Package 'gamboostMSM'

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Type Package

Title Boosting Multistate Models

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Description
Contains infrastructure for using mboost::gamboost() in order to estimate multistate models.

Imports mboost (>= 2.2-2)

License GPL (>= 2)

NeedsCompilation no

Repository CRAN

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R topics documented:

gamboostMSM-package *Component-wise Functional Gradient Descent Boosting of Multi State Models*

Description

Gradient boosting for Cox-type multi state models: minimization of negative partial log likelihood using component- and transition-wise base-learners.

Details

This package provides function objects to fit Cox-type multi state models using the functional gradient descent boosting algorithm as implemented in the splendid package `mboost`. Therefore, function `Family()` for fitting multi state models is given, including negative log partial likelihood of a Cox-type multi state model as risk function and its negative first partial derivative with respect to the linear predictor as working response function.

Author(s)

Holger Reulen

References

Andersen, P. K., Borgan, O., Gill, R. D., Keiding, N. (1993) *Statistical Models Based on Counting Processes*. Springer Series in Statistics, New York: Springer-Verlag.

Buehlmann, P. Hothorn, T. (2007) Boosting Algorithms: Regularization, Prediction and Model Fitting (with Discussion). Statistical Science, **22(4)**, p. 477–505.

Hothorn, T., Buehlmann, P., Kneib, T., Schmid, M., Hofner, B. (2012) mboost: Model-Based Boosting, R package version 2.2-0. http://CRAN.R-project.org/package=mboost.

Kneib, T., Hothorn, T., Tutz, G. (2009) Variable Selection and Model Choice in Geoadditive Regression Models. BIOMETRICS **65**, p. 626–634.

Ridgeway, G. (1999) The state of boosting. Computing Science and Statistics **31**, p. 172–181.

See Also

`mboost`

`breslow` *Breslow estimator for cumulative baseline hazard rate*

Description

This function calculates the Breslow estimator for the cumulative baseline hazard rate, given fitted linear predictor values.

Usage

```
breslow(f, riskset, entry, exit, trans, event)
```

Arguments

`f`	fitted linear predictor values
`riskset`	riskset list as generated by `buildrisksets`.
`entry`	entry times.
`exit`	exit times.
`trans`	transition index.
`event`	observed event indicator.

Details

This function calculates the Breslow estimator for the cumulative baseline hazard rate, given fitted linear predictor values.

Value

A list of length Q with each element including including elements

`times`	a vector of observed event times,
`cbhr`	a vector of calculated cumulative hazard rate values.

Author(s)

Holger Reulen

Examples

```
## Not run: breslow(f, riskset, entry, exit, trans, event)
```

buildrisksets *Calculation of risksets*

Description

Calculates risksets needed for using family `multistate`.

Usage

```
buildrisksets(entry, exit, trans, event, statusinfo)
```

Arguments

`entry`	a vector with entry times.
`exit`	a vector with exit times.
`trans`	a vector with transition types.
`event`	a vector with noncensoring event indicators.
`statusinfo`	a logical indicating if information on the calculation process should be printed.

Details

This function calculates riksets needed for family `multistate`.

Value

A list of length 2 with elements `Ci` and `Ri`, each vectors of length `n`.

Author(s)

Holger Reulen

cvriskMSM *Cross-validation for Boosting Multi-state Models*

Description

Cross-validation for Boosting Multi-state Models.

Usage

```
cvriskMSM(m, d, id, formulaMSM, xlist, qlist, k, riskset)
```

Arguments

m	...
d	...
id	...
formulaMSM	...
xlist	...
qlist	...
k	...
riskset	...

Details

...

Value

...

Author(s)

Holger Reulen

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degreesoffreedom *Degrees of Freedom*

Description

This function calculates the degrees of freedom as part of the calculation of the Akaike Information Criterion (AIC).

Usage

```
degreesoffreedom(m, statusinfo)
```

Arguments

m	a boosted multi state model.
statusinfo	a logical indicating if information on the calculation process should be printed.

Details

This function calculates the degress of freedom as part of the calculation of the Akaike Information Criterion.

Value

A vector of length equal to the number of boosting iterations in the plugged in model object.

Author(s)

Holger Reulen

Examples

```
## Not run: degreesoffreedom(m, statusinfo)
```

---

helpfunctionmultistate1 ...

Description

...

Usage

```
helpfunctionmultistate1(x, ef)
```

Arguments

x	...
ef	...

Details

...

Author(s)

Holger Reulen

Examples

```
## Not run: helpfunctionmultistate1(x, ef)
```

helpfunctionmultistate2 ...

Description

...

Usage

```
helpfunctionmultistate2(x, dummy)
```

Arguments

x	...
dummy	...

Details

...

Author(s)

Holger Reulen

Examples

```
## Not run: helpfunctionmultistate2(x, dummy)
```

meancentering *Mean Centering with Taking Care of the Transition Type(s)*

Description

...

Usage

```
meancentering(d, x, q, x.name, q.name)
```

Arguments

d	data set
x	covariate
q	transition type(s)
x.name	name of the covariate for pasting the new transition type specific covariate name
q.name	name of the transition type for pasting the new transition type specific covariate name

Details

...

Value

...

Author(s)

Holger Reulen

`multistate` *Family for Multistate Models*

Description

This function implements a family for fitting multistate models using `mboost`.

Usage

```
multistate(Ri, Ci)
```

Arguments

`Ri`	a list giving the individual (i.e., spell specific) risksets.
`Ci`	a list giving the indexes of risksets an individual spell is a part of (see page 213 in the book Generalized Additive Models by T.J. Hastie and R.J. Tibshirani for a description).

Details

This function implements a family for multistate models and will be used inside the `gamboost` or `glmboost` function.

Value

Functions to be used inside gamboost.

Author(s)

Holger Reulen

plloss ...

Description

...

Usage

```
plloss(event, f, Ri)
```

Arguments

event	...
f	...
Ri	...

Details

...

Value

...

Author(s)

Holger Reulen

plotcvriskMSM *Plot Cross-validation for Boosting Multi-state Models*

Description

Plot cross-validation for boosting multi-state models.

Usage

```
plotcvriskMSM(cvriskMSMobject, type)
```

Arguments

cvriskMSMobject	result from cvriskMSM
type	should all stratified results be plotted ("all", default), or only mean ("mean")

Details

...

Value

...

Author(s)

Holger Reulen

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