**AUTOMATED ATTENDANCE SYSTEM**

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**Introduction:**

The traditional manual methods of monitoring student attendance in lectures are tedious as the signed attendance sheets have to be manually logged in to a computer system for analysis. This is tedious, time consuming and prone to inaccuracies as some students in the department often sign for their absent colleagues, rendering this method ineffective in tracking the students’ class attendance. Use of the face detection and recognition system in lieu of the traditional methods will provide a fast and effective method of capturing student attendance accurately while offering a secure, stable and robust storage of the system records where upon authorization; one can access them for purposes like administration, parents or even the students themselves.

**Problem Description:**

In most educational institutions the attendance is taken manually. It is not only time consuming, but it is also unsecure and unreliable and it can be lost. Some institutions are using punch card for attendance while this will be difficult for teachers to keep track of the large number of students because by using punch card, a student can help the other students or his/her friend to punch their card even the other student may be absent or come late in class, so it is not reliable.

To overcome these problems I have developed a better system application; it is fully responsive where a user can use different computer systems. In this system records are kept safe and secure and the attendance information of particular or all students of particular class can be accessed easily and without time consuming, the report is generated automatically.

The main characteristics of my developed system is that it is fully responsive and flexible. It can be accessed from any computer no matter where you are.

The objective of using such a system is to eliminate duplicate data entry and errors in time and attendance entries, eliminate paperwork and save time, automatic calculation of attendance and to increase security.

**Data Description:**

The type of my data will be image type. The sample consists of some images from class, the system will take a picture on the first day and after analyzing it will add the details of the students who are present into the dataset. If a new student comes into the next class it will add the detail of that student while for the ones who were present in the last class and are present today as well - it will do a +1 into their attendance. This way it will keep a check on attendance of all the students in the class. Right now I have around 10 instance but since it will start working on the attendance for that class from the first day by taking that picture and will keep adding new pictures for every class so this way we will keep adding more data into the database. I don’t need to classify my data since it is not a classification problem so I don’t need one right now.

**Preprocessing:**

For pre-processing I am thinking about taking 4-5 pictures every day and then I can pick the best one among them since the facial recognition algorithm is robust I don’t think I really need a special pre-processing step. Same is the case with segmentation, with the facial recognition algorithm the data can be collected with one picture and there’s no need for segmentation. Like I said I will take multiple pictures for a particular day and then I can pick the best one.

About labelling, since the pictures will be taken in every class and I will be using my cell phone for the same so in my phone it will automatically put a time-stamp on that picture so we don’t need to label them. But yeah if we are taking a picture via some other source we can label the pictures for that particular date. About the text, I will be working manually to measure accuracy. I will take manual attendance and will match it with my result. There will be no text analysis since I am working with image data.

**Processing:**

The application have a dataset of all the students i.e. a picture of all the students and the name of the picture is the student’s name. Then the application scans for all the faces in the class, before scanning the faces it reads all the pictures which are already there in the dataset.

Once the application is done with reading the dataset, it scans the faces in the class and matches it with the pictures already there in the dataset. On comparison, it finds out the name of the students who are present in the class. Once the comparison is done, it prints the name of all the students who are present and the ones who are absent. It looks for all the familiar faces in the class and starts comparing the one which is closest to the camera and then keeps on moving to the next one.

For new students we need to add their picture first so the system can compare their details as well.

**It works with the ‘dlib’ library which we imported in the program by ‘import face\_recognition’ module. It’s network uses the resnet model(image classification model). The face\_recognition module is built using dlib’s state of art face recognition.**

**Dlib is a modern toolkit containing machine learning algorithms and tools for creating complex software to solve real world problems. From Dlib we used the Deep Learning Algorithm which is already there in the Dlib and accesses through face\_recognition module.**

**Results:**

The application matches the current picture with the pictures of the students already stored in the dataset. Then it prints the names of the student who are present in the class and the ones who are absent. It gives an accuracy of 90-95%(with a really big dataset), while for small dataset it’s always 100%.

**Analysis of result/approach:**

The results I got were 90-95% correct, the only thing was that sometimes the application takes a bit longer to see all the faces while there’s a bit dataset. Then it checks it with the faces already stores in the dataset.

**Conclusion:**

In this work, the attendance management system is developed using Python language. This system overcome many limitations incorporated in attendance, this system saves a great amount of time and reduces errors which may occur during attendance calculation. The system I have developed is fully responsive which can be used in different computer systems. Some other benefits are, it is automated for easy accessibility. It is a dynamic and flexible system. It excludes paperwork and the possibility of making mistakes while using paper for taking attendance. Also, it is very user friendly and handy. Moreover, the records of current and previous can be available in prompt and an immediate.

**References:**

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