IMAGe Seminar

Institute for Mathematics Applied to Geosciences at NCAR

Structural Break Detection in Time Series Models

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Abstract:

Much of the recent interest in time series modeling has focused on data from financial markets, from communications channels, from speech recognition and from engineering applications, where the need for non-Gaussian, non-linear, and nonstationary models is clear. With faster computation and new estimation algorithms, it is now possible make significant in-roads on modeling more complex-phenomena. In this talk, we will develop estimation procedures for a class of models that can be used for analyzing a wide range of time series data that exhibit structural breaks. The novelty of the approach taken here is to combine the use of genetic algorithms with the principle of minimum description length (MDL), an idea developed by Rissanan in the 1980s, to find "optimal" models over a potentially large class of models.

This methodology will be demonstrated in a number of applications. In addition to fitting piece-wise autoregressive models, which works well even for local stationary models that are smooth, we will also consider extensions to piece-wise nonlinear models including stochastic volatility and GARCH models.

(This research is joint work with Thomas Lee and Gabriel Rodriguez-Yam.).

Chapman Room- ML
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1:00 pm
(Refreshments at 12:45)

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