

Robert Bohrer Lectures & Workshop for Student Papers in Statistics

Schedule of Events

Thursday, April 3, 2008
Room 122 Illini Hall

3:30 p.m. – 3:55 p.m. **Coffee & Cookies in Room 122 Illini Hall**

4:00 – 5:00 p.m. **Ker-Chau Li**
Institute of Statistical Science, Academia Sinica
Department of Statistics, UCLA

Title: “Statistical analysis of voluminous genomics data”

Place: 2 Illini Hall

Abstract:

With advent of biotechnologies such as genome sequencing, microarray gene expression, Chromatin-ImmunoPrecipitation DNA chip (ChIP-chip), and mass spectrometry (MS/MS) proteomics, biologists are poised to launch system-wide investigations on how cells manage to orchestrate the numerous well-programmed biological tasks, starting from the fundamental interplay between the three major types of cellular macromolecules, DNA, RNA, and protein. But the gigantic volume of genetic, genomic, and biological pathway data that the scientists produce cannot be understood without sophisticated computational methods guided by mathematical and statistical principles. By examples, we will demonstrate the fruitful applications of statistical methods, including clustering, classification, dimension reduction and a newly introduced concept “liquid association”. We will also discuss the challenges ahead in the development of systems biology.

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Friday, April 4, 2008

Friday, April 4, 2008, 1:00 p.m. – 6:00 p.m.
Reading Room, Levis Faculty Center
919 W. Illinois St., Urbana, IL 61801
Phone: (217) 333-0691

1:00 p.m.-1:15 p.m. Registration
 Coffee

1:15 p.m. – 1:30 p.m. Introduction by Prof. **Douglas Simpson**
 Student Papers Presentation—**Session Chair: Prof. Feng Liang**

- 1:35 p.m.-1:55 p.m. **Name: Hyokyung (Grace) Hong, Statistics, UIUC**
Title: “Prediction of Quantiles in Ordinal Regression with Applications to Aging Research”
- 2:00 p.m.-2:20 p.m. **Name: Mark D. Butala, Engineering, UIUC**
Title: “Tomographic Imaging of Dynamic Objects With the Localized Ensemble Kalman Filter”
- 2:25 p.m. – 2:45 p.m. Coffee and Conversation
- 2:45 p.m. – 3:05 p.m. **Name: Zhou Zhou, Statistics, University of Chicago**
Title: “Local Linear Quantile Estimation for Non-stationary Time Series”
- 3:10 p.m.-3:30 p.m. **Name: Alan Huebner, Statistics, UIUC**
Title: “Conditional Risk Models for Ordinal Response Data”
- 3:35 p.m.-3:55 p.m. Coffee & pastries and Conversation
- 4:00 p.m.-5:00 p.m. **Keynote address—Introduction by Prof. Steve Portnoy**

Ker-Chau Li
Institute of Statistical Science, Academia Sinica
Department of Statistics, UCLA

Title: “Model selection, dimension reduction and liquid association: a trilogy via Stein’s lemma”

Abstract:

Nowadays statisticians are facing more and more complex data structures with many variables and the analysis of which requires good model building, variable selection, and dimension reduction techniques. In this talk, I will describe how a basic idea from Stein’s monumental work in decision theory has led to my earlier research in model selection (generalized cross validation), dimension reduction (sliced inverse regression and principal Hessian direction) and more recently in the development of liquid association for bioinformatics applications.

Key References:

- Li, K. C. (1985). From Stein's unbiased risk estimates to the method of generalized cross validation. *Ann. Statist.* 13 1352-1377.**
- Li, K. C. (1992). On principal Hessian directions for data visualization and dimension reduction : another application of Stein's lemma. *J. Ameri. Stat. Assoc.* 87, 1025-1039.**
- Li, K.C. (2002) Genome-wide co-expression dynamics: theory and application. *Proceedings of National Academy of Science* . 99, 16875-16880.**
- Li, KC, Palotie A, Yuan, S, Bronnikov, D., Chen D., Wei X., Choi, O., Saarela J., Peltonen L. (2007) Finding candidate disease genes by liquid association. *Genome Biology*, 8, R205. oi:10.1186/gb-2007-8-10-r205**

Reception will be from 5:00-6:00 p.m. in the lobby of the Second Floor. Reservations for the reception will have to be made in advance. If you intend to attend the reception, please contact Usha Dhar (udhar@uiuc.edu) or call 244-7192 by Thursday, April 3, 2008.