22QA895 Special Topics in QA

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Course Objectives:

This course is a PhD level seminar course on advanced research topics. We will focus on two main areas of research (a) nonparametric estimation (b) corporate bankruptcy prediction, which are in line with my current research interest. We will also discuss two important data bases CRSP and COMPUSTAT through Wharton website. Students are expected to be able to replicate and understand the discussed research work with further implementation on updated data or through simulation studies. Sample Matlab and SAS code will be provided for you to replicate work or for further implementation.

For topic (a) nonpametric estimation, we will explore ongoing research areas on local linear and penalized spline methods on (1a) univariate nonparametric smoothing, (2a) additive models, (3a) single-index models, (4a) varying-coefficient models on regression, nonlinear time-series and (5a) conditional quantiles. We will also discuss (6a) applications to finance, for example, on capital asset pricing model.

For topic (b) corporate bankruptcy prediction, we will explore (1b) CRSP and COMPUSTAT data base. Sample SAS code will be provided to obtain bankruptcy data by merging two important databases. (2b) Literature survey using cross-sectional data. We will then explore ongoing research areas on (3b) data sample selection (4b) dynamic variable selection (5b) simple hazard model (6b) transformation survival model.

Finally, you are expected to write a 5 page research proposal of possible future research topics to explore after conducting a comprehensive literature search and examining relevant recent journal articles and working papers. A sample proposal will be provided.

Course Format: This will be a flexible style seminar course with combinations of lecture, presentation, and discussion. The aim is for students to obtain hands-on experience of important databases, to learn Matlab computing on advance research topics on nonparametric estimation and to gain deep understanding of research in general. Regular weekly assignments involve paper reading, presentation, and replicating work using sample code with possibly tailored modification.

Prerequisites: Good understanding of Probability, Statistical Inference, and Regression (at graduate level of math/stat). Programming skills of at least one of SAS, Matlab, R or Splus. Genuine interest in pursuing advanced research.

Reference Text: The book listed can be used for reference reading.

Ruppert, D., Wand, M.P. and Carroll, R. (2003), Semiparametric Regression, Cambridge University Press.