Automated Attendance and Monitoring system using Machine Learning

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Abstract—**The conventional attendance method is arbitrary, inefficient, and time consuming. The proposed solution aims to increase the attendance system's adaptability and performance. To improve and upgrade the current attendance system, this study describes a face acknowledgment based participation checking framework for instructive foundations. Face detection and identification technology will be used behind the scenes. Understudies whose countenances are perceived are promptly gotten participation, which is refreshed in the EXCEL sheet alongside the time the face is perceived. A wire bunch contains the names of the understudies who are missing from class. Students who are present in class for a specified period of time are rewarded attendance. This is accomplished by monitoring. The entire database is uploaded to the cloud and can be accessed at any time.**

Keywords: LDA, Machine Learning , KNN.

I. INTRODUCTION

With regards to participation of understudies, perceiving the human face is a functioning issue for validation reason Face acknowledgement based participation framework utilizes facial acknowledgement innovation to distinguish furthermore, confirm an individual and imprint participation consequently.

Maintaining keeping up with participation is very crucial in all of the foundations for holding under encloses on the steadfast quality by preparing. In this process, we make and also collect certain data of understudies and weight them in a framework utilizing PC vision library. A facial interest structure utilizes biometrics to plan facial highlights from a picture or a video. It differentiates the information and a database of known figures and views as the coordinated one to stamp the participation.

As opposed to using the standard strategies, the proposed structure means to cultivate a motorized system that records the understudy's venture by utilizing facial confirmation advancement besides, Machine learning calculations. The principal objective of this is to make the participation checking and the executives framework precise, effective, efficient, and simple.

II. LITERATURESURVEY

Shireesha Chintalpati and M.V.Raghunadh addressed a programmed framework; the two of them created face acknowledgment calculations that are used to capture a person's image when they enter the classroom. After that, the most efficient facial region is chosen and excised for further preparation. Finally, it is fed to put up processing after being flashed directly in the face of the student.

They chose the Viola-Jones detection method over other strategies because of its high detection rate. To obtain a clear photo, the Histogram Normalization approach has also been reported to be used. Because PCA ignores the discriminative data included in the facts, Linear Discriminant Analysis (LDA) was introduced, expands the dispersing proportion. The Latterly neighborhood Binary pattern Histogram (LBPH) was included to help the device's accuracy when the database size changed. To overcome joke, a covered eye squint locator is utilized, which keeps up with accuracy paying little mind to facial modifications.

The detriment of this technique is that main the best people are allowed to enter the study hall at an at once, to accelerate the calculation's endeavors and stay away from record jumbling. This method, then again, ended up being both efficient and secure; assuming that somebody makes any accidental changes, the face acknowledgment rate will consistently diminish.

Aditya Tyagi, Suman Kumar Jha, Kundan Kumar, and Madhvi Sharma fostered an extraordinary procedure in view of the LBPH standards and the classifying of Haar Cascade. The LBPH is generally used to surrender the front face and get a full participation machine. It separates the picture into pixels, with every pixel being held by the 8 pixels nearest to it. Haar Cascade Classifier is used to get a high level of accuracy. In terms of functionality, this program encourages two distinct elements: the construction of a Face Popularity gadget and the development of an Attendance gadget. The pupil's roll num1ber

and name are kept in the first two fields, after which the photograph is taken, converted to greyscale, and finally stored in the database.

Disservice of this framework be order of high handling power, decreased exactness/nature of picture as certain pictures presents clamor. It also restricts the number of students on a sequential basis.

ML is a subdivision of AI that gives machine permission to acquire from knowledge,further develop execution gleaned from past encounters, produce expectations consequently.AI is an assortment of calculations that cycle a lot of information. These calculations are taken care of information to prepare them, and afterward they foster the model and play out a specific errand in view of that preparation.In the initiated procedure, the ML involved calculation is utilised. Like KNN can be utilised by considering various face location as well as acknowledgment.

The K-nearest neighbors, a basic, viable strategy for order. Closeness estimation out of tests is a vital piece of KNN computations. By KNN calculation accompanying, the class of a specific dataset can be effectively distinguished. In view of the comparability, KNN calculation keeps all the accessible information and groups another data of interest. In this way, when new information shows up, by utilizing KNN calculation, it can be grouped into a well-suit class.

