Package 'RGraph2js'

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Type Package

Title Convert a Graph into a D3js Script

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Imports utils, whisker, rjson, digest, graph

Suggests RUnit, BiocStyle, BiocGenerics, xtable, sna

Description Generator of web pages which display interactive network/graph visualizations with D3js, jQuery and Raphael.

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SystemRequirements jQuery, jQueryUI, qTip2, D3js and Raphael are required Javascript libraries made available via the online CDNJS service (http://cdnjs.cloudflare.com).

Collate 'RGraph2js-package.R' 'dataformating.R' 'utils.R' 'jstemplate.R' 'htmltemplate.R' 'graph2js.R'

biocViews Visualization, Network, GraphAndNetwork, ThirdPartyClient

NeedsCompilation no

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Contents

`generateOptionsJSCode` *Generate javascript code based on general options, options for containers and network data*

Description

Generate javascript code based on general options, options for containers and network data

Usage

```
generateOptionsJSCode(opts)
```

Arguments

`opts`	`list` containing general options for GraphRender component

Value

String containing JS code for component options

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

getAdjMat *Get a RGraph2js compatible adjacency matrix from the provided R object.*

Description

Get a RGraph2js compatible adjacency matrix from the provided R object.

Usage

```
getAdjMat(A)
```

Arguments

A	signed weighted adjacency matrix or an instance of the class graphAM, graphBAM, graphNEL or clusterGraph from the graph package

Value

the RGraph2js compatible adjacency matrix

Author(s)

Stephane Cano <stephane.cano@pmi.com>, PMP SA.

getDefaultOptions *Generate a list containing parameters for the D3js component's options with default values*

Description

Generate a list containing parameters for the D3js component's options with default values

Usage

```
getDefaultOptions()
```

Value

list of parameters with default values

Description of the available options

w : width of the component in pixels
h : height of the component in pixels

minZoomFactor : float [0,n], 1 means 100%
maxZoomFactor : float [0,n], 1 means 100%

layout_forceLinkDistance : float
If distance is specified, sets the target distance between linked nodes to the specified value. If distance is not specified, returns the layout's current link distance, which defaults to 20. Typically, the distance is specified in pixels; however, the units are arbitrary relative to the layout's size.

layout_forceCharge : float
If charge is specified, sets the charge strength to the specified value. If charge is not specified, returns the current charge strength, which defaults to -900. A negative value results in node repulsion, while a positive value results in node attraction. For graph layout, negative values should be used; for n-body simulation, positive values can be used. All nodes are assumed to be infinitesimal points with equal charge and mass. Charge forces are implemented efficiently via the Barnes-Hut algorithm, computing a quadtree for each tick. Setting the charge force to zero disables computation of the quadtree, which can noticeably improve performance if you do not need n-body forces.

layout_linkStrength : float [0,1]
If strength is specified, sets the strength (rigidity) of links to the specified value in the range [0,1]. If strength is not specified, returns the layout's current link strength, which defaults to 1.

layout_friction : float
If friction is specified, sets the friction coefficient to the specified value. If friction is not specified, returns the current coefficient, which defaults to 0.9. The name of this parameter is perhaps misleading; it does not correspond to a standard physical coefficient of friction. Instead, it more closely approximates velocity decay: at each tick of the simulation, the particle velocity is scaled by the specified friction. Thus, a value of 1 corresponds to a frictionless environment, while a value of 0 freezes all particles in place. Values outside the range [0,1] are not recommended and may have destabilizing effects.

layout_chargeDistance : float
If distance is specified, sets the maximum distance over which charge forces are applied. If distance is not specified, returns the current maximum charge distance, which defaults to infinity. Specifying a finite charge distance improves the performance of the force layout and produces a more localized layout; distance-limited charge forces are especially useful in conjunction with custom gravity.

layout_theta : float
If theta is specified, sets the Barnes-Hut approximation criterion to the specified value. If theta is not specified, returns the current value, which defaults to 0.8. Unlike links, which only affect two linked nodes, the charge force is global: every node affects every other node, even if they are on disconnected subgraphs. To avoid quadratic performance slowdown for large graphs, the force layout uses the Barnes-Hut approximation which takes O(n log n) per tick. For each tick, a quadtree is created to store the current node positions; then for each node, the sum charge force of all other nodes on the given node are computed. For clusters of nodes that are far away, the charge force is

approximated by treating the distance cluster of nodes as a single, larger node. Theta determines the accuracy of the computation: if the ratio of the area of a quadrant in the quadtree to the distance between a node to the quadrant's center of mass is less than theta, all nodes in the given quadrant are treated as a single, larger node rather than computed individually.

