

Package ‘recp’

Type Package

Title Rank Energy Statistics in the Context of Change Point Analysis

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Description Implements procedure for detecting multiple change-points using ranked energy distance.

<Rank Energy Statistics in the Context of Change Point Detection

<Change Point Analysis of Multivariate Data via Multivariate Rank-based Distribution-free

Nonparametric Testing Using Measure Transportation

Measure transportation is used in multivariate rank-based distribution-free nonparametric testing. This method returns the set of estimated change points.

Licence N/A

Encoding UTF-8

Lazydata true

Depends clue, energy, randtoolbox, pracma, kernlab, crossmatch, HHG, gTests

RoxygenNote 7.1.1

Repository CRAN

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Required Packages

```
require(clue, quietly=T)
require(energy, quietly = T)
require(randtoolbox, quietly = T)
require(pracma, quietly = T)
require(kernlab, quietly = T)
require(crossmatch, quietly = T)
require(HHG, quietly = T)
require(gTests, quietly = T)
require(ramify)
```

Data Generation

```
m=200
n=200
data1=cbind(rcauchy(m,0,1),rcauchy(m,0,1))
data2=cbind(rcauchy(n,0.5,1),rcauchy(n,0,1))
```

Computing Rank Energy Statistic

```
computestatistic=function(x,y,m=nrow(x),n=nrow(y),dim=ncol(x),gr
idch=torus(m+n,dim))
{
  comdata=rbind(x,y)
  distmat=matrix(0,nrow=m+n,ncol=m+n)
  for(i in 1:(m+n))
    distmat[i,]=apply((comdata[i,]-t(gridch)),2,Norm)^2
  assignmentFUN=solve_LSAP(distmat)
  assignmentSOL=cbind(seq_along(assignmentFUN),assignmentFUN)
  randenergySTAT=eqdist.etest(gridch[assignmentSOL[,2],],sizes =
c(m,n), R=1)
  return(randenergySTAT$statistic)
```

Scaled Sample Measure of Divergence

```
EqDisttest=((m+n)/(m*n))(randenergySTAT)
```

Estimate Change Point Location

```
changept=argmax(EqDisttest)}
```