

# Department of Systems Engineering and Engineering Management

Seminar Series

## Quantile and quantile function estimations under density ratio model

**Dr. Jiahua Chen**

Canada Research Chair, tier I,  
University of British Columbia, Vancouver, Canada

Date:	15 January, 2013 (Tue)
Time:	10:00 am (Tea reception at 9:45 am)
Venue:	Room Y5-412 (AC1)

### Abstract

Population quantiles and their functions are important parameters in many applications. For example, the lower level quantiles often serve as crucial quality indices of forestry products and others. In the presence of several independent samples from populations satisfying density ratio model, we investigate the properties of the empirical likelihood (EL) based inferences of quantiles and their functions. In this paper, we first establish the consistency and asymptotic normality of the estimators of parameters and cumulative distributions. The induced EL quantile estimators are then shown to admit Bahadur representation. The results are used to construct asymptotically valid confidence intervals for functions of quantiles. In addition, we rigorously prove that the EL quantiles based on all samples are more efficient than the empirical quantiles which can only utilize information from individual samples. Simulation study shows that the EL quantiles and their functions have superior performances both when the density ratio model assumption is satisfied and mildly violated. An application example is used to demonstrate the new methods and potential cost savings. This is joint work with Yukun Liu (East China Normal University).

## **About the Speaker**

**Jiahua Chen** currently holds a Canada Research Chair, tier I, in the department of statistics at the University of British Columbia, Vancouver, Canada.

Dr. Chen obtained his Ph.D with Professor C.F.Jeff Wu on the design of experiment at University of Wisconsin-Madison. He joined the Department of Statistics and Actuarial Science at University of Waterloo as assistant professor in 1991. He is the winner of CRM-SSC prize for the outstanding contribution to statistical science made within the first 15 years of Ph.D in Canada (2005). He served as the president of the International Chinese Statistical Association (2005-2006). He is the elected fellow of the Institute of Mathematical Statistics and the American Statistical Association. He has been the editor-in-chief of the Canadian Journal of Statistics from 2010-2012. His current research interest includes finite mixture models, empirical likelihood, sample survey, statistical genetics, variable selection, large sample theory.

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***All are welcome!***

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