"Attendance System Using Face Detection"

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Abstract: Attendance system using face detection is android application based on Viola Jones algorithm that uses mobile camera to detect faces. The objective of this project is to minimize manual work, reduce paper use and save the time. manual attendance record system requires lots of time and efforts to arrange record and to calculate every individuals attendance report also average attendance of student. The proposed attendance system is intended to replace manual model with extra benefits. Attendance using face detection and QR code scanning allow us to avoid proxy attendance.

Keywords: Face detection, Face recognition, Viola Jones Face Algorithm, Attendance Reports

I.Introduction

face recognition is frequently utilized in authentication software. Students are recognised using their facial data by matching currently recorded facial records as part of an attendance system that uses face recognition. To eliminate pen and paper work and the time-consuming process associated with the traditional attendance system, this solution was designed. The current method of taking attendance is tedious and time-consuming. Manual recording makes it simple to alter attendance data. Proxy attacks can compromise the current biometric systems and the conventional method of taking attendance. So, it is suggested that this document be used to address these issues. The viola Jones algorithm was used in the creation of this system. Attendance reports will be generated following face recognition, and staff can quickly access them with just one click. The proposed system was demonstrated to be a reliable and effective tool for taking attendance in a classroom without taking up any time or requiring manual labour. The technology created is affordable and requires little installation.

II.Existing Systems :

A)Register Records   Manually documenting whether a student is present or absent allows for attendance to be maintained. As a result, monitoring attendance necessitates additional paperwork and consumes time. The manual method of keeping attendance records is inefficient. because it takes time to reorganise the records and calculate the average attendance for each individual student. Attendance is kept manually by typing whether a student is present or absent. As a result, additional paperwork is required to maintain attendance, which takes time.

B)Thumb Scanner and Smart Card   Thumb scanners are automatic methods of recognising people based on their thumbs or hand fingers, which are unique to each individual. This form of attendance takes time because students must wait in queue. As a result, due to the large number of students, this system is inefficient for student attendance. For a large number of students, the smart card system takes longer, and there is a waiting queue of pupils for attendance. A student can carry two or more smart cards and register other students' attendance, resulting in proxy attendance.

III.Literature Survey

Krishna Mridha Computer Engineering, Marwadi University, Rajkot, Gujarat, India. We can make our Attendance Management System (AMS) intelligent by using a face-to-face recognition strategy. For that, we have to fix a CCTV camera in the classroom at any best point, which makes a person's picture at a fixed time and tests a face-to-face image. Traditionally, student attendance at the institutes is manually reported on the attendance sheets. It's not a productive operation, because it takes 5 or more minutes for attendance. For, solving this big issue we are proposed a novel automatic technique namely "Face Detection with OpenCV". [1]

Abhishek Potdar, Parva Barbhaya Department of Information Technology, K J Somaiya College of Engineering, Mumbai, "The high-speed development of the technology behind facial recognition systems has enabled its usage in the application to record attendance without human interference. The advantage of the software lies in its security, authentication, and identification features. The paper proposes one such attendance system for educators. The five phases of the attendance system are database creation of students, face detection, liveliness detection, face recognition, and attendance marking."[2]

Shreyak Sawhney ,Karan Kacker Amity University, Noida, Uttar Pradesh, "The management of the attendance can be a great burden on the teachers if it is done by hand. To resolve this problem, smart and auto attendance management system is being utilized.. The smart attendance system is generally executed with the help of biometrics. Face recognition is one of the biometric methods to improve this system. Being a prime feature of biometric verification, facial recognition is being used enormously in several such applications, like video monitoring and CCTV footage system, an interaction between computer & humans and access systems present indoors and network security"[3]

P Mary Jenifer,P Mahasri Department of Computer Science and Engineering, KCG College of Technology, Chennai, India "Facial detection and recognition is an important field in computer vision, it attracts increasing interest because of the multiple applications that result from it. In this context, the strategies that supported machine learning that permits a machine to evolve through a learning method has been used, and it also perform tasks that area unit troublesome or not possible to fill a lot of standards algorithmic."[4]

J. Harikrishnan,Arya Sudarshan Department of Electronics and Communication Engineering, Amrita Vishwa Vidyapeetham, Amritapuri, India "Nowadays, Artificial Neural networks can be trained over several billion images and can be used to detect and recognize faces with relative ease and flexibility in an instant. This concept is used in the implementation of this real time attendance cum surveillance system that can be prototyped and set into action. Some of the major applications of this innovative method include face attendance using a single snap mode in smartphones for university classes, further real-time facial recognition surveillance of lab facilities and work places which can set this as a first line of defense against intruders from gaining access."[5]

