Package ‘ontologyPlot’

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annotation_grid

Get logical matrix of term annotation for group of cases

Description

Get logical matrix of term annotation for group of cases

Usage

annotation_grid(ontology, term_sets, all_terms = grid_terms(ontology, term_sets), remove_unanimous = FALSE, cluster_rows = TRUE, cluster_cols = TRUE)

Arguments

- **ontology**
  - ontology_index object
- **term_sets**
  - List of character vectors of ontological term IDs
- **all_terms**
  - Character vector giving terms to use in annotation.
- **remove_unanimous**
  - Logical value determining whether to remove terms present in all term_sets.
- **cluster_rows**
  - Logical value rows determining whether to use hclust to cluster term_sets.
- **cluster_cols**
  - Logical value rows determining whether to use hclust to cluster terms (based on correlation of inclusion in term_sets).
**calibrate_sizes**

Function to scale values between two given limits

**Description**

Could be useful to modify a vector of sizes to between, say 1 and 3, before passing to `onto_plot`.

**Usage**

```r
calibrate_sizes(x, high, low)
```

**Arguments**

- `x` Numeric vector
- `high` Numeric value of largest size
- `low` Numeric value of smallest size

**Value**

Numeric vector

**Examples**

```r
calibrate_sizes(c("HP:0000001"=10, "HP:0000006"=5), high=3, low=1)
```

**colour_by_frequency**

Function to assign colours to terms based on frequency with which terms appear in `term_sets`

**Description**

Function to assign colours to terms based on frequency with which terms appear in `term_sets`

**Usage**

```r
colour_by_frequency(ontology, terms, term_sets,
    colour_func = colorRampPalette(c("Yellow", "Green", "#0099FF")))
```
colour_by_population_frequency

Arguments

- **ontology**: ontology_index object
- **terms**: Character vector of ontological terms
- **term_sets**: List of character vectors of ontological term IDs
- **colour_func**: Function capable of returning a set of colours, given the number of colours it needs to return

Value

Character vector of colours, named by term

See Also

 colour_by_term_set, colour_by_population_frequency

colour_by_population_frequency

Function to assign colours to terms based on population frequency of terms

Description

Function to assign colours to terms based on population frequency of terms

Usage

colour_by_population_frequency(ontology, terms, frequencies, colour_palette = colorRampPalette(c("Yellow", "Green", "#0099FF")(10)), max_colour_freq = max(terms_freq), min_colour_freq = min(terms_freq))

Arguments

- **ontology**: ontology_index object
- **terms**: Character vector of ontological terms
- **frequencies**: Numeric vector of term frequencies named by term IDs
- **colour_palette**: Character vector of colours for the different information contents of the terms to be plotted, going from rare to common
- **max_colour_freq**: Numeric value in [0, 1] giving the maximum frequency (to which the dullest color will be assigned)
- **min_colour_freq**: Numeric value in [0, 1] giving the minimum frequency (to which the brightest color will be assigned)
colour_by_term_set

Value

Character vector of colours, named by term

See Also

colour_by_term_set, colour_by_frequency

colour_by_term_set Function to set colours of nodes in plot to distinguish terms belonging to different term sets

Description

Function to set colours of nodes in plot to distinguish terms belonging to different term sets

Usage

colour_by_term_set(ontology, terms, term_sets, colour_generator = rainbow, alpha = 0.5)

Arguments

ontology ontology_index object
terms Character vector of ontological terms
term_sets List of character vectors of ontological term IDs
colour_generator Function which returns a vector of colours, e.g. rainbow or heat.colors.
alpha alpha parameter to pass to colour_generator.

Value

Character vector of colours, named by term.

See Also

colour_by_frequency, colour_by_population_frequency
get_adjacency_matrix

```
dot_string   ontology_plot object to dot string
```

Description
---

ontology_plot object to dot string

Usage
---

dot_string(ontology_plot)

Arguments
---

- **ontology_plot**: Object of class `ontology_plot` to export.

