Package 'SIT'

May 7, 2026

Title Association Measurement Through Sliced Independence Test (SIT)

Version 0.1.1

Description Computes the sit coefficient between two vectors x and y,
possibly all paired coefficients for a matrix. The reference for the methods implemented here is
Zhang, Yilin, Canyi Chen, and Liping Zhu. 2022. ``Sliced Independence Test." Statistica Sinica. <doi:10.5705/ss.202021.0203>.
This package incorporates the Galton peas example.

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Encoding UTF-8

RoxygenNote 7.2.3

LinkingTo Rcpp, RcppArmadillo

Imports Rcpp, stats

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Suggests ggplot2, psychTools

URL https://github.com/canyi-chen/SIT

BugReports https://github.com/canyi-chen/SIT/issues

NeedsCompilation yes

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Repository CRAN

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Contents

blocksum *Compute the block-wise sum of a vector.*

Description

Compute the block-wise sum of a vector.

Usage

```
blocksum(r, c)
```

Arguments

r	An integer vector
c	The number of observations in each block

Value

The function returns the block sum of the vector.

calculateSIT *Compute the cross rank coefficient sit on two vectors.*

Description

This function computes the sit coefficient between two vectors x and y.

Usage

```
calculateSIT(x, y, c = 2)
```

Arguments

x	Vector of numeric values in the first coordinate.
y	Vector of numeric values in the second coordinate.
c	The number of observations in each slice.

Value

The function returns the value of the sit coefficient.

Note

Auxiliary function with no checks for NA, etc.

Author(s)

Yilin Zhang, Canyi Chen & Liping Zhu

References

Zhang Y., Chen C., & Zhu L. (2021). Sliced Independence Test. Statistica Sinica. https://doi.org/10.5705/ss.202021.0203.

See Also

sitcor

Examples

```
# Compute one of the coefficients
library("psychTools")
data(peas)
calculateSIT(peas$parent,peas$child)
calculateSIT(peas$child,peas$parent)
```

`sitcor` *Conduct the sliced independence test.*

Description

This function computes the sit coefficient between two vectors x and y, possibly all paired coefficients for a matrix.

Usage

```
sitcor(
  x,
  y = NULL,
  c = 2,
  pvalue = FALSE,
  ties = FALSE,
  method = "asymptotic",
  nperm = 199,
  factor = FALSE
)
```

Arguments

`x`	Vector of numeric values in the first coordinate.
`y`	Vector of numeric values in the second coordinate.
`c`	The number of observations in each slice.
`pvalue`	Whether or not to return the p-value of rejecting independence, if TRUE the function also returns the standard deviation of sit.

ties	Do we need to handle ties? If ties=TRUE the algorithm assumes that the data has ties and employs the more elaborated theory for calculating s.d. and P-value. Otherwise, it uses the simpler theory. There is no harm in putting ties = TRUE even if there are no ties.
method	If method = "asymptotic" the function returns P-values computed by the asymptotic theory (not available in the presence of ties). If method = "permutation", a permutation test with nperm permutations is employed to estimate the P-value. Usually, there is no need for the permutation test. The asymptotic theory is good enough.
nperm	In the case of a permutation test, nperm is the number of permutations to do.
factor	Whether to transform integers into factors, the default is to leave them alone.

Value

In the case pvalue=FALSE, function returns the value of the sit coefficient, if the input is a matrix, a matrix of coefficients is returned. In the case pvalue=TRUE is chosen, the function returns a list:

sitcor The value of the sit coefficient.

sd The standard deviation.

pval The test p-value.

Author(s)

Yilin Zhang, Canyi Chen & Liping Zhu

References

Zhang Y., Chen C., & Zhu L. (2022). Sliced Independence Test. Statistica Sinica. https://doi.org/10.5705/ss.202021.0203.

Examples

```
##---- Should be DIRECTLY executable !! ----
library("psychTools")
data(peas)
# Visualize       the peas data
library(ggplot2)
ggplot(peas,aes(parent,child)) +
geom_count() + scale_radius(range=c(0,5)) +
       xlim(c(13.5,24))+ylim(c(13.5,24))+       coord_fixed() +
       theme(legend.position="bottom")
# Compute one of the coefficients
sitcor(peas$parent,peas$child, c = 4, pvalue=TRUE)
sitcor(peas$child,peas$parent, c = 4)
# Compute all the coefficients
sitcor(peas, c = 4)
```

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