A Survey on Automated Student Attendance Management System Using Face Recognition

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Abstract: Maintaining attendance system of students of various classes and accessing them is a difficult task. Calling names of each student in each hour and keeping a record of the attendance is time consuming as well. Other issues would be false sign, name missing out in sheets, manually entering data to computers and there is also a chance of proxy attendance. The following system marks attendance based on the concept of face detection and face recognition. The daily attendance of all the students is noted subject wise and is stored by the administrator. Hence, accessing as well as storing the attendance system is easier and more efficient. It makes effective and perfect application of man power and resources.

Keywords: Attendance Management; Mobile Application; Face Recognition; Convolutional Neural Network (CNN); Machine Learning

I. INTRODUCTION

The Face detection refers to the concept of identifying human faces on referred images or videos. There are different approaches of algorithms to accomplish face detection. A face recognition system is a technology that is capable of matching a human face from a referred image or a video against a database of faces. The algorithm used in the proposed system is Convolutional Neural Networks (CNN).Our objective is to build a mobile application that helps faculties to take attendance in an easier way. We propose a system that would be automatically marking attendance of the students and keeping record by itself. The application also helps students view their everyday attendance record along with their eligibility criteria. The system applies face detection and face recognition algorithm to the snaps of students and maintain the attendance record for a longer period of time.

Students' data (names and roll numbers) is stored initially with the detected faces of students. Teacher takes snaps of the students and uploads it to the application after which it applies face detection and face recognition algorithms and marks attendance to the recognized students. Since the database already contains their names as well as their roll numbers, the attendance is marked for that hour of the particular system. Proposed system is being intended in such a way that many users can have a view with the system simultaneously. New system will exclude all manual and semi-automatic processes and make complete computation of student attendance management process.

II. LITERATURE SURVEY

A. Automatic Attendance System using Deep Learning

[1] This paper discusses about various frameworks proposed for participation the board utilizing various advancements. In view of this conversation another methodology for participation the board is proposed to be utilized explicitly for customary level schools. The proposed framework comprises of RFID part and Mobile application part. The RFID part is proposed for capturing understudy participation and recording in the back end information base. The application part is planned for imparting attendance data to their parents. The application part utilized as a backup for recording the attendance in the event if there is no power or no enough assets to send the RFID part.

[2] This system proposes an automated attendance management system which handles the issue of recognition of faces in biometric frameworks subject to various constant situations, for example, light, revolution and scaling. The model consolidates a camera that takes input image, a calculation to identify a face from the input picture, encode it and perceive the face and imprint the participation in a spreadsheet and convert it into PDF record. The camera of an android phone takes the picture

and sends it to the server where faces are recognized from data set and attendance is marked.

[3] This system presents another strategy utilizing Local Binary Pattern (LBP) calculation joined with advanced image processing, for example, Contrast Adjustment, Bilateral Filter, Image Blending and , Histogram Equalization to address a portion of the issues hampering face recognition accuracy to improve the LBP codes, hence improve the accuracy of the general face acknowledgment framework. The examination results show that the method is exceptionally precise, solid and powerful for face acknowledgment system that can be basically executed in real-life environment as a programmed attendance management system.

[4] This research develops the attendance system which intends to build up the confronting orderly framework to be more viable and the mechanic of the system which students can easily be approved. The trial of this research is to discover the best approach to recognize the face by utilizing the method of Android Face Recognition with Deep Learning which can accurately recognize up to 97%. The data set is associated with Attendance Management System web worker by utilizing cloud storage. The outcome on screen on the application has the goal of students confirming and checking the data.

[5] The proposed framework gives highlights such as recognition of faces, extraction of the highlights, discovery of removed highlights, investigation of students' attendance and monthly report. The proposed system incorporates methods, for example, picture contrasts, integral pictures, Ada-Boost, Haar-like highlights and falling classifier for detecting features. Faces are perceived using progressed LBP utilizing the information base that contains pictures of students and is utilized to recognize faces of students utilizing the caught picture. Better precision is achieved in outcomes and the framework considers the progressions that happens in the face throughout the time frame.

[6] The proposed system comprises of a high resolution digital camera that is placed on a gate/door to monitor the class. The pictures captured by the camera are lead to a computer application for further analysis. The obtained pictures are compared to reference images that are stored in the database. The references images are of the students. This framework targets giving a system to consequently record the students' participation during class hours in a room utilizing facial recognition innovation rather than the conventional manual methods. The target behind this research is to completely examine the field if pattern recognition which is vital and is used in different applications like identification and detection.

