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Digital Attendance Monitoring using Mask Detection

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***Abstract*:- Attendance is the concept of the people, individual or a team appearing at a location for a previously scheduled event. Manual attendance marking is hectic , and time consuming work. It's vulnerable to error and manipulation.Also with this ongoing pandemic one has to stay cautious al; the time and hence have to wear a mask. This system provides an economical and good methodology for marking attendance while one is wearing a mask .Face recognition while wearing a mask is an identification of humans by distinctive features of their faces above their nose like eyes,eyebrows,forehead. An automatic way for distinguishing supportive students from video frames is the student attendance observation system. Images of students are available. On an individual basis, captured and identified. Once the faces have been detected and compared to the training data, we should begin training the dataset. The images are going to be captured by the web camera or any external camera source connected to the device and also the recognition algorithmic program to be used here Haar cascade algorithm. The student attendance reporting system is to enhance existing features with some advanced features like, real time information, quick computing through less hardware value and high economics.**

Keywords- Face recognition, video frame, Web camera,Haar cascade.

I. INTRODUCTION

Each and every Face has its own unique traits and features that differentiate a person from others. The process to correctly identify a person based on their characteristics is inherent to humans.One of the most commonly followed procedures is attendance management; practiced by almost every institute or organization. The participation is usually checked using a hard and chance requirement, such as a pen and paper. The incredible contribution narratives that were kept up are now used for future references [2]. With the growing need and desire to automate and speed up processes for the facilitation, saving time and efforts and reducing manual errors, development of these processes is undertaken by incorporating latest technologies. Due to a pandemic, face masks have become an important part of daily life This paper introduces a system that uses facial recognition technology with masks to record attendance automatically by acquiring images through a webcam of the device. The data acquired is fed to the computer for classification. However, for a machine to be able to identify a person based on their characteristics, it needs to be trained by the use of different algorithms suitable for the causes. The algorithm defined in the paper, is therefore able to recognize faces by means of comparing the test images. Acquired on runtime, with the face images stored in the training database and decisions are made using suitable classifiers. Once the test face matches a stored image, attendance is marked with that date and time.

II. PROBLEM

Covid-19 , A deadly disease is not fully cured till now , we have experienced 2 years of lockdown and still it is not the best way to deal with it. So, we have to continue with our daily life routine like we used to pre-covid . But we have to stay cautious all the time, one should wear a mask every time they step out of the house, sanitize their hands and maintain social distance. Coming to classrooms students are advised to wear a mask during the class so the question arises how will attendance be marked using digital attendance monitoring system while a student is wearing a mask .To overcome this issue we came up with this system to recognize faces while a student is wearing a face mask.

III. EXISTING SYSTEM RFID

Radio Frequency Identification is one strategy for participation stamping. In this innovation an individual needs to convey his/her very own RFID identity card within the personality card. ThusThis system is cost-effective, but it can also lead to deception because any unapproved user can use the card for false participation [1]. Biometric: To take student attendance, biometric techniques such as fingerprint, iris, and voice recognition are used. Biometric identification technologies do not appear to be completely accurate. False dismissal and false acknowledgment are two examples of mistakes that might lead to extortion.

Wi-Fi based: The system is absolutely unique when it comes to the marking system. Students may use their smartphones to identify groups of people who are acting in a certain way [3]. Using the camera on a smartphone to perform automatic facial recognition The system also takes use of the field Wireless-Fidelity system to verify a student's identity. to take a look at the student's position [6].

Face Recognition: For obvious confirmation of people, the method is a champion among the best identity frameworks of the present time [4]. It will be used in schools, universities, and other businesses. To prevent the problem of

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visiting a large collection, there is a requirement for programmed going to a framework that is quick and reduces the risk of artificial visiting. Among this Block Diagram Innovation framework is a method for transmitting a simple and secure manner of lowering visits [5]. The PC code primarily distinguishes and compare the appearances , contrasts and brightness them and predefined database.

IV. PROPOSED SYSTEM

In the proposed framework there will be a "Face Recognition Attendance System With Mask Detection" which utilizes the essential thought of image through frame process captured through video clips. During the proposed technique to the finding and identifiable verification of students' faces, the person is detected by comparing facial traits to those of stored people. where emphasis has been laid on the extraction of unique features, termed as eigenfaces through a dimensionality reduction algorithm known as principal component analysis (PCA). Similar approach has been demonstrated in 2019[7]. Face recognition is the most remarkable fragment of this technique. It's an automatic methodology of determining an individual from a computerized image or a video. The individual faces of each student square measure recognized by the face detection rule. The students attend a monitoring system in front of a device to be complete within the visual studio tool and therefore the artificial language. The proposed calculation made use of the Haar Cascade technique, which is a machine learning object recognition strategy used to identify things in a photo or video and backed up the idea of alternatives.

