# Package: BayesianGLasso (via r-universe)

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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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**Repository** https://trainorp.r-universe.dev

**RemoteUrl** https://github.com/cran/BayesianGLasso

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`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

```
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)

Patrick Trainor (University of Louisville)

Hao Wang

## References

Wang, H. (2012). Bayesian graphical lasso models and efficient posterior computation. *Bayesian Analysis, 7*(4). <doi:10.1214/12-BA729> .

## 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)
```

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