Aashish Rai,Rashmi Karnani Electronics Engineering Department, SVNIT, Surat, India "Carrying out the attendance process in any academic organization is a very significant task. However, the manual attendance process is very tedious and time- consuming. Hence, an automatic face attendance system using CCTV camera may be helpful by reducing the manpower and it also makes the attendance process faultless. n this paper, we propose an end-to-end face identification and attendance approach using Convolutional Neural Networks (CNN), which processes the CCTV footage or a video of the class and mark the attendance of the entire class in a single shot. "[6]

IV.SYSTEM METHODOLOGY

The proposed system is straightforward, easy to use, and managed, with clear actions. It comprises a database of student faces as well as personal information such as name, enrolment number, and course. During the lesson, the mobile camera will capture images via the Android application. When the teacher activates the system by clicking, the image acquisition is complete. After pressing the start button, the system will perform face detection. After detecting

faces in a camera image, the discovered faces are compared to stored photographs of students in the database. Once a match is found, the present is marked in front of the relevant enrolment number and name in excel format. Some actions must be taken in order to successfully develop an intelligent attendance management system. The teacher will generate the QR code for the specific lecture, and the students who will present will have their attendance marked by face recognition and QR code scanning.

The steps are definable as follows:
- ➢   Database creation
- ➢   Image amelioration
- ➢   Face detection
- ➢   Feature extraction
- ➢   Face recognition
- ➢   Redundancy
- ➢   removal Report
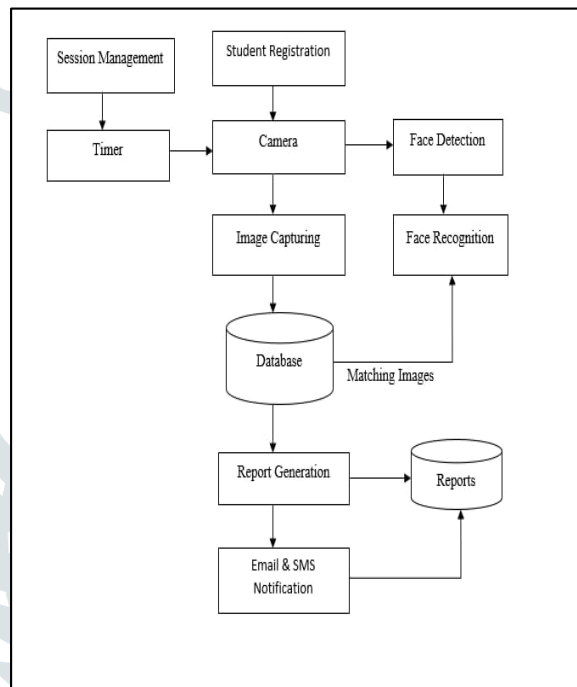- ➢   generation

Fig 1. Architecture of the system

Steps for implementation:

A) Gathering student details Student details like name student ID, profile information with image are collected and stored in the student database.
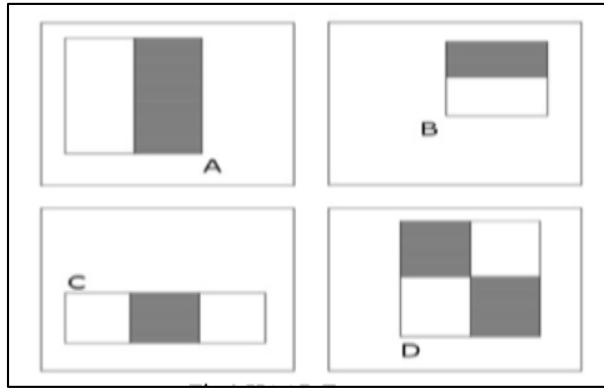
B) Attendance through camera -Camera is placed exactly at a position from where camera can capture images of student's face. The face image will be detected from the captured current frame or Image by using Viola Jones face detection algorithm

C) Face recognition Faces from captured images are compared with stored face images by using Viola Jones Face Algorithm and according to the result system will mark the attendance of the students. The resultant data will be stored into the database.

