e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:04/April-2022 Impact Factor- 6.752 www.irjmets.com

PASSIVE FACIAL LIVENESS DETECTION

Alex Issac Varghese*1, Anuj Matadeen Tiwari*2, Abhishek Kumar*3

*1,2,3Dept Of Computer Engineering, SOEA, Savitribai Phule Pune University, Pune, India.

ABSTRACT

The main purpose of this project is to create a Passive Facial Liveness Detection (attendance monitoring system) to improve and update the current attendance system and make it more efficient and effective. The current method is riddled with inconsistencies, making attendance tracking inaccurate and inefficient. A flurry of issues arise when the authority is unable to enforce the prior system's regulations. Face recognition software will be employed. The face is one of the natural qualities that might help to identify a person. As a result, it's used to hunt down a person's identity because the possibilities of a face deviating or being copied are low. In order to give information into the recognizer algorithm, this project will create face databases. During the attendance-taking session, faces will be linked to the database to determine identity. When a person is identified, their attendance is automatically logged, and the necessary information is saved in an excel file. At the end of the day, an excel document including all participants' attendance information is emailed to the appropriate professors.

Keywords: Python, Numpy, Opencv, Hadoop, Pandas, Facial Liveness.

I. INTRODUCTION

For today's educational institutions, the consistency of students' performance is a concern. One reason for this reduction in student performance is insufficient attendance. Signing or phoning the students is the most common way of recording attendance. It took a little longer and was a little more tough. To assist staff in maintaining attendance records, a computer-based student attendance verification system will be required from now on.

We deployed a face recognition-based intelligent attendance system in this project. We propose to build a "Passive Facial Liveness Detection" system that will have a variety of uses. The present implementation includes facial identification as a result of the face authorization, which reduces time and eliminates the possibility of proxy attendance.

This technology can now be employed in situations where active participation is required. OpenCV and Dlib in Python are required for the system to work.

Motivation:

The previous attendance monitoring system had a serious flaw in terms of data accuracy. This is because attendance may not be recorded by the original person; in other words, a third party may take a specific person's attendance without the institution's knowledge, jeopardizing the data's integrity. For example, if student A is too tired to attend a lesson, student B will sign for him/her, despite the fact that student A did not attend. Due to a lack of enforcement, the system will overlook this. If the institution decides to enforce, it would most likely waste a lot of people resources and time, both of which are inefficient. As a result, the old system's recorded attendance is useless for research. The previous system's second fault is that it takes too long. Assume that a student signs his or her name on a three- to four-paged name list in roughly one minute. In an hour, only approximately 60 students sign their attendance, which is clearly useless and time consuming. The ability of a legitimately interested party to get the information is the final point to evaluate. Most parents, for example, are concerned about tracking their child's location in order to ensure that their child attends college/school classes. In the previous system, however, parents had no access to such information. As a result, the former system is no longer viable.

II. LITERATURE REVIEW

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

According to the study publication "Attendance System Using NFC (Near Field Communication) Technology with Embedded Camera on Mobile Device," "Attendance System Using NFC (Near Field Communication) Technology with Embedded Camera on Mobile Device" (Bhise, Khichi, Korde,Lokare, 2015). The use of NFC

technology and a mobile application has improved the attendance system. During their enrolment into the college, each student is given an NFC tag with a unique ID, according to the research article. The lecturer's cell phone will subsequently be used to track attendance for each lesson by tapping or repositioning these tags. The phone's embedded camera will then capture the student's face, which will be used to submit all of the data to the college server for confirmation and verification. The benefits of this technology are the ease of use of NFC and the rapid speed of connection establishment. It significantly reduces the time it takes to take attendance. When the NFC tag is not personally tagged by the original owner, however, this method is unable to detect the violation automatically. Apart from that, the professor found the convenience of the system, which employs the lecturer's phone as an NFC reader, to be inconvenient. Consider what would happen if a professor neglected to bring their phone to work. What would be the backup mechanism for recording attendance? Furthermore, most lecturers are unlikely to want their personal smart phones to be utilized in this manner due to privacy concerns. As a result, instead of using the NFC tag, unique information about the student, such as biometrics or face recognition, which is guanine for a student, should be employed. This will verify that the attendance is taken by the actual student.

