Package ‘daVis’

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Type Package

Title Visualization Of Differential Expression Analysis

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Description This package contains utility functions to visualize the output from differential expression analysis. The input can be either a model or a list of top tables or a combination of the two. The model can be output from limma, edgeR or DESeq2.

Imports edgeR, ggh4x, ggplot2, grDevices, limma, plyr, stats, utils, DESeq2, rlang, legendry, UpSetR

Suggests AnnotationDbi, Biobase, ggrepel, ggtext, knitr, methods, org.Mm.eg.db, pander, plotly, rmarkdown, S4Vectors, scales, testthat, tools, BiocStyle

URL `https://github.com/openanalytics/daVis`

BugReports `https://github.com/openanalytics/daVis/issues`

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biocViews Visualization, DataRepresentation, DifferentialExpression, Software, Microarray, RNASeq

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Author Katarzyna Gorczak [aut, cre],
Laure Cougnaud [aut]

Maintainer Katarzyna Gorczak <`katarzyna.gorczak@openanalytics.eu`>

Contents

`addHoverText` *Add column with hover text to top table*

Description

Add column with hover text to top table

Usage

```
addHoverText(input, columns)
```

Arguments

`input`	top table
`columns`	columns to extract from top table for hover info

Value

top table with additional 'hoverText' column

Author(s)

Katarzyna Gorczak

`arrangeTopTables` *Arrange top tables*

Description

Arrange top tables

Usage

```
arrangeTopTables(
  input,
  featuresIdVar,
  logFCrange = NULL,
  commonFeatures = FALSE,
  fdr = NULL,
  dir = NULL,
  output = c("table", "list")
)
```

Arguments

`input`	list of top tables or long table
`featuresIdVar`	column with feature identifier (must be unique)
`logFCrange`	numeric vector with two values (low- and high-threshold for log-foldchange)
`commonFeatures`	logical whether to keep the same set of features per coefficients
`fdr`	fdr threshold
`dir`	direction for the logFC ("pos" or "neg"; NULL by default). The features with "pos" diraction will be extracted with logFC above 0. The features with "neg" diraction will be extracted with logFC below 0.
`output`	whether to output list of top tables or long table

Value

arranged list or long data.frame with top tables for coefficients of interest

Author(s)

Katarzyna Gorczak

`calcCorrelation` *Calculate correlation*

Description

Calculate correlation

Usage

```
calcCorrelation(input)
```

Arguments

`input`	long-format table

Value

text with information from `cor.test`

Author(s)

Katarzyna Gorczak

`callBarplot` *Create ggplot object with barplot*

Description

Create ggplot object with barplot

Usage

```
callBarplot(
  tbl,
  color,
  annotCex,
  addPercentage,
  title,
  titleCex,
  xlab,
  ylab,
  axesTitleCex,
  axesCex,
  legendPosition,
  legendTitleCex,
  legendCex
)
```

Arguments

`tbl`	combined summaries for all coefficients (i.e.: number of significantly up- and down-regulated genes)
`color`	color palette, must contain two colors.
`annotCex`	cex for the text displayed in the plot (indicating number of genes).
`addPercentage`	logical whether to add percentage
`title`	plot title, NULL by default.
`titleCex`	cex for the plot title.
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`axesTitleCex`	cex for the axis title.
`axesCex`	cex for the axis text.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`callHeatmap` *Create ggplot object with heatmap*

Description

Create ggplot object with heatmap

Usage

```
callHeatmap(
  topTableOutput,
  xlab,
  ylab,
  title,
  color,
  axesCex,
  featuresColor,
  axesTitleCex,
  titleCex,
  legendTitleCex,
  legendCex,
  typePlot,
  coefColor,
  colorNA
)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`title`	plot title, NULL by default.
`color`	palette for gradient to fill the heatmap.
`axesCex`	cex for the axis text.
`featuresColor`	character vector specifying colors to use for the feature label text. Either length 1 or the same length as `features`, allowing particular features to be highlighted.
`axesTitleCex`	cex for the axis title.
`titleCex`	cex for the plot title.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`typePlot`	plot type, can be one of "static" or "interactive".
`coefColor`	color palette for coef labels.
`colorNA`	color for missing values.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`callLogRatioPlot` *Create ggplot object with log ratio plot*

Description

Create ggplot object with log ratio plot

Usage

```
callLogRatioPlot(
  topTableOutput,
  xlab,
  xexpand,
  axesCex,
  axesTitleCex,
  title,
  titleCex,
  facetNCol,
  facetCex,
  facetColor,
  color,
  textVar = NULL,
  textVarCex,
  featuresColor,
  typePlot,
  multiplePlot
)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`xlab`	x-axis title, or `NULL` to remove. By default, set to: 'logFC' or 'logFC (+- SE)' if error bar(s) are available.
`xexpand`	expansion factor for the x-axis (see `expansion`. If `text` is specified, the x-axis is expanded by 20% on each side.
`axesCex`	relative size for the label of the axes.
`axesTitleCex`	relative size for the title of the axes.
`title`	plot title, NULL by default.
`titleCex`	relative size for the title of the plot.
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`color`	string with colors for the bars, one per coefficient.
`textVar`	(optional) String with name of a column to display as text.

`textVarCex`	cex for the text next to bars
`featuresColor`	character vector specifying colors to use for the feature label text. Either length 1 or the same length as `features`, allowing particular features to be highlighted.
`typePlot`	plot type, can be one of "static" or "interactive".
`multiplePlot`	whether to use facet_wrap on coefficients

Value

ggplot object

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

`callMAplot` *Create ggplot object with MA plot*

Description

Create ggplot object with MA plot

Usage

```
callMAplot(
  topTableOutput,
  topTableOutputTopGenes,
  includeTableGenesOfInterest,
  title,
  topTableOutputGenesOfInterest,
  xlab,
  ylab,
  axesCex,
  axesTitleCex,
  titleCex,
  facetCex,
  facetColor,
  facetNCol,
  genesToHighlightCex,
  topGenesCex,
  color,
  direction,
  alpha,
  sizeVar,
  size,
  legendPosition,
  legendTitleCex,
  legendCex,
  typePlot,
  multiplePlot,
  ...
)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`topTableOutputTopGenes`	data.frame with top genes
`includeTableGenesOfInterest`	whether to label `genesToHighlight`
`title`	plot title, NULL by default.
`topTableOutputGenesOfInterest`	data.frame with `genesToHighlight`
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`titleCex`	cex for the plot title.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`genesToHighlightCex`	cex for genesToHighlight
`topGenesCex`	cex for topGenes labels
`color`	colors for points indicating direction (should be three colors: significant up- and down-regulated and non-significant)
`direction`	logical whether to color significant up- and down-regulated genes
`alpha`	transparency level for the points, 0.4 by default.
`sizeVar`	column name used for the size, empty by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`typePlot`	plot type can be one of "static" or "interactive".
`multiplePlot`	whether to use facet_wrap on coefficients
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`callScatterPlot` *Create ggplot object with scatter plot*

Description

Create ggplot object with scatter plot

Usage

```
callScatterPlot(
  topTableOutput,
  topTableOutputTopGenes,
  includeTableGenesOfInterest,
  coef,
  topTableOutputGenesOfInterest,
  facetNCol,
  xlab,
  ylab,
  title,
  fdr,
  color,
  axesCex,
  axesTitleCex,
  titleCex,
  legendPosition,
  legendTitleCex,
  legendCex,
  facetCex,
  facetColor,
  topGenesCex,
  genesToHighlightCex,
  alpha,
  pointSize,
  typePlot,
  multiplePlot,
  correlation,
  correlationCex,
  ...
)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`topTableOutputTopGenes`	data.frame with top genes
`includeTableGenesOfInterest`	whether to label `genesToHighlight`
`coef`	character, coefficient names.
`topTableOutputGenesOfInterest`	data.frame with `genesToHighlight`

`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`title`	plot title, NULL by default.
`fdr`	threshold considered for significance, NULL by default.
`color`	color palette to distinguish significance groups. Four colors must be specified.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`titleCex`	cex for the plot title.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`topGenesCex`	cex for topGenes labels
`genesToHighlightCex`	cex for genesToHighlight
`alpha`	transparency level for the points, 0.4 by default.
`pointSize`	point size, 2 by default.
`typePlot`	plot type, can be one of "static" or "interactive"
`multiplePlot`	logical whether to use facet on coefficients
`correlation`	logical whether to calculate the correlation and add text to the plot.
`correlationCex`	cex for the text with correlation value
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`callVolcanoPlot` *Create ggplot object with volcano plot*

Description

Create ggplot object with volcano plot

Usage

```
callVolcanoPlot(
  topTableOutput,
  topTableOutputTopGenes,
  includeTableGenesOfInterest,
  topTableOutputGenesOfInterest,
  xlab,
  ylab,
  title,
  fdr,
  colorVar,
  color,
  shapeVar,
  shape,
  alphaVar,
  alpha,
  alphaRange,
  sizeVar,
  size,
  sizeRange,
  axesCex,
  axesTitleCex,
  titleCex,
  legendPosition,
  legendTitleCex,
  legendCex,
  facetCex,
  facetColor,
  facetNCol,
  topGenesCex,
  genesToHighlightCex,
  typePlot,
  multiplePlot,
  ...
)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`topTableOutputTopGenes`	data.frame with top genes
`includeTableGenesOfInterest`	whether to label `genesToHighlight`
`topTableOutputGenesOfInterest`	data.frame with `genesToHighlight`
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`title`	plot title, NULL by default.
`fdr`	threshold considered for significance, NULL by default.
`colorVar`	(optional) string with column name containing variable used for coloring. If not specified, coloring is based on the adjusted p-values.

`color`	color palette, only used if `colorVar` is specified.
`shapeVar`	(optional) string with column name containing variable used for shaping. If not specified, only points are used.
`shape`	shape palette, only used if `shapeVar` is specified.
`alphaVar`	column name used for the transparency, empty by default.
`alpha`	character or factor with specified transparency(s) for the points, replicated if needed. By default: '1' if alphaVar is not specified.
`alphaRange`	transparency (alpha) range used in the plot, possible only if the alphaVar is 'numeric' or 'integer'.
`sizeVar`	column name used for the size, empty by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise
`sizeRange`	size (cex) range used in the plot, possible only if the sizeVar is 'numeric' or 'integer'
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`titleCex`	cex for the plot title.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`topGenesCex`	cex for topGenes labels
`genesToHighlightCex`	cex for genesToHighlight
`typePlot`	plot type can be one of "static" or "interactive".
`multiplePlot`	whether to use facet_wrap on coefficients
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels.

Value

ggplot object

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

`callWaterfallPlot` *Create ggplot object with waterfall plot*

Description

Create ggplot object with waterfall plot

Usage

