Package ‘GGally’
June 5, 2020

Version  2.0.0
License  GPL (>= 2.0)
Title    Extension to 'ggplot2'
Type  Package
LazyLoad  yes
LazyData  true


BugReports  https://github.com/ggobi/ggally/issues

Description  The R package 'ggplot2' is a plotting system based on the grammar of graphics. 'GGally' extends 'ggplot2' by adding several functions to reduce the complexity of combining geometric objects with transformed data. Some of these functions include a pairwise plot matrix, a two group pairwise plot matrix, a parallel coordinates plot, a survival plot, and several functions to plot networks.

Depends  R (>= 3.1),
          ggplot2 (>= 3.3.0)

Imports  grDevices,
          grid,
          gtable (>= 0.2.0),
          plyr (>= 1.8.3),
          progress,
          RColorBrewer,
          reshape (>= 0.8.5),
          scales (>= 1.1.0),
          utils,
          rlang,
          lifecycle

Suggests  broom (>= 0.4.0),
          chemometrics,
          geosphere (>= 1.5-1),
          ggforce,
          Hmisc,
          igraph (>= 1.0.1),
          intergraph (>= 2.0-2),
          maps (>= 3.1.0),
          mapproj,
network (>= 1.12.0),
sagnostics,
sna (>= 2.3-2),
survival,
rmardown,
roxygen2,
testthat,
crosstalk,
knitr,
spelling

Roxygen list(markdown = FALSE)

RoxygenNote 7.1.0

SystemRequirements openssl

Encoding UTF-8

Language en-US

RdMacros lifecycle

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Modify a `ggmatrix` object by adding an `ggplot2` object to all plots

**Description**

This operator allows you to add `ggplot2` objects to a `ggmatrix` object.

**Usage**

```r
## S3 method for class 'gg'
e1 + e2

dd_to_ggmatrix(e1, e2, location = NULL, rows = NULL, cols = NULL)
```

**Arguments**

- `e1` An object of class `ggnostic` or `ggplot`
- `e2` A component to add to `e1`
- `location` "all", TRUE All row and col combinations
  "none" No row and column combinations
  "upper" Locations where the column value is higher than the row value
  "lower" Locations where the row value is higher than the column value
  "diag" Locations where the column value is equal to the row value
- `matrix` or `data.frame` matrix values will be converted into `data.frame`
  - A `data.frame` with the exact column names `c("row","col")`
  - A `data.frame` with the number of rows and columns matching the plot
    matrix object provided. Each cell will be tested for a "truthy" value to
determine if the location should be kept.
- `rows` numeric vector of the rows to be used. Will be used with `cols` if `location` is
  NULL
- `cols` numeric vector of the cols to be used. Will be used with `rows` if `location` is
  NULL
Details

If the first object is an object of class \texttt{ggmatrix}, you can add the following types of objects, and it will return a modified \texttt{ggplot2} object.

- \texttt{theme}: update plot theme
- \texttt{scale}: replace current scale
- \texttt{coord}: override current coordinate system

The \texttt{+} operator completely replaces elements with elements from \texttt{e2}.

\texttt{add_to_ggmatrix} gives you more control to modify only some subplots. This function may be replaced and/or removed in the future. \textbf{Experimental}

See Also

\texttt{+.gg} and \texttt{theme} \\
\texttt{ggmatrix_location}

Examples

# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")

pm <- ggpairs(tips[, 2:4], ggplot2::aes(color = sex))
## change to black and white theme
pm + ggplot2::theme_bw()
## change to linedraw theme
p_(pm + ggplot2::theme_linedraw())
## change to custom theme
p_(pm + ggplot2::theme(panel.background = ggplot2::element_rect(fill = "lightblue")))
## add a list of information
extra <- list(ggplot2::theme_bw(), ggplot2::labs(caption = "My caption!"))
p_(pm + extra)
## modify scale
p_(pm + scale_fill_brewer(type = "qual"))
## only first row
p_(add_to_ggmatrix(pm, scale_fill_brewer(type = "qual"), rows = 1:2))
## only second col
p_(add_to_ggmatrix(pm, scale_fill_brewer(type = "qual"), cols = 2:3))
## only to upper triangle of plot matrix
p_(add_to_ggmatrix(
    pm,
    scale_fill_brewer(type = "qual"),
    location = "upper"
))
**add_ref_boxes**

Add reference boxes around each cell of the glyphmap.

