**Pattern Recognition**

**Lab 4**

**2013-11-07**

In this assignment we will do simple face recognition test. Step 1 and step 2 combine the data, step 3 normalizes the data matrix, step 4-8 apply PCA for dimension reduction (from 2500 to 50), step 9 labels data and divides data training and test (we can change 50% and 50%, 80% and 20%, …) and step 10 and step 11 test face recognition using kNN classifier.

1. Read given images from a folder.
2. Resize each image by size 50 x 50.
3. Normalize the data to have a min value of 0 and max value of 1
4. Compute a mean image among all the images.
5. Subtract the mean image from each image.
6. Compute covariance matrix
7. Compute eigenvectors and eigenvalues of the covariance matrix
8. Compute projected values for each images with eigenvectors corresponding maximum 50 eigenvalues
9. Label data start from 0 and divide data training 70% and test 30% for each person.
10. Test kNN face recognition test
11. Analyse your results changing different k (k=1, 3, 5, …) values
12. Write a report, which includes face recognition performance table in different k values, important source code part and your conclusion.
13. Submit or send the report of experimental results.