Πανεπιστημιο Κρητης

Τμημα Μαθηματικων και Εφαρμοσμενων Μαθηματικων

Ομιλιες Στατιστικης και Πιθανοτητων

12:15, Πέμπτη, 1 Ιουνίου 2017
Αίθουσα Α-303

Ιωάννης Καμαριανάκης, *Arizona State University*

Bayesian shrinkage estimates of logistic smooth transition autoregressions

The logistic smooth transition autoregressive (LSTAR) model is a regime-switching nonlinear time series model that has been adopted in a wide variety of applications. LSTAR is formulated as a weighted combination of two or more linear autoregressive (AR) processes. In this work, LSTAR models are estimated using Bayesian shrinkage (laplace and horseshoe) priors on the autoregressive coefficients of each regime. Dirichlet priors are used to estimate composite threshold variables in the transition function. The above specification provides a flexible alternative to existing reversible jump Markov-chain Monte-Carlo schemes for LSTAR model building, which can be implemented in existing Bayesian software packages. A series of Monte Carlo experiments is presented to demonstrate the efficacy of the proposed methodology. Application to a classic nonlinear time series illustrates the ability to achieve superior forecasting performance. Finally, the capability to handle multiple input exogenous time series is exemplified through forecasting daily maximum water temperatures. For 31 Spanish rivers, Bayesian estimated linear and nonlinear river specific models are evaluated on 7-step ahead forecast performance.