Face Recognition-Based Attendance System

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Abstract:

Attendance face recognition technologies have seen dramatic improvements in performance since so many years back such computers are now generally used for certainty and commercial applications. An automated system for human face recognition in a real time background which can be useful for a college to mark the attendance of their students. Using Real Time Face Recognition is a real-world solution which comes with day-to-day activities of handling various activities.

The real time background subtraction using picture is still a challenge. To detect real time human face are used and a simple fast LBPH has used to recognize the faces detected with a high accuracy rate. The recognized face is used to detect accurate user. Our computer stores the collection of user facial features as datasets and use them for verification.

Introduction:

continuing the attendance is very much important for all the institutes to check the activity of students. Every institute has its own procedure. Few are taking attendance 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 for long time in making a queue at time they enter the college.

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. 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.

Methodology

1. Face detection: Picture is captured from which a human face is detected from the cluttered surroundings.

2. Picture normalization: in which the image need be standardized consistent with its scale, orientation, pose, size, illumination etc. comparatively to the pictures saved in datasets. This is a vital step in the process of recognition since the recognition of the face will not be a successful process unless the attributes of the probe image are more or less identical to the attributes of the faces stored in the datasets.

3. Feature extraction: in which distinctive attributes of the face are extracted for recognition.

4. Face recognition or authentication: whereas finding the input face to the system is unknown and the machine is responsible to find a match to that face (i.e., To identify individual) from already known stored faces in the system. While in authentication, the input face is claimed to be that of a specific person and the computer can control either to verify or to reject the claimed identity of that input face.

EXISTING SYSTEM:

➢ Till today attendance is maintained manually on paper. Colleges and schools maintain attendance in books. Some have adopted methods of automatic attendance using some biometric techniques such as fingerprints.

➢ There are two major way of scanning fingers. An optical scanner works by shining a bright light over your fingerprint and taking what is effectively known as the digital photograph.

DISADVANTAGES:

➢ Handbook Attendance System is a process in which teacher calls out for each & every student and individual; marks their attendance.

➢ Once in a while student may answer for their friend or teacher someone. There are a lot of problems in this traditional way taking the attendance.

➢ It can be considered a time-consuming process still there can be error of judgment from teacher also.

PROPOSED SYSTEM:

- ➤ The system consists of a camera that captures the images of the users and sends it to the image of the users and sends it to the image enhancement programs.
- ➤ After enhancement of image comes in the Face Detection and Recognition modules and then the user face is recognized with the existing dataset.

ADVANTAGES:

- ➤ LBPH is one of the simplest algorithms for face recognition.
- ➤ The local features of captured pictures can be characterized by this algorithm.
- ➤ Using this formulation considerable output can be obtained.
- ➤ High accuracy in recognition
- ➤ Student record is maintained on the excel sheet so anyone can access it for purposes like administration, lecturers themselves.
- ➤ It removes the risk of manual error.
- ➤ This security system would be useful for tracking & effective way of user authentication is performed.

LITERATURE SURVEY:

[1] PeaceMuyambo, "An investigation on the use of LBPH algorithm for face recognition to find missing people in Zi-bawae", International Journal of Engineering Research and Technology (IJERT), July-2019

This technique is one of the challenging problems in the Computer Vision industry. Some programs have been developed to address the issue of facial recognition during the last thirty years. Formulations based on LDA, PCA, ICA and Artificial Neural Networks have been used to try to address the issue of face recognition. These formulations are affected by illumination thus variation in lighting as well as pose variation. Face Recognition has been greatly used to develop security systems as well as surveillance systems to keep track fraud and criminal activities. In this paper, the researcher used the LBPH (Local Binary Patterns Histograms) algorithm to produce a paradigm of a system that will find missing people using facial identification. The vital part of the research is to determine the accuracy of the system as well as the recognition rate.

[2] Karthik B U, "Face recognition using machine learning algorithm", International Journal of Research in Advent Technology, Special Issue (IJRATSI), August -2019

This method has attaining very much consideration in security systems, due to its fast and accurate output

etc. The work done here uses different feature removal and classification methods and the result has been compared. Local Binary Pattern Histogram Features (LBPH) and Eigen features are used. Minimum distance classifier and SVM classifiers are used and results are compared. Algorithm is realized using OpenCV with python. Algorithm is tested on FEI, ORL and our own MSRIT datasets.

