Face Recognition Technology to Improve Attendance Tracking

**Under the guidance of Prof.Kalyani Kadam**

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**ABSTRACT**

There is no compelling reason to stick to traditional, time-consuming methods for fundamental instructional practises such as classroom participation in today's rapidly advancing technological era." It is less recommended because to the difficulties of handling large groups of students in a classroom environment, as well as the possibility of mistakes while manually inputting information into a system. Constant Face Recognition, on the other hand, provides a realistic method for successfully controlling daily student attendance. While there are many algorithms and techniques for improving face recognition, our proposed model employs the Haarcascade classifier for facial feature detection and the LBPH (Patterns Histograms) algorithms used for recognition of face, both of which are useful in Python using the OpenCV package. For user-friendly interaction, the tkinter GUI interface is used.

**INTRODUCTION**

Maintaining understudy involvement with old-fashioned ways is incredibly unappealing for any organisation, and the consistency of that plan is extremely bad.

The old technique of recording attendance, in which manual recording of each student's attendance, is being changed with a Management System of Attendance that incorporates Face Recognition. The technique is employed by a variety of organisations as well as a distinct educational facility.

for marking the involvement. Face recognition is a biometric technology that compares live footage to identify a person. Face recognition technology, as compared to other biometric solutions, is progressively emerging into a universal biometric solution since it takes essentially little user effort.

Because it simply uses only one dataset as an input and applies a range of ML methods to get a sensible result.

ML is said to be the most promising disciplines. Historically, every educational entity, including schools and universities, took student attendance extremely seriously. Attendance based on Face Recognition has computerised system of management will be especially beneficial since they clarify all time and safety with delegating concerns. Haar Cascade's major job is to improve these systems. Haar Outpouring is commonly used for analysing photographs. Participation The board Framework Using Face Recognition reduces time, avoids fraudulent participation, and aids in security.

Face-Recognition is a well-known image handling invention because of its largespread use.

1. Take a photo and identify each person.

2. Focus on a single face to remember that whether the person is same, regardless of whether it has bowed somewhere unexpected or has poor lighting.

3. Look for the face's particular highlights to helps us to distinguish it from the other photographs. Qualities include the nose, skin, the dimensions of the face, and some other features.

The living being cerebrum is perfectly capable of seeing faces. PCs can be programmed to recognise the uniqueness of faces, therefore we should programme or prepare the system to do so.

Recognise faces based on different characteristics. As stated below, face recognizing may be divided into 2 categories:

1. Verification.

2. Distinguishing evidence

Check is a one on one matching interaction. The item may be useful for lock and unlock frameworks, mobilephones, and other electronic gadgets .ID is a mechanism for recognising a person among a group of people, such as one out of M.

Face recognition might be useful for recognizing persons in an organisation for participation purposes. Support and evaluation of Participation records are essential in any association’s presentation audit. The goal of creating a participation verification framework is to automate the standard technique for taking participation. Computerised Participation requires less human collaboration. The board Framework is in charge of the routine tasks of participation screening and auditing. When the force is more visible, the standard form of participation stamping becomes highly laborious and perplexing. Mechanisation of Participation Framework has some advantages over traditional tactics in that it is time saving and may also be used for testing. This also contributes to the fight against phoney collaboration. Other biometric processes, such as those listed below,

May also be used to modernise the participatory interaction:

1. Section of the Logbook.

2. Framework based on unique finger impressions

3. IRIS Recognition

Framework based on RFID.

5. Face Identification.

Facial recognition is the most intriguing, effective, precise, and astute of the previously depicted approaches.

**LITERATURE SURVEY**

In [1], Hajar Filaliet and colleagues investigated four machine learning algorithms - GFSVM, and GFNN - to perform tasks that are difficult to complete with traditional algorithms. The first two algorithms use supporting computation to select and obtain a classifier for a given output order. The final two methods - GFSVM and GF-NN - employ the channel to eliminate characteristics. This study has found that Haar-AdaBoost was the best strategy in terms of yield rate, despite varying location times.

