Package: Wcompo (via r-universe)

October 8, 2026

Type Package

Title Semiparametric Proportional Means Regression of Weighted Composite Endpoint

Version 1.0

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URL https://sites.google.com/view/lmaowisc/

Description Implements inferential and graphic procedures for the semiparametric proportional means regression of weighted composite endpoint of recurrent event and death (Mao and Lin, 2016, <doi:10.1093/biostatistics/kxv050>).

License GPL (>= 2)

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

VignetteBuilder knitr

Imports survival

Depends R (>= 2.10)

Suggests knitr, rmarkdown

NeedsCompilation no

Repository https://lmaowisc.r-universe.dev

Date/Publication 2021-11-30 20:30:02 UTC

RemoteUrl https://github.com/cran/Wcompo

RemoteRef HEAD

RemoteSha 45c9eadad7d0d27c68a4fca80a53c20519c02c99

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`CompoML` *Fit a proportional means regression model for weighted composite endpoint of recurrent event and death*

Description

Fit a semiparametric proportional means regression model for the weighted composite endpoint of recurrent event and death (Mao and Lin, 2016). (Jared D. Huling (ORCID: 0000-0003-0670-4845) contributed to the optimization of this code.)

Usage

```
CompoML(id, time, status, Z, w = NULL, ep = 1e-04)
```

Arguments

`id`	A vector of unique patient identifiers.
`time`	A vector of event times.
`status`	A vector of event type labels. 0: censoring; 1: death; 2, 3,..., K: different types of (possibly recurrent) nonfatal event.
`Z`	Covariate matrix (must be time-constant).
`w`	A K-vector of weights assigned to event types 1 (death), 2, ..., K (nonfatal events); If `NULL`, an unweighted endpoint is modeled (i.e., with `w=c(1, 1, ..., 1)`).
`ep`	Convergence threshold for the Newton-Raphson algorithm.

Value

An object of class `CompoML` with the following components. `beta`: a vector of estimated regression coefficients (log-mean ratios); `var`: estimated covariance matrix for `beta`; `t`: unique event times; `y`: estimated baseline mean function (of `t`).

References

Mao, L. and Lin, D. Y. (2016). Semiparametric regression for the weighted composite endpoint of recurrent and terminal events. Biostatistics, 17, 390-403.

See Also

plot.CompoML, print.CompoML

Examples

```
## load package and data
library(Wcompo)
head(hfmock)
## fit a weighted PM (w_D=2, w_1=1)
obj <- CompoML(hfmock$id,hfmock$time,hfmock$status,hfmock[,c("Training","HF.etiology")],
               w=c(2,1))
## print out the result
obj

oldpar <- par(mfrow = par("mfrow"))
par(mfrow=c(1,2))
## plot the estimated mean function for
## non-ischemic patients by treatment
plot(obj,c(1,0),ylim=c(0,1.5),xlim=c(0,50),
     main="Non-ischemic",
     xlab="Time (months)",cex.main=1.2,lwd=2)
plot(obj,c(0,0),add=TRUE,cex.main=1.2,lwd=2,lty=2)
legend("topleft",lty=1:2,lwd=2,c("Exercise training","Usual care"))


## plot the estimated mean function for
## ischemic patients by treatment
plot(obj,c(1,1),ylim=c(0,1.5),xlim=c(0,50),
     main="Ischemic",
     xlab="Time (months)",cex.main=1.2,lwd=2)
plot(obj,c(0,1),add=TRUE,cex.main=1.2,lwd=2,lty=2)
legend("topleft",lty=1:2,lwd=2,c("Exercise training","Usual care"))
par(oldpar)
```

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hfmock *A dataset from the HF-ACTION trial*

Description

The Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION) study was conducted between 2003–2007 to investigate whether adding exercise training to the usual care of heart failure patients improves their cardiovascular outcomes (O'Conner et al., 2009). This is a mock dataset consisting of 963 patients with baseline information about heart failure etiology.

Usage

```
hfmock
```

Format

A data frame with 1,315 rows and 5 variables:

id Unique patient identifier.

time Event time (months).

status Event type; 2 = recurrent hospitalization, 1 = death, 0 = censoring.

Training 1 = exercise training, 0 = usual care.

HF.etiology 1 = ischemic, 0 = non-ischemic.

References

O'CONNOR, C. M., WHELLAN, D. J., LEE, K. L., KETEYIAN, S. J., COOPER, L. S., ELLIS, S. J., LEIFER, E. S., KRAUS, W. E., KITZMAN, D. W., BLUMENTHAL, J. A. et al. (2009). Efficacy and safety of exercise training in patients with chronic heart failure: Hf-action randomized controlled trial. J. Am. Med. Assoc. 301, 1439–1450.

`plot.CompoML` *Plot the predicted mean function under the proportional means model*

Description

Plot the predicted mean function under the proportional means model for a new observation.

Usage

```
## S3 method for class 'CompoML'
plot(
  x,
  z = NULL,
  xlab = "Time",
  ylab = "Mean function",
  lty = 1,
  frame.plot = FALSE,
  add = FALSE,
  ...
)
```

Arguments

`x`	An object returned by `CompoML`.
`z`	Covariate vector for the new observation. If `NULL`, the baseline mean function will be plotted.
`xlab`	A label for the x axis.
`ylab`	A label for the y axis.
`lty`	Line type for the plot.

frame.plot	Boolean argument indicating whether to add a rectangular frame to the plot.
add	If TRUE, the curve will be overlaid on an existing plot; otherwise, a separate plot will be constructed.
...	Other arguments that can be passed to the underlying plot method.

Value

No return value, called for side effects.

See Also

CompoML, print.CompoML.

Examples

```
## see example for CompoML
```

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print.CompoML *Print the analysis results of the proportional means model*

Description

Print the analysis results of the proportional means model.

Usage

```
## S3 method for class 'CompoML'
print(x, ...)
```

Arguments

x	An object returned by CompoML.
...	Further arguments passed to or from other methods.

Value

Print the results of CompoML object

See Also

CompoML, plot.CompoML.

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