

Package ‘dccc’

October 13, 2022

Type Package

Title Fast Computation of Distance Correlations

Version 0.0.2

Date 2022-03-01

Description Fast computation of the distance covariance ‘dcov’ and distance correlation ‘dcor’. The computation cost is only $O(n \log(n))$ for the distance correlation (see Chaudhuri, Hu (2019) <[arXiv:1810.11332](https://arxiv.org/abs/1810.11332)> <[doi:10.1016/j.csda.2019.01.016](https://doi.org/10.1016/j.csda.2019.01.016)>). The functions are written entirely in C++ to speed up the computation.

License GPL (>= 3)

SystemRequirements C++11

URL <https://dccc.berrisch.biz/>, <https://github.com/BerriJ/dccc>

BugReports <https://github.com/BerriJ/dccc/issues>

Encoding UTF-8

Imports Rcpp (>= 1.0.8)

LinkingTo Rcpp, RcppArmadillo

RoxygenNote 7.1.2

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation yes

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dcor *Distance Correlation*

Description

Distance Correlation

Usage

dcor(x,y)

Arguments

x numeric vector
y numeric vector

Value

Returns a numeric value: the distance correlation between x and y.

Examples

```
## Not run:  
  
set.seed(1)  
x <- rnorm(1000)  
y <- -x ^ 2  
  
dcor(x, y) # dcor shows dependence between x and y  
cor(x, y) # cor does not detect any dependence due to nonlinearity  
  
## End(Not run)
```

dcov *Distance Covariance*

Description

Distance Covariance

Usage

dcov(x,y)

Arguments

x	numeric vector
y	numeric vector

Details

Implements the algorithm described in Chaudhuri, Hu (2019) doi: [10.1016/j.csda.2019.01.016](https://doi.org/10.1016/j.csda.2019.01.016) which only has $O(n \log(n))$ complexity.

Value

Returns a numeric value: the distance covariance between x and y.

Examples

```
## Not run:  
  
set.seed(1)  
x <- -rnorm(1000)  
y <- -x ^ 2  
  
dcov(x, y)  
dvov(x, x)  
dvov(y, y)  
  
## End(Not run)
```

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