PROJECT Report

[Biometric-based office access controller]

1. Team members

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2. Introduction

Nowadays, we are talking more and more about insecurity in various sectors as well as the computer techniques to be implemented to counter this trend: access control to computers, e-commerce, banking, etc. There are two traditional ways of identifying an individual. The first method is a knowledge-based method. It is based on the knowledge of an individual's information such as the PIN code to allow him/her to activate a mobile phone. The second method is based on the possession of token. It can be a piece of identification, a key, a badge, etc. These two methods of identification can be used in a complementary way to obtain increased security like in bank cards. However, they each have their weaknesses. In the first case, the password can be forgotten or guessed by a third party. In the second case, the badge (or ID or key) may be lost or stolen. Biometric features are an alternative solution to the two previous identification modes. The advantage of using the biometric features is that they are all universal, measurable, unique, and permanent. The interest of applications using biometrics can be summed up in two classes: to facilitate the way of life and to avoid fraud.

-**Face Recognition**

The requirement for reliable personal identification in computerized access control has resulted in an increased interest in biometrics. Among all biometrics applications, face recognition has the benefit of being a passive, non intrusive system for verifying personal identity.

3. Needs/Problems

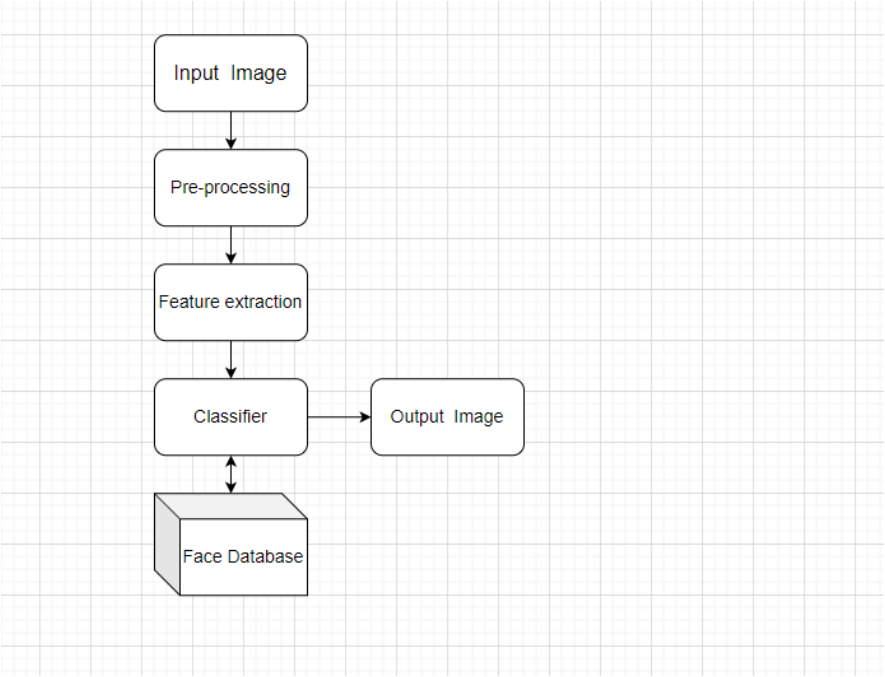
Why biometrics? From the answer of that question we can deduce our need to biometrics applications in access controlling. Here are some reasonable reasons:

- Strong authentication
- Quick, painless process
- Reduce security risks
- Hassle free customer onboarding

