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## **ABSTRACT**

*The automatic detection of objects in an image is done without human intervention using the proposed system. This system detects the face of a person and compare with the data that is already stored in the form of images and recognizes the person in real-time through a webcam and generate the details of the person (such as name of the person, the time of their login and logout). Generally, the process of taking the attendance involves biometric or passing the attendance sheet or making a roll call. This paper deals with the structure and implementation of face recognition and monitoring system . The main focus of this paper is recognising the user and maintains the list of users who are using the system so that it will be easier to take the attendance and monitoring of the people's status(such as login and logout).*

**KEYWORDS:** Face-Recognition, Open –CV Python, PyQt5 designer

## **1.INTRODUCTION**

The basic method that institutions uses is the faculty passes an attendance sheet or make roll calls and mark the attendance of the students, which sometimes disturbs the discipline of the class and this sheet further goes to the admin department, which is then updated to an excel sheet. This process is quite hectic and time-consuming. Also, for professors or employees at institutes or organizations, the biometric system serves one at a time. Chances of proxy are also an issue that arises in such type of attendance marking. Also, there is an attendance marking system such as RFID (Radio Frequency Identification), Biometrics etc The purpose of developing the new attendance management system is to computerize the traditional methods of taking the attendance. Therefore, in order to drag the attention of students and make them interactive in observing technologies, we try to move on to the latest upcoming trends on developing attendance monitoring systems. This is the technique through which the college/school manages the attendance and observe the presence of the students and faculty as well and there by ensures a strong contribution of students in classrooms.

### **1.1 EXISTING SYSTEM**

Maintaining the attendance is very important in all the schools/colleges for checking the performance of students. Every school/college has its own method in this regard. Some are taking attendance of students manually using attendance registers or marking attendance sheets or file based approach and some have adopted the methods of automatic attendance using some biometric techniques. But in these methods, students have to wait for a long time in making a queue at the time they enter inside the classroom. Many biometric systems are available in the market but the key authentications are same in all of the techniques.

### **1.2. PROPOSED SYSTEM**

In our proposed system, the system is instantiated by the webcam .After it triggers then the system starts processing the image of the students for which we want to mark the attendance. Image Capturing phase is one in which we capture the image of the students. This is the very basic phase from which we start initializing our system. We capture an image from our camera which predominantly checks for certain constraints like lightning, spacing, density, facial expressions etc. The captured image is resolute according to our requirements. Once it is resolute,

we make sure it is either in .png or .jpeg format. It contains various modules that perform all the needed functionalities for face recognition and keep the list of identified users.

The proposed system uses feature extracting technique such as HOG(Histogram of Gradients). Using this method the original image is turned into a HOG representation that captures the major features of the image regardless of image brightness. To find faces in this HOG image, all we have to do is find the part of our image that looks the most similar to a known HOG pattern that was extracted from a bunch of other training faces. The purpose of developing this new attendance monitoring system is to computerize the traditional methods of taking the attendance and thereby improving the quality in monitoring presence of students or faculty.

The system mainly and simply involves the following

1. It displays the current date and time.
2. It allows accessing the webcam and detects the face and stores the details like name of the person, date and time.
3. We can collect data from excel sheet.

## **2. PREREQUISITES FOR SYSTEM IMPLEMENTATION**

Python is high-level, object oriented and general-purpose programming language. Python language mainly emphasizes on code readability with the use of its significant features. It is one of the most accessible programming languages available because it has simplified syntax that gives more emphasis on natural language.

### **2.1 FEATURES OF PYTHON LANGUAGE**

- Python is easy to code.
- Python supports GUI.
- Python is a high-level language.
- Python is highly portable

### **2.2 LIBRARIES**

Various sophisticated libraries are available in Python for face recognition which are reusable . In general libraries are core collection of modules in Python and they do not pertain to any specific context like the C or C++ languages. The following are the various modules for identifying objects in the given image and perform various activities like object detection, feature extraction and face identification in our system.

#### **2.2.1 PyQt5 –Designer**

- The PyQt5 Designer is used to design the output windows that user wants to display in the front end.
- It saves the files with ‘.ui’ extensions.

#### **2.2.2 Face Recognition**

Recognize and manipulate faces from Python or from the command line. This also provides a simple face recognition command line tool that lets you do face recognition on a folder of images from the command line.

#### **2.2.3 Dilib**

Dilib Contains a wide range of machine learning algorithms. All designed to be highly modular, quick to execute, and simple to use. It is used in a wide range of applications including robotics, embedded devices, mobile phones, and large high performance computing.