**Description**

Add reference boxes around each cell of the glyphmap.

**Usage**

```r
add_ref_boxes(
  data,
  var_fill = NULL,
  color = "white",
  size = 0.5,
  fill = NA,
  ...
)
```

**Arguments**

- `data`: A glyphmap structure.
- `var_fill`: Variable name to use to set the fill color
- `color`: Set the color to draw in, default is "white"
- `size`: Set the line size, default is 0.5
- `fill`: fill value used if `var_fill` is NULL
- `...`: other arguments passed onto `geom_rect`

**add_ref_lines**

Add reference lines for each cell of the glyphmap.

**Description**

Add reference lines for each cell of the glyphmap.

**Usage**

```r
add_ref_lines(data, color = "white", size = 1.5, ...)
```

**Arguments**

- `data`: A glyphmap structure.
- `color`: Set the color to draw in, default is "white"
- `size`: Set the line size, default is 1.5
- `...`: other arguments passed onto `geom_line`
### Description

**About PISA**

**Usage**

```r
data(australia_PISA2012)
```

### Format

A data frame with 8247 rows and 32 variables

### Details

The Programme for International Student Assessment (PISA) is a triennial international survey which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. To date, students representing more than 70 economies have participated in the assessment.

While 65 economies took part in the 2012 study, this data set only contains information from the country of Australia.

- gender : Factor w/ 2 levels "female","male": 1 1 2 2 2 1 1 2 1 ...
- age : Factor w/ 4 levels "4","5","6","7": 2 2 2 4 3 1 2 2 2 ...
- homework : num 5 5 9 3 2 3 4 3 5 1 ...
- desk : num 1 0 1 1 1 1 1 1 1 1 ...
- room : num 1 1 1 1 1 1 1 1 1 1 ...
- study : num 1 1 1 1 1 1 1 1 1 1 ...
- computer : num 1 1 1 1 1 1 1 1 1 1 ...
- software : num 1 1 1 1 1 1 1 1 1 1 ...
- internet : num 1 1 1 1 1 1 1 1 1 1 ...
- literature : num 0 0 1 0 1 1 1 1 1 0 ...
- poetry : num 0 0 1 0 1 1 0 1 1 1 ...
- art : num 1 0 1 0 1 1 0 1 1 1 ...
- textbook : num 1 1 1 1 0 1 1 1 1 ...
- dictionary : num 1 1 1 1 1 1 1 1 1 1 ...
- dishwasher : num 1 1 1 1 0 1 1 1 1 1 ...
- PV1MATH : num 562 565 602 520 613 ...
- PV2MATH : num 569 557 594 507 567 ...
- PV3MATH : num 555 553 552 501 585 ...
- PV4MATH : num 579 538 526 521 596 ...
- PV5MATH : num 548 573 619 547 603 ...
- PV1READ : num 582 617 650 554 605 ...
- PV2READ : num 571 572 608 560 557 ...
- PV3READ : num 602 560 594 517 627 ...
- PV4READ : num 572 564 575 564 597 ...
- PV5READ : num 585 565 620 572 598 ...
- PV1SCIE : num 583 627 668 574 639 ...
- PV2SCIE : num 579 600 665 612 635 ...
- PV3SCIE : num 593 574 620 571 666 ...
- PV4SCIE : num 567 582 592 598 700 ...
- PV5SCIE : num 587 625 656 662 670 ...
- SENWGT_STU : num 0.133 0.133 0.141 0.141 0.141 ...
- possessions: num 10 8 12 9 11 11 10 12 12 11 ...

Source


brew_colors

**RColorBrewer Set1 colors**

**Description**

RColorBrewer Set1 colors

**Usage**

`brew_colors(col)`

**Arguments**

- `col`  standard color name used to retrieve hex color value

broomify

**Broomify a model**

**Description**

broom::augment a model and add broom::glance and broom::tidy output as attributes. X and Y variables are also added.

**Usage**

`broomify(model, lmStars = TRUE)`

**Arguments**

- `model`  model to be sent to broom::augment, broom::glance, and broom::tidy
- `lmStars`  boolean that determines if stars are added to labels
**eval_data_col**

Value

broom::augmented data frame with the broom::glance data.frame and broom::tidy data.frame as 'broom_glance' and 'broom_tidy' attributes respectively. var_x and var_y variables are also added as attributes.