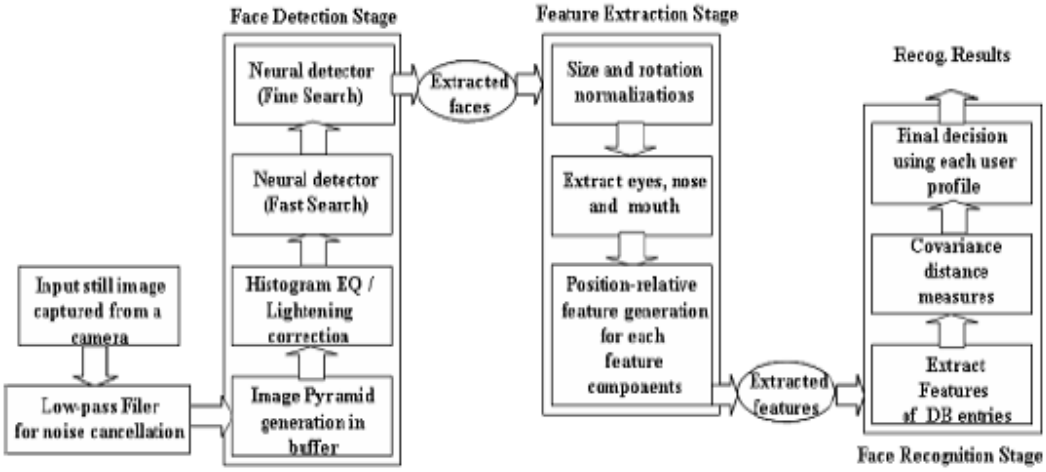
4. Goals/Objectives

Our goal is to build an office access controller, where the system grants access to specific persons based on their faces.

5. Procedures/Scope of Work



The initial block diagram.



More detailed block diagram

6. Used libraries & functions

We will use Skimage library for the pre-processing of the image and OpenCv library to deal with the faces and extract information from it.

7. Conclusion

In these proposal we have introduced briefly Biometrics, specially the face recognition for access controlling system.

8. Appendix

supporting material for our proposal:

- Visual Impairment and Blindness- what we know and what we have to know
- https://www.researchgate.net/publication/319764715_Image_Processing_Methods_for_Biometric_Applications

9. Used algorithms:

1- Eigen faces for face recognition
2- Viola jones for face detection (not completed)

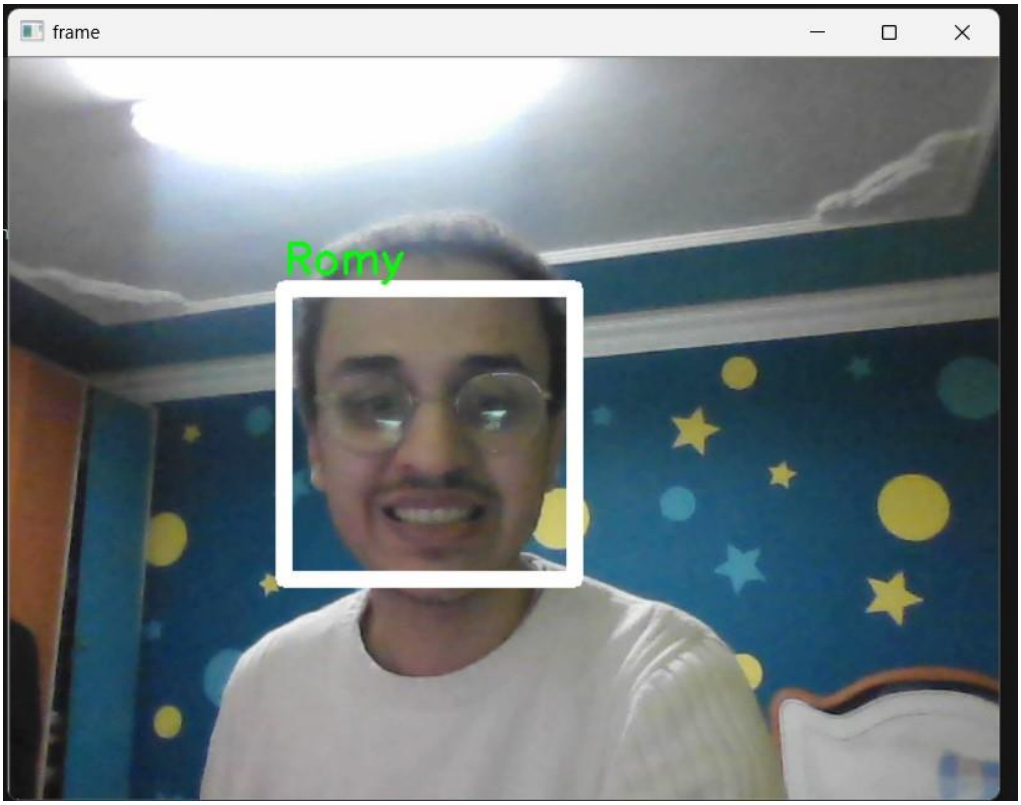
We didn't have time to finish out implementation of viola jones algorithm so we used the face detection function of open cv (.xml file) to make the project working and we need the detection to be working in real time.

