International Journal of Modern Computation, Information, and Communication Technology
2021;4(2):55-60.
ISSN: 2581-5954

Smart Attendance Using Face Recognition

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Abstract. Face recognition is one of the greatest image-handling techniques, which is critical in the specialized field. The identification of the human face is a practical problem for validation purposes, particularly when understudies are involved. A face biostatistics-based participation framework is a strategy for identifying pupils based on high-quality observation and other PC developments. This framework's development intends to digitalize the old way of gauging participation by calling names and keeping pen-and-paper records. In this digital era, every organization is concerned about recording the presence of someone's attendance is important. Generally, attendance is often done by using manually signed within the register, calling one by one, RFID, and a Biometric system. To enhance time efficiency and authentication this paper proposes a sensible attendance system using Machine learning algorithms to record the attendance from everyone present in an organization. The proposed system is meant for automating the attendance of the various organizations and reduces the issues of the prevailing manual system. Once faces are detected and recognized with the prevailing database, the system calculates attendance for the recognized persons with the respective ID in real-time, and an excel sheet generated and saved by the system automatically. To implement the smart attendance system (model) for a specific face and distinguish it from an outsized number of stored faces with some real-time variations also. It uses OpenCV and Python to get the dataset, record the attendance and store the end in the excel sheet. The proposed system is meant for automating the attendance of the various organizations and reduces the issues of existing manual system. Once faces are detected and recognized with the prevailing database, the system calculates attendance for the recognized students with the respective subject in real time. And an excel sheet generated and saved by the system automatically.

Keywords: Safety, Face recognition, Attendance, Advanced, Security.

INTRODUCTION

Every organization requires a strong and stable system to record the attendance of their students. and each organization has their own method to try to so, some are taking attendance manually with a sheet of paper by calling their names during lecture hours and a few have adopted biometrics system like fingerprint, RFID card reader, Iris system to mark the attendance [1][2]. The traditional method of calling the names of scholars manually is time consuming event [3][4]. The RFID card system, each student assigns a card with their corresponding identity but there's chance of card loss or unauthorized person may misuse the cardboard for fake attendance [5]. While in other biometrics like fingerprint, iris or voice recognition, all of them have their own flaws and, they're not 100% accurate [6][7]. Use of face recognition for the aim of attendance marking is that the smart way of attendance management system [8]. Face recognition is more accurate and faster technique among other techniques and reduces chance of proxy attendance [9].

Face recognition provides passive identification that's an individual which is to be identified doesn't wish to require any action for his identity [10]. Face recognition involves two steps, initiative involves the detection of faces, and the second step contains identification of these detected face images with the prevailing database [11]. There are number of face detection and recognition methods introduced [12]. Face recognition works either in sort of appearance based which covers the features of whole face or feature based which covers the geometric feature like eyes, nose, eyebrows, and cheeks to acknowledge the face [13]. Our system uses face recognition approach to scale back the issues of existing system with the assistance of OpenCV ; it requires an honest quality camera to capture the pictures of scholars; the detection process is completed by comparing the dataset image with the trained images and recognizing the face with appreciable accuracy [14].

Received: 02.11.2021 Revised: 12.12.2021 Accepted: 20.12.2021

The LBPH algorithm recognizes grey scale images and is one of the most accurate methods used for face recognition. The pictures captured by the camera are shipped to the system for further analysis, the input image is then compared with a group of reference images of every of the scholar and mark their attendance [15].

PROPOSED METHOD

Technologies which are developed to exchange the manual system include fingerprint, retina scan, voice recognition etc [16]. The problem with the existing system is that the manual system is time consuming and is too expensive to be implemented on an outsized scale in any organization.

