Face Recognition with Eigenfaces (PCA)

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What is PCA?

(1) Collecting data in terms of array/structures

(2) Normalizing the data by calculating the difference with the mean

(3) Finding the covariance of the normalized data

(4) Compute the eigenvalues and eigenvectors from the covariance matrix

(5) Generate (reconstruct) using the product of eigenvectors with data

Steps:

1. Read all 10 training images of 10 datasets
2. Find the Mean of all image and generate a mean and stdev using that image
3. Find covariance matrices and use that to find eigenvalues and eigenvectors
4. Normalize eigenvectors and eigenvalues
5. Using the eigenvectors reconstruct the image that will be termed as recognized image
6. Using MATLAB Only

[Source code attached: PCA\_MATLAB\_Only.m]

1. Using Shark Repo with Boost Libraries and MATLAB

[Source codes attached: PCA\_MATLAB-CPP.m and pca\_calc.cpp]

# Results

1. Training:



1. Mean Image:



1. Eigenfaces:



1. Reconstructed:



Problems faced:

In CMake gui whilst linking boost libraries and building shark repo for to be used in msvc14 or mingw.

Thus results of CPP+MATLAB are not included.