



Android Application for Smart Attendance Management System by Using Face Recognition

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March 15, 2020

AN ANDROID APPLICATION FOR SMART ATTENDANCE MANAGEMENT SYSTEM BY USING FACE RECOGNITION

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ABSTRACT

Stylish Attendance using Real-Time Face Recognition is a real-world solution which comes with day to day activities of handling student attendance classification. Face recognition-based attendance classification is a process of recognizing the students face for charming attendance by using face biometrics based on high - definition monitor video and additional information technology. Manual entering of attendance in logbooks becomes a difficult task and it also wastes the time. So it is designed a competent module that comprises of face recognition to manage the attendance records of employees. Our module enrolls the staff's face. This enrolling is a onetime process and their face will be stored in the database. During enrolling of face it require a system since it is a onetime process. It is proposed an automatic audience management classification. It was entirely based on face recognition and the face recognition. This both detection and recognition will mechanically detect the students in the classroom and scratch the attendance by recognizing the person. This research includes for Face detection Students and system is based on CNN perspectives and algorithms

Key Words: Face recognition, Face detection, Deep Learning, Convolution Neural Network.

1. INTRODUCTION

Maintaining the attendance is very important in all the institutes for checking the performance of employees (4). Every institute has its own method in this regard. Some are taking attendance manually using the old paper or file based approach and some have adopted methods of automatic attendance using some biometric techniques. But in these methods employees have to wait for long time in making a queue at time

they enter the office. Many biometric systems are available but the key authentications are same is all the techniques. 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.

2. RELATED WORK

2.1 A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques:

In this paper, 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 and details about the marks of the student is obtained as feedback.

2.2 Automated Attendance System Using Face Recognition:

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.

2.4 Face Recognition-based Lecture Attendance System:

This paper proposes that the system takes the attendance automatically recognition obtained by continuous observation. Continuous observation helps in estimating and improving the performance of the attendance. To obtain the attendance, positions and face images of the students present in the class room are captured. Through continuous observation and recording the system estimates seating position and location of each student for attendance marking. The work is focused on the method to obtain the different weights of each focused seat according to its location. The effectiveness of the picture is also being discussed to enable the faster recognition of the image.

Face recognition is crucial in daily life in order to identify family, friends or someone it are familiar with. It might not perceive that several steps have actually taken in order to identify human faces. Human intelligence allows us to receive information and interpret the information in the recognition process. It receive information through the image projected into our eyes, by specifically retina in the form of light. Light is a form of electromagnetic waves which are radiated from a source onto an object and projected to human vision. In this RFID based system have been proposed where the students carry their ID card that card has the radio frequency waves with the help of that waves the reader will record the attendance when the card is placed on the reader .By this system any authorized person may use and enter the classroom or organization.

3. EXISTING SYSTEM

In the Fingerprint based existing attendance system, a portable fingerprint device need to be configured with the students fingerprint earlier. Later either during the lecture hours or before, the student needs to record the fingerprint on the configured device to ensure their attendance for the day. The problem with this approach is that during the lecture time it may distract the attention of the student

4. PROPOSED SYSTEM

The various techniques for marking attendance are:

- 1) Signature based System
- 2) Fingerprint based System
- 3) Iris Recognition
- 4) RFID based System
- 5) Face Recognition

Amongst the above techniques, Face Recognition is natural, easy to use and does not require aid from the test subject. It is a series of several related problems which are solved step by step:

1. To capture a picture and discern all the faces in it.
2. Concentrate on one face at a time and understand that even if a face is turned in a strange direction or in bad lighting, it is still the same person.
3. Determine various unique features of the face that can help in distinguishing it from the face of any other person. These characteristics could be the size eyes, nose, length of face, skin color, etc.
4. Compare these distinctive features of that face to all the faces of people we already know to find out the person's name.

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.

5. IMPLEMENTATION

The method proposed in this paper is marking attendance using face recognition technique. As shown in Fig 5 1, the attendance is recorded by using a camera that will stream video of students, detect the faces in the image and compare the detected faces with the student database and mark the attendance. The attendance gets marked in a spreadsheet which gets converted into PDF file which is mailed to the concerned e-mail Ids.

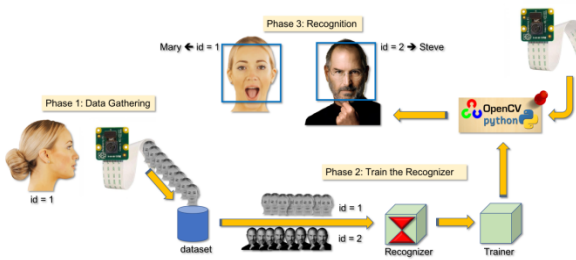


Fig 5.1 Face Recognition system

The project has two main parts:

- 1 Development of Face Recognition System.
- 2 Development of Attendance System.

Face recognition is achieved using machine learning and the basic pipeline used for it is as follows:

1. Finds face in an image.
2. Analyses facial features.
3. Compares against known faces and makes a prediction.

Development of complete attendance system is achieved using UI and Android application. Here the application takes data like subject details, faculty details, date and time and provides a click to start the attendance. The images of students are clicked and sent to Linux server where python script runs to mark attendance and generate spreadsheet and PDF file which is then mailed.