STEPS:
STEP 1: Compile an Image Database
STEP 2: Organizing Negative Images
STEP 3: Crop Positive Images and Mark Them STEP 4: Keep positive image vectors in-tact. STEP 5: HAAR-TRAINING
STEP 6: Make an XML or Excel File V.

V. PROPOSED METHODOLOGY

a.) Acquiring the image
This can be the first step in the project wherever we'll take a small video clip of the students present inside the classroom individually with the assistance of a camera introduced to put in on the laptop cam.It will then convert the video into images for our dataset.

b.) Face detection
This will be the next method once the images are fetched. To recognize the area of the appearance in a video frame .The Haar cascade Frontal Face xml file which will detect the face from the video.

c.) Individual face recognition
Individual understudy appearances will be prepared using web cam here, and their subtle aspects will be saved alongside databases we have a tendency to generate currently. The Haar Cascade algorithmic makes use of their well-prepared dataset to help characterize the appearances.

d.) Face Recognition
By mapping the facial highlights of prepared information, the classifier's highlights (for detecting the work face) will be used to differentiate understudying subtle elements.

e.) Organizing Attendance
The attendance will be entered in XL Sheet for record maintenance once the system admin has submitted the attendance.

VI. IMPLEMENTATION

The following is the list of components of the proposed attendance monitoring system based on face recognition:
• Enrollment of the student details.
• Capturing of student's face for dataset.
• Collection of All Training Faces.
• Recognition of face and stamping attendance.
• Generation of attendance.

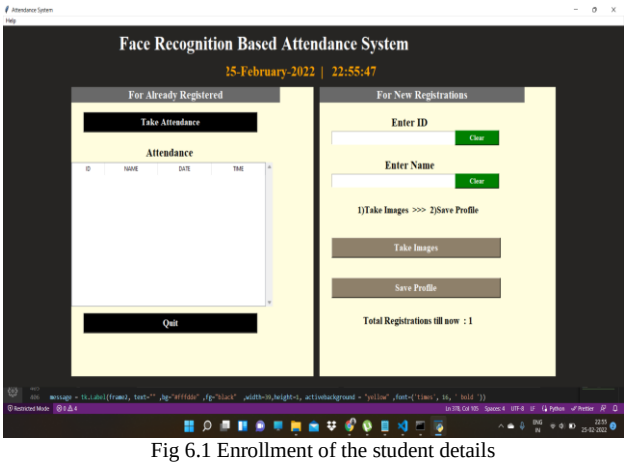

Fig 6.1 Enrollment of the student details

Following are the screen captures of the usage of this venture.
Enrolment of student details Fig 6.1 Enroll the student details The screenshot shows
the basic information of the student details to be enrolled into the database. The details are Registration Id and Name.Collect all student details presented in the classroom and everyone has the unique identifier of the Register number used to store the student image.

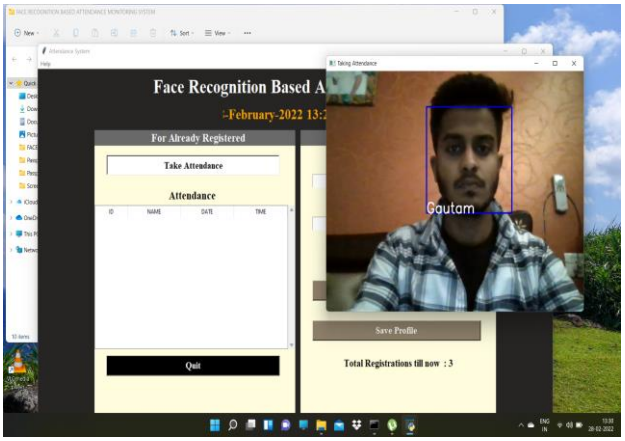

Fig 6.2 Capturing of student's face for dataset

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Fig 6.2 Train all student images individually. Train the student images as the name of the register number because it is the unique identity to classify the student differences.

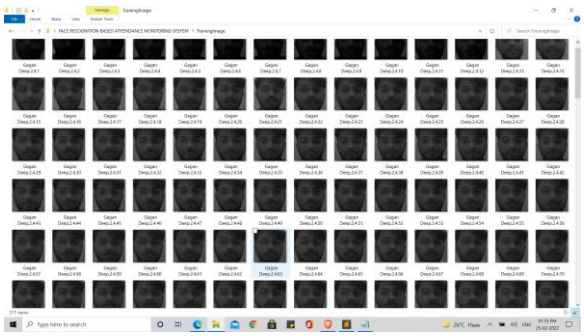

Fig 6.3 Collection of All Training Faces

Fig 6.3 training database The trained faces are to be stored in the Microsoft SQL server database. A student will be trained many times to perform the clear clarification of the machine understandable.

