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Face Recognition Attendance System

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Abstract: Face recognition systems are used in practically every industry in this digital age. One of the most widely utilized biometrics is face recognition. It can be used for security, authentication, and identity, among other things. Despite its low accuracy relative to iris and fingerprint identification, it is extensively utilized because it is a contactless and non-invasive technique. Face recognition systems can also be used to track attendance in schools, colleges, and companies. Because the existing manual attendance system is time consuming and difficult to maintain, this system intends to create a class attendance system that employs the concept of face recognition. There's also the possibility of proxy attendance. As a result, the demand for this system grows. Database development, face detection, face recognition, and attendance updating are the four steps of this system. The photos of the kids in class are used to generate the database. Faces are discovered and recognized from the classroom's live streaming footage. At the end of the session, the attendance will be mailed to the appropriate faculty.

Keywords: Smart Attendance System, NFC, RFID, OpenCV, NumPy

I. INTRODUCTION

This is a project for educational institutions on a facial recognition-based attendance system. The traditional way of marking commute to work can be a tedious task in many skills and colleges. It is also an additional responsibility for schools to mark an attendance by naming Individuals which may take up to 5 minutes for a full session. This can be time consuming. There are certain chances of a representative. Therefore, many institutions began using many other recording methods such as the use of Frequency Identification (RFID) [3], Iris recognition [4], fingerprint recognition, and more. However, these online based systems can be time consuming and disruptive in nature. Face recognition has set a very important biometric feature, which is easily accessible and unobtrusive. Face-based systems that ignore a lot of facial expressions. The face recognition program consists of two stages: verification and facial recognition. Face verification is a 1: 1 matching process, comparing face-to-face image processing and there is a 1: N comparing face query image. The purpose of this approach is to create a travel plan based on face recognition strategies. Here a personal face is considered a mark of presence. Today, facial recognition is gaining popularity and has been widely used. In the middle of this page, we suggested a face recognition system in the live video class and attendees will be marked when the found face is found within the website. In comparison to existing procedures, this new technology will take less time.

II. LITERATURE REVIEW

A. Attendance System Using NFC Technology with Embedded Camera on Mobile Device

"NFC (Near Field Communication) Technology with a camera incorporated in a mobile device," according to a study publication (Bhise, Khichi, Korde, Lokare, 2015). NFC technology and a mobile application are used to improve the attendance system. At the time of enrolment in the faculty, each student is issued an NFC tag with a unique ID, according to the research article. The travelling instructor will then take attendance at each lesson by touching or distributing these tags. The integrated camera will then take a picture of the student's face before sending all of the data to the college server for verification. The benefits of this technology include the ease of use of NFC and the fast connection speed. It greatly facilitates the process of being in the present moment. However, if the NFC tag was not tagged by the user, the system would not be able to identify infringement automatically. Aside from that, the usage of a mobile app was necessary since the NFC student was interrupting the teacher. Would it be a support system to record everyone present if a pastor failed to bring his mobile phone to work? Furthermore, because of a confidential topic, most professors would not want their iPhones to be used in this manner. As a result, instead of the NFC marker, unique student information such as biometrics or face recognition, genuine to the student should be employed. This ensures that a specific student will be the first to take attendance.

B. Face Recognition Based Attendance Marking System

Face recognition is used in the second research publication, "Face Recognition System Based on Face Recognition" (SenthamilSelvi, Chitrakala, Antony Jenitha, 2014), to overcome prior system challenges.

This method involves taking images of the employee using a camera in order to capture their faces and visions. When the result is located on the face website, the taken image is compared individually with the face mask to display the employee's face, where presence is noted. The key benefit of this method is that the presence is recorded on a highly secure server that no one else can access. Furthermore, the face detection algorithm in this suggested system is built employing a skin-splitting approach to improve the accuracy of the detection process. Despite ongoing efforts to improve the accuracy of the face detection algorithm, the system remains unaffected at this time. This application needs a stand-alone computer with a constant power source that is not portable. This sort of system is prepared to mark staff attendance since they only need to submit attendance once a day, unlike students who must indicate that they are present in each class on a certain day. If marking is present, it will be tough. The system is out of control. To address this issue, the whole old system management system is converted to a portable module, which is then used to operate a Python system.