```
callWaterfallPlot(
  topTableOutput,
  featuresColor,
  xlab,
  ylab,
  axesCex,
  axesTitleCex,
  title,
  titleCex,
  facetNCol,
  fillVar,
  fill,
  colorVar,
  color,
  alphaVar,
  alpha,
  alphaRange,
  legendPosition,
  legendCex,
  legendTitleCex,
  facetCex,
  facetColor,
  typePlot,
  multiplePlot
)
```

Arguments

`topTableOutput`	combined top tables for all coefficients
`featuresColor`	character vector specifying colors to use for the feature label text. Either length 1 or the same length as `features`, allowing particular features to be highlighted.
`xlab`	x-axis title, 'logFC' by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`title`	plot title, NULL by default.
`titleCex`	cex for the plot title.
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`fillVar`	name of variable (in 'input') used for filling, empty by default

`fill`	character or factor with specified color(s) for the boxplot inside, replicated if needed. By default: 'skyblue2' if fillVar is not specified and default ggplot palette otherwise.
`colorVar`	name of variable (in 'input') used for coloring, empty by default
`color`	character or factor with specified color(s) for the bar border, replicated if needed. By default: 'skyblue2' if colorVar is not specified and default ggplot palette otherwise.
`alphaVar`	column name used for the transparency, empty by default.
`alpha`	character or factor with specified transparency(s) for the bars, replicated if needed. By default: '1' if alphaVar is not specified.
`alphaRange`	transparency (alpha) range used in the plot, possible only if the alphaVar is 'numeric' or 'integer'.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendCex`	cex for the legend text.
`legendTitleCex`	cex for the legend title.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`typePlot`	plot type, can be one of "static" or "interactive".
`multiplePlot`	logical whether to use facet_wrap on coefficients

Value

ggplot object

Author(s)

Katarzyna Gorczak

`cbindFill` *Combine data.frames by columns allowing for different number of rows.*

Description

Combine data.frames by columns allowing for different number of rows.

Usage

```
cbindFill(list, featuresIdVar, sort = FALSE)
```

Arguments

`list`	list with data frames which should be combined by columns
`featuresIdVar`	columns with feature ids by which data frames should be combined
`sort`	logical, whether the rows should be sorted

Value

data.frame

Author(s)

Katarzyna Gorczak

`checkCoef` *Check coefficients*

Description

Check coefficients

Usage

```
checkCoef(input, coef = NULL)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients

Value

no returned value, error if any of the coefficients not present

---

`checkColumns` *Check input fields*

Description

Check input fields

Usage

```
checkColumns(input, featuresIdVar, coef, cols, error = TRUE)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`featuresIdVar`	column name with unique feature identifiers
`coef`	coefficient name
`cols`	columns with feature annotation
`error`	Logical, if TRUE (by default) an error is returned if required columns are not present

Value

(invisibly) columns not available in the input and error if required columns not present (if `error` is TRUE)

Author(s)

Katarzyna Gorczak

`checkInput` *Check input*

Description

Check input

Usage

```
checkInput(input, error = TRUE)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`error`	logical whether to return error message

Value

(invisible) logical indicating if `input` passes the check, and error if input is not of the desired class (if `error` is TRUE).

`colorBlindPalette` *Color-blind palette*

Description

Color-blind palette

Usage

```
colorBlindPalette(n, grey = TRUE)
```

Arguments

`n`	number of colors to return
`grey`	whether '#999999' color should be included

Value

n colors

`concatenateVars` *Concatenate feature variables*

Description

Concatenate feature variables

Usage

```
concatenateVars(tbl, vars, nChar = NULL)
```

Arguments

`tbl`	long-form top table for all coefficients
`vars`	column names to concatenate
`nChar`	maximum number of characters to truncate the feature labels to

Value

character vector with concatenated with ' `|` ' columns

Author(s)

Katarzyna Gorczak

`createDataBarplot` *Create table for barplot*

Description

Create table for barplot

Usage

```
createDataBarplot(
  input,
  coef,
  coefLabel = coef,
  fdr,
  logFCrange = NULL,
  addPercentage = FALSE
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)
`fdr`	threshold considered for significance, NULL by default.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`addPercentage`	logical whether to add percentage

Value

data.frame

Author(s)

Katarzyna Gorczak

`createDataHeatmap` *Create table for heatmap*

Description

Create table for heatmap

Usage

```
createDataHeatmap(
  input,
  coef,
  coefLabel = NULL,
  features = NULL,
  featuresIdVar,
  featuresVar,
  featuresMaxNChar,
  typePlot
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform the existing labels.
`features`	IDs of features to show. If NULL (by default), show top 20 features.

`featuresIdVar`	column name with feature ids.
`featuresVar`	column name with feature ids to label, the same as `featuresIdVar` by default.
`featuresMaxNChar`	maximum number of characters to truncate the feature labels to.
`typePlot`	plot type, can be one of "static" or "interactive".

Value

data.frame

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`createDataLogRatioPlot` *Create table for log ratio plot*

Description

Create table for log ratio plot

Usage

```
createDataLogRatioPlot(
  input,
  coef,
  coefLabel = NULL,
  text = NULL,
  features = NULL,
  featuresIdVar,
  featuresVar,
  featuresMaxNChar,
  order,
  featuresOrder,
  errorBars,
  typePlot
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)

`text`	(optional) String with name of a column, or function to extract a text from the columns of a top table, to display as text. See the available columns in the top table in section: Top table format.
`features`	character vector with features to subset `input`. If NULL, top table for the top `n` features (for the first coefficient) is extracted.
`featuresIdVar`	column name with unique feature ids (empty by default)
`featuresVar`	column name with feature ids to label.
`featuresMaxNChar`	maximum number of characters to truncate the feature labels to.
`order`	logical whether to order features
`featuresOrder`	if not NULL, features in the graph are re-ordered, either based on similarity ('similarity') or significance ('significance') of the statistics. See section 'Feature ordering'.
`errorBars`	logical whether to add standard errors. Allowed only for `input` of class `"MArrayLM"` (or list of those).
`typePlot`	plot type, can be one of "static" or "interactive".

Value

data.frame

`createDataMAplot` *Create table for MA plot*

Description

Create table for MA plot

Usage

```
createDataMAplot(
  input,
  coef,
  coefLabel = NULL,
  featuresIdVar,
  featuresVar,
  topGenes,
  topGenesVar,
  genesToHighlight,
  genesToHighlightVar,
  logFCrange,
  direction,
  sizeVar,
  fdr,
  typePlot
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)
`featuresIdVar`	column name with unique feature ids (empty by default)
`featuresVar`	column name with feature ids to label.
`topGenes`	numeric, number of top genes with highest logFC or p-value to highlight in the plot for each considered coefficient, 0 by default.
`topGenesVar`	column name with feature identifier to label topGenes
`genesToHighlight`	string with identifiers of the genes to highlight, NULL by default. The gene identifiers should correspond to the variable specified in `featuresIdVar` or row names of `input`
`genesToHighlightVar`	column name for the labels of genesToHighlight. Same as `featuresIdVar` by default.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`direction`	logical whether to color significant up- and down-regulated genes
`sizeVar`	column name used for the size, empty by default.
`fdr`	threshold considered for direction (up- or down- significant features), 0.05 by default.
`typePlot`	plot type can be one of "static" or "interactive".

Value

data.frame

Author(s)

Katarzyna Gorczak

`createDataScatterPlot` *Create table for the scatter plot*

Description

Create table for the scatter plot

Usage

```
createDataScatterPlot(
  input,
  coef,
  coefLabel = NULL,
  featuresIdVar,
  featuresVar,
  fdr,
  topGenes,
  topGenesVar,
  genesToHighlight,
  genesToHighlightVar,
  genesToHighlightThresholdPValue,
  genesToHighlightThresholdLogFC,
  logFCrange,
  typePlot
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)
`featuresIdVar`	column name with unique feature ids (empty by default)
`featuresVar`	column name with feature ids to label, the same as 'featuresIdVar' by default.
`fdr`	threshold considered for significance, NULL by default.
`topGenes`	numeric, number of top genes with highest logFC or p-value to highlight in the plot for each considered coefficient, 0 by default.
`topGenesVar`	column name with feature identifier to label topGenes
`genesToHighlight`	string with identifiers of the genes to highlight, NULL by default. The gene identifiers should correspond to the variable specified in `genesToHighlightVar`, and be contained among the column names of the output of the `topTable` function from `limma`.
`genesToHighlightVar`	column name with the genes to highlight. Same as `featuresIdVar` by default.
`genesToHighlightThresholdPValue`	numeric, if specified (1 by default) keep among the genes to highlight, the genes which have a raw p-value lower (strict) than this threshold for at least one of the coefficient considered.
`genesToHighlightThresholdLogFC`	numeric, if specified (NULL by default) keep among the genes to highlight, the genes which have an absolute log FC higher (strict) than this threshold for at least one of the coefficient considered.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`typePlot`	plot type, can be one of "static" or "interactive"

Value

data.frame

Author(s)

Katarzyna Gorczak

`createDataUpsetPlot` *Create data for upset plot*

Description

Create data for upset plot

Usage

```
createDataUpsetPlot(
  input,
  coef,
  coefLabel = NULL,
  featuresIdVar = character(),
  fdr,
  dir
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)
`featuresIdVar`	column name with unique feature ids (empty by default)
`fdr`	threshold considered for significance, 0.05 by default.
`dir`	direction for feature regulation ('up' to select up-regulated features; 'down' to select down-regulated features)

Value

data.frame compatible with UpSetR

Author(s)

Kirsten Van Hoorde, Katarzyna Gorczak

`createDataVolcanoPlot` *Create table for the volcano plot*

Description

Create table for the volcano plot

Usage

```
createDataVolcanoPlot(
  input,
  coef,
  coefLabel = NULL,
  featuresIdVar,
  featuresVar,
  colorVar,
  shapeVar,
  alphaVar,
  sizeVar,
  fdr,
  additionalThresholdsAdjPValue,
  topGenes,
  topGenesVar,
  genesToHighlight,
  genesToHighlightVar,
  genesToHighlightThresholdPValue,
  genesToHighlightThresholdLogFC,
  logFCrange,
  typePlot
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)
`featuresIdVar`	column name with unique feature ids (empty by default)
`featuresVar`	column name with feature ids to label; used for extra labels if `typePlot` is 'interactive'.
`colorVar`	(optional) string with column name containing variable used for coloring. If not specified, coloring is based on the adjusted p-values.
`shapeVar`	(optional) string with column name containing variable used for shaping. If not specified, only points are used.
`alphaVar`	column name used for the transparency, empty by default.
`sizeVar`	column name used for the size, empty by default.

`fdr`	threshold considered for significance, NULL by default.
`additionalThresholdsAdjPValue`	numeric, additional adjusted p-values thresholds to use for the coloring of the points, and indicated in the legend.
`topGenes`	numeric, number of top genes with highest logFC or p-value to highlight in the plot for each considered coefficient, 0 by default.
`topGenesVar`	column name with feature identifier to label topGenes
`genesToHighlight`	string with identifiers of the genes to highlight, NULL by default. The gene identifiers should correspond to the variable specified in `genesToHighlightVar`, and be contained among the column names of the output of the `topTable` function from `limma`.
`genesToHighlightVar`	column name with the genes to highlight. Same as `featuresIdVar` by default.
`genesToHighlightThresholdPValue`	numeric, if specified (1 by default) keep among the genes to highlight, the genes which have a raw p-value lower (strict) than this threshold for at least one of the coefficient considered.
`genesToHighlightThresholdLogFC`	numeric, if specified (NULL by default) keep among the genes to highlight, the genes which have an absolute log FC higher (strict) than this threshold for at least one of the coefficient considered.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`typePlot`	plot type can be one of "static" or "interactive".

Value

data.frame

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak, Michela Pasetto

---

`createDataWaterfallPlot`

Create data for waterfall plot

Description

Create data for waterfall plot

Usage

