**Data Practicum on Face Recognition**

Notes:

1. Intro
   1. Implement different classifiers to achieve face recognition.
   2. Given: dataset of faces and their corresponding labels.
   3. Split the data and train your classifiers.
2. Preprocessing
   1. PCA.
      1. Apply to all data, before feeding it into classifiers.
   2. MDA.
      1. Similar to PCA.
3. Classifiers.
   1. Bayes’ Classifier.
      1. Assuming the underlying distribution is Gaussian, implement Maximum Likelihood estimation, followed by Bayes’ Classification.
   2. k-NN Rule.
      1. Implement k-NN to classify the test data. Experiment different values of ‘k’.
4. Datasets.
   1. Divide each dataset file into test and train.
   2. Data.
      1. Variable **face**. 24x21x600.
      2. Each image of size 24x21; 200 subjects/people, 3 images of each = 600 images.
      3. Three images (n = 1,2,…200):
         1. Neutral face. face(: , : , 3\*n-2)
         2. Facial expression. face(: , : , 3\*n-1)
         3. Illumination variations. face(: , : , 3\*n)
   3. Pose.
      1. Variable **pose**. 68 subjects. 13 poses for each subject.
      2. ith pose of jth subject => pose(: , : , i , j)
   4. Illumination.
      1. Additional dataset for pose.
5. Classifying
   1. Neutral faces vs Smiling faces.
      1. Dataset **data.mat**
      2. Use PCA for preprocessing.
      3. Bayes’ and k-NN classifiers.
      4. Experiment with
         1. splitting the dataset to training and test subsets,
         2. the dimension of the PCA space,
         3. with number k of nearest neighbors.
      5. In ‘each’ experiment , find the numbers of images classified correctly and incorrectly.
   2. Identifying subjects.
      1. Dataset **pose.mat**
      2. Use PCA and/or MDA for preprocessing.
      3. Bayes’ and k-NN classifiers.
      4. (feel free to start with few subjects) First 10 poses as train and remaining 3 poses as test.
      5. Experiment
         1. with preprocessing and with classifiers, trying to maximize correct classification.
         2. You also might want to experiment with illumination effects.