While the checking is done, it finds the appearances in the edge through face identification and sees as the highlights utilizing face acknowledgment. The facial picture is extricated, resized, and normally changed over in advance in the grayscale for the acknowledgment reason.
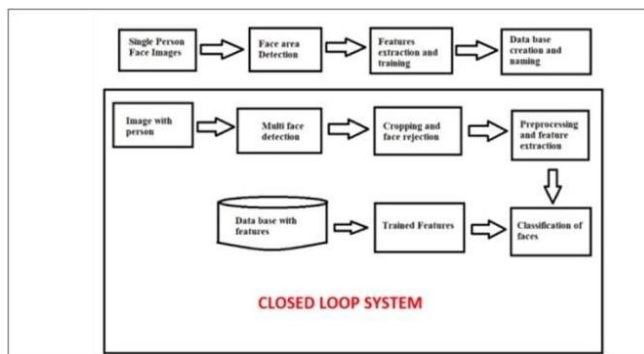

Fig. 1. KNN Classifier

Fig. 2. Flowchart

Open CV is utilized for face acknowledgment. The strategy saves the information of a person alongside the name during preparing. The preparation information contrasted and the info stated, also consequently gives result. All this is being carried out in Anaconda Navigator, this is basically a work space graphical UI.
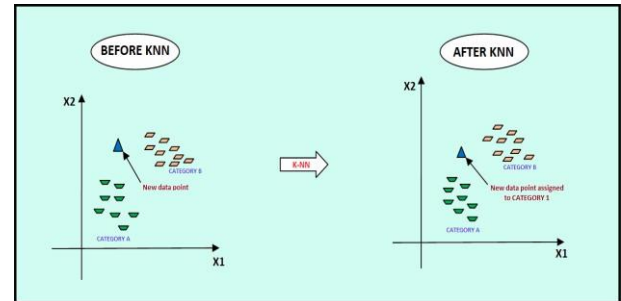

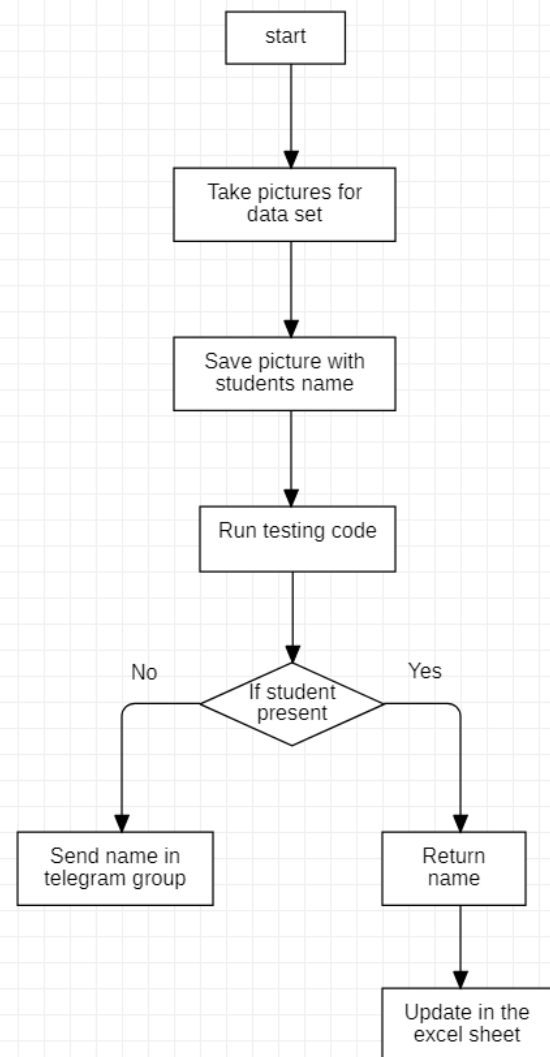Fig. 3. KNN Classifier Graph

III. ALGORITHM

Fig. 4. Algorithm

IV. INTERPRETATION

Face Detection: Face location effectively means that a framework can detect the presence of a human face in a photograph.

