system in the office. It can be constructed using a camera and computer.

5. REFERENCES

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[6]" Class Attendance framework the on- Face Recognition" composed by Priyanka Wagh. Authors**:** Neha Kumari Dubey, Pooja M. R. , K Vishal, Dhanush Gowda H. L, Keertiraj B. R.