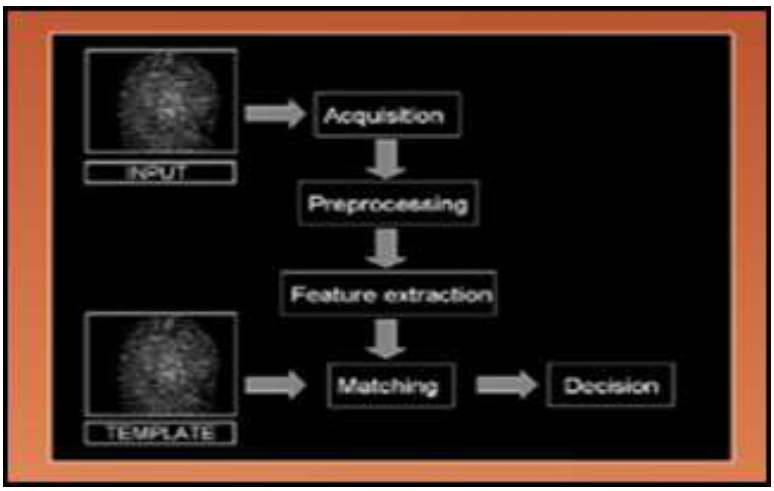

FIGURE 1. Fingerprint Recognition

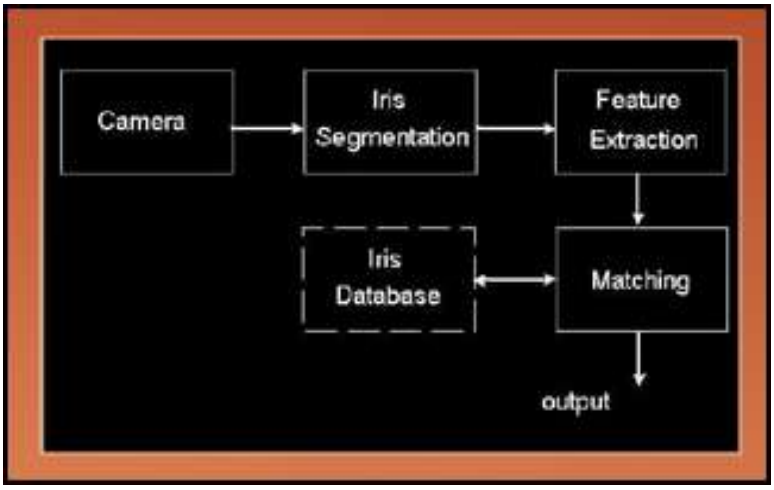

FIGURE 2. IRIS scanning

The method developed provides a secure and effective recording of attendance. The automatic attendance system uses mainly two algorithms, i.e. Viola Jones Algorithm and native binary pattern algorithm. The Viola Jones algorithm is employed for face detection and native binary pattern is employed for feature extraction and face recognition.

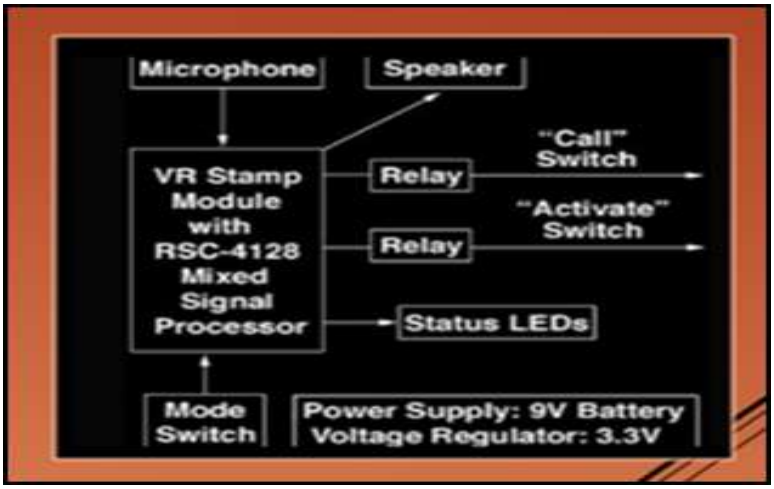

FIGURE 3. Voice Recognition

During this project we have implemented the automated attendance system using PYTHON. We've projected our ideas to implement "automated attendance system supported facial recognition", during which it imbibes large applications. The appliance includes face identification, which saves time and eliminates chances of proxy attendance due to the face authorization. Hence, this technique is often implemented during a field where attendance plays a crucial role. The system is meant by using PYTHON platform.

The proposed system uses principal component analysis (PCA) algorithms which are predicated on the eigen face approach. This algorithm compares the test image and training image and determines students who are present and absent. The attendance record is maintained in an excel sheet which is updated automatically within the system.

RESULT AND DISCUSSION

The Smart Attendance Management System is straightforward and works efficiently. The system works automatically once the registration of individual students is created by the administration.