layout_gravity : float
If gravity is specified, sets the gravitational strength to the specified value. If gravity is not specified, returns the current gravitational strength, which defaults to 0.1. The name of this parameter is perhaps misleading; it does not correspond to physical gravity (which can be simulated using a positive charge parameter). Instead, gravity is implemented as a weak geometric constraint similar to a virtual spring connecting each node to the center of the layout's size. This approach has nice properties: near the center of the layout, the gravitational strength is almost zero, avoiding any local distortion of the layout; as nodes get pushed farther away from the center, the gravitational strength becomes strong in linear proportion to the distance. Thus, gravity will always overcome repulsive charge forces at some threshold, preventing disconnected nodes from escaping the layout. Gravity can be disabled by setting the gravitational strength to zero. If you disable gravity, it is recommended that you implement some other geometric constraint to prevent nodes from escaping the layout, such as constraining them within the layout's bounds.

maxLayoutIterations : the max allowed number to perform

displayNetworkEveryNLayoutIterations : 1 means always, 0 to display only on layout completion

optimizeDisplayWhenLayoutRunning : boolean, TRUE to simplify the display when the layout engine is running
FALSE otherwise.

nodeSize : size of the node in pixels

nodeRoundedCornerPixels : apply rounded corners on rectangle like shapes

displayNodeLabels : boolean, display node names besides them

nodeBorderColor : RGB hex color

leadingNodeBorderColor : RGB hex color

noneLeadingNodeOpacity : float [0,1], 1 means fully opaque

nodeLabelsColor : RGB hex color, example "#444444"

nodeLabelsFont : example "6px sans-serif"

dragNodeBorderColor : the node border color to apply on dragging

selectNodeBorderColor : the node border color to apply on left-click, "#ff0000"

displayBarPlotsInsideNodes : boolean, display barplots inside nodes

barplotInNodeTooltips : boolean, display barplots inside node's tooltips

barplotInsideNodeBorderColor : the barplot borders color, example '#000000'
barplotInsideNodeBorderWidth : the barplot borders width in pixels, example '2px'

nodeTooltipOpacity : float [0,1], 1 means fully opaque (for link tooltips as well)

displayBarplotTooltips : boolean, (dis/en)able tooltips for each barplot's bar

nodeTooltipActivationDelay : milliseconds (for link tooltips as well)

nodeTooltipDeactivationDelay : milliseconds (for link tooltips as well)

barplotInNodeTooltipsFontSize : pixels

enableNodeDragging : boolean, allow/deny node dragging

jsFunctionToCallOnNodeClick : name of the javascript function to call on node click
example:
To call the following function
var myfunction = function(nodeObj) alert(nodeObj.name); ;
you should set jsFunctionToCallOnNodeClick='myfunction'

displayColorScale : show a color scale in the toolbar

scaleGradient : define the linear color gradient
Linear gradient format is "<angle>-<colour>[-<colour>[:<offset>]]*-<colour>"
examples: "90-#fff-#000" => 90 degree gradient from white to black
"0-#fff-#f00:20-#000" -> 0 degree gradient from white via red (at 20%) to black.

scaleLabelsFontFamily : example "monospace"

scaleLabelsFontSize : in pixels

scaleHeight : in pixels

scaleTickSize : in pixels

scaleTicksPercents : to draw a tick every 20%: "[20,40,60,80,100]"

exportCGI : boolean, enable a CGI convertion in the export function, permit only the SVG export otherwise

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

Examples

```
v <- c(0, 0, 1, 1, 0,
       0, 0, 0, 0, 0,
      -1, 0, 0, 1, 0)
a <- matrix(v, 3, 5)
colnames(a) <- LETTERS[1:5]
rownames(a) <- LETTERS[1:3]

opts <- getDefaultOptions()
opts$nodeLabelsFont <- '16px sans-serif'

g <- graph2js(A=a, opts=opts)
```

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getDefaultToolParameters

Function wich generates a list containing parameters for Tools in the D3js component with default values

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Description

Function wich generates a list containing parameters for Tools in the D3js component with default values

Usage

```
getDefaultToolParameters()
```

Value

`list` of parameters with default values

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

getEdgesDataFrame *Create Edges* data.frame *from Adjacency matrix and properties*

