Christopher Song

CMSC426

Dr. Teli

Group Members:
Ritik Gupta, Christopher Song

Contributions:

Chris - I coded the project by myself but got help with projection and displaying with reconstruction of the faces

Ritik - Wrote the project by himself but needed my clarification on the face reconstruction and recognition

Report:

In the project for steps one, two and three in PCA I went off the class code PCA example and used that as a guideline. For the covariance matrix I originally tried to multiply the matrix of the flattened and centered faces with the transpose of itself but found that it took too much resources so I used np.cov. I got some help from Ritik to display the eigenfaces. For the facial recognition section, I first chose an image from the test dataset then normalized it using the code I had written in step 1 then I projected the vector onto the basis with the same code that I had in the second step. I then got the weight of each face in the training set. I picked 100 for k as it was not too much to slow down the runtime but enough to provide a decently accurate result. I also displayed my recombination images with the corresponding original images. Although the

recombination images lacked the proper details to make all the images look somewhat the same, each image matched accordingly with the highlights and shadows. Then I found the norm of the test picture weight and norm of each test dataset weight and found the lowest value and using that corresponding index displayed that picture as the closest match. My accuracy was around 60% for my face recognition. The lower dimensionality of the face takes away most of the details of the face and just leaves it mostly clumps of black. There is some resemblance to the original picture as far as the overall dark spots and face shape.