

Package ‘melt’

October 8, 2021

Type Package

Title Multiple Empirical Likelihood Tests

Version 1.0.1

Description Multiple hypothesis testing via empirical likelihood in general block designs. It provides asymptotic generalized family-wise error rate control.

License GPL (>= 2)

Depends R (>= 3.5.0)

Imports Rcpp (>= 1.0.6), stats

LinkingTo Rcpp, RcppEigen, RcppProgress

Encoding UTF-8

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| | |
|--------------|---|
| clothianidin | <i>Clothianidin concentration in maize plants</i> |
|--------------|---|

Description

A dataset summarizing field experiments result of seed treatments on clothianidin concentration.

Usage

```
data("clothianidin")
```

Format

A data frame with 102 rows and 3 variables:

blk New blocks constructed from original data. The format is 'days post planting_original block_year'.

trt Seed treatment.

clo Log transformed clothianidin concentration (μg).

Details

The original data is provided by Alford and Krupke (2017). Only some of the shoot region observations are taken from the original data and processed for illustration.

Source

Alford A, Krupke CH (2017) Translocation of the neonicotinoid seed treatment clothianidin in maize. PLoS ONE 12(3): e0173836. doi: [10.1371/journal.pone.0173836](https://doi.org/10.1371/journal.pone.0173836)

| | |
|---------|---|
| el_mean | <i>Empirical likelihood test for mean</i> |
|---------|---|

Description

Computes empirical likelihood for mean parameter.

Usage

```
el_mean(theta, x, maxit = 50L, abstol = 1e-08)
```

Arguments

| | |
|--------|---|
| theta | Numeric vector of parameters to be tested. |
| x | Numeric matrix or vector of data. If x is a matrix, each row corresponds to an observation. |
| maxit | Maximum number of iterations for optimization. Defaults to 50. |
| abstol | Absolute convergence tolerance for optimization. Defaults to 1e-08. |

Value

A list with class `c("mean", "melt")`.

Examples

```
## scalar mean
theta <- 0
x <- rnorm(100)
el_mean(theta, x)

## vector mean
x <- matrix(rnorm(100), ncol = 2)
theta <- c(0, 0)
el_mean(theta, x)
```

el_pairwise

Empirical likelihood pairwise comparisons

Description

Tests all pairwise comparisons or comparisons with control for general block designs. Two single step asymptotic k -FWER (generalized family-wise error rate) controlling procedures are available: asymptotic Monte Carlo (AMC) and nonparametric bootstrap (NB).

Usage

```
el_pairwise(
  formula,
  data,
  control = NULL,
  k = 1,
  alpha = 0.05,
  method = c("AMC", "NB"),
  B,
  nthread = 1,
  progress = TRUE,
  maxit = 10000,
  abstol = 1e-08
)
```

Arguments

| | |
|---------|---|
| formula | A formula object. It must specify variables for response, treatment, and block as 'response ~ treatment block'. Note that the use of vertical bar () separating treatment and block. |
| data | A data frame containing the variables in the formula. |

| | |
|----------|--|
| control | Optional character specifying the treatment for comparisons with control. |
| k | Single integer for k in k -FWER. Defaults to 1. |
| alpha | Level of the test. Defaults to 0.05. |
| method | Single character for the procedure to be used; either 'AMC' or 'NB' is supported. Defaults to 'AMC'. |
| B | Number of Monte Carlo samples for the AMC (number of bootstrap replicates for the NB). |
| nthread | Number of threads to be used with OpenMP. Only applied when the NB is chosen as the method. Defaults to 1. |
| progress | If TRUE, will show progress status. |
| maxit | Maximum number of iterations for optimization. Defaults to 10000. |
| abstol | Absolute convergence tolerance for optimization. Defaults to 1e-08. |

Value

A list with class `c("pairwise", "melt")`.

Examples

```
## all pairwise comparisons
el_pairwise(clo ~ trt | blk, clothianidin, B = 10000)

## comparisons with control
el_pairwise(clo ~ trt | blk, clothianidin, control = "Naked", method = "NB", B = 1000)
```

el_test

Empirical likelihood hypothesis testing

Description

Tests single hypothesis for general block designs.

Usage

```
el_test(formula, data, lhs, rhs = NULL, maxit = 10000, abstol = 1e-08)
```

Arguments

| | |
|---------|---|
| formula | A formula object. It must specify variables for response, treatment, and block as 'response ~ treatment block'. Note that the use of vertical bar () separating treatment and block. |
| data | A data frame containing the variables in the formula. |
| lhs | Numeric matrix specifying linear hypothesis in terms of parameters. |

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