Package 'rD3plot'

October 14, 2022

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rD3plot-package

The rD3plot package.

Description

Creates interactive analytic graphs with 'R'. It joins the data analysis power of R and the visualization libraries of JavaScript in one package. The package provides interactive networks, timelines, barplots, image galleries and evolving networks. Graphs are represented as D3 graphs embedded in a web page ready for its interactive analysis and exploration

barplot_rd3

Networked barplot.

Description

barplot_rd3 produces an interactive barplot of coincidences between events.

Usage

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Arguments

events a data frame with at least two columns of event names (by default 1st column)

and incidences (2nd column). Columns for each variable can be specified at

name and incidences parameters.

links a data frame with at least three columns indicating source event, target event and

number of coincidences (in that order). Columns assigned to each variable can

be specified at source, target and concidences parameters.

column name with event names in the events data frame.

column name with source names in the links data frame.

column name with target names in the links data frame.

select event name to start the visualization.

label column name with labels in the events data frame.

text column name with html text in the events data frame.

color column name with color variable in the events data frame.

coincidences column name with coincidences in the links data frame.

incidences column name with incidences in the events data frame.

expected column name with expected coincidences in the links data frame. confidence column name with confidence interval in the links data frame.

level confidence level

significance column name with significance in the links data frame.

sort column name in the events data frame to order the bars in the graph.

decreasing order the events in a decreasing order.

scalebar bars are represented filling all the screen height.

defaultColor a string giving a valid html color.

note the lower title of the graph.

cex a number giving the amount by which plotting text should be scaled relative to

the default.

language a character string indicating the language of the graph (en=english (default);

es=spanish; ca=catalan).

dir a character string representing the directory where the web files will be saved.

Value

Object of class barplot_rd3.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

4 evolNetwork_rd3

Examples

evolNetwork_rd3

Create evolving networks.

Description

evolNetwork_rd3 produce an evolving network.

Usage

```
evolNetwork_rd3(..., frame = 0, speed = 50, dir = NULL)
```

Arguments

... network_rd3 objects that will be integrated as temporal frames in the evolving

network.

frame a frame ordinal position where the playback will start.

speed a percentage value for the playback speed of network frames.

dir a "character" string representing the directory where the graph will be saved.

Value

This function returns a network_rd3 object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

```
nets <- list()
N <- data.frame(name=paste0("node",1:2))
E <- data.frame(Source="node1", Target="node2")
nets[["net1"]] <- network_rd3(N, E, repulsion=98, label=FALSE)

for(i in 3:100){
    N <- rbind(N,data.frame(name=paste0("node",i)))
    E <- rbind(E,data.frame(Source=paste0("node",i-1), Target=paste0("node",i)))
    nets[[paste0("net",i-1)]] <- network_rd3(N, E, repulsion=100-i, label=FALSE)</pre>
```

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```
}
nets$speed=100

net <- do.call(evolNetwork_rd3,nets)
## Not run:
plot(net)
## End(Not run)
</pre>
```

finches

Data: Finches' attributes in Galapagos islands.

Description

Data frame with events as result.

Usage

```
data("finches")
```

Format

A data frame with 13 observations (pinches) and 4 variables (name and characteristics):

name: Genus and species of the finche

frequency: number of islands where the finche can be found

type: Genus of the finche

species: name of the file containing the picture of the finche

References

Sanderson, James (2000). Testing Ecological Patterns: A Well-known Algorithm from Computer Science Aids the Evaluation of Species Distributions. American Scientist, 88, pp. 332-339.

```
data(finches)
head(finches,10)
```

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galapagos

Data: Finches' presence in Galapagos Islands.

Description

Data frame containing data of finches coapperance in the Galagos Islands.

Usage

```
data("galapagos")
```

Format

This links data set consists of three variables of length 60:

Source : Finche 1 Target : Finche 2

coincidences: number of islands they share

References

Sanderson, James (2000). Testing Ecological Patterns: A Well-known Algorithm from Computer Science Aids the Evaluation of Species Distributions. American Scientist, 88, pp. 332-339.

Examples

```
data(galapagos)
head(galapagos,10)
```

gallery_rd3

Images in a grid gallery.

Description

gallery_rd3 produces an interactive image gallery.

Usage

