Attendance using Artifical Intellengence

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Abstract

Attendance has always been a topic of debate. As student want to be treated as adult and don't want professor to take attendance, whereas professor take attendance to make student attend college as it's very important for overall growth of the student. Sometime professor uses attendance as a category to award marks to students. In most of the colleges in under developed or developing countries like India, professor still uses registers to take attendance. And using registers and taking each student's attendance is a time consuming process, on an average class of 60 students taking attendance manually with roll-on. Takes 5 min (approx). This paper shows a methodology based on facial recognition technique to take attendance which automates the complete process and the attendance is marked as well as stored in the database, when required professor can check the attendance by calling the values from the database.

Keywords - *facial recognition technique, database, values.*

I. INTRODUCTION

A. Importance of attendance

For successful college life, it's most important to attend college regularly, because in most of the cases it has been observed that student with low attendance are unable to perform well in examinations. And it's very important to attend college on regular basis, as it helps in overall growth of the student. It helps student develop healthy life habit and often help them score good marks in exams. And it also helps them to stay connected to the community, help them make friends.

Taking attendance daily is a very important part of teachers or professor's daily routine as it helps them keep a proper record of each and every student. To know if a student is present or absent on a given day. Further they can analyses the record to find out who are low on attendance and may need little external motivation, in order to start attending college on regular basis. It is also completely common for law enforcement agencies to contact the institution and ask for attendance of a particulars student. Therefore keeping an accurate record of attendance of each and every student is one of the most important jobs of institution.

B. Methodology used

In most of the colleges in India, still attendance is recorded in attendance register manually by the professor. Not only India, all the developing or under developed countries. Countries like Bangladesh, Nepal, Pakistan still uses the old method to take attendance. Whereas other colleges in India has started taking attendance using biometric attendance machines which is a machine for marking attendance by biometric finger scanning, colleges like Indian institute of technology Kanpur, Indian institute of technology Bombay and others. Biometric finger scan is fast process as compared to the classical method, it takes 1 to 5 seconds of student's time and there is no role of professor in taking attendance. And there is one more modern approach of taking attendance is online attendance system.

C. Issues with current methods

In classical method where attendance register is used both student's as well as professor's time is consumed in taking attendance. When coming to modern methodology of biometric system, professor has no role in it but still student's times is used in giving the attendance. For solution of this issue we need a system, where students don't have to do anything and the attendance gets marked by itself.

II. FACIAL RECOGNITION TECHNIQUE

Facial recognition technique is recognizing faces at real time with a trained model. This is the technology used in face unlock features provided in modern Smartphone nowadays. In this paper we will talk about implementation of "open source computer vision library", the opencv in order to develop the artificial intelligence system based attendance system.

When it comes to facial recognition, the complete process for developing the system to recognize faces can be divided into three phases.

i. Face detection and data gathering
ii. Training the recognizer
iii. Face recognition

A. Face detection and data gathering

In this process we detect the face and collect all the data we need. In this step camera takes lots of images from all possible angle. And then the images are processed to decrease size, images with small size makes the training fast. After images are processed labels are also added to the images. In the following system we will use student's name as label with the image of the student for training our model.

B. Training the recognizer

In this process we pass the dataset with labels and images to the recognizer which then process the data and generates an .yml file.

C. Face recognition

Now the .yml file generated by recognizer is passed to the system running opencv and now this system can use the .yml file data and create a model to recognize images either in real time or from images.

III. USING FACIAL RECOGNITION SYSTEM FOR TAKING ATTENDANCE

We use facial recognition system to take attendance of a class. The attendance is marked all by itself and also stored in the system. When require professor can get the attendance of any student from the system. Requirement for the system:

A. images of student with labels

We need lots of images of student, because number of images used is directly proportional to the accuracy of the system. And the number of images used in the dataset for every student should be equal. Also the images should be taken from different angles, so that machine can be very precise. And the images should be labeled properly with student names or we can use a specific id for every student, as because sometime two or more students in the same class can have same name.

B. server running recognizer

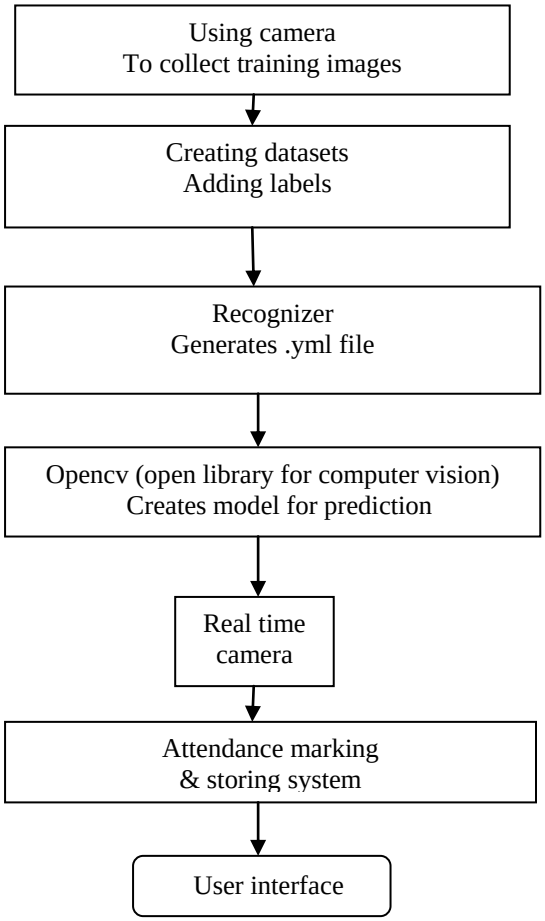
We will need a server that will run the recognizer or instead we can run it in our local machine. We will pass the dataset that contains images with labels to the recognizer and recognizer will pass us the .yml file. (pre-caution) We should be sure that number of images provided to the machine is equal to the multiplication of number of students in the class and number of images each student, or in other word number of images provided by each student should be equal

C. Server RunningOopencv & Trained Model Attached to Camera

We use opencv here which is a open library for computer vision and we will pass our .yml file to the opencv code running on the server and we connect a camera to the server. This camera will be fixed in the class room at an angle from where it can cover the whole class if required more than one camera can be used. And with the camera attached to server. We will be able to recognize student present in the class. And we can apply conditions as per requirement and rules in order to mark attendance.

For example: if a student x is in class for 30 minutes the mark present. And what basically machine will do in the time or recognition and testing is that it will give unique id to each and every student of the class. Once a student get recognized by our system it will keep checking the presence of student in class for 30 minutes and if the student is present in class for 30 minutes or more that 30 minutes the system will mark that student's present or vice versa. And if a student is present that the system will pass a value of 1 to the database and give it to the unique id and add it to the total attendance and if a student is absent then system will pass 0 to the unique id of those students who are absent and add it to their total attendance.

D. System Representation



IV. CONCLUSION

This system is very accurate as compared to other systems because sometime student tries to give fake attendance of their classmates, which is not possible with our system. The system will mark a student present only if the students attend the class. And also in this system nor professor nor the student have to invest their precise time to give attendance. If specified the student will only get attendance only when attended lecture for more than a threshold time. As it was 30 minutes in the above example. This system can also calculate other things such as total percentage and can also point out those students who are low on attendance. The system can also keep all the record very accurately as it's not possible in the case of professor making and keeping the record as human's mostly makes mistake. But with artificial intelligence the chances of mistake is very low.

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