September 7-9, 2011

Instantaneous Frequencies and Trends for Nonstationary Nonlinear Data

IMA Hot Topics Workshop

Organizers:
Ingrid Daubechies (Department of Mathematics, Duke University)
Jianqing Fan (Department of Operations Research & Financial Engineering, Department of Economics, Bendheim Center for Finance, Princeton University)
Thomas Yizhao Hou (Department of Computing and Mathematical Sciences, California Institute of Technology)
Norden E. Huang (Center for Adaptive Data Analysis, National Central University, Taiwan, R.O.C.)

Description:
This workshop will explore the issues involved in trend determination and instantaneous frequency. There has been some recent exciting progress in developing new mathematical theory and effective computational algorithms to define trend and instantaneous frequency. These efforts involve a number of mathematical tools, including nonlinear variational methods, optimization, sparse representation of data, and compressed sensing, TVD-based denoising methods, multiscale analysis, randomized algorithms and statistical methods.

This workshop will bring together experts from these areas to exchange ideas and identify new research opportunities for this emerging research area. One of the main objectives of the workshop is to promote research that leads to the discovery and understanding of the underlying processes in order to provide a base for building predictive models. An extension of the trend study is the problem of regression, which is also of great interests to a broad research community, including the econometrics/finance community.

Speakers:
Florentina Bunea (Cornell University)
Rainer Dahlhaus (Ruprecht-Karls-Universität Heidelberg)
Ingrid Daubechies (Duke University)
Richard Davis (Columbia University)
Bjorn Engquist (University of Texas at Austin)
Jianqing Fan (Princeton University)
Thomas Hou (California Institute of Technology)
Norden Huang (National Central University)
Azadeh Moghtaderi (Queen’s University)
Sofia Olhede (University College London)
Stanley Osher (University of California, Los Angeles)
Chung-Kang Peng (Harvard Medical School)
Vladimir Rokhlin (Yale University)
Richard Smith (University of North Carolina)
Joel Tropp (California Institute of Technology)
Zhaohua Wu (Florida State University)