Description

Create Edges data.frame from Adjacency matrix and properties

Usage

```
getEdgesDataFrame(A, eGlobal = NULL, eProp = NULL)
```

Arguments

A	signed weighted adjacency matrix
eGlobal	A list of properties for assigning all edges. Default value is NULL
eProp	A data.frame for assigning some nodes properties Default value is NULL

Value

A data.frame

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

Examples

```
v <- c(0, 0, 1, 1, 0,
       0, 0, 0, 0, 0,
      -1, 0, 0, 1, 0)
a <- matrix(v, 3, 5)
colnames(a) <- LETTERS[1:5]
rownames(a) <- LETTERS[1:3]
eGlobal <- list(color="#5555ff")
eProp <- data.frame(from=c('A','C'), to=c('B', 'A'), width=c(2,2))
getEdgesDataFrame(A=a, eGlobal=eGlobal, eProp=eProp)
```

getHTMLContainerCode *Generate a HTML table node code for component based on template*

Description

Generate a HTML table node code for component based on template

Usage

```
getHTMLContainerCode(id, toolParam)
```

Arguments

id	String for component identification
toolParam	list containing options for tools options of the GraphRender component

Value

String which is the HTML code generated

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

getHTMLStyleCode *Generate a HTML style code for component based on template*

Description

Generate a HTML style code for component based on template

Usage

```
getHTMLStyleCode(id)
```

Arguments

id	String for component identification

Value

String which is the HTML style code generated

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

getJSCode *Generate javascript code based on general options and network data*

Description

Generate javascript code based on general options and network data

Usage

```
getJSCode(dataJson, id, opts, toolParam)
```

Arguments

dataJson	list containing network data for nodes and links
id	String for component identification
opts	list containing general options for GraphRender component
toolParam	list containing urls to jquery, jquery-ui, d3js, GraphRender JS library, options for the GraphRender tool

Value

String corresponding to JS code

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

getNodesDataFrame *Create Nodes* data.frame *from Adjacency matrix and properties for specific nodes*

Description

Create Nodes data.frame from Adjacency matrix and properties for specific nodes

Usage

```
getNodesDataFrame(A, nGlobal = NULL, nProp = NULL)
```

Arguments

A	signed weighted adjacency matrix
nGlobal	A list of properties for assigning all nodes. Default value is NULL
nProp	A data.frame for assigning some nodes properties Default value is NULL

Value

A data.frame

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

Examples

```
v <- c(0, 0, 1, 1, 0,
       0, 0, 0, 0, 0,
      -1, 0, 0, 1, 0)
a <- matrix(v, 3, 5)
colnames(a) <- LETTERS[1:5]
rownames(a) <- LETTERS[1:3]
nGlobal <- list(color="#dedeff")
nProp <- data.frame(shape=c('triangle', 'lozenge'))
rownames(nProp) <- c('C', 'E')
getNodesDataFrame(A=a, nGlobal=nGlobal, nProp=nProp)
```

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getUUID *Function wich generates a UUID version 4*

Description

Function wich generates a UUID version 4

Usage

```
getUUID(seed = NULL)
```

Arguments

seed	Integer for seeding the R random generator

Value

String corresponding to the UUID generated.

graph2js *Generate the JSON code using D3js that draws A network from Adjacency matrix and edges, nodes properties.*

Description

Generate the JSON code using D3js that draws A network from Adjacency matrix and edges, nodes properties.

Usage

```
graph2js(A, innerValues = NULL, innerColors = NULL, innerTexts = NULL,
  starplotValues = NULL, starplotColors = NULL, starplotLabels = NULL,
  starplotTooltips = NULL, starplotUrlLinks = NULL,
  starplotSectorStartedRad = NULL, starplotCircleFillColor = NULL,
  starplotCircleFillOpacity = NULL, nodesGlobal = NULL, nodesProp = NULL,
  edgesGlobal = NULL, edgesProp = NULL, outputDir = NULL,
  filename = NULL, opts = list(), userCssStyles = NULL,
  toolsPar = list(), id = getUUID())
```

