

Package ‘RDnp’

July 21, 2025

Type Package

Date 2021-09-07

Title Robust Test for Complete Independence in High-Dimensions

Version 1.3

Author Hasan BULUT [aut,cre]

Maintainer Hasan BULUT <hasan.bulut@omu.edu.tr>

Description Test Statistics for Independence in High-Dimensional Datasets. This package consists of two functions to perform the complete independence test based on test statistics proposed by Bulut (unpublished yet) and suggested by Najrzadeh (2021) <[doi:10.1080/03610926.2019.1702699](https://doi.org/10.1080/03610926.2019.1702699)>. The Bulut's statistic is not sensitive to outliers in high-dimensional data, unlike one of Najrzadeh (2021) <[doi:10.1080/03610926.2019.1702699](https://doi.org/10.1080/03610926.2019.1702699)>. So, the Bulut's statistic can be performed robustly by using RDnp function.

License GPL-2

Depends R (>= 4.0)

Imports cellWise, MASS

Encoding UTF-8

RoxygenNote 7.1.1

NeedsCompilation no

Repository CRAN

Date/Publication 2021-09-09 09:00:16 UTC

Contents

Dnp_Test	2
RDnp_Test	3
Index	5

Dnp_Test

*Test for Independence in High-Dimensional Data***Description**

A Test Statistic for Independence in High-Dimensional Datasets

Usage

```
Dnp_Test(X)
```

Arguments

X the data. It must be matrix.

Details

Dnp_Test function tests the complete independence in high-dimensional data sets. This statistic was proposed by Najarzadeh (2021).

Value

a list with 2 elements:

TestValue	The value of test statistic
pval	The p value
robust	Logical. Indicates whether the results are based on robust statistic. Here, it returns robust=FALSE

Author(s)

Hasan BULUT <hasan.bulut@omu.edu.tr>

References

Najarzadeg, D (2021). Testing independence in high-dimensional multivariate normal data, Communication in Statistics: Theory and Methods. 50 (14): 3421-3435.

Examples

```
# Under H0
library(MASS)
data_H0<-mvrnorm(n = 20,mu = rep(0,30),Sigma = diag(30))
Dnp_Test(data_H0)

# Under H1
library(MASS)
data_H1<-mvrnorm(n = 20,mu = rep(0,30),Sigma = (diag(30)+1))
Dnp_Test(data_H1)
```

Description

A Robust Test Statistic for Independence in High-Dimensional Datasets

Usage

```
RDnp_Test(X, alpha = 0.75)
```

Arguments

X	the data. It must be matrix.
alpha	numeric parameter. It gives the rate of uncontaminated observations. Allowed values are between 0.5 and 1 and the default is 0.75.

Details

RDnp_Test function tests the complete independence in high-dimensional data sets without being affected by outliers.

Value

a list with 2 elements:

TestValue	The value of test statistic
pval	The p value
robust	Logical. Indicates whether the results are based on robust statistic. Here, it returns robust=TRUE

Author(s)

Hasan BULUT <hasan.bulut@omu.edu.tr>

References

Bulut, H (Unpublished). A Robust Test Statistic for Independence in High Dimensional Data

Examples

```
# Under H0
library(MASS)
data_H0<-mvrnorm(n = 20,mu = rep(0,30),Sigma = diag(30))
RDnp_Test(data_H0)

# Under H1
library(MASS)
```

```
data_H1<-mvrnorm(n = 20,mu = rep(0,30),Sigma = (diag(30)+1))  
RDnp_Test(data_H1)
```

Index

Dnp_Test, [2](#)

RDnp_Test, [3](#)