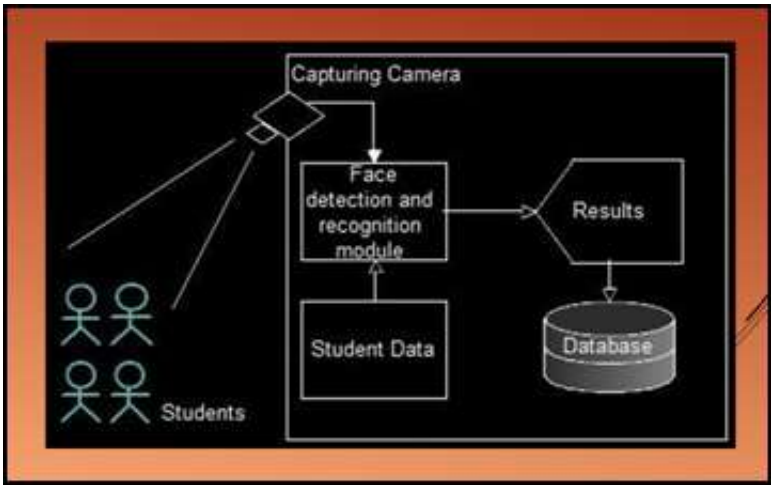

FIGURE 4. Block Diagram of the Proposed Method

FIGURE 5. Training the System by Giving Individual Photo

This is the file where we store the photos, and for this we'd like to make an empty Folder named "dataSet" within the same directory where the python scripts are:
>Create an empty folder called “trainer” In same directory.
To Execute we would like to run the dataSetGenerator.py and enter a singular id to make face samples together with your face, run trainer.py and run detector.py

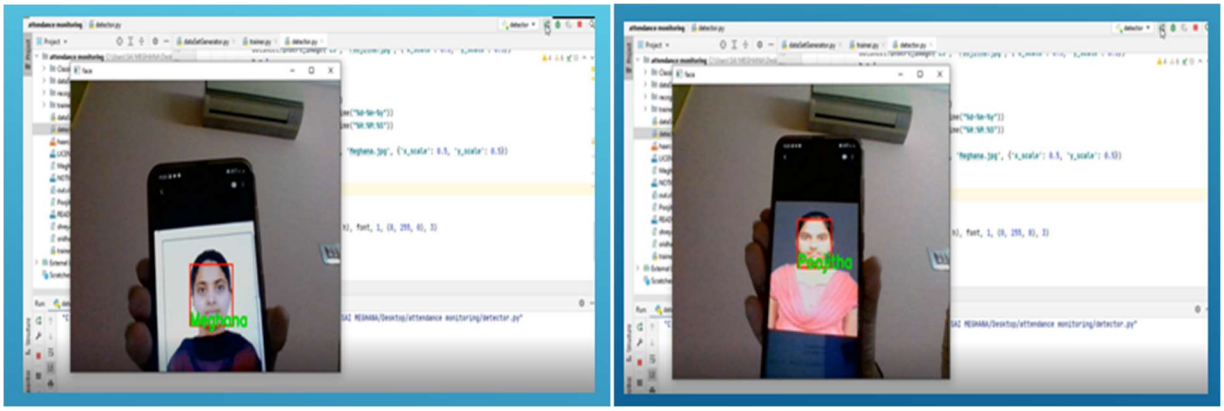

FIGURE 6. Output

Attendance system proved to acknowledge images in several angles. The faces which aren't in our training dataset are marked as unknown.

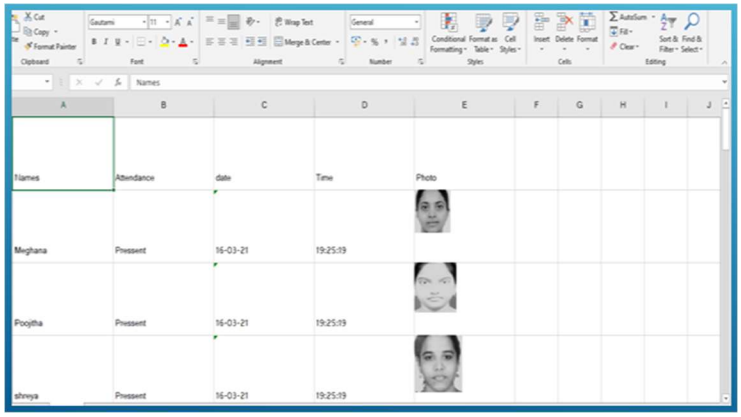

FIGURE 7. Excel Sheet with Candidate Details

The attendance of recognize images of scholars is marked in real time and import to excel sheet and saved by the system automatically.

CONCLUSION

Smart attendance management system is meant to unravel the problems of existing manual systems. We've used the face recognition concept to mark the attendance of students and make the system better. The system performs satisfactory results. In future this technique needs, be improved because this system sometimes fails to acknowledge students from a long way and in lightning conditions, also we've some processing limitations, working with a system of high processing may result in even better performance of this technique. The recommended framework satisfies the required high accuracy and low computational complexity. Consequently, its construction needs less manual labor. It is now much easier to use the exact Gabor channels. Convolutional neural networks (CNN), support vector machines (SVM), and K-closest neighbour (KNN) are three techniques that have been employed for facial recognition (SVM). The KNN method was found to have a 99.27% accuracy rate. Convolutional brain networks were discovered to have low computational complexity. SVM calculations proved to be less accurate.

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