#### **2.2.4 Numpy**

A library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate with.

### 2.2.5 Open-CV

Open CV (Open Source Computer Vision) is a free graphics library generally targeted the real-time computer vision. Open CV was developed to process images. OpenCV-Python makes use of NumPy, which is a highly optimized library for numerical operations with MATLAB-style syntax. All the OpenCV array structures are converted to and from NumPy arrays.

## 3. EXPERIMENTAL RESULTS

**a) HOME PAGE:** This is the first window page which appears after we run the code.



Fig 3.a Home page of Face Recognition and Monitoring System

**b) Output Window:**

In the main window if we click the start button it redirects to the Output window where it display current date and time.



Fig 3.b Output Window for Face Recognition and Monitoring System

**c) CLOCK IN PAGE:**

When the output window appears, after a few seconds the web cam will activated to capture the image and recognize the person who is in front of it. After it pop up a dialog box with the name of person that makes sure whether the person wants to login or not. If the person logged in, then the details of them will appear on the window.

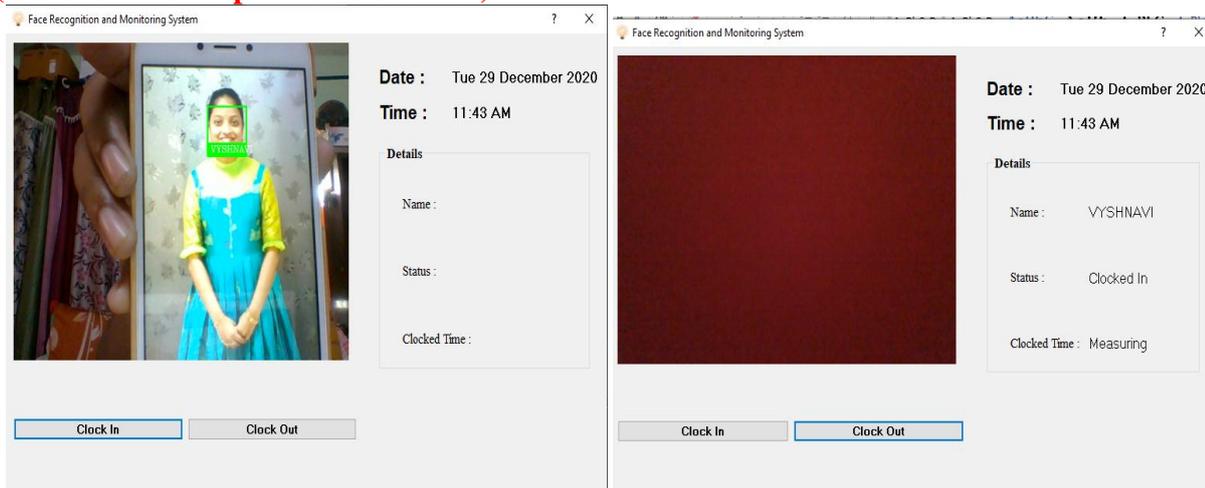


Fig 3.c (i) Sample **Clock In** page for Student in Face Recognition and Monitoring System

