

Package: natcpp (via r-universe)

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Type Package

Title Fast C++ Primitives for the 'NeuroAnatomy Toolbox'

Version 0.1.1

Description Fast functions implemented in C++ via 'Rcpp' to support the 'NeuroAnatomy Toolbox' ('nat') ecosystem. These functions provide large speed-ups for basic manipulation of neuronal skeletons over pure R functions found in the 'nat' package. The expectation is that end users will not use this package directly, but instead the 'nat' package will automatically use routines from this package when it is available to enable large performance gains.

License GPL (>= 3)

URL <https://github.com/natverse/natcpp>

BugReports <https://github.com/natverse/natcpp/issues>

Imports Rcpp (>= 1.0.6)

Suggests spelling, testthat (>= 3.0.0)

LinkingTo Rcpp

Config/testthat/edition 3

Encoding UTF-8

Language en-GB

RoxygenNote 7.1.2

Repository <https://natverse.r-universe.dev>

RemoteUrl <https://github.com/natverse/natcpp>

RemoteRef HEAD

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c_EdgeListFromSegList *Turn a segment list into an edgelist suitable for constructing an ngraph*

Description

Turn a segment list into an edgelist suitable for constructing an ngraph

Usage

```
c_EdgeListFromSegList(L)
```

Arguments

L a list containing integer vectors from `as.seglist`

Details

It is up to the caller to generate the `seglist`. Note that isolated points will be dropped since they have no edges.

Value

An integer matrix of N rows and 2 columns

Examples

```
## Not run:
library(nat)
# make a neuron with multiple subtrees
n=prune_vertices(Cell07PNs[[1]], 48L)
# Must use flatten=T if including all subtrees
sl=as.seglist(n, all = TRUE, flatten = TRUE)
c_EdgeListFromSegList(sl)

## End(Not run)
```

c_listlengths	<i>A simple function to compute the lengths of the elements of an R list</i>
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Description

A simple function to compute the lengths of the elements of an R list

Usage

```
c_listlengths(L)
```

Arguments

L a list

Details

This is equivalent to the base::lengths however it is much faster for long lists (and somewhat slower for short ones).

Value

An integer vector containing the length of each element of L

c_ListofMatrixRows	<i>Convert a matrix into list of row vectors</i>
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Description

Convert a matrix into list of row vectors

Usage

```
c_ListofMatrixRows(object)
```

Arguments

object An integer, numeric, character or logical matrix of N rows and M columns

Details

Typically this will be for 3D coordinates but there are no limits on row length.

Value

a list containing N vectors of length M corresponding to the rows of object.

Examples

```
## Not run:
library(nat)
xyz=xyzmatrix(Cell07PNs)
mat2list = function(m) {
  um=unname(m)
  lapply(1:nrow(um), function(i) um[i,])
}
bench::mark(rcpp=c_ListofMatrixRows(xyz), r=mat2list(xyz))

## End(Not run)
```

<code>c_seglengths</code>	<i>Compute summed segment lengths or total cable</i>
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Description

`c_seglengths` computes the summed segment length equivalent to `nat::seglengths(sumsegment = T)`

`c_total_cable` computes the summed total cable for a whole neuron. It's intended use is the `nat::summary.neuron` function.

Usage

```
c_seglengths(s1, x, y, z)
```

```
c_total_cable(s1, x, y, z)
```

Arguments

<code>s1</code>	A seglist with 1-indices into vectors x,y,z
<code>x, y, z</code>	Numeric vectors with 3D coordinate data (which could be columns from a data frame)

<code>c_topntail</code>	<i>Find the first and last elements of all vectors in a list</i>
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Description

`c_topntail` returns an $2 \times N$ matrix containing the start and end of each of the vectors in the input list. Length 0 vectors are ignored, while length 1 vectors are duplicated

For `c_topntail_list`, a list of the same length as `L` having the same elements when their length is ≤ 2 or the first and last elements when $\text{length} > 2$.

Usage

`c_topntail(L)`

`c_topntail_list(L)`

Arguments

`L` a list containing integer vectors, typically a `seglist`

Value

For `c_topntail` an integer matrix. For `c_topntail_list` a list.

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