

Package ‘densratio’

March 29, 2016

Type Package

Version 0.0.3

Title Density Ratio Estimation

Description Density ratio estimation.

The estimated density ratio function can be used in many applications such as the inlier-based outlier detection, covariate shift adaptation and etc.

URL <https://github.com/hoxo-m/densratio>

BugReports <https://github.com/hoxo-m/densratio/issues>

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Imports utils

Suggests graphics, knitr, mvtnorm, rmarkdown, stats

RoxygenNote 5.0.1

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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R topics documented:

densratio	2
KLIEP	3
uLSIF	3
Index	5

densratio	<i>Estimate Density Ratio $p_{nu}(x)/p_{de}(y)$</i>
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Description

Estimate Density Ratio $p_{nu}(x)/p_{de}(y)$

Usage

```
densratio(x, y, method = c("uLSIF", "KLIEP"), sigma = "auto",  
lambda = "auto", kernel_num = 100, fold = 5, verbose = TRUE)
```

Arguments

x	numeric vector or matrix as data from a numerator distribution $p_{nu}(x)$.
y	numeric vector or matrix as data from a denominator distribution $p_{de}(y)$.
method	"uLSIF"(default) or "KLIEP".
sigma	positive numeric vector as a search range of Gaussian kernel bandwidth.
lambda	positive numeric vector as a search range of regularization parameter for uLSIF.
kernel_num	positive integer as number of kernels.
fold	positive integer as a numer of the folds of cross validation for KLIEP.
verbose	logical(default TRUE).

Value

densratio object that contains the function to estimate density ratio.

Examples

```
set.seed(3)  
x <- rnorm(200, mean = 1, sd = 1/8)  
y <- rnorm(200, mean = 1, sd = 1/2)  
densratio(x, y)
```

KLIEP	<i>Estimate Density Ratio $p_{nu}(x)/p_{de}(y)$ by KLIEP (Kullback-Leibler Importance Estimation Procedure)</i>
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Description

Estimate Density Ratio $p_{nu}(x)/p_{de}(y)$ by KLIEP (Kullback-Leibler Importance Estimation Procedure)

Usage

```
KLIEP(x, y, sigma = "auto", kernel_num = 100, fold = 5, verbose = TRUE)
```

Arguments

x	numeric vector or matrix as data from a numerator distribution $p_{nu}(x)$.
y	numeric vector or matrix as data from a denominator distribution $p_{de}(y)$.
sigma	positive numeric vector as a search range of Gaussian kernel bandwidth.
kernel_num	positive integer as number of kernels.
fold	positive integer as a numer of the folds of cross validation.
verbose	logical(default TRUE).

Value

KLIEP object that contains the function to estimate density ratio.

uLSIF	<i>Estimate Density Ratio $p_{nu}(x)/p_{de}(y)$ by uLSIF (unconstrained Least-Square Importance Fitting)</i>
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Description

Estimate Density Ratio $p_{nu}(x)/p_{de}(y)$ by uLSIF (unconstrained Least-Square Importance Fitting)

Usage

```
uLSIF(x, y, sigma = 10^seq(-3, 1, length.out = 9), lambda = 10^seq(-3, 1, length.out = 9), kernel_num = 100, verbose = TRUE)
```

Arguments

x	numeric vector or matrix as data from a numerator distribution $p_{\text{nu}}(x)$.
y	numeric vector or matrix as data from a denominator distribution $p_{\text{de}}(y)$.
sigma	positive numeric vector as a search range of Gaussian kernel bandwidth.
lambda	positive numeric vector as a search range of regularization parameter.
kernel_num	positive integer as number of kernels.
verbose	logical(default TRUE).

Value

uLSIF object that contains the function to estimate density ratio.

Index

densratio, 2

KLIEP, 3

uLSIF, 3