Package 'scorepeak'

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Type Package

Title Peak Functions for Peak Detection in Univariate Time Series

Version 0.1.2

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Description Provides peak functions, which enable us to detect peaks in time series. The methods implemented in this package are based on Girish Keshav Palshikar (2009) <https://www.researchgate.net/publication/228853276_Simple_Algorithms_for_Peak_Detection_in_Time-Series>.

License GPL-3

Depends R (>= 3.5.0)

Imports checkmate (>= 1.9.1), Rcpp (>= 1.0.0)

Suggests knitr, rmarkdown, testthat (>= 2.0.0), cluster

URL https://github.com/ShotaOchi/scorepeak

BugReports https://github.com/ShotaOchi/scorepeak/issues

NeedsCompilation yes

LinkingTo Rcpp

LazyData true

RoxygenNote 6.1.1

VignetteBuilder knitr

Encoding UTF-8

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Repository CRAN

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R topics documented:

building_blocks   *Building Blocks of Peak Functions*

Description

Computes max, min, mean, and standard deviation of temporal neighbors.

Usage

```
max_neighbors(data, w, side, boundary = "reflecting")

min_neighbors(data, w, side, boundary = "reflecting")

mean_neighbors(data, w, side, boundary = "reflecting")

sd_neighbors(data, w, side, boundary = "reflecting")
```

Arguments

data	a numeric vector. Length of data must be greater than 1.
w	window size. w must be odd and greater than 2 and smaller than double length of data.
side	determines which side of neighbors of data point will be used in calculation. "left", "l": left temporal neighbors, "right", "r": right temporal neighbors, "both", "b": left and right temporal neighbors, "all", "a": data point and its left and right temporal neighbors.
boundary	determines how data points in the beginning and end of the time series will be treated. "reflecting", "r": reflecting boundary condition, "periodic", "p": periodic boundary condition, "discard", "d", discarding data points in the beginning and end of the time series. See the vignette "Introduction to scorepeak" for detail.

Value

a numeric vector

Author(s)

Shota Ochi

Examples

```
data("ecgca102")
max_neighbors(ecgca102, 11, "all")
min_neighbors(ecgca102, 11, "all")
mean_neighbors(ecgca102, 11, "all")
sd_neighbors(ecgca102, 11, "all")
```

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detect_localmaxima   *detect local maxima in univariate time series data*

Description

detect local maxima in univariate time series data

Usage

```
detect_localmaxima(data, w = 3, boundary = "reflecting")
```

Arguments

data
: a numeric vector. Length of data must be greater than 1.

w
: window size. w must be odd and greater than 2 and smaller than double length of data.

boundary
: determines how data points in the beginning and end of the time series will be treated. "reflecting", "r": reflecting boundary condition, "periodic", "p": periodic boundary condition, "discard", "d", discarding data points in the beginning and end of the time series. See the vignette "Introduction to scorepeak" for detail.

Value

a logical vector. TRUE indicates local peak. FALSE indicates not local peak.

Author(s)

Shota Ochi

Examples

```
data("ecgca102")
peaks <- detect_localmaxima(ecgca102)
plot(ecgca102, type = "l")
points(which(peaks), ecgca102[peaks], pch = 1, col = "red")
```

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ecgca102   *Time Series Data of Electrocardiogram*

Description

This data is a part of ecgca102.edf file of Non-Invasive Fetal Electrocardiogram Database.

Usage

```
data("ecgca102")
```

Format

a numeric vector

Source

Non-Invasive Fetal Electrocardiogram Database (<https://doi.org/10.13026/C2X30H>)

References

Goldberger AL, Amaral LAN, Glass L, Hausdorff JM, Ivanov PCh, Mark RG, Mietus JE, Moody GB, Peng C-K, Stanley HE. PhysioBank, PhysioToolkit, and PhysioNet: Components of a New Research Resource for Complex Physiologic Signals. Circulation 101(23):e215-e220 [Circulation Electronic Pages; http://circ.ahajournals.org/cgi/content/full/101/23/e215]; 2000 (June 13).

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peak_functions   *Peak Functions for Peak Detection in Univariate Time Series*

Description

scorepeak package provides several types of peak function. See the vignette "Introduction to score-peak" for detail.

Usage

```
score_type1(data, w, boundary = "reflecting")

score_type2(data, w, boundary = "reflecting")

score_type3(data, w, boundary = "reflecting")
```

Arguments

`data`	a numeric vector. Length of data must be greater than 1.
`w`	window size. w must be odd and greater than 2 and smaller than double length of data.
`boundary`	determines how data points in the beginning and end of the time series will be treated. "reflecting", "r": reflecting boundary condition, "periodic", "p": periodic boundary condition, "discard", "d", discarding data points in the beginning and end of the time series. See the vignette "Introduction to scorepeak" for detail.

Value

a numeric vector

Author(s)

Shota Ochi

Examples

```
data("ecgca102")
plot(ecgca102, type = "l", ylim = c(-0.38, 0.53))
points(seq(length(ecgca102)), score_type1(ecgca102, 51), col = "red", type = "l")
points(seq(length(ecgca102)), score_type2(ecgca102, 51), col = "blue", type = "l")
points(seq(length(ecgca102)), score_type3(ecgca102, 51), col = "green", type = "l")
```

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scorepeak	*scorepeak: Peak Functions for Peak Detection in Univariate Time Series*

Description

scorepeak provides peak functions and its building blocks. Peak functions enable us to detect peaks.

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