Package ‘pdglasso’

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Type Package

Title What the Package Does (Title Case)

Version 0.1.0

Author Who wrote it

Maintainer The package maintainer <yourself@somewhere.net>

Description More about what it does (maybe more than one line)
Use four spaces when indenting paragraphs within the Description.

License What license is it under?

Encoding UTF-8

LazyData true

RoxygenNote 7.2.3

Roxygen list(markdown = TRUE)

R topics documented:

`admm.pdglasso` *Estimate a concentration matrix under the pdglasso model using adaptive ADMM algorithm.*

Description

Description here.

Usage

```
admm.pdglasso(
  S,
  lambda1 = 1,
  lambda2 = 1e-04,
  type = c("vertex", "inside.block.edge", "across.block.edge"),
  force.symm = NULL,
  X.init = NULL,
  rho1 = 1,
  rho2 = 1,
  varying.rho1 = TRUE,
  varying.rho2 = TRUE,
  max_iter = 1000,
  eps.abs = 1e-12,
  eps.rel = 1e-12,
  verbose = FALSE
)
```

Arguments

`S` A $p \times p$ covariance (or correlation) matrix.

`lambda1` A non-negative scalar (or vector) penalty that encourages sparsity in the concentration matrix. If a vector is provided, it should match the appropriate length, i.e.

`lambda2` A non-negative scalar (or vector) penalty that encourages equality constraints in the concentration matrix. If a vector is provided, it should match the appropriate length, i.e.

`type` A string or vector of strings for the type of equality constraints to be imposed; zero, one or more available options can be selected among: * "vertex", symmetries are imposed on the diagonal entries of the concentration matrix. * "inside.block.edge", symmetries are imposed between elements of the LL and RR block the concentration matrix. * "across.block.edge", symmetries are imposed between elements of the LR and RL block the concentration matrix. Shortened forms are accepted too, i.e. "V" or "vert" for "vertex".

`force.symm` A string or vector of strings to impose forced symmetry on the corresponding block of the concentration matrix. Same options as "type".

`X.init` (optional) A $p \times p$ initial guess for the concentration matrix and/or starting solution for the ADMM algorithm.

`rho1` A scalar; tuning parameter of the ADMM algorithm to be used for the outer loop. It must be strictly positive.

`rho2` A scalar; tuning parameter of the ADMM algorithm to be used for the inner loop. It must be strictly positive.

`varying.rho1` A boolean value; if `TRUE` the parameter rho1 is updated iteratively to speed-up convergence.

`varying.rho2` A boolean value; if `TRUE` the parameter rho2 is updated iteratively to speed-up convergence.

`max_iter` An integer; maximum number of iterations to be run in case the algorithm does not converge.

`eps.abs` A scalar; the absolute precision required for the computation of primal and dual residuals of the ADMM algorithm.

`eps.rel` A scalar; the relative precision required for the computation of primal and dual residuals of the ADMM algorithm.

`verbose` A boolean value; if `TRUE` the progress (and internal convergence of inner loop) is shown in the console while the algorithm is running.

Value

A list, whose element are:

- `X`, the estimated concentration matrix under the pdglasso model; the model is identified by the values of lambda1 and lambda 2, together with the type of penalization imposed.
- `acronims`, a vector of strings for the type of penalties and forced symmetries imposed when calling the function.
- `internal.par`, a list of internal parameters passed to the function at the call, as well as convergence information.

Examples

```
!!! Create fake dataset
S <- cov(toy.data)
admm.pdglasso(S)
```

`get.graph` *Build a graph from the output of a call to* `admm.pdglasso`.

Description

Description here.

Usage

```
get.graph(admm.out, th1 = NULL, th2 = NULL, verbose = FALSE)
```

Arguments

`admm.out`	An object of list type, that is the output of a call to the `admm-pdglasso` function.
`th1`	(optional) A scalar, the threshold to identify edges in the graph; it must be non-negative.
`th2`	(optional) A scalar, the threshold to identify coloured edges in the graph; it must be non-negative.
`verbose`	(optional) if `TRUE` provides summary statistics of the graph.

Value

a list, containing:

- g, the graph in matrix form.
- dof, the degrees of freedom corresponding to the graph build under the pdglasso model provided.

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