Package ‘onlineBcp’

November 22, 2021

Type Package
Title Online Bayesian Methods for Change Point Analysis
Version 0.1.3
Description It implements the online Bayesian methods for change point analysis. It can also perform missing data imputation with methods from 'VIM'. The reference is Yigiter A, Chen J, An L, Danacioglu N (2015) <doi:10.1080/02664763.2014.1001330>.
License GPL
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aCGH

Transformed aCGH data

Description
A dataset containing the transformed aCGH data from the genome of the fibroblast cell line GM02948

Usage
aCGH

Format
A data frame with 2046 rows and 1 variable:

transNorm normalized aCGH intensity

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cnv_H2347

GC-corrected data for copy number variation

Description
A dataset containing the raw data and GC-corrected/normalized data

Usage
cnv_H2347

Format
A data frame with 14189 rows and 2 variables:

raw.count raw read counts
normalized.count normalized read counts
**combine**

*Combine two BayesCP objects*

**Description**
Combine two BayesCP objects

**Usage**
```r
combine(bcp1, bcp2)
```

**Arguments**
- `bcp1`: the first BayesCP object to be combined
- `bcp2`: the second BayesCP object to be combined

**Value**
The combined BayesCP object

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**covid**

*US COVID-19 data*

**Description**
A dataset containing new daily cases in the United States downloaded from the World Health Organization on August 25, 2020

**Usage**
covid

**Format**
A data frame with 219 rows and 8 variables

- **Date_reported**: The report date
- **Country_code**: The code for country
- **Country**: Country in full name
- **WHO_region**: Geographic region defined by WHO
- **New_cases**: New COVID-19 cases
- **Cumulative_cases**: Cumulative COVID-19 cases
- **New_deaths**: New COVID-19 deaths
- **Cumulative_deaths**: Cumulative COVID-19 deaths
imputation

Impute missing data

**Usage**

```r
imputation(x, method = c("Median", "kNN"))
```

**Arguments**

- `x`: the normalized data with missing
- `method`: the imputation method

**Value**

The vector of imputed data with no missing values

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online_cp

*Online change point detection algorithm for normally distributed data.*

**Description**

Online change point detection algorithm for normally distributed data.

**Usage**

```r
online_cp(x, theta = 0.9, alpha = 1, beta = 1, th_cp = 0.5)
```

**Arguments**

- `x`: the normalized data
- `theta`: the probability of occurrence of a change point, default 0.9
- `alpha`: the hyperparameter of posterior distribution, default 1.0
- `beta`: the hyperparameter of posterior distribution, default 1.0
- `th_cp`: threshold level for the posterior distribution of change point, default 0.5

**Value**

An object of the BayesCP class
plot.BayesCP

Plot BayesCP object

Description
Plot BayesCP object

Usage
```r
## S3 method for class 'BayesCP'
plot(x, xlab = "Index", ylab = "x", ...)
```

Arguments
- `x`: the BayesCP class object to be plotted
- `xlab`: the default x-axis label, default "Index"
- `ylab`: the default y-axis label, default "x"
- `...`: the plotting parameters passed to plot()

Value
No return value, called for side effects

summary.BayesCP
Summarize BayesCP object

Description
Summarize BayesCP object

Usage
```r
## S3 method for class 'BayesCP'
summary(object, norm.test = FALSE, ...)
```

Arguments
- `object`: the BayesCP class object to be summarized
- `norm.test`: logical value for normality test, default is false
- `...`: parameters passed to summary()

Value
An object of BayesCP class with updated summary result
Examples

```r
x <- c(rnorm(10, 0, 1), rnorm(10, 5, 1))
bcp <- online_cp(x)
summary(bcp)
```
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