Statistics Seminar for Spring 2019
Schedule and Abstract

Date	Speaker	Talk Title
April 19 at 11am-12noon, Fretwell 124	Mei-Ling Ting Lee, University of Maryland	**First-hitting-time Based Threshold Regressions with Shocks for Degradation Processes**
April 26 at 11am-12noon, Fretwell 122	Grace Yi, University of Waterloo	**Semiparametric Methods with Mixed Measurement Error and Misclassication in Covariates**
April 26 2:00-3:00pm, Fretwell 120	Wenqing He, University of Western Ontario	**Data Adaptive Support Vector Machine, with Application to Prostate Cancer Imaging Data**
April 30	Last day of classes	

Speaker #1:
Date: April 19, 2019
Time and location: 11:00am-12:00noon, Fretwell 124
Speaker: Prof. Mei-Ling Ting Lee, University of Maryland

Title: First-hitting-time Based Threshold Regressions with Shocks for Degradation Processes

Abstract: People's health or engineering systems experience gradual degradation while simultaneously being exposed to a stream of random shocks of varying magnitudes that eventually cause death or failure when a shock exceeds the residual strength. I'll present theory and statistical properties of this model. Applications including a study of osteoporotic hip fractures in the elderly.

(Hosted by Dr. Yang Li, UNC Charlotte)

Speaker #2:
Date: April 26, 2019
Time and location: 11:00am-12:00noon, Fretwell 122
Speaker: Prof. Grace Yi, University of Waterloo

Title: Semiparametric Methods with Mixed Measurement Error and Misclassication in Covariates

Abstract: Measurement error arises ubiquitously from various fields including health sciences, epidemiological studies, survey research, economics, and so on. It has been a longstanding concern in data analysis and has attracted extensive research interest over the past few decades. The effects of measurement error are complex and vary from problem to problem. While there are settings where measurement error effects are negligible, it has been well documented that ignoring measurement error in statistical analyses often yields erroneous or even misleading results. It is sensible to conduct a case-by-case examination in order to reach a valid statistical analysis for error-contaminated data. Although in practice both measurement error in covariates and misclassification in covariates may occur simultaneously, research attention in the literature has mainly focused on addressing either one of these problems separately but not both. In this talk, I will discuss issues pertinent to analysis of error-contaminated data and describe several methods of handling data with both measurement error and misclassification in covariates. (Hosted by Dr. Yanqing Sun, UNC Charlotte)

Speaker #3:
Date: April 26, 2019
Time and location: 2:00pm-3:00pm, Fretwell 120
Speaker: Prof. Wenqing He, University of Western Ontario

Title: Data Adaptive Support Vector Machine, with Application to Prostate Cancer Imaging Data

Abstract: Support vector machines (SVM) have been widely used as classifiers in various settings including pattern recognition, texture mining and image retrieval. However, such methods are faced with newly emerging challenges such as imbalanced observations and noise data. In this talk, I will discuss the impact of noise data and imbalanced observations on SVM classification and present a new data adaptive SVM classification method.

This work is motivated by a prostate cancer imaging study conducted in London Health Science Center. A primary objective of this study is to improve prostate cancer diagnosis and thereby to guide the treatment based on statistical predictive models. The prostate imaging data, however, are quite imbalanced in that the majority voxels are cancer-free while only a very small portion of voxels are cancerous. This issue makes the available SVM classifiers typically skew to one class and thus generate invalid results. Our proposed SVM method uses a data adaptive kernel to reflect the feature of imbalanced observations; the proposed method takes into consideration of the location of support vectors in the feature space and thereby generates more accurate classification results. The performance of the proposed method is compared with existing methods using numerical studies. (Hosted by Dr. Yanqing Sun, UNC Charlotte)