RESEARCH PAPER

"FACE RECOGNITION IN E-ATTENDANCE"

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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 is vulnerable to proxies. This paper is therefore proposed to tackle all these problems. The proposed system makes the use of Haar classifiers, KNN, CNN, SVM, Generative adversarial networks, and Gabor filters. 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.

https://ijcrt.org/papers/IJCRTI020016.pdf

INTRODUCTION

Attendance systems of old practices are not quite efficient now a days for keeping track of students' attendance. Student enrollment in schools and colleges is increasing every year and taking each student's attendance plays a very vital role. So, it is necessary to discuss an effective system which records the attendance of a student automatically.

Maintaining attendance is very important in all the schools/colleges for checking the performance of students. Every school/college has its own method in this regard. Some are taking attendance of students manually using attendance registers or marking attendance sheets or file-based approach and some have adopted the methods of automatic attendance using some biometric techniques. But in these methods, students must wait for a long time in a queue at the time they enter inside the classroom.

Many biometric systems are available in the market, but the key authentications are the same in all the techniques. Every biometric system consists of an enrollment process in which the unique feature of a person is stored in the database and after that, there are some processes of identification and verification of the person. These two processes compare the biometric features of a person with previously stored template captured at the time of enrolment of a student. Biometric templates can be of many types like Fingerprints, Eye Iris, voice etc. Our system uses the face recognition approach for the automatic attendance of the students in the classroom environment without student intervention. Therefore, to draw the attention of students and make them interactive in observing technologies, we try to move on to the latest upcoming trends in developing attendance systems. To track the attendance of the students, we have introduced the attendance management system. With the introduction of this attendance system, skipping classes for students without the staff's knowledge has become difficult. The attendance management system is to count the number of students and urge students to attend the classes on time, to improve the quality of teaching.

https://ijrar.org/papers/IJRAR1CNP010.pdf

LITERATURE REVIEW

In [1] 2017 Samuel John presented a Face Recognition Attendance System with GSM Notification. This system uses theViolaJones algorithm. This algorithm used for detect faces. Also, Fisher faces algorithm was used to create patterns of the faces which were caught. That created templates stored in the database. This system used library which is OpenCV and used Software Development Kit (SDK) to create the graphical user interface.

In[2] other paper, Jenif D Souza introduces a Automated Attendance Marking and Management System by Facial Recognition. This system marked students attendanceautomatically by the camera which captures the photo of studentin the class. This system uses the algorithm called Histogram. Histogram algorithm used for face identification purpose. In this algorithm, The face image is converted to matrix form. Histogram are used for recognize of the exact faces. This system overcome the problem of time consuming.

In[3] 2019 Nandhini R. introduced Attendance System based on face recognition. This system capture the video of the students, convert it into frames and store it in the database.

Also, Convolution Neural Network(CNN) algorithm is used to detect faces. This System helps in improving the accuracyand speed.

In[4] 2019, Shreyak Sawhney, karan kicker, Samyakjain introduced Real Time Smart Attendance Management SystemUsing Face Recognition Techniques. In this system they use face detection and recognition method using convolution Neural Network and Principal Component Analysis (PCA) but using two camera some camera is used for the face detection and recognition at the door of classroom and the camera is used at inside the classroom for checking proxy attendance.

In[5] 2016, E Vardharajan, R Dharani, S Jeevitha,SHemalata introduced Automatic Attendance Management System Using Face Recognition. In this system the use Eigen Faces, Eigen Weight method for face detection this system the camera detention the image and then system crop the faces ofstudent and tie the faces with student database.

In [6] 2017, Poornima S, Sripriya N introduced Attendance Management System using Facial Recognition with Audio Output and Gender Classification. In this system they use Viola Jones algorithm and Principal Component Analysis(PCA) for the face recognition and they also use the gender classification and Voice conversion module. After the face.

In[7] 2018, Omkar abdul rhmansa lim introduced Class Attendance Management System Using Face Recognition. The system is based on RaspberryPi. By facing the camera. Itwill capture the image. The Raspberry Pi is a programmed to handle the face recognition by implement in the Binary Patterns algorithm LBPs.