```
gallery_rd3(nodes, name = NULL, label = NULL, color = NULL,
    ntext = NULL, info = NULL, image = NULL, zoom = 1,
    itemsPerRow = NULL, main = NULL, note = NULL,
    showLegend = TRUE, frequencies = FALSE,
    help = NULL, helpOn = FALSE, description = NULL,
    descriptionWidth = NULL, roundedItems = FALSE, controls = 1:2,
    cex = 1, language = c("en", "es", "ca"), dir = NULL)
```

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Arguments

nodes a data frame with at least three columns of names, start and end.

name column name with image names in the nodes data frame.

label column name with image labels in the nodes data frame.

color column name with image background color variable in the nodes data frame.

ntext column name with html text in the nodes data frame.

info column name with information to display in a panel in the nodes data frame.

image column name which indicates the image paths in the nodes data frame.

zoom a number between 0.1 and 10 as initial displaying zoom.

itemsPerRow number of items in each row.

main upper title of the graph.

note lower title of the graph.

frequencies a logical value true if barplots representing node attributes frequencies will be

added to the final graph.

showLegend a logical value true if the legend is to be shown.

help a character string indicating a help text of the graph.

helpOn Should the help be shown at the beginning?

description a character string indicating a description text for the graph.

descriptionWidth

a percentage indicating a width for the description panel (25 by default).

roundedItems Display items with rounded borders.

controls a numeric vector indicating which controls will be shown. 1 = topbar, 2 = export

buttons. NULL hide all controls, negative values deny each control and 0 deny

all.

cex number indicating the amount by which plotting text should be scaled relative

to the default.

language a character string indicating the language of the graph (en=english (default);

es=spanish; ca=catalan).

dir a character string representing the directory where the web files will be saved.

Value

Object of class gallery_rd3.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

8 miserables

Examples

miserables

Coappearance network of characters in Les Miserables (undirected)

Description

A list of two datasets, vertices and edges, containing data on characters and their coapperance in chapters in Victor Hugo's Les Miserables.

Usage

```
data("miserables")
```

Format

A list of two data frames:

- the links data set consists of three variables of length 254:
 - Source: Character 1Target: Character 2
 - value: number of times they appear together in a chapter of Les Miserables
- the nodes data set consists of two variables with information on 77 characters:
 - name: Character namegroup: Character group

References

D. E. Knuth, The Stanford GraphBase: A Platform for Combinatorial Computing, Addison-Wesley, Reading, MA (1993).

```
data(miserables)
head(miserables,10)
```

network_rd3

| network. | | |
|----------|--|--|
|----------|--|--|

Description

network_rd3 produces a network_rd3 object ready for its representation as an interactive network in a web browser. Its input has to be two data.frames: one of attributes of events or nodes, and the other of attributes of the edges or links.

Usage

