BANA 9085 Special Topics in Business Analytics I
Statistics and Finance

Prof. Yan YU
Lindner College of Business
2016 Fall, Lindner 537, Thursday 12-3:50pm

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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) corporate bankruptcy and loss given default; (b) nonparametric estimation, which are in line with my current research interest. We will briefly 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 real data and through simulation studies. Some sample R and Matlab codes will be provided for you to replicate work or for further implementation.

For topic (a) corporate bankruptcy prediction and loss given default, we will first quickly introduce CRSP and COMPUSTAT data base and literature survey. We will then explore ongoing research areas on (1a) dynamic variable selection and discrete hazard model for default prediction; (2a) loss given default.

For topic (b) nonparametric estimation, we will first introduce local linear and penalized spline methods focusing on univariate nonparametric smoothing; and then explore (1b) generalized additive models; (2b) single-index models; (3b) generalized partially linear single-index model; (4b) an applications to finance, specifically, on the conditional capital asset pricing model. General discussion on nonlinear time-series, conditional quantiles as well as recent advances in nonparametric estimation and its application will be given on regression, nonlinear time-series and conditional quantiles.

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 R and Matlab computing on advance research topics on variable selection, 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 R, Matlab, and SAS. Genuine interest in pursuing advanced research.

**Reference Texts:** The books listed can be used for nonparametric reference reading.


HOMEWORK

Reading assignment:
There are three reading assignments. Please write one page summary for each paper.

General guidelines of Reading assignments:
Using your OWN words to write three paragraphs to summarize the paper by answering the following questions:
• What is the main contribution of the paper? What are the proposed model, statistics, and results?
• What is the possible weakness (if any) of the paper? What could be future research based on the paper?
• Conduct a quick literature search and summarize recent advances in research on this topic.

Computing assignment:
There are four computing assignments in replicating some current research. You are welcome to exploring different analysis. Please run your idea before you proceed.

Presentation:
Each of you will lead a paper discussion and/or computing assignment.

Final Project/Proposal
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. Alternatively, you are more than welcome to directly working on a research project.