Workshop on time-varying parameter models

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Half-day workshop at University of Technology Sydney (UTS)

Aim

The aim of the workshop is to give an introduction to time-varying parameter models and Bayesian inference for such models, with an outlook to some new developments. The workshop consists of lectures on the models, theory and computations, with some light demos in R. The participants are expected to leave the workshop with enough knowledge to solve the computer lab exercises by themselves after the workshop.

Instructor

Mattias Villani Professor of Statistics Stockholm University

Prerequisites

- Basic knowledge of Bayesian statistics is assumed.
- Familiarity with Markov Chain Monte Carlo (MCMC) is needed for some parts of the workshop.
- Basic knowledge of R is needed to follow along in the demos (although this is a small part of the workshop).

Before the workshop

It is not necessary to bring your own laptop, but if you want to follow along in the demos, participants are encouraged to:

- Install R and RStudio
- Install the `dlm` package in R

Plan and material

Lecture 1 - Time-varying parameter models and state-space models Reading: Bayesian Learning - Chapter 17 | Slides Interactivity: local level | local trend | time-varying regression

Lecture 2 - Inference in linear Gaussian models Reading: Bayesian Learning - Chapter 17 | Slides - TBA Code: demo of the `dlm` package in R Interactivity: filtering local level | nile river data

Lecture 3 - Inference in non-linear and non-Gaussian models Reading: Slides - TBA Interactivity: poisson time series | stochastic volatility

Lecture 4 - Global-local shrinkage processes for more realistic parameter evolutions Reading: Slides - TBA Interactivity: local level model with dsp prior | poisson with dsp prior

Computer lab computer lab - TBA