Package ‘BayesianGLasso’

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Title Bayesian Graphical Lasso

Version 0.2.0

Description Implements a data-augmented block Gibbs sampler for simulating the posterior distribution of concentration matrices for specifying the topology and parameterization of a Gaussian Graphical Model (GGM). This sampler was originally proposed in Wang (2012) <doi:10.1214/12-BA729>.

Depends R (>= 3.0.0)

License GPL-3

Encoding UTF-8

LazyData true

Imports statmod, MASS

RoxygenNote 6.0.1

NeedsCompilation no

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R topics documented:

blockGLasso ................................................................. 2

Index 4
blockGLasso  

*Block Gibbs sampler function*

**Description**

Blockwise sampling from the conditional distribution of a permuted column/row for simulating the posterior distribution for the concentration matrix specifying a Gaussian Graphical Model.

**Usage**

```r
blockGLasso(X, iterations = 2000, burnIn = 1000, lambdaPriora = 1, lambdaPriorb = 1/10, verbose = TRUE)
```

**Arguments**

- `X`: Data matrix
- `iterations`: Length of Markov chain after burn-in
- `burnIn`: Number of burn-in iterations
- `lambdaPriora`: Shrinkage hyperparameter (lambda) gamma distribution shape
- `lambdaPriorb`: Shrinkage hyperparameter (lambda) gamma distribution scale
- `verbose`: logical; if TRUE return MCMC progress

**Details**

Implements the block Gibbs sampler for the Bayesian graphical lasso introduced in Wang (2012). Samples from the conditional distribution of a permuted column/row for simulating the posterior distribution for the concentration matrix specifying a Gaussian Graphical Model.

**Value**

- `Sigma`: List of covariance matrices from the Markov chain
- `Omega`: List of concentration matrices from the Markov chains
- `Lambda`: Vector of simulated lambda parameters

**Author(s)**

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**References**

Examples

# Generate true covariance matrix:
s<-.9**toeplitz(0:9)
# Generate multivariate normal distribution:
set.seed(5)
x<-MASS::mvrnorm(n=100,mu=rep(0,10),Sigma=s)
blockGLasso(X=x)

# Same example with short MCMC chain:
s<-.9**toeplitz(0:9)
set.seed(6)
x<-MASS::mvrnorm(n=100,mu=rep(0,10),Sigma=s)
blockGLasso(X=x,iterations=100,burnIn=100)
Index

blockGLasso, 2