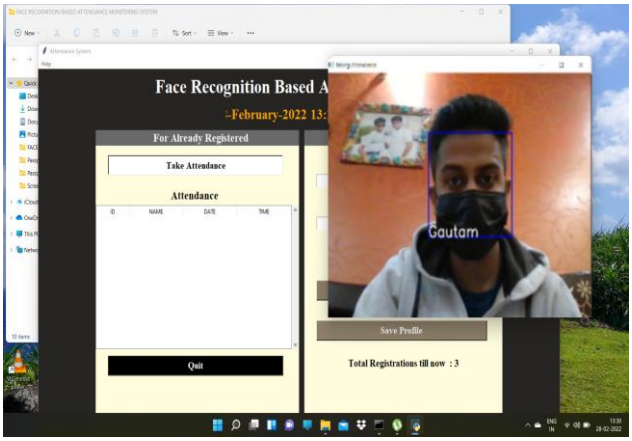

Fig 6.4 Recognition of face and stamping attendance

Fig 6.4 Face identification and detection to be performed for each and every student by their unique identity as the register number.

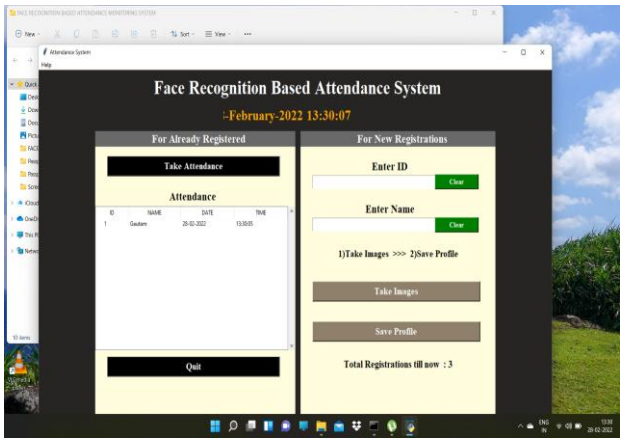

Fig 6.5 Generating Results

6.5 Face recognition and marking attendance After the process of trained faces then perform the image detection and image identification .when the camera is on by the server admin the faces are captured as the name of the register number are stored the student attendance and ready to explore to Excel.

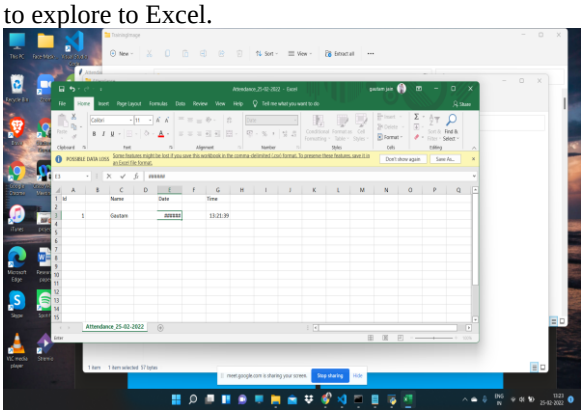

Fig 6.6 Generating Data in Excel Sheet

Fig 6.6 Generating Results in Excel file Finally generate attendance report to Excel sheet for maintaining the attendance record.

VII. ALGORITHMS USED

A. Haar Cascade Frontal Face

This algorithm is based on the Object Detection Algorithm which detects the human faces from an image and real time video which can be used in the dataset generation.

B. OpenCV

OpenCV is the best tool Image processing and computer vision jobs are made easier using this application. It's an open-source library for tasks including face detection, objection tracking, landmark detection, and more.

VIII. SCOPE OF THE PROJECT

A digital attendance monitoring system with face mask detection can be used globally at many platforms. Since every industry and organization are fully focused on marking attendance on daily basis so this system can be a useful entity.

As of now we are having this system in a static mode but with introduction to more advancement in this it can be made dynamic as well which will be of more ease, not only this , it also have following characteristics :

- Easy to operate.
- User friendly.
- Satisfies Client’s demand.
- Good interface
- Expandable.

IX CONCLUSION

Since we all know that a student's face is an important part of their identification, the concept of face recognition exemplifies the importance of automating during the running period. This work consists of Haar course calculation modules. This role also allows others to look to be open to a lot of improvisation with new ideas for handling equipment improvements and innovation. Model has a precision of 75% and provides a clear face recognition visual

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studio device that is far superior to the general calculations since it only requires a single image to calculate on and does not require changing it to dark scale. This venture will be worn out the essential time accordingly we can spare the ideal opportunity for going to stamping and cost viable. The more extended term extent of the undertaking is the expanding rate and precision of the model, with this mask detection system it is very useful as well as a very safe and hygienic way to monitor attendance of employees , Students or members of an organization.

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