Package 'Convolutioner'

May 7, 2026

Type Package

Title Convolution of Data

Version 0.1.0

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Description General functions for convolutions of data. Moving average, running median, and other filters are available.
Bibliography regarding the functions can be found in the following text.
Richard G. Brereton (2003) <ISBN:9780471489771>.

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

NeedsCompilation no

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Repository CRAN

Date/Publication 2021-03-11 10:40:02 UTC

Contents

Hamming *Hamming window filter.*

Description

This function return the data smoothed using the an Hamming window filter. Data are smoothed using a cosine window with particular coefficients.

Usage

```
Hamming(raw_data, buffer_size = 5)
```

Arguments

raw_data	Data upon which the algorithm is applied
buffer_size	number of points the algorithm use to compute the coefficients of the Hann window

Value

Smoothed data using Hann Window filter

Examples

```
raw_data = c(1:100)
smoothed_data = Hamming(raw_data)
```

Hann *Hann window filter.*

Description

This function return the data smoothed using the an Hann window filter. Data are smoothed using a cosine window.

Usage

```
Hann(raw_data, buffer_size = 5)
```

Arguments

raw_data	Data upon which the algorithm is applied
buffer_size	number of points the algorithm use to compute the coefficients of the Hann window

Value

Smoothed data using Hann Window filter

Examples

```
raw_data = c(1:100)
smoothed_data = Hann(raw_data)
```

MA *Moving average filter.*

Description

This function return the data smoothed using the basic moving average algorithm. For each chunk of data of size equal to the buffer_size parameter is calculated the average and this value is used as the i term of the newly smoothed data. zero padding is applied for initial and final values

Usage

```
MA(raw_data, buffer_size = 5)
```

Arguments

raw_data	Data upon which the algorithm is applied
buffer_size	number of points the algorithm use to compute the average

Value

Smoothed data using moving average algorithm

Examples

```
raw_data = c(1:100)
smoothed_data = MA(raw_data)
```

RMS *Running median smoothing.*

Description

This function return the data smoothed using the running median algorithm. For each chunk of data of size equal to the buffer_size parameter is calculated the median and this value is used as the i term of the newly smoothed data. For initial and final values zero padding is applied.

Usage

```
RMS(raw_data, buffer_size = 5)
```

Arguments

raw_data	Data upon which the algorithm is applied
buffer_size	number of points the algorithm use to compute the median

Value

Smoothed data using running median algorithm

Examples

```
raw_data = c(1:100)
smoothed_data = RMS(raw_data)
```

sine *Sine window filter.*

Description

This function return the data smoothed using the a sine window filter.

Usage

```
sine(raw_data, buffer_size = 5)
```

Arguments

raw_data	Data upon which the algorithm is applied
buffer_size	number of points the algorithm use to compute the coefficients of the Hann window

Value

Smoothed data using Hann Window filter

Examples

```
raw_data = c(1:100)
smoothed_data = sine(raw_data)
```

`test_data` *Test data generator*

Description

Generate test data in order to test the filtering functions. To a signal function is added random noise contribution. V0.1 = noise is assumed gaussian

Usage

```
test_data(
  amplitude = 1,
  f = 100,
  npoints = 1000,
  type = "sinusoidal",
  x0 = 0,
  noise_contribution = 100
)
```

Arguments

`amplitude`	amplitude of the signal, default = 1
`f`	frequency of the sinusoidal signal, default = 100
`npoints`	number of points of the time serie
`type`	type of signal, default = sinusoidal. Available types: sinusoidal, gaussian
`x0`	signal position for gaussian type. Default = 0
`noise_contribution`	percentage pointing the maximum wanted signal/noise ratio. Default = 10

Value

A time serie with added random noise.

Examples

```
test_data()
```

Index