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Face Recognition Attendance System Using AI

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ABSTRACT: This communication presents the design of an embedded system to accelerate the recognition of faces in images and/or videos. A recognition system consists of four steps:

1. Face detection to detect if there is a face in the image (it provides the location and size of the face in the image).
2. Face alignment to locate the position of the face and, using geometric transformations, normalizes it with respect to geometric properties, such as size and pose, and photometric such as lighting.
3. Feature extraction to provide a feature vector with information to distinguish faces from different individuals according to geometric or photometric variations.
4. Recognition step in which the extracted feature vector is compared with the vectors in a database.

KEYWORDS: Digital Image Processing, Artificial Intelligence, Machine Learning.

I. INTRODUCTION

Maintaining the attendance is very important in all the institutes for checking the performance of employees. 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 employees have to wait for long time in making a queue at time they enter the office. Many biometric systems are available but the key authentications are same is all the techniques. Every biometric system consists of enrolment process in which unique features of a person is stored in the database and then there are processes of identification and verification. These two processes compare the biometric feature of a person with previously stored template captured at the time of enrollment. 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 employees in the office room environment without employees' 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 office room 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 Discriminant Analysis (LDA), Principal Component Analysis (PCA), Kernel Methods, and Neural Networks, Eigen-faces have been used for construction of face templates. Illumination invariant algorithm is utilized for removing the lighting effect inside the office room.

II. RELATED WORK

- To help the lecturers, improve and organize the process of track and manage student attendance. Provides a valuable attendance service for both teachers and students. Reduce manual process errors by provide automated and a reliable attendance system. Increase privacy and security which student cannot present him or his friend while they are not. Produce monthly reports for lecturers. Flexibility, lectures capability of editing attendance records.
- The system is developed for deploying an easy and a secure way of taking down attendance.
- The software first captures an image of all the authorized persons and stores the information into database.

- The system then stores the image by mapping it into a face coordinate structure. Next time whenever the registered person enters the premises the system recognizes the person and marks his attendance along with the time

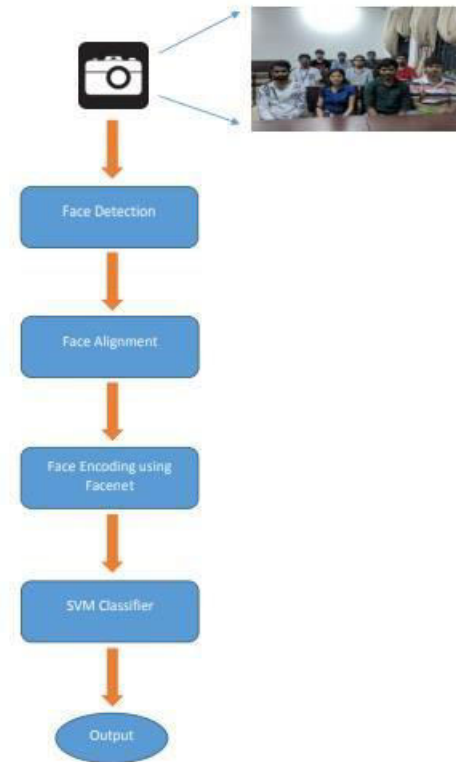


Fig 1. Flow chart

III. METHODOLOGY

In this proposed system, the system is instantiated by the mobile. After it triggers then the system starts processing the image for which we want to mark the attendance. Image Capturing phase is one in which we capture the image. This is basic phase from which we start initializing our system. We capture an image from a camera which is predominantly checked for certain constraints like lightning, spacing, density, facial expressions. The captured image is resolute for our requirements. Once it is resolute we make sure it is either in png or jpeg format else it is converted. We take individuals different frontal postures so that the accuracy can be attained to the maximum extent. This is the training database in which every individual has been classified based on labels. For the captured image, from an every object we detect only frontal faces from viola-jones algorithm which detects only the frontal face posture of an every individual from the captured image. This detects only faces and removes every other parts since we are exploring the features of only faces. These detected faces are stored in the test database for further enquiry. Features are extracted in this extraction phase. The detected bounding boxes are further queried to look for features extraction and the extracted features are stored in matrix. For every detected phase this feature extraction is done. Features we look here are Shape, Edge, Color, Wavelet, Auto-Correlation and LBP. Face is recognized once we completed extracting features. The feature which is already trained with every individual is compared with the detected faces feature and if both features match then it is recognised. Once, it recognizes it is going to update in the student attendance database. Once, the process is completed the testing images gets deleted since, we are trying to design it for both the accuracy as well as efficiency co-efficient.