In [2], the authors propose a strategy that uses facial detection and identification to track student attendance. The system uses a camera to collect images in the classroom and includes procedures such as student database development, HOG features, face and eye detection, classifier, comparison/recognition, and attendance marking. The paper had several problems, such as sensitivity to light, which can be addressed by using various algorithms that are not affected by illumination, as well as high-resolution camera.

In [7], E.Varadharaja and colleagues proposed a system that uses facial recognition for automated attendance. The system has four components - background subtraction, face detection and cropping, Eigenvalue approach for picture recognition, and attendance recording. Face recognition accuracy using the Eigenvalue approach is 60-70%, but the proposed system uses Haar features to achieve better results.

In [8], Chintalapati, Raghunadh, and colleagues explored different approaches for developing a facial recognition-based attendance tracking system. The Viola-Jones face identification method, which includes features, integral graphic, Adaboost algo, and cascade function, is used for face detection. Local binary patterns (LBP) can be used for face recognition.

Finally, in [3] and [4], Nandhini R. and Shreyak Sawhney and colleagues respectively presented frameworks that use facial recognition to track student attendance. The former uses Convolution Brain Network (CNN) computation to recognize faces, while the latter uses a face detection and recognition technique with two cameras, one at the entrance of the classroom for face recognition and acknowledgment and the other inside the classroom for monitoring intermediate attendance.

**FACE RECOGNITION METHOD CORRELATION**

* IMAGE ENHANCEMENT.

It captures photographs from the client side, checks the quality of the pictures, and improves the quality of the pictures using AI techniques.

Because image quality is the most important factor in identifying a certain individual, Haar Fountain calculation is quite helpful in the image upgrading and enhancement process.

* RECOGNITION OF FACE.

In participation, the board structure first confines photos enlisted by the understudy and that Picture created in our data set generated by the administration side.

Enlisted image matched to each data set picture supposing that is present in framework data set then that understudy patent as a present or set aside as a missing.

* EXTRACTION should be included.

In this stage, all information will be extracted from the layout sample using facial recognition.

* Data set FACE.

In this stage, the framework can use the dataset that was previously available in the framework's data set to match an entered duplicate with data set photographs.

Save all understudy information in data set for supplying to framework to take point by point understudy presence in exceptionally little time.

* RECOGNITION OF FACE.

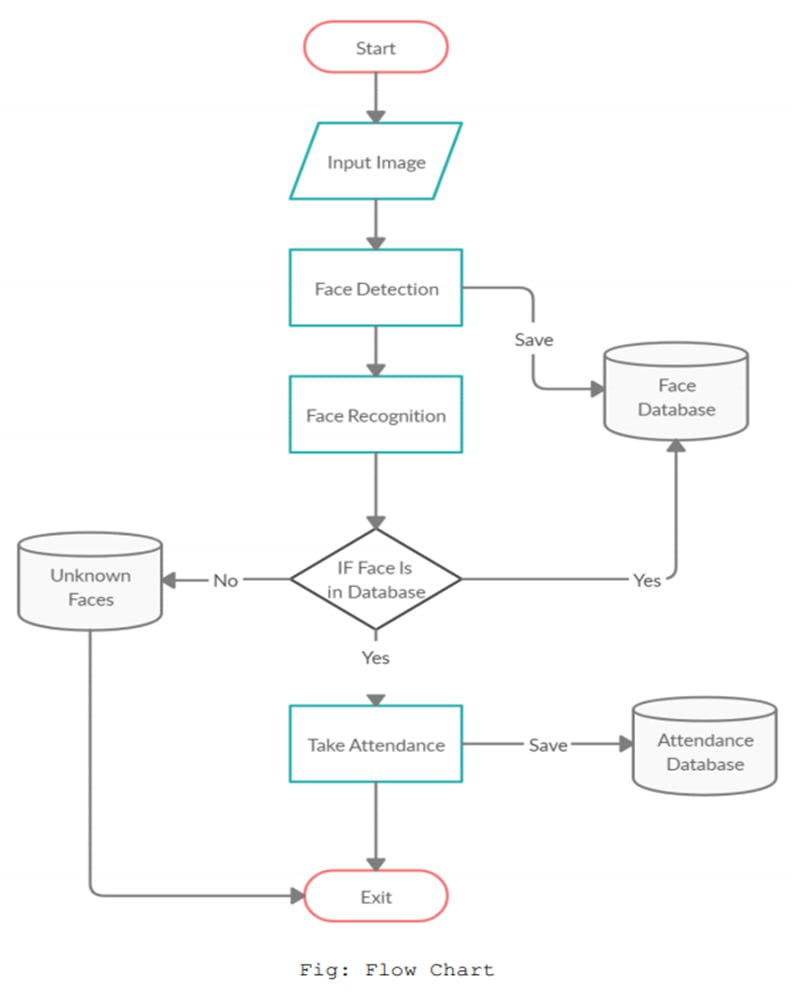
In the last stage of face recognition, the collected instances' face designs are compared to those in a facial information base or not. It will only take a second. We may apply the Haar Outpouring method in this framework.

