

Package: r.blip (via r-universe)

September 11, 2024

Title R binding of blip (Bayesian network Learning Improved Project)

Version 1.1

Description Offers many approaches to score-based structure learning of Bayesian networks.

Depends R (>= 3.0.0)

Imports foreign, bnlearn (>= 4.0)

SystemRequirements Java (>= 1.5)

License GPLv3

Encoding UTF-8

LazyData true

RoxygenNote 6.1.1

Repository <https://mauro-idsia.r-universe.dev>

RemoteUrl <https://github.com/mauro-idsia/r.blip>

RemoteRef HEAD

RemoteSha 76daa6ce60896a4e3adbcabeaa1a42ffa57970b5

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blip	<i>Bayesian Learning Package - Main function.</i>
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Description

Used by most of the functions in the r.blip binding, provides access to the included jar file.

Usage

```
blip(args)
```

Arguments

args	Vector of arguments to be passed to the jar
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Details

The arguments vector is formatted in a system call to the included jar file. Should not be called directly by the user, unless you know exactly what you are doing. In that case, call directly the blip jar.

blip.learn	<i>Learns a BN</i>
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Description

Fully learns a Bayesian networks.

Usage

```
blip.learn(dat, scorer.method = "is", solver.method = "winasobs",
  indeg = 6, time = 3600, allocated = 80, scorefunction = "bic",
  alpha = 1, cores = 1, verbose = 0)
```

Arguments

dat	dataframe from which to learn the parent sets.(required)
scorer.method	Method to be used for scoring the parent sets. Possible values: "is" (independence selection), "sq" (sequential selection). (default: is)
solver.method	Method to be used for structure exploration. Possible values: "winasobs", "winobs", "asobs", "obs". (default: winasobs)
indeg	Maximum number of parents (default: 6)
time	Execution time (default: 3600)
allocated	Percentage of the total execution time dedicated to parent set exploration (default: 80)

scorefunction	Chosen score function. Possible choices: BIC, BDeu (default: bic)
alpha	(if BDeu is chosen) equivalent sample size parameter (default: 1.0)
cores	Number of machine cores to use. If 0, all are used. (default: 1)
verbose	Verbose level (default: 0)

Details

The input data is required to be complete and discrete. Accordingly missing values in the input data.frame will be ignored, and all numeric values will be converted to integers.

Value

The learned Bayesian network in the bnlearn format.

Examples

```
bn <- blip.learn(read.table('data/child-5000.dat', sep = ' '), time = 10)
```

blip.learn.tw	<i>Learns a BN with a treewidth bound</i>
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Description

Fully learns a Bayesian networks with a treewidth bound.

Usage

```
blip.learn.tw(dat, scorer.method = "is", solver.method = "kmax",
  treewidth = 4, time = 3600, allocated = 80,
  scorefunction = "bic", alpha = 1, cores = 1, verbose = 0)
```

Arguments

dat	dataframe from which to learn the parent sets.(required)
scorer.method	Method to be used for scoring the parent sets. Possible values: "is" (independence selection), "sq" (sequential selection). (default: is)
solver.method	Method to be used for bounded-treewidth structure exploration. Possible values: "kmax", "kg", "ka". (default: kmax)
treewidth	Maximum treewidth (default: 4)
time	Execution time (default: 3600)
allocated	Percentage of the total execution time dedicated to parent set exploration (default: 80)
scorefunction	Chosen score function. Possible choices: BIC, BDeu (default: bic)
alpha	(if BDeu is chosen) equivalent sample size parameter (default: 1.0)
cores	Number of machine cores to use. If 0, all are used. (default: 1)
verbose	Verbose level (default: 0)

Details

The input data is required to be complete and discrete. Accordingly missing values in the input data.frame will be ignored, and all numeric values will be converted to integers.

Value

The learned Bayesian network in the bnlearn format.

blip.scorer	<i>Parent set exploration</i>
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Description

Generates the cache of parent sets from a given data source

Usage

```
blip.scorer(dat, method = "is", indeg = 6, time = 3600,
            scorefunction = "bic", alpha = 1, cores = 1, verbose = 1)
```

Arguments

dat	dataframe from which to learn the parent sets.(required)
method	Method to be used. Possible values: "is" (independence selection), "sq" (sequential selection). (default: is)
indeg	Maximum number of parents (default: 6)
time	Maximum Execution time (default: 3600)
scorefunction	Chosen score function. Possible choices: BIC, BDeu (default: bic)
alpha	(if BDeu is chosen) equivalent sample size parameter (default: 1.0)
cores	Number of machine cores to use. If 0, all are used. (default: 1)
verbose	Verbose level (default: 0)

Details

Usually the first step in the learning of a Bayesian network.

The input data is required to be complete and discrete. Accordingly missing values in the input data.frame will be ignored, and all numeric values will be converted to integers.

Value

Cache of parent sets

blip.solver

Structure Optimization

Description

Find an optimal structure from the cache of parent sets

Usage

```
blip.solver(jkl, method = "winasobs", time = 3600, cores = 1,
  verbose = 1)
```

Arguments

jkl	cache of pre-computed parent sets.(required)
method	Method to be used. Possible values: "winasobs", "winobs", "asobs", "obs". (default: winasobs)
time	Maximum Execution time (default: 3600)
cores	Number of machine cores to use. If 0, all are used. (default: 1)
verbose	Verbose level (default: 0)

Details

The input data is required to be complete and discrete. Accordingly missing values in the input data.frame will be ignored, and all numeric values will be converted to integers.

Value

Structure

blip.solver.tw

Structure Optimization - treewidth bound

Description

Find an optimal structure from the cache of parent sets

Usage

```
blip.solver.tw(jkl, method = "kmax", treewidth = 4, time = 3600,
  cores = 1, verbose = 1)
```

Arguments

jdkl	cache of pre-computed parent sets.(required)
method	Method to be used. Possible values: "kmax", "kg", "ka". (default: kmax)
treewidth	Maximum treewidth (default: 4)
time	Maximum Execution time (default: 3600)
cores	Number of machine cores to use. If 0, all are used. (default: 1)
verbose	Verbose level (default: 0)

Details

The input data is required to be complete and discrete. Accordingly missing values in the input data.frame will be ignored, and all numeric values will be converted to integers.

Value

Structure

read.jkl	<i>Read a Jkl file (parent sets cache)</i>
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Description

Read a Jkl file (parent sets cache)

Usage

read.jkl(path, data)

read.str	<i>Read a res file for bnlearn loading</i>
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Description

Read a res file for bnlearn loading

Usage

read.str(path, data)

<code>write.jkl</code>	<i>Write a Jkl file (parent sets cache)</i>
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Description

Write a Jkl file (parent sets cache)

Usage

`write.jkl(path, jkl, data)`

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