Indian Institute of Information Technology Guwahati
CS360: Machine Learning

Lab 4: Bayesian learning and KNN

Date: 27.08.2019 Total Marks: 25
Deadline: 02.09.2019

Implement the following questions in Matlab:

Q.1) Bayes minimum risk classifier using the dataset in Lab 3. Use the following cost/loss while minimizing the risk:

$$\lambda(\text{no-recurrence-events/recurrence-events}) = 0.8$$
$$\lambda(\text{recurrence-events/no-recurrence-events}) = 0.2$$
$$\lambda(\text{no-recurrence-events/no-recurrence-events}) = 0$$
$$\lambda(\text{recurrence-events/recurrence-events}) = 0$$

Compare the result with bayes minimum error classifier and create confusion matrix for both classifiers to analyse the result.

10 marks

Q.2) K-Nearest Neighbour classifier (you can fix K by empirically) and do the experiment with following datasets:

a) USPS: Its a digit dataset with the dimension of 256
   1. Obtain classification result based on the given training and testing data
   2. Combine training and testing data, then obtain the result using 5-fold cross validation

b) MNIST: Its a digit dataset with the dimension of 784
   1. Obtain classification result based on the given training and testing data
   2. Analyse the performance with USPS dataset

10+5 marks