[3] NandhiniR, Duraimurugan N, S P Chokkalingam, "Face recognition-based attendance system", International Journal of Engineering and Advance Technology (IJEAT), February-2019

Automated face recognition (AFR) technologies have made improvements in the changing world. In this technique real time face recognition is a real-world solution which comes with day-to-day activities of handling student attendance system. this paper tells us about a procedure of identifying the students face for taking attendance by using biometric based on high – definition monitor video and other information automation. Here a computer system will be able to find and recognize human faces fast and precisely in images or videos that are being captured through a surveillance camera. A lot of formulation and techniques have been developed for improving the performance of face recognition but the concept to be implemented here is deep learning.

[4] Sudha Narang, Kriti Jain, "Comparison of face recognition algorithms using OpenCV for attendance system", International Journal of Scientific and Research Publications, February-2018

In this paper; they have proposed a real-time Face Recognition System for monitoring attendance of students in class rather than relying on methods that are time-consuming. The proposed implementation comprised of using the Viola-Jones algorithm for detecting the human faces from a web camera and then the detected face is resized to the required size; this resized face is further processed by using a simple Local Binary Patterns Histograms program. Once recognition is done, automatically attendance will be updated in an SQLite database with the required attributes. The paper also shares the rationale for preferring OpenCV implementation over MATLAB. The database is spontaneously updated by the developed system so that a remote authenticated user can access the attendance. The execution also makes sure that the attendance results are accessing to a remote authenticated user through the application GUI of attendance system.
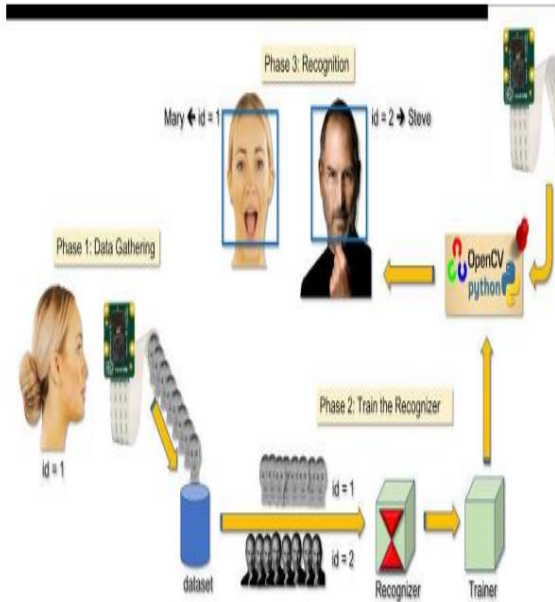
ARCHITECTURE:

Figure: Architecture of the face detection-based attendance system

Results and Analysis:
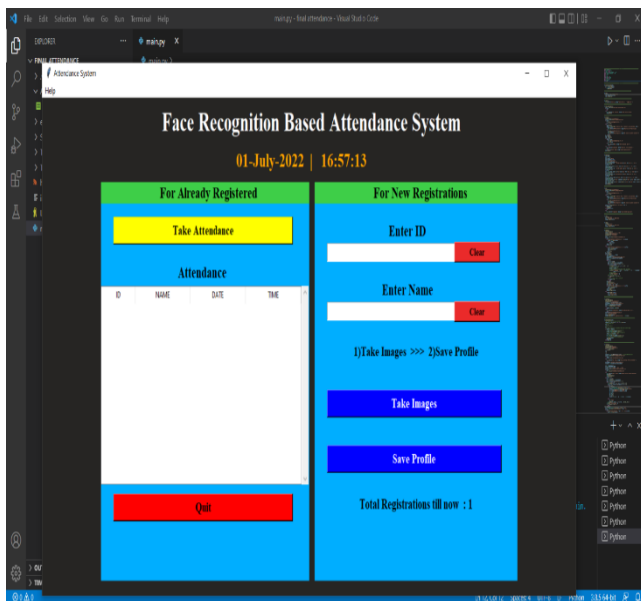

Figure: registration page

SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

- System   : Core i3

- Hard Disk   : 100 GB.

- Monitor   : 15 VGA Color.

- Mouse   : Logitech.

- RAM   : 1 GB.

SOFTWARE REQUIREMENTS:

- Programming language: python

- Operating System: Windows 7 or above

- Front end: pyqt5

- Library: OpenCV

CONCLUSION:

Automated smart 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.

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https://doi.org/10.1371/journal.pone.0029740

[3] Grundland M, Dodgson N (2007) Decolorize: Fast, contrast enhancing, color to grayscale conversion. Pattern Recognition 40: 2891- 2896.

[4] T. Kaneda, Computer Recognition of Human Faces. Basel and Stuttgart: Birkhauser Verlag 1997.

[5] Modern Face Recognition with Deep learning. Website   Reference: https://medium.com/@ageitgey/machine-learning-is-fun-part-4-   modern-face-recognition-with-deep-learning.