



OPENCV BASED IMAGE PROCESSED ATTENDANCE SYSTEM

Sushant Borkar, Shrutik Ghavate, Sudhanshu Pawar, Prof. Vinod Bharat

Dept of Computer Engineering, DY Patil School of Engineering Academy, Savitribai Phule Pune University, Pune, Maharashtra, India.

ABSTRACT:

Face recognition is among the most productive image processing applications and has a pivotal role in the technical field. Recognition of the human face is an active issue for authentication purposes specifically in the context of attendance of students. Attendance system using face recognition is a procedure of recognizing students by using face biostatistics based on the high definition monitoring and other computer technologies. The development of this system is aimed to accomplish digitization of the traditional system of taking attendance by calling names and maintaining pen-paper records. Present strategies for taking attendance are tedious and time-consuming. Attendance records can be easily manipulated by manual recording. The traditional process of making attendance and present biometric systems are vulnerable to proxies. This project is therefore proposed to tackle all these problems. The proposed system makes the use of Open CV and face recognition libraries. After face recognition attendance reports will be generated and stored in excel format. The system is tested under various conditions like illumination, head movements, the variation of distance between the student and cameras. After vigorous testing overall complexity and accuracy are calculated. The Proposed system proved to be an efficient and robust device for taking attendance in a classroom without any time consumption and manual work. The system developed is cost-efficient and needs less installation.

Keyword- *OpenCV, Face Recognition, AI, Data Set.*

I. Introduction:

Education institutes across the world have closed due to the COVID-19 pandemic jeopardizing the academic calendars. Most educational institutes have shifted to online learning platforms to keep the academic activities going. However, the questions about of e-learning is still not clearly understood. One of the problems is of attendance system in current online service providing education platforms. It has become very hard for teachers to keep track of students really attending the lectures. so this project aims to minimize that particular flaw using face recognition techniques with the use of OpenCV library

II. Literature Survey:

1. Paper name: Face Recongnition Based Attendance Marking System

Authors: SenthamilSelvi, Chitrakala, Antony Jenitha,

Face recognition to solve the previous attendance system's issues. This system uses camera to capture the images of the employee to do face detection and recognition. The captured image is compared one by one with the face database to search for the worker's face where attendance will be marked when a result is found in the face database. The main advantage of this system is where attendance is marked on the server which is highly secure where no one can mark the attendance of other. Moreover, in this proposed system, the face detection algorithm is improved by using the skin classification technique to increase the accuracy of the detection process. Although more efforts are invested in the accuracy of the face detection algorithm, the system is yet not portable. This system requires a standalone computer which will need a constant power supply that makes it not portable. This type of system is only suitable for marking staff's attendance as they only need to report their presence once a day, unlike students which require to report their attendance at every class on a particular day, it will be inconvenient if the attendance marking system is not portable.

2. Paper name: RFID based Student Attendance System

Author: Hussain, Dugar, Deka, Hannan,

The proposed solution is almost similar to the first research journal where RFID technology is used to improve the older attendance system. In this system, a tag and a reader is again used as a method of tracking the attendance of the students. The difference between the first journals with this is where attendance's information can be accessed through a web portal. It provides more convenient for information retrieval. Again, this system is imperfect in the sense that, firstly, it is not portable, as the RFID reader can only work when it is connected to a PC. Secondly, the RFID tag is not a guanine information that can uniquely identify a student, thus, resulting in the inaccuracy of the collected attendance information.

3. Paper name: Fingerprint Based Attendance System Using Microcontroller and LabView

This system is using 2 microcontrollers to deal with the fingerprint recognition process. Firstly, the fingerprint pattern will be obtained through a fingerprint sensor, then the information will be transmitted to microcontroller 1. Next microcontroller 1 will pass the information to microcontroller 2 to do the checking with the database that resides in it. After finding a student's match, the details are sent to the PC through serial

communication to be displayed. This design is good as it accelerates development while maintaining design flexibility and simplifies testing. But again, this system is attached to a PC which make it not portable. Other than that, the database information cannot be accessible easily. Meaning that, for the parents whom are interested in knowing their child's attendance cannot easily or conveniently access the information. Therefore, to provide accessibility of the student's information to the legitimate concerned party, the information can be uploaded to a web server for easy access. While the authentication for the appropriate access can be enforced through a login screen.