```
createDataWaterfallPlot(
  input,
  coef,
  coefLabel = NULL,
  features = NULL,
  featuresIdVar,
```

```
  featuresVar,
  featuresMaxNChar,
  fillVar,
  colorVar,
  alphaVar,
  fdr,
  logFCrange,
  typePlot
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)
`features`	character vector with features to subset `input`. If NULL, top table for the top `n` features (for the first coefficient) is extracted.
`featuresIdVar`	column name with unique feature ids (empty by default)
`featuresVar`	column name with feature ids to label, the same as 'featuresIdVar' by default.
`featuresMaxNChar`	numeric, maximum number of characters to truncate the feature labels to.
`fillVar`	name of variable (in 'input') used for filling, empty by default
`colorVar`	name of variable (in 'input') used for coloring, empty by default
`alphaVar`	column name used for the transparency, empty by default.
`fdr`	threshold considered for significance, NULL by default.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`typePlot`	plot type, can be one of "static" or "interactive".

Value

data.frame

Author(s)

Katarzyna Gorczak

`createExampleData` *Create example limma-, edgeR-object or a list of top tables.*

Description

Create example limma-, edgeR-object or a list of top tables.

Usage

```
createExampleData(
  path = ".",
  output = c("limma", "topTable", "edgeR", "deseq2"),
  quiet = TRUE
)
```

Arguments

`path`	absolute path where data should be downloaded to
`output`	which object should be created. Possible options: limma, edgeR, topTableList, DESeq2
`quiet`	if TRUE, suppress status messages (if any), and the progress bar (see `download.file` function)

Value

list with specific objects (output from `limma`, `edgeR`, `topTable` and/or `DESeq2`)

Examples

```
tmpDir <- tempfile(); dir.create(tmpDir)
getData <- createExampleData(path = tmpDir, output = "limma")
```

`createExpressionSet` *Create ExpressionSet object from example data*

Description

Create ExpressionSet object from example data

Usage

```
createExpressionSet(path)
```

Arguments

`path`	absolute path where data should be downloaded to

Value

ExpressionSet object

Author(s)

Katarzyna Gorczak

`createPairData` *Create pairwise data*

Description

Create pairwise data

Usage

```
createPairData(tbl, featuresIdVar, fdr, typePlot, columns)
```

Arguments

`tbl`	list of top tables
`featuresIdVar`	column name with feature ids, empty by default. If specified and input is a model, featuresIdVar should be a column name in 'genes' slot.
`fdr`	threshold considered for significance, NULL by default.
`typePlot`	plot type, can be one of "static" or "interactive"
`columns`	columns of interest from top table

Value

data.frame with reference and compared contrasts

Author(s)

Katarzyna Gorczak

`createSampleAnnotation` *Create sample annotation from example data*

Description

Create sample annotation from example data

Usage

```
createSampleAnnotation(path)
```

Arguments

`path`	absolute path where data should be downloaded to

Value

data.frame with sample annotation

Author(s)

Katarzyna Gorczak

`createTopTableGenesOfInterest` *Create table for genes of interest*

Description

Create table for genes of interest

Usage

```
createTopTableGenesOfInterest(
  input,
  featuresIdVar = character(),
  genesToHighlight,
  genesToHighlightVar,
  genesToHighlightThresholdPValue = 1,
  genesToHighlightThresholdLogFC = NULL
)
```

Arguments

`input`	long-format table with top tables for coefficients of interest
`featuresIdVar`	column name with feature ids, 'ENTREZID' by default.
`genesToHighlight`	string with identifiers of the genes to highlight. The gene identifiers should correspond to the variable specified in `genesToHighlightVar`.
`genesToHighlightVar`	column of the data to which the genes to highlight should be map
`genesToHighlightThresholdPValue`	numeric, if specified (1 by default) keep among the genes to highlight, the genes which have a raw p-value lower (strict) than this threshold for at least one of the coefficient considered
`genesToHighlightThresholdLogFC`	numeric, if specified (NULL by default) keep among the genes to highlight, the genes which have an absolute log FC higher (strict) than this threshold for at least one of the coefficient considered

Value

long-format table

Author(s)

Laure Cougnaud, Kirsten Van Hoorde

`daHeatmapLogFC` *Heatmap of log fold-changes*

Description

This is a function to create a heatmap that represents logFC values for several coefficients.

Usage

```
daHeatmapLogFC(
  input,
  coef = NULL,
  coefLabel = NULL,
  features = NULL,
  featuresIdVar = character(),
  featuresVar = featuresIdVar,
  featuresColor = "black",
  featuresMaxNChar = 50,
  xlab = NULL,
  ylab = NULL,
  axesCex = 1,
  axesTitleCex = 1,
  title = NULL,
  titleCex = 1,
  legendTitleCex = 1,
  legendCex = 0.8,
  coefColor = "black",
  color = c("#0072B2", "white", "#D55E00"),
  colorNA = "grey",
  typePlot = c("static", "interactive")
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform the existing labels.
`features`	IDs of features to show. If NULL (by default), show top 20 features.
`featuresIdVar`	column name with feature ids.
`featuresVar`	column name with feature ids to label, the same as `featuresIdVar` by default.
`featuresColor`	character vector specifying colors to use for the feature label text. Either length 1 or the same length as `features`, allowing particular features to be highlighted.

`featuresMaxNChar`	maximum number of characters to truncate the feature labels to.
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`title`	plot title, NULL by default.
`titleCex`	cex for the plot title.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`coefColor`	color palette for coef labels.
`color`	palette for gradient to fill the heatmap.
`colorNA`	color for missing values.
`typePlot`	plot type, can be one of "static" or "interactive".

Value

ggplot object

Author(s)

Kirsten Van Hoorde, Laure Cougnaud and Katarzyna Gorczak

Examples

```
exampleData <- createExampleData(path = ".", output = c("limma", "topTable"))
model <- exampleData$limma
topTableList <- exampleData$topTable
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV")

# Simple heatmap
daHeatmapLogFC(input = model, coef = coefs)

# Specify feature annotation
daHeatmapLogFC(input = model, coef = coefs, featuresIdVar = "ENTREZID",
featuresVar = c("SYMBOL", "GENENAME"), featuresMaxNChar = 35)

# Color coefficient labels
daHeatmapLogFC(input = model, coef = coefs,
coefLabel = c("A", "B", "C", "D"),
coefColor = c("blue", "red", "blue", "red"))

# Specify different set of features
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV", "A")
daHeatmapLogFC(
input = list(model, A = topTableList[["B.LvsP"]][c(seq_len(6), 9, 10), ]),
coef = coefs)

# see vignette for other examples
```

`daLogRatioPlot` *Plot log ratios*

Description

This is a function to create barplot with log-foldchanges.

Usage

```
daLogRatioPlot(
  input,
  coef = NULL,
  coefLabel = NULL,
  features = NULL,
  featuresIdVar = character(),
  featuresVar = featuresIdVar,
  featuresOrder = NULL,
  featuresMaxNChar = 50,
  featuresColor = "black",
  color = character(),
  text = NULL,
  textCex = 4,
  xlab,
  xexpand = if (!is.null(text)) {
     ggplot2::expansion(mult = 0.2)
 },
  axesCex = 1,
  axesTitleCex = 1,
  title = NULL,
  titleCex = 1,
  facetCex = 1,
  facetColor = "black",
  facetNCol = NULL,
  errorBars = TRUE,
  typePlot = c("static", "interactive")
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or function to transform the existing labels, or list with such labels. If a list is specified, nested facets are used. In that case, the coefficients are ordered based on the groups defined by the coefficient labels.
`features`	feature ids or numeric. If NULL (by default), show top 20 features according to the first `coef`. If numeric and `input` is a list, the tables are subsetted according to the row names of the table for the first `coef`.

`featuresIdVar`	column name with feature ids.
`featuresVar`	column name with feature ids to label.
`featuresOrder`	if not NULL, features in the graph are re-ordered, either based on similarity ('similarity') or significance ('significance') of the statistics. See section 'Feature ordering'.
`featuresMaxNChar`	maximum number of characters to truncate the feature labels to.
`featuresColor`	character vector specifying colors to use for the feature label text. Either length 1 or the same length as `features`, allowing particular features to be highlighted.
`color`	string with colors for the bars, one per coefficient.
`text`	(optional) String with name of a column, or function to extract a text from the columns of a top table, to display as text. See the available columns in the top table in section: Top table format.
`textCex`	cex for the text next to bars
`xlab`	x-axis title, or `NULL` to remove. By default, set to: 'logFC' or 'logFC (+- SE)' if error bar(s) are available.
`xexpand`	expansion factor for the x-axis (see `expansion`. If `text` is specified, the x-axis is expanded by 20% on each side.
`axesCex`	relative size for the label of the axes.
`axesTitleCex`	relative size for the title of the axes.
`title`	plot title, NULL by default.
`titleCex`	relative size for the title of the plot.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`errorBars`	logical whether to add error bars to the plot (+/- one standard error). If `input` (or each element within a `input` list) is a: • model: only supported for `MArrayLM` • top table: a 'se' column should be available
`typePlot`	plot type, can be one of "static" or "interactive".

Value

ggplot object

Feature ordering

The features are ordered based on:

- 'similarity': a hierarchical clustering of the (Euclidean) distances between the statistics. The statistics are for:
  - limma: the t-statistic of each coefficient
  - edgeR: the (overall) F-statistic is considered
- 'significance': decreasing average (-log10) p-values across coefficients. The p-values are for:
  - limma: the significance of each coefficient
  - edgeR: the (overall) p-value of the model

Author(s)

Laure Cougnaud, Katarzyna Gorczak, Heather Turner, Aditya Bhagwat, Kirsten Van Hoorde

Examples

```
exampleData <- createExampleData(path = ".", output = c("limma", "topTable"))
model <- exampleData$limma
topTableList <- exampleData$topTable
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV")

# Simple log-ratio plot
daLogRatioPlot(input = model, coef = coefs, facetNCol = 4)

# Specify features and annotation
features <- daVis:::getTopFeatures(input = model, coef = "B.LvsP",
featuresIdVar = "ENTREZID", n = 20)
daLogRatioPlot(input = model, coef = coefs,
features = features, featuresIdVar = "ENTREZID",
featuresVar = c("SYMBOL", "GENENAME"), featuresMaxNChar = 35, facetNCol = 4)

# Specify different set of features
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV", "A")
set.seed(123)
features <- sample(features, 20)
daLogRatioPlot(
input = list(model, A = topTableList[["B.LvsP"]][c(seq_len(6), 9, 10), ]),
featuresIdVar = "ENTREZID", features = features, coef = coefs,
facetNCol = 5, errorBars = TRUE)

# Sort features as specified
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV")
daLogRatioPlot(input = model, featuresIdVar = "ENTREZID",
features = features, coef = coefs, facetNCol = 4, errorBars = TRUE)

# Sort features based on similarity
daLogRatioPlot(input = model, featuresIdVar = "ENTREZID",
features = features, coef = coefs, facetNCol = 4, errorBars = TRUE,
featuresOrder = "similarity")

# see vignette for other examples
```

`daMAplot` *MA plot*

Description

This is a function to create a MA plot. When several coefficients are used, multiple plots side by side are returned. MAplot visualizes mean expression versus logFC for each gene.

