

The survBayes Package

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Type Package

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 or gamma frailty term can be fitted.

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Depends survival, coda

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aneurism.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(aneurism.data)
```

Format

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

left time of the begin of the interval

right time of the end of the interval

cens censoring variable

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

loc 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.

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(aneurism.data)
```

survBayes-package *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 or gamma frailty term can be fitted.

Details

Package: survBayes
Type: Package
Version: 0.2.1
Date: 2007-02-19
License: GPL Version 2 or newer

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.

Author(s)

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See Also

[coxph](#), [Surv](#)

Examples

```
data(aneurism.data)
control<-survBayes.control(delta.taylor = 0.3, sigma.lbh.1=0.01,rate.sigma.lbh.1 = 1e-3, sha
aneurism.res<-survBayes(Surv(left,right,cens*3,type="interval")~mo+loc+frailty(gr,dist="gam
```

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

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

<code>t.where</code>	used grid points
<code>beta</code>	samples of the vector of covariates
<code>lbh.coef</code>	samples of the log baseline hazard coefficients at the grid points
<code>sigma.lbh</code>	samples of <code>sigma.lbh.0</code> and <code>sigma.lbh.1</code>
<code>alpha.cluster</code>	samples of the frailty values

<code>sigma.cluster</code>	samples of frailty variance
<code>z.cluster</code>	samples of the frailty values
<code>mu.cluster</code>	samples of the rate and shape of the gamma prior
<code>m.h.performance</code>	The performance of the Metropolis-Hasting steps is checked for beta, lbh and, if appropriate, alpha.cluster or mu.cluster

Author(s)

V. Henschel, Ch. Heiss, U. Mansmann

See Also

[coxph](#), [Surv](#)

Examples

```
data(aneurism.data)
control<-survBayes.control(sigma.lbh.1=0.01,rate.sigma.lbh.1 = 1e-3, shape.sigma.lbh.1 = 1e-
aneurism.res<-survBayes(Surv(left,right,cens*3,type="interval")~mo+loc+frailty(gr,dist="gamma
```

```
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", ci = FALSE, n.inter = 3, start =
```

Arguments

<code>surv.res</code>	result of <code>survBayes</code>
<code>type</code>	One of "log"(default),"plain","cum". Determines if the log baseline hazard, the baseline hazard or the cumulative baseline hazard is calculated.
<code>ci</code>	if TRUE credibility intervals of the chosen type of baseline hazard are calculated
<code>n.inter</code>	number of points between the interval points to display, not for type="cum"
<code>start</code>	the first iteration of interest
<code>end</code>	the last iteration of interest
<code>thin</code>	the required interval between successive samples

Value

The returned values are

time	used times
log.base.haz	log baseline hazard, if type="log", with .lower and .upper if ci
base.haz	baseline hazard, if type="plain", with .lower and .upper if ci
cum.base.haz	cumulative baseline hazard, if type="cum", with .lower and .upper if ci

Author(s)

V. Henschel, U. Mansmann

See Also

[window.mcmc](#)

Examples

survBayes.control *Package options for survBayes*

Description

These function checks and packages the fitting options for survBayes

Usage

```
survBayes.control(n.inter = 1000, delta.taylor = 0.3, beta.init = NULL, prec.beta.i
sigma.lbh.0 = 100, sigma.lbh.1 = 100,
rate.sigma.lbh.0 = 1e-04, rate.sigma.lbh.1 = 1e-04,
shape.sigma.lbh.0 = 1e-04, shape.sigma.lbh.1 = 1e-04)
```

Arguments

n.inter	number of intervals to display
delta.taylor	bandwidth for Taylor approximation
beta.init	initialization of beta
prec.beta.init	initialization of the precision of the prior of beta
sigma.lbh.0	initialization of sigma.lbh.0
sigma.lbh.1	initialization of sigma.lbh.0
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
```

Value

A list with the same elements as the input

Author(s)

V. Henschel, Ch. Heiss, U. Mansmann

Examples

```
survBayes.control.gamma.frailty
      Package options for gamma frailty in survBayes
```

Description

This function checks and packages the fitting options for the gamma frailty in `survBayes`. The frailty values are assumed to 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

Examples

```
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

<code>sigma.RE</code>	initialization of <code>sigma.RE</code>
<code>rate.sigma.clust</code>	initialization of rate of the gamma prior of <code>rate.sigma.clust</code>
<code>shape.sigma.clust</code>	initialization of shape of the gamma prior of <code>shape.sigma.clust</code>

Value

A list with the same elements as the input

Author(s)

V. Henschel, Ch. Heiss, U. Mansmann

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