* A Haar Outpouring is a type of phoney brain network used in image recognition and image management that is especially designed for pixel data. • Participation Verification The final stage of the framework tactics at this stage is to verify for understudy involvement. If the following improvements are completed and a reasonable duplication is detected, it will be marked as a continuing; otherwise, it will be marked as a missing in the system's server.

**RESEARCH GAPS**

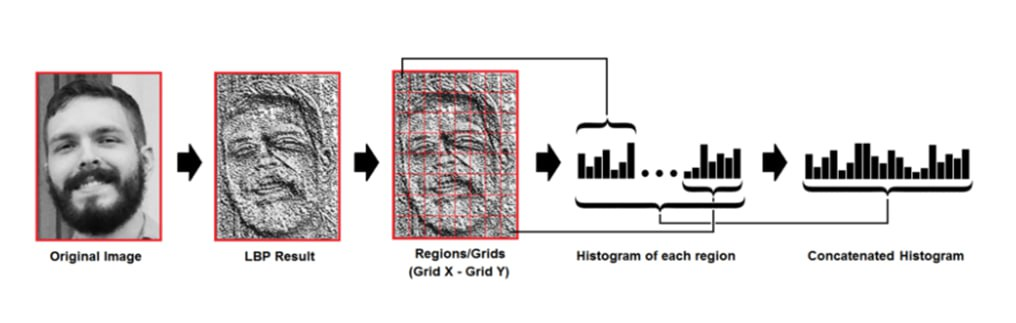
When there are many understudies in an organisation and it is a time consuming, it becomes more difficult to verify involvement for every understudy. The current setup of any institution is a manual portion for the students. This framework confronts the problem of having nothing to do, and it grows more complicated as the strength increases. It is an extremely boring duty to participate in logbooks and maintain track of the information. Face recognition is difficult problem in PC visualization. Various challenges to contend with comprise lighting concerns, presentation issues and scale volatility, low picture capture precision, and to some part obstructed faces.

The proposed technique in this endeavour is to screen participation using face recognition technologies. The PC can capture camera video and transfer the faces in image design. The notable appearances will be linked to the understudy data set, and involvement will be recorded in a Succeed calculation sheet. Using these Succeed sheets, we can create a graphic that depicts the average involvement of the entire individual understudy.

[](Sai,%20E%20Charan,%20et%20al.%20“Student%20Attendance%20Monitoring%20System%20Using%20Face%20Recognition.”%20SSRN,%2024%20May%202021,%20https:/deliverypdf.ssrn.com/delivery.php?ID=568002118065021064069003126087005066118047006051032007118027116118017121026102065004017058006012005023096082094071127000002084055058054000080076081009127029016086110064018021124112007093022006116110025067029002104108071010021066125067104120071016082084.)

(student, n.d.)

