

THE CHINESE UNIVERSITY OF HONG KONG

Department of Statistics

will present a seminar entitled

Kernel methods for optimal estimation of change-points in derivatives

by

Professor Ming-Yen Cheng
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on

Tuesday, 13 November 2007
2:00pm – 3:00pm

in

Lady Shaw Building C5
The Chinese University of Hong Kong

Abstract:

We propose an implementation of the so-called zero-crossing-time detection technique specifically designed for estimating the location of jump-points in the first derivative (kinks) of a regression function. Our algorithm relies on a new class of kernel functions having a second derivative with vanishing moments and an asymmetric first derivative steep enough near the origin. We provide a software package which, for a sample of size n , produces estimators with an accuracy of order, at least, $O(n^{-2/5})$. This contrasts with current algorithms for kink estimation which at best provide an accuracy of order $O(n^{-1/3})$. In the software, the kernel statistic is standardised and compared to the universal threshold to test the existence of a kink. A simulation study shows that our algorithm enjoys very good finite sample properties even for low sample sizes. The method reveals kink features in real data sets with high noise levels at places where traditional smoothers tend to oversmooth the data.

This is joint work with Marc Raimondo, the University of Sydney.

All are Welcome