

Package ‘otinference’

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Type Package

Title Inference for Optimal Transport

Version 0.1.0

Imports MASS ($\geq 7.3-45$), Rglpk ($\geq 0.6-2$), sm ($\geq 2.2-5.4$), transport ($\geq 0.8-1$)

Suggests Rcomplex ($\geq 0.3.3$)

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.

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Encoding UTF-8

RoxygenNote 5.0.1

NeedsCompilation no

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binWDTTest	<i>Two-sample test for multivariate data based on binning.</i>
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Description

Two-sample test for multivariate data based on binning.

Usage

```
binWDTTest(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

```
## 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 <- binWDTTest(x, y)
## End(Not run)
```

limDisAlt	<i>Sample from the limit distribution under the alternative.</i>
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Description

Sample from the limit distribution under the alternative.

Usage

```
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	<i>m-out-of-n Bootstrap for the limiting distribution.</i>
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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	$m = n^{\text{gamma}}$. Defaults to 0.9.

Value

A sample from the limiting distribution.

limDisNull	<i>Sample from the limiting distribution under the null.</i>
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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.

<code>limDisNullGrid</code>	<i>Sample from the limiting distribution under the null when the underlying space is a grid.</i>
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Description

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

Usage

```
limDisNullGrid(B = 500, r, p = 1)
```

Arguments

<code>B</code>	Number of bootstrap samples to generate. Defaults to 500.
<code>r</code>	vector of probabilities in the original problem. Is interpreted as a square matrix.
<code>p</code>	cost exponent.

Value

A vector of samples.

<code>wassDist</code>	<i>Compute the Wasserstein distance between to finite distributions.</i>
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Description

Compute the Wasserstein distance between to finite distributions.

Usage

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

Arguments

<code>a, b</code>	Vectors representing probability distributions.
<code>distMat</code>	Cost matrix.
<code>p</code>	cost exponent.

Value

The Wasserstein distance.

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