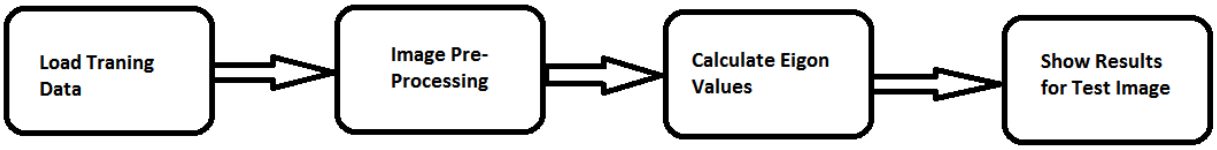
PROBLEM STATEMENT

Recognize Human Faces from Given Image on the basis of eigonfaces with training dataset.

METHODOLOGY

In this project, eigonfaces are used to create eigonvector from 10 images of each person.



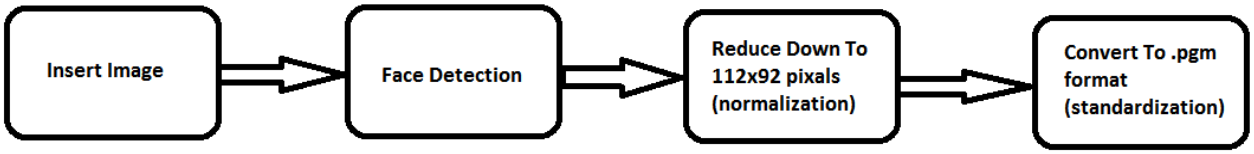
1-Data Collection

- Dataset1[1] is collected from online database of faces. There are total 400 images of 40 people (10 images for each).
- Dataset2 is created manually from images taken from google.

Images for Each Subject are 10 to use for Training.

2- Image Processing

Find the face in the original image with `vision.CascadeObjectDetector` and crop extra surroundings then resize it to 112 x 92 pixels and change to greyscale for normalization. Then convert it to **.pgm** format for standardizing it.



3- Classification

There are 10 images for Each Subject. Classify them in different folders and each folder from has Numerical ID as 1,2,3…In this project, we are using Signatures to classify them after calculating eigonfaces. There are 20 different signatures for each image are used as weights.

4- EigonFaces Calculation

First, load given training data set into 2D array and calculate mean of all the images in this array. Then subtract that mean from array or in other words subtract mean from given training images to reduce similarity then calculate eigonvector using MATLAB function. Pick eigon vectors corresponding to 10 largest eigon values. Then assign Signature for each image of training dataset.