Examples

data(mtcars)
model <- stats::lm(mpg ~ wt + qsec + am, data = mtcars)
broomified_model <- broomify(model)
str(broomified_model)

---

**eval_data_col**

Evaluate data column

Description

Evaluate data column

Usage

eval_data_col(data, aes_col)

Arguments

data : data set to evaluate the data with
aes_col : Single value from an ggplot2::aes(...) object

Value

Aes mapping with the x and y values switched

Examples

mapping <- ggplot2::aes(Petal.Length)
eval_data_col(iris, mapping$x)

---

**flea**

Historical data used for classification examples.

Description

This data contains physical measurements on three species of flea beetles.

Usage

data(flea)

Format

A data frame with 74 rows and 7 variables
Details

- species Ch. concinna, Ch. heptapotamica, Ch. heikertingeri
- tars1 width of the first joint of the first tarsus in microns
- tars2 width of the second joint of the first tarsus in microns
- head the maximal width of the head between the external edges of the eyes in 0.01 mm
- aede1 the maximal width of the aedeagus in the fore-part in microns
- aede2 the front angle of the aedeagus (1 unit = 7.5 degrees)
- aede3 the aedeagus width from the side in microns

References


---

**fn_switch**

**Function switch**

Description

Function that allows you to call different functions based upon an aesthetic variable value.

Usage

`fn_switch(types, mapping_val = "y")`

Arguments

- `types` list of functions that follow the `ggmatrix` function standard: `Function(data, mapping,...){ #make ggplot2 object }`. One key should be a ’default’ key for a default switch case.
- `mapping_val` mapping value to switch on. Defaults to the ’y’ variable of the aesthetics list.

Examples

```r
# ggnostic_continuous_fn
(ggnostic_continuous_fn <- fn_switch(list(
default = ggally_points,
.fitted = ggally_points,
.se.fit = ggally_nostic_se_fit,
.resid = ggally_nostic_resid,
.hat = ggally_nostic_hat,
.sigma = ggally_nostic_sigma,
.cooksd = ggally_nostic_cooksd,
.std.resid = ggally_nostic_std_resid )))

# ggnostic_combo_fn
(ggnostic_combo_fn <- fn_switch(list(
default = ggally_box_no_facet,
fitted = ggally_box_no_facet,
.se.fit = ggally_nostic_se_fit,
.resid = ggally_nostic_resid,
)))
```
getPlot

```r

getPlot

hat = ggally_nostic_hat,
sigma = ggally_nostic_sigma,
ocooksd = ggally_nostic_cooksd,
std.resid = ggally_nostic_std_resid
```

### Description

Retrieves the ggplot object at the desired location.

### Usage

```r
getPlot(pm, i, j)
```

### Arguments

- `pm`: `ggmatrix` object to select from
- `i`: row from the top
- `j`: column from the left
- `...`: ignored

### Author(s)

Barret Schloerke

### See Also

- `putPlot`

### Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
plotMatrix2 <- ggpairs(tips[, 3:2], upper = list(combo = "denstrip"))
p_(plotMatrix2[1, 2])
```
ggally_autopoint  Scatterplot for continuous and categorical variables

Description

Make scatterplots compatible with both continuous and categorical variables using geom_autopoint from package ggforce.

Usage

ggally_autopoint(data, mapping, ...)

ggally_autopointDiag(data, mapping, ...)

Arguments

data  data set using

mapping  aesthetics being used

...  other arguments passed to geom_autopoint(...)

Author(s)

Joseph Larmarange

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_autopoint(tips, mapping = aes(x = tip, y = total_bill)))
p_(ggally_autopoint(tips, mapping = aes(x = tip, y = sex)))
p_(ggally_autopoint(tips, mapping = aes(x = smoker, y = sex)))
p_(ggally_autopoint(tips, mapping = aes(x = smoker, y = sex, color = day)))
p_(ggally_autopoint(tips, mapping = aes(x = smoker, y = sex, size = 8)))
p_(ggally_autopoint(tips, mapping = aes(x = smoker, y = sex), alpha = .9))

p_(ggpairs(
  tips,
  mapping = aes(colour = sex),
  upper = list(discrete = "autopoint", combo = "autopoint", continuous = "autopoint"),
  diag = list(discrete = "autopointDiag", continuous = "autopointDiag")
))
ggally_barDiag  

Description
Displays a bar plot for the diagonal of a ggpairs plot matrix.

Usage
ggally_barDiag(data, mapping, ..., rescale = FALSE)

Arguments
- data: data set using
- mapping: aesthetics being used
- ...: other arguments are sent to geom_bar
- rescale: boolean to decide whether or not to rescale the count output. Only applies to numeric data

Author(s)
Barret Schloerke

Examples
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
data(tips, package = "reshape")
p_(ggally_barDiag(tips, mapping = ggplot2::aes(x = day)))
p_(ggally_barDiag(tips, mapping = ggplot2::aes(x = tip), binwidth = 0.25))

# gally_barDiag

---

ggally_blank  

Description
Draws nothing.

Usage
ggally_blank(...)
ggally_blankDiag(...)

Arguments
...: other arguments ignored
**ggally_box**

**Details**

Makes a "blank" ggplot object that will only draw white space

**Author(s)**

Barret Schloerke

**See Also**

`ggplot2::element_blank()`

---

**ggally_box**  
*Box plot*

**Description**

Make a box plot with a given data set. `ggally_box_no_facet` will be a single panel plot, while `ggally_box` will be a faceted plot

**Usage**