III. Proposed System:

Problem Statement:

The accuracy of the data collected is the biggest issue. This is because the attendance might not be recorded personally by the original person, in another word, the attendance of a particular person can be taken by a third party without the realization of the institution which violates the accuracy of the data. For example, student A is lazy to attend a particular class, so student B helped him/her to sign for the attendance which in fact student A didn't attend the class, but the system overlooked this matter due to no enforcement practiced. Supposing the institution establish an enforcement, it might need to waste a lot of human resource and time which in turn will not be practical at all. Thus, all the recorded attendance in the previous system is not reliable for analysis usage. The second problem of the previous system is where it is too time consuming. Assuming the time taken for a student to sign his/her attendance on a 3-4 paged name list is approximately 1 minute. In 1 hour, only approximately 60 students can sign their attendance which is obviously inefficient and time consuming. The third issue is with the accessibility of those information by the legitimate concerned party. For an example, most of the parents are very concerned to track their child's actual whereabouts to ensure their kid really attend the classes in college/school. However in the previous system, there are no ways for the parents to access such information. Therefore, evolution is needed to be done to the previous system to improve efficiency, data accuracy and provides accessibility to the information for those legitimate party.

Objectives:

- To develop a portable Smart Attendance System which is handy and self-powered
- To ensure the speed of the attendance recording process is faster than the previous system which can go as fast as approximately 3 second for each student

- Have enough memory space to store the database.
- Able to recognize the face of an individual accurately based on the face database.
- Allow parents to track their child's attendance.

Algorithm:

OPEN CV :

OpenCV is a package of highlights of programming that gradually relies primarily on PC vision. The library is stage cross. It is principally focused on picture preparing progressively.

FACE DETECTION :

The base calculation used to differentiate the face is discussed in this section. At that point, the AdaBoostestimate is evaluated first, and the option is addressed.

Face detection Steps:

- a. Acquire the desired output.
- b. Create a histogram and the section that should be searched for initially.
- c. Find the pixelated zone with the most populated.
- d. Determine the central location of the whole area being searched.
- e. Transfer the searched region's centre to the entire region's centre.
- f. Switch back to phase d, if going forward needs to be converted.
- g. The new search window is now created, with the centre originating from the previous centre.
- h. Find out the new processing area.
- i. New window's beginning is chosen

IV. Conclusion:

Before the development of this project. There are many loopholes in the process of taking attendance using the old method which caused many troubles to most of the institutions. Therefore, the facial recognition feature embedded in the attendance monitoring system can not only ensure attendance to be taken accurately and also eliminated the flaws in the previous system. By using technology to conquer the defects cannot merely save resources but also reduces human intervention in the whole process by handling all the complicated task to the machine. The only cost to this solution is to have sufficient space in to store all the faces into the database storage. Fortunately, there is such existence of micro SD that can compensate with the volume of the data. In this project, the face database is successfully built. Apart from that, the face recognizing system is also working well. At the end, the system not only resolve troubles that exist in the old model but also provide convenience to the user to access the information collected by mailing the attendance sheet to the respected faculty.

V. References:

- [1] Mayank Srivastava; Amit Kumar; Aditya Dixit; Aman Kumar, "Real Time Attendance system using face recognition ", in 2020 International Conference on Power Electronics & IoT Applications in Renewable Energy and its Control (PARC); DOI: 10.1109/PARC49193.2020.236628; Year: 2020
- [2] "Attendance System Using NFC Technology with Embedded Camera on Mobile Device" (Bhise, Khichi, Korde, Lokare, 2015)
- [3] K.SenthamilSelvi, P.Chitrakala, A.AntonyJenitha, "Face Recognition Based Attendance Marking System", IJCSMC, Vol. 3, Issue. 2, February 2014.
- [4] "Fingerprint Based Attendance System Using Microcontroller and LabView" (Kumar Yadav, Singh, Pujari, Mishra, 2015)
- [5] "RFID based Student Attendance System" (Hussain, Dugar, Deka, Hannan, 2014)
- [6] Dr. V Suresh, Srinivasa Chakravarthi Dumpa, Chiranjeevi Deepak Vankayala, Haneesha Aduri, Jayasree Rapa "Facial Recognition Attendance System Using Python and OpenCv" ISSN(Online) :2321-3795 ;Year: 2019
- [7] Kruti Goyal; Kartikey Agarwal ; Rishi Kumar "Face detection and tracking Using OpenCV" in 2017 International conference of Electronics, Communication and Aerospace Technology(ICECA); DOI: 10.1109/ICECA.2017.8203730; Year: 2017
- [8] Xianghua Fan ; Fuyou Zhang; Haixia Wang; Xiao Lu "The system of face detection based on OpenCV" in 2012 24th Chinese Control and Decision Conference(CCDC);