Usage

```
daMAplot(
  input,
```

```
  coef = NULL,
  coefLabel = NULL,
  featuresIdVar = character(),
  featuresVar = featuresIdVar,
  logFCrange = NULL,
  xlab = "log2 mean expression",
  ylab = "logFC",
  axesCex = 1,
  axesTitleCex = 1,
  title = NULL,
  titleCex = 1,
  legendPosition = c("right", "bottom", "none"),
  legendTitleCex = 1,
  legendCex = 0.8,
  facetCex = 1.1,
  facetColor = "black",
  facetNCol = grDevices::n2mfrow(length(coef))[2],
  topGenes = 0,
  topGenesVar = featuresIdVar,
  topGenesCex = 2.5,
  returnTopGenes = FALSE,
  genesToHighlight = NULL,
  genesToHighlightVar = featuresIdVar,
  genesToHighlightCex = 2.5,
  direction = FALSE,
  fdr = 0.05,
  color = if (direction) character() else "grey",
  alpha = 0.5,
  sizeVar = character(),
  size = if (length(sizeVar) > 0) numeric() else 2,
  typePlot = c("static", "interactive"),
  ...
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see edgeR) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform existing labels.
`featuresIdVar`	column name with feature ids.
`featuresVar`	column name with feature ids to label.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`title`	plot title, NULL by default.

`titleCex`	cex for the plot title.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`topGenes`	numeric, number of top genes with highest logFC or p-value to highlight in the plot for each considered coefficient, 0 by default.
`topGenesVar`	column name with feature identifier to label topGenes
`topGenesCex`	cex for topGenes labels
`returnTopGenes`	logical, if TRUE (FALSE by default), return a list with the top genes highlighted in the plot.
`genesToHighlight`	string with identifiers of the genes to highlight, NULL by default. The gene identifiers should correspond to the variable specified in `featuresIdVar` or row names of `input`
`genesToHighlightVar`	column name for the labels of genesToHighlight. Same as `featuresIdVar` by default.
`genesToHighlightCex`	cex for genesToHighlight
`direction`	logical whether to color significant up- and down-regulated genes
`fdr`	threshold considered for direction (up- or down- significant features), 0.05 by default.
`color`	colors for points indicating direction (should be three colors: significant up- and down-regulated and non-significant)
`alpha`	transparency level for the points, 0.4 by default.
`sizeVar`	column name used for the size, empty by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise
`typePlot`	plot type can be one of "static" or "interactive".
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels.

Value

ggplot object or a list with ggplot object and top genes highlighted in the MA plot (top 10 genes with highest significance and/or highest logFC) `featuresVar` with names `featuresIdVar` (if `returnTopGenes` is set to TRUE)

Author(s)

Katarzyna Gorczak

Examples

```
exampleData <- createExampleData(path = ".", output = "limma")
model <- exampleData$limma
coefs <- c("B.LvsP", "L.LvsP")

# Simple MA plot
daMAplot(input = model, coef = coefs[1])

# Color by significant direction
daMAplot(input = model, coef = coefs, coefLabel = c("A", "B"),
direction = TRUE, color = c("steelblue", "firebrick", "grey"), facetNCol = 2)

# see vignette for other examples
```

`daScatterPlot` *Scatter plot*

Description

This is a function to create a scatter plot. When several coefficients are used, multiple plots side by side are returned.

Usage

```
daScatterPlot(
  input,
  coef = NULL,
  coefLabel = coef,
  featuresIdVar = character(),
  featuresVar = featuresIdVar,
  fdr = 0.05,
  logFCrange = NULL,
  xlab = NULL,
  ylab = NULL,
  axesCex = 1,
  axesTitleCex = 1,
  title = NULL,
  titleCex = 1,
  legendPosition = c("right", "bottom", "none"),
  legendTitleCex = 1,
  legendCex = 0.8,
  facetCex = 1,
  facetColor = "black",
  facetNCol = grDevices::n2mfrow(length(coef))[2],
  color = c("gray90", "darkgoldenrod1", "dodgerblue", "darkgreen"),
  topGenes = 0,
  topGenesVar = featuresIdVar,
  topGenesCex = 2.5,
  returnTopGenes = FALSE,
  genesToHighlight = NULL,
```

```
  genesToHighlightVar = featuresIdVar,
  genesToHighlightCex = 2.5,
  genesToHighlightThresholdPValue = 1,
  genesToHighlightThresholdLogFC = NULL,
  alpha = 0.4,
  pointSize = 2,
  correlation = FALSE,
  correlationCex = 3,
  typePlot = c("static", "interactive"),
  ...
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see edgeR) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform existing labels.
`featuresIdVar`	column name with feature ids, empty by default. If specified and input is a model, featuresIdVar should be a column name in 'genes' slot.
`featuresVar`	column name with feature ids to label, the same as 'featuresIdVar' by default.
`fdr`	threshold considered for significance, NULL by default.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`title`	plot title, NULL by default.
`titleCex`	cex for the plot title.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`color`	color palette to distinguish significance groups. Four colors must be specified.
`topGenes`	numeric, number of top genes with highest logFC or p-value to highlight in the plot for each considered coefficient, 0 by default.
`topGenesVar`	column name with feature identifier to label topGenes
`topGenesCex`	cex for topGenes labels
`returnTopGenes`	logical, if TRUE (FALSE by default), return a list with the top genes highlighted in the plot.

`genesToHighlight`	string with identifiers of the genes to highlight, NULL by default. The gene identifiers should correspond to the variable specified in `genesToHighlightVar`, and be contained among the column names of the output of the `topTable` function from `limma`.
`genesToHighlightVar`	column name with the genes to highlight. Same as `featuresIdVar` by default.
`genesToHighlightCex`	cex for genesToHighlight
`genesToHighlightThresholdPValue`	numeric, if specified (1 by default) keep among the genes to highlight, the genes which have a raw p-value lower (strict) than this threshold for at least one of the coefficient considered.
`genesToHighlightThresholdLogFC`	numeric, if specified (NULL by default) keep among the genes to highlight, the genes which have an absolute log FC higher (strict) than this threshold for at least one of the coefficient considered.
`alpha`	transparency level for the points, 0.4 by default.
`pointSize`	point size, 2 by default.
`correlation`	logical whether to calculate the correlation and add text to the plot.
`correlationCex`	cex for the text with correlation value
`typePlot`	plot type, can be one of "static" or "interactive"
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels.

Value

ggplot object or a list with ggplot object and top genes highlighted in the scatter plot (top 10 genes with highest significance and/or highest logFC) `featuresVar` with names `featuresIdVar` (if `returnTopGenes` is set to TRUE)

Author(s)

Katarzyna Gorczak

Examples

```
exampleData <- createExampleData(path = ".", output = "limma")
model <- exampleData$limma
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV")

# Simple scatter plot
daScatterPlot(input = model, coef = coefs[c(1,2)])

# More coefficients
daScatterPlot(input = model, coef = coefs, coefLabel = c("A", "B", "C", "D"),
facetNCol = 3)

# LogFC range
daScatterPlot(input = model, coef = coefs, coefLabel = c("A", "B", "C", "D"),
facetNCol = 3, logFCrange = c(-2, 2))

# see vignette for other examples
```

`daSignificantGenesBarplot`

Barplot with the number of significant genes

Description

This is a function to create a barplot indicating the number of significant genes in each coefficient. The number of up- and down-regulated genes is shown.

Usage

```
daSignificantGenesBarplot(
  input,
  coef,
  coefLabel = coef,
  fdr = 0.05,
  logFCrange = NULL,
  xlab = NULL,
  ylab = NULL,
  axesCex = 1,
  axesTitleCex = 1.1,
  title = NULL,
  titleCex = 1.1,
  legendPosition = c("right", "bottom", "none"),
  legendTitleCex = 1,
  legendCex = 0.8,
  color = c("#32a6d3", "#e52323"),
  annotCex = 3.5,
  addPercentage = FALSE
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform the existing labels.
`fdr`	threshold considered for significance, NULL by default.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`title`	plot title, NULL by default.
`titleCex`	cex for the plot title.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.

`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`color`	color palette, must contain two colors.
`annotCex`	cex for the text displayed in the plot (indicating number of genes).
`addPercentage`	logical whether to add percentage

Value

ggplot object

Author(s)

Katarzyna Gorczak

Examples

```
exampleData <- createExampleData(path = ".", output = "limma")
model <- exampleData$limma
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV")

# Simple barplot
daSignificantGenesBarplot(input = model, coef = coefs)

# Add percentage of genes
daSignificantGenesBarplot(input = model, coef = coefs,
coefLabel = c("A", "B", "C", "D"), addPercentage = TRUE)

# see vignette for other examples
```

`daUpset` *Upset plot for up- or down-regulated genes*

Description

This is a function to create a customized upset plot for up- or down-regulated genes.

Usage

```
daUpset(
  input,
  coef = NULL,
  coefLabel = coef,
  featuresIdVar = character(),
  fdr = 0.05,
  dir = c("up", "down"),
  ylab = "Intersection Size",
  xlab = "Set Size",
  axesCex = c(1.2, 1.7),
  axesTitleCex = c(1.4, 1.9),
  barsCex = 1.5,
  returnAnalysis = FALSE
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see edgeR) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform existing labels.
`featuresIdVar`	column name with unique feature ids, empty by default.
`fdr`	threshold considered for significance, 0.05 by default.
`dir`	direction for feature regulation ('up' to select up-regulated features; 'down' to select down-regulated features)
`ylab`	y-axis title
`xlab`	x-axis title
`axesCex`	cex for the axis text. If two numbers provided, the first one is used for the x-axis and the second one for y-axis.
`axesTitleCex`	cex for the axis title. If two numbers provided, the first one is used for the x-axis and the second one for y-axis.
`barsCex`	cex for the counts above the bars.
`returnAnalysis`	logical, if TRUE (FALSE by default), return also the output of the analysis (list with all overlapping sets based on `featuresIdVar`), otherwise only the plot object

Value

uspet plot; if `returnAnalysis` is TRUE, return a list with overlapping sets and plot

Author(s)

Kirsten Van Hoorde, Katarzyna Gorczak, Michela Pasetto

Examples

```
exampleData <- createExampleData(path = ".", output = "limma")
model <- exampleData$limma
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV")

# Significantly up-regulated genes
daUpset(input = model, coef = coefs, fdr = 0.05, dir = "up")

# see vignette for other examples
```

`daVis-common-args` *Common parameters for the functions of the* `daVis` *package.*

Description

Common parameters for the functions of the `daVis` package.

