

# Exercise 9

January 21, 2021

1. Re-transform PCA algorithm by yourself
2. Eigenface is one of the most popular methods in facial recognition problem. The idea of Eigenface is to find a space with a smaller number of dimensions to represent each face, thereby using the vector in this low space as feature vector for doing classification. It is worth mentioning that an image of a face about  $200 \times 200$  will have a dimension of 40k - an extremely large number, whereas feature vectors usually have only a few hundred dimensions.

Eigenface is actually PCA. The Eigenfaces are the eigenvectors corresponding to the maximum eigenvalues of the covariance matrix.

Let's do a little experiment on Yale face database.