2. Face Recognition Based Attendance Marking System:

The second research publication, "Facial Recognition Based Attendance Marking System" (SenthamilSelvi, Chitrakala, Antony Jenitha, 2014), is based on the identification of face recognition to tackle the concerns with the prior attendance system. This technology detects and recognizes faces by using a camera to capture photos of the employee. When a match is detected in the face database, the taken image is compared one by one with the face database to look for the worker's face, and attendance is recorded. The key benefit of this method is that attendance is recorded on a server that is highly secure, with no one else being able to record other people's attendance. Furthermore, the face detection method in this proposed system is improved by employing a skin categorization technique to boost the detection process' accuracy. Despite the fact that more effort is being put into improving the accuracy of the face identification algorithm, the technology is still not portable. This system necessitates a stand-alone computer with a constant power source, rendering It non-portable. This type of system is only appropriate for marking staff attendance because they only need to report their presence once a day, unlike students who must report their attendance at every class on a given day. If the attendance marking system is not portable, it will be inconvenient. To address this problem, the entire attendance management system can be built as a portable module that can be run simply by running a Python program.

3. Fingerprint Based Attendance System Using Microcontroller and LabView:

The third research article, "Fingerprint Based Attendance System Using Microcontroller and LabView" (Kumar Yadav, Singh, Pujari, Mishra, 2015), suggested a technique for marking attendance using fingerprints. To handle the fingerprint identification procedure, this system employs two microcontrollers. The fingerprint pattern will be collected using a fingerprint sensor, and the data will then be sent to microcontroller 1. Following that, microcontroller 1 will send the data to microcontroller 2 for validation against the database stored there. After locating a student match, the information is delivered to the PC via serial communication and displayed. This architecture is useful since it speeds up development while preserving design flexibility and making testing easier. However, because this system is connected to a PC, it is not portable. Aside from that, the database information is difficult to obtain. This means that parents who want to know about their child's attendance will not be able to do so simply or conveniently. As a result, to enable easy access to the student's information to the legitimate concerned party, the information might be uploaded to a web server. While adequate access authentication can be enforced using a login screen.

4. 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 nearly identical to the first research magazine, which employed RFID technology to improve an earlier attendance system. A tag and a reader are used to track the pupils' attendance in this system. The difference between the first and this journals is that this one allows users to view attendance data via a web portal. It makes retrieving information easier. Again, this solution is flawed in that it is not portable, as the RFID reader can only function when it is attached to a computer. Second, the RFID tag

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:04/April-2022 Impact Factor- 6.752 www.irjmets.com

does not contain guanine information that can be used to individually identify a student, resulting in inaccuracies in the attendance data obtained. Finally, a better attendance monitoring system should be designed based on its portability, accessibility, and the accuracy of the data obtained.