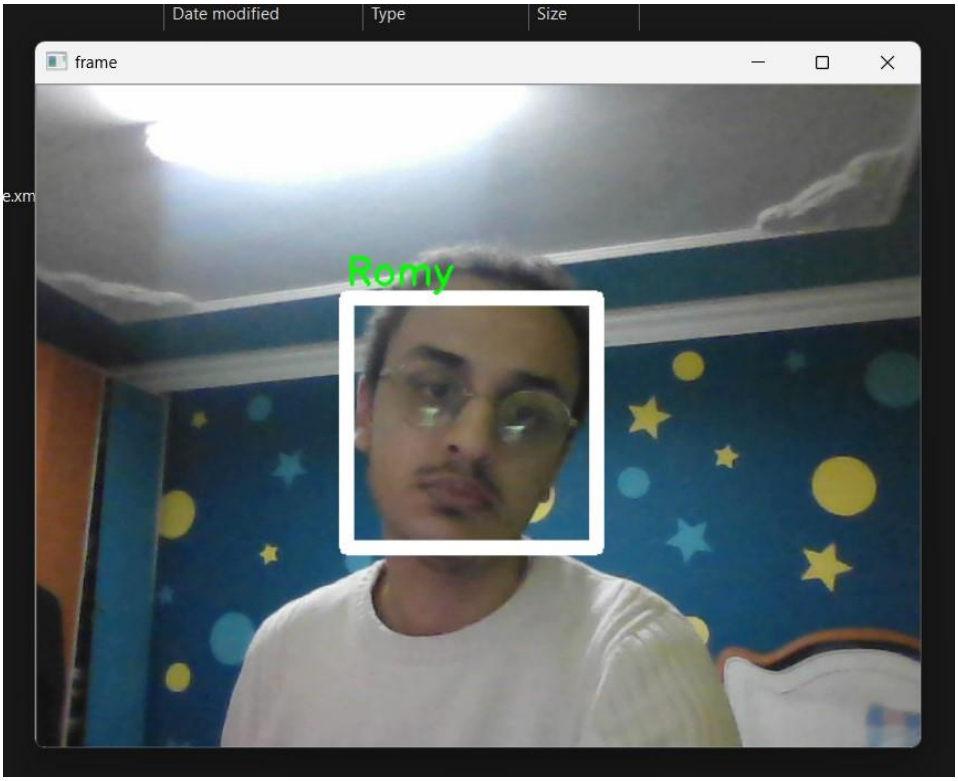
10. Weakness

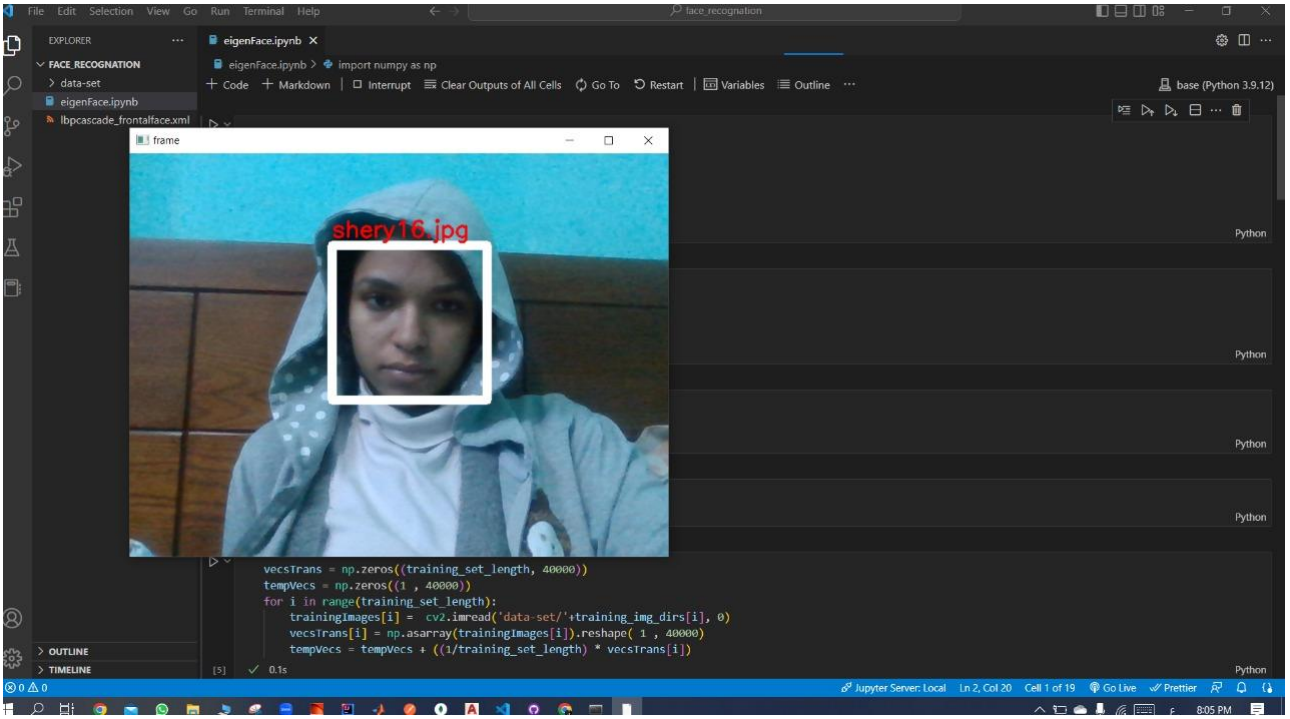
Eigen faces: the Eigen faces algorithm have one weakness that the light affects its results

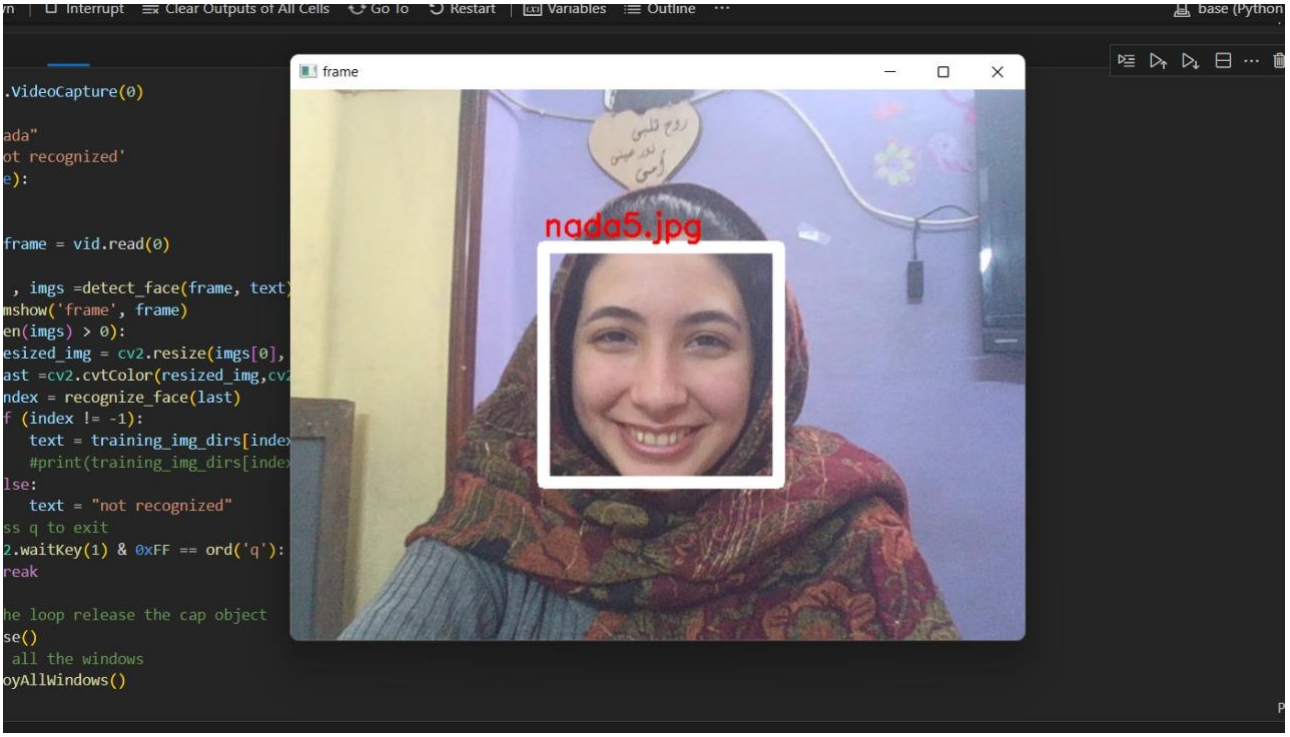
So we can put a constraint that the data set and the recognized face should have the same light effect to avoid wrong results, so in our project idea (office access control) we can put the camera that get the data set and the camera that recognize the person in the same place.

