

Package ‘nopaco’

January 19, 2017

Type Package

Title Non-Parametric Concordance Coefficient: A Non-Parametric Concordance Test

Version 0.99.8

Date 2017-01-19

Copyright inst/COPYRIGHTS

Description A non-parametric test for multi-observer concordance and differences between concordances in (un)balanced data.

License GPL (>= 3)

Imports methods, Matrix (>= 1.1.5), parallel, stats

Suggests MASS

RoxygenNote 5.0.1.9000

NeedsCompilation yes

Author Rowan Kuiper [cre, aut],
Remco Hoogenboezem [aut],
Sjoerd Huisman [ctb],
google-sparsehash@googlegroups.com [aut, cph] (Copyright by Google Inc.
as mentioned in inst/COPYRIGHTS, applies to all the files in the
src/densehash directory)

Maintainer Rowan Kuiper <r.kuiper.emc@gmail.com>

Repository CRAN

Date/Publication 2017-01-19 15:15:09

R topics documented:

| | |
|--|---|
| coef | 2 |
| concordance.test | 2 |
| ConcordanceTest-class | 4 |
| getPsi | 4 |
| names,ConcordanceTest-method | 5 |
| rfromPsi | 6 |
| \$.ConcordanceTest-method | 7 |

Index**9**

| | |
|------|--|
| coef | <i>Extract test results from the results of a concordance.test</i> |
|------|--|

Description

coef extract the test results from the results of a concordance.test

Usage

```
## S4 method for signature 'ConcordanceTest'
coef(object, ...)
```

Arguments

| | |
|--------|--|
| object | An object of ConcordanceTest-class |
| ... | Not used |

Value

A matrix

See Also

Other concordance functions: [concordance.test](#), [getPsi](#), [rfromPsi](#)

Examples

```
matRandom <- matrix(rnorm(3*20),20,3)
testResult <- concordance.test(matRandom)
getPsi(testResult)
coef(testResult)
```

| | |
|------------------|--|
| concordance.test | <i>Perform a nonparametric concordance test.</i> |
|------------------|--|

Description

concordance.test performs a test for a random concordance (if a single matrix is given) or tests for equal concordance between two matrices.

Usage

```
concordance.test(x, y = NULL, alternative = NULL, alpha = 0.05, ...)
```

Arguments

| | |
|-------------|--|
| x | a numeric matrix, subjects in the rows, repeated measurements in the columns |
| y | (optional) a numeric matrix of equal size as argument x |
| alternative | "less", "greater" or "two.sided". Only used when y is given. |
| alpha | significance level (default = 0.05) |
| ... | see details |

Details

- Testing the deviation from random concordance: if only one matrix is given (i.e. argument x), its concordance will be tested for a deviation from a random concordance. The default alternative hypothesis is 'greater', thus higher concordance than would have been observed by chance. For small matrices (depending on number of replicate measurements) an exact method will be used to determine to p-value. In case of larger matrices either, the alternative beta approach (default), a beta approximation or a normal approximation is used. To enforce the use of either one method, the `method` argument can be used with value "exact", "alt.beta", "beta" or "normal".
- Testing for a difference between concordances: if both arguments x and y have been given, the equality of concordances of both matrices is tested. The default alternative hypothesis is 'two.sided'. Both matrices must be of equal size and have corresponding missing entries. Eventual missing data in one matrix will also be set missing in the other.

Unbalanced data due to randomly missing data or an unequal number of repeated measurements per subject is allowed. In that case, missing or unknown values must be set to NA.

Value

An object of [ConcordanceTest-class](#)

See Also

Other concordance functions: [coef](#), [getPsi](#), [rfromPsi](#)

Examples

```
require(MASS) ##to use mvnorm function

#Generate a matrix without concordance
matRandom <- matrix(rnorm(3*20),20,3)
concordance.test(matRandom)

#Generate a matrix with strong concordance
sigma<-matrix(0.8,3,3)
diag(sigma)<-1
matConcordant <- mvnorm(20,mu=rep(0,3),Sigma=sigma)
concordance.test(matConcordant)

#Test concordances between matrices
aTest <- concordance.test(matConcordant, matRandom)
```

```
getPsi(aTest)  
coef(aTest)
```

ConcordanceTest-class *Class ConcordanceTest*

Description

This class stores results obtained from a concordance test.

Details

Class ConcordanceTest stores results from a concordance test.

