Statistics Seminar

Department of Mathematical Sciences

DATE:	Thursday, March 12, 2015
TIME:	1:15pm to 2:15pm
LOCATION:	WH 100E
SPEAKER:	Heng Yang (Graduate Center, City University of New York)
TITLE:	Simultaneous detection and identification with post-change uncertainty

Abstract

We consider the problem of quickest detection of an abrupt change when there is uncertainty about the post-change distribution. Because of the uncertainty, We would like not only detecting the change point but also identifying the post-change distribution simultaneously. In particular we examine this problem in the continuous-time Wiener model where the drift of observations changes from zero to a drift randomly chosen from a collection. We set up the problem as a stochastic optimization in which the objective is to minimize a measure of detection delay subject to a frequency of false alarm constraint, while also identifying the value of the post-change drift up to pre-specified error bounds. We consider a composite rule involving the CUSUM reaction period, that is coupled with an identification function, and show that by choosing parameters appropriately, such a pair of composite rule and identification function can be asymptotically optimal of first order to detect the change point and simultaneously satisfies the error bounds to identify the post-change drift as the average first false alarm increases without bound. We also discuss the detection problem under different situations.