

NYU Stern School of Business
Department of Information, Operations & Management Sciences
STATISTICS RESEARCH SEMINAR

TOPIC: Wavelet Variance Analysis for Gappy Time Series Data

SPEAKER: Debashis Mondal (University of Chicago)

DATE: Friday, October 11th, 2013

TIME: 11:30 AM - 12:30 PM

PLACE: KMC 5-75

ABSTRACT

Wavelet variances and covariances (sometime also known as wavelet spectra and co-spectra) are a form of analysis of variance that find extensive use in the study of time series arising from atmospheric science, economics, hydrology, oceanography, soil science and other areas of geophysics. Specifically, as precursor to a more formal statistical analysis, wavelet variances and covariances are often applied to time series to explore their structure and behavior, to identify important scales, to assess long memory parameters, to detect inhomogeneity and to estimate time-varying spectral densities. In this talk, we focus on estimation and inference of wavelet variances and covariances when the observed time series is “gappy”, i.e., sampled at regular intervals, but certain observations are missing. In particular, we propose a method of estimation that extends the usual estimation procedure for the non-gappy data, investigate statistical properties and discuss large sample theory. We then show how our approach to this problem opens up new avenues in advancing statistical calculations for wavelet-based principal components, clustering and classification of multivariate time series that contain missing values. Finally, we consider an application of our method to NOAA's tropical sea level barometric pressure data.