DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE
THE UNIVERSITY OF HONG KONG

50th Anniversary Seminar Series

Professor Bernard DELYON

Department of Mathematics
University of Rennes
France

will give a talk

entitled

ACCELERATION OF EMPIRICAL MEANS

Abstract

Let $(X_1, \dots, X_n)$ be an i.i.d. sequence of random variables in $\mathbb{R}^d$, $d \geq 1$. We show that, for any function $\varphi : \mathbb{R}^d \to \mathbb{R}$, under regularity conditions,

$$n^{1/2}\left(n^{-1}\sum_{i=1}^{n}\frac{\varphi(X_i)}{\hat{f}(X_i)} - \int \varphi(x)dx\right) \xrightarrow{\mathbb{P}} 0,$$

where $\hat{f}$ is the classical kernel estimator of the density of X_1. This result is striking because it speeds up traditional rates, in root n, derived from the central limit theorem when $\hat{f} = f$. We derive upper bounds for the rate of convergence in probability. These bounds depend on the regularity of the functions φ and f, the dimension d and the bandwidth of the kernel estimator $\hat{f}$.

As an application to regression modeling with random design, we provide the asymptotic normality of the estimation of the linear functionals of a regression function. As a consequence of the above result, the asymptotic variance does not depend on the regression function.

on

Wednesday, April 19, 2017

(Refreshments will be served from 2:15 p.m. <u>outside Room 301 Run Run Shaw Building</u>)

2:30 p.m. – 3:30 p.m.

at

Room 301, Run Run Shaw Building

<u>**Visitors Please Note**</u> **that the University has limited parking space. If you are driving please call the Department at 3917 2466 for parking arrangement.**

ALL INTERESTED ARE WELCOME