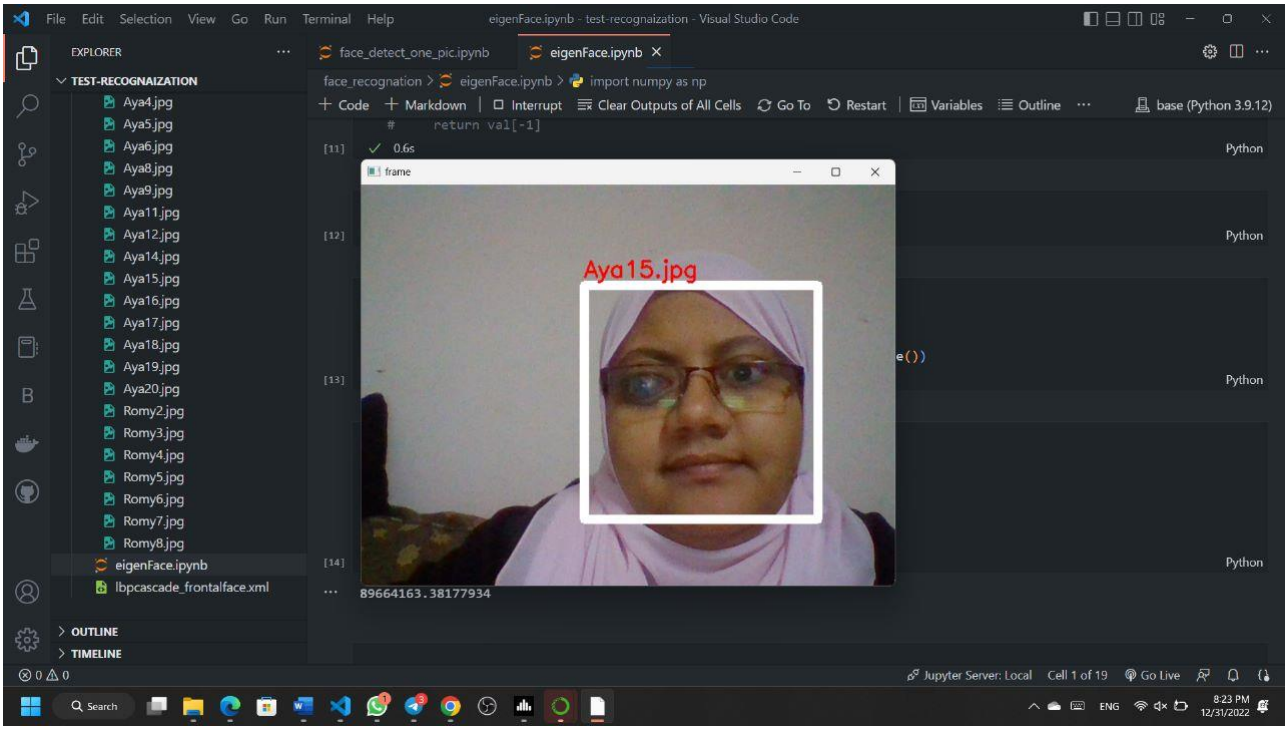
11. Test cases:







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EXPLORER
TEST-RECOGNAIZATION
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face_recognation > eigenFace.ipynb > import numpy as np
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