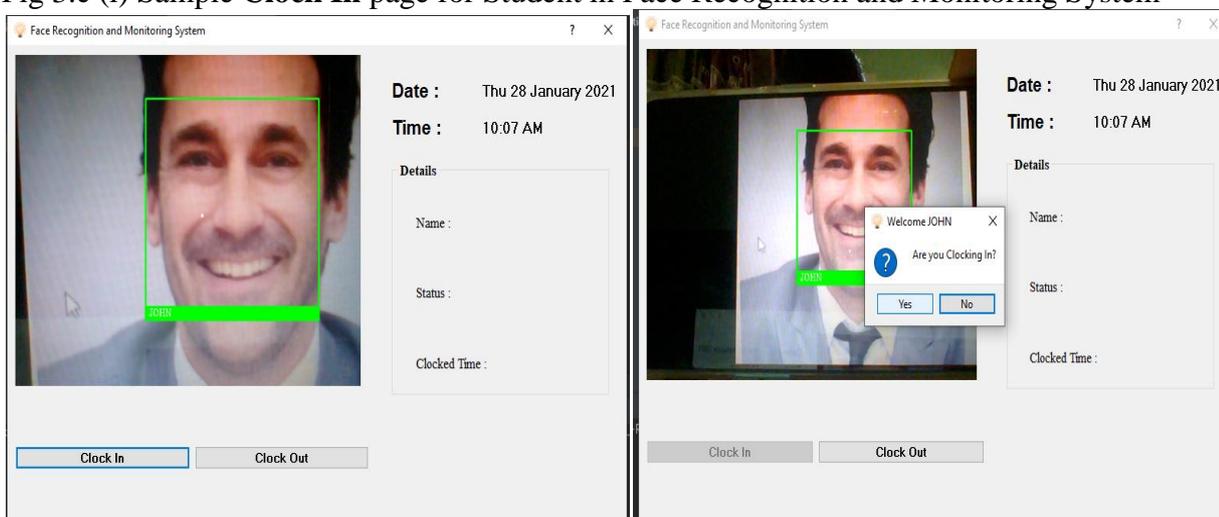


Fig 3.c (ii) Sample **Clock In** page for Faculty Face Recognition and Monitoring System

**d) CLOCK OUT PAGE:**

After when they click on clock-out button again it pop up a dialog box to make sure that if they want to log out or not. when they click on yes, they successfully logged out and then the status and the clocked time will be updated on the window.

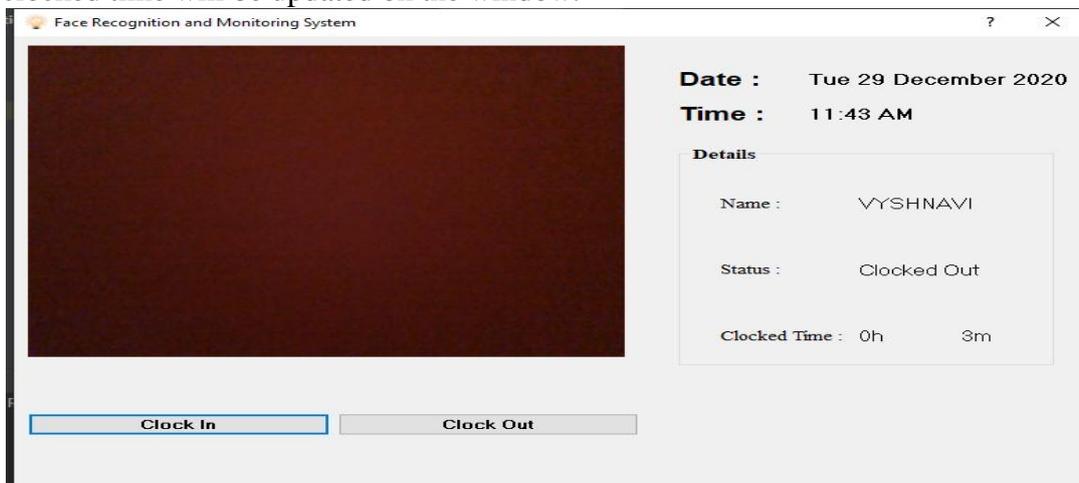


Fig 3.d (i) Sample **Clock Out** page for Student in Face Recognition and Monitoring System

