Package: newIMVC (via r-universe)

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Type Package

Title A Robust Integrated Mean Variance Correlation

Version 0.1.0

Description Measure the dependence structure between two random variables with IMVC and extend IMVC to hypothesis test, feature screening and FDR control.

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Encoding UTF-8

Imports splines, quantreg, expm, CompQuadForm, GGMridge, limma

RoxygenNote 7.2.3

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

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IMVC *Integrated Mean Variance Correlation*

Description

This function is used to calculate the integrated mean variance correlation between two vectors

Usage

```
IMVC(y, x, K, NN = 3, type)
```

Arguments

y	is a numeric vector
x	is a numeric vector
K	is the number of quantile levels
NN	is the number of B spline basis, default is 3
type	is an indicator for measuring linear or nonlinear correlation, "linear" represents linear correlation and "nonlinear" represents linear or nonlinear correlation using B splines

IMVCFDR *Integrated Mean Variance Correlation Based FDR Control*

Description

This function is used for FDR control with integrated mean variance correlation

Usage

```
IMVCFDR(y, x, K, NN = 3, numboot, timeboot, true_signal, null_method, alpha)
```

Arguments

y	is the response vector
x	is the covariate matrix
K	is the number of quantile levels
NN	is the number of B spline basis, default is 3
numboot	is the size of bootstrap samples
timeboot	is the number of bootstrap times for computing standard deviation of the IMVC
true_signal	is the true active set
null_method	is the estimation method for proportion of true null hypotheses. Choices are "lfdr", "mean", "hist" or "convest"
alpha	is the nominal FDR level

Value

A list of FDP, power and selected variables

IMVCS *Integrated Mean Variance Correlation Based Screening*

Description

This function is used to select important features using integrated mean variance correlation

Usage

```
IMVCS(y, x, K, d, NN = 3, type)
```

Arguments

y	is the response vector
x	is the covariate matrix
K	is the number of quantile levels
d	is the size of selected variables
NN	is the number of B spline basis, default is 3
type	is an indicator for measuring linear or nonlinear correlation, "linear" represents linear correlation and "nonlinear" represents linear or nonlinear correlation using B splines

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IMVCT *Integrated Mean Variance Correlation Based Hypothesis Test*

Description

This function is used to test significance of linear or nonlinear correlation using integrated mean variance correlation

Usage

```
IMVCT(x, y, K, num_per, NN = 3, type)
```

Arguments

x	is the univariate covariate vector
y	is the response vector
K	is the number of quantile levels
num_per	is the number of permutation times
NN	is the number of B spline basis, default is 3
type	is an indicator for measuring linear or nonlinear correlation, "linear" represents linear correlation and "nonlinear" represents linear or nonlinear correlation using B splines

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