Project Report

on

Face Recognition Based Automatic Attendance Taking and Management System

For the partial fulfilment of Image Processing Laboratory

Submitted By

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Under the Supervision of

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CERTIFICATE

This is to certify that the project report entitled "**Face Recognition Based Automatic Attendance Taking and Management System**", submitted by **Mr. Muhammad Kasim** is an authentic report for the work carried out under my supervision as a part of Image Processing Laboratory during the Winter semester, 2020 at National Institute of Technology Sikkim, Ravangla-737139, Sikkim.

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I am indeed grateful to all the faculties and staff of the National Institute of Technology Sikkim for providing an environment conducive to my project.

Finally, I would like to thank God Almighty for giving me the strength, knowledge, ability and opportunity to undertake this project study and to persevere and complete it satisfactorily.

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ABSTRACT

The aim of this project is to develop a Face Recognition Based Automatic Attendance Taking and Management System to take the attendance of the students automatically when they face camera. So. this can reduce the time taken by the teachers to take the attendances and can be utilized in other works. It is a GUI Based software through which anyone can easily interact even without any prior knowledge of this software and can be used by anyone. It can be used not only in classes but also in meeting halls etc. where attendance is required.

INTRODUCTION

The Project Automated Attendance Management System is a GUI based application designed using OpenCV, Tensorflow, Tkinter etc. in Python. The main aim of this project is to develop an Automated Attendance Management System which can take attendance of the students automatically after training. It takes the attendance at regular interval using camera. The students have to only face the camera at once in a period. The face is recognized automatically and attendance has been filled in a csv file and also in MySQL database. The teachers can also see the attendance of the students after login. It also provides to manually fill the attendance by the teachers after login.

PROBLEM FORMULATION

After analyzing many existing Face Recognition Based Attendance Taking and Management System, we have now the obvious of the project to developed. Before we started to build the application, we had many challenges.

We defined our problem statement as :

- To make GUI and Image Processing Based Application of Face Recognition Based Attendance Taking and Management System at smaller scale.
- To make the system easily managed and can be secured.
- To cover all the areas of Attendance Taking Process like filling attendance and seeing the attendance of students by the teachers through GUI, making all interaction with the software through GUI.

REQUIREMENT ANALYSIS

Requirement Gathering:

Requirement Analysis is the first and most important step in the software development activity for building robust and user-friendly applications. I have started working on determining the functionalities that the application should provide. I have done a good amount of research on existing systems and disadvantages of those. Once the functional requirements are finalized, I did research on the current technologies that are widely used in the industry.

Requirement Specifications:

Hardware:

- CPU – Intel Core i5 (Tensorflow Used So High Processing Required)
- Nvidia GPU -- 2GB (min.)
- RAM – 8GB (min)
- Hard Disk – 80GB(min)

Performance Requirements :-

The software is designed for the attendance using facial recognition and can run from a standalone desktop PC. The software will support multiple user access only if there are multiple terminals. Database will be handled by the Software. For normal conditions, 95% of the image processing should be processed in less than 5 seconds.

Software Requirements:

- Python 3.5 or above
- Tensorflow
- OpenCV
- OpenCV-contrib-python
- Pandas
- Numpy
- Tkinter (available in Python)
- PIL
- PyMySQL
- MySQL Server (for storing the attendance of the students)
- IDE(PyCharm) for developing Code

Description

The goal is to design software for attendance system using Face Recognition. First, look at a picture and find all the faces in it. Second, focus on each face and be able to understand that even if a face is turned in a weird direction or in bad lighting, it is still the same person. Third, be able to pick out unique features of the face that you can use to tell it apart from other people— like how big the eyes are, how long the face is, etc. Finally, compare the unique features of that face to all the people you already know to determine the person's name. This system can also be implemented in the industrial sector as well.

The software must be able to perform the following operations:

- **Login:** The user login to the system by entering valid username & password. If username and password is incorrect, then user will not get access to the system.

- **Capture image:** The user uses the camera to capture the images of the student so as to detect it for comparison with the database.

