Bayesian R packages for Econometrics

by Hedibert Freitas Lopes

Disclaimer: This list is certainly not complete as it is based on my own personal experience.

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1 MCMCpack: MCMC Package

This package contains functions to perform Bayesian inference using posterior simulation for a number of statistical models.

- Version: 1.3-3
- Depends: R (≥ 2.10.0), coda (≥ 0.11-3), MASS, stats
- Published: 2013-05-01
- Author: Andrew D. Martin, Kevin M. Quinn, and Jong Hee Park
- Maintainer: Jong Hee Park <jongheepark@snu.ac.kr>

A few models in the MCMCpack:

- `MCMCregress` - MCMC for Gaussian Linear Regression (GLR)
- `MCMChregress` - MCMC for the Hierarchical GLR
- `MCMCllogit` - MCMC for Logistic Regression
- `MCMCmnl` - MCMC for Multinomial Logistic Regression
- `MCMCpoisson` - MCMC for Poisson Regression
- `MCMCtobit` - MCMC for GLR with a Censored Dependent Variable
- `MCMCprobit` - MCMC for Probit Regression
- `MCMCoprobit` - MCMC for Ordered Probit Regression
- `MCMCoprobitChange` - MCMC for Ordered Probit Changepoint Regression
- `MCMCfactanal` - MCMC for Normal Theory Factor Analysis
- `MCMCordfactanal` - MCMC for Ordinal Data Factor Analysis
- `MCMCquantreg` - Bayesian quantile regression using Gibbs sampling
2 bayesm: Bayes for Marketing/Micro-econometrics

bayesm covers many important models used in marketing and micro-econometrics applications.

- Version: 2.2-5
- Depends: R (≥ 2.10)
- Published: 2012-05-16
- Author: Peter Rossi.
- Maintainer: Peter Rossi <perossichi@gmail.com>

A few models in the bayesm:

- `runireg` - IID Sampler for Univariate Regression
- `runiregGibbs` - Gibbs Sampler for Univariate Regression
- `rsurGibbs` - Gibbs Sampler for Seemingly Unrelated Regressions
- `rordprobitGibbs` - Gibbs Sampler for Ordered Probit
- `rnmixGibbs` - Gibbs Sampler for Normal Mixtures
- `rnegbinRw` - MCMC Algorithm for Negative Binomial Regression
- `rmvpGibbs` - Gibbs Sampler for Multivariate Probit
- `rmultireg` - Draw from the Posterior of a Multivariate Regression
- `rmnpGibbs` - Gibbs Sampler for Multinomial Probit
- `rmnlIndepMetrop` - MCMC Algorithm for Multinomial Logit Model
- `rivGibbs` - Gibbs Sampler for Linear IV Model
- `rivDP` - Linear IV Model with DP Process Prior for Errors
- `rhirerLinearModel` - Gibbs Sampler for Hierarchical Linear Model
- `rbprobitGibbs` - Gibbs Sampler (Albert and Chib) for Binary Probit
3 BayesLogit: Logistic Regression

The BayesLogit package does posterior simulation for binomial and multinomial logistic regression using the Polya-Gamma latent variable technique. This method is fully automatic, exact, and fast. A routine to efficiently sample from the Polya-Gamma class of distributions is included.

- Version: 0.2-4
- Depends: R (≥ 2.14.0)
- Published: 2013-11-12
- Author: Nicholas G. Polson, James G. Scott, and Jesse Windle
- Maintainer: Jesse Windle <jwindle@ices.utexas.edu>

4 bayesGARCH: GARCH(1,1) with Student-t errors

This package provides the bayesGARCH function which performs the Bayesian estimation of the GARCH(1,1) model with Student’s t innovations.

- Version: 2.0.1
- Depends: mvtnorm, coda
- Published: 2014-01-07
- Author: David Ardia
- Maintainer: David Ardia <david.ardia@fsa.ulaval.ca>

5  **stochvol**: Bayesian inference for SV models

This package provides efficient algorithms for fully Bayesian estimation of stochastic volatility (SV) models via Markov chain Monte Carlo (MCMC) methods.

- Version: 0.8-1
- Depends: R (≥ 2.14), coda
- Imports: Rcpp (≥ 0.9.10)
- Published: 2014-02-07
- Author: Gregor Kastner
- Maintainer: Gregor Kastner <gregor.kastner@wu.ac.at>

6  **dlm**: Bayesian and Likelihood Analysis of DLM

Maximum likelihood, Kalman filtering and smoothing, and Bayesian analysis of Normal linear State Space models, also known as Dynamic Linear Models.

- Version: 1.1-3
- Published: 2013-03-26
- Author: Giovanni Petris.
- Maintainer: Giovanni Petris <GPetris@uark.edu>
7 Other Bayesian packages in R

- **BayesCR**: Censored linear regression models with SMN distributions
- **Bayesianbetareg**: Beta regression: joint mean and precision modeling
- **BayesLCA**: Latent Class Analysis
- **bayesmix**: Mixture Models with JAGS
- **bayesQR**: Quantile regression
- **BAYSTAR**: Threshold autoregressive model
- **bayesSurv**: Survival Regression with Flexible Error and Random Effects
- **Bayesthresh**: Thresholds mixed-effects models for categorical data
- **BayesTree**: Tree Based Models
- **BayesVarSel**: Variable selection in Linear Models
- **bfa**: Factor Analysis
- **BGLR**: Generalized Linear Regression
- **BLR**: Linear Regression
- **BMA**: Bayesian Model Averaging
- **Brq**: Quantile regression models
- **BRugs**: R interface to the OpenBUGS MCMC software
- **blme**: Linear Mixed-Effects Models
- **CCAGFA**: Canonical correlation analysis and group factor analysis
- **conting**: Bayesian analysis of contingency tables
- **DIRECT**: Clustering of Multivariate Data Under the Dirichlet-Process Prior
- **DPpackage**: Bayesian nonparametric modeling in R
- **evdbayes**: Bayesian Analysis in Extreme Value Theory
- **FacPad**: Sparse Factor Analysis for pathways responsive to drug treatment
- **factorQR**: Bayesian quantile regression factor models
- **ivbma**: IV Estimation/Model Determination via Conditional Bayes Factors
- **mlogitBMA**: Bayesian Model Averaging for Multinomial Logit Models
- **MSBVAR**: Markov-Switching, Bayesian, Vector Autoregression Models
- **spikeSlabGAM**: Variable selection and model choice for GAM models
- **spTimer**: Spatio-Temporal Bayesian Modelling Using R
- **survBayes**: Proportional hazards model to time to event data
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