Insper

Bayesian Econometrics Syllabus

D.Sc. in Business Economics

Hedibert Freitas Lopes

`www.hedibert.org`

hedibertFL@insper.edu.br

Objective

The end of the course goal is to allow the student to critically decide between a Bayesian, a frequentist or Bayesian-frequentist compromise when facing real world problems in the fields of micro-econometrics, macro-econometrics, marketing and finance. With this end in mind, we will visit well known Bayesian issues, such as prior specification and model comparison and model averaging, but also study regularization, "small n, large p" issues, Bayesian statistical learning (additive regression trees) and large-scale factor models.

Course description

- Basic ingredients: prior, posterior, and predictive distributions, sequential Bayes, conjugate analysis, exchangeability, principles of data reduction and decision theory.
- Model criticism: Bayes factor, computing marginal likelihoods, Savage-Dickey ratio, reversible jump MCMC, Bayesian model averaging and deviance information criterion.
- Modern computation via (Markov chain) Monte Carlo methods: Monte Carlo integration, sampling-importance resampling, Gibbs sampler, Metropolis-Hastings algorithms.
- Mixture models
- Hierarchical models
- Bayesian regularization
- Instrumental variables modeling
- Large-scale (sparse) factor modeling
- Bayesian additive regression trees (BART) and related topics
- Dynamic models
- Sequential Monte Carlo algorithms
- Bayesian methods in microeconometrics, macroeconometrics, marketing and finance