

Package ‘smvgraph’

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Type Package

Title Various Multivariate Graphics with Variable Choice in Shiny Apps

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Description

Mosaic diagram, scatterplot matrix, Andrews curves, parallel coordinate diagram, radar diagram, and Chernoff plots as a Shiny app, which allow the order of variables to be changed interactively. The apps are intended as teaching examples.

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Encoding UTF-8

Imports MASS, fmsb, DescTools, shiny, shinydashboard, sortable

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NeedsCompilation no

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andrews *andrews*

Description

Andrews curves for visualization of multidimensional data. `step` determines the number of line segments for each curve. If `ymax==NA` then the maximum y coordinate will be determined from the curves. Note that for `type==3` the x range is $[0, 4 * \pi]$ otherwise $[-\pi, \pi]$.

Usage

```
andrews(x, type = 1, step = 100, ..., normalize = 1, ymax = NA)
```

Arguments

<code>x</code>	data frame or matrix
<code>type</code>	type of curve (default: 1) <ul style="list-style-type: none"> 1: $f(t) = x1/(2^0.5) + x2 * \sin(t) + x3 * \cos(t) + x4 * \sin(2 * t) + x5 * \cos(2 * t) + \dots$ 2: $f(t) = x1 * \sin(t) + x2 * \cos(t) + x3 * \sin(2 * t) + x4 * \cos(2 * t) + \dots$ 3: $f(t) = x1 * \cos(t) + x2 * \cos((2 * t)^0.5) + x3 * \cos((3 * t)^0.5) + \dots$ 4: $f(t) = 1/(2^0.5) * (x1 + x2 * (\sin(t) + \cos(t)) + x3 * (\sin(t) - \cos(t)) + x4 * (\sin(2 * t) + \cos(2 * t)) + x5 * (\sin(2 * t) - \cos(2 * t)) + \dots)$
<code>step</code>	smoothness of curves
<code>...</code>	further parameters given to <code>graphics::plot</code> and <code>graphics::lines()</code>
<code>normalize</code>	integer: normalization method (default: 1) <ul style="list-style-type: none"> 0: no rescaling 1: $(x - \min(x)) / (\max(x) - \min(x))$ 2: $(x - \text{mean}(x)) / \text{sd}(x)$
<code>ymax</code>	numeric: maximum of y coordinate (default: NA)

Value

nothing

References

- Andrews, D. F. (1972) Plots of High-Dimensional Data. *Biometrics*, vol. 28, no. 1, pp. 125-136.
- Khattree, R., Naik, D. N. (2002) Andrews Plots for Multivariate Data: Some New Suggestions and Applications. *Journal of Statistical Planning and Inference*, vol. 100, no. 2, pp. 411-425.

See Also

In package [andrews](#) or at [CRAN](#)

Examples

```
andrews(iris[,-5], col=as.factor(iris[,5]))
andrews(iris[,-5], type=4, col=as.factor(iris[,5]), ymax=2)
```

normalize	<i>normalize</i>
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Description

Extracts the numeric vectors from a data frame and normalizes each vector.

Usage

```
normalize(x, method = 1)
```

Arguments

x	data.frame or matrix
method	integer: normalization method (default: 1) <ul style="list-style-type: none">• 0: no rescaling• 1: $(x - \min(x)) / (\max(x) - \min(x))$• 2: $(x - \text{mean}(x)) / \text{sd}(x)$

Value

numeric matrix

See Also

In package [normalize](#) or at [CRAN](#)

Examples

```
normalize(iris, 2)
```

order_andrews	<i>order_andrews</i>
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Description

Returns a reordering of the columns of x to visualize outliers or clusters better. If no column names are given then $V1, V2, \dots$ will be used.

Usage

```
order_andrews(x, method = 1)
```

Arguments

x	data matrix
method	numeric: order method (default: 1) <ul style="list-style-type: none"> • 1: interquartile range • 2: $\max(x - \text{median}(x))/IQR(x)$ (outlier) • 3: fit to a Ward cluster solution with euclidean distance

Value

order of column vectors

Examples

```
order_andrews(iris)
```

order_parcoord	<i>order_parcoord</i>
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Description

Returns a reordering of the columns of x to visualize highly correlated variable pairs based on a cluster analysis of the correlation matrix. If no column names are given then $V1, V2, \dots$ will be used.

Usage

```
order_parcoord(x, method = "spearman", ...)
```

Arguments

x	data matrix
method	numeric: order method (default: "spearman")
\dots	further parameters given to <code>stats::cor()</code>

Value

order of column vectors

Examples

```
order_parcoord(iris)
```

sandrews

sandrews

Description

Shiny app for creating an Andrews curve diagram with interactive variable selection.

Usage

```
sandrews(data, xvar = character(0), ...)
```

Arguments

data	matrix or data.frame
xvar	character: names of selected variables for the plot
...	further parameters given to andrews()

Value

nothing

Examples

```
if (interactive()) sandrews(iris)
```

schernoff

schernoff

Description

Shiny app for creating a Chernoff faces plot with interactive variable selection.

Usage

```
schernoff(data, xvar = character(0), ...)
```

Arguments

data matrix or data.frame
xvar character: names of selected variables for the plot
... further parameters given to [DescTools::PlotFaces\(\)](#)

Value

nothing

Examples

```
if (interactive()) schernoff(normalize(iris))
```

smosaic	<i>smosaic</i>
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Description

Shiny app for creating a Mosaic plot with interactive variable selection.

Usage

```
smosaic(data, xvar = character(0), yvar = character(0), ...)
```

Arguments

data table or data.frame
xvar character: names of selected variables for x-axis
yvar character: names of selected variables for y-axis
... further parameters given to [graphics::mosaicplot\(\)](#)

Value

nothing

Examples

```
if (interactive()) smosaic(Titanic)  
dfTitanic <- table2dataframe(Titanic)  
if (interactive()) smosaic(dfTitanic)
```

spairs	<i>spairs</i>
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Description

Shiny app for creating a scatterplot matrix with interactive variable selection.

Usage

```
spairs(data, xvar = character(0), ...)
```

Arguments

data	matrix or data.frame
xvar	character: names of selected variables for the plot
...	further parameters given to graphics::pairs()

Value

nothing

Examples

```
if (interactive()) spairs(iris, col=as.factor(iris$Species))
```

sparcoord	<i>sandrews</i>
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Description

Shiny app for creating a Parallel Coordinate plot with interactive variable selection.

Usage

```
sparcoord(data, xvar = character(0), ...)
```

Arguments

data	matrix or data.frame
xvar	character: names of selected variables for the plot
...	further parameters given to MASS::parcoord()

Value

nothing

Examples

```
if (interactive()) sparcoord(iris, col=as.factor(iris$Species))
```

sradar	<i>sradar</i>
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Description

Shiny app for creating radar charts with interactive variable selection.

Usage

```
sradar(data, xvar = character(0), ...)
```

Arguments

data	matrix or data.frame
xvar	character: names of selected variables for the plot
...	further parameters given to <code>fmsb::radarchart()</code>

Value

nothing

Examples

```
if (interactive()) sradar(normalize(iris))
```

table2dataframe	<i>table2dataframe</i>
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Description

Converts a table to a full data frame.

Usage

```
table2dataframe(tab, ...)
```

Arguments

tab	table: contingency table
...	further parameters given to <code>base::as.data.frame.table()</code>

table2dataframe

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Value

a data frame with `sum(tab)` rows and `length(dim(tab))` cols

Examples

```
table2dataframe(Titanic)
```

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