In[8]2018,KritikaShrivastava,ShwetaManda,Prof.P.S. Chavan introduced Automated Attendance System based on Face Recognition and Gender Classification using HaarCascade, LBPH Algorithm along with LDA Model.

In[9] 2017, Prof. Arun Katara1 , Mr. SudeshV. Kolhe2 introduced Attendance System Using Face Recognition and Class Monitoring.This paper introduced the raspberrypi.They used OpenCv library installed for both. The web camera connected with raspberry pi and also database which is connected to pi.

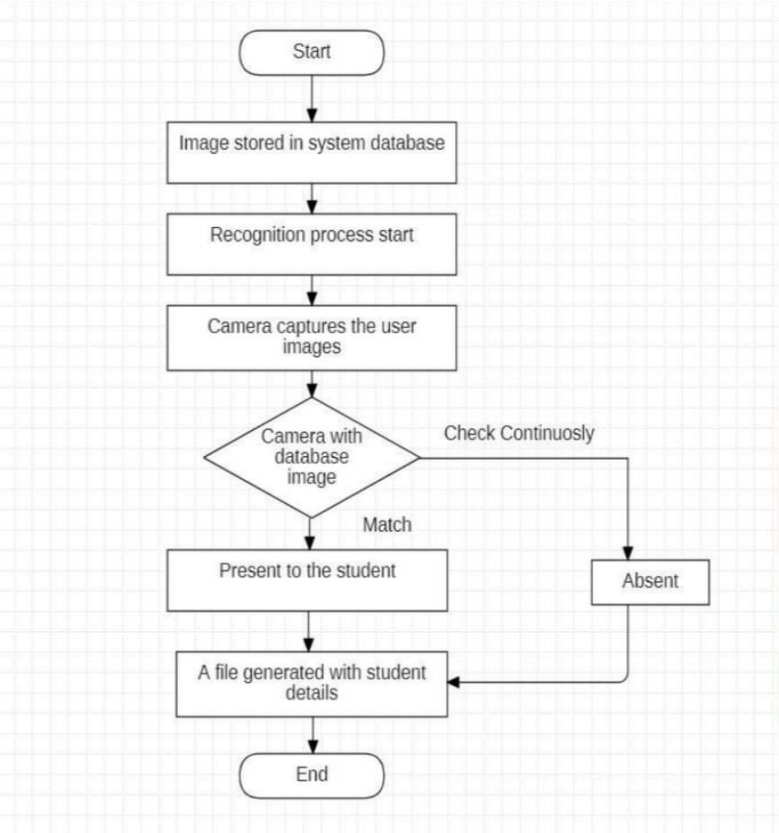
METHODOLOGY

The approach performs face recognition-based student attendance system. The methodology flow begins with the capture of image by using simple and handy interface, followed by preprocessing of the captured facial images, then feature extraction from the facial images, subjective selection and lastly classification of the facial images to be recognized. Both LBP and PCA feature extraction methods are studied in detail and computed in this proposed approach in order to make comparisons. LBP is enhanced in this approach to reduce the illumination effect. An algorithm to combine enhanced LBP and PCA is also designed for subjective selection in order to increase the accuracy. The details of each stage will be discussed in the following sections.

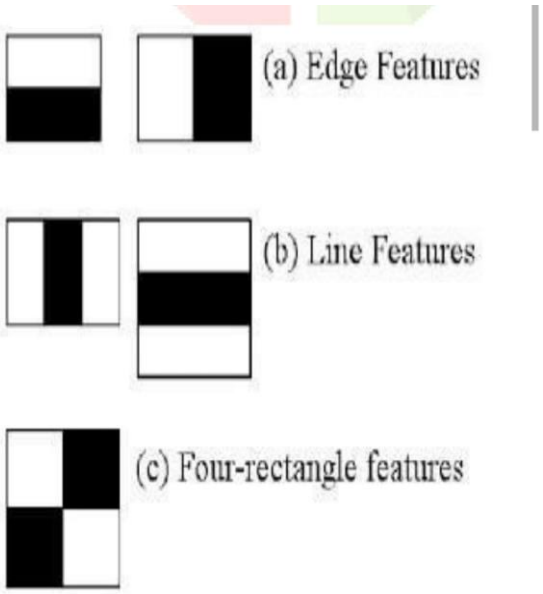
The flow chart for the proposed system is categorized into two parts, first training of images followed by testing images (recognize the unknown input image) shown in Figure 1 and Figure 2 respectively.

