Attendance Management Portal

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Abstract: Keeping track of applicants and student attendance in many educational institutions is difficult because there are often many students in each class. There are times when students fill in for absent friends by acting on their behalf. Based on face detection and recognition algorithms, this system automatically recognizes the student as soon as he enters the classroom and records his attendance by identifying him. The database is then automatically updated or amended. By doing this, manually updating the attendance takes less time and effort. As there is a potentialthat a third party can trespass, this system additionally offers authentication using recognition of the administrator's or teacher's face to unlock. So, the level of security increases.

Keyword: Attendance, Face Detection, Computer Vision, Algorithms, Artificial Intelligence

I. INTRODUCTION

Manual attendance marking in a class is a bit burdensome due to a wide number of students present in a class and maybe a chance of proxy attendance.[1] The suggested technique for keeping track of and updating attendance logs is effective and trustworthy. The haarcascade classifier is used to identify faces in the camera frame's live feed. Like how faces are detected, the Local Binary Pattern Histogram (LBPH) technique is used to extract features from thefaces, and if the features match, a score greater than the threshold value is returned, the results are provided**.** Therefore, developing a facial recognition-based attendance system that can handle the student records will be more advantageous, time-saving, and secure.

Our primary goal is to develop a system that can record the attendance of numerous students simultaneously or within a single capture to identify and record the attendance of students ina group regardless of background. Python and machine learning were used to do this. Face recognition is a technique for identifying or validating a human from any image, whether it is from an image capture system or a real image in a movie. A machine is incapable of understanding at a high level on its own. We must train faces utilizing cutting-edge ideas like LBPH SVM superior classifiers in order to identify and recognize them. Finding faces in the image is the initial stage in this procedure. Since we don't require color to recognize faces in photos, the image should first be converted to grayscale.

II. LITERATURE REVIEW

- H. Rathod [1] authors have proposed that to get over the problems with the conventional manual attendance method, the authors have devised a solution. This essay explains how actual face detection and identification might be advantageous for recording student attendance. The paper provides an example of an automated attendance system using a camera installed in the classroom for picture capture and multiple face detection. This method entails several phases, including the creation of student face databases, the use of HOG features, face and eye detection, SVM classifiers, comparison/recognition, and attendance marking. The method may be sensitive to illumination, which was one of the paper's limitations. By utilizing modern high-resolution cameras and algorithms that may not be light-sensitive, the suggested system may be able to overcome this flaw.

- J. Joseph [2] authors have focused on transforming manual access to a digital system that uses facial recognition. The Principal Component Analysis (PCA) technique was used by the computer using the MATLAB tools for the facial recognition module. Before face identification was successful, the door was opened using the Microcontroller PIC, which was also connected to the servo engine, to load the code onto the built-in hardware system.

- E.Varadharaja [3] author proposed model is split into four sections. The first one is background subtraction, in which an image's backdrop is removed, leaving only the subject's face. The second step is face detection and picture cropping, in which only faces are preserved. The final phase involves identifying photos using the Eigenvalue approach. This approach uses formulas to calculate Eigenvectors and picture recognition Between the test photos and the stored images, the Euclidean distance is determined. Then, attendance is recorded for the pupils who match. Face recognition is challenging with this technology, but hardware installation is straightforward. The accuracy of the eigenvector approach utilized in this study is between 60 and 70%. For this reason, the proposed system would employ Haar features rather of an eigenvector.

III. PROPOSED SYSTEM

The proposed method is efficient and reliable for registering and updating attendance logs. The haarcascade classifier is utilized for face detection from the live feed of the camera frame.Likewise, the Local Binary Pattern Histogram (LBPH) algorithm is implemented to extract features from detected faces and provides the result accordingly if the features match a score above the threshold value.

Face detection is a computer method that locates people in digital images and is utilized in a variety of applications. In order to utilize these faces as a reference, the face recognition phase would identify faces in the collected photos. After the code has been executed, a window will open where we must enter our name or roll number. By pressing the register button, it will then begin to snap pictures of us and train its camera. After successfully training a picture, the camera starts up again, but this time it uses our enrolled ID and name. Additionally, it logs the time that students arrive for log-in. It takes pictures, creates its own dataset from them, and then trains itself to finish the attendance process.

Algorithm: The haarcascade classifier is used to identify faces in the camera frame's live feed. Like how faces are detected, the Local Binary Pattern Histogram (LBPH) technique is used to extract features from the faces, and if the features match, a score greater than the threshold value isreturned, the results are provided.

