STUDENT ATTENDANCE $ ATTENTION SYSTEM (AUTO AND MANUAL)

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Abstract: This research paper discuss the two of the process, first is marking the attendance of the students by analyzing their face structure and the second is studying their attentiveness during the class. The main aim of developing this python based application is to provide a complete school or college-based attendance management and attentiveness system for students and a profile system for staff and management. this system will monitor the attendance of the students for the entire year in the class by recognizing their faces with the help of Haar cascade, use for object identification as well as detection and LBPH Face recognizer. The attentiveness will be monitor considering face gestures such as yawning and inattentiveness, Dlib is used to detect facial features and landmarks like mouth distance and eye ratio of a person.

Keywords **- Attendance system, Attention System, Qt designer, Python, Haar cascade, LBPH face recognizer, Dlib**

I. INTRODUCTION

A face can be analyzed by its relative position, size or shape of eyes, nose, cheekbones and jaw. As a person's face has a high degree of variability in its appearance through various positions, it makes face detection a difficult task in the field of computer science and image recognition. In a face recognition system accuracy and recognition speed complexity plays an important role. This paper aims to give us an analysis of some various face detection and recognition methods. Also it provides an outline of an image-based face recognition attendance maintaining system with an advantage of good accuracy, speed and response rate. The analysis which is provided is constructed by performing various tests on a large database of student images in terms of poses, orientation and emotions they show.

The system is divided into Auto and Manual attendance and attentiveness mode which gives faculty the opportunity to maintain the record of a student using any mode and if one mode fails or serves any issues the other one is always prompt to be working. Faculty data is to be feed securely and should be attainable only to the administrator when required. Student's daily attendance will be entered by the faculty and they will be able to manage perfectly. In the existing system, the corresponding faculty enters attendance details in files. If the administrator wants to know the student information, they will search the sheets, this consumes a lot of time. Thus, using this product, the faculty can just simply download the excel sheet which will be updated onto their system. This will be the project that eliminates the problem and makes the process automated.

II. BASIC CONCEPTS OF SENTIMENTAL ANALYSIS

Attendance Marking In a simple terms, it access the presence of a student in a room in order to evaluate the attendance of an individual as a proof for the records.

Attentiveness: It evaluates the activeness in a person existing at a place on the basis of their devotion, actions and gestures. A person is said to be inattentive if they interprets the in-activeness.

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Auto system: The auto system is reliable to work automatically without any assistance needed by the human being to fill in the attendance of a person attending the class or an event.

Manual system: The manual system here does not represent the traditional ways of marking the attendance and acknowledge the inattentiveness in a student. It represent an additional function or choice in a system for manually marking and detecting the presence of a person by the Host.

III. RESEARCH METHODOLOGY

The methodology section outlines the plan and method of how the study is conducted.

3.1 Data and Sources of Data

The system uses MySQL as a language for the database used in training, and the migration methods for selecting various types of databases for the system such as SQL Server, SQLite. It is vital to understand what is database, an application that contains the organized collection of records and data. It can easily be accessed or managed by the user using this system. It allows us to organize data in tables with rows, columns and indexes to quickly find the relevant information in a form of excel sheet. Each database contains distinct APIs to perform various database methods like creating, managing, accessing, and searching the data stored in it.

MySQL is a database management system software used in mantaining the database, an open-source database software, supported by Oracle which is fast, scalable, and easy to operate database management system in comparison with Microsoft SQL Server and Oracle Database or any other database management systems available. We are simply using it to create powerful and dynamic server and application.

Figure 1. Adding a new person in the record

3.2 Theoretical framework

Designing:

To create a GUI for our windows and dialogs we have used **PyQt**(Qt designer), we can take two main paths: either we can use Qt Designer, or we can hand code to the GUI in plain Python code. The first path can improve the productivity, whereas the second path puts us in the full control of our application code. GUI applications often consist of main window and dialogs. If you're looking to create some graphical components user-friendly way, then Qt Designer is the tool for you.

Qt Designer is a tool that provides us with a what-you-see-is-what-you-get (WYSIWYG) user interface to create GUIs for your PyQt applications in an easy way. With the help of this tool, we can easily create GUIs by dragging and dropping QWidget objects in an empty form. After that, we need to arrange them in coherent GUI using different layout methods. Using Qt Designer also allows us to preview our GUIs using different styles and resolution, connect some signals and slots, create menus and toolbars that develops the outlook of this project.

