The University of Chicago
Department of Statistics

PhD Thesis Presentation

YINXIAO HUANG

Department of Statistics
The University of Chicago

Nonparametric Online Inference for Time Series and Series Estimation under Dependence

THURSDAY, July 21, 2011, at 2:00 PM
117 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

We first consider online kernel estimation for time series data. The online algorithms are computationally efficient by making real-time updates when new observations are available. The asymptotic behavior of our online kernel estimators, both for density and regression function, is explored for a general class of stationary time series under the dependence framework developed by Wu (2005). We establish the asymptotic normality, almost sure convergence for the online kernel estimators and in particular, a law of iterated logarithm (LIL) for the online kernel density estimator, while one generally does not have such a sharp convergence rate for traditional estimators. Our approach can be extended further to nonstationary processes.

As our second major contribution, we consider a series estimator for nonparametric regression models under short-range as well as long-range dependent assumptions. Series estimators are least-squares fits of a regression function where the number of regressors K depends on sample size n. Newey (1997) and de Jong (2002) obtained uniform convergence rate and asymptotic normality under certain conditions for iid data. We aim to show parallel results for dependent data and establish the asymptotic normality and uniform convergence rates of series estimators under mild regularity conditions. Furthermore, we deal with Gaussian processes and consider the nonlinear transformations of Gaussian long memory time series. A dichotomous phenomena is expected depending on the interplay between the long memory index α and the power rank of the regression function.

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).