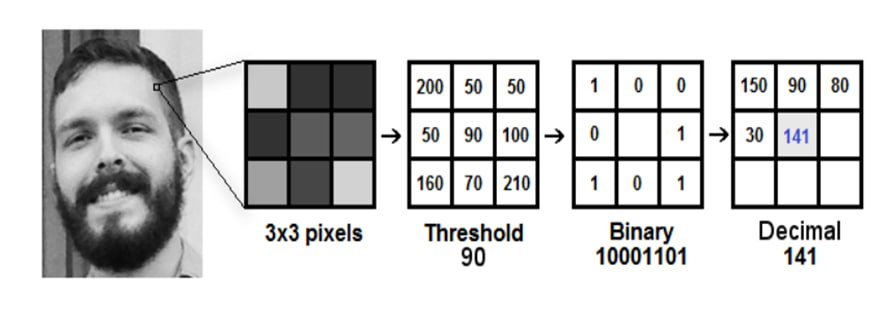
**PROPOSED SOLUTION**

The process of facial recognition involves assigning a histogram to each image in the prepared dataset. When given a new image, a histogram is generated for that image by rehashing the means of the image. To find the matching image, we compare the histograms of the new image and the images in the dataset using methods like Euclidean distance. The algorithm returns the ID of the image with the closest histogram, along with a confidence level indicating the strength of the match. A lower confidence level indicates a stronger match between the histograms. By setting a limit, we can determine whether the algorithm has correctly identified the image based on the confidence level. If the confidence level is lower than the limit, we can say that the algo can successfully recognized the image.*[](Sai,%20E%20Charan,%20et%20al.%20“Student%20Attendance%20Monitoring%20System%20Using%20Face%20Recognition.”%20SSRN,%2024%20May%202021,%20https:/deliverypdf.ssrn.com/delivery.php?ID=568002118065021064069003126087005066118047006051032007118027116118017121026102065004017058006012005023096082094071127000002084055058054000080076081009127029016086110064018021124112007093022006116110025067029002104108071010021066125067104120071016082084.)*

(student, n.d.)

We have a validation mechanism for a staff in our suggested framework. Following confirmation, the staff must enlist the understudy with their nuances. and outstanding identification.

During the enrolling procedure, workers take 100 photographs of an understudy. To avoid complication and get the desired effects, we convert the shaded image totally to grayscale. Webcams are used to collect image testing. We adjusted the border to catch the image testing so that it truly captures the facial area.

*[](Sai,%20E%20Charan,%20et%20al.%20“Student%20Attendance%20Monitoring%20System%20Using%20Face%20Recognition.”%20SSRN,%2024%20May%202021,%20https:/deliverypdf.ssrn.com/delivery.php?ID=568002118065021064069003126087005066118047006051032007118027116118017121026102065004017058006012005023096082094071127000002084055058054000080076081009127029016086110064018021124112007093022006116110025067029002104108071010021066125067104120071016082084.)*

(student, n.d.)

Following the collection of 100 photographs of an individual, the photographs are saved in a distinct organiser, which aids in the preparation of the model.

Figure. Perception of the understudy.

When the face is coordinated with the rundown of countenances accessible in the data collection, it can effectively detect the individual and exhibits the ID and Name of the person.