- **Sketch matching:** A technique in which we are using the templates of images to make sketches and retrieve it from the database if available.

- **Interact:** Detection and recognition of object which is placed in front of camera is done. All image processing algorithms are applied to identify the image.

- **Perform operation:** If image is already present in system, then information related to object is retrieved through database and it will be displayed and message will be send. Otherwise image have to be added into the system.

- **Add images:** If the image is new to the system then it must have to be added in a system. Next time when we placed that image in provided space then system will identify the image.

- **Detect and recognize:** Another technique which we are using for facial recognition is to recognize the faces in the images and display the result.

Set Up

- Install the software requirements described above.
- First create two databases ‘Face_reco_fill’ and ‘manually_fill_attendance’ in the database.
- Change username and password at line no. 489 and 490.
- Now run AMS_Run.py.
- A GUI Window is opened through which you can interact input and button
- First you have to register the students by entering Enrollment No. and Name and then take images for each student.
- train the model.
- Now Students can fill the attendance by clicking on ‘Automatic Attendance’ and filling the subject and facing towards the camera.

Working Process

- **Take Images :-** Take Images takes 71 images of the entered Enrollment No and Student Name and stored the images in the folder 'TrainingImage'.

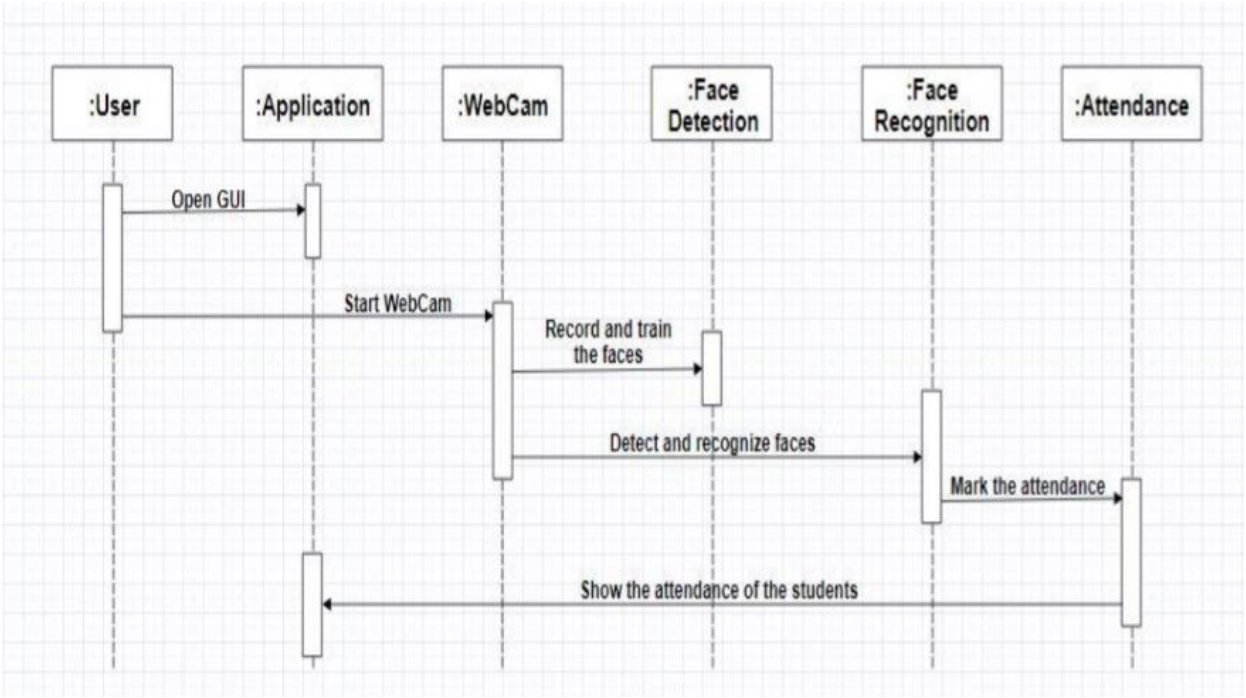
- **Train Images :-** Train Images train the model and store related configuration in Trainner.yml in TrainingImageLabel folder.