The term face acknowledgment stretches out past distinguishing the presence of a human face to decide whose face it is. The interaction utilizes a PC application that catches a computerized picture of a singular's face furthermore, looks at it to pictures in a data set. Face catching is an essential headway and it is used to separate appearances in the edges.

Working of the Face Detection:- Face acknowledgment frameworks use calculations and ML to get explicit, particular insights concerning an individual's face.

The machine should initially find the face in the picture or video. At this point, most cameras have an in-constructed face location work. Face discovery is additionally what Snapchat, Facebook and other web-based entertainment stages use to permit clients to add impacts to the photographs and recordings that they take with their applications.

Face Recognition with HAARCASCADE: The HAAR flood is an AI approach, where a cutoff is being prepared with an immense heap of positive and negative pictures. Positive pictures are the ones that incorporates appearances, and negative pictures are the one that doesn't have faces. In face affirmation, picture highlights are treated as mathematical information, which is taken out from the photos that can recollect one picture from another.from the photographs that can remember one picture from another.

Both the coach and locator are given by OpenCV. There are two essential states of the outpouring picture classifier, one is preparing and the other one is recognition. The two applications gave by OpenCV are to get ready fountain classifier. They are OpenCV_haartraining and OpenCV_traincascade. These two applications store the classifier in the different record plans. The models expected for getting ready are negative and positive models

The normal classifiers are stacked and subsequently load them into input pictures in dark scale mode.Later changing over the image into dark scale, picture can be resized, altered, and sharpened. The features from the image are taken by using edge area, line acknowledgment, and center distinguishing proof. Then, at that point, the bearings x, y, w, h, are given whose shape makes a rectangular box in the picture to show the region of the face. Any spot the rectangular face is made, it perceives the human face.

V. IMPLEMENTATION

Webcam is used to acquire the data sets for this project. When the code for data entry is launched, it asked for the student's name. When the student's name is given, the camera opens, and the student's face is detected by a green colour rectangle around the face, with the student's name on top. The following figure shows how data training is taken out.

The file contains the names of the students. The file which contains the students names will be saved with the format npy file. When we run the code, the student's name is recognized,

and a green rectangle box with their name on top appears around their face, as seen in Figure 7. This code can be used to identify and recognize multiple faces..
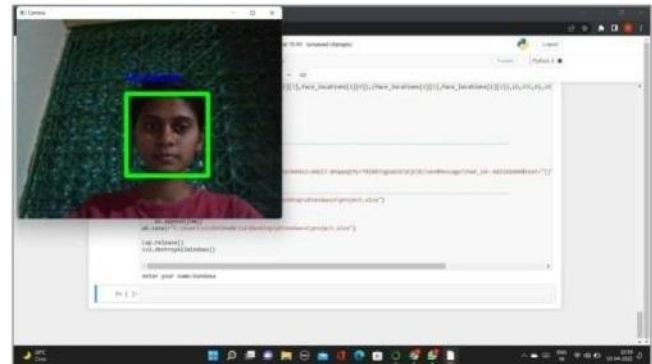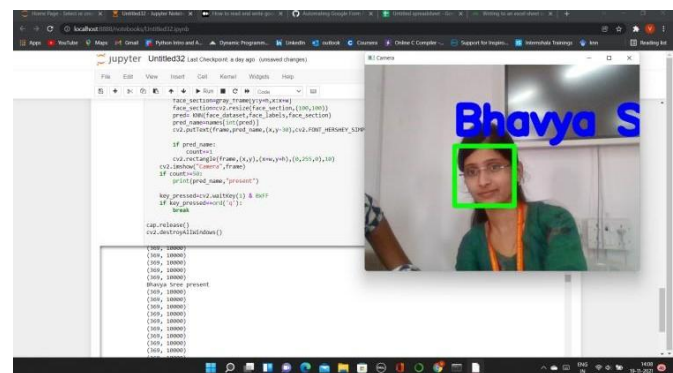

