

Package: BayesMFSurv (via r-universe)

October 31, 2024

Type Package

Title Bayesian Misclassified-Failure Survival Model

Version 0.2.0

Description Contains a split population survival estimator that models the misclassification probability of failure versus right-censored events. The split population survival estimator is described in Bagozzi et al. (2019) <[doi:10.1017/pan.2019.6](https://doi.org/10.1017/pan.2019.6)>.

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Encoding UTF-8

LazyData true

Depends R (>= 3.5.0)

BugReports <https://github.com/Nicolas-Schmidt/BayesMFSurv/issues>

URL <https://github.com/Nicolas-Schmidt/BayesMFSurv>

Imports MCMCpack, FastGP, stats, Rcpp (>= 1.0.3), coda, mvtnorm

LinkingTo Rcpp, RcppArmadillo

RoxygenNote 7.1.0

Repository <https://nicolas-schmidt.r-universe.dev>

RemoteUrl <https://github.com/nicolas-schmidt/bayesmfSurv>

RemoteRef HEAD

RemoteSha bda06213b17c4969c0e2341b8c0530d186167b0f

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Buhaugetal_2009_JCR *Buhaugetal_2009_JCR*

Description

Subsetting version of survival database extracted from [Buhaug et al. \(2009\)](#). It has precisely dated duration data of internal conflict as well as geographic data. Variables Y, Y0 and C were later added by [Bagozzi et al. \(2019\)](#). It is used to estimate the Bayesian Misclassified Failure (MF) Weibull model presented in [Bagozzi et al. \(2019\)](#).

Usage

```
data(Buhaugetal_2009_JCR)
```

Format

A data frame with 1562 rows and 13 variables

Details

Indistx log conflict-capital distance.

confbord conflict zone at border.

borddist confbord * Indistx centred.

figcapdum rebel fighting capacity at least moderate.

lgdp_onset gdp capita in onset year.

sip2l_onset [Gates et al. \(2006\)](#) SIP code (1 year lag) for the onset year.

pcw post cold war period, 1989+.

frst percentage of forest in conflict zone.

mt percentage of mountains in conflict zone.

Y conflict duration.

Y0 elapsed time since inception to Y (t-1).

C censoring variable.

coupx coup d'etat, except if overlapping with other gov't conflict (PHI 1989).

Source

Buhaug, Halvard, Scott Gates, and Päivi Lujala (2009), Geography, rebel capability, and the duration of civil conflict, *Journal of Conflict Resolution* 53(4), 544 - 569.

mcmcsurv

mcmcsurv

Description

mcmcsurv estimates a Bayesian Exponential or Weibull survival model via Markov Chain Monte Carlo (MCMC). Slice sampling is employed to draw the posterior sample of the model's survival stage parameters.

Returns a summary of a mfsurv object via [summary.mcmc](#).

Usage

```
mcmcsurv(Y, Y0, C, X, N, burn, thin, w = c(1, 1, 1), m = 10, form)
```

```
## S3 method for class 'mcmcsurv'
summary(object, parameter = c("betas", "rho"), ...)
```

Arguments

Y	response variable.
Y0	the elapsed time since inception until the beginning of time period (t-1).
C	censoring indicator.
X	covariates for betas.
N	number of MCMC iterations.
burn	burn-in to be discarded.
thin	thinning to prevent from autocorrelation.
w	size of the slice in the slice sampling for (betas, gammas, rho).
m	limit on steps in the slice sampling.
form	type of parametric model (Exponential or Weibull).
object	an object of class mfsurv, the output of mfsurv .
parameter	one of three parameters of the mfsurv output. Indicate either "betas" or "rho".
...	additional parameter

Value

chain of the variables of interest.

list. Empirical mean, standard deviation and quantiles for each variable.

Examples

```
set.seed(95)
bgl <- Buhaugetal_2009_JCR
bgl <- subset(bgl, coupx == 0)
bgl <- na.omit(bgl)
Y <- bgl$Y
X <- as.matrix(cbind(1, bgl[,1:7]))
C <- bgl$C
Y0 <- bgl$Y0
model2 <- mcmcsmurv(Y = Y, Y0 = Y0, C = C, X = X,
                   N = 50,
                   burn = 20,
                   thin = 15,
                   w = c(0.5, 0.5, 0.5),
                   m = 5,
                   form = "Weibull")

summary(model2, parameter = "betas")
```

mfsurv.stats

mfsurv.stats

Description

A function to calculate the deviance information criterion (DIC) for fitted model objects of class `mfsurv` for which a log-likelihood can be obtained, according to the formula $DIC = -2 * (L - P)$, where L is the log likelihood of the data given the posterior means of the parameter and P is the estimate of the effective number of parameters in the model.

Usage

```
mfsurv.stats(object)
```

Arguments

`object` an object of class `mfsurv`, the output of `mfsurv()`.

Value

list.

mfsurv.summary	summary.mfsurv
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Description

Returns a summary of a mfsurv object via [summary.mcmc](#).

mfsurv fits a parametric Bayesian MF model via Markov Chain Monte Carlo (MCMC) to estimate the misclassification in the first stage and the hazard in the second stage. Slice sampling is employed to draw the posterior sample of the model's split and survival stage parameters.