Face Detection Using Viola Jones Face Algorithm

The Viola Jones Face algorithm is a widely used mechanism for object detection. The main property of this algorithm is that processing is slow, but the detection is fast. This algorithm uses Haar basis feature filters, so it does not use multiplications. Detection happens inside a detection window. A minimum and maximum window size is chosen, and for each window size a sliding step size is been chosen. Then the detecting window is moved across the image as follows:

1. Set the minimum window size, and the sliding step corresponding to that size.

2. For the window size chosen, slide the window vertically and horizontally with the same step. At every step, a set of N face recognition filters is applied. If one filter provides a positive answer, the face is detected in the current widow.

3. If the size of the window is the maximum, then stop the procedure immediately. Otherwise increase the size of the window and correspondingly slip the step to the next chosen size and go to the step 2.

V.HAAR FEATURES

A Haar-like feature at a specific location considers adjacent rectangular regions during a detection window, sums up the pixel intensities in these regions and calculates the difference between them. This difference is then used to make subsections of an image.

Steps:

1. Load the image.

2. Convert it into gray-scale, so that we can detect faces easily.

3. Apply the haar classifier of face and eye.

4. The faces are detected and other part of image is discarded.
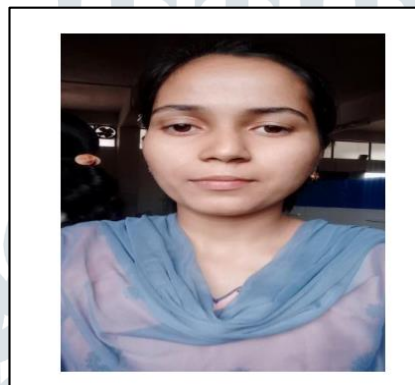
Fig 2. Haar Features

VI.Methods Of Implementation

The main goal is to recognise faces in the current frame or in a camera-captured image. The captured photos will then be submitted for storage. The captured image from the camera will then be compared to the photographs in the database. We've now covered two approaches to face detection: the Viola Jones face algorithm and the OpenCV framework. The following steps are part of the procedure.

Step 1: Capturing the current frame or image using camera .

Step 2: Then convert the image into grayscale as shown in fig.3

Fig.3 Image of Grayscale

Step 3: The faces are detected by face method [9] based on haar features and face marked as shown in fig.4.

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Fig.4 Face Detection

a. Face Detection using Viola Jones face Algorithm.
b. Storing the details in the database.
c. Automatic attendance by face recognition using the HAAR feature.
d. Reporting by month wise, subject wise, date wise.
e. Alerting SMS and Email.

VII. Mathematical Model

However, the speed at which features may be assessed is insufficient to offset their abundance. It would be too expensive to assess every one of the M = 162,336[4] potential features in a typical 24x24 pixel sub-window when examining an image. In order to choose the optimal features and train classifiers that use them, the object detection framework uses a variation of the learning method AdaBoost.. This algorithm constructs a "strong" classifier as a linear combination of weighted simple "weak" classifiers

VIII. Limitations

Some limitations for this concept are:
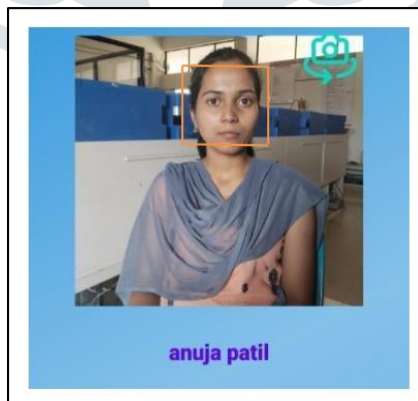
• Depend on projector: Projector is required to display QR code in order to avoid proxy.

• Limited Scope: Use limited to attendance application.

IX. Conclusion

In this study, we proposed a system for tracking student attendance that relied on facial recognition and identification. Detection and recognition are achieved by converting a conventional image into a camera-taken grayscale image. The faces are recognized by comparing the recently acquired camera frame to previously saved faces. The proposed system is where all attendance reports are generated .In this paper, in order to obtain the attendance of students, we proposed Students Attendance System based on face detection and recognition method. The detection and recognition is done by

converting normal image into gray scale image taken by camera. The faces are detected by current frame captured by camera and com-pared with stored faces. In proposed system all attendance reports are generated. Hence this is an android application in which we reduce paper work of manual attendance and also reduces the time.

X.References

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$$h(\mathbf{x}) = \mathrm{sgn}\left(\sum_{j-1}^{M} \alpha_j h_j(\mathbf{x})\right)$$