Fig. 5. Training of Dataset
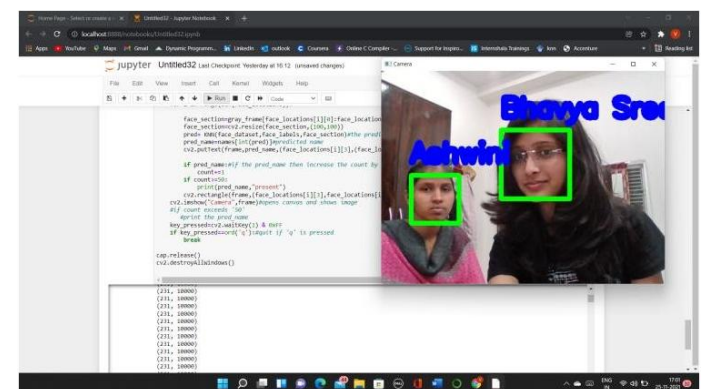

Fig. 6. Single Face-Recognition

Fig. 7. Multi Face-Recognition

The students who are present for a particular amount of time then only their names will be entered into the presentees list. And the number of students in attendance is updated on an excel page with their names. In addition to the name, the moment at which the student is marked present in the format of (%H:%M:%S) is updated.

Telegram is the messaging platform used. The names of the absentees are announced on a telegram group, as shown in Figure 9.
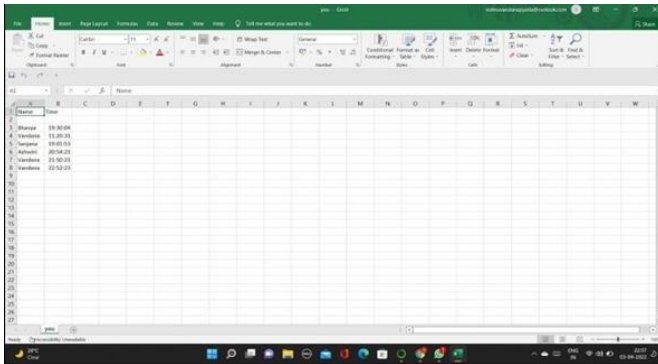
Fig. 8.   Update to EXCEL

Fig. 9.   Messages sent to Telegram.

The data is stored to cloud by syncing both the One drive and Google drive. After uploading a file in One drive, the status will be shown as follows:
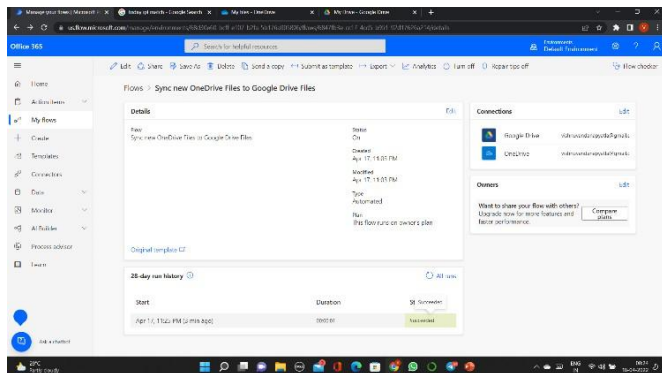

Fig. 10. Data Updation to cloud.

VI.   COMPARISION WITH THE OTHER ML ALGORITHMS

The accuracy using KNN algorithm (ML) is 96.6% and the comparision table of the attribute i.e., accuracy is as shown in Fig:11

ALGORITHMS	Accuracy
K-nearest neighbors	96.6%
Decision Tree	96%
Convolutional neural network	95%
Linear Recognition	90.6%
Local Binary Pattern Histogram	89.1%

Fig. 11. Accuracy comparision table.

VII.   RESULT

The KNN algorithm will gives the correct results in detection of face and recognition. The result will be shown on the screen. The telegram group be updated with the absentees details, this telegram group is connected with the parents of the students. The EXCEL sheet will automatically carry the students names who are present and also the time at which the attendance has been taken.

VIII.   CONCLUSION

The technology that recognizes faces uses the algorithms of machine leaning to mark the attendance if the student present. The Automated Attendance System will provide the highest level of precision, speed, and delicacy.

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