Package 'survBayes'

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Title Fits a proportional hazards model to time to event data by a Bayesian approach

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Description Fits a proportional hazards model to time to event data by a Bayesian approach. Right and interval censored data and a lognormal frailty term can be fitted.

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Depends survival, coda

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R topics documented:

AA.data *Shrinkage of aneurisms*

Description

Data on the shrinkage of aneurisms associated with cerebral arteriovenous malformations (cAVM) after treatment. The time to a shrinkage of the aneurism to below 50% of the baseline volume was of interest. There is one random inspection time (current status). The data is given in interval notation. Several patients had multiple aneurisms.

Usage

```
data(AA.data)
```

Format

A data frame with 149 observations on the following 6 variables.

z censoring variable

mo the degree of cAMV occlusion by embolization (dichotomized at 50%)

lok the location of the aneurism, whether at the midline arteries or at other afferent cerebral arteries

gr The single aneurisms are not independent because aneurisms within a patient may shrink in the same way. Multiple aneurisms were observed per patient. This clustering of aneurisms is indicated by this grouping variable.

t.left time of the begin of the interval

t.right time of the end of the interval

Source

H.~J. Meisel, U.~Mansmann, H.~Alvarez, G.~Rodesch, M.~Brock, and P.~Lasjaunias. Cerebral arteriovenous malformations and associated aneurysms: Analysis of 305 cases from a series of 662 patients. *Neurosurgery*, 46:793–802, 2000.

Examples

```
data(AA.data)
```

`survBayes` *Fits a proportional hazards model to time to event data by a Bayesian approach*

Description

Fits a proportional hazards model to time to event data by a Bayesian approach. Right and interval censored data and a lognormal frailty term can be fitted.

Usage

```
survBayes(formula = formula(data), data = parent.frame(), burn.in = 1000, number.sa
```

Arguments

`formula`	a formula object, with the response on the left of a ~ operator, and the terms on the right. The response must be a survival object of type `"right"` or `"interval"` as returned by the `Surv` function.
`data`	a data.frame in which to interpret the variables named in the `formula`.
`burn.in`	burn.in
`number.sample`	number of sample
`max.grid.size`	number of grid points
`control`	Object of class `control` specifying iteration limit and other control options. Default is survBayes.control(...).
`control.frailty`	Object of class `control.frailty` specifying parameters for the priors of frailties and other control options. Default is survBayes.control.lognormal.frailty(...) or survBayes.control.gamma.frailty(...).
`seed.set`	setting of the seed of the random number generator
`...`	further parameters

Details

Fits a proportional hazards model to time to event data by a Bayesian approach. The time axis is split into `max.grid.size` intervals and the log baseline hazard is assumed to be cubic spline penalized by an auto regressive process of order one. Right and interval censored data and a lognormal or gamma frailty term can be fitted. In case of interval censored data the assumed observation times are augmented by a piecewise exponential distribution conditioned on the respective interval.

Value

The returned values are, if appropriate

`t.where`	used grid points
`beta`	samples of the vector of covariates
`lbh.coef`	samples of the log baseline hazard coefficients at the grid points
`sigma.lbh`	samples of sigma.lbh.0 and sigma.lbh.1
`alpha.cluster`	samples of the frailty values
`sigma.cluster`	samples of frailty variance
`z.cluster`	samples of the frailty values
`mu.cluster`	samples of the rate and shape of the gamma prior
`m.h.performance`	The performance of the Metropolis-Hasting steps is checked for beta, lbh and, if appropriate, alpha

Author(s)

V. Henschel, Ch. Heiss, U. Mansmann

See Also

`coxph`, `Surv`

Examples

```
data(AA.data)
control<-survBayes.control(delta.taylor = 0.3, sigma.lbh.1=0.01,rate.sigma.lbh.1 = 1e-3, sha
AA.res<-survBayes(Surv(t.left,t.right,z*3,type="interval")~mo+lok+frailty(gr,dist="gamma"),d
```