C. RFID based Student Attendance System

According to the fourth research journal "RFID based Student Attendance System" (Hussain, Dugar, DeKa, Hannan, 2014), the proposed solution is almost identical to the first research journal in which RFID technology was used to enhance the adult attendance program. During this process, the tag and the student are also used as a way to track the presence of students. The difference between the original journals and that is where the information for the participants will be available through the web site. Provides very easy to retrieve information. Also, this method is not perfect in the sense that, first of all, it is not portable, because the RFID reader can only work if it is connected to a PC. Second, the RFID tag is not genuine information that can specifically identify the reader, thus, leading to inaccuracies in the data collected by attendees.

III. PROPOSED SYSTEM

The function of the proposed system is to capture the face of every student and keep it on the website for them to attend. The face of the expert must be taken in such a way that everyone can see what the student's face is like, even the seating area and the way the students stand. There is no need for the teacher to be physically present in the classroom because the system records the video and then with continuous face processing steps is monitored and therefore the attendance website is updated. All Individuals in the category must register themselves by entering the information they require so that their photos can be taken and stored within the database. During each session, a face is found in the live streaming video of the class. The recovered faces are compared with the existing images in the database. Once a match is found, attendees are marked on the appropriate reader. At the top of each session, a list of absentees will be sent to the appropriate faculty in charge of the session.

A. Existing Recognition Systems

- 1) *Fingerprint Based Recognition System:* For a fingerprint-based departure system, the portable fingerprint device should be pre-configured with Individual fingerprints ahead of time. Later in the teaching hours or before, the coed should record fingerprints on the suspended device to ensure their daily presence. The point is that during the study it should be distracting to the eyes of individuals.
- 2) *RFID (Radio Frequency Identification) Based Recognition System:* In an existing RFID-based system, Co-ed should always carry good identification and place an ID with a cardboard reader to record their daily presence. The system is able to connect to RS232 and record attendees on a saved website. There is a possibility of fraudulent access that may occur. Some students may use another student's ID to verify their presence in the absence of the real student or themselves try to misuse it sometimes.
- 3) *Iris Based Recognition System:* In an Iris-based student travel program, the scholar should rotate in front of the camera, so that the camera will scan the Iris code. The scanned iris is compared with the individual data stored on the website and their presence should be updated. This reduces the paper and pen function of the college members of the institution. This also reduces the chances of being represented within the classroom, and helps maintain secure code records. It is a wireless biometric method that solves the issue of false existence and therefore the problem of setting up a compatible network.
- 4) *Face Based Recognition System:* Biometric detection technology will be used to record attendees with a high-definition camera that detects individual faces so the machine compares known faces with student faces stored within the website. When the face of the code is matched to a saved image, attendees are marked with the current website for further calculation. If the captured image does not match the existing student face on the website, this image is saved as a new image on the website. During this process, there is a chance that the camera will not take the correct picture or will miss the number of individuals in the picture.

IV. RESULTS AND DISCUSSIONS

The main rule of the project is that the video captured by the video is converted into an image for viewing and viewing. In addition, a known code image is also provided, otherwise the system will mark the site as non-existent.

- 1) *Take a Video:* The camera is positioned at a selected distance within the classroom to capture pre-video videos of perfect students of the class.
- 2) *Divide as Frames in Video:* The captured video must be converted to self-contained every second so that it can be easily accessed and seen by the students' faces in order to present the audience.
- 3) *Face Recognition:* Face detection is a process by which an image, provided as input (image) is searched to investigate any face, after finding the face processing image cleans the face image so that the face can easily be seen.
- 4) *Facial Recognition:* After completing the face detection and analysis, it is compared with the existing face on the student website to review the Individual presence.
- 5) *After Processing:* Post-processing process includes the process of updating expert names on an excel sheet. An excel sheet is usually kept weekly or monthly to record student attendance.

A. Face Recognition and Detection

In every session, as soon as you run the program the camera starts automatically and starts detecting the face in the frame. If the face detected is registered in the database, the system recognizes the face and shows his/her name on the screen. If the face is not registered the program will quit automatically.

