

# Package ‘scorepeak’

August 21, 2019

**Type** Package

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

**Version** 0.1.2

**Maintainer** Shota Ochi <shotaochi1990@gmail.com>

**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](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

**Author** Shota Ochi [aut, cre, cph]

**Repository** CRAN

**Date/Publication** 2019-08-21 08:20:02 UTC

## R topics documented:

building_blocks . . . . .	2
detect_localmaxima . . . . .	3
ecga102 . . . . .	4
peak_functions . . . . .	4
scorepeak . . . . .	5

---

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")
```

---

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")
```

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).

---

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")
```

---

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.

# Index

## \*Topic **datasets**

ecgca102, [4](#)

building\_blocks, [2](#)

detect\_localmaxima, [3](#)

ecgca102, [4](#)

max\_neighbors (building\_blocks), [2](#)

mean\_neighbors (building\_blocks), [2](#)

min\_neighbors (building\_blocks), [2](#)

peak\_functions, [4](#)

score\_type1 (peak\_functions), [4](#)

score\_type2 (peak\_functions), [4](#)

score\_type3 (peak\_functions), [4](#)

scorepeak, [5](#)

scorepeak-package (scorepeak), [5](#)

sd\_neighbors (building\_blocks), [2](#)