**RESULTS**

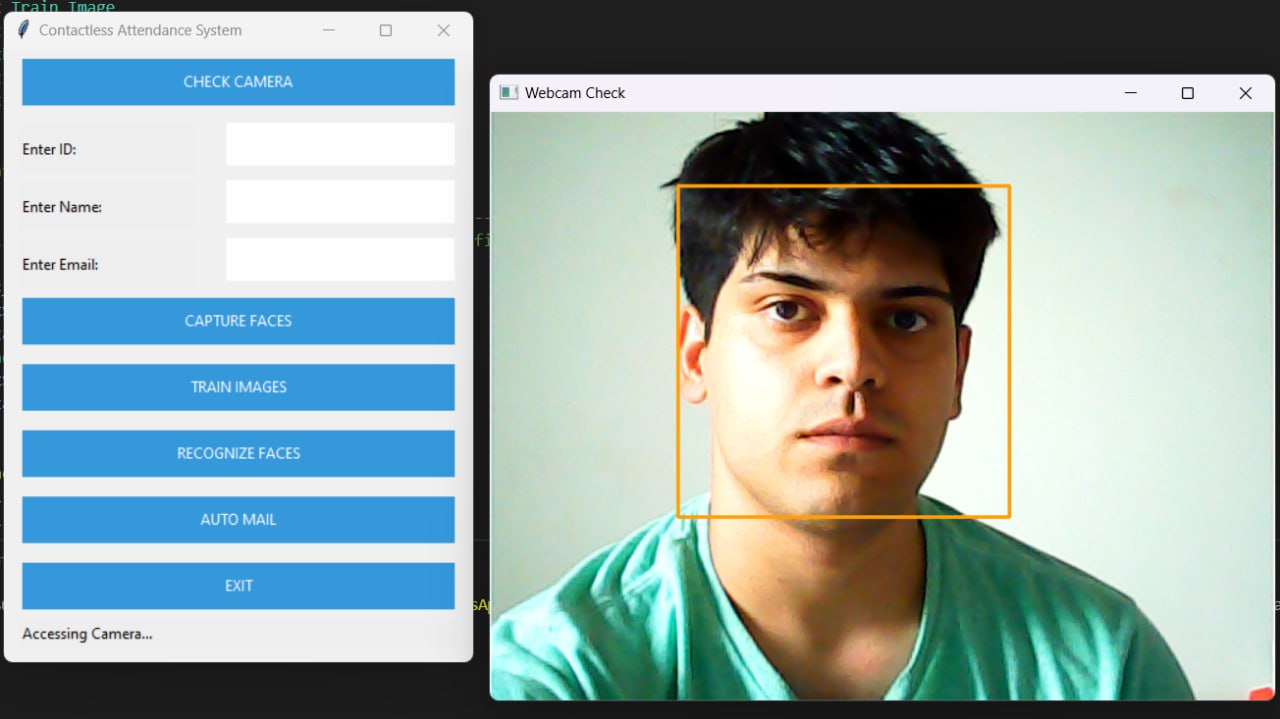
Participation The board architecture utilising face affirmations is incredibly simple to use and performs well under time constraints.

Because this is a computerised framework, if an administrator creates an understudy profile once in the data set, it will use it naturally by the no. of times in the face identification and acknowledgment procedure. The Haar Outpouring methods are used in this framework.

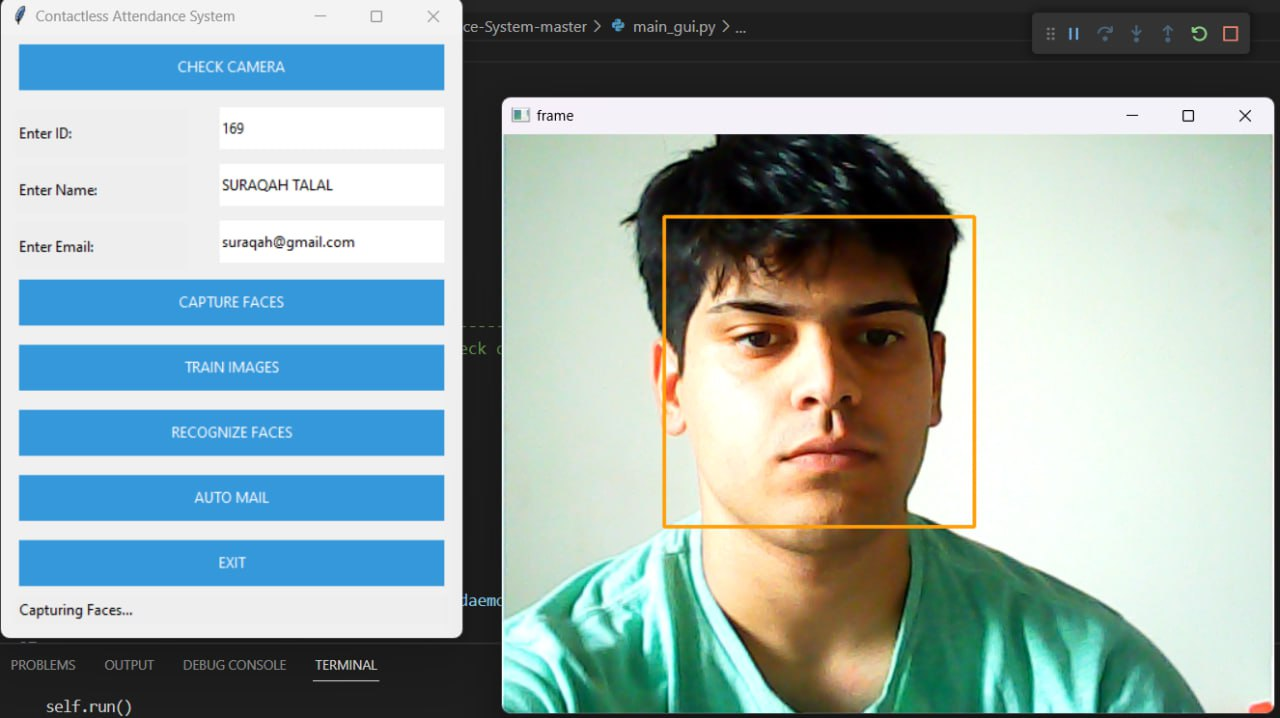
Administrators must first create all understudy profiles with their name, roll number, division, and other instructional nuances before offering this framework.