Slots

pvalue The pvalue
psi1 The concordance in matrix x
psi2 The concordance in matrix y
method The method used to obtain the pvalue
alternative The alternative hypothesis
ci.lower The lower confidence boudary
ci.upper The upper confidence boudary
ci.method The method used to obtain the confidence interval
alpha The significance level
call The call made to the [concordance.test](#) function

getPsi *Obtain concordance coefficients.*

Description

getPsi returns the concordance coefficient(s) from a matrix or a result obtained by the [concordance.test](#) function.

Usage

```
getPsi(x, y, ...)  
  
## S4 method for signature 'ConcordanceTest,missing'  
getPsi(x)  
  
## S4 method for signature 'matrix,missing'  
getPsi(x, y, ...)  
  
## S4 method for signature 'matrix,`NULL`'  
getPsi(x, y, ...)  
  
## S4 method for signature 'matrix,matrix'  
getPsi(x, y, ...)
```

Arguments

| | |
|-----|---|
| x | A numeric matrix or an object ConcordanceTest-class |
| y | A numeric matrix (optional) |
| ... | Not used |

Value

A numeric vector with coefficient(s)

See Also

Other concordance functions: [coef](#), [concordance.test](#), [rfromPsi](#)

Examples

```
matRandom <- matrix(rnorm(30),10,3)  
testResult <- concordance.test(matRandom)  
getPsi(testResult)  
getPsi(matRandom)
```

names,ConcordanceTest-method

Extract argument names from a ConcordanceTest object

Description

names extracts argument names from a [ConcordanceTest-class](#) object

Usage

```
## S4 method for signature 'ConcordanceTest'
names(x)
```

Arguments

x An object of [ConcordanceTest-class](#)

Value

A character vector

Examples

```
matRandom <- matrix(rnorm(3*20),20,3)
testResult <- concordance.test(matRandom)
names(testResult)
```

| | |
|----------|---|
| rfromPsi | <i>Conversion between Pearson correlation and the non paramtric concordance coefficient</i> |
|----------|---|

Description

Conversion between Pearson correlation and the non paramtric concordance coefficient

Usage

```
rfromPsi(psi)
```

```
psifromR(r)
```

Arguments

psi a (vector of) non paramtric concordance coefficient(s)

r a (vector of) Pearson correlation coefficient(s)

Details

The conversion is performed following the relationship described by Rothery (1979). $2*\cos(\pi*(1-\text{psi}))-1$

Value

A (vector of) corresponding Pearson correlation coefficient(s).

References

Rothery, P. 'A nonparametric measure of intraclass correlation', *Biometrika*, 66, 3, 629-639 (1979).

See Also

Other concordance functions: [coef](#), [concordance.test](#), [getPsi](#)

Examples

```
#Generate a matrix without concordance
matRandom <- matrix(rnorm(30),10,3)
result<-concordance.test(matRandom)
getPsi(result) #concordance coefficient
result$ci      #95% confidence interval

#Corresponding Pearson correlation
rfromPsi(getPsi(result))
rfromPsi(result$ci)

#Plot the relation between Pearson correlation and the nonparametric concordance coefficient.
r<-seq(-1,1,0.01)
psi<-psifromR(r)
plot(r,psi,type='l',xlab="Pearson correlation", ylab="nonparametric concordance")
```

\$.ConcordanceTest-method

Extract argument values from a ConcordanceTest object

Description

Extracts argument values from a [ConcordanceTest-class](#) object

Usage

```
## S4 method for signature 'ConcordanceTest'
x$name
```

Arguments

x An object of [ConcordanceTest-class](#)
name The argument to get the value of

Value

The value of the requested argument

Examples

```
matRandom <- matrix(rnorm(3*20),20,3)
testResult <- concordance.test(matRandom)
names(testResult)
testResult$psi
```


Index

`$`, `ConcordanceTest`-method, 7

`coef`, 2, 3, 5, 7
`coef`, `ConcordanceTest`-method (`coef`), 2
`concordance.test`, 2, 2, 4, 5, 7
`ConcordanceTest`-class, 4

`get`, `ConcordanceTest`-method
 (`$`, `ConcordanceTest`-method), 7
`getPsi`, 2, 3, 4, 7
`getPsi`, `ConcordanceTest`, `missing`-method
 (`getPsi`), 4
`getPsi`, `matrix`, `matrix`-method (`getPsi`), 4
`getPsi`, `matrix`, `missing`-method (`getPsi`), 4
`getPsi`, `matrix`, `NULL`-method (`getPsi`), 4

`names`, `ConcordanceTest`-method, 5
`nopaco` (`concordance.test`), 2

`psifromR` (`rfromPsi`), 6

`rfromPsi`, 2, 3, 5, 6