Returns a summary of a mfsurv object via [summary.mcmc](#).

Usage

```
mfsurv.summary(object, parameter)
```

```
mfsurv(
  formula,
  Y0,
  data = list(),
  N,
  burn,
  thin,
  w = c(1, 1, 1),
  m = 10,
  form = c("Weibull", "Exponential"),
  na.action = c("na.omit", "na.fail")
)
```

```
## S3 method for class 'mfsurv'
summary(object, parameter = c("betas", "gammas", "lambda"), ...)
```

Arguments

object	an object of class mfsurv, the output of mfsurv .
parameter	one of three parameters of the mfsurv output. Indicate either "betas", "gammas" or "lambda".
formula	a formula in the form $Y \sim X1 + X2... \mid C \sim Z1 + Z2 ...$ where Y is the duration until failure or censoring, and C is a binary indicator of observed failure.
Y0	the elapsed time since inception until the beginning of time period (t-1).
data	list object of data.
N	number of MCMC iterations.
burn	burn-ins to be discarded.
thin	thinning to prevent autocorrelation of chain of samples by only taking the n-th values.

w	size of the slice in the slice sampling for (betas, gammas, lambda). The default is c(1,1,1). This value may be changed by the user to meet one's needs.
m	limit on steps in the slice sampling. The default is 10. This value may be changed by the user to meet one's needs.
form	type of parametric model distribution to be used. Options are "Exponential" or "Weibull". The default is "Weibull".
na.action	a function indicating what should happen when NAs are included in the data. Options are "na.omit" or "na.fail". The default is "na.omit".
...	additional parameter

Value

list. Empirical mean, standard deviation and quantiles for each variable.

mfsurv returns an object of class "mfsurv".

A "mfsurv" object has the following elements:

Y	the vector of 'Y'.
Y0	the vector of 'Y0'.
C	the vector of 'C'.
X	matrix X's variables.
Z	the vector of 'Z'.
betas	data.frame, X.intercept and X variables.
gammas	data.frame, Z.intercept and Z variables.
lambda	integer.
post	integer.
iterations	number of MCMC iterations.
burn_in	burn-ins to be discarded.
thinning	integer.
betan	integer, length of posterior sample for betas.
gamman	integer, length of posterior sample for gammas.
distribution	character, type of distribution.
call	the call.
formula	description for the model to be estimated.

list. Empirical mean, standard deviation and quantiles for each variable.

Examples

```
set.seed(95)
bgl <- Buhaugetal_2009_JCR
bgl <- subset(bgl, coupx == 0)
bgl <- na.omit(bgl)
Y <- bgl$Y
```

```

X <- as.matrix(cbind(1, bgl[,1:7]))
C <- bgl$C
Z1 <- matrix(1, nrow = nrow(bgl))
Y0 <- bgl$Y0
model1 <- mfsurv(Y ~ X | C ~ Z1, Y0 = Y0,
                N = 50,
                burn = 20,
                thin = 15,
                w = c(0.1, .1, .1),
                m = 5,
                form = "Weibull")

```

RBS

RBS

Description

The [Reenock, Bernhard and Sobek \(2007\)](#) dataset uses continuous-time event history techniques to code episodes of democratic breakdown in all democracies from 1961 to 1995. In addition, it provides data on a number of economic and political variables.

Usage

```
data(RBS)
```

Format

A data frame with 1794 rows and 13 variables

Details

calinv inverse of caloric intake
Inlevel gross domestic product per capita (logged)
calileve interaction calinv*Inlevel
necon economic growth
presi presidential regime
tag effective number of parties
rel religious fractionalization
ethn ethnic fractionalization
prevdem previous democratic episodes
openc trade openness
Y years in current democratic episode
Y0 years in current democratic episode (lagged)
C breakdown of democratic episode

Source

Reenock, Christopher, Bernhard, Michael, Sobek, David (2007), Regressive Socioeconomic Distribution and Democratic Survival, *International Studies Quarterly*, Volume 51, Issue 3, September 2007, Pages 677–699

stats	<i>mfsurv.stats</i>
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Description

A function to calculate the deviance information criterion (DIC) for fitted model objects of class *mfsurv* for which a log-likelihood can be obtained, according to the formula $DIC = -2 * (L - P)$, where L is the log likelihood of the data given the posterior means of the parameter and P is the estimate of the effective number of parameters in the model.

Usage

```
stats(object)
```

Arguments

`object` an object of class *mfsurv*, the output of *mfsurv()*.

Value

list.

Examples

```
set.seed(95)
bgl <- Buhaugetal_2009_JCR
bgl <- subset(bgl, coupx == 0)
bgl <- na.omit(bgl)
Y <- bgl$Y
X <- as.matrix(cbind(1, bgl[,1:7]))
C <- bgl$C
Z1 <- matrix(1, nrow = nrow(bgl))
Y0 <- bgl$Y0
model1 <- mfsurv(Y ~ X | C ~ Z1, Y0 = Y0,
                N = 50,
                burn = 20,
                thin = 15,
                w = c(0.1, .1, .1),
                m = 5,
                form = "Weibull",
                na.action = 'na.omit')

stats(model1)
```


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