Signature value=20

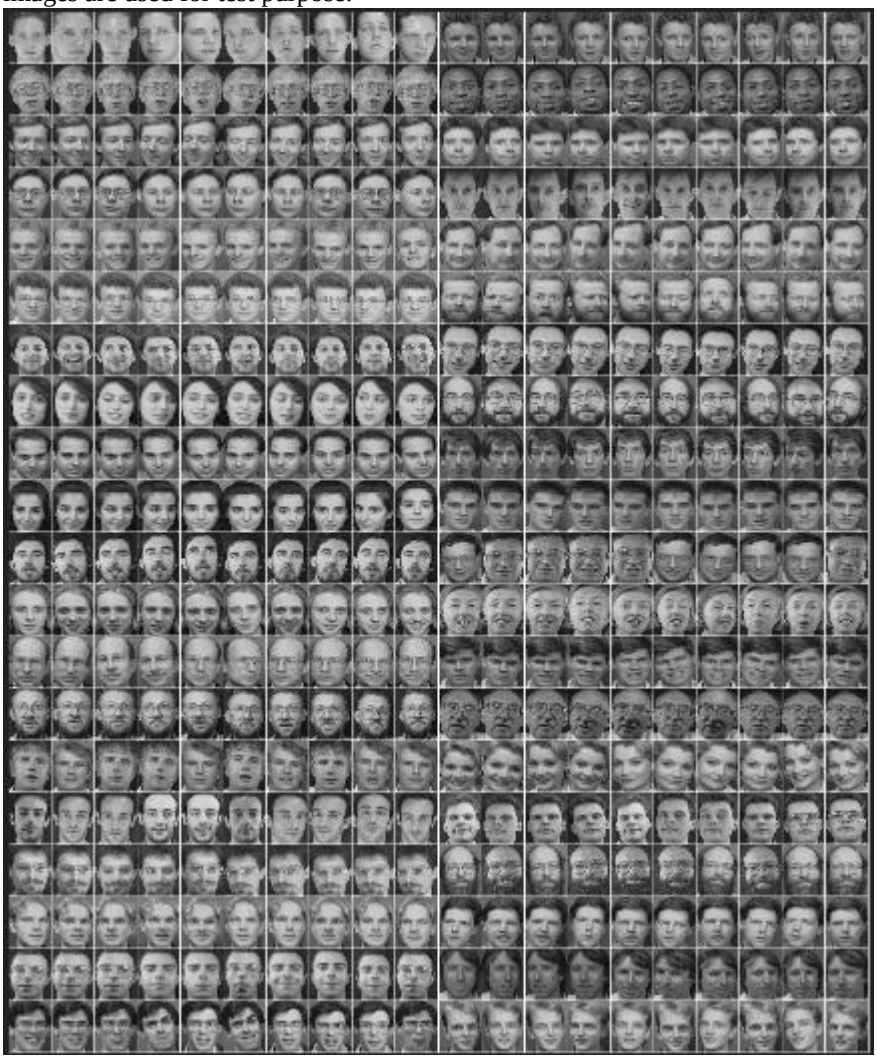
5- FaceRecognition

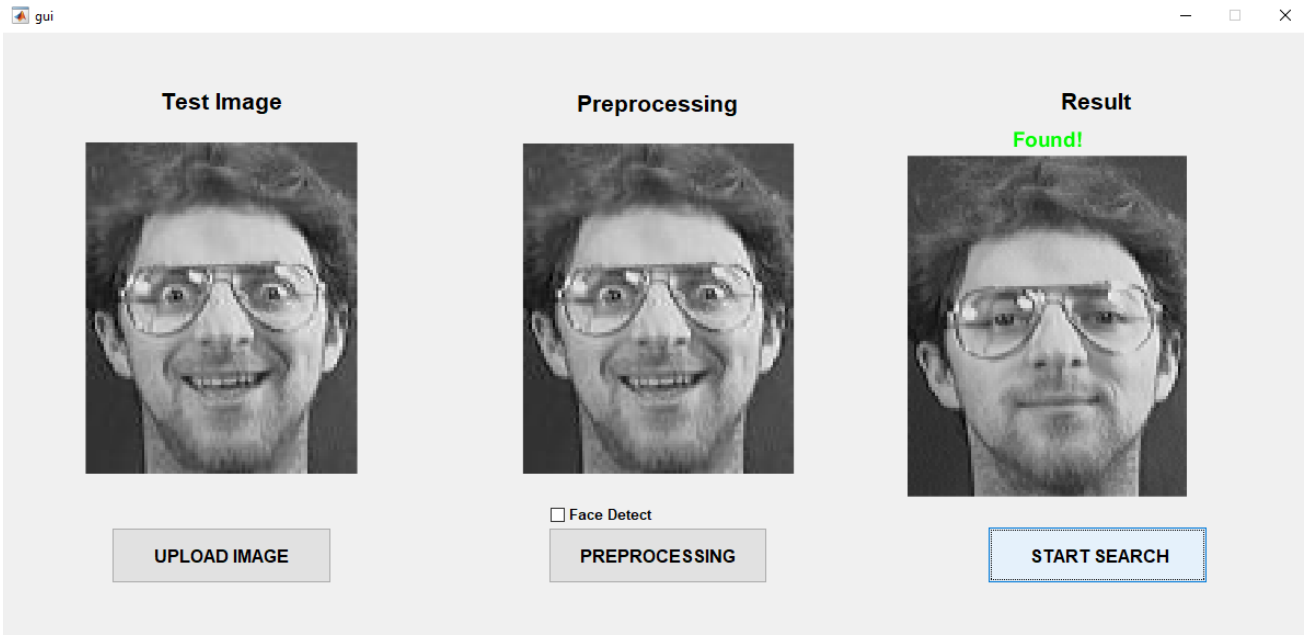
Take Test image apply preprocessing techniques mentioned above and then its eigon vector and compare eigon values with all images from training dataset eigon values array face will be recognized if maximum of eigon values are similar to eigon values of training dataset.

EXPERIMENTAL SETUP AND RESULTS

DATASET

In this project, take dataset and which have total 400 images of 40 people (10 of each person) so which are already preprocessed. So, 8 images out of 10 of each person are used to train and calculate the eigonfaces. And remaining 2 images are used for test purpose.





Experiment gives false results if test subject is not included in training data or face is blur or not clear in given picture as it calculates maximum similar eigon values.

There is an extra datasets created manually from google images.

RESULTS

The dataset mentioned in the previous section is used for experiments gives almost 85% accuracy on Dataset1, but dataset2 gives 60% accuracy.

REFERENCES

[1] AT&T Laboratories Cambridge *(1992), The Database of Faces, Available at: http://www.cl.cam.ac.uk/research/dtg/attarchive/facedatabase.html*