Pattern Classification and Machine Learning

FEN3202

Discussion Agenda and Exercises for Lecture 8

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I. Discussion Agenda

1) Sparse Kernel Machines Chapter 6 of the text book.

   Main Topic: Support Vector Machine (SVM)

   Discussion Points: Introduction to the chapter 6, sparse kernel machines, SVM and RVM introduction

   Maximum margin classifiers: equation 7.1, assumption of exact linear seperability, generalization error, concept of margin, towards maximum margin solution, equation 7.2-7.3, why equation 7.4?, equation 7.5-7.12, advantage of dual representation, equation 7.13-7.16, role of support vectors, Figure 7.1, equation 7.17-7.18, Figure 7.2

   Overlapping class distributions (section 7.1.1): concept of slack variable, equation 7.20-7.37, Figure 7.4, comments on quadratic programming, kernel and curse of dimensionality, equation 7.42, manifold.

   Multiclass SVM (section 7.1.3): SVM is fundamentally a two-class solution, extension to multiclass, one-versus-rest, one-versus-one

   SVMs for regression (section 7.1.4): Heydar will discuss in the class.

II. Assignment

1) Big Data and some comments
2) Distributed SVM (Journal of Machine Learning paper) - Study the paper as homework and present (atleast one student has to agree to present the paper)