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.

Value

No returned value

`daVis-common-doc` *Common documentation for the* `daVis` *package.*

Description

Common documentation for the `daVis` package.

Value

No returned value

Top table format

The top table extracted from a specified model, or specified by the user contains at least the columns:

- 'logFC': log fold change
- 'AveExpr': average expression
- 'P.Value' and 'adj.PVal': raw and (multiplicity correction) adjusted p-values
  - For `edgeR` model: this is extracted from the columns: 'PValue' and 'FDR' respectively.
- feature identifier as specified by: `featuresIdVar`

`daVolcanoPlot` *Volcano plot*

Description

This is a function to create a volcano plot. When several coefficients are used, multiple plots side by side are returned.

Usage

```
daVolcanoPlot(
  input,
  coef = NULL,
  coefLabel = NULL,
  featuresIdVar = character(),
  featuresVar = featuresIdVar,
  fdr = 0.05,
  logFCrange = NULL,
  xlab = "logFC",
  ylab = "-log10(p-value)",
  axesCex = 1,
  axesTitleCex = 1.1,
  title = NULL,
  titleCex = 1.1,
  legendPosition = c("right", "bottom", "none"),
  legendTitleCex = 1,
  legendCex = 0.8,
  facetCex = 1,
  facetColor = "black",
  facetNCol = grDevices::n2mfrow(length(coef))[2],
  topGenes = 0,
  topGenesVar = featuresIdVar,
  topGenesCex = 2.5,
  returnTopGenes = FALSE,
  genesToHighlight = NULL,
  genesToHighlightVar = featuresIdVar,
  genesToHighlightCex = 2.5,
  genesToHighlightThresholdPValue = 1,
  genesToHighlightThresholdLogFC = NULL,
  colorVar = character(),
  color = if (length(colorVar) > 0) character() else "black",
  shapeVar = character(),
  shape = if (length(shapeVar) > 0) numeric() else 19,
  alphaVar = character(),
  alpha = if (length(alphaVar) > 0) numeric() else 0.4,
  alphaRange = numeric(),
  sizeVar = character(),
  size = if (length(sizeVar) > 0) numeric() else 2,
  sizeRange = numeric(),
  additionalThresholdsAdjPValue = NULL,
  typePlot = c("static", "interactive"),
```

```
  ...
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform existing labels.
`featuresIdVar`	column name with feature ids (should be unique). If not specified, row names are used. `featuresIdVar` is used to label `topGenes` unless `topGenesVar` is specified.
`featuresVar`	column name with feature ids to label; used for extra labels if `typePlot` is 'interactive'.
`fdr`	threshold considered for significance, NULL by default.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`xlab`	x-axis title, NULL by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`title`	plot title, NULL by default.
`titleCex`	cex for the plot title.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`topGenes`	numeric, number of top genes with highest logFC or p-value to highlight in the plot for each considered coefficient, 0 by default.
`topGenesVar`	column name with feature identifier to label topGenes
`topGenesCex`	cex for topGenes labels
`returnTopGenes`	logical, if TRUE (FALSE by default), return a list with the top genes highlighted in the plot.
`genesToHighlight`	string with identifiers of the genes to highlight, NULL by default. The gene identifiers should correspond to the variable specified in `genesToHighlightVar`, and be contained among the column names of the output of the `topTable` function from `limma`.
`genesToHighlightVar`	column name with the genes to highlight. Same as `featuresIdVar` by default.
`genesToHighlightCex`	cex for genesToHighlight

`genesToHighlightThresholdPValue`	numeric, if specified (1 by default) keep among the genes to highlight, the genes which have a raw p-value lower (strict) than this threshold for at least one of the coefficient considered.
`genesToHighlightThresholdLogFC`	numeric, if specified (NULL by default) keep among the genes to highlight, the genes which have an absolute log FC higher (strict) than this threshold for at least one of the coefficient considered.
`colorVar`	(optional) string with column name containing variable used for coloring. If not specified, coloring is based on the adjusted p-values.
`color`	color palette, only used if `colorVar` is specified.
`shapeVar`	(optional) string with column name containing variable used for shaping. If not specified, only points are used.
`shape`	shape palette, only used if `shapeVar` is specified.
`alphaVar`	column name used for the transparency, empty by default.
`alpha`	character or factor with specified transparency(s) for the points, replicated if needed. By default: '1' if alphaVar is not specified.
`alphaRange`	transparency (alpha) range used in the plot, possible only if the alphaVar is 'numeric' or 'integer'.
`sizeVar`	column name used for the size, empty by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise
`sizeRange`	size (cex) range used in the plot, possible only if the sizeVar is 'numeric' or 'integer'
`additionalThresholdsAdjPValue`	numeric, additional adjusted p-values thresholds to use for the coloring of the points, and indicated in the legend.
`typePlot`	plot type can be one of "static" or "interactive".
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels.

Value

ggplot object or list with ggplot object and top genes highlighted in the volcano plot (top 10 genes with highest significance and/or highest logFC) `topGenesVar` with names `featuresIdVar` (if `returnTopGenes` is set to TRUE)

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

Examples

```
exampleData <- createExampleData(path = ".", output = "limma")
model <- exampleData$limma

# Simple volcano plot
daVolcanoPlot(input = model, coef = "B.LvsP")
```

```
# Specify logFC range
daVolcanoPlot(input = model, coef = "B.LvsP", logFCrange = c(-2, 2))

# Customized aesthetics
daVolcanoPlot(input = model, coef = c("B.LvsP", "L.LvsP"),
coefLabel = c("A", "B"), facetNCol = 2, colorVar = "adj.P.Val")

# Customized gene annotation
model$genes$group <- rep(c("gr A", "gr B", "gr C"), each = 5323)
daVolcanoPlot(input = model, coef = "B.LvsP", colorVar = "group",
color = setNames(c("orange", "red", "blue"), c("gr A", "gr B", "gr C")))

# Facet by variable(s)
coefs <- c("B.LvsP", "L.LvsP", "B.PvsV", "L.PvsV")
coefsLabel <- list(
sub("(.+)\\.(.+)", "\\2", coefs),
sub("(.+)\\.(.+)", "\\1", coefs)
)
daVolcanoPlot(input = model, coef = coefs, coefLabel = coefsLabel,
facetNCol = 4, colorVar = "adj.P.Val")

# see vignette for other examples
```

`daWaterfallPlot` *Waterfall plot*

Description

This is a function to create a waterfall plot. When several coefficients are used, multiple plots side by side are returned.

Usage

```
daWaterfallPlot(
  input,
  features = NULL,
  coef,
  coefLabel = coef,
  featuresIdVar = character(),
  featuresVar = featuresIdVar,
  featuresColor = "black",
  featuresMaxNChar = 60,
  fdr = NULL,
  logFCrange = NULL,
  xlab = "logFC",
  ylab = NULL,
  axesCex = 1,
  axesTitleCex = 1.1,
  title = NULL,
  titleCex = 1.1,
  legendPosition = c("right", "bottom", "none"),
  legendTitleCex = 1,
```

```
  legendCex = 0.8,
  facetCex = 1,
  facetColor = "black",
  facetNCol = grDevices::n2mfrow(length(coef))[2],
  fillVar = character(),
  fill = if (length(fillVar) > 0) character() else "skyblue2",
  colorVar = character(),
  color = if (length(colorVar) > 0) character() else "white",
  alphaVar = character(),
  alpha = if (length(alphaVar) > 0) 1 else numeric(),
  alphaRange = numeric(),
  typePlot = c("static", "interactive")
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`features`	IDs of features to show. If NULL (by default), show top 20 features.
`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform existing labels.
`featuresIdVar`	column name with feature ids, empty by default. If specified and input is a model, featuresIdVar should be a column name in 'genes' slot.
`featuresVar`	column name with feature ids to label, the same as 'featuresIdVar' by default.
`featuresColor`	character vector specifying colors to use for the feature label text. Either length 1 or the same length as `features`, allowing particular features to be highlighted.
`featuresMaxNChar`	numeric, maximum number of characters to truncate the feature labels to.
`fdr`	threshold considered for significance, NULL by default.
`logFCrange`	numeric, two values (upper and lower bounds for logFC).
`xlab`	x-axis title, 'logFC' by default.
`ylab`	y-axis title, NULL by default.
`axesCex`	cex for the axis text.
`axesTitleCex`	cex for the axis title.
`title`	plot title, NULL by default.
`titleCex`	cex for the plot title.
`legendPosition`	legend position ("right", "bottom", "none"). If 'none', no legend is shown.
`legendTitleCex`	cex for the legend title.
`legendCex`	cex for the legend text.
`facetCex`	cex for the facets if multiple plot are used.
`facetColor`	color for the text of the facets
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used to.
`fillVar`	name of variable (in 'input') used for filling, empty by default

`fill`	character or factor with specified color(s) for the boxplot inside, replicated if needed. By default: 'skyblue2' if fillVar is not specified and default ggplot palette otherwise.
`colorVar`	name of variable (in 'input') used for coloring, empty by default
`color`	character or factor with specified color(s) for the bar border, replicated if needed. By default: 'skyblue2' if colorVar is not specified and default ggplot palette otherwise.
`alphaVar`	column name used for the transparency, empty by default.
`alpha`	character or factor with specified transparency(s) for the bars, replicated if needed. By default: '1' if alphaVar is not specified.
`alphaRange`	transparency (alpha) range used in the plot, possible only if the alphaVar is 'numeric' or 'integer'.
`typePlot`	plot type, can be one of "static" or "interactive".

Value

ggplot object

Author(s)

Katarzyna Gorczak

Examples

```
exampleData <- createExampleData(path = ".", output = "limma")
model <- exampleData$limma

# Simple waterfall plot
daWaterfallPlot(input = model, coef = "B.LvsP")

# see vignette for other examples
```

`downloadData` *Download example data from https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE6045*

Description

Download example data from https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE60450

Usage

```
downloadData(path, quiet)
```

Arguments

`path`	absolute path where data should be downloaded to
`quiet`	if TRUE, suppress status messages (if any), and the progress bar (see `download.file` function)

Value

(invisibly) downloads files at specific location ('path')

Author(s)

Katarzyna Gorczak

`extractColsOfInterest` *Extract columns of interest from top table*

Description

Extract columns of interest from top table

Usage

```
extractColsOfInterest(
  mean,
  topTableCoef,
  columns,
  stat,
  errorBars,
  coefI,
  text
)
```

Arguments

`mean`	logical (FALSE by default) whether to extract column with averaged expression or logCPM ("AveExpr" or "logCPM") depending on the `input`
`topTableCoef`	top table for one coefficient
`columns`	columns to extract
`stat`	logical (FALSE by default) whether to extract column with statistic: 't' or 'F'
`errorBars`	logical whether to add standard errors. Allowed only for `input` of class `"MArrayLM"` (or list of those).
`coefI`	coefficient of interest
`text`	(optional) String with name of a column, or function to extract a text from the columns of a top table, to display as text. See the available columns in the top table in section: Top table format.