- **Automatic Attendance :-** After clicking this button, you have to fill up the subject and click on the 'fill attendance' button. to take photo using camera to fill the attendance and storing your attendance in the database.

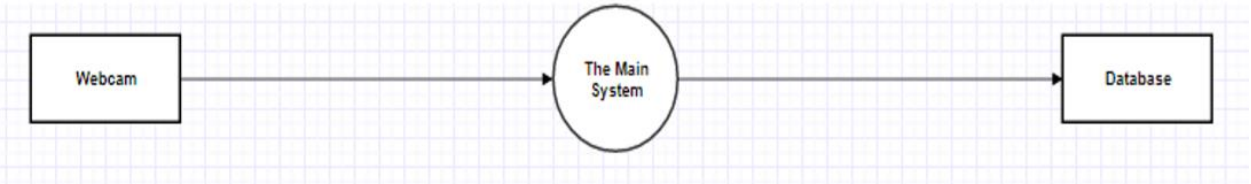
- **Manually Fill Attendance :-** It allow you to manually fill the attendance using their enrollment id and name and stored in the database.

- **Check Register Details :-** It allows you to check the details of the attendance stored in the database.

Sequence Diagram

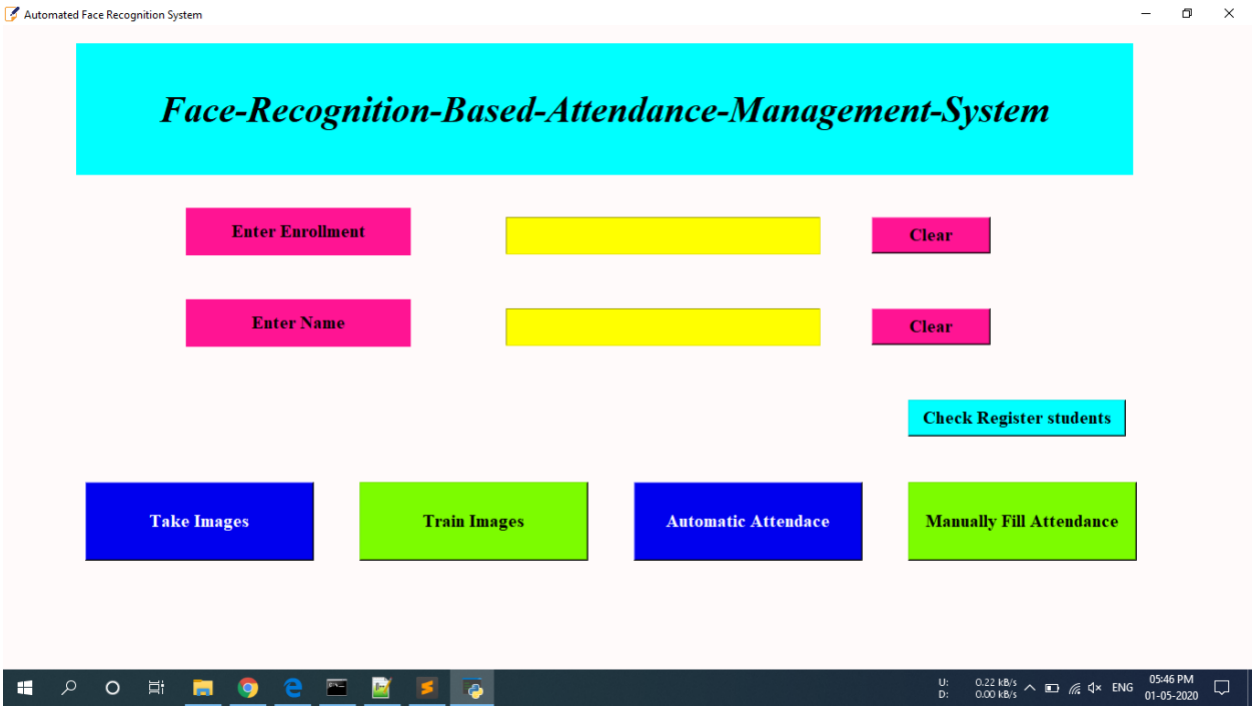


Data Flow Diagram



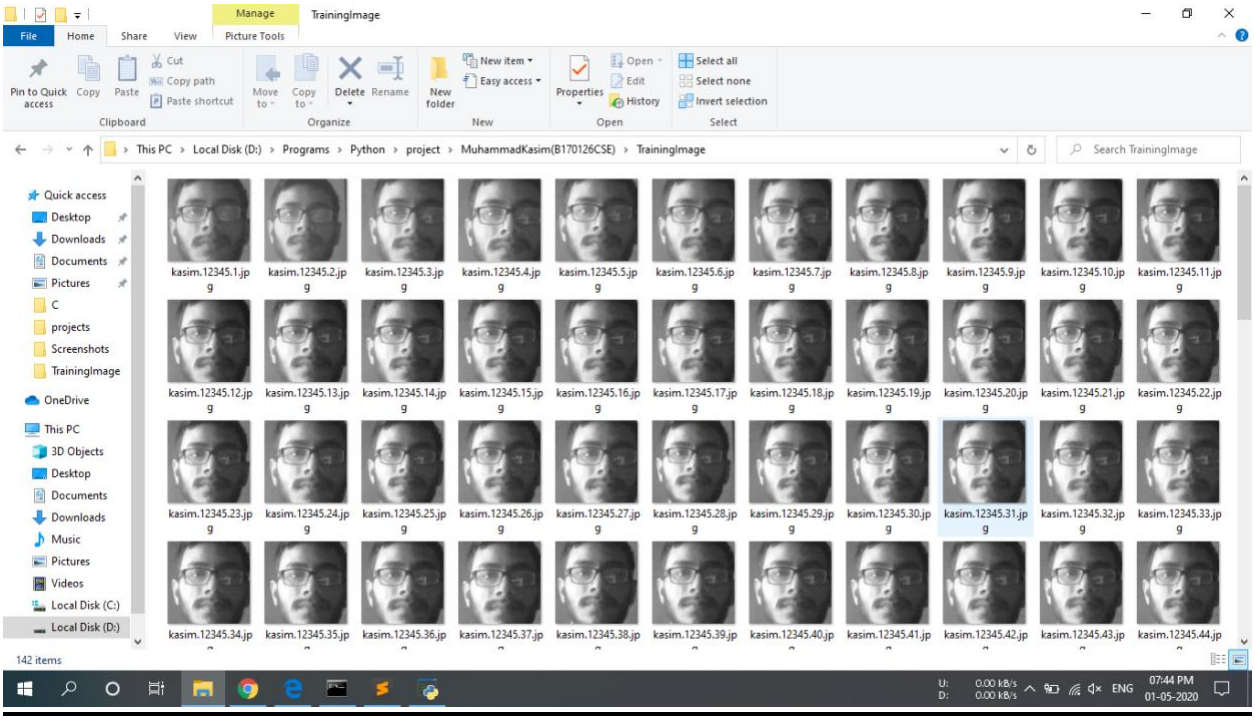
Snapshots of the Project

Home Page:-