```r
ggally_box(data, mapping, ...)
ggally_box_no_facet(data, mapping, ...)
```

**Arguments**

- **data**
  - data set using
- **mapping**
  - aesthetics being used
- **...**
  - other arguments being supplied to `geom_boxplot`

**Author(s)**

Barret Schloerke

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_box(tips, mapping = ggplot2::aes(x = total_bill, y = sex)))
p_(ggally_box(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "sex")))
p_(ggally_box(tips, mapping = ggplot2::aes_string(y = "total_bill", x = "sex", color = "sex"),
  outlier.colour = "red",
  outlier.shape = 13,
  outlier.size = 8))
```
**Description**

Plot column or row percentage using bar plots.

**Usage**

```r
ggally_colbar(
  data,  
  mapping, 
  label_format = scales::label_percent(accuracy = 0.1),
  ...,  
  remove_background = FALSE,  
  remove_percentage_axis = FALSE,  
  geom_bar_args = NULL
)
```

```r
ggally_rowbar(
  data,  
  mapping, 
  label_format = scales::label_percent(accuracy = 0.1),
  ...,  
  remove_background = FALSE,  
  remove_percentage_axis = FALSE,  
  geom_bar_args = NULL
)
```

**Arguments**

- `data`: data set using
- `mapping`: aesthetics being used
- `label_format`: formatter function for displaying proportions
- `...`: other arguments passed to `geom_text(...)`
- `remove_background`: should the `panel.background` be removed?
- `remove_percentage_axis`: should percentage axis be removed? Removes the y-axis for `ggally_colbar()` and x-axis for `ggally_rowbar()`
- `geom_bar_args`: other arguments passed to `geom_bar(...)`

**Author(s)**

Joseph Larmarange
Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_colbar(tips, mapping = aes(x = smoker, y = sex)))
p_(ggally_rowbar(tips, mapping = aes(x = smoker, y = sex)))

# change labels' size
p_(ggally_colbar(tips, mapping = aes(x = smoker, y = sex), size = 8))

# change labels' colour and use bold
p_(ggally_colbar(tips, mapping = aes(x = smoker, y = sex),
    colour = "white", fontface = "bold"))

# custom bar width
p_(ggally_colbar(tips, mapping = aes(x = smoker, y = sex), geom_bar_args = list(width = .5)))

# change format of labels
p_(ggally_colbar(tips, mapping = aes(x = smoker, y = sex),
    label_format = scales::label_percent(accuracy = .01, decimal.mark = ",")))

p_(ggduo(
    data = as.data.frame(Titanic),
    mapping = aes(weight = Freq),
    columnsX = "Survived",
    columnsY = c("Sex", "Class", "Age"),
    types = list(discrete = "rowbar"),
    legend = 1
))

---

**ggally_cor**

Correlation value plot

Description

Estimate correlation from the given data. If a color variable is supplied, the correlation will also be calculated per group.