Value
---

String

See Also
---

onto_plot

get_adjacency_matrix

```
Get an adjacency matrix for a set of ontological terms
```

Description
---

Get an adjacency matrix for a set of ontological terms

Usage
---

get_adjacency_matrix(ontology, terms)

Arguments
---

- **ontology**: ontology_index object
- **terms**: Character vector of ontological terms

Value
---

A logical matrix representing the adjacency matrix of terms based on the directed acyclic graph of ontology. A TRUE entry means the term corresponding to the column is a parent of the row term in ontology.
get_node_friendly_long_names

See Also

get_pseudo_adjacency_matrix

Examples

library(ontologyIndex)
data(hpo)
get_adjacency_matrix(hpo, c("HP:0000118", "HP:0001873", "HP:0011877"))

get_node_friendly_long_names

Split up node labels across lines so they fit in nodes better

Description

Split up node labels across lines so they fit in nodes better

Usage

get_node_friendly_long_names(ontology, terms, official_names = FALSE)

Arguments

ontology  ontology_index object
terms     Character vector of ontological terms
official_names Logical value indicating whether to use the exact names from the ontology. Otherwise, shortened, capitalised names are used.

Value

Character vector.

Examples

library(ontologyIndex)
data(hpo)
get_node_friendly_long_names(hpo, c("HP:0001873", "HP:0011877"))
get_ontology_plot  
Get ontology_plot object

Description  
Function to create ontology_plot objects where all graphical parameters to be used must be specified.

Usage  
get_ontology_plot(ontology, terms, edge_attributes = list(color = "#000000", lty = "solid"), ...)

Arguments  

- ontology: ontology_index object  
- terms: Character vector of ontological terms  
- edge_attributes: List of properties to set for arrows (note, these properties will be used for all arrow).  
  ...  
  Named graphical parameters. These must either be vectors of values the same length as terms, or of length 1 if they should be used for all terms.

Value  

ontology_plot object.

get_pseudo_adjacency_matrix  
Get an adjacency matrix for a set of ontological terms

Description  
Get an adjacency matrix for a set of ontological terms

Usage  
get_pseudo_adjacency_matrix(ontology, terms)

Arguments  

- ontology: ontology_index object  
- terms: Character vector of ontological terms
get_shortened_names

Value

A logical matrix representing the adjacency matrix of terms based on the directed acyclic graph of ontology. A TRUE entry means the term corresponding to the column is a parent of the row term within terms.

See Also

get_adjacency_matrix

Examples

library(ontologyIndex)
data(hpo)
get_pseudo_adjacency_matrix(hpo, c("HP:0000118", "HP:0001873", "HP:0011877"))

get_shortened_names

Get human readable, shortened (where possible) ontological term names

Description

Get human readable, shortened (where possible) ontological term names

Usage

get_shortened_names(ontology, terms)

Arguments

ontology ontology_index object
terms Character vector of ontological terms

Value

Character vector

Examples

library(ontologyIndex)
data(hpo)
get_shortened_names(hpo, c("HP:0001873", "HP:0011877"))
**grid_terms**  
*Get set of HPO terms appropriate for showing in a grid*

**Description**

Get set of HPO terms appropriate for showing in a grid

**Usage**

`grid_terms(ontology, term_sets)`

**Arguments**

- `ontology` ontology_index object
- `term_sets` List of character vectors of ontological term IDs

**Value**

Character vector of term IDs.

---

**label_by_frequency**  
*Function to get plot labels for terms based on frequency in term_sets*

**Description**

Function to get plot labels for terms based on frequency in `term_sets`

**Usage**

`label_by_frequency(ontology, terms, term_sets)`

**Arguments**

- `ontology` ontology_index object
- `terms` Character vector of ontological terms
- `term_sets` List of character vectors of ontological term IDs

**Value**

Character vector of labels, named by term.

**See Also**

`simple_labels, long_labels`
**label_by_term_set**

*Function to label nodes by term_set*

**Description**

Function to label nodes by term_set

**Usage**

`label_by_term_set(ontology, terms, term_sets)`

**Arguments**

- `ontology` : ontology_index object
- `terms` : Character vector of ontological terms
- `term_sets` : List of character vectors of ontological term IDs

**Value**

Character vector of colours, named by term.

**See Also**

`simple_labels, label_by_frequency, long_labels`

---

**long_labels**

*Function to assign detailed node labels to terms*

**Description**

Label includes term ID, term name, number of instances of term amongst `term_sets` and percentage frequency in population.

**Usage**

`long_labels(ontology, terms, term_sets, frequencies)`

**Arguments**

- `ontology` : ontology_index object
- `terms` : Character vector of ontological terms
- `term_sets` : List of character vectors of ontological term IDs
- `frequencies` : Numeric vector of term frequencies named by term IDs
n_most_frequent_terms

Value
Character vector of labels, named by term.

See Also
simple_labels, label_by_frequency, label_by_term_set

---

n_most_frequent_terms  Select n most prevalent terms in term_sets

Description
Selects n most prevalent terms in set of term sets/annotations including implicit terms. If more than one term are tied at the nth position, all terms are included in the result.

