ASSIGNMENT 6 - IIT2016039

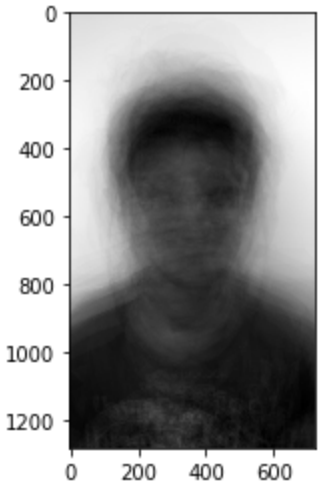
Problem Statement 1:

1. Face recognition using PCA

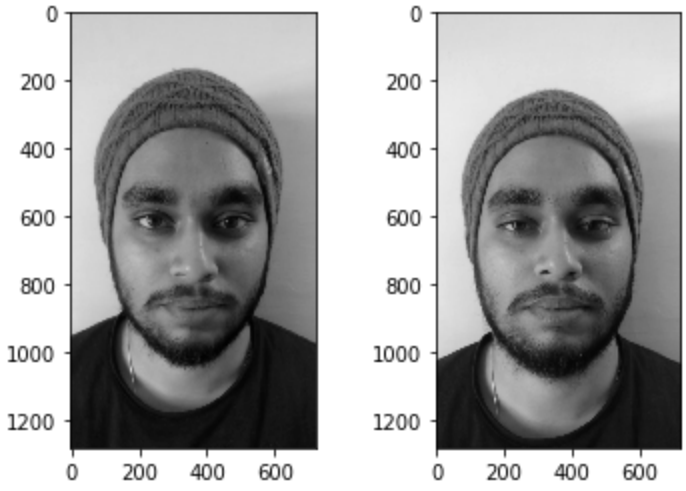
Procedure:

- First we created a dataset of 8 persons, we have total of 6 images of each person 5 for training and 1 for prediction.
- For this we exactly followed the pdf present in the course site.
- We took the train images, then we found the average image of all training images to normalize the training data.
- Then we found the covariance matrix and using that we found Eigen-vectors .
- We those Eigen-vectors according to their Eigenvalues and then we took 20 Eigen-vectors among them.
- Then we multiplied them with input data to get eigen faces.
- Then we again multiplied the Eigenfaces with the input images to get the weights of each training image.
- During testing we take a test image normalize it and we calculate the weights by multiplying with the eigenfaces.
- Then we take the image with minimum difference in weights and predict as that person.

Mean image



Prediction



Problem Statement 2:

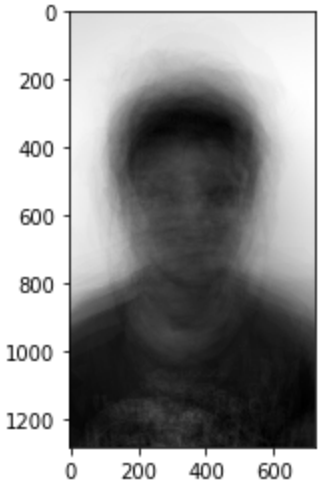
1. Face recognition using LDA

In the beginning we will perform the same steps as PCA and calculate Eigenfaces, Weights as follow

- First we created a dataset of 8 persons, we have total of 6 images of each person 5 for training and 1 for prediction.
- For this we exactly followed the pdf present in the course site.
- We took the train images, then we found the average image of all training images to normalize the training data.
- Then we found the covariance matrix and using that we found Eigen-vectors .
- We those Eigen-vectors according to their Eigenvalues and then we took 20 Eigen-vectors among them.
- Then we multiplied them with input data to get eigen faces.
- Then we again multiplied the Eigenfaces with the input images to get the weights of each training image.
- Then we find covariances to calculate Inter class difference SB and Intra class difference SW.

- We have to reduce Sw and maximize SB. J = (SW)^-1* SB
- We calculate covariance for J and then Eigenvectors and we took best 15 among them.
- .We got Fisher Faces by multiplying them with the projected faces (EigenFaces).
- During testing we take a test image normalize it and we calculate the weights by multiplying with the eigenfaces.
- Then we multiply it with the Eigenfaces and then we multiply the result with the final eigenvectors, Then we calculate the difference between the weights and the best among them.

Mean Face



Prediction