Package 'BayesPieceHazSelect'

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Type Package

Title Variable Selection in a Hierarchical Bayesian Model for a Hazard
Function

Version 1.1.0

Maintainer Andrew Chapple <AndrewChapple21@gmail.com>

Description Fits a piecewise exponential hazard to survival data using a
Hierarchical Bayesian model with an Intrinsic Conditional Autoregressive
formulation for the spatial dependency in the hazard rates for each piece.
This function uses Metropolis- Hastings-Green MCMC to allow the number of split
points to vary and also uses Stochastic Search Variable Selection to determine
what covariates drive the risk of the event. This function outputs trace plots
depicting the number of split points in the hazard and the number of variables
included in the hazard. The function saves all posterior quantities to the
desired path.

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LazyData TRUE

RoxygenNote 5.0.1

Depends mvtnorm

NeedsCompilation no

Author Andrew Chapple [aut, cre]

Repository CRAN

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Contents

PiecewiseBayesSelect   *PiecewiseBayesSelect*

Description

PiecewiseBayesSelect

Usage

```
PiecewiseBayesSelect(Y1, I1, X, hyperparameters, beta1start, B, inc, Path, burn)
```

Arguments

Y1	Vector Containing event times (or censoring time due to death/censoring)
I1	Vector Containing event indicators (1 if l event for a patient, 0 otherwise)
X	Matrix of Patient Covariates, the last inc are left out of the selection procedure
hyperparameters	
	List containing 11 hyperparameters and four starting values. In order they are: psi-the swap rate of the SVSS algorithm. c-parameter involved in Sigma matrix for selection. z1a, z1b - beta hyper parameters on probability of inclusion for each of the three hazard functions. a1,b1- hyperparameters on sigma_lambda. clam1- spatial dependency of baseline hazard (between 0 and 1) for the hazard function. Alpha1 - The parameter for the number of split points in the hazard (must be whole number). J1max - Maximum number of split points allowed (must be whole number). J1- Starting number of split points. cl1 -Tuning parameter for log baseline hazard height sampler.
beta1start	Starting Values for Beta1
B	Number of iterations
inc	Number of variables left out of selection
Path	Where to save posterior samples
burn	percent of posterior sample to burn in (burn*B must be a whole number)

Examples

```
##Randomly Generate Semicompeting Risks Data
####Generates random patient time, indicator and covariates.
n=100
Y1=runif(n,0,100)
I1=rbinom(n,1,.5)
library(mvtnorm)
X=rmvnorm(n,rep(0,13),diag(13))
####Read in Hyperparameters
##Swap Rate
psi=.5
c=20
###Eta Beta function probabilities
```

```
z1a=.4
z1b=1.6
####Hierarchical lam params
###Sigma^2 lambda_ hyperparameters
a1=.7
b1=.7
##Spacing dependence c in [0,1]
clam1=1
#####NumSplit
alpha1=3
J1max=10
####Split Point Starting Value ###
J1=3
##Tuning parameter for lambda
cl1=.25
###Beta Starting Values
beta1start=c(0,0,-1,0,0,0,1,1,1,1,1,-1,-1)
hyper=c(psi,c,z1a,z1b,a1,b1,clam1,alpha1,J1max,J1,cl1)
###Number of iterations and output location
B=200
Path=tempdir()
inc=2
burn=.4
PiecewiseBayesSelect(Y1,I1,X,hyper,beta1start,B,inc,Path,burn)
```

Index