The University of Chicago
Department of Statistics

**PHD DISSERTATION PROPOSAL PRESENTATION**

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## Statistical Inference Under Parameter Instability

**TUESDAY, November 16, 2010, at 11:00 AM**
110 Eckhart Hall, 5734 S. University Avenue

## ABSTRACT


Although parameter stability and independence play a pivotal role in the literature, they have been challenged and proven to be violated in many scientific areas in recent decades. We tackle this problem by considering locally stationary processes which allow a smooth change in the underlying causal representation. Based on this framework, we first address the problem of testing parametric hypotheses on the mean trend of an observed time series. A bias correction procedure and a simulation based method are proposed to improve the finite sample performance. As an extension, we consider the problem of testing parallelism for mean functions of multiple time series which is motivated by a Motorola phone download data set.

We will then move on to the time-varying coefficient models where both covariates and errors are modeled as locally stationary processes which can be correlated in a nonlinear way. Based on these non-parametric models, we consider the problem of parameter estimation, hypothesis testing and variable selection. It is remarkable that variable selection under both parameter instability and dependence can be very difficult. We tackle this problem by proposing both an information criterion and a local linear shrinkage method while the later one can do parameter estimation and variable selection simultaneously in a computationally efficient manner. To be more ambitious, we further address the fear that only part of the coefficients are time-varying which gives us the partially time-varying coefficient models. Model building procedures for these semi-parametric models together with some future topics will also be discussed if time permits.


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Information about building access for persons with disabilities may be obtained in advance by calling Sandra Romero at 773.702-0541 or by email (sandra@galton.uchicago.edu).