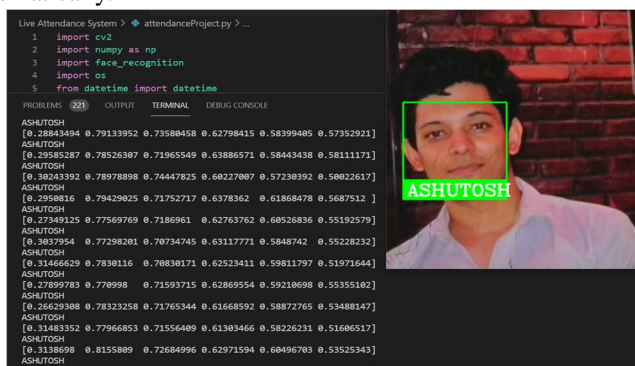


Fig.1 Face Detection

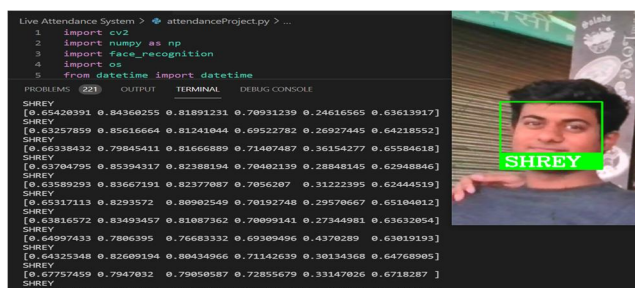


Fig.2 Face Detection

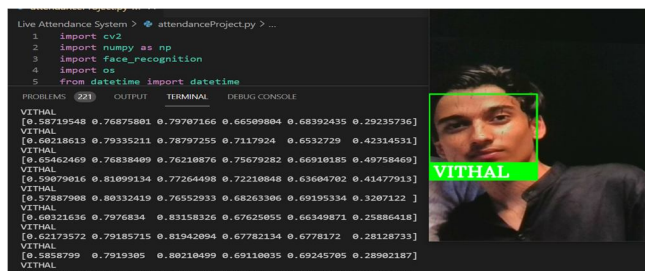
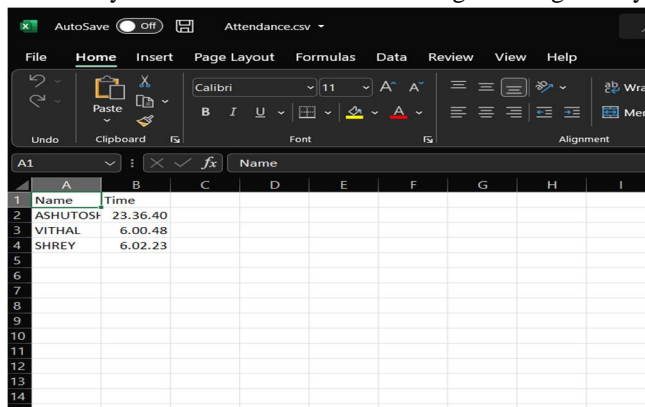


Fig.3 Face Detection

B. Post Processing

After face recognition and detection, the program creates an entry in the .csv file and exports name and time in which the face was detected and marks the attendance. The system does not allow overwriting of a single entry.



	A	B	C	D	E	F	G	H	I
1	Name	Time							
2	ASHUTOSH	23.36.40							
3	VITHAL	6.00.48							
4	SHREY	6.02.23							
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

Fig.4 Attendance Sheet

V. CONCLUSION

Therefore, the purpose of this project is to capture a video of people, convert it into frames, link it to a database to ensure their presence or absence, to mark the presence of a real student to keep a record. The Automated Classroom Attendance System helps to increase accuracy and speed and ultimately achieve the highest accuracy of real-time arrival to satisfy the need for automatic classroom testing

VI. FUTURE ENHANCEMENTS

The Automated Attendance System is used in larger areas such as the seminar where it helps to feel the presence of more people. Sometimes poor classroom lighting may affect image quality that indirectly reduces system performance, this may be overcome in the later phase by improving video quality or using certain algorithms.

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