Pseudo Maximization and Limit Theorems

Victor de la Pena

Department of Statistics, Columbia University

In this talk I discuss the method of pseudo-maximization and show how it can be used to prove an upper LIL for continuous martingales and other processes. Pseudo-maximization is closely related to the method of mixtures and provides a nice heuristic for obtaining close to ideal exponential inequalities

(joint work with M. J. Klass and T. L. Lai).

Limit theorems for weighted quadratic forms of time series with long range dependence

Qiying Wang

University of Sydney

Central and non-central limit theorems for a class of weighted quadratic forms with long memory innovations are derived. The results are used to investigate model specification tests for non-parametric time series regression with long range dependence. This talk partially depends on a joint work with Prof Jiti Gao.

Sharp large deviations for Gaussian quadratic forms

Bernard Bercu

Universite Paul Sabatier

We establish a sharp large deviation principle for Hermitian quadratic forms of Gaussian stationary processes. Our result is similar to the well-known Bahadur-Rao theorem on the sample mean. We propose several statistical applications such as a sharp large deviation principle for the sum of squares and for the Neyman-Pearson likelihood ratio statistic. We also investigate the sharp large deviation properties of the Yule-Walker estimator of the parameter of a stable, unstable or explosive Gaussian autoregressive process. Similar results associated with the standard Ornstein-Uhlenbeck process are also provided.

Spectral Measure of Large Hankel, Markov and Toeplitz Matrices

Tiefeng Jiang

University of Minnesota

We study the limiting spectral measure of large symmetric random matrices. This includes the asymptotic behavior of properly scaled eigenvalues of Hankel, Markov and Toeplitz matrices. This solves three unsolved random matrix problems. It is the joint work with W. Bryc and A. Dembo.

Independent Constants and Some Gaussian Inequalities

Wenbo Li

University of Delaware

Given d real valued random variables $X_1, \cdots, X_d$, there are various ways to measure dependence structures among them, such as correlations, mixed moments, etc. In this talk, we define and study a new measure that captures the amount of dependence when it is compared with the ``best" independent ones. To be more precise, we consider the best (largest constant α and smallest constant β) possible probability bounds
$$ \alpha \prod_{i=1}^d P(W_i\in B_i)
\le P(\cap_{i=1}^d \{X_i \in B_i\}) \le \beta \prod_{i=1}^d P(Y_i\in B_i) $$
for some real valued random variables W_i, Y_i, and all Borel sets B_i, $1 \le i \le d$. The joint Gaussian case will be discussed in detail