[7] This system uses face detection which is used to recognize human face and concentrate the locale of interest. It further deals with the areas of interest via face recognition methods. This system offers a novel and robust hybrid procedure of skin-color model for face detection and indistinct neural network to recognize the faces which are already detected. Proposed hybrid algorithm would be given with high precision and low false positive outcome by using skin shading model and speed processing to recognize the detected picture by utilizing fuzzy neural network.

[8] The system starts the procedure through Create Training Dataset by using face detection method. Create Training Dataset refers to applying face detection algorithm to the selected images from database and storing the face in the database. Work-flow of the proposed system for detecting face is, load pictures from Yale base, apply pre-processing which includes rgb to gray transformation and the process of histogram equalization. Haar classifier is applied on handled picture to identify face and the detected faces are stored in Training data set. After consummation of first stage the subsequent stage of face recognition, dependent on strategies PCA starts. The framework loads a picture from Yale information base, then rgb to gray and histogram equalization pre-processing are applied on the pictures. Haar classifier used face detection is applied to detect face. Further, PCA method is applied for highlights (feature) extraction that is important features of the face. Then Euclidean distance classifier matches these features to training database. If they are matched, it means that the faces are recognized.

[9] The computational model add to speculative pieces of information just as to various practical applications like motorized gathering observation, will control, plan of human PC interface (HCI), content based image data set the heads, criminal recognizable confirmation, and so forth. Face recognition is a process that individuals perform regularly and effectively in our step by step lives. In the proposed methodology, the light normalization in a pre-planning stage is used to remove the brightened parts from the photos. The results of this assessment showed up at 86.76% of acknowledgment on the Multi-PIE data set that was used to survey SSR + LPQ.

[10] This system tends to the present status of the craftsmanship qualities and shortcomings of the face, general face, and hybrid (2D, 3D and 2D+3D respectfully) face recognition strategies. Few popular face recognition techniques including Eigenfaces, Fisherfaces and Local Binary Pattern (LBP) are critically evaluated. Moreover, the acquired results of these techniques are compared against the system's novel A-LBP (Augmented Local Binary Pattern) face recognition technique. Receiver Operating Characteristic (ROC) curve is plotted on the face databases like AT, T-ORL and Indian Face Database (IFD), Extended Yale A, Yale B, Labeled Faces in the Wild (LFW) and Own database and then the results are verified. A-LBP face recognition technique performs in a way that is better than Eigenfaces, Fisherfaces and LBP strategies, particularly for those facial data sets having varieties like gentle posture and surrounding brightening.

III. RELATED WORKS

Coordination of facial acknowledgment calculation is done with AI calculation into the process of automatic attendance system. This framework is executed in essential and crucial guideline on the presence of an advanced camera in the room. The computerized camera would catch two pictures in the time timespan minutes in a talk of 50 minutes. Then the picture would be given to framework and it would extract all the faces from the picture. Now the face would be contrasted and the current prepared model of appearances and checks if face exists in the database or not. On the off chance that face exists on current information base, at that point the framework would save one of a unique ID of student data set or it disposes of on the off chance that it doesn't exist in data set. In this paper, they have addressed various problems such as real-time face detection, multiple face detection and integration with the machine learning algorithm.

During the implementation of an idea, the real problem was the extraction of a face from the image in real time. To address this issue we utilized Tensor Flow assessor API to arrange various faces utilizing Deep Neural Network (DNN) which again gets prepared from the pictures extricated continuously. However, detecting face like patterns constitutes just a part of the problem. One must implement a face recognition algorithm which is used to positively identify a student from a database of students. To address this issue, facenet develop by Google is used to which is a pre-trained model in 150000 images inspired by Google pixel.

IV. CONCLUSION

Attendance Management of students is a difficult and time consuming task. The purpose is to make the task easier with the help of a mobile application. Attendance marking is done on the application after using face detection and face recognition algorithms. We have inferred different algorithms and methods that can be used for facial recognition and detection using ML from the papers. Storing and retrieval of data will be fast and can be maintained efficiently. All the data will be fed into the application immediately and reports are generated that require no paperwork. The resources being used by the system will be compatible with the latest technologies available in the market and will be very less wear and tear, making it highly accurate.

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