**WORKING**

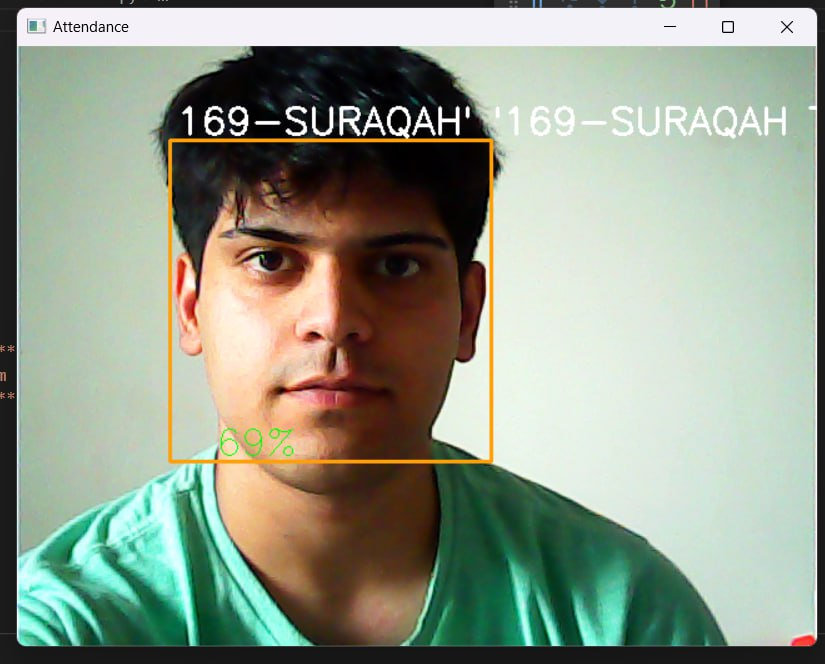
1.Checking the working of camera.