Usage

```r
ggally_cor(
data, mapping, 
..., 
stars = TRUE, 
method = "pearson",
use = "complete.obs",
display_grid = FALSE, 
digits = 3, 
title_args = list(...),
group_args = list(...),
justify_labels = "right",
```
align_percent = 0.5,
title = "Corr",
alignPercent = warning("deprecated. Use `align_percent`")
displayGrid = warning("deprecated. Use `display_grid`")
)

Arguments

data data set using
mapping aesthetics being used
... other arguments being supplied to geom_text() for the title and groups
stars logical value which determines if the significance stars should be displayed.
Given the cor.test p-values, display
"***" if the p-value is < 0.001
"**" if the p-value is < 0.01
"*" if the p-value is < 0.05
"." if the p-value is < 0.10
"" otherwise
method method supplied to cor function
use use supplied to cor function
display_grid if TRUE, display aligned panel grid lines. If FALSE (default), display a thin panel border.
digits number of digits to be displayed after the decimal point. See formatC for how numbers are calculated.
title_args arguments being supplied to the title’s geom_text()
group_args arguments being supplied to the split-by-color group’s geom_text()
justify_labels justify argument supplied when formatting the labels
align_percent relative align position of the text. When justify_labels = 0.5, this should not be needed to be set.
title title text to be displayed
alignPercent, displayGrid deprecated. Please use their snake-case counterparts.

Author(s)
Barret Schloerke

See Also

ggally_statistic, ggally_cor_v1_5

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_cor(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "tip")))
# display with grid
```r
p_(ggally_cor(
  tips,
  mapping = ggplot2::aes_string(x = "total_bill", y = "tip"),
  display_grid = TRUE
))
```

# change text attributes
```r
p_(ggally_cor(
  tips,
  mapping = ggplot2::aes(x = total_bill, y = tip),
  size = 15,
  colour = I("red"),
  title = "Correlation"
))
```

# split by a variable
```r
p_(ggally_cor(
  tips,
  mapping = ggplot2::aes_string(x = "total_bill", y = "tip", color = "sex"),
  size = 5
))
```

---

ggally_cor_v1.5 **Correlation value plot**

**Description**

(Deprecated. See `ggally_cor`.)

**Usage**

```r
ggally_cor_v1.5(
  data,
  mapping,
  alignPercent = 0.6,
  method = "pearson",
  use = "complete.obs",
  corAlignPercent = NULL,
  corMethod = NULL,
  corUse = NULL,
  displayGrid = TRUE,
  ...
)
```

**Arguments**

- `data` : data set using
- `mapping` : aesthetics being used
- `alignPercent` : right align position of numbers. Default is 60 percent across the horizontal
- `method` : method supplied to cor function
- `use` : use supplied to cor function
- `corAlignPercent` : deprecated. Use parameter `alignPercent`
corMethod deprecated. Use parameter method
corUse deprecated. Use parameter use
displayGrid if TRUE, display aligned panel gridlines
...
other arguments being supplied to geom_text

Details

Estimate correlation from the given data.

Author(s)

Barret Schloerke

See Also

ggally_cor

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
data(tips, package = "reshape")
p_(ggally_cor_v1_5(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "tip")))

# display with no grid
p_(ggally_cor_v1_5(
  tips,  
  mapping = ggplot2::aes_string(x = "total_bill", y = "tip"),  
  displayGrid = FALSE
))

# change text attributes
p_(ggally_cor_v1_5(
  tips,  
  mapping = ggplot2::aes(x = total_bill, y = tip),  
  size = 15,  
  colour = I("red")
))

# split by a variable
p_(ggally_cor_v1_5(
  tips,  
  mapping = ggplot2::aes_string(x = "total_bill", y = "tip", color = "sex"),  
  size = 5
))


**ggally_count**  
*Display counts of observations*

**Description**
Plot the number of observations by using rectangles with proportional areas.

**Usage**

```r
ggally_count(data, mapping, ...)
```

```r
ggally_countDiag(data, mapping, ...)
```

**Arguments**
- `data`: data set using
- `mapping`: aesthetics being used
- `...`: other arguments passed to `geom_tile(...)`

**Details**
You can adjust the size of rectangles with the `x.width` argument.

**Author(s)**
Joseph Larmarange

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
data(tips, package = "reshape")
p_(ggally_count(tips, mapping = ggplot2::aes(x = smoker, y = sex)))
p_(ggally_count(tips, mapping = ggplot2::aes(x = smoker, y = sex, fill = day)))
p_(ggally_count(
  as.data.frame(Titanic),
  mapping = ggplot2::aes(x = Class, y = Survived, weight = Freq)
))
p_(ggally_count(
  as.data.frame(Titanic),
  mapping = ggplot2::aes(x = Class, y = Survived, weight = Freq),
  x.width = 0.5
))
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
p_(ggally_countDiag(tips, mapping = ggplot2::aes(x = smoker)))
p_(ggally_countDiag(tips, mapping = ggplot2::aes(x = smoker, fill = sex)))
```
**ggally_cross**

Plots the number of observations

**Description**

Plot the number of observations by using square points with proportional areas. Could be filled according to chi-squared statistics computed by `stat_cross`. Labels could also be added (see examples).

**Usage**