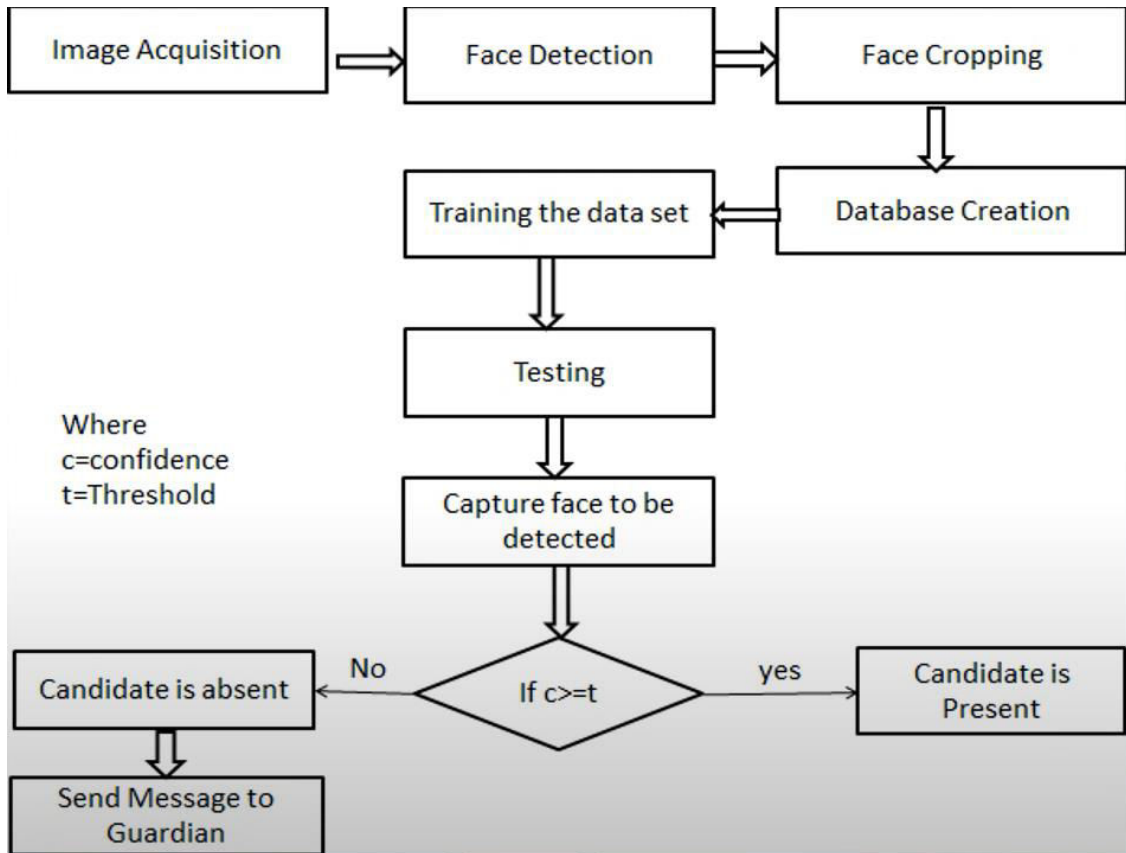


Fig 2. System Model

IV. BLOCK DIAGRAM

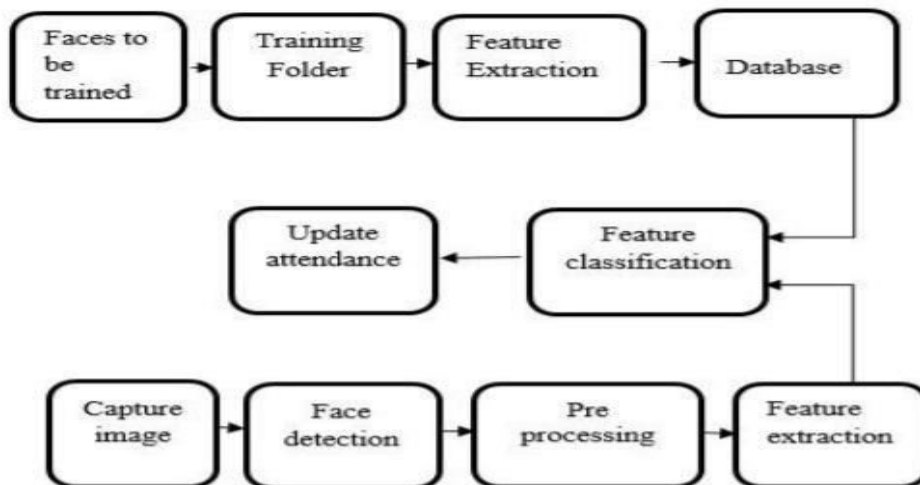


Fig 3. Working

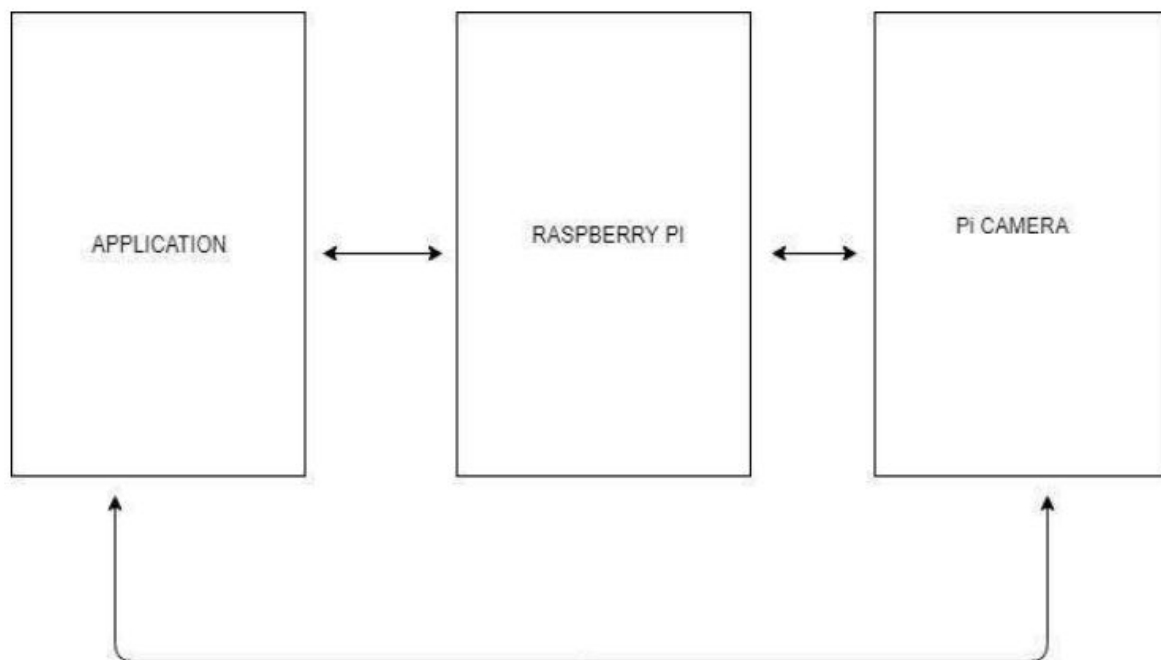


Fig 4. Flow of System

V. 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 institute 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 institute. It can be constructed using a camera and computer.

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