Value

character vector

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`extractFeatures` *Extract feature ids for each overlapping set*

Description

Extract feature ids for each overlapping set

Usage

```
extractFeatures(data)
```

Arguments

`data`	data.frame with 0s and 1s; the number of columns corresponds to the number of coefs and the number of rows corresponds to the number of unique feature ids each column is filled with 0s or 1s depending on the overlapping set

Value

list with features in overlapping sets

Author(s)

Katarzyna Gorczak

`extractPairs` *Get top table per pair (ref and comp coef) for scatter plot*

Description

Get top table per pair (ref and comp coef) for scatter plot

Usage

```
extractPairs(
  decideTestsOutput,
  refCoef,
  iCoef,
  multiplePlot,
  compCoef,
  tbl,
  typePlot,
  columns
)
```

Arguments

`decideTestsOutput`	output of `decideTests`
`refCoef`	coefficient on the x-axis
`iCoef`	coefficients on the y-axis
`multiplePlot`	whether to facet on coefs to compare
`compCoef`	coefficients to compare with `refCoef`
`tbl`	list of top tables
`typePlot`	plot type, can be one of "static" or "interactive"
`columns`	columns of interest from top table

Value

ggplot object

Author(s)

Katarzyna Gorczak

`extractQueryList` *Extract query list*

Description

Extract query list

Usage

```
extractQueryList(dataFrameSG)
```

Arguments

`dataFrameSG`	data.frame compatible with UpSetR

Value

a list with queries for upset plot

`extractTopTables` *Extract top tables for coefficients of interest*

Description

Extract top tables for coefficients of interest

Usage

```
extractTopTables(
  input,
  coef,
  coefLabel = NULL,
  features = NULL,
  n = 20,
  columns,
  errorBars = FALSE,
  mean = FALSE,
  stat = FALSE,
  featuresIdVar = character(),
  hoverText = FALSE,
  text = NULL,
  output = c("table", "list")
)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficients
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)
`features`	character vector with features to subset `input`. If NULL, top table for the top `n` features (for the first coefficient) is extracted.
`n`	top features to extract. If set to Inf, all features are extracted
`columns`	columns to extract
`errorBars`	logical whether to add standard errors. Allowed only for `input` of class `"MArrayLM"` (or list of those).
`mean`	logical (FALSE by default) whether to extract column with averaged expression or logCPM ("AveExpr" or "logCPM") depending on the `input`
`stat`	logical (FALSE by default) whether to extract column with statistic: 't' or 'F'
`featuresIdVar`	column name with unique feature ids (empty by default)
`hoverText`	logical whether to add point label for interactive plot (FALSE by default)
`text`	(optional) String with name of a column, or function to extract a text from the columns of a top table, to display as text. See the available columns in the top table in section: Top table format.
`output`	output can be one of "table" or "list"

Value

data.frame with top tables or list of those (if `output` is 'list') for coefficients of interest

Author(s)

Katarzyna Gorczak, Laure Cougnaud

`extractTTcoef` *Extract top table for a specific coef*

Description

Extract top table for a specific coef

Usage

```
extractTTcoef(input, coefI, errorBars, text)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coefI`	coefficient of interest
`errorBars`	logical whether to add standard errors. Allowed only for `input` of class `"MArrayLM"` (or list of those).
`text`	(optional) String with name of a column, or function to extract a text from the columns of a top table, to display as text. See the available columns in the top table in section: Top table format.

Value

data.frame with statistics for a specific coef

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`facet` *Add facets to ggplot object*

Description

Add facets to ggplot object

Usage

```
facet(g, topTableOutput, facetNCol, scales = "fixed")
```

Arguments

`g`	ggplot object
`topTableOutput`	combined topTables for all coefficients
`facetNCol`	number of columns in facets, by default the function `n2mfrow` is used
`scales`	see `facet_wrap` or `facet_nested_wrap`

Value

ggplot object

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`filterCommonFeatures` *Filter top tables based on common features across all tables*

Description

Filter top tables based on common features across all tables

Usage

```
filterCommonFeatures(input, featuresIdVar)
```

Arguments

`input`	list of top tables
`featuresIdVar`	column with feature identifier (must be unique)

Value

list of top tables with common features

Author(s)

Katarzyna Gorczak

`filterGenesOfInterest` *Filter genes of interest*

Description

Filter genes of interest

Usage

```
filterGenesOfInterest(
  input,
  featuresIdVar = character(),
  genesToHighlightVar,
  genesToHighlightThresholdPValue = 1,
  genesToHighlightThresholdLogFC = NULL
)
```

Arguments

`input`	long-format table
`featuresIdVar`	column name with feature ids, 'ENTREZID' by default.
`genesToHighlightVar`	column name with genes to highlight
`genesToHighlightThresholdPValue`	numeric, if specified keep among the genes to highlight, the genes which have a raw p-value lower (strict) than this threshold for at least one of the coefficient considered
`genesToHighlightThresholdLogFC`	numeric, if specified keep among the genes to highlight, the genes which have an absolute log FC higher (strict) than this threshold for at least one of the coefficient considered

Value

long-format table

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

`filterLogFC` *Filter top tables based on logFC threshold*

Description

Filter top tables based on logFC threshold

Usage

```
filterLogFC(input, logFCrange)
```

Arguments

`input`	list of top tables
`logFCrange`	numeric vector with two values (low- and high-threshold for log-foldchange)

Value

list of top tables with subset of features based on logFC range

Author(s)

Katarzyna Gorczak

`formatAesMA` *Format aesthetics for the main plot with MA plot*

Description

Format aesthetics for the main plot with MA plot

Usage

```
formatAesMA(g, topTableOutput, direction, color, sizeVar, size)
```

Arguments

`g`	ggplot object with MA plot
`topTableOutput`	combined topTables for all coefficients
`direction`	logical whether to color significant up- and down-regulated genes
`color`	colors for points indicating direction (should be three colors: significant up- and down-regulated and non-significant)
`sizeVar`	column name used for the size, empty by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise

Value

ggplot object

Author(s)

Katarzyna Gorczak

`formatAesVP` *Format aesthetics for the main plot with volcano plot*

Description

Format aesthetics for the main plot with volcano plot

Usage

```
formatAesVP(
  g,
  topTableOutput,
  colorVar,
  color,
  shapeVar,
  shape,
  alphaVar,
  alpha,
  alphaRange,
  sizeVar,
  size,
  sizeRange
)
```

Arguments

`g`	ggplot object with volcano plot
`topTableOutput`	combined topTables for all coefficients
`colorVar`	(optional) string with column name containing variable used for coloring. If not specified, coloring is based on the adjusted p-values.
`color`	color palette, only used if `colorVar` is specified.
`shapeVar`	(optional) string with column name containing variable used for shaping. If not specified, only points are used.
`shape`	shape palette, only used if `shapeVar` is specified.
`alphaVar`	column name used for the transparency, empty by default.
`alpha`	character or factor with specified transparency(s) for the points, replicated if needed. By default: '1' if alphaVar is not specified.
`alphaRange`	transparency (alpha) range used in the plot, possible only if the alphaVar is 'numeric' or 'integer'.
`sizeVar`	column name used for the size, empty by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise
`sizeRange`	size (cex) range used in the plot, possible only if the sizeVar is 'numeric' or 'integer'

Value

ggplot object

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

`formatAesWP` *Format aesthetics for the main plot with waterfall plot*

Description

Format aesthetics for the main plot with waterfall plot

Usage

```
formatAesWP(
  topTableOutput,
  colorVar,
  color,
  g,
  fillVar,
  fill,
  alphaVar,
  alpha,
  alphaRange
)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`colorVar`	name of variable (in 'input') used for coloring, empty by default
`color`	character or factor with specified color(s) for the bar border, replicated if needed. By default: 'skyblue2' if colorVar is not specified and default ggplot palette otherwise.
`g`	ggplot object with volcano plot
`fillVar`	name of variable (in 'input') used for filling, empty by default
`fill`	character or factor with specified color(s) for the boxplot inside, replicated if needed. By default: 'skyblue2' if fillVar is not specified and default ggplot palette otherwise.
`alphaVar`	column name used for the transparency, empty by default.
`alpha`	character or factor with specified transparency(s) for the bars, replicated if needed. By default: '1' if alphaVar is not specified.
`alphaRange`	transparency (alpha) range used in the plot, possible only if the alphaVar is 'numeric' or 'integer'.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`formatManualScale` *extend manual scale values if required*

Description

extend manual scale values if required

Usage

```
formatManualScale(x, valVar, nameVar)
```

Arguments

`x`	data.frame with `nameVar`
`valVar`	fixed value of variable of aesthetic
`nameVar`	name of variable for aesthetic

Value

vector of manual scales

Author(s)

Laure Cougnaud

`formatTTcoef` *Format top table for a specific coefficient*

Description

Format top table for a specific coefficient

Usage

```
formatTTcoef(
  topTableCoef,
  columns,
  mean,
  coefI,
  coef,
  featuresIdVar,
  hoverText
)
```

Arguments

`topTableCoef`	top table for one coefficient
`columns`	columns to extract
`mean`	logical (FALSE by default) whether to extract column with averaged expression or logCPM ("AveExpr" or "logCPM") depending on the `input`
`coefI`	coefficient of interest
`coef`	character vector with coefficients
`featuresIdVar`	column name with unique feature ids (empty by default)
`hoverText`	logical whether to add point label for interactive plot (FALSE by default)

Value

data.frame

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`formatVariableLength` *shorten string length*

Description

shorten string length

Usage

```
formatVariableLength(x, var, length)
```

Arguments

`x`	data.frame with `var`
`var`	column name
`length`	max number of characters in each string

Value

string of length `length`

Character vector with shortened variable.

Author(s)

Katarzyna Gorczak

`formatVariableSpace` *remove space in variable name*

Description

remove space in variable name

Usage

```
formatVariableSpace(var)
```

Arguments

`var`	string

Value

String with formatted variable

`getCoefColor` *Create colors for coefficient labels*

Description

Create colors for coefficient labels

Usage

```
getCoefColor(coef, coefLabel, coefColor)
```

Arguments

`coef`	character, coefficient names.
`coefLabel`	character vector of labels or a function to transform the existing labels.
`coefColor`	color palette for coef labels.

Value

named character (named color palette)

Author(s)

Katarzyna Gorczak

`getCoefLabel` *Get coefficient label*

Description

Get coefficient label

Usage

