Package: cosCorr (via r-universe)

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Title Cosine-Correlation Coefficient for Vector Variables

Version 1.0.0

Description Computes the cosine-correlation coefficient for measuring the degree of linear dependence among variables in a multidimensional context. The package implements the generalized cosine-correlation theorem for p-1 variables, providing a quantitative assessment of interrelationships within experimental frameworks. This methodology extends classical correlation measures to higher-dimensional spaces using a dimensional exploration approach based on time scale calculus.

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Encoding UTF-8

RoxygenNote 7.3.3

Imports stats

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

NeedsCompilation no

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

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Contents

cosCorr *Cosine-Correlation Coefficient Computation*

Description

Computes the cosine-correlation coefficient for a vector of p-1 variables, measuring the degree of linear dependence among variables in a multidimensional context.

Usage

```
cosCorr(x, na.rm = FALSE)
```

Arguments

x	A numeric vector of length p >= 2, where x[1] should be 0 (representing t_1). The remaining elements x[2], x[3], ..., x[p] represent the p-1 variables (t_2, t_3, ..., t_p).
na.rm	Logical. If TRUE, NA values are removed before computation. Default is FALSE.

Details

The cosine-correlation coefficient is defined as:

$\rho_{p-1} = \frac{(p-1)\prod_{i=2}^{p}|t_i|}{\sum_{i=2}^{p}|t_i|^{p-1}}$

where $t_1 = 0$ and $t_2, \ldots, t_p$ are the variables within the system. The coefficient serves as a measure of the degree of linear dependence among the p-1 variables, providing a quantitative assessment of their interrelationships within a multidimensional context.

Value

A numeric value representing the cosine-correlation coefficient ρ_{p-1}. The coefficient ranges from 0 to 1, where higher values indicate greater linear dependence among the variables.

Examples

```
# Example 1: Simple vector
x <- c(0, 2, 3, 4)
cosCorr(x)

# Example 2: Vector with 5 variables
x <- c(0, 1, 2, 3, 4, 5)
cosCorr(x)
```

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