```
network_rd3(nodes = NULL, links = NULL, tree = NULL,
        community = NULL, layout = NULL,
        name = NULL, label = NULL, group = NULL, labelSize = NULL,
        size = NULL, color = NULL, shape = NULL, legend = NULL,
        sort = NULL, decreasing = FALSE, ntext = NULL, info = NULL,
        image = NULL, imageNames = NULL,
        nodeBipolar = FALSE, nodeFilter = NULL, degreeFilter = NULL,
        source = NULL, target = NULL,
        lwidth = NULL, lweight = NULL, lcolor = NULL, ltext = NULL,
        intensity = NULL, linkBipolar = FALSE, linkFilter = NULL,
        repulsion = 25, distance = 10, zoom = 1,
        fixed = showCoordinates, limits = NULL,
        main = NULL, note = NULL, showCoordinates = FALSE, showArrows = FALSE,
        showLegend = TRUE, frequencies = FALSE, showAxes = FALSE,
        axesLabels = NULL, scenarios = NULL, help = NULL, helpOn = FALSE,
        mode = c("network", "heatmap"), controls = 1:4, cex = 1,
        background = NULL, defaultColor = "#1f77b4",
        language = c("en","es","ca"), dir = NULL)
```

Arguments

| nodes | a data frame with at least one column of node names. |
|--------|---|
| links | a data frame with at least two columns with source and target node names. |
| tree | a data frame with two columns: source and target, describing relationships between nodes. It indicates a hierarchy between nodes which can be dynamically explored. |
| name | name of the column with names in the nodes data frame. By default, if language="en", name is "name". |
| source | name of the column with source names in the links data frame. |
| target | name of the column with target names in the links data frame. |
| label | name of the column with labels in the nodes data frame. |
| group | name of the column with groups in the nodes data frame. |

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community algorithm to make communities: edge_betweenness("ed"), fast_greedy("fa"),

label_prop("la"), leiden_eigen("le"), louvain("lo"), optimal("op"), spinglass("sp"),

walktrap("wa")

labelSize name of the column with label size in the nodes data frame.

size name of the column with size in the nodes data frame.

color name of the column with color variable in the nodes data frame. shape name of the column with shape variable in the nodes data frame.

legend name of the column with the variable to represent as a legend in the nodes data

frame.

ntext name of the column with html text in the nodes data frame.

info name of the column with information to display in a panel in the nodes data

frame.

sort name of the column with node order in the nodes data frame (only for heatmap).

decreasing decreasing or increasing sort of the nodes (only for heatmap).

intensity name of the column with intensity variable in the links data frame (only for

heatmap).

lwidth name of the column with width variable in the links data frame.

lweight name of the column with weight variable in the links data frame.

lcolor name of the column with color variable in the links data frame.

name of the column with labels in the links data frame.
 nodeFilter a character string with a condition for filtering nodes.
 linkFilter a character string with a condition for filtering links.

degreeFilter numeric vector to filter the resulting network by degree. Input can be a number

which specifies the minimum degree or two numbers which specify the lower

and upper limits of the filter.

nodeBipolar a logical value that polarizes negative and positive node values in the graphical

representation. Indicates whether the color key should be made symmetric about

0.

linkBipolar a logical value that polarizes negative and positive link values in the graphical

representation. Indicates whether the color key should be made symmetric about

0.

defaultColor a character vector giving a valid html color for node representation.

repulsion a percentage for repulsion between nodes.

distance a percentage for distance of links.

zoom a number between 0.1 and 10 to start displaying zoom.

fixed prevent nodes from being dragged. scenarios a note showing number of scenarios.

main upper title of the graph.

note lower title of the graph.

network rd3

frequencies a logical value true if barplots representing node attributes frequencies will be

added to the final graph.

help help text of the graph.

helpOn Should the help be shown at the beginning? background background color or image path of the graph.

layout a matrix with two columns with x/y coordinates or an algorithm to calculate the

static layout of the network: davidson.harel drl("da"), circle("ci"), Force-Atlas-2("fo"), fruchterman.reingold("fr"), gem("ge"), grid("gr"), kamada.kawai("ka"), lgl("lg"), mds("md"), random("ra"), reingold.tilford("re"), star("sta"), sugiyama("sug")

limits vector indicating the layout limits, must be a numeric vector of length 4 on this

order: x_min, y_min, x_max, y_max.

cex number indicating the amount by which plotting text should be scaled relative

to the default.

controls a numeric vector indicating which controls will be shown. 1 = sidebar, 2 =

selection buttons, 3 = export buttons, 4 = nodes table, 5 = links table. NULL

hide all controls, negative values deny each control and 0 deny all.

mode a character vector indicating the graph mode allowed: network, heatmap or both

(both by default).

showCoordinates

a logical value true if the coordinates are to be shown in tables and axes. Default

= FALSE.

showArrows a logical value true if the directional arrows are to be shown. Default = FALSE.

showLegend a logical value true if the legend is to be shown. showAxes a logical value true if the axes are to be shown.

axesLabels a character vector giving the axes names.

language a character string indicating the language of the graph (en=english (default);

es=spanish; ca=catalan).

image name of the column with the path to node image files in the nodes data frame.

imageNames name of the column with names for image files in the nodes data frame which

will be shown in the legend.

dir a "character" string representing the directory where the resulting web files will

be saved.

Value

This function returns a network_rd3 object. If the 'dir' attribute is specified, the function creates a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Note

nodes and links arguments can be substituted by a network_rd3 object to add or change options to it.

rd3_fromIgraph

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

rd3_fromIgraph

Produce interactive networks from 'igraph' objects.

Description

rd3_fromIgraph produce an interactive network from an 'igraph' object.

Usage

```
rd3_fromIgraph(G, ...)
```

Arguments

```
G an igraph object.
... Any network_rd3 argument.
```

Value

This function returns a network_rd3 object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

```
g <- igraph::make_ring(10)
rd3_fromIgraph(g)</pre>
```

rd3_layoutCircle

rd3_layoutCircle

Produce a circle layout of any number of nodes.

Description

rd3_layoutCircle produces a circle layout of any number of nodes.

Usage

```
rd3_layoutCircle(N,nodes=seq_len(nrow(N)),deg=0,name=NULL)
```

Arguments

N a data frame of nodes.

nodes a vector specifing the node names inclued in the layout calculation.

deg rotation degrees.

name column name with node names in the N data frame.

Value

'rd3_layoutCircle' produces a circle layout of any number of nodes.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

```
A <- data.frame(name=letters)
L <- rd3_layoutCircle(A,name="name")
net <- network_rd3(A,layout=L)
## Not run:
plot(net)
## End(Not run)</pre>
```

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| | - | | _ | |
|------|-----|------|----|----|
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Produce a grid layout of any number of nodes.

Description

rd3_layoutGrid produces a grid layout of any number of nodes.

Usage

