Assignment 3

Due: Nov 9th before class.

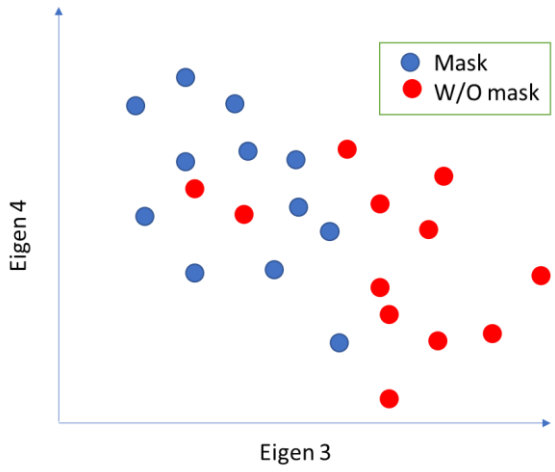
The goal of the project is to use a dimension reduction approach (PCA, etc.) to decompose and transform high-dimension image data into a (much) lower dimension space for classification and clustering. The dataset can be found here:
https://drive.google.com/drive/folders/1FcSHxEKHIyZ_Vckh6K1GDTN-VdM7tgD6
For each subtask listed below, find the best two eigenvectors that define a 2D space to best separate corresponding categories, visualize individual data points in a 2D plot and calculate a Silhouette score for each subtask.

Subtask 1. Emotion recognition

Subtask 2. Mask detection

Subtask 3. Person identification

Below is a make-up example of visualization, in which the two dimensions correspond to the best two eigenvectors to separate two categories.



Bonus points: Instead of using a whole image, you are encouraged to try other (creative) ways to solve each problem. A better solution should have a lower Silhouette score than the default one. Even if you may not be able to implement an idea you come up with, you will earn extra points by clearly describing a new idea and explaining in what ways it may improve performance.

Write a report to explain your results and summarize what you've learned by trying to find the best dimension reduction solution for each problem.