Package ‘otinference’

Type Package
Title Inference for Optimal Transport
Version 0.1.0
Imports MASS (>= 7.3-45), Rglpk (>= 0.6-2), sm (>= 2.2-5.4), transport
(>= 0.8-1)
Suggests Rcplex (>= 0.3.3)
Description Sample from the limiting distributions of empirical Wasserstein
distances under the null hypothesis and under the alternative. Perform a
two-sample test on multivariate data using these limiting distributions and
binning.
License GPL-2
Encoding UTF-8
RoxygenNote 5.0.1
NeedsCompilation no
Author Max Sommerfeld [aut, cre]
Maintainer Max Sommerfeld <max.sommerfeld@mathematik.uni-goettingen.de>
Repository CRAN
Date/Publication 2017-03-07 14:46:11

R topics documented:

  binWDTest ....................................................... 2
  limDisAlt ....................................................... 2
  limDisAltBoot ............................................... 3
  limDisNull ..................................................... 3
  limDisNullGrid ............................................... 4
  wassDist ....................................................... 4

Index 5
### binWDTest

**Two-sample test for multivariate data based on binning.**

**Description**

Two-sample test for multivariate data based on binning.

**Usage**

```r
binWDTest(x, y, L = 5, B = 100)
```

**Arguments**

- `x, y`: The two samples, rows are realizations.
- `L`: Number of bins in each dimension.
- `B`: Number of realizations of limiting distribution to simulate.

**Value**

p-value.

**Examples**

```r
## not run:
x <- MASS::mvrnorm(n = 100, mean = c(0, 0), Sigma = diag(1, 2))
y <- MASS::mvrnorm(n = 100, mean = c(0, 0), Sigma = diag(2, 2))
pVal <- binWDTest(x, y)
## end(not run)
```

---

### limDisAlt

**Sample from the limit distribution under the alternative.**

**Description**

Sample from the limit distribution under the alternative.

**Usage**

```r
limDisAlt(B = 1000, r, s, distMat, p = 1)
```

**Arguments**

- `B`: Number of samples to generate.
- `r, s`: Number of counts giving the two samples.
- `distMat`: Distance matrix.
- `p`: Cost exponent. Defaults to 1.
**Value**

A vector of samples.

---

**limDisAltBoot**

*m-out-of-n Bootstrap for the limiting distribution.*

**Description**

m-out-of-n Bootstrap for the limiting distribution.

**Usage**

`limDisAltBoot(r, s, distMat, B = 1000, p = 1, gamma = 0.9)`

**Arguments**

- `r`, `s` Vectors of counts giving the two samples.
- `distMat` Distance matrix.
- `B` The number of samples to generate. Defaults to 1000.
- `p` Cost exponent. Defaults to 1.
- `gamma` `m = n^gamma`. Defaults to 0.9.

**Value**

A sample from the limiting distribution.

---

**limDisNull**

Sample from the limiting distribution under the null.

**Description**

Sample from the limiting distribution under the null.

**Usage**

`limDisNull(B = 500, r, distMat, p = 1)`

**Arguments**

- `B` number of samples to generate. Defaults to 500.
- `r` vector of probabilities in the original problem.
- `distMat` distance matrix in the original problem.
- `p` cost exponent. Defaults to 1.

**Value**

A vector of samples.
**limDisNullGrid**  
*Sample from the limiting distribution under the null when the underlying space is a grid.*

**Description**  
Sample from the limiting distribution under the null when the underlying space is a grid.

**Usage**  
`limDisNullGrid(b = 500L, r, p = 1)`

**Arguments**
- `b` Number of bootstrap samples to generate. Defaults to 500.
- `r` Vector of probabilities in the original problem. Is interpreted as a square matrix.
- `p` Cost exponent.

**Value**
A vector of samples.

---

**wassDist**  
*Compute the Wasserstein distance between finite distributions.*

**Description**  
Compute the Wasserstein distance between finite distributions.

**Usage**  
`wassDist(a, b, distMat, p = 1)`

**Arguments**
- `a`, `b` Vectors representing probability distributions.
- `distMat` Cost matrix.
- `p` Cost exponent.

**Value**
The Wasserstein distance.
Index

binWDTes, 2
limDisAlt, 2
limDisAltBoot, 3
limDisNull, 3
limDisNullGrid, 4
wassDist, 4