FACE RECOGNITION BASED ATTENDANCE SYSTEM USING OPEN-CV AND PYTHON

LALIT KATHANE[1], YASHIKA BHUTE[2], YOGESH SHRIWAS[3], ITIHAS UIKEY[4], SHUBHAM SHRAWANKAR[5], DR.(MRS) J.S.GAWAI[6]

[1,2,3,4,5]*Student, Department of Electronics Engineering, K.D.K.C.E, Nagpur, India*
[6]*Professor, Department of Electronics Engineering, K.D.K.C.E, Nagpur, India*

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Abstract - The main purpose of this project is to mark the attendance of the employee/ student by detecting the face. As the manual method to mark the attendance consumes a lot of time and also it is difficult sometimes to manage the attendance manually, to overcome this problem this attendance system might be a solution to upgrade the technologies. This system is already available in the local market with low accuracy, we aim to upgrade the accuracy of the already existing system.

In this system the camera sensor will detect the profiles of the employees/student to mark the attendance. This might save time and also sometimes it is not possible for the teachers manually mark the attendance in time so this will automatically mark the attendance. This will also prevent the fake attendance problems faced in colleges as the face of the student have to be detected to mark the attendance. Face recognition system will be easy to use for everyone. The user of this system will be lecturer, student, employs etc.

The student and employee can confirm their attendance marked but they don't have authority to change or edit the attendance. Face recognition based will help to student and employees.

Keywords**:** Open CV, Detection, Recognition, Dataset generation.

1. INTRODUCTION

Now a days the whole world is facing the challenge of covid-19. In this pandemic situation it is very dangerous to touch anywhere. We have many solutions for the maintain students & employees. As the government offices cannot be stopped at any cost and any situation. Till now we have a biometric attendance system to maintain the attendance employees. But in this pandemic situation it is very risky to touch anywhere without any precautions, to overcome this problem this attendance system might be a solution. As the system recognizes the face of the employee & mark the attendance & the employee do not have to touch anywhere.

2. LITERATURE SURVEY

1. Face Recognition Based Attendance Monitoring System Using Raspberry-pi and Open-CV[1]

According to research journal "Face Recognition Based Attendance Monitoring System Using Raspberry-pi and Open-CV" (Omkar Biradar, Anurag bhave, 2019). In this system the attendance is mark by using a camera attached with the system which captures images of students employees, and detect the faces in images and compare with the detected faces which is in the student database and mark their attendance. Then the attendance will be updated automatically on the web page which they have created by using face detection and face recognition, the facial recognition process can be divided into two main stages: processing before detection where face detection and alignment take place and afterwards recognition occur through feature extraction and matching steps. As well as according to requirement of the system image normalization is also done with the help of Raspberry-pi and Open-cv software.

2. Automated Attendance System Using Face Recognition[2]

The second research journals "Automated Attendance System Using Face Recognition"(Akshara Jadhav, Akshay Jadhav, Tushar Ladhe, Krishna Yeolekar, 2017) is based on face recognition techniques thus proved to be time saving and secured. This system is used to identify an unknown person. The student detect automatically when he/she enter in the class room then attendance will be mark by recognizing him. In real time scenarios PCA perform better than other algorithms with better recognition rate and low false positive rate. The future work is to improve the recognition rate of algorithms when there are changes in a person like tonsuring head, beard. The system developed only recognizes face up to 30 degrees angle variations which has to be improved further.

3. Face Recognition Based Attendance Marking System[3]

The third research journals "Face Recognition Based Attendance Marking System" (Senthamil Selvi, Chitrakala, Antony Jenitha, 2014) is based on the identification of face recognition to solve the previous attendance systems issues. This system uses camera to capture the images of the employee, students to do face detection and recognition. The captured image is compared with the face database to search for the workers and students face where attendance will be marked when a result is found in the face database. The main advantage of this system was 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 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. Thus, to solve this issue, the whole attendance management system can be developed on an portable module so that it can be work just by executing the python program.

4. Implementation of automated attendance system using face recognition [4]

The forth research journals "Implementation of automated attendance system using face recognition" (Mathana Gopala Krishnan, Balaji, Shyam Babu, 2015) In order to reduce the faculty effort and to manage the time effectively. The authors proposed automated attendance system using face recognition which is very useful for school and colleges for taking attendance. The system takes attendance for particular amount of time and after the time expires the system automatically closes the attendance. The system will recognize the face and saves the details regarding attendance in database automatically. System also includes the feature which is create the list of students who are absent in a particular day. The system uses the eigenface approach for face recognition. The method analyzes and computes eigenfaces which are faces composed of eigen-vectors. The method also compares the eigenfaces to identify the presence of a person (face) and its identity. The method involves the following steps. As a first step should be start with initialized a set of training faces. Then, the system compares the eigenvectors of the current face and the stored face image and determines whether the face is identified or not. The final step is that if the unknown face is detected repeatedly the system may learn to recognize.
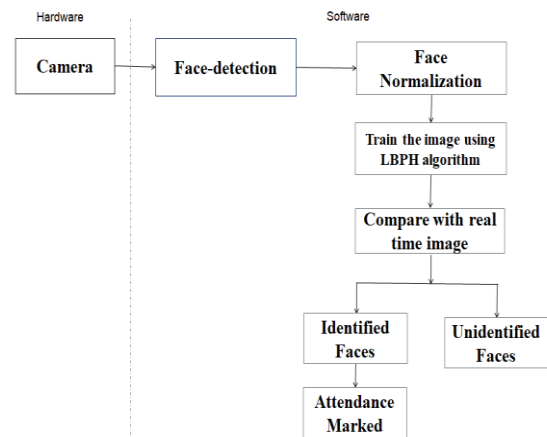
3. PROPOSED WORK

Fig 3.1: Block diagram of proposed system.

Our project is face recognition based attendance system using open-cv and python. This project is helpful for students and employee for marking there attendance also it is helpful to provide a safe and touch less entry. We are use camera sensor for capturing image. First of all the students or employee can register there profiles. The camera sensor will first scan the person profiles, and then it will normalize the image. Normalizing the image is nothing but avoiding and canceling the background, i.e avoiding unwanted pictures light, darkness, etc. Then created profile will be saved in the data set. The profile saved will have some details of the person such as the person name, pictures of the person and other details as well. The saved image will be trained using LBPH algorithm. This process is for the first entry to register the profile of the person.

Once the profile of the person is saved , then in the next entry the person will just have to click a picture, and the recently clicked picture will be compared with the image already stored in the dataset. And after the image is compared if the image is matched with the already existing picture the attendance will be marked and if not then a message will be shown **"No match found"** and that person image will be saved in folder.

4. COMPONENTS

The main components used in this system are the camera and open source computer vision library (Open-CV). Camera is used for capturing images and Open-cv is an open source computer vision and machine learning software library. It plays a major role in real time operation which is very important in today system. by using it one can process images and videos to identify objects, faces.

5. CONCLUSIONS

As a result of this literature survey we aim to get a more accurate face recognition based attendance system, we aim to get accuracy up-to 95% and also using this attendance system will also help the employees/ students to get a safe & touch less entry. And also it will easy to maintain the attendance.

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