The University of Chicago
Department of Statistics
Seminars for Fourth Year PhD Students

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"Statistical Theory for Curve/level Crossing Analysis"

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ABSTRACT

Curve/Level-crossing methods have been widely used in engineering, physics, speech recognition and other related fields. For a linear process $X(n)$, we consider the bivariate empirical process $S(n, x, y)$ of adjacent pairs $(X(n-1), X(n))$. $S(n, x, y)$ contains all the information about the number of level crossings of the process $X(n)$ at a fixed level and two fixed levels. For a function $f(t)$ on $[0, 1]$, we will discuss the number of curve crossings of the process $X(n)$ by the curve $f(t)$. Uniform reduction principle and asymptotic normality and non-normality of the number of level/curve crossings are established. Some generalization to certain stationary processes $X(n)$ will be discussed.

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