```
rd3_layoutGrid(N,string,name=NULL,byrow=FALSE)
```

Arguments

N a data frame of nodes.

string a character vector specifing grouped nodes.

name column name with node names in the N data frame.

byrow order nodes by row (default) or by columns (FALSE)

Value

'rd3_layoutGrid' produces a grid layout of any number of nodes.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

```
A <- data.frame(name=letters)
L <- rd3_layoutGrid(A,"a,b,c,d,e.f,g,h,i,j.k,l,m,n,o,p.q,r,s,t,u.v,w,x,y,z","name")
net <- network_rd3(A,layout=L)
## Not run:
plot(net)
## End(Not run)</pre>
```

rd3_multigraph

Description

rd3_multigraph produce an interactive multi graph with the integration of 'rD3plot' graphs in the final result.

Usage

Arguments

| _ | | |
|---|-------|--|
| | | rD3plot graphs (network_rd3, barplot_rd3, timeplot_rd3) objects or string paths to html "directories". |
| | mode | a string specifying the displaying mode: |
| | | default Graphs are shown one by one by selecting The proposal category, which describes what sort of object will be viewed (a label from A to G). |
| | | parallel Shows two graphs at once by splitting the layout into two parts. |
| | | frame Integrates dynamic networks as an interactive evolving network.). |
| | frame | number of frame to start a dynamic network. |
| | speed | a percentage for frame speed in dynamic networks. |
| | dir | a "character" string representing the directory where the graph will be saved. |
| | show | a logical value true if the graph is to be shown. Default = TRUE. |

Value

The function creates a folder in your computer with an HTML document named index.html which contains the graph. This file can be directly opened with your browser.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

rd3_toIgraph

```
data(sociologists)
time <- timeline_rd3(sociologists,"name","birth","death","birthcountry")
rd3_multigraph(network=net, barplot=bar, timeline=time)
## End(Not run)</pre>
```

rd3_toIgraph

'igraph' object.

Description

creates an igraph object from a network_rd3 object.

Usage

```
rd3_toIgraph(net)
```

Arguments

net

is a network_rd3 object. See network_rd3

Value

An igraph object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

```
# A character column (with separator)
data(miserables)
net <- network_rd3(miserables$nodes, miserables$links,
    size="degree", color="group", lwidth="value")
rd3_toIgraph(net) # conversion into a igraph object</pre>
```

shiny_rd3

shiny_rd3

Include rD3plot graphs in 'Shiny'.

Description

Load a rD3plot graph to display in 'Shiny'.

Usage

```
shiny_rd3(x)
```

Arguments

Х

is a network_rd3, barplot_rd3 or timeplot_rd3 object.

Value

This function returns a shiny. tag object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

sociologists

Data: Sociologists born in the 19th century.

Description

Data frame with names, birth and death year data, birth country and movement.

Usage

```
data("sociologists")
```

Format

A data frame with 33 observations and the following 4 variables (events) to study coincidences in time:

name: name and last name of the sociologist

birth: birth year death: death year

birthcountry: birth country

movements: movement or school of thought

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Source

Own elaboration from manuals of sociology.

Examples

```
data(sociologists)
head(sociologists, 10)
tail(sociologists, 10)
```

timeline_rd3

Interactive time-bar plot.

Description

timeline_rd3 produces a timeline_rd3 object ready for its representation as an interactive time line in a web browser.

Usage

Arguments

| periods | a data frame with at least three columns describing period names, start and end. |
|-------------|--|
| name | name of the column with names in the periods data frame. |
| start | name of the column with starts in the periods data frame. |
| end | name of the column with ends in the periods data frame. |
| group | name of the column with a grouping criteria in the periods data frame. |
| text | name of the column with a descriptive text of periods (html format) in the periods data frame. |
| main | upper title of the graph. |
| note | lower title of the graph. |
| info | name of the column in the periods data frame with information to display on the information panel. |
| events | a data frame of events related to periods (shown as dots) with three columns: interval name, event name and event date |
| eventNames | name of the column with event identifiers in the events data frame. |
| eventPeriod | name of the column with interval identifiers in the events data frame. |
| eventTime | name of the column with time points in the events data frame. |

timeline_rd3

eventColor name of the column with the color criteria in the events data frame.

eventShape name of the column with the shape criteria in the events data frame.

cex number indicating the amount by which plotting text should be scaled relative

to the default.

language a character string indicating the language of the graph (en=english (default);

es=spanish; ca=catalan).

dir a "character" string representing the directory where the web files will be saved.

Value

Object of class timeline_rd3.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

```
# Database of 19th century sociologists
data(sociologists)
timeline <- timeline_rd3(sociologists,"name","birth","death","birthcountry")
## Not run:
plot(timeline)
## End(Not run)</pre>
```

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