```
getCoefLabel(coef, coefLabel)
```

Arguments

`coef`	character vector with coefficients
`coefLabel`	character vector of coefficient labels or a function to transform the coefficients

Value

labels of the coefficients; either a vector or a list with nested labels

---

`getFeatureColor` *Create colors for feature labels*

Description

Create colors for feature labels

Usage

```
getFeatureColor(
  topTableOutput,
  features,
  featuresIdVar,
  featuresColor,
  order = FALSE,
  plot = c("logRatio", "heatmap", "waterfall")
)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`features`	feature ids or numeric. If NULL (by default), show top 20 features according to the first `coef`. If numeric and `input` is a list, the tables are subsetted according to the row names of the table for the first `coef`.
`featuresIdVar`	column name with feature ids.
`featuresColor`	character vector specifying colors to use for the feature label text. Either length 1 or the same length as `features`, allowing particular features to be highlighted.
`order`	logical whether to order features (used only when plot is 'logRatio')
`plot`	plot

Value

named color palette for feature labels

Author(s)

Katarzyna Gorczak

`getFeatures` *Get features from input*

Description

Get features from input

Usage

```
getFeatures(input, featuresIdVar = character())
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`featuresIdVar`	column with unique feature identifiers

Value

character with all features from input

Author(s)

Katarzyna Gorczak

`getInputIdCoef` *Get ID of the input* `list` *matching to the specific coefficient*

Description

Get ID of the input `list` matching to the specific coefficient

Usage

```
getInputIdCoef(input, coef)
```

Arguments

`input`	input list
`coef`	character vector of length 1 with coefficient

Value

numeric of length 1 specifying which element of the list contains the coefficient

---

`getModelCoefs` *Get coefficients in input*

Description

Get coefficients in input

Usage

```
getModelCoefs(input, coef = NULL)
```

Arguments

`input`	object of class `MArrayLM` (see `limma`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`)
`coef`	(optional) coefficient of interest

Value

Character vector with coefficients

`getNumberOfRegulatedGenes` *Get number of significant genes for coefficient*

Description

Get number of significant genes for coefficient

Usage

```
getNumberOfRegulatedGenes(
  input,
  fdr = 0.05,
  logFCrange = NULL,
  dir = c("up", "down")
)
```

Arguments

`input`	a list of top tables.
`fdr`	threshold for adjusted p-value.
`logFCrange`	numeric, upper and lower bound for logFC
`dir`	direction, select either up- or down-regulated genes ('up' - genes with logFC larger than 0, 'down' - genes with logFC smaller than 0).

Value

named numeric vector with number of up- or down-regulated genes

Author(s)

Katarzyna Gorczak

`getNumberOfSignificantGenes` *Get number of significant genes for coefficient*

Description

Get number of significant genes for coefficient

Usage

```
getNumberOfSignificantGenes(input, logFCrange = NULL, fdr = 0.05)
```

Arguments

`input`	a list of top tables.
`logFCrange`	numeric, upper and lower bound for logFC
`fdr`	threshold for adjusted p-value.

Value

named numeric vector with number of significant genes

Author(s)

Katarzyna Gorczak

`getSEModel` *Get standard error from a limma model.*

Description

The standard errors are computed, according to BioC support question 70175, as:

$$stdev.unscaled * \sqrt{s2.post}$$

with:

- stdev.unscaled: unscaled standard deviations
- s2.post: posterior values for sigma^2

Usage

```
getSEModel(input, coef)
```

Arguments

`input`	object of class `MArrayLM` (see `limma`)
`coef`	character vector with one single coefficient

Value

If `input` is `MArrayLM`, a numeric vector with SE named by feature ID, NA otherwise.

Author(s)

Laure Cougnaud

Examples

```
exampleData <- createExampleData(path = ".", output = "limma")
model <- exampleData$limma
getSEModel(input = model, coef = "B.LvsP")
```

`getTopFeatures` *Get top features*

Description

Get top features

Usage

```
getTopFeatures(input, coef, featuresIdVar = character(), n = 10)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficient
`featuresIdVar`	column with unique feature identifiers
`n`	numeric, number of top features

Value

top n features based on their adjusted p-value

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`getTopGenes` *Get top genes with highest significance and top genes with highest logFC*

Description

Get top genes with highest significance and top genes with highest logFC

Usage

```
getTopGenes(input, topGenes, featuresIdVar = character())
```

Arguments

`input`	long-format table
`topGenes`	number of top genes to extract
`featuresIdVar`	column with feature identifier (must be unique)

Value

data.frame with top genes

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`getTopTableFromModel` *Extract top tables from a model*

Description

Extract top tables from a model

Usage

```
getTopTableFromModel(input, coef, se = FALSE)
```

Arguments

`input`	object of class `MArrayLM` (see `limma`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`)
`coef`	coefficient of interest
`se`	Logical (FALSE by default), should standard errors be extracted?

Value

data.frame with top tables for coefficient of interest.
The features are ordered in original (unsorted) order in the model.
Standard errors, if requested are in the column: 'SE'.

Author(s)

Katarzyna Gorczak

`ggPlotTheme` *Customized ggplot theme*

Description

Customized ggplot theme

Usage

```
ggPlotTheme(
  ggObject,
  panelBackground = NULL,
  panelBorder = "black",
  title = NULL,
  titleSize = 2,
  xTextSize = 1.2,
  xTextColor = "black",
  xTitle = NULL,
  xTitleSize = 1.4,
  xTextAngle = 0,
  xTextHjust = 0.5,
  yTextSize = 1.2,
  yTextColor = "black",
  yTitle = NULL,
  yTitleSize = 1.4,
  facetLabelSize = 1.5,
  facetLabelColor = "black",
  gridMajor = TRUE,
  gridMinor = TRUE,
  yTicks = TRUE,
  xTicks = TRUE,
  legendPosition = "right",
  legendTitleSize = 1.3,
  legendTextSize = 1.1
)
```

Arguments

`ggObject`	ggplot object
`panelBackground`	panel background of the entire plot
`panelBorder`	border around plotting area, by default black
`title`	plot title
`titleSize`	cex for plot title, relative to the parent
`xTextSize`	cex for axis text
`xTextColor`	color font on the x axis, by default black

`xTitle`	title of the x axis
`xTitleSize`	cex for the x axis title
`xTextAngle`	angle of the x axis labels
`xTextHjust`	numeric for horizontal adjustment, 0.5 by default
`yTextSize`	cex for axis text
`yTextColor`	color font on the y axis, by default black
`yTitle`	title of the y axis, NULL by default
`yTitleSize`	cex for the y axis title
`facetLabelSize`	cex for the facet labels
`facetLabelColor`	color of the text in facets
`gridMajor`	logical whether to show the major grid lines
`gridMinor`	logical whether to show the minor grid lines
`yTicks`	logical whether to show ticks on the y axis
`xTicks`	logical whether to show ticks on the x axis
`legendPosition`	legend position, by default right
`legendTitleSize`	cex for the legend title
`legendTextSize`	cex for the legend

Value

ggplot object with customized theme

`isModel` *Check if input is a model*

Description

Check if input is a model

Usage

```
isModel(input)
```

Arguments

`input`	object of class `MArrayLM` (see `limma`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`)

Value

logical

`isTopTable` *Check if input is a topTable containing colums with logFC, p-value and adjusted p-value*

Description

Check if input is a topTable containing colums with logFC, p-value and adjusted p-value

Usage

```
isTopTable(input)
```

Arguments

`input`	a top table (see `limma::topTable`)

Value

logical

`labelCorr` *Add label with correlation to scatter plot*

Description

Add label with correlation to scatter plot

Usage

```
labelCorr(topTableOutput, g, correlationCex)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`g`	ggplot object
`correlationCex`	cex for the text with correlation value

Value

ggplot object

Author(s)

Katarzyna Gorczak

`labelGenesOfInterest` *Add layer with genes of interest to ggplot object*

Description

Add layer with genes of interest to ggplot object

Usage

```
labelGenesOfInterest(
  g,
  topTableOutputGenesOfInterest,
  typePlot,
  color = "red",
  sizeVar = character(),
  size = if (length(sizeVar) > 0) numeric() else 2,
  genesToHighlightCex,
  ...
)
```

Arguments

`g`	ggplot object
`topTableOutputGenesOfInterest`	data.frame with `genesToHighlight`
`typePlot`	plot type can be one of "static" or "interactive".
`color`	color palette, only used if `colorVar` is specified.
`sizeVar`	column name used for the size, empty by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise
`genesToHighlightCex`	cex for genesToHighlight
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels.

Value

ggplot object

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`labelTextLRP` *Add optional text to the log-ratio plot*

Description

Add optional text to the log-ratio plot

Usage

```
labelTextLRP(topTableOutput, errorBars, g, textVar, textVarCex)
```

Arguments

`topTableOutput`	combined topTables for all coefficients
`errorBars`	logical whether to add error bars to the plot (+/- one standard error). If `input` (or each element within a `input` list) is a: • model: only supported for `MArrayLM` • top table: a 'se' column should be available
`g`	ggplot object with volcano plot
`textVar`	(optional) String with name of a column to display as text.
`textVarCex`	cex for the text next to bars

Value

ggplot object

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

`labelTopGenes` *Add point labels to ggplot object*

Description

Add point labels to ggplot object

Usage

```
labelTopGenes(
  g,
  includeTableGenesOfInterest,
  topTableOutputTopGenes,
  topTableOutputGenesOfInterest,
  colorVar,
  topGenesCex,
  ...
)
```

Arguments

`g`	ggplot object
`includeTableGenesOfInterest`	whether to label `genesToHighlight`
`topTableOutputTopGenes`	data.frame with top genes
`topTableOutputGenesOfInterest`	data.frame with `genesToHighlight`
`colorVar`	string with column name containing variable used for coloring
`topGenesCex`	cex for topGenes labels
`...`	Extra parameters passed to `geom_text_repel` to customize the position of the gene labels

Value

ggplot object

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`mainH` *Create main plot object with heatmap*

Description

Create main plot object with heatmap

Usage

```
mainH(typePlot, topTableOutput, color, colorNA)
```

Arguments

`typePlot`	plot type, can be one of "static" or "interactive".
`topTableOutput`	combined topTables for all coefficients
`color`	palette for gradient to fill the heatmap.
`colorNA`	color for missing values.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`mainLRP` *Create main plot object with log-ratio plot*

Description

Create main plot object with log-ratio plot

Usage

```
mainLRP(typePlot, color, topTableOutput, errorBars)
```

Arguments

`typePlot`	plot type, can be one of "static" or "interactive".
`color`	string with colors for the bars, one per coefficient.
`topTableOutput`	combined topTables for all coefficients
`errorBars`	logical whether to add error bars to the plot (+/- one standard error). If `input` (or each element within a `input` list) is a: • model: only supported for `MArrayLM` • top table: a 'se' column should be available

Value

ggplot object

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

`mainMA` *Create main plot object with MA plot*

Description

Create main plot object with MA plot

Usage

