RESEARCH ARTICLE PEN CCESS

ATTENDANCE MANAGEMENT SYSTEM BY USING FACE RECOGNITION

Mr.C.Mani M.C.A.,M.Phil.,M.E., [1] ,V.kirubaa[2]

[1]Associate Professor, Department of Computer Science and Engineering, Nandha Engineering College (Autonomus),Erode,Tamilnadu,India.

[2]Final MCA,Department of Computer Application,Nandha Engineering College(Autonomus),Erode,Tamilnadu,India.

Email: [1]cmanimca@gmail.com,[2]v.kirubaakaran143@gmail.com

Abstract -Face recognition is the identification of humans by the unique characteristics of their Faces. Face recognition technology is the least intrusive and fastest bio- metric technology. It works with the most obvious individual identifier the human face. This research aims at providing a system to automatically record the students' attendance during lecture hours in a hall or room using facial recognition technology instead of the traditional manual methods. The objective behind this research is to thoroughly study the field if pattern recognition (facial recognition) which is very important and is used in various applications like identification and detection. Nowadays we are facing a pandemic, there is a situation where people are not ready to wear face masks, or they do not wear them properly, so, in this research, we are introducing an automatic mask detection system using image processing and soft computing techniques to tackle this problem. In the midst of the pandemic, covering our faces with a mask has become a new normal, as face masks are active in preventing the spread of the virus. Other precautionary measures are also advocated by the government apart from covering faces, to ensure protection and hygiene. In addition, because of the limited supply of masks in the industry, millions of people are learning to make their face masks. On the opposite, identifying faces with masks on any surveillance devices would be demanding while ensuring less access control in buildings. Face coverage with masks is a problem for algorithms and success in face detection. Currently, the authorities have to manually ask people to wear masks even then they tend to fool the authorities, to avoid that we are proposing a face Machine learning-based model of recognition. In the field of computer vision, not wear a mask, they are given an alert and they would have to wear a mask

INTRODUCTION

The technology aims in imparting a tremendous knowledge oriented technical innovations these days. Deep Learning is one among the interesting domain that enables the machine to train itself by providing some datasets as input and

provides an appropriate output during testing by applying different learning algorithms. Nowadays Attendance is considered as an important factor for both the student as well as the teacher of an educational organization. With the advancement of the deep learning technology the machine automatically detects the attendance performance of the students and maintains a record of those collected data. In general, the attendance system of the student can be maintained in two different forms namely. Manual Attendance System Attendance Management System. Manual Student Attendance Management system is a process where a teacher concerned with the particular subject need to call the students name and mark the attendance manually. Manual attendance may be considered as a time-consuming process or sometimes it happens for the teacher to miss someone or students may answer multiple times on the absence of their friends. So, the problem arises when we think about the traditional process of taking attendance in the classroom. To solve all these issues we go with Attendance Management System (AMS). Attendance Management System is a process to automatically stimulate the presence or the absence of the student in the classroom by using face recognition technology. It is also possible to recognize whether the student is sleeping or awake during the lecture and it can also be implemented in the exam sessions to ensure the presence of the student. The presence of the students can be determined by capturing their faces on to a high-definition monitor video streaming service, so it becomes highly reliable for the machine to understand the presence of all the students in the classroom.

LITERATURE REVIEW:

A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques, the idea of two technologies namely Student Attendance and Feedback system has been implemented with a machine learning approach. This system automatically detects the student performance and maintains the student's records like attendance and their feedback on the subjects like Science, English, etc. Therefore the attendance of the student can be made available by recognizing the face. On recognizing, the attendance details anddetails about the marks of the student is obtained as feedback.

Automated Attendance System using Face Recognition proposes that the system is based on face detection and recognition algorithms, which is used to automatically detects the student face when he/she enters the class and the system is capable to marks the attendance by recognizing him. Viola-Jones Algorithm has been used for face detection which detect human face using cascade classifier and PCA algorithm for feature selection and SVM for classification. When it is compared to traditional attendance marking this system saves the time and also helps to monitor the students.

4) Varadharajan et al., proposed a new attendance management system used by biometric concept. This system automatically replaces the existing traditional method. Traditional methods are a time consuming process and

maintenance of the system is also very difficult. In this proposed system make the attendance process with human contact. Here the camera is installed in the class room to collect the facial image and compared with the stored image and finally the attendance of the student is marked. The student is absent in the class, the system will automatically send the smsmessage to the stored contact peoples like parents. In this system the Eigen face method is used to identify the faces problem of face recognition.

C.B.Yuvaraj, et al., is developing a new system for record the student attendance using facial features. In this method the process method is divided into four phases. The phases are face detection, label the faces, train the data and label the dataset based on labeled data. The classifier is used to identify the faces. The input images are received from the class room.