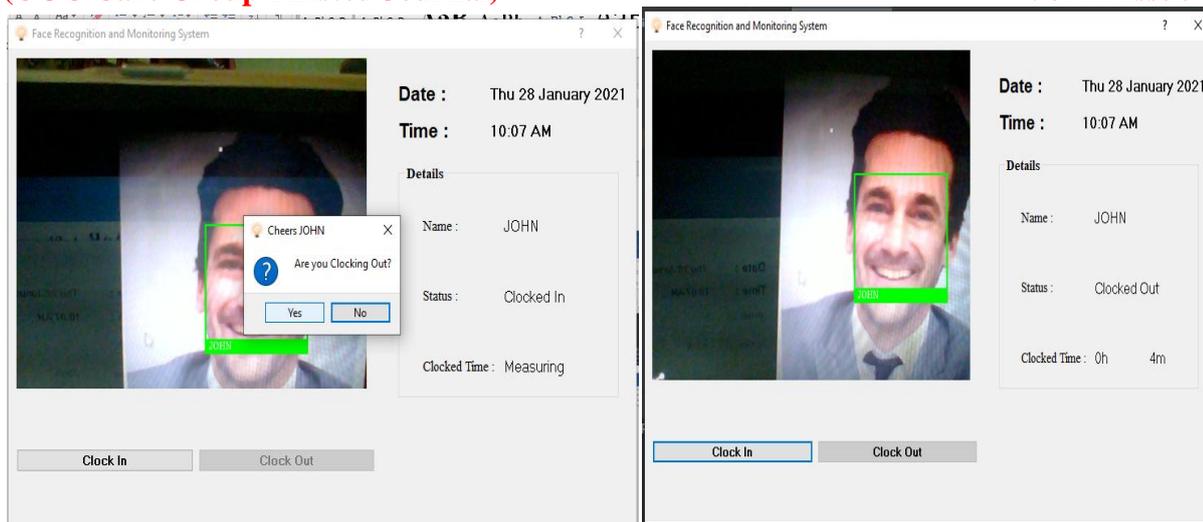


Fig 3.d (ii) Sample **Clock Out** page for Faculty in Face Recognition and Monitoring System

**e) Acquiring the Attendance from .CSV FILE**

The details can be view from Attendance.csv file.

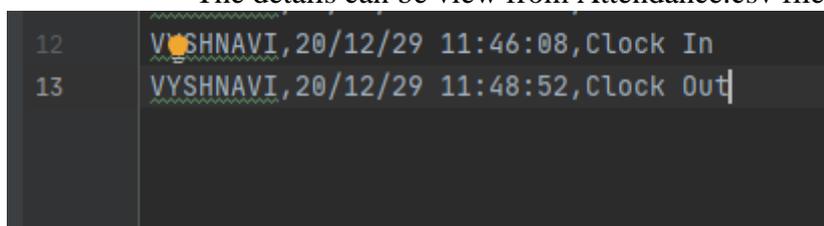


Fig 3.e (i) Attendance in CSV for Student in Face Recognition and Monitoring System

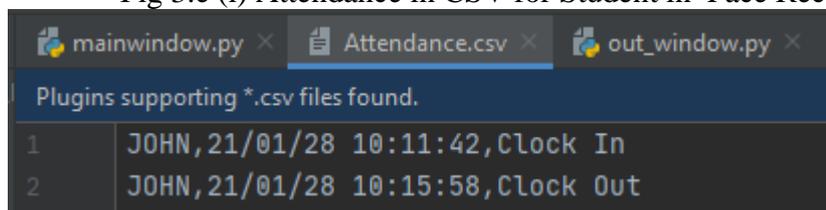


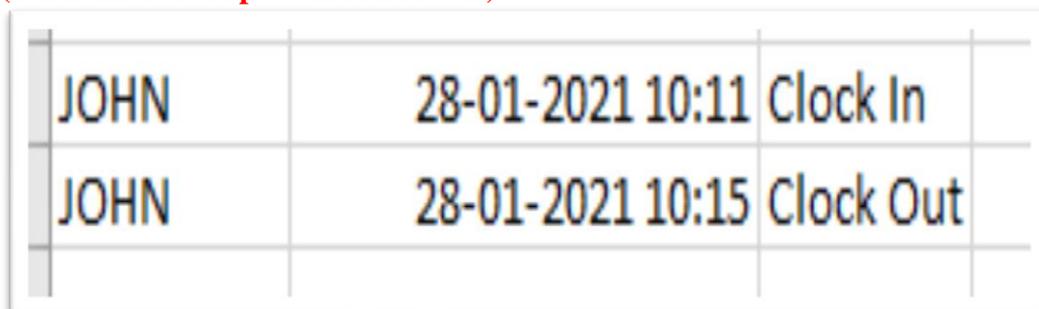
Fig 3.e (ii) Attendance in CSV for Faculty in Face Recognition and Monitoring System

**f) View the obtained Attendance in the Excel sheet:**

Attendance.xls will be created in the project directory. The attendance can be viewed from the excel sheets like in the below diagrams.

12	VYSHNAVI	29-12-2020 11:46	Clock In
13	VYSHNAVI	29-12-2020 11:48	Clock Out
14			

Fig 3.f (i) Attendance in Excel for Student in Face Recognition and Monitoring System



JOHN	28-01-2021 10:11	Clock In
JOHN	28-01-2021 10:15	Clock Out

Fig 3.f (ii) Attendance in Excel for faculty in Face Recognition and Monitoring System

#### 4. CONCLUSION

Face Recognition and Monitoring 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 make a system that is useful to the organization such as an institute. It can be constructed simply using a camera and computer with out need of specialized hardware . This is the efficient and accurate method of obtaining attendance in the office environment that can replace the old manual methods. This method is secure enough, reliable and available for use with minimum cost and less equipment. We will also use our system in the application areas like Surveillance, Border security services and Qualitative payment processing.

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