# Antoine Labatie   MVA 2008-2009

Object Recognition and Computer Vision :

## Assignment 3: Eigenfaces for Recognition

I had to create the function calculating the nearest neighbour, which is **nn.m.** This function takes 2 different sets of vectors, that is all the training vectors and all the test vectors. Then for every test vector it finds the nearest neighbour among the training vectors. I used this function for the comparisons in the face space, and I adapted it into a **ncc.m** function for the baseline.

For the different elements to hand in I created different .m files. For the pictures of the top PCA components and the mean face I used the file **PCA_pictures.m.** For the pictures of incorrect matches I adapted the debugging part of the template and wrote the file **incorrect_matches.m**. Finally for the dependence in K I wrote the file **Dep_in_K**.

The results seem to be correct since the classification rate increases rapidly in K and then levels off as we see on this plot with linear absciss. It seems to be capped at 0.9 for this set of images but the baseline based on maximizing the cross-correlation does not work better than the PCA method if K is greater than 20.

Dependence in K
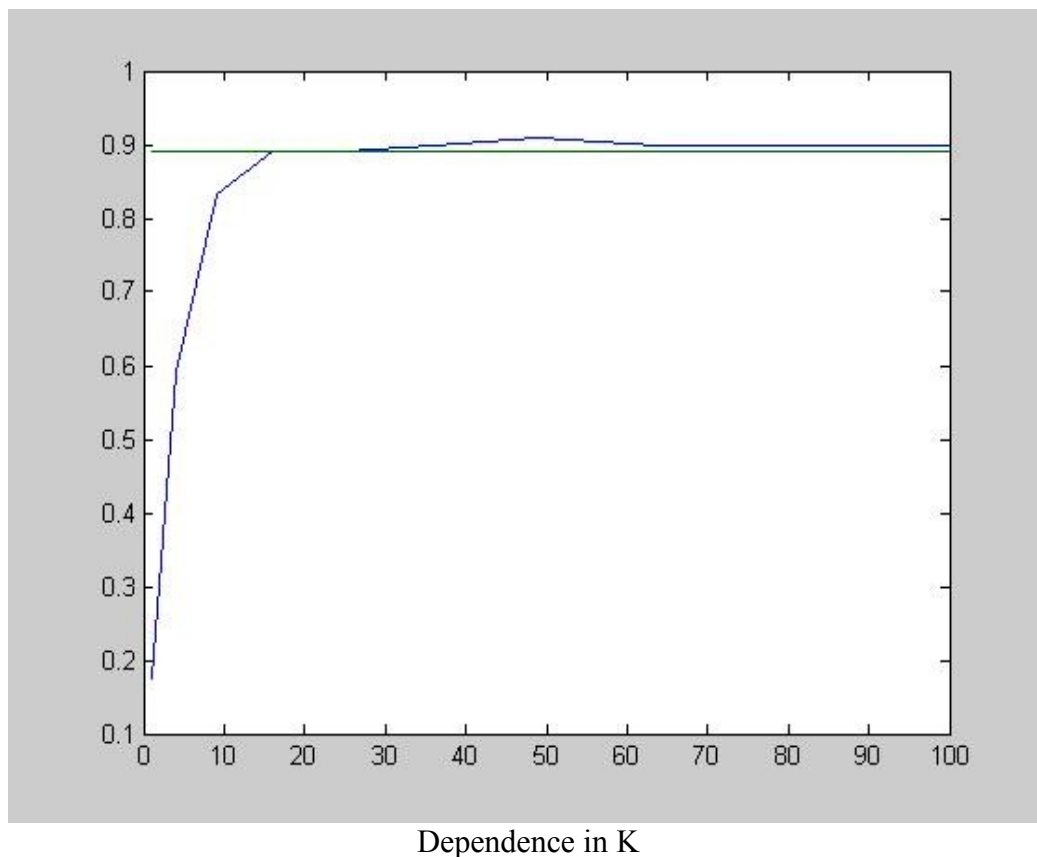
I displayed the first PCA components but it did not seem easy to interpret. I thought that it is because it is their superposition which makes it recognizable.On the contrary the result for the mean face does not seem surprising.
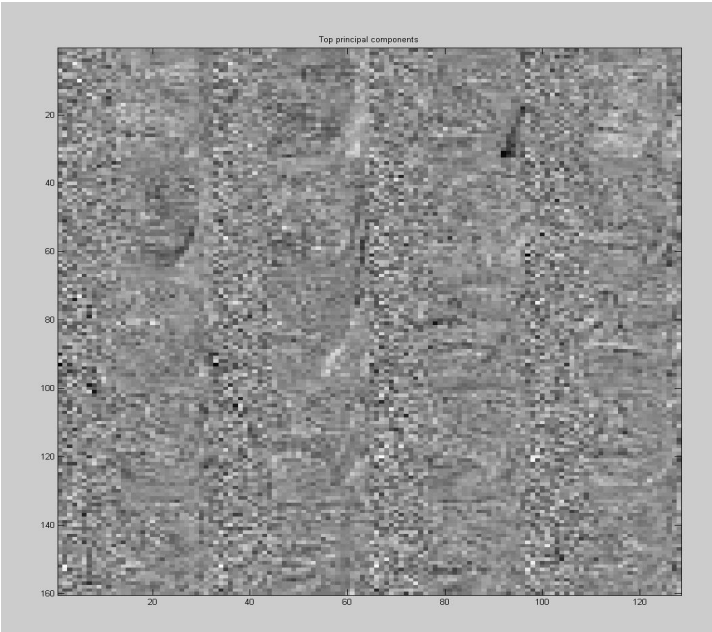
20 first Principal Components
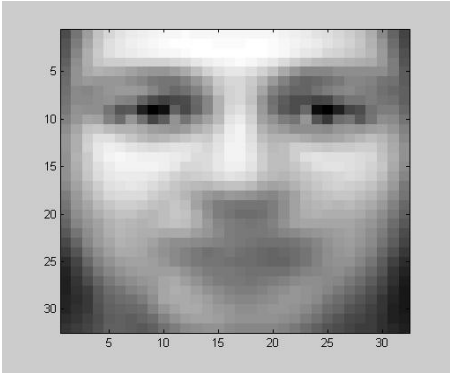
Mean face

Finally if we look at the incorrect matches it also seems consistent with the result, 2 nearest neighbours look very similar in the face space, though they do not come from the same person.

Incorrect matches