Package ‘ahMLE’

March 10, 2022

Type Package
Title Methods for the Additive Hazard Model
Version 1.20.1
Date 2022-3-8
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Description Methods for fitting additive hazards model.
   Perform the maximum likelihood method as well as the traditional Aalen's method for estimating
   the additive hazards model.
License GPL (>= 2)
Depends R (>= 3.1.0), survival
Imports Rcpp (>= 1.0.1), Matrix, invGauss
LinkingTo Rcpp, RcppArmadillo, Matrix
SystemRequirements C++11
Encoding UTF-8
Suggests knitr, rmarkdown
VignetteBuilder knitr
RoxygenNote 7.1.0
NeedsCompilation yes
Repository CRAN
Date/Publication 2022-03-09 23:10:02 UTC

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**Description**

This function offers the methods to fit the additive hazards model, including Aalen’s method and Maximum likelihood method.

**Usage**

```r
ah(
  formula = formula(data),
  data = sys.parent(),
  matrix_domain = NULL,
  progbar = FALSE,
  method = "ml_opt",
  scale = TRUE,
  startedge = NULL
)
```

**Arguments**

- `formula`: A formula, the dependent variable must be of type Surv in the survival package.
- `data`: A data frame with the covariates mentioned in the formula stored.
- `matrix_domain`: A matrix describing the domain to find the maximum likelihood. The default constraint matrix guarantees the hazards to be positive for all possible covariates.
- `progbar`: A logical value, shows the progress bar if it is TRUE, hide the progress bar if FALSE, default value is FALSE.
- `method`: A string with values "aalen", "ml_opt", "ml_enum", "ml_asc" and "ml_desc". Default value is "ml_opt". "aalen" represents the Aalen’s method. "ml_opt" is the default method with respect to the default constraint matrix. "ml_enum"，“ml_asc" and "ml_desc" represents to the naive method, ascending method and descending method. Please check the referee for details.
- `scale`: A logical value, scales the input data in the interval [0,1] if it is TRUE. Default value is TRUE.
- `startedge`: a vector which satisfies the domain condition. Only used for the ascending method.

**Value**

A data frame, containing the coefficients (beta) at each time point and the cumulative beta at each time point.

**References**

Examples

\begin{verbatim}
X1 = rnorm(100); X2 = rnorm(100)
Survival_Time = rep(0,100)
U = runif(100,min =0, max =1)
for (i in 1:100){Survival_Time[i] = sqrt((-2*log(U[i]))/(0.3*X1[i] + 0.7*X2[i]))}
tcens = runif(100, 2.5, 7.5)
time = pmin(Survival_Time, tcens)
event = as.numeric(Survival_Time<=tcens)
Data = data.frame(time = time, X1 = X1, X2 = X2, event = event)

Result = ah(Surv(time = time, event = event)~ X1 + X2, Data)
\end{verbatim}

Calc_Cbeta

Description
Computing cumulative beta from beta (the magnitude of the jumps of the coefficient function)

Usage
Calc_Cbeta(beta)

Arguments

\begin{itemize}
  \item \textbf{beta} \hspace{1cm} The dataframe storing the magnitude of the jumps beta of the coefficients of the additive hazard. The first column should be the survival time.
\end{itemize}

Value
Return the cumulative beta by the giving beta.

Examples

\begin{verbatim}
beta = data.frame(time = c(1,2,3,4), beta = c(5,6,7,8))
cbeta = Calc_Cbeta(beta)
\end{verbatim}
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