Usage
n_most_frequent_terms(ontology, term_sets, n,
  terms = unique(unlist(term_sets)))

Arguments
- ontology  ontology_index object
- term_sets  List of character vectors of ontological term IDs
- n          Integer
- terms      Character vector of ontological terms

Value
Character vector of length at most n

See Also
remove_terms_with_less_than_n_occurrences

Examples
library(ontologyIndex)
data(hpo)
n_most_frequent_terms(hpo, c("HP:0001873"),
  list(term_sets=list("HP:0001873", "HP:0001902"), n=2))
official_labels

Get official names for terms

Description

Get official names for terms

Usage

official_labels(ontology, terms)

Arguments

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ontology</td>
<td>ontology_index object</td>
</tr>
<tr>
<td>terms</td>
<td>Character vector of ontological terms</td>
</tr>
</tbody>
</table>

Value

Character vector of labels, named by term.

See Also

simple_labels

ontologyPlot

Functions for Visualising Sets of Ontological Terms

Description

Functions for visualising sets of ontological terms using the ‘graphviz’ layout system.

Details

Package: ontologyPlot
Type: Package
Version: 1.0
Date: 2016-01-11
License: GPL (>= 2)

This package succeeds the package hpoPlot with an improved interface and focusing on general ontologies. The key function is onto_plot, which creates an object of class ontology_plot which can be displayed as a graph or exported to dot format.
Author(s)

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References


onto_plot

Get ontology_plot object

Description

A convenience wrapper for the get_ontology_plot function, enabling functions to be passed to generate graphical parameters for terms automatically.

Usage

onto_plot(ontology, term_sets = NULL, frequencies = NULL, terms = remove_uninformative_terms(ontology, term_sets), edge_attributes = list(color = "#000000", lty = "solid"), fillcolor = "powderblue", label = simple_labels, color = "transparent", width = 0.75, fontsize = 30, style = "filled", fixedsize = "true", shape = "circle", ...)

Arguments

ontology ontology_index object
term_sets List of character vectors of ontological term IDs
frequencies Numeric vector of term frequencies named by term IDs
terms Character vector of ontological terms
dg

edge_attributes

List of properties to set for arrows (note, these properties will be used for all arrow).

fillcolor Character vector of colours to fill nodes corresponding to terms with. Alternatively a function to set the colours of the nodes in the graph based on term_sets.
label Character vector of labels (or function to set them).
color Character vector of colours for borders of nodes representing terms (or function to set them).
width Numeric vector of widths for nodes (or function to set them).
Plotting function for `ontology_plot` object

**Description**

Plotting function for `ontology_plot` object

**Usage**

```r
## S3 method for class 'ontology_plot'
plot(x, ...)```
Arguments
   x  Object of class ontologicalPlot.
   ... Other options passed to plot().

Value
   Nothing, side-effect: plots a graph.

plot_annotation_grid  Plot a logical matrix of term annotation

Description
   Plot a logical matrix of term annotation

Usage
   plot_annotation_grid(..., on_colour = "#FF0000FF", off_colour = "#FFFFFF")

Arguments
   ... Arguments to be passed to annotation_grid.
   on_colour  Colour to use to show presence of term.
   off_colour  Colour to use to show absence of term.

Value
   Plots heatmap.

print.ontology_plot  Print function for ontology_plot object

Description
   Print function for ontology_plot object

Usage
   ## S3 method for class 'ontology_plot'
   print(x, ...)

Arguments
   x  Object of class ontologicalPlot.
   ... Other options passed to be passed to plot().
**p_values_for_occurrence_of_term_in_group**

Get p-values for observing at least as many of each term as occur in `term_sets` given the population frequencies of the terms.

**Description**

Get p-values for observing at least as many of each term as occur in `term_sets` given the population frequencies of the terms.

**Usage**

```r
p_values_for_occurrence_of_term_in_group(ontology, term_sets, terms_freq)
```

**Arguments**

- `ontology`: ontology_index object
- `term_sets`: List of character vectors of ontological term IDs
- `terms_freq`: Numeric vector of population frequencies of terms.

**Value**

Numeric vector of log p-values named by corresponding term.

**See Also**

`width_by_significance`

---

**remove_links**

Remove terms which just link two other terms together in a subontology.

**Description**

Remove terms which just link two other terms together in a subontology.

**Usage**