III. PROPOSED SYSTEM

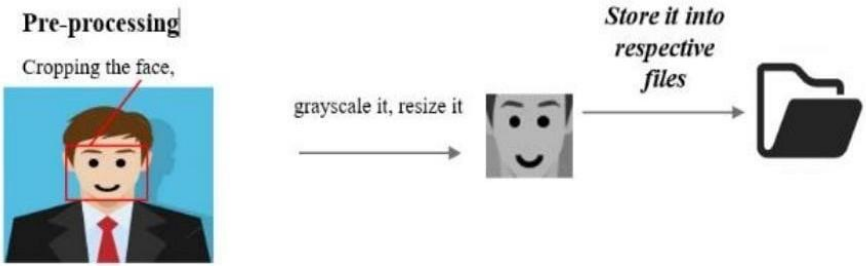

Fig: Proposed System

The attendance management system requires a collection of data to be entered before it can function, which generally consists of the individual's basic information, such as their ID and faces. The first stage in the portrait creation process is to capture the subject's face with the camera. The algorithm will initially look for a face in the captured image; if no face is found, the user will be asked to capture their face again until a certain number of portraits is reached, which in this case will be ten for each student. Because the university's total student population is considered large, Due to the Pandas' limited storage space, it was decided to store only 10 photographs per student. The photographs will then be pre-processed to create a grayscale image and cropped faces of equal size images, which are necessary to use the EigenFaces Recognizer.

The photos are saved in a file hierarchy after they have been processed. In this project, all of the faces will be saved in a hierarchy under the "database" folder. When you expand the database folder, you'll discover that it has a lot of sub-folders, each with its own set of files.This symbolises an individual and has a series of portraits of the same person that's why it's maintained in that subfolder. Each individual's subfolders will be named after him or her. Individual identification number, which is unique to each and every person in the institution. The script construct database.py takes care of the entire picture retrieval, pre-processing, and storage process.

The images will be incorporated into a training process after a sufficient number of shots have been collected in the database. The three primary types of training methods in OpenCV 3.4 are EigenFaces, FisherFaces, and Local Binary Patterns Histograms (LBPH). In this project, the EigenFaces recognizer will be the focal point. The premise behind EigenFaces is simple: it recognises a certain face by capturing the face's biggest deviation and then turning those differences into information that can be compared when a new face appears. During the training phase, the csv file will be read to provide the path to all of the photographs, which will then be loaded into a list variable. After that, the list will be given to the training function, which will run for a set length of time. The longer it takes to train them, the more photos in the face database there are.

IV. CONCLUSION

Prior to the creation of this project. There are numerous flaws in the old technique of taking attendance, which have produced numerous problems for most schools. As a result, the facial recognition technology built into the attendance tracking system not only ensures accurate attendance but also eliminates the shortcomings in the prior method. Using technology to eliminate faults not only saves time and money, but it also decreases human intervention in the process by delegating all of the difficult tasks to the machine. The sole cost of this technique is having enough space in the database storage to hold all of the faces. Fortunately, there are micro SD cards available that can compensate for the data volume. The face database is successfully constructed in this project. Apart from that, the face recognition system performs admirably. Finally, the system not only resolves issues that existed in the previous model, but it also allows the user to obtain the data acquired by mailing the attendance sheet to the respected faculty.

V. REFERENCES

[1] K. Bakshi, "Considerations for Big Data: Architecture and Approach", Aerospace Conference IEEE, Big Sky Montana, March 2012.

[2] C. Eaton, D. Deroos, T. Deutsch, G. Lapis and P.C. Zikopoulos, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGraw-Hill Companies, 978-0-07179053-6, 2012.

[3] http://blog.m2sys.com/biometrichardware/advantages biometric- identification-management system.

[4] http://en.wikipedia.org/wiki/Biometrics.

[5] http://www.webopedia.com/TERM/B/biometrics.htm

[6] http://searchsecurity.techtarget.com/definition/biometrics.

[7] V. Borkar, M.J. Carey and C. Li, "Inside υBig Data Management ؤ: Ogres, Onions, or Parfaits?" EDBT/ICDT 2012 Joint Conference Berlin Germany, 2012.

[8] B.Gerhardt, K. Griffin and R. Klemann, "Unlocking Value in the Fragmented World of Big Data Analytics", Cisco Internet Business Solutions Group, June 2012,
http://www.cisco.com/web/about/ac79/docs/sp/Infor mation-Infomediaries.pdf

[9] Vailaya, "What's All the Buzz Around-Big Data", IEEE Women in Engineering Magazine, December 2012, pp. 24-31.

[10] Open Cv Documentation -https://opencv.org

[11] Numpy - https://numpy.org