PROBLEM STATEMENT:

The classical process is very tedious and hard to keep a track of. The task of every day attendance is a real struggle as it frustrates the one who is calling each name in every class that too in every single lecture. This leads in pure wastage of time, also the manual process leads to several miss-placing of the names and the marks of the attendance which irritates both students and the respective faculty.

The application isn't scalable to the most. Perfect attendance marking requires concentration and even the smallest of lapses can help proxies happen. Concentration lapses are natural and also the students sometimes forget to call out their names. This is again irritating for the teacher to revisit the page after a long lecture to mark the attendance of the students who 'forget'. The new system introduced will solve the problem to a greater extent.

PROPOSED SYSTEM:

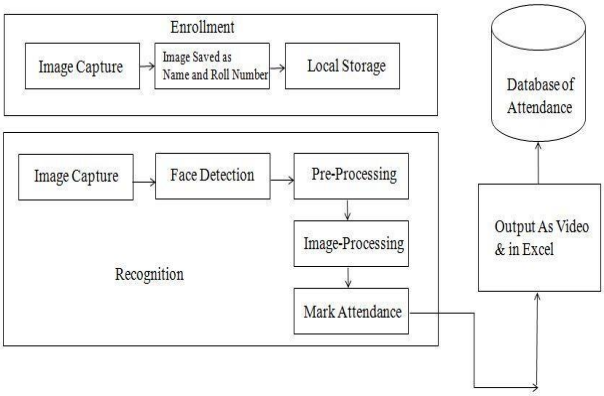
The architecture for the proposed system has been designed to keep it pretty straightforward and easy to understand. The steps that have to be undertaken to reach the final end step of the system which is making sure the attendance of the student is updated correctly and timely. The system can easily be accessed by anyone, where attendance of the students can easily be checked and maintained by the faculty as when required. The Droid-Cam ap will allow easy use for capturing live video feeds of the class and simultaneously perform recognition for the students. OpenCV-Python will be used to access the Haar Cascade and LBPH algorithms and their libraries that are required for training, recognition and matching of the captured images against the stored images available in the previously acquired data sets. The task of the proposed system is to capture the face of each student and to store it in the database for their attendance. The face of the student needs to be captured in such a manner that all the feature of the students' face needs to be detected, even the seating and the posture of the student need to be recognized. There is no need for the teacher to manually take attendance in the class because the system records a video and through further processing steps the

face is being recognized and the attendance database is updated. In the standalone application, face was captured by the webcam cameras and the detected faces are stored in desktop webcam folder. The entire process is described in the pseudo code [Put the camera on the door. If it detects someone then capture the

image and compare it with the stored database images If image matched then mark his/her attendance If not then ignore]The required infrastructure in classroom that camera should be positioned centrally in the front of the classroom. Using this setup, the camera is capable to capture frontal images from students. A different approach would be to use a camera at the entrance of the classroom, which would individually detect faces for everyone entering the classroom. Hardworking, aspirational and a correct attitude are the most important. The story of Michael Faraday, (the discoverer of electromagnetic induction) is a fine example of our claim.

ARCHITECTURE

Attendance management system using face recognition involves two steps, first step involves the detection of faces and second step consist of identification of those detected face images with the existing and to mark the attendance of each student. Once the face is identify with the image stored in CSV file, python generate roll numbers of present students and return that, when data is returned, the system generates attendance table which includes the name, roll number, date, day and time. And then passes the data to python to store the table into an excel sheet automatically. The data's is also stored in database for future use



Flow Chart of Attendance Management System

MODULES:

ENROLLMENT PROCESS:

The enrollment is done in three steps like Image capture, Storage of image, Local Storage these steps are involved to store the image of each and every student of the class.

A) IMAGE CAPTURE:

In Image capture first we need to take photo of the each student by using camera. The image of the student should be taken very clearly. There are various ways to acquire images such as with the help of camera or scanner. The acquired image should retain all the features.

B) STORAGE OF IMAGE:

In Storage of Image we need to store the student of each student in local machine. The format of the image should be saved in jpeg format only. This image is saved as student name followed by roll number of the each student.

C) LOCAL STORAGE:

In local storage we save the image in the local machine to retrieve the student image to check the live image to mark the attendance and also to take the student name and to take roll number.

RECOGNITION PROCESS:

The recognition process is done in five steps like Image Capture, Face Detection, Pre-Processing, Image Processing, Mark Attendance these steps are involved to mark the attendance of students.

IMAGE CAPTURE:

Performing image acquisition in image processing is always the first step in the work flow sequence because, without an image, no processing is possible. After the image has been obtained, various methods of processing can be applied to the image to perform the many different vision tasks. There are various ways to acquire images such as with the help of camera or scanner. The acquired images should retain all the features.

A) FACE DETECTION:

Face detection is important as the image taken through the camera given to the system, face detection algorithm applies to identify the human faces in that image, the number of image processing algorithms are introduce to detect faces in an images and also the location of that detected faces. We have used HOG method to detect human faces in given image.

