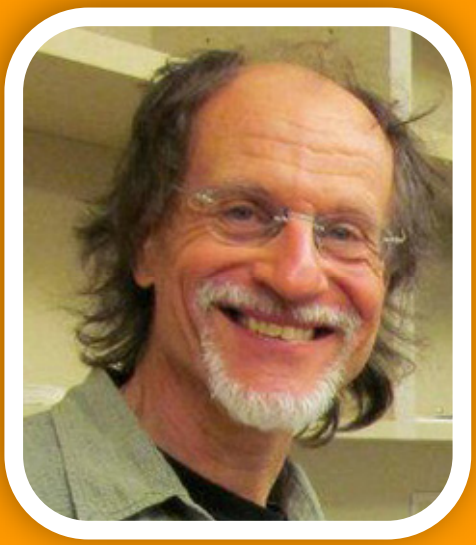
Friday, January 19th

J. Wayne Reitz Union, Auditorium

9:00 AM



Dr. Hans-Georg Müller

Professor of Statistics
University of California, Davis

"Frechet Regression and Applications "

Regression models that relate responses consisting of random objects in a metric space with Euclidean predictors are of interest in various applications. We introduce generalized versions of both global least squares regression and local weighted least squares smoothing by extending the concept of Frechet means to conditional Frechet means. Asymptotic rates of convergence for the corresponding fitted regressions to the population targets and other properties are obtained with empirical process theory. The broad applicability of Frechet regression is demonstrated with data from brain imaging, demography and child development that feature regression responses ranging from probability distributions to covariance matrices. This presentation is based on joint work with Alexander Petersen, UC Santa Barbara.

Bio

Distinguished Professor Hans-Georg Mueller of the Department of Statistics, specializes in nonparametric statistics, biostatistics and statistical methodology for stochastic processes (data that includes random variables that change over time). Applications of his work include neuroimaging, genomics, mortality and aging, demography and economics.

Friday, January 19th

J. Wayne Reitz Union, Auditorium

9:55 AM

Dr. Wei Biao Wu

Professor of Statistics

University of Chicago

" Testing for Trends in High-dimensional Time Series"

We consider statistical inference for trends of high-dimensional time series. Based on a modified L2-distance between parametric and nonparametric trend estimators, we propose a de-diagonalized quadratic form test statistic for testing patterns on trends, such as linear, quadratic or parallel forms. We develop an asymptotic theory for the test statistic. A Gaussian multiplier testing procedure is proposed and it has an improved finite sample performance. Our testing procedure is applied to a spatial temporal temperature data gathered from various locations across America. A simulation study is also presented to illustrate the performance of our testing method. The work is joint with Likai Chen

Bio

Wei Biao Wu received the Ph.D. degree in statistics in 2001 from The University of Michigan, Ann Arbor. He is currently Professor of Statistics at The University of Chicago. His research interests include probability theory, statistics, financial time series and econometrics. He is currently interested in developing asymptotic theory for high-dimensional time series. He has received the National Science Foundation Career Award (2004) and The Tjalling C. Koopmans Econometric Theory Prize (2009). His research is supported by National Science Foundation research grants.

Friday, January 19th

J. Wayne Reitz Union, Auditorium

11:20 AM

Dr. Guang Cheng

Professor of Statistics

Purdue University

"Can We Do Statistical Inference in a Non-Asymptotic Way"

Many classical statistical inferential procedures are built upon large sample theory that relies on a growing amount of data information. However, in practice, it is often the case that only a small to moderate samples are available. This talk explores the possibility of establishing statistical inference with finite sample validity. The leading example is smoothing spline models under Gaussian errors. Specifically, we develop a set of non-parametric testing procedures with *exact* statistical guarantees in the sense that Type I and II errors are controlled for any finite sample size. An immediate consequence of this non-asymptotic theory is a new formula (different from GCV) for selecting the optimal smoothing parameter in non-parametric testing. Simulations demonstrate that our proposed test improves over the Conventional asymptotic test when sample size is small to moderate.

Bio

Guang Cheng is a Professor of Statistics at Purdue University. He received his PhD in Statistics from University of Wisconsin-Madison in 2006. His research interests include Big Data, Machine Learning and High Dimensional Statistical Inferences. Please visit his big data theory research group at http://www.stat.purdue.edu/~chengg/.

Friday, January 19th

J. Wayne Reitz Union, Auditorium

2:00 PM

Dr. Yanyuan Ma

Professor of Statistics

Penn State University

" On Estimation of General Index Model for Survival Data"

We propose a general index model for survival data, which generalizes many commonly used semiparametric survival models and belongs to the framework of dimension reduction. Using a combination of geometric approach in semiparametrics and martingale treatment in survival data analysis, we devise estimation procedures that are feasible and do not require covariate-independent censoring as assumed in many dimension reduction methods for censored survival data. We establish the root-n consistency and asymptotic normality of the proposed estimators and derive the most efficient estimator in this class for the general index model. Numerical experiments are carried out to demonstrate the empirical performance of the proposed estimators and an application to an AIDS data further illustrates the usefulness of the work.

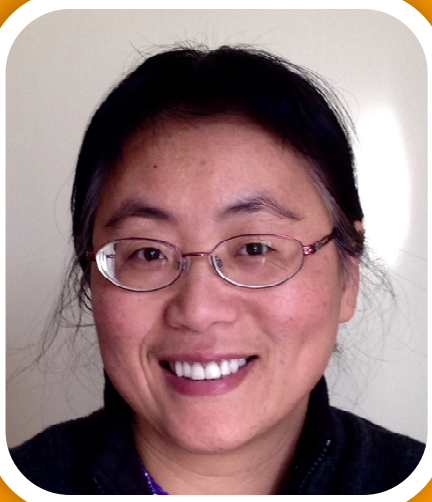
Bio

Yanyuan Ma is a Professor of Statistics at Penn State University. He received his PhD in Applied Mathematics from MIT in 1999. His research interests include dimension reduction, latent variable models, mixed samples, nonparametrics, semiparametrics, and survival analysis.

Friday, January 19th

J. Wayne Reitz Union, Auditorium

2:55 PM



Dr. Annie Qu

Professor of Statistics

University of Illinois at Urban-Champaign

"Multilayer tensor factorization with applications to recommender systems"

Recommender systems have been widely adopted by electronic commerce and entertainment industries for individualized prediction and recommendation, which benefit consumers and improve business intelligence. In this article, we propose and innovative method, namely the recommendation engine of multilayers (REM), for tensor recommender systems. The proposed method utilizes the structure of a tensor response to integrate information from multiple modes, and creates an additional layer of nested latent factors to accommodate between –subjects dependency. One major advantage is that the proposed method is able to address the "cold-start" issue in the absence of information from new customers, new products or new contexts. Specifically, it provides more effective recommendations through sub-group information. To achieve scalable computation, we develop a new algorithm for the proposed method, which incorporates a maximum block improvement strategy into the cyclic block-wise-coordinate-descent algorithm. In theory, we investigate both algorithmic properties for global and local convergence, along with the asymptotic consistency of estimated parameters. Finally, the proposed method is applied in simulations and IRI marketing data with 116 million observations of product sales. Numerical studies demonstrate that the proposed method outperforms existing competitors in the literature. This is joing work with Xuan Bi and XiaotongShen.

Bio

Annie Qu is Professor of Statistics at University of Illinois at Urban-Champaign. She is the current Section Chair of Statistical Learning and Data Science of ASA. She is fellow of IMS and ASA, and is working on nonparametric and semiparametric model and inference for longitudinal data, machine learning, high-dimensional data, text mining, and recommender system.