Package ‘BayesPiecewiseICAR’

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Type Package
Title Hierarchical Bayesian Model for a Hazard Function
Version 0.2.1
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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. This function outputs graphics that display the histogram of the number of split points and the trace plots of the hierarchical parameters. The function outputs a list that contains the posterior samples for the number of split points, the location of the split points, and the log hazard rates corresponding to these splits. Additionally, this outputs the posterior samples of the two hierarchical parameters, Mu and Sigma^2.
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Depends mvtnorm
NeedsCompilation no
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ICARBHSampler

*This function fits a piecewise hazard using a hierarchical model with a ICAR dependence applied to the hazard heights*

**Description**

This function fits a piecewise hazard using a hierarchical model with a ICAR dependence applied to the hazard heights

**Usage**

`ICARBHSampler(Y, I, B, hyper)`

**Arguments**

- `Y`: This is a n-vector containing patient survival times
- `I`: This is a n-vector containing patient censoring indicators (0 for censored patient)
- `B`: Number of iterations to run the sample
- `hyper`: Vector of hyperparameters. In order, this contains a1, b1 which are the inverse gamma hyperparameters on sigma^2. Phi which is the hyperparameter on the mean number of split points. Jmax which is the maximum allowed number of split points. c1 which is a tuning parameter greater than 0. J1 is the starting number of split points for the MCMC. Finally, clam1 which is between 0 and 1 and characterizes the spatial dependency of the baseline hazard heights.

**Value**

Returns a list containing the posterior samples of the split points, split point locations, log hazard rates and hierarchical samples

**References**


**Examples**

```R
###This generates random survival data
Y=rexp(100,1/20)
I=rbinom(100,1,.5)
###Sets hyperparameters
a1=.7
b1=.7
phi=3
Jmax=20
```
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```r
cl1 = .25
clam1 = .5
J1 = 3

### Combines the hyperparameters into a vector
hyper = c(a1, b1, phi, Jmax, cl1, J1, clam1)

### Set Number of iterations
B = 100

### Run the Sampler
X = ICARBHSampler(Y, I, B, hyper)
X
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