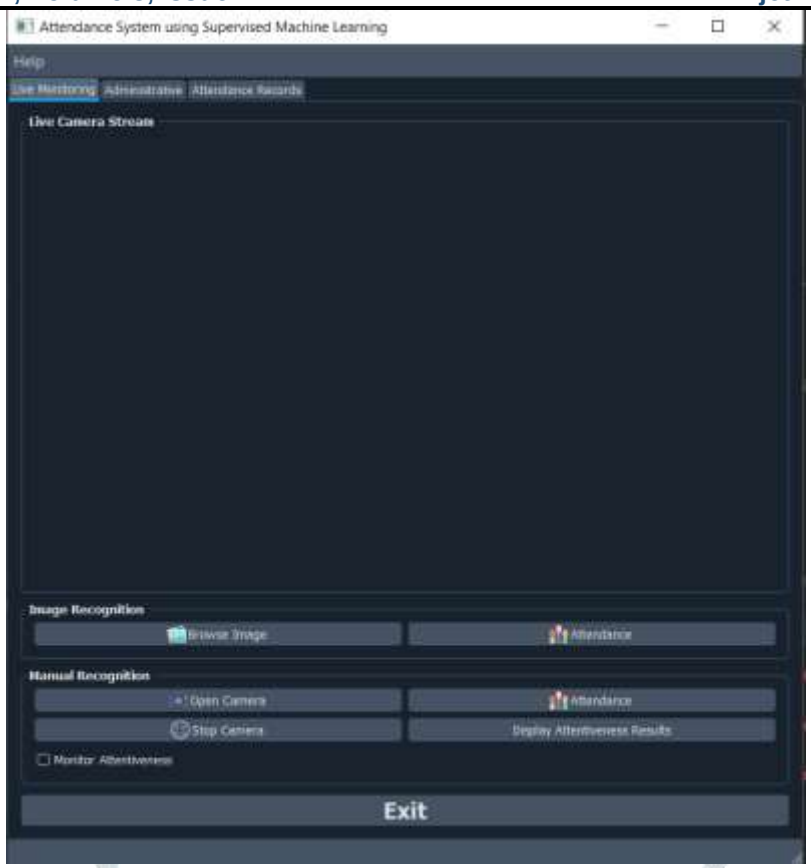

Figure 2. Live streaming and menu for record of data

Programming:

We have used **Python** because it can be feasibly used on server to create web applications and can easily connect to database which is the most important aspect of our paper to study the database of a student individually. Python can also read and modify files and handles the big data at the same time. The ease of use of python is one of the main reason for using it with machine learning algorithms. Python has many inbuilt modules and packages that help us to train and test various machine learning algorithms and make different models. It makes it a lot easier for the developer to clean the data and visualize it so as to focus more on the problem using the python.

3.3 Algorithms :

- **Haar cascade** -

  Haar cascade is an algorithm for detection of object. This algorithm is used to identify the face in an image or in a video. It is a machine learning based approach which uses a lot of positive and negative images to train the classifier. Positive images are the images that we want our classifier identify and negative images are the images that we don't want our classifier to identify. We have used the haar cascade algorithm for the identification of the face and to count the number of times eyes blink.

- **LBPH Face recognizer -**

  Facial recognition has always undergone through a consistent research area due to its nature of being non-modelling and having diverse applications. Due to this, many day-to-day activities are now being carried out electronically rather than in pencil and paper. Today, computer vision is a comprehensive field that deals with a high level of programming codes by providing the input images/videos to perform tasks such as detection, recognition and classification automatically. Even with deep learning techniques, these things are better than the normal human visual system earlier used. We developed a facial recognition system based on the Local Binary Pattern Histogram (LBPH) method to check some real-time recognition of a human face in a low and high-level images. We wanted to maximize the variation that can be seen to facial expressions and open edges so as to sort encode edges in a very easy way. Here, the Local Binary Pattern can also detect multiple faces in the screen.

➢ **Dlib -**

Facial Landmarks can also be detected using the dlib. The front face detector works really well in dlib. Identifying faces in photos or videos is astonishing, but isn't enough information. We took more information about the person's face using the positions of the face, the distance of the mouth or between the two lips, if the gap is unusual the person is considered to be yawning, the ratio of the eyes if closed and open. It works well with python and it is easy to bind with python.