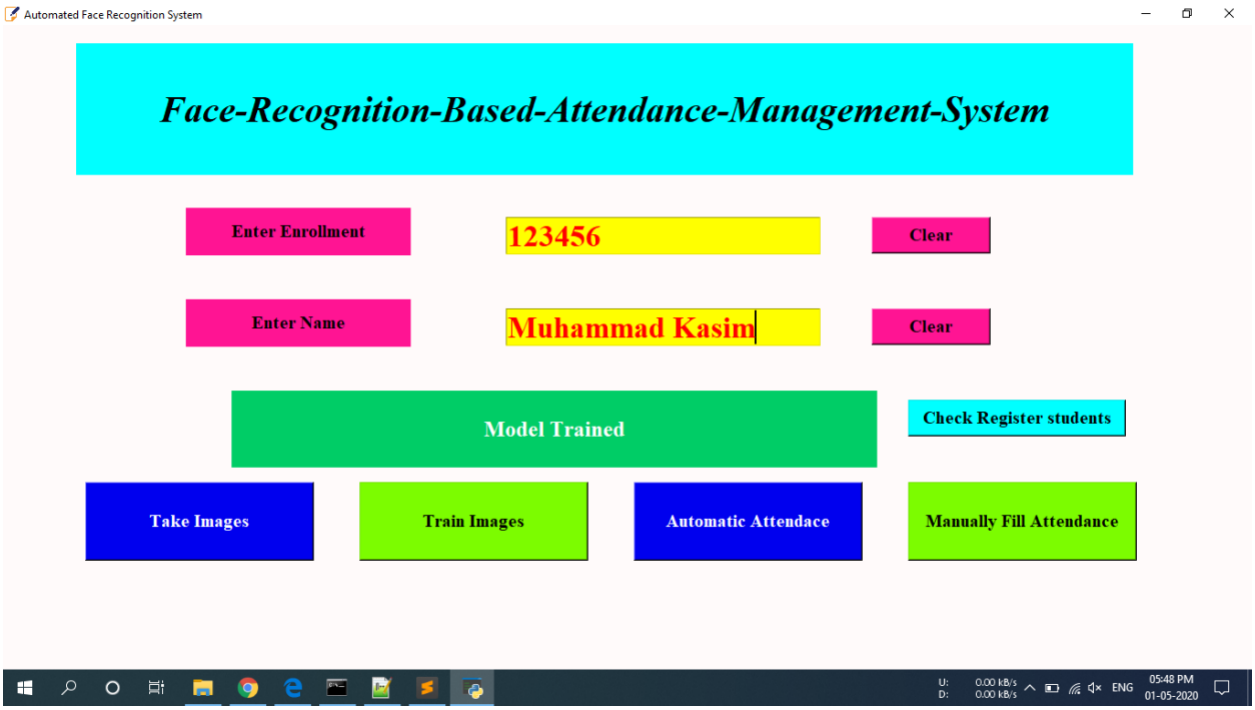


Registering a Student:-

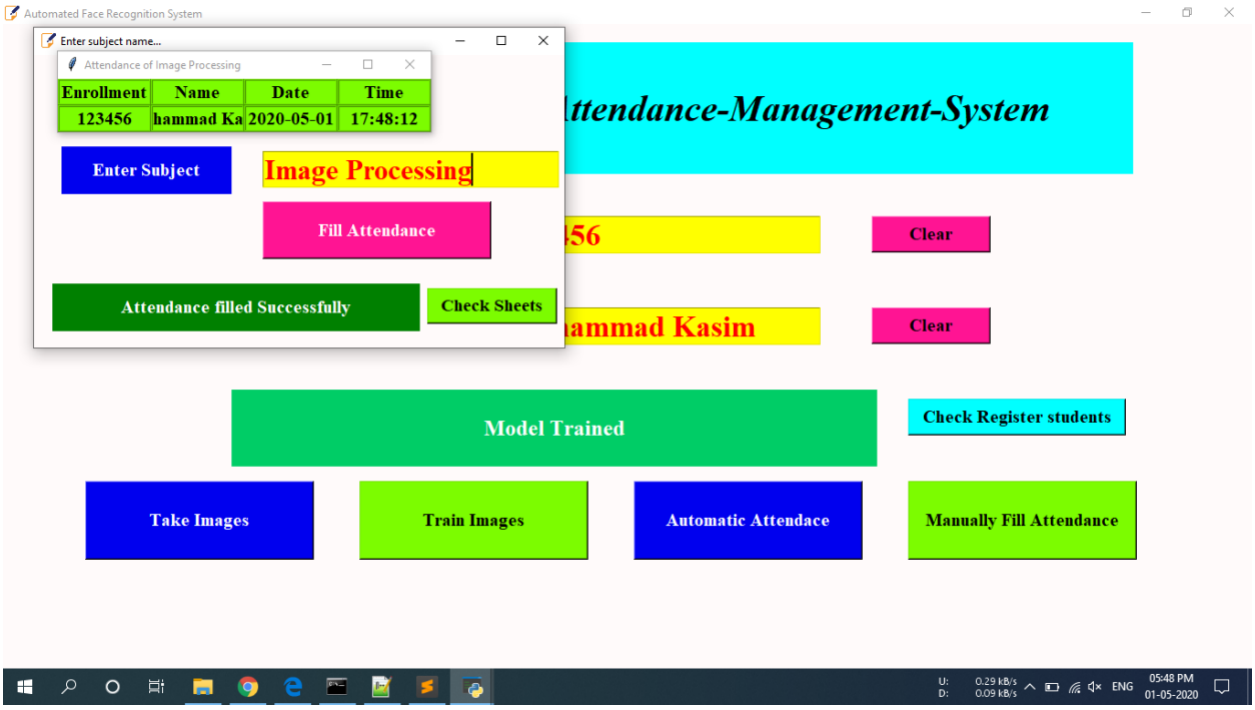
Saving Lots of images for training :-



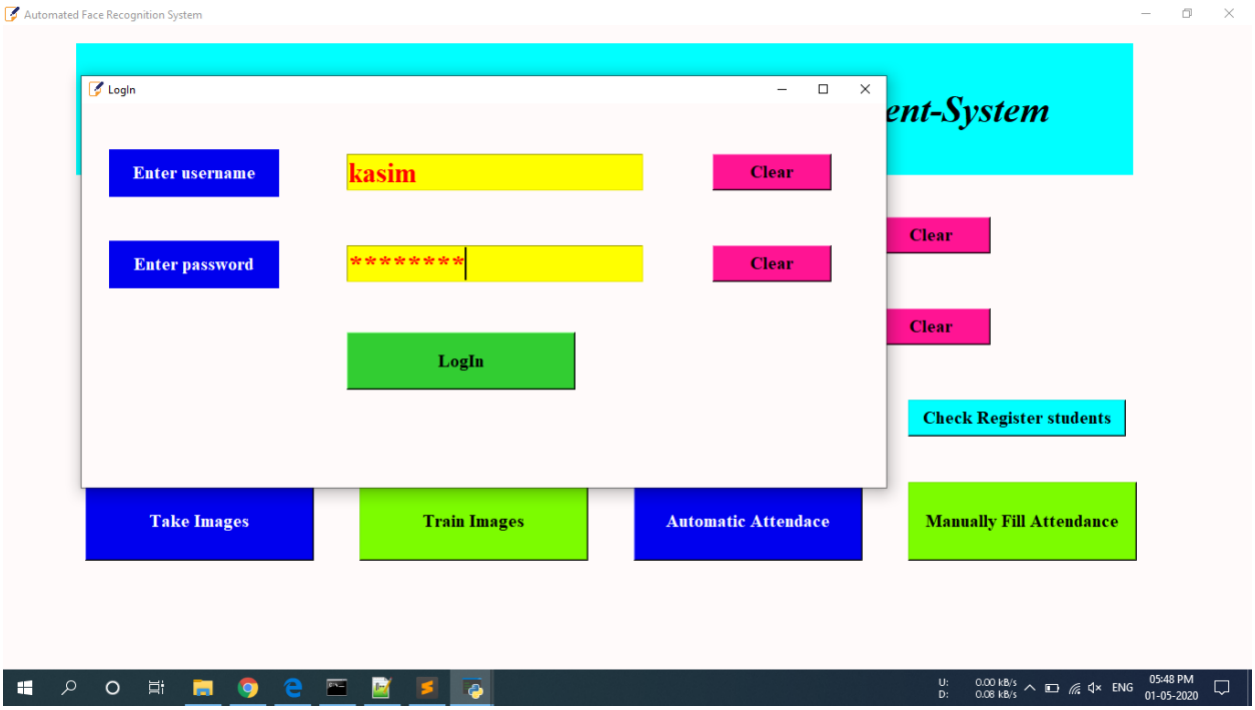
Training Model after registering new students:-



