Indian Institute of Space Science and Technology – Thiruvananthapuram

MA622 Pattern Recognition and Machine Learning

Assignment-11

Date: 11-03-2016

1. Apply SVM classification on Data1 and Data2 & regression on Data3 and Data4 (find the attached documents).
   (a) Apply (a) iterative technique (b) chunking and decomposition to solve the problem.
   (b) Describe the methods you used for finding the suitable kernel.
   (c) Plot the decision boundary for classification and the SVM points.
   (d) Plot the function that generates the data for the regression and SVM points.
   (e) Plot the value of primal and dual objective function against iteration. Report the value of the duality gap.
   (f) Assess the performance of the model.

2. Consider the following data {((1,1),-1), (1,-1),1), (-1,-1),-1), (-1,1), 1)}.
   (a) Plot the nonlinear boundary in the input space.
   (b) Desribe the linear boundary in RKHS space generated by the kernel $k(x,y) = (\langle x,y\rangle)^2$ and the representor of evaluation at the input points.

3. Implement SMO for classification
   (a) Analyze Vertebral Column Data Set using SMO.

Notes

- Assignment has to be written in latex.
- All the files related with the assignment should be saved in a single folder and send to sumitra@iist.ac.in.
- Last date of submission: 23-03-2016.
- **As far as assignments are concerned, students are expected to observe academic honesty and integrity. Though the students can collaborate and discuss, copying directly other students' assignment or allowing your own assignment to be copied constitute academic dishonesty and is highly discouraged.**