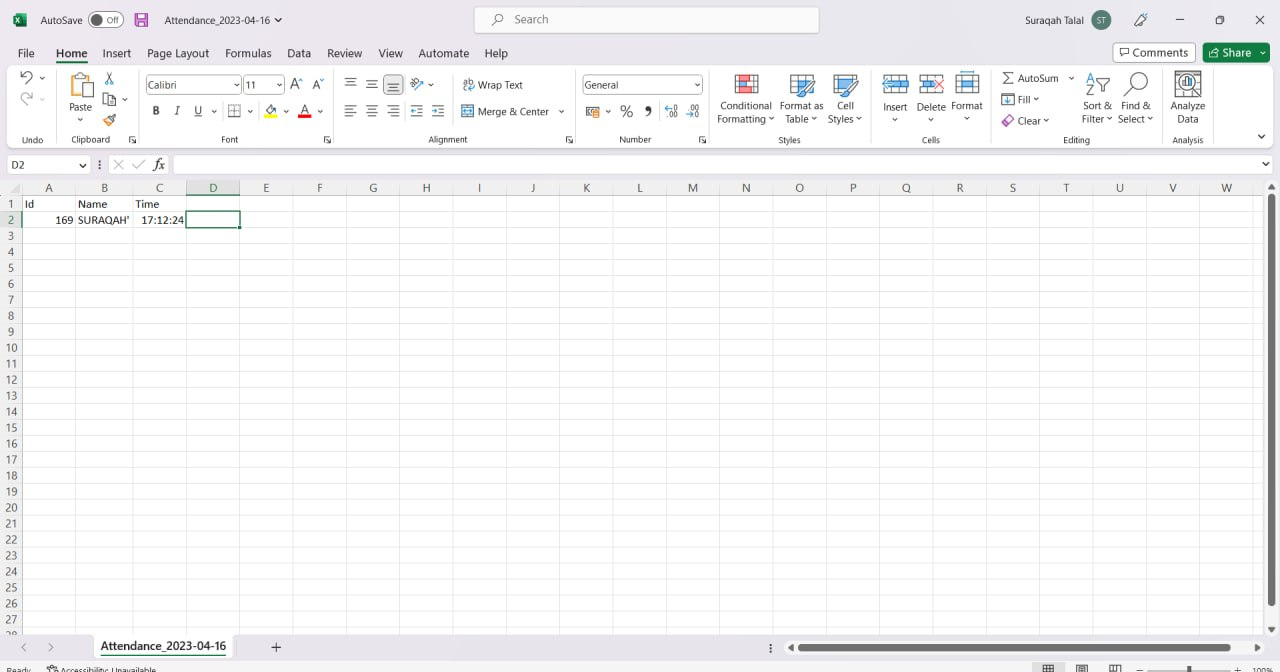
2.Capturing the faces.



3.Recognizing the face.



4. Auto update/ recording of attendance in the excel sheet.



**CONCLUSION**

The goal of implementing this method is to save time and money by decreasing labour force. This technique

Better algorithm comprehension

A Strict Approach to Accurate Detection. The result demonstrates the system's performance.

Addressing face posture improvement, project planning, and room adjustments.

based on face recognition

face recognition, machine learning

The issue of long-term environmental change

The original picture is transformed into her HOG.

A presentation that captures the most crucial aspects of a picture regardless of its brightness.

Local facial traits are considered for subsequent processing in a face recognition system. The identified faces are encoded, 128 measurements are taken, and the best face is chosen.

The identification is accomplished by deleting the.

personal name derived from encoding.

The outcomes are employed in the development of Excel.

Spreadsheet. Currently, the system has

Up to 70% accuracy is possible.

The use of face recognition in the attendance control system recommended this time.

Management of student attendance in the classroom and beyond. There are various technologies available now, such as biometrics or any other method, but facial recognition is the finest.

Option for precision

System implementation does not necessitate any extra hardware. laptop and camera. A database is sufficient to create an attendance management system based on facial recognition.

**FUTURE SCOPE**

The strength of the planned task may need taking many distinct images of the understudies and storing them in cloud.

The device can be customised and used in various machines such as: ATM machines to detect the deception.

• Furthermore, the devices may be useful during choices to recognise residents by sensing their expressions. When used with high resolution cameras, the framework can provide increased results and precision.

• This effort shown that appearances must be recognised when the individual's face is visible clearly, and that appearances cannot identify when the individual is remaining in another heading. As a result, subsequent investigation is planned to employ deep learning calculations to recognise people's clearly looks this way and that.

• We might want to consider making a programme that would allow the customer to update the understudy's image tests in the preparation dataset as a part of future development.

The customers will have the ability to form their own groups of clients instead of being restricted to a set of choices already made available on the server. Furthermore, we aim to investigate and enhance facial recognition algorithms to increase the number of students who can be identified and acknowledged.

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