Lab KNN & SVM

We will have a competition for this lab. Extra points for each student who achieved the best results for KNN or SVM.

In this Lab, we will try to build a gender detection system based on images (similar to the homework 1). We used a the same data as the homework. The data is given in the zip file. It contains two directories male/female. Each directory contains two other directories Train and Test.

1. Train a PCA in all training data.
2. Transform both the training and the test data using this PCA bases.
3. Explore the performance of KNN and SVM by varying the number of bases.

4. KNN: Implement K-nearest neighbor algorithms. Try different K value (1,5,10,50,100) and see how the accuracy change. Compare your result with Homework 1.

5. SVM: Use the Matlab function to do the binary classification. Examples can be found in https://www.mathworks.com/help/stats/support-vector-machine-classification.html for Matlab. For Python you can use scikit-learn: http://scikit-learn.org/stable/modules/svm.html . Play with different C values and kernel functions and see how they influence the result. Report your best accuracy and settings include dimension, C value, kernel function you used.

Submit all your code and obtaining performances. **Do not include the data directory**.