`survBayes.baseline.hazard`

Baseline hazard of survBayes result

Description

These function calculates the plain, log or cumulative baseline hazard for a `survBayes` result

Usage

```
survBayes.baseline.hazard(surv.res,type="log",n.inter=3,start=NULL,end=NULL,thin=1)
```

Arguments

surv.res	result of survBayes
type	One of "log"(default),"plain","cum". Determines if the log baseline hazard, the baseline hazard or the cumulative baseline hazard is calculated.
n.inter	number of points between the interval points to display
start	the first iteration of interest
end	the last iteration of interest
thin	the required interval between successive samples

Value

The returned values are

time	used times
log.base.haz	log baseline hazard, if type="log"
base.haz	baseline hazard, if type="plain"
cum.base.haz	cumulative baseline hazard, if type="cum"

Author(s)

V. Henschel, U. Mansmann

See Also

window.mcmc

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survBayes.control *Package options for survBayes*

Description

These function checks and packages the fitting options for survBayes

Usage

```
survBayes.control(n.inter = 100, delta.taylor = 0.1, sigma.lbh.0 = 100, sigma.lbh.1
prec.beta.init = 1e-04, rate.wishart.beta = 1e-04, shape.wishart.beta = 1e-04,
rate.sigma.lbh.0 = 1e-04, rate.sigma.lbh.1 = 1e-04, shape.sigma.lbh.0 = 1e-04, shap
beta.init=NULL)
```

Arguments

n.inter	number of intervals to display
delta.taylor	bandwidth for Taylor approximation
sigma.lbh.0	initialization of sigma.lbh.0
sigma.lbh.1	initialization of sigma.lbh.0
prec.beta.init	initialization of the precision of the prior of beta
rate.wishart.beta	initialization of rate of the wishart prior of cov.beta
shape.wishart.beta	initialization of shape factor of the wishart prior of cov.beta the matrix is 1 at the diagonal and 0.05 at the off diagonal elements
rate.sigma.lbh.0	initialization of rate of the gamma prior of sigma.lbh.0
rate.sigma.lbh.1	initialization of rate of the gamma prior of sigma.lbh.1
shape.sigma.lbh.0	initialization of shape of the gamma prior of sigma.lbh.0
shape.sigma.lbh.1	initialization of shape of the gamma prior of sigma.lbh.1
beta.init	initialization of beta

Value

A list with the same elements as the input

Author(s)

V. Henschel, Ch. Heiss, U. Mansmann

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survBayes.control.gamma.frailty

Package options for gamma frailty in survBayes

Description

These function checks and packages the fitting options for the gamma frailty in survBayes. The frailty values are assumed the be gamma distributed with rate and shape mu.cl such that the expected value is one. The prior of tau.cl=log(mu.cl) is assumed to be normal distributed with mean zero and precision prec.tau.cl

Usage

```
survBayes.control.gamma.frailty(mu.cl = 1, prec.tau.cl = 1e-04)
```

Arguments

mu.cl	initialization of rate and shape of the prior of mu.cl
prec.tau.cl	initialization of precision of the prior of prec.tau.cl

Value

A list with the same element as the input

Author(s)

V. Henschel, U. Mansmann

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survBayes.control.lognormal.frailty

Package options for lognormal frailty in survBayes

Description

These function checks and packages the fitting options for the gaussian frailty in survBayes. The prior of sigma.RE is assumed to be gamma distributed with rate rate.sigma.clust and shape shape.sigma.clust.

Usage

```
survBayes.control.lognormal.frailty(sigma.RE = 100, rate.sigma.clust = 1e-04, shape
```

Arguments

sigma.RE	initialization of sigma.RE
rate.sigma.clust	initialization of rate of the gamma prior of rate.sigma.clust
shape.sigma.clust	initialization of shape of the gamma prior of shape.sigma.clust

Value

A list with the same elements as the input

Author(s)

V. Henschel, Ch. Heiss, U. Mansmann

Index