Homework 12, due April 11th, 11:59pm

April 4, 2024

1. Use `sklearn.svm.SVC` or another package to train SVM classifiers. For each dataset use the training and test sets specified in the syllabus.

a) Using the `hill-valley` data, train a SVM classifier with $C = 1$ and a polynomial kernel of degree $d \in \{1, ..., 15\}$ for a total of 15 classifiers. Display on the same graph the training and test misclassification errors vs d. (1 point)

b) Using the `hill-valley` data, train a SVM classifier with $C = 1$ and an RBF kernel with $\gamma = 2^{-i}$ for $i \in \{0, 1, ...20\}$ for a total of 21 classifiers. Display on the same graph the training and test misclassification errors vs γ using a logarithmic scale for x (use `matplotlib.semilogx` for that). (1 point)

c) Repeat point a) for the `satimage` data with $d \in \{1, ..., 5\}$ for a total of 5 classifiers. (1 point)

d) Repeat point b) for the `satimage` data. (2 points)

e) Repeat point a) for the `madelon` data with $d \in \{1, ..., 15\}$ for a total of 15 classifiers. (1 point)

f) Repeat point b) for the `madelon` data. (1 point)

g) Repeat point b) for the `gisette` data. (2 points)