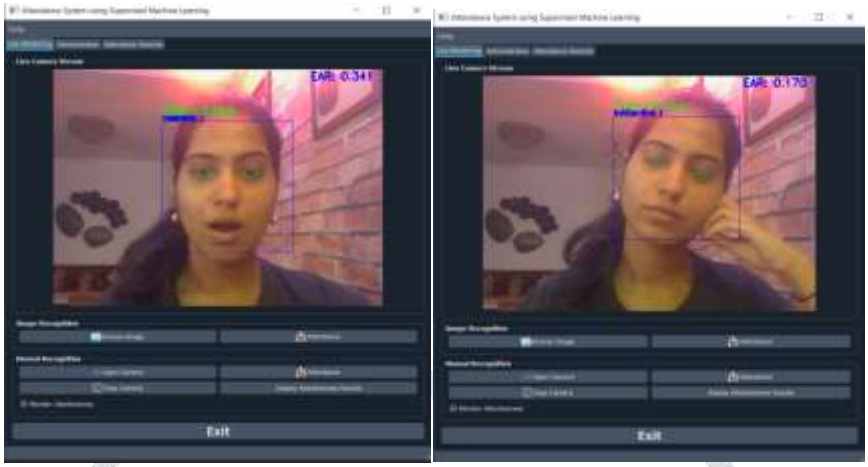

Figure 3. Attention detection

IV. Results and Conclusion

The conclusion of the product ends with the report and 'Individual record' of the student that displays the number of days present and the number of days a student is absent upon the total number of days under the 'Attendance Records' tab.

1. To analyze the attendance report on the daily basis, 'Daily Record' button is use.
2. To analyze the attendance report on the weekly basis, 'Weekly Record' button is use.
3. To analyze the attendance report on the monthly basis, 'Monthly Record' button is use
4. 'Download Record' is use to keep the updated attendance data stored in the system for assessment.

We quantitatively demonstrated a real time face recognition along with facial landmark detectors to monitor expressions. Therefore, we have managed to successfully develop and implement the attendance and attentive system.

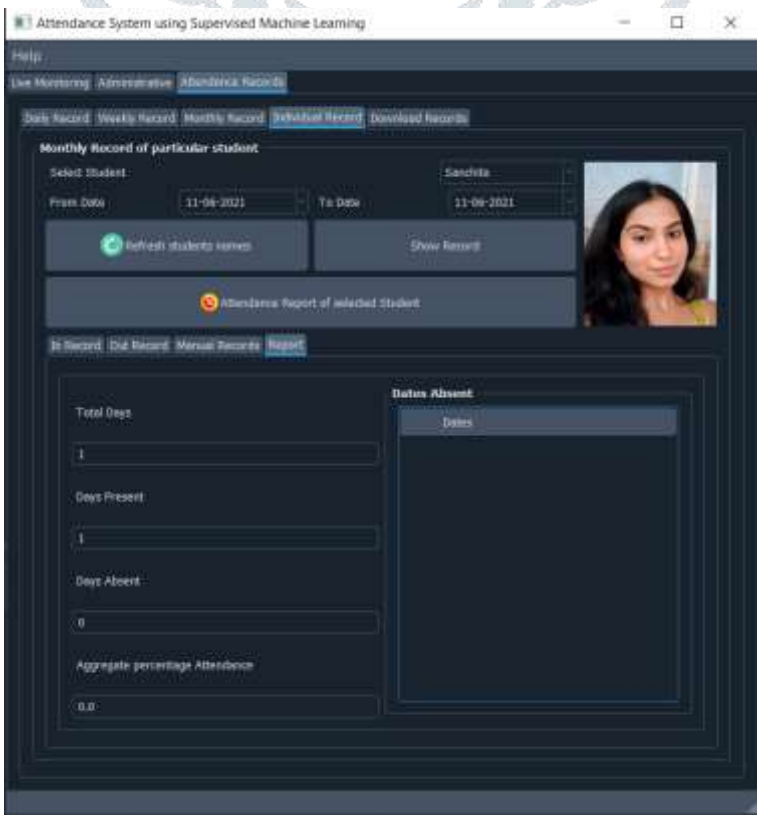

Figure 4. Student wise record

V. FUTURE SCOPE

This project celebrates its importance in the future. The project can be implemented on the intranet in the upcoming scenario. When the requirement for the project arises, it is very flexible in terms of expansion. With the help of the proposed software of database space manager is ready and fully functional, the client can now manage and hence run the entire work in a much better, accurate, and error-free manner. The following are the interesting scope of the project;

a) Discontinue of particular student eliminate potential attendance.
b) Bar code Reader based attendance system
c) Individual Attendance system with a photo using the Student login

We can make it work on multiple computers at the same time and make attendance automatically from each computer and compile it automatically in the database.

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