Package 'pdcor'

February 25, 2025

Type Package

Title Fast and Light-Weight Partial Distance Correlation

Version 1.0

Date 2025-02-23

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Depends R (>= 4.0)

Imports dcov, Rfast, Rfast2, stats

Description

License GPL (>= 2)

NeedsCompilation no

Repository CRAN

Date/Publication 2025-02-25 12:20:02 UTC

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pdcor-package   *Fast and Light-Weight Partial Distance Correlation*

Description

Fast and memory-less computation of the partial distance correlation for vectors and matrices. Permutation-based and asymptotic hypothesis testing for zero partial distance correlation are also performed.

Details

Package:	pdcor
Type:	Package
Version:	1.0
Date:	2025-02-23
License:	GPL-2

Maintainers

Michail Tsagris <mtsagris@uoc.gr>.

Author(s)

Michail Tsagris <mtsagris@uoc.gr> and Nikolaos Kontemeniotis <kontemeniotisn@gmail.com>.

Partial distance correlation

Partial distance correlation

Description

Partial distance correlation.

Usage

```
pdcor(x, y, z)
```

Arguments

x	A numerical vector or matrix.
y	A numerical vector or matrix.
z	A numerical vector or matrix.

Details

The unbiased partial distance correlation between x and y conditioning on z is computed. **Note:** currently, ony two cases are supported, all x, y, and z are vectors or they are all matrices with the same dimensions.

Value

The unbiased partial distance correlation.

Author(s)

Michail Tsagris.

R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr>.

References

Szekely G. J. and Rizzo M. L. (2014). Partial Distance Correlation with Methods for Dissimilarities. The Annals of Statistics, 42(6): 2382–2412.

Szekely G. J. and Rizzo M. L. (2023). The Energy of Data and Distance Correlation. Chapman and Hall/CRC.

Tsagris M. and Papadakis M. (2025). Fast and light-weight energy statistics using the R package Rfast. https://arxiv.org/abs/2501.02849

See Also

pdcor.test

Examples

```
x <- iris[, 1]
y <- iris[, 2]
z <- iris[, 3]
pdcor(x, y, z)
```

Permutation testing for the partial distance correlation
Permutation testing for the partial distance correlation

Description

Permutation testing for the partial distance correlation.

Usage

```
pdcor.test(x, y, z, type = 1, R = 500)
```

Arguments

x	A numerical vector or matrix.
y	A numerical vector or matrix.
z	A numerical vector or matrix.
type	In case that all x, y, and z are vectors the user may select the type = 2 which is even faster, but at the expense of requiring more memory.
R	The number of permutations to implement.

Details

Permuation testing using the unbiased partial distance correlation between x and y conditioning on z is computed. **Note:** currently, ony two cases are supported, all x, y, and z are vectors or they are all matrices with the same dimensions.

Value

A vector with the unbiased partial distance correlation, the permutation based p-value and the asymptotic p-value.

Author(s)

Michail Tsagris and Nikolaos Kontemeniotis .

R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr> and Nikolaos Kontemeniotis <kontemeniotisn@gmail.com>.

References

Szekely G. J. and Rizzo M. L. (2014). Partial Distance Correlation with Methods for Dissimilarities. The Annals of Statistics, 42(6): 2382–2412.

Shen C., Panda S. and Vogelstein J. T. (2022). The Chi-Square Test of Distance Correlation. Journal of Computational and Graphical Statistics, 31(1): 254–262.

Szekely G. J. and Rizzo M. L. (2023). The Energy of Data and Distance Correlation. Chapman and Hall/CRC.

Tsagris M. and Papadakis M. (2025). Fast and light-weight energy statistics using the R package Rfast. https://arxiv.org/abs/2501.02849

See Also

[pdcor](#)

Examples

```
x <- iris[, 1]
y <- iris[, 2]
z <- iris[, 3]
pdcor.test(x, y, z)
```

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