```r
ggally_cross(data, mapping, ..., scale_max_size = 20, geom_text_args = NULL)
```

**Arguments**

- `data` : data set using
- `mapping` : aesthetics being used
- `...` : other arguments passed to `geom_point(...)`
- `scale_max_size` : `max_size` argument supplied to `scale_size_area()`
- `geom_text_args` : other arguments passed to `geom_text(...)`

**Author(s)**

Joseph Larmarange

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_cross(tips, mapping = aes(x = smoker, y = sex)))
p_(ggally_cross(tips, mapping = aes(x = day, y = time)))

# Custom max size
p_(ggally_cross(tips, mapping = aes(x = smoker, y = sex)) +
   scale_size_area(max_size = 40))

# Custom fill
p_(ggally_cross(tips, mapping = aes(x = smoker, y = sex), fill = "red"))

# Custom shape
p_(ggally_cross(tips, mapping = aes(x = smoker, y = sex), shape = 21))

# Fill squares according to standardized residuals
d <- as.data.frame(Titanic)
p_(ggally_cross(
  d,
  mapping = aes(x = Class, y = Survived, weight = Freq, fill = after_stat(stdres))
) +
   scale_fill_steps2(breaks = c(-3, -2, 2, 3), show.limits = TRUE))
```
# Add labels
```
p_(ggally_cross(
tips,
mapping = aes(
   x = smoker, y = sex, colour = smoker,
   label = scales::percent(after_stat(prop))
)
))
```

# Customize labels' appearance and same size for all squares
```
p_(ggally_cross(
tips,
mapping = aes(
   x = smoker, y = sex,
   size = NULL, # do not map size to a variable
   label = scales::percent(after_stat(prop))
),
   size = 40, # fix value for points size
   fill = "darkblue",
   geom_text_args = list(colour = "white", fontface = "bold", size = 6)
))
```

---

**ggally_crosstable**

*Display a cross-tabulated table*

**Description**

`ggally_crosstable` is a variation of `ggally_table` with few modifications: (i) table cells are drawn; (ii) x and y axis are not expanded (and therefore are not aligned with other `ggally_*` plots); (iii) content and fill of cells can be easily controlled with dedicated arguments.

**Usage**

```
ggally_crosstable(
data,  
mapping,  
cells = c("observed", "prop", "row.prop", "col.prop", "expected", "residuals", "stdres"),  
fill = c("none", "stdres", "residuals"),  
...,  
geom_tile_args = list(colour = "grey50")
)
```

**Arguments**

- `data` data set using
- `mapping` aesthetics being used
- `cells` Which statistic should be displayed in table cells?
- `fill` Which statistic should be used for filling table cells?
- `geom_tile_args` other arguments passed to `geom_tile(...)`
## Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")

# differences with ggally_table()
p_(ggally_table(tips, mapping = aes(x = day, y = time)))
p_(ggally_crosstable(tips, mapping = aes(x = day, y = time)))

# display column proportions
p_(ggally_crosstable(tips, mapping = aes(x = day, y = sex), cells = "col.prop"))

# display row proportions
p_(ggally_crosstable(tips, mapping = aes(x = day, y = sex), cells = "row.prop"))

# change size of text
p_(ggally_crosstable(tips, mapping = aes(x = day, y = sex), size = 8))

# fill cells with standardized residuals
p_(ggally_crosstable(tips, mapping = aes(x = day, y = sex), fill = "stdres"))

# change scale for fill
p_(ggally_crosstable(tips, mapping = aes(x = day, y = sex), fill = "stdres") +
  scale_fill_steps2(breaks = c(-2, 0, 2), show.limits = TRUE))
```

## Description

Make a 2D density plot from a given data.

## Usage