5.1 ENCODING IMAGES

Face Detection

Face Detection is the process where the image, given as an input (picture) is searched to find any face, after finding the face the image processing cleans up the facial image for easier recognition of the face. CNN algorithm can be implemented to detect the faces.

CNN algorithm

In neural networks, Convolutional neural network (ConvNets or CNNs) is one of the main categories to do images recognition, images classifications. CNN image classifications takes

an input image, process it and classify it under certain categories.

A CNN (Convolution Neural Network) uses a system like a multilayer perceptron that has been designed to process the requirements faster. The CNN layer consist of an input layer, an output layer and a hidden layer that includes multiple convolution layers, pooling layers, fully connected layers, and normalization layers.

The removal of limitations and increase in efficiency for image processing results in a system that is far more effective, simpler to trains limited for image processing and natural language processing.

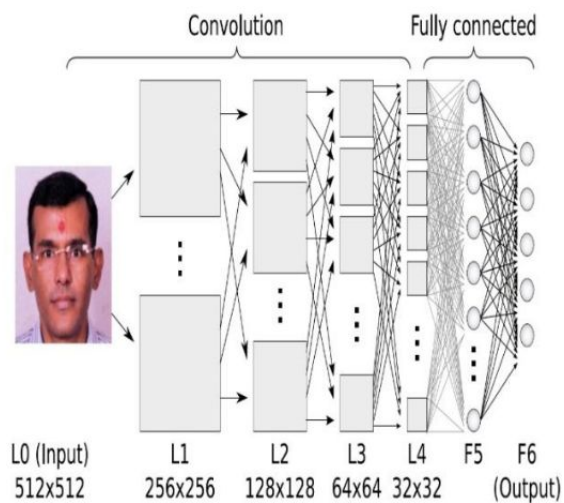


Figure 5.2 Multilayer Process

Next step involves recognizing the detected face for which it need to extract a few basic measurements from each face. Then it could measure our unknown face the same way and find the known face with closest measurements. The most accurate approach is to let the computer figure out the measurements to collect itself.

Deep learning does a better job than humans at figuring out which parts of a face are important to measure. The solution is to train a Deep Convolution Neural Network to generate 128 measurements for each face. The training process works by looking at 3 face images at a time:

1. Load a training face image of a known person.
2. Load another picture of the same known person.
3. Load a picture of a totally different person.

Then the algorithm looks at the measurements it is currently generating for each of those three images. This process of training a convolution neural network to output face embeddings requires a lot of data and computer power. So this step only needs to be done once and several trained networks are already been published by Open Face.

The proposed attendance system used some simple classifiers for face recognition, including logistic regression (LR), linear discriminant analysis (LDA), and k-nearest neighbor (k- NN). Such classifier was chosen since it does not require a high computational cost and a high computer resource.

6. CONCLUSION

Automatic Attendance System has been envisioned for the purpose of reducing the errors that occur in the traditional (manual) attendance taking system. The aim is to automate and create

a system that is useful to the organization such as an institute. The efficient and correct method of attendance in the office environment that can replace the old manual methods. This technique is secure enough, reliable and available for use. No need for particular hardware for installing the system in the office. It can be construct using a camera and computer.

7. REFERENCES

[1]. N.Sudhakar Reddy, M.V.Sumanth, S.SureshBabu, "A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques",Journal of Emerging Technologies and Innovative Research (JETIR), Volume 5, Issue 12, Dec 2018.

[2]. Dan Wang, Rong Fu, Zuying Luo, "Classroom Attendance Auto-management Based on Deep Learning",Advances in Social Science, Education and Humanities Research, volume 123,ICESAME 2017.

[3]. AksharaJadhav, AkshayJadhav, TusharLadhe, Krishna Yeolekar, "Automated Attendance System Using Face Recognition", International Research Journal of Engineering and Technology (IRJET), Volume 4, Issue 1, Jan 2017.

[4]. B Prabhavathi, V Tanuja, V MadhuViswanatham and M RajashekharaBabu, "A smart technique for attendance system to recognize faces through parallelism", IOP Conf.

Series: Materials Science and Engineering 263, 2017.

[5] Viola, Paul, and Michael J. Jones, "Robust real-time face detection", International journal of computer vision 57.2 (2004):137-154.

[6] Degtyarev, Nikolay, and Oleg Seredin, "Comparative testing of face detection algorithms", Image and Signal Processing. Springer Berlin Heidelberg 2010. 200-209.

[7] Nilesh D. Veer, B. F. Momin, "An automated attendance system using video surveillance camera", IEEE International Conference On Recent Trends In Electronics Information Communication Technology, May 20-21, 2016.

[8] Nazare Kanchan Jayant, SurekhaBorra, "Attendance Management System Using Hybrid Face Recognition Techniques", Conference on Advances in Signal Processing (CASP). Jun9-11, 2016.

[9] T.Lim,S.Lim and M.Mansor, "RFID based Attendance System", IEEE Symposium on Industrial Electronics and Applications, Oct2009,vol 2,pp.778-782.

[10] Rashid. R.A., Mahalin, N.H., Sarijari, M.A., and Abdul Aziz, A.A. "Security system using biometric technology: Design and implementation of voice recognition system (VRS)", International Conference on Computer and Communication Engineering, 2008, pp.898-902.