Package'DVDtest'

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Type Package

Title Difference between Varying Distributions Test (DVDtest)

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Description See DVDtest.

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Imports gamlss, mgcv, parallel, gamlss.dist

Suggests ggplot2, reshape2

R topics documented:

`DVDtest-package` *Difference between Varying Distributions Test (DVDtest)*

Description

This package contains a series of internal and external functions of Difference between Varying Distributions Test (DVDtest), which tests the pointwise group differences between two varying distributions.

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See Also

`DVDtest`

DVDtest *Difference between Varying Distributions Test (DVDtest)*

Description

Testing the difference of two varying distributions.

Usage

```
DVDtest(ydata1, ydata2, nperm, grid, dist.method = "wass",
  mgcv.gam = TRUE, ..., exclude = NULL, permadj = FALSE,
  mc.cores = 1)
```

Arguments

ydata1 a data.frame or a list of data.frame, containing at least 3 columns called '.obs', '.index' and '.value' which specify which curve the point belongs to (.obs) at which ('.index') it was observed and the observed value ('.value'). See details in the package refund. Other columns are available as well for modelling the varying distributions.

ydata2 same as ydata1.

nperm a scalar, number of permutation

grid a vector, evaluation grids of .index

dist.method the distance measure to be used. This must be one of Wasserstein distance ('wass'), 'L2' distance, 'L1' distance and 'Hellinger'. Defaults to 'wass'.

mgcv.gam a logical variable, whether to apply mgcv::gam for eastimating distributions, whose parameters are a smooth function of a continuous variable. If FALSE, gamlss::gamlss is adopted.

... passed to arguments of gam or gamlss. If mgcv.gam = TRUE, ... should include formula, family (=gaulss()) and other optional arguments in mgcv::gam. Otherwise, ... passed to arguments inside of gamlss::gamlss.

exclude passed to exclude inside of predict.gam in case mgcv.gam = TRUE.

permadj a logical variable, whether to adjust the permutated data to cover the entire range, esp. in case of sparsity. Defaults to FALSE.

mc.cores passed to mc.cores inside of mclapply (not available on Windows unless mc.cores = 1). Defaults to 1.

Details

This is the Details section

Value

.index a vector, evaluation grids

pval a vector or matrix of (corrected) p values

Note

- If `ydata1` and `ydata2` are `lists` of `data.frames`, the lenghs of two lists must be the same.
- If `mgcv.gam` is `TRUE`, `...` and `exclue` are `NULL` (default settings), then defaults to `formula <- list(.value~s(.in` and `exclude <- "s(.obs)"`, repectively.

Author(s)

Meng Xu, Philip Reiss

References

reiss-EMR18.pdf

Examples

```
## Data Generation ##
 p <- 6
 mu1 <- function(t) 0.2*(p-1)*sin(pi*t)+t+1
 mu2 <- function(t) -0.2*(p-1)*sin(pi*t)+t+1
 sig1 <- function(t) t+1
 sig2 <- sig1
 nperson <- 10
 fun1 <- function(t) rnorm(nperson, mu1(t), sig1(t))
 fun2 <- function(t) rnorm(nperson, mu2(t), sig2(t))
 tp <- seq(0,1,,10)
 data1 <- sapply(tp,fun1)
 data2 <- sapply(tp,fun2)

 library(reshape2)
 colnames(data1) <- tp
 dg1 <- melt(data1)
 colnames(dg1) <- c('.obs','.index','.value')
 dg1$.obs <- as.factor(dg1$.obs)

 colnames(data2) <- tp
 rownames(data2) <- 1:nperson+2*nperson
 dg2 <- melt(data2)
 colnames(dg2) <- c('.obs','.index','.value')
 dg2$.obs <- as.factor(dg2$.obs)
 # library(ggplot2)
 # ggplot() + geom_line(data = dg1, aes(x = .index,y = .value, col = factor(.obs)))
 # + geom_line(data = dg2, aes(x = .index, y = .value, col = factor(.obs)))

 ngrid <- 50
 ev.grid <- seq(0, 1, , ngrid)
 nperm. <- 50

####
 simu.test <- DVDtest(dg1, dg2, nperm. ,ev.grid)

 #ggplot(data.frame(simu.test), aes(x = .index, y = pval)) + geom_line()
 # + geom_hline(yintercept = 0.05, linetype = 2, col = "red")
```

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