B) PRE-PROCESSING:

The main goal of the pre-processing to enhance the visual appearance of images and improve the manipulation of data sets. Image pre- processing, also called image restoration, and involves the correction of distortion, degradation, and noise introduced during the imaging process. Interpolation is the technique mostly used for tasks such as zooming, rotating, shrinking, and for geometric corrections. Removing the noise is an important step when processing is being performed. However, noise affects segmentation and pattern matching.

C) IMAGE PROCESSING:

This is last step of face recognition process. We have used the one of the best learning technique that is deep metric learning which is highly accurate and capable of outputting real value feature vector. Our system ratifies the faces, constructing the 128- d embedding (ratification) for each. Internally compare faces function is used to compute the Euclidean distance between face in image and all faces in the dataset. If the current image is matched with the 60% threshold with the existing dataset, it will move to attendance marking.

D) MARK ATTENDANCE:

Once the face is identify with the image stored in CSV file, python generate roll numbers of present students and return that, when data is returned, the system generates attendance table which includes the name, roll number, date, day. And then passes the data to python to store the table into an excel sheet automatically. When system generates excel sheet by sending the compiled sheet in an array to python, the python first checks whether there exit

any excel sheet of that date, if yes then it create separateworksheet, so that attendance is differentiated for different subjects

RESULTS:

Attendance system proved to recognize images in different angle and light conditions. The faces which are not in our training dataset are marked as unknown. The attendance of recognize images of students is marked in real time. And import to excel sheet and saved by the system automatically

CONCLUSION

Smart attendance management system is designed to solve the issues of existing manual systems. We have used face recognition concept to mark the attendance of student and make the system better. The system performs satisfactory in different poses and variations. In future this system need beimproved because these system sometimes fails to recognize students from some distance, also we have some processing limitation, working with a system of high processing may result even better performance of this system

REFERENCES:

[1] Kar, Nirmalya, et al. "Study of implementing automated attendance system using face recognition technique." International Journal of computer and communication engineering 1.2 (2012): 100.

[2] RoshanTharanga, J. G., et al. "Smart attendance using real time face recognition (smart-fr)." Department of Electronic and Computer Engineering, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka (2013).

[3] Selvi, K. Senthamil, P. Chitrakala, and A. Antony Jenitha. "Face recognition based attendance marking system." Corresponding Author: S. Rajkumar*, Email: rajkumarsrajkumar@gmail. com (2014).

[4] Joseph, Jomon, and K. P. Zacharia. "Automatic attendance management system using face recognition." International Journal of Science and Research (IJSR) 2.11 (2013): 327- 330.

[5] Patil, Ajinkya, and Mrudang Shukla. "Implementation of classroom attendance system based on face recognition in class." International Journal of Advances in Engineering & Technology 7.3 (2014): 974.

[6] Kanti, Jyotshana, and Shubha Sharm. "Automated Attendance using Face Recognition based on PCA with Artificial Neural Network." International journal of science and research IJSR(2012).

[7] MuthuKalyani, K., and A. VeeraMuthu. "Smart application for AMS using face recognition." Computer Science & Engineering 3.5 (2013): 13.

[8] Deshmukh, Badal J., and Sudhir M. Kharad. "Efficient Attendance Management: A Face Recognition Approach." (2014).

[9] Wagh, Priyanka, et al. "Attendance system based on face recognition using eigen face and PCA algorithms." 2015 International Conference on Green Computing and Internet of Things (ICGCIoT). IEEE, 2015.

[10] Bhattacharya, Shubhobrata, et al. "Smart Attendance Monitoring System (SAMS): A Face Recognition Based Attendance System for Classroom Environment." 2018 IEEE 18th International Conference on Advanced Learning Technologies (ICALT). IEEE, 2018.

[11] Samet, Refik, and Muhammed Tanriverdi. "Face recognition-based mobile automatic classroom attendance management system." 2017 International Conference on Cyberworlds (CW). IEEE, 2017.

[12] Li, Xiang-Yu, and Zhen-Xian Lin. "Face recognition based on HOG and fast PCA algorithm." The Euro-China Conference on Intelligent Data Analysis and Applications. Springer, Cham, 2017.

[13] Arsenovic, Marko, et al. "FaceTime—Deep learning based face recognition attendance system." 2017 IEEE 15th International Symposium on Intelligent Systems and Informatics (SISY). IEEE, 2017.

[14] Rekha, N., and M. Z. Kurian. "Face detection in real time based on HOG." International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) 3.4 (2014): 1345-1352.

[15] Kwolek, Bogdan. "Face detection using convolutional neural networks and Gabor filters." International Conference on Artificial Neural Networks. Springer, Berlin, Heidelberg, 2005.