

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Department of Electrical and Computer Engineering

ECE 544 PATTERN RECOGNITION

Problem Set 4
Fall 2007

Issued: Tuesday, October 16, 2007

Due: Thursday, October 25, 2007

Reading for problem set 4: DHS (Duda, Hart, & Stork) chapter 5

Written Problems (40%)

DHS problems 5.10, 5.16, 5.26, 5.33.

Library Problem (20%)

Write a one-page review of a paper of your choice (same format as in previous homeworks).

Prescribed Computer Problem (20%)

DHS computer exercise 5.11. You may optimize the SVM criterion using gradient descent, or using any other method that pleases you.

Open-Ended Computer Problem (20%)

Find data that interest you. Plot a scatter plot of the first two dimensions of the first two classes. Compute the LDA separatrix, and plot the LDA separatrix in your scatter plot. Train a perceptron classifier using the two-dimensional data, using either single-sample or batch update, and show the resulting separatrix in your two-dimensional scatter plot. Comment on any differences and similarities between the LDA and perceptron results.