BELOW DIAGRAM IS THE FLOWCHART OF THE SYSTEM
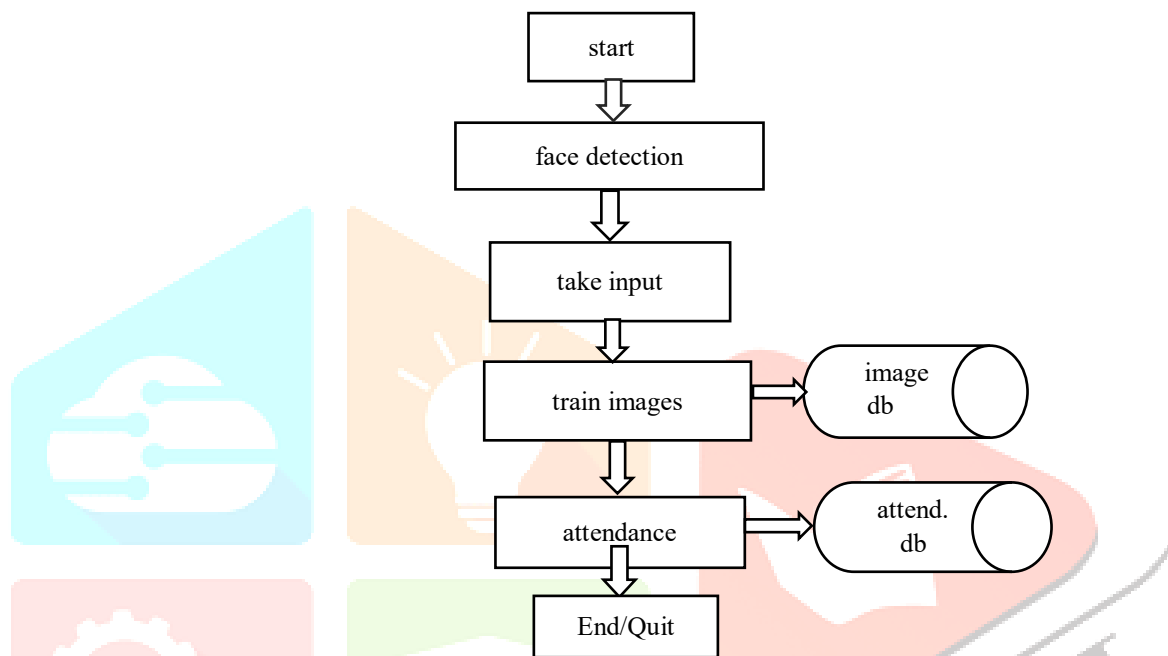
fig1. Flowchart

IV. RESULT AND DISCUSSION

Finally, we will showcase our font-end application, the operational procedure, and the attendance sheet with actual-time present data in the outcome and discussion section. The application of facial recognition has yielded the following results:

A) *USER INTERFACE & FACE DETECTION*

In this user interface application, we will see every option for shooting, teaching, and reviewing images. There are several input choices, including ID, Name, and Status. The new students must provide their ID number, name, and snap one photo during registration. 60 samples are included in the photographs so that the computer can specifically identify the individual in each one. Additionally, this interface has a quit button so that users may leave the application. Attendance allows users to observe the current students.
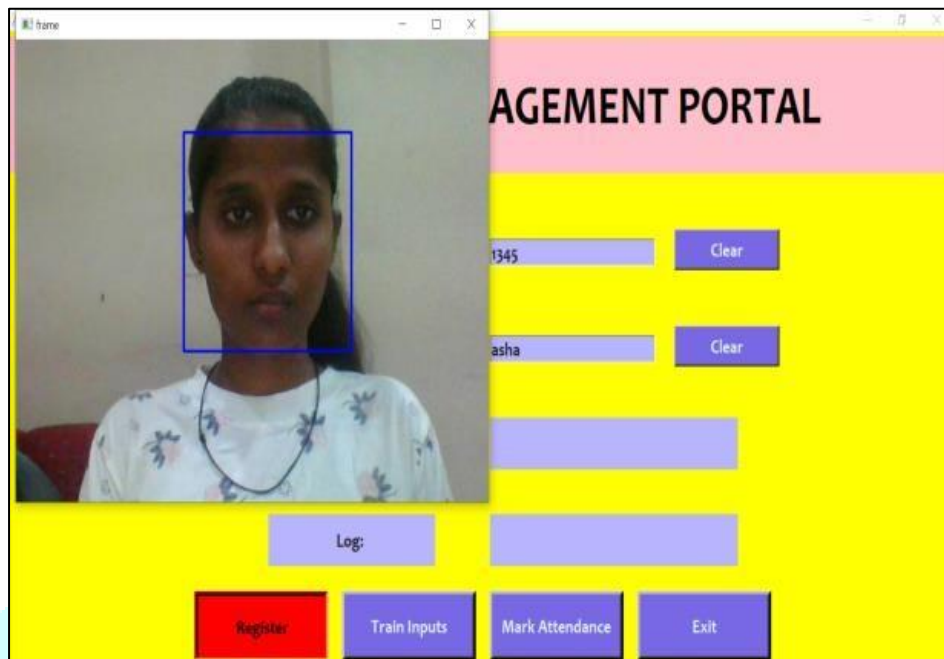
fig2. user interface & face detection