```r
remove_links(ontology, terms, hard = FALSE)
```
Arguments

- **ontology**: ontology_index object
- **terms**: Character vector of ontological terms
- **hard**: Logical value determining whether to multiple edges to leaf terms are kept - `hard=FALSE`, or removed - `hard=TRUE`.

Value

- Character vector.

See Also

- `remove_uninformative_terms`

Examples

```r
library(ontologyIndex)
data(hpo)
remove_links(hpo, c("HP:0001873", "HP:0001872", "HP:0011873", "HP:0011877"))
```

---

**remove_terms_with_less_than_n_occurrences**

*Remove terms with less than certain number of occurrences*

Description

Remove terms with less than certain number of occurrences

Usage

```r
remove_terms_with_less_than_n_occurrences(ontology, term_sets, n, terms = unique(unlist(term_sets)))
```

Arguments

- **ontology**: ontology_index object
- **term_sets**: List of character vectors of ontological term IDs
- **n**: Integer
- **terms**: Character vector of ontological terms

Value

- Character vector

See Also

- `n_most_frequent_terms`
Examples

library(ontologyIndex)
data(hpo)
remove_terms_with_less_than_n_occurrences(hpo,
term_sets=list("HP:0001873", "HP:0001902"), n=2)

remove_uninformative_terms

Remove uninformative terms from union of all terms in set of annotations

Description

For a set of ontological annotation sets, remove terms annotated to the same objects as all their children. Useful for selecting terms for summarising a set of annotation sets, as it can lead to a significant reduction in the number of terms.

Usage

remove_uninformative_terms(ontology, term_sets)

Arguments

ontology      ontology_index object
term_sets     List of character vectors of ontological term IDs

Value

Character vector of terms

Examples

library(ontologyIndex)
data(hpo)
remove_uninformative_terms(hpo, list(Patient1=c("HP:0001873","HP:0000118")))
### simple_cap

**Capitalise words in character vector**

**Description**

Capitalise words in character vector

**Usage**

```r
simple_cap(x)
```

**Arguments**

- `x`: Character vector

**Value**

Character vector

**Examples**

```r
simple_cap(c("a simple test", "Another-test"))
```

### simple_labels

**Get simplified labels for terms**

**Description**

Get simplified labels for terms

**Usage**

```r
simple_labels(ontology, terms)
```

**Arguments**

- `ontology`: ontology_index object
- `terms`: Character vector of ontological terms

**Value**

Character vector of labels, named by term.

**See Also**

`official_labels`
to_svg_string  

Convert ontology_plot to SVG string

Description
Note that by setting "id" and "class" attributes it enables nodes to be selected for manipulation using Javascript if interactivity is desired.

Usage
\[
\text{to\_svg\_string}(\text{op})
\]

Arguments

\[
\begin{array}{ll}
\text{op} & \text{Object of class ontology\_plot}.
\end{array}
\]

Value
Character vector of length 1 containing SVG representation of node.

See Also

onto_plot, get_ontology_plot

width_by_frequency  

Function to get node sizes for terms based on frequency in term_sets

Description
Function to get node sizes for terms based on frequency in term_sets

Usage

\[
\text{width\_by\_frequency}(\text{ontology}, \text{terms}, \text{term\_sets})
\]

Arguments

\[
\begin{array}{ll}
\text{ontology} & \text{ont} \\
\text{terms} & \text{ontological terms} \\
\text{term\_sets} & \text{ontological term IDs}
\end{array}
\]

Value
Character vector of sizes, named by term

See Also

width_by_significance
width_by_significance  

*Function to get node sizes for terms based on statistical significance of seeing at least this number of each term in term_sets*

**Description**

Function to get node sizes for terms based on statistical significance of seeing at least this number of each term in term_sets

**Usage**

`width_by_significance(ontology, terms, term_sets, frequencies)`

**Arguments**

- `ontology`: ontology_index object
- `terms`: Character vector of ontological terms
- `term_sets`: List of character vectors of ontological term IDs
- `frequencies`: Numeric vector of term frequencies named by term IDs

**Value**

Character vector of sizes, named by term

**See Also**

`width_by_frequency`

---

**write_dot**

*Export ontology_plot object as dot file*

**Description**

Export ontology_plot object as dot file

**Usage**

`write_dot(ontology_plot, file)`

**Arguments**

- `ontology_plot`: Object of class ‘ontology_plot’ to export.
- `file`: Character value of target file path.
write_dot

Value

Nothing, side effect - writes to file.

See Also

dot_string
Index

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