https://www.ijert.org/research/face-recognition-system-IJERTV8IS050150.pdf

PROJECT ARCHITECTURE



PICTORIAL VIEW OF THE CHART



DESCRIBED VIEW OF THE RECOGNITION

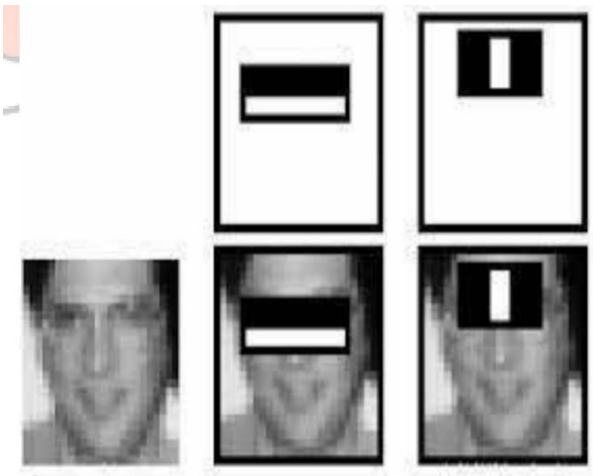


Fig. Max Pooling.

MAX POOLING

FEATURES

In this section, we describe the features of the proposed system, such as password protection, CSV file creation and updates, and live attendance updates. We also provide a screenshot of the GUI and explain the various components of the GUI.

1) Provides a valuable attendance service for both teachers and students.

2) Reduce manual process errors by provide automated and a reliable attendance system uses face recognition technology.

3) Increase privacy and security which student cannot presenting himself or his friend while they are not.

4) Produce monthly reports for lecturers.

5) Flexibility, Lectures capability of editing attendance records.

6) Calculate absenteeism percentage and send reminder messages to students.

7) Easily manageable by School/College Staff and convert in the form of excel sheet.

8) Avoiding the time losses during class started.

https://www.hindawi.com/journals/scn/2022/4246750/

Results & Discussion

In this section, we present the results of experiments conducted on the proposed system. We evaluate the performance of the proposed system on a dataset of 50 students and compare its performance with other state-ofthe-art approaches. We also discuss the impact of various factors such as lighting conditions, pose variations, and occlusion on the performance of the proposed system.

B Prabhavathi, V Tanuja, V Madhu Viswanatham and M Rajashekhara Babu, "A clever system of presence to see the face in the same way", IOP Conf. Series:Materials Science and Engineering 263, 2017

https://www.electronicid.eu/en/blog/post/face-recognition/en

Conclusion

In conclusion, the proposed Python-based face recognition attendance system with a GUI offers ease of use and interactivity. The LBPH algorithm is a robust and efficient approach for face recognition that can handle variations in lighting conditions, pose variations, and occlusion. The proposed system has shown better performance than other state-of-the-art approaches in terms of accuracy and robustness. We believe that the proposed system has the potential to revolutionize the attendance management systems in various industries.

Experimenting several techniques all technique is working well face recognition. Face Recognition Systems is based on face recognition. This system can be used to identify unknown person. In realtime scenarios, PCA outperforms other algorithms. The future work is for the recognition of the algorithm. In [10], the system developed only by recognizing the 30-degree angle variations that should be improved. Gait recognition can be fused with face recognition systems. Poor lighting conditions. Our system will perform well but it is not a perfect solution.

https://www.videonetics.com/meraface-facial-recognition-system

Future Enhancements

In future work, we plan to investigate the use of deep learning techniques such as convolutional neural networks (CNNs) for face recognition in attendance management systems. We also plan to explore the use of multi-modal biometric systems for attendance management, which can combine multiple biometric modalities to improve the accuracy and reliability of attendance management systems.

“A Train System Based on Fingerprints Using a Small Controller and LabView” (Kumar Yadav, Singh, Pujari, Mishra, 2015)

http://www.pace.ac.in/documents/ece/FACE%20RECOGNITION%20SYSTEM%20WITH%20FACE%20DETECTION.pdf

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