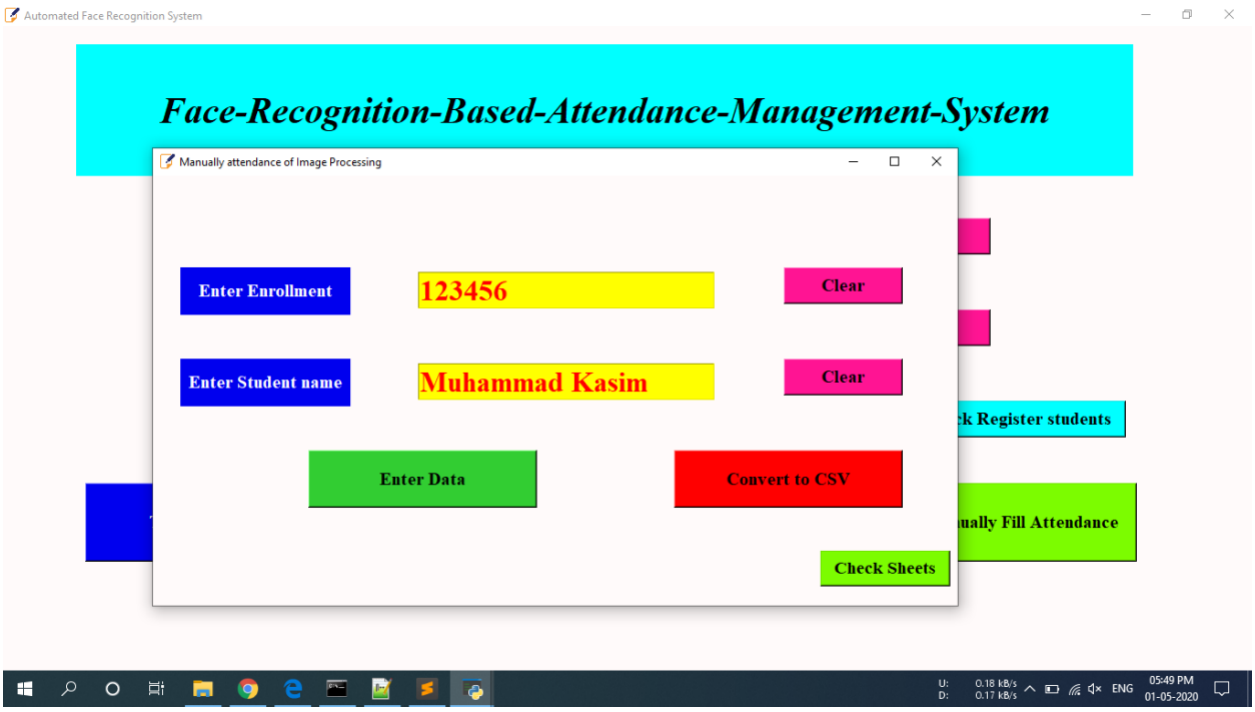
Taking Attendance automatically using camera :-



Admin Login (Username – kasim & password - kasim123) :-



<u>Manually Attendance taking Page</u> :-



CONCLUSION

To conclude, Face Recognition Based Automatic Attendance taking and Management System is a simple GUI based application basically suitable for colleges. I am successful in making the application through which automatic attendance of the students can be taken and stored in the database. This application also provides a simple Graphical view of the attendance of students to the admin. Some of the features of the project are listed as follows:

- Interactive user interface design.
- Manage Attendance database wise.
- Use of MySQL as its database.
- Also provides manually filling attendance sheet.
- Flexible system in any type.
- Lost and Breakage.

REFERENCE

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