Arguments

A	signed weighted adjacency matrix or an instance of the class graphAM, graphBAM, graphNEL or clusterGraph from the graph package
innerValues	A matrix of inner node values to display Barplot or other component. In a row, numerical values for a node.
innerColors	A matrix of colors for coloring the inner node barplot or component . In a row, colors values for a node.
innerTexts	A matrix of labels for each bar in inner barplots. In a row, labels values for a node.
starplotValues	A matrix of [0,1] values for starpot sectors size
starplotColors	A matrix of hex RGB colors for sectors colors
starplotLabels	A matrix of labels identifying the sectors
starplotTooltips	A matrix of text or even html content for the sectors tooltips
starplotUrlLinks	A matrix of text for the sectors url links
starplotSectorStartedRad	A matrix with a single column of [0,2PI] values for the sector start in radians
starplotCircleFillColor	A matrix of hex RGB colors for the circle background
starplotCircleFillOpacity	A matrix of [0.0,1.0] values for the background opacity
nodesGlobal	A list of global nodes properties.

nodesProp	A data.frame object containing properties for specifics nodes width, shape (in 'rect', 'circle', 'lozenge', 'triangle'), link, tooltip, highlight.X (X from 0 to N for animation) columns
edgesGlobal	A list of global edges properties.
edgesProp	A data.frame object containing properties for specific edges from, to, width, type, link, color columns
outputDir	String that corresponds to the path to a folder or file where js code and dependencies will be generated. If NULL is provided, javascript code is returned in the returned list by the function with the slots: 'jsIncludes' A character string containing JS code for including the necessary JS files 'styling' A character string which contains the CSS code for the GraphRenderer component 'js' A character string containing the JavaScript code for the rendering of the data 'html' A character string containing the HTML code for the rendering of the component
filename	String the name of the result HTML file, a name will be automatically generated if not provided and by default.
opts	list of options of the GraphRenderer component (See getDefaultOptions function available options)
userCssStyles	String containing user css styles. (See starplot demo)
toolsPar	list of options for tools attached to GraphRenderer component. (See getDefaultToolParameters for details)
id	function, Unique IDs generator, Internal function getUUID by default.

Value

A list containing information of the generated js code.

Examples

```
v <- c(0, 0, 1, 1, 0,
       0, 0, 0, 0, 0,
      -1, 0, 0, 1, 0)
a <- matrix(v, 3, 5)
colnames(a) <- LETTERS[1:5]
rownames(a) <- LETTERS[1:3]
g <- graph2js(a)
```

graph2json *Generates JSON string correponding the the graph description*

Description

Generates JSON string correponding the the graph description

Usage

```
graph2json(ndf, edf, innerValues = NULL, innerColors = NULL,
  innerTexts = NULL, starplotColors = NULL, starplotValues = NULL,
  starplotLabels = NULL, starplotTooltips = NULL, starplotUrlLinks = NULL,
  starplotSectorStartRad = NULL, starplotCircleFillColor = NULL,
  starplotCircleFillOpacity = NULL)
```

Arguments

ndf	A data.frame correponding to nodes definition
edf	A data.frame correponding to edges definition
innerValues	A matrix of numerical values for plotting in the node
innerColors	A matrix of string colors values for plotting in the node
innerTexts	A matrix of strings for plotting in the node
starplotColors	A matrix of hex RGB colors for sectors colors
starplotValues	A matrix of [0,1] values for starpot sectors size
starplotLabels	A matrix of labels identifying the sectors
starplotTooltips	A matrix of text or even html content for the sectors tooltips
starplotUrlLinks	A matrix of text for the sectors url links
starplotSectorStartRad	A matrix with a single column of [0,2PI] values for the sector start in radians
starplotCircleFillColor	A matrix of hex RGB colors for the circle background
starplotCircleFillOpacity	A matrix of [0.0,1.0] values for the circle background opacity

Value

A JSON string with formatting

Author(s)

Sylvain Gubian <DL.RSupport@pmi.com>

Examples

```
v <- c(0, 0, 1, 1, 0,
       0, 0, 0, 0, 0,
      -1, 0, 0, 1, 0)
a <- matrix(v, 3, 5)
colnames(a) <- LETTERS[1:5]
rownames(a) <- LETTERS[1:3]

nGlobal <- list(color="#dedeff")
nProp <- data.frame(shape=c('triangle', 'lozenge'))
rownames(nProp) <- c('C', 'E')
ndf <-getNodesDataFrame(A=a, nGlobal=nGlobal, nProp=nProp)

eGlobal <- list(color="#5555ff")
eProp <- data.frame(from=c('A','C'), to=c('B', 'A'), width=c(2,2))
edf <- getEdgesDataFrame(A=a, eGlobal=eGlobal, eProp=eProp)

graph2json(ndf=ndf, edf=edf)
```

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