```
mainMA(typePlot, direction, color, sizeVar, topTableOutput, alpha, size)
```

Arguments

`typePlot`	plot type can be one of "static" or "interactive".
`direction`	logical whether to color significant up- and down-regulated genes
`color`	colors for points indicating direction (should be three colors: significant up- and down-regulated and non-significant)
`sizeVar`	column name used for the size, empty by default.
`topTableOutput`	combined topTables for all coefficients
`alpha`	transparency level for the points, 0.4 by default.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise

Value

ggplot object

Author(s)

Katarzyna Gorczak

`mainSP` *Create main plot object with scatter plot*

Description

Create main plot object with scatter plot

Usage

```
mainSP(
  typePlot,
  color,
  topTableOutput,
  xlab,
  coef,
  ylab,
  multiplePlot,
  pointSize,
  alpha
)
```

Arguments

`typePlot`	plot type, can be one of "static" or "interactive"
`color`	color palette to distinguish significance groups. Four colors must be specified.
`topTableOutput`	combined topTables for all coefficients
`xlab`	x-axis title, NULL by default.
`coef`	character, coefficient names.

`ylab`	y-axis title, NULL by default.
`multiplePlot`	logical whether to use facet on coefficients
`pointSize`	point size, 2 by default.
`alpha`	transparency level for the points, 0.4 by default.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`mainVP` *Create main plot object with volcano plot*

Description

Create main plot object with volcano plot

Usage

```
mainVP(
  colorVar,
  shapeVar,
  alphaVar,
  sizeVar,
  topTableOutput,
  typePlot,
  color,
  shape,
  alpha,
  size
)
```

Arguments

`colorVar`	(optional) string with column name containing variable used for coloring. If not specified, coloring is based on the adjusted p-values.
`shapeVar`	(optional) string with column name containing variable used for shaping. If not specified, only points are used.
`alphaVar`	column name used for the transparency, empty by default.
`sizeVar`	column name used for the size, empty by default.
`topTableOutput`	combined topTables for all coefficients
`typePlot`	plot type can be one of "static" or "interactive".
`color`	color palette, only used if `colorVar` is specified.
`shape`	shape palette, only used if `shapeVar` is specified.

`alpha`	character or factor with specified transparency(s) for the points, replicated if needed. By default: '1' if alphaVar is not specified.
`size`	character or factor with specified size(s) (cex) for the points, replicated if needed. This is used only if sizeVar is empty. By default: '2.5' if sizeVar is not specified and default ggplot size(s) otherwise

Value

ggplot object

Author(s)

Laure Cougnaud, Kirsten Van Hoorde, Katarzyna Gorczak

`mainWP` *Create main plot object with waterfall plot*

Description

Create main plot object with waterfall plot

Usage

```
mainWP(
  typePlot,
  colorVar,
  fillVar,
  alphaVar,
  topTableOutput,
  fill,
  color,
  alpha
)
```

Arguments

`typePlot`	plot type, can be one of "static" or "interactive".
`colorVar`	name of variable (in 'input') used for coloring, empty by default
`fillVar`	name of variable (in 'input') used for filling, empty by default
`alphaVar`	column name used for the transparency, empty by default.
`topTableOutput`	combined topTables for all coefficients
`fill`	character or factor with specified color(s) for the boxplot inside, replicated if needed. By default: 'skyblue2' if fillVar is not specified and default ggplot palette otherwise.
`color`	character or factor with specified color(s) for the bar border, replicated if needed. By default: 'skyblue2' if colorVar is not specified and default ggplot palette otherwise.
`alpha`	character or factor with specified transparency(s) for the bars, replicated if needed. By default: '1' if alphaVar is not specified.

Value

ggplot object

Author(s)

Katarzyna Gorczak

`makeElementsUnique` *Make elements unique*

Description

Make elements unique

Usage

```
makeElementsUnique(x)
```

Arguments

`x`	vector with values

Value

vector with unique values, for duplicated values a suffix '_' is added

---

`modelExampleData` *Normalize data, create model matrix and contrasts*

Description

Normalize data, create model matrix and contrasts

Usage

```
modelExampleData(eset)
```

Arguments

`eset`	ExpressionSet

Value

a list with data, model, design matrix and contrast matrix

Author(s)

Katarzyna Gorczak

`orderComparison` *Sort the comparison columns according to the coefficients*

Description

Sort the comparison columns according to the coefficients

Usage

```
orderComparison(df, coefLabel)
```

Arguments

`df`	top table for one coefficient
`coefLabel`	character vector with coefficient labels or list with such vector (in case of multiple labels)

Value

data.frame

Author(s)

Laure Cougnaud, Katarzyna Gorczak

`orderFeatures` *Order features based on similarity or significance*

Description

Order features based on similarity or significance

Usage

```
orderFeatures(input, featuresOrder, featuresIdVar)
```

Arguments

`input`	list of top tables
`featuresOrder`	if not NULL, features in the graph are re-ordered, either based on similarity ('similarity') or significance ('significance') of the statistics. See section 'Feature ordering'.
`featuresIdVar`	column name with feature ids.

Value

ordered features

Feature ordering

The features are ordered based on:

- 'similarity': a hierarchical clustering of the (Euclidean) distances between the statistics. The statistics are for:
  - limma: the t-statistic of each coefficient
  - edgeR: the (overall) F-statistic is considered
- 'significance': decreasing average (-log10) p-values across coefficients. The p-values are for:
  - limma: the significance of each coefficient
  - edgeR: the (overall) p-value of the model

`processFeatures` *Process table for visualizations.*

Description

Some can be missing across different coefficients (either different subsets of to tables are provided or provided 'features' are not present in each top table). The table will be processed for each coefficient:

- 1: missing features will be added (if a missing feature in coef X is present in coef Y, this label will be used)
- 2: feature missing in all coefs will obviously not be plotted
- 3: the same 'featuresVar' can happen for different 'featuresIdVar' - add index to duplicates as 'featuresVar' is used for plotting

Usage

```
processFeatures(tbl, coef, featuresIdVar, order)
```

Arguments

`tbl`	logn-form table (top tables for specified coefs)
`coef`	character, coefficient names.
`featuresIdVar`	column name with feature ids.
`order`	character vector with feature ids in a specific order

Value

data.frame with processed features

Author(s)

Katarzyna Gorczak

`reshapeTable` *Reshape table*

Description

Reshape table

Usage

```
reshapeTable(table, timevar)
```

Arguments

`table`	long- or wide-format table
`timevar`	column name in long-format table that differentiates multiple records from the same group

Value

a list of tables

Author(s)

Katarzyna Gorczak

`runDESeq2` *Fit the model with DESeq2*

Description

Fit the model with DESeq2

Usage

```
runDESeq2(input)
```

Arguments

`input`	list of objects (data, contrasts and model matrix)

Value

DESeq2 output from results() function

Author(s)

Katarzyna Gorczak

`runEdgeR` *Fit the model with edgeR*

Description

Fit the model with edgeR

Usage

```
runEdgeR(input)
```

Arguments

`input`	list of objects (data, contrasts and model matrix)

Value

edgeR output from glmQLFTest() function

Author(s)

Katarzyna Gorczak

`runLimma` *Fit the model with limma*

Description

Fit the model with limma

Usage

```
runLimma(input)
```

Arguments

`input`	list of objects (data, contrasts and model matrix)

Value

limma outpur from eBayes() function

Author(s)

Katarzyna Gorczak

`runTopTable` *Fit the model and return top table*

Description

Fit the model and return top table

Usage

```
runTopTable(input)
```

Arguments

`input`	list of objects (data, contrasts and model matrix)

Value

a list of top tables

Author(s)

Katarzyna Gorczak

`setCategoricalElement` *check if variable is not numeric (or integer)*

Description

check if variable is not numeric (or integer)

Usage

```
setCategoricalElement(x, typeVar)
```

Arguments

`x`	data.frame
`typeVar`	column name in `x`

Value

Logical, TRUE if the variable is not a numeric or integer

`setFixElement` *check if the aesthetic is fixed (e.g. color, shape, size 'palette')*

Description

check if the aesthetic is fixed (e.g. color, shape, size 'palette')

Usage

```
setFixElement(typeVar, valVar)
```

Arguments

`typeVar`	name of variable for aesthetic
`valVar`	fixed value of variable of aesthetic

Value

logical, if TRUE the element is fixed

Author(s)

Laure Cougnaud

`setGradientScale` *check if manual aesthetic for the gradient should be set*

Description

This is the case only if `typeVar` and `valVar` are specified, and if the variable is numeric or integer

Usage

```
setGradientScale(x, typeVar, valVar)
```

Arguments

`x`	data.frame with `typeVar`
`typeVar`	name of variable for aesthetic
`valVar`	fixed value of variable of aesthetic

Value

logical, if TRUE the manual scale should be set

Author(s)

Katarzyna Gorczak

`setManualScale` *check if manual aesthetic should be set*

Description

This is the case only if `typeVar` and `valVar` are specified, and if the variable is not numeric or integer (doesn't work with ggplot2)

Usage

```
setManualScale(x, typeVar, valVar)
```

Arguments

`x`	data.frame with `typeVar`
`typeVar`	name of variable for aesthetic
`valVar`	fixed value of variable of aesthetic

Value

logical, if TRUE the manual scale should be set

Author(s)

Laure Cougnaud

`subsetFeatures` *Subset input with specific features*

Description

Subset input with specific features

Usage

```
subsetFeatures(input, features, featuresIdVar = character())
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`features`	features of interest
`featuresIdVar`	column with unique feature identifiers

Value

input with subset of features

Author(s)

Katarzyna Gorczak

`topFeaturesDeseq` *Extract top features from* `DESeq2` *output*

Description

Extract top features from `DESeq2` output

Usage

```
topFeaturesDeseq(input, n, featuresIdVar)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`n`	numeric, number of top features
`featuresIdVar`	column with unique feature identifiers

Value

character vector with feature names

Author(s)

Katarzyna Gorczak

`topFeaturesEdger` *Extract top features from* `edgeR` *output*

Description

Extract top features from `edgeR` output

Usage

```
topFeaturesEdger(input, n, featuresIdVar)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`n`	numeric, number of top features
`featuresIdVar`	column with unique feature identifiers

Value

character vector with feature names

Author(s)

Katarzyna Gorczak

`topFeaturesLimma` *Extract top features from `limma` output*

Description

Extract top features from `limma` output

Usage

```
topFeaturesLimma(input, coef, n, featuresIdVar)
```

Arguments

`input`	model or a list with top tables named with coefficients. For model: object of class `MArrayLM` (linear model, see `eBayes`), `DGELRT` (see `edgeR`) or `DESeqResults` (see `DESeq2`) are supported. See more details on the top table format in section: Top table format.
`coef`	character vector with coefficient
`n`	numeric, number of top features
`featuresIdVar`	column with unique feature identifiers

Value

character vector with feature names

Author(s)

Katarzyna Gorczak

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