

HW6 (ECE7252 Spring 2008)

1. Exercise 12.1.

2. Exercise 12.9.

2. SVM can also be used to design nonlinear classifiers. Use the zip code data (about 7000 training token) to design two-class SVM-based classifiers for handwritten digit classification. You can experiment it by choosing a few different numbers of support vectors to obtain different results in the following.

- 1) First pick a “reasonable” number of support vectors, and choose a pair of digits, say one and seven, to perform 1-7 classifiers. Compare the accuracy in terms of a contingency table using only test data from the classes of digit one and seven;
- 2) Repeat the above with another number of vectors, and compare the results.
- 3) Compare the results from SVM and those obtained with ANN results by training a 1-7 ANN classifier (using the algorithm you used in HW5);
- 4) Suppose an engineer is interested in digit classification (ten classes rather than two), what can you suggest him to do so that he can perform 10-class digit recognition using a combination of two-class SVM classifiers performed above. Explain why you would suggest such a strategy.