Package 'pathRender'

March 26, 2013

Version 1.26.0

Title Render molecular pathways

Author Li Long <lilong@isb-sib.ch>

Maintainer Li Long <lilong@isb-sib.ch>

Depends graph, Rgraphviz, RColorBrewer, cMAP, AnnotationDbi, methods

Suggests ALL, hgu95av2.db

Description build graphs from pathway databases, render them by Rgraphviz

biocViews GraphsAndNetworks, Pathways, NetworkVisualization

License LGPL

URL http://www.bioconductor.org

LazyLoad yes

R topics documented:

1

coloredGraph-class   *Class "coloredGraph"*

Description

a graph to which color attributes have been attached

Objects from the Class

Objects can be created by calls of the form new("coloredGraph", nodes, edgeL, edgemode). these are graphNEL instances with some additional graphData

Slots

nodes: Object of class "vector" ~~

edgeL: Object of class "list" ~~

edgeData: Object of class "attrData" ~~

nodeData: Object of class "attrData" ~~

renderInfo: Object of class "renderInfo" ~~

graphData: Object of class "list" ~~

Extends

Class "graphNEL-class", directly. Class "graph-class", by class "graphNEL", distance 2.

Methods

plot signature(x = "coloredGraph"): ...

Examples

```
showClass("coloredGraph")
example(randomGraph)
nn = nodes(g1)
x = runif(length(nn))
names(x) = nn
h1 = colorNodes(g1, x, colorRampPalette(brewer.pal(9, "Blues"))(length(nn)),
 pwayRendAttrs)
h1
plot(h1)
```

---

colorNodes *attach node coloring information to a graphNEL instance*

Description

attach node coloring information to a graphNEL instance

Usage

colorNodes(g, nodeAss, pal, attgen)

Arguments

g	graphNEL instance
nodeAss	color map for nodes: vector with elements evaluating to colors and nodes as element names
pal	a palette (use colorRampPalette for color interpolation)
attgen	attribute generating function – pwayRendAttrs is prototype

Value

a graphNEL instance with additional rendering data

Author(s)

Vince Carey <stvjc@channing.harvard.edu>

Examples

```
example(randomGraph)
nn = nodes(g1)
x = runif(length(nn))
names(x) = nn
h1 = colorNodes(g1, x, colorRampPalette(brewer.pal(9, "Blues"))(length(nn)),
 pwayRendAttrs)
h1
```

---

graphcMAP *obtain a graph object corresponding to a cMAP pathway*

Description

obtain a graph object corresponding to a cMAP pathway

Usage

graphcMAP(pname)

Arguments

    pname   character token identifying a KEGG or cMAP pathway

Details

reuses code from pathRender but emits a [graphNEL-class](#) instance with some additional information for rendering

Value

an instance of pwayGraph, which extends graphNEL

Author(s)

Vince Carey <stvjc@channing.harvard.edu>

Examples

```
G1 = graphcMAP("p53pathway")
G1
nodes(G1)
if (require(Rgraphviz)) plot(G1)
```

---

    plotExGraph   *plot a gene network, coloring nodes according to relative expression*
                                                    values

Description

plot a gene network, coloring nodes according to relative expression values

Usage

plotExGraph(g, es, sampind=1, pal=colorRampPalette(brewer.pal(9, "Blues"))(length(nodes(g))), attgen=pwa

Arguments

g	graph representing a gene network
es	an ExpressionSet instance
sampind	sample to be used to obtain relative expression values
pal	palette for coloring the nodes
attgen	attribute generating function

Details

plots a colored network on the current graphics display

Value

as returned by Rgraphviz plot method for graphNEL instances

Author(s)

Vince Carey <stvjc@channing.harvard.edu>

Examples

```
library(graph)
data(pancrCaIni)
library(ALL)
data(ALL)
library(hgu95av2.db)
collap1 = reduceES( ALL, nodes(pancrCaIni), revmap(hgu95av2SYMBOL), "symbol", mean )
library(RColorBrewer)
plotExGraph( pancrCaIni, collap1, 1 )
```

---

pwayGraph-class   *Class "pwayGraph" – extension to graphNEL for pathway rendering*

Description

extension to graphNEL for pathway rendering

Objects from the Class

Objects can be created by calls of the form new("pwayGraph", nodes, edgeL, edgemode).

There is a plot method that will work reasonably well if the plotting surface is big enough.

Slots

pwaySource: Object of class "character" KEGG or BIOCARTA

nodes: Object of class "vector" pathway constituents in the native vocabulary

edgeL: Object of class "list" constituent relations in the native vocabulary

edgeData: Object of class "attrData" relationship attributes

nodeData: Object of class "attrData" node attributes

renderInfo: Object of class "renderInfo" render info

graphData: Object of class "list" this holds the special rendering attributes for edges and nodes, for nodes it seems particularly important to have fixedsize = FALSE

Extends

Class graphNEL-class, directly. Class graph-class, by class "graphNEL", distance 2.

Methods

plot signature(x = "pwayGraph"): renders the pathway

Author(s)

Vince Carey <stvjc@channing.harvard.edu>

Examples

```
showClass("pwayGraph")
G1 = graphcMAP("stresspathway")
G1@graphData$nAttrs$labels[1:10]
```

| reduceES | *collapse the assay values in an ExpressionSet to a set of specified genes, using a statistic when multiple probes map to a given gene* |

Description

collapse the assay values in an ExpressionSet to a set of specified genes, using a statistic when multiple probes map to a given gene

Usage

```
reduceES(es, annovec, ann2featMap, pdvname="symbol", collapseFun=NULL)
```

Arguments

es	ExpressionSet instance
annovec	genes to retain
ann2featMap	either an AnnDbBimap from AnnotationDbi (typically constructed with revmap(), or a named vector mapping from symbols to probe set IDs
pdvname	featureData variable name to be used to hold the annotations of variables kept
collapseFun	statistical function for collapsing data across probes mapping to the same gene

Value

An ExpressionSet instance limited to genes in annovec, condensed if necessary using collapseFun to get one number per gene from multiple probes

Author(s)

Vince Carey <stvjc@channing.harvard.edu>

Examples

```
library(ALL)
data(ALL)
library(hgu95av2.db)
rr = revmap(hgu95av2SYMBOL)
exprs(reduceES(ALL[,1:3], c("DDR1", "CPNE1"), rr, "sym", mean))
```

---

rendercMAPPathway   *Render pathways from cMAP*

Description

Build graphs based on pathway or interaction data from cMAP database, render them using Rgraphviz.

Usage

rendercMAPPathway(pname, ino=0)

Arguments

pname   name of the pathway to render

ino   index of the interaction in the given pathway to render

Details

For a given pathway in cMAP database, we build a subgraph for each interaction in the pathway, join them together to form the graph for the complete pathway. The subgraphs for interactions and the graph for the pathway include info for rendering, such as labels/shapes/fillcolors for nodes, colors/styles/weights for edges. If user specifies an index of interaction, only the interaction is rendered. Otherwise, the complete pathway is rendered.

Value

None. A graphical output is presented.

Author(s)

Li Long <li.long@isb-sib.ch>

Examples

```
rendercMAPPathway("plateletapppathway")
rendercMAPPathway("plateletapppathway", 5)
rendercMAPPathway("hsa00601")
rendercMAPPathway("hsa00601", 10)
```

Index