



The Chinese University of Hong Kong  
Department of Statistics

## Seminar

# Nonparametric Inference of Doubly Stochastic Poisson Process Data via the Kernel Method

By  
Dr. Tingting Zhang  
Department of Statistics  
University of Virginia, USA

### Abstract

Doubly stochastic Poisson processes, also known as the Cox processes, frequently occur in various scientific fields. In this study, motivated primarily by analyzing Cox process data in biophysics, we propose a nonparametric kernel-based inference method. We conduct a detailed study, including an asymptotic analysis, of the proposed method, and provide guidelines for its practical use, introducing a fast and stable regression method for bandwidth selection. We apply our method to real photon arrival data from recent singlemolecule biophysical experiments, investigating proteins' conformational dynamics. Our result shows that conformational fluctuation is widely present in protein systems, and that the fluctuation covers a broad range of time scales, highlighting the dynamic and complex nature of proteins' structure.

Date: December 17<sup>th</sup>, 2010  
Time: 11:00 a.m. - 12:00 p.m.  
Place: Lady Shaw Building, Room G36  
The Chinese University of Hong Kong