Face detection entails taking a photo or recording the student. This program will automatically end after capturing 60 samples per label or student at the moment the image is taken.

B) *Training Image*:

We can train our set of 70 samples for each student if we make this decision. Samples are entered into the main database and given labels like ID and Name.

fig3. image dataset

C) ATTENDANCE:

The system will automatically note the presence or absence on the attendance sheet after the Face Detection phase is complete. Any file format, such excel, is acceptable for the attendance. In this report, we make use of the excel sheet. The ID, name, year, and time of attendance are all listed on the form.
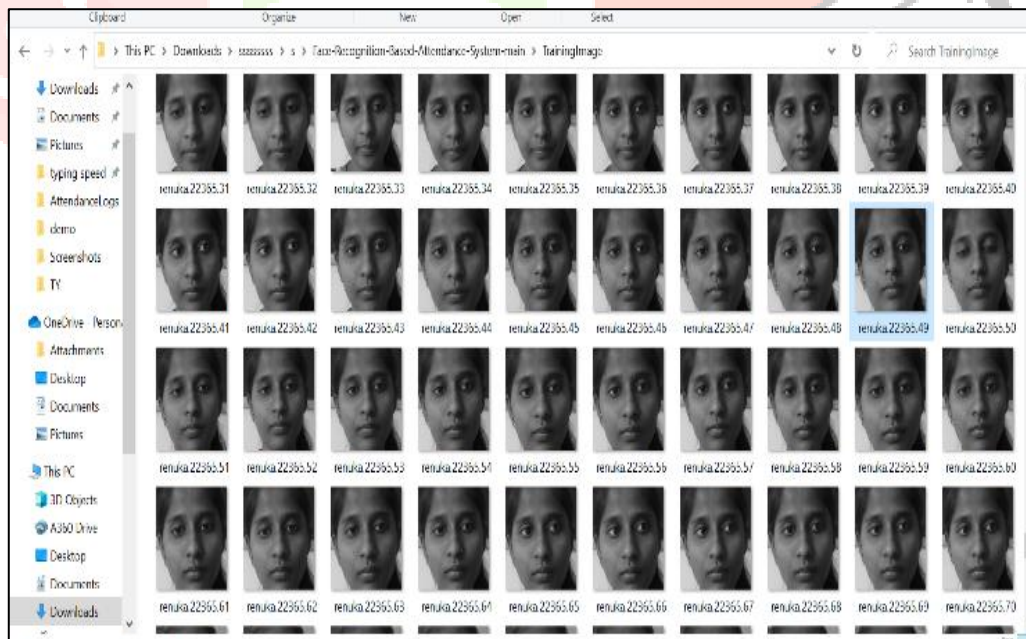

fig4. attendance sheet

V. FUTURE SCOPE

There is no such thing as a college, school, or university where students are required to attend. However, they are manually utilizing the attendance. Because our programme is a clever Face recognition kids attendance management system, it may play a significant role in this industry. In addition to taking up time, it will save money by eliminating the need to purchase attendance sheets. In the future, technology might be used in elections to allow voters to cast their ballots using a facial recognition system. On the other side, we can recognize persons and follow their movements.

CONCLUSION

This technique has been suggested to keep up attendance. The manual method is replaced with an automated one that is quick, effective, cost- and time-saving, and it also eliminates the need for stationary and paper work. But it is anticipated that the proposed system will produce the desired outcomes. Additionally, by incorporating other effective methods, the efficiency could be increased. In the article, I have created a highly genuine programme that aids any corporate or educational organization in keeping track of attendance. The only expensive components of our smart application are the camera and CPU. Our software is legitimate, user-friendly, and incredibly secure. The biggest benefit is that it will result in more time savings.

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