```r
ggally_density(data, mapping, ...)
```

## Arguments

- **data**: data set using
- **mapping**: aesthetics being used
- **...**: parameters sent to either stat_density2d or geom_density2d

## Details

The aesthetic "fill" determines whether or not stat_density2d (filled) or geom_density2d (lines) is used.

## Author(s)

Barret Schloerke
Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_densityDiag(tips, mapping = ggplot2::aes(x = total_bill)))
p_(ggally_densityDiag(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "tip")))
p_(ggally_densityDiag(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "tip", fill = "..level.."))
) + ggplot2::scale_fill_gradient(breaks = c(0.05, 0.1, 0.15, 0.2))

ggally_densityDiag  Univariate density plot

Description

Displays a density plot for the diagonal of a ggpairs plot matrix.

Usage

ggally_densityDiag(data, mapping, ..., rescale = FALSE)

Arguments

data  data set using
mapping aesthetics being used.
... other arguments sent to stat_density
rescale boolean to decide whether or not to rescale the count output

Author(s)

Barret Schloerke

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_densityDiag(tips, mapping = ggplot2::aes(x = total_bill)))
p_(ggally_densityDiag(tips, mapping = ggplot2::aes(x = total_bill, color = day)))
**ggally_denstrip**  
*Tile plot with facets*

**Description**  
Displays a Tile Plot as densely as possible.

**Usage**  
```
ggally_denstrip(data, mapping, ...)
```

**Arguments**  
- `data` data set using
- `mapping` aesthetics being used
- `...` other arguments being sent to `stat_bin`

**Author(s)**  
Barret Schloerke

**Examples**
```
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_denstrip(tips, mapping = ggplot2::aes(x = total_bill, y = sex)))
p_(ggally_denstrip(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "sex")))
p_(ggally_denstrip(tips,
  mapping = ggplot2::aes_string(x = "sex", y = "tip", binwidth = "0.2")
) + ggplot2::scale_fill_gradient(low = "grey80", high = "black"))
```

**ggally_diagAxis**  
*Internal axis labels for ggpairs*

**Description**  
This function is used when `axisLabels == "internal"`.

**Usage**
```
ggally_diagAxis(
  data,
  mapping,
  label = mapping$x,
  labelSize = 5,
  labelXPercent = 0.5,
  labelYPercent = 0.55,
)```
Arguments

- **data**: dataset being plotted
- **mapping**: aesthetics being used (x is the variable the plot will be made for)
- **label**: title to be displayed in the middle. Defaults to `mapping$x`
- **labelSize**: size of variable label
- **labelXPercent**: percent of horizontal range
- **labelYPercent**: percent of vertical range
- **labelHJust**: hjust supplied to label
- **labelVJust**: vjust supplied to label
- **gridLabelSize**: size of grid labels
- **...**: other arguments for `geom_text`

Author(s)

Jason Crowley and Barret Schloerke

Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_diagAxis(tips, ggplot2::aes(x=tip)))
p_(ggally_diagAxis(tips, ggplot2::aes(x=sex)))
```

---

**ggally_dot**  
*Grouped dot plot*

Description

Add jittering with the box plot. `ggally_dot_no_facet` will be a single panel plot, while `ggally_dot` will be a faceted plot

Usage

- `ggally_dot(data, mapping, ...)`
- `ggally_dot_no_facet(data, mapping, ...)`

Arguments

- **data**: data set using
- **mapping**: aesthetics being used
- **...**: other arguments being supplied to `geom_jitter`
**ggally_facetbar**

**Author(s)**
Barret Schloerke

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_dot(tips, mapping = ggplot2::aes(x = total_bill, y = sex)))
p_(ggally_dot(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "sex")))
p_(ggally_dot(tips,
  mapping = ggplot2::aes_string(y = "total_bill", x = "sex", color = "sex")))
p_(ggally_dot(tips,
  mapping = ggplot2::aes_string(y = "total_bill", x = "sex", color = "sex", shape = "sex"))
  + ggplot2::scale_shape(solid=FALSE))
```

---

**ggally_facetbar**  
**Faceted bar plot**

**Description**
X variables are plotted using `geom_bar` and are faceted by the Y variable.

**Usage**

`ggally_facetbar(data, mapping, ...)`

**Arguments**

- `data`  
data set using
- `mapping`  
aesthetics being used
- `...`  
other arguments are sent to `geom_bar`

**Author(s)**
Barret Schloerke

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_facetbar(tips, ggplot2::aes(x = sex, y = smoker, fill = time)))
p_(ggally_facetbar(tips, ggplot2::aes(x = smoker, y = sex, fill = time)))
```
ggally_facetdensity  Faceted density plot

Description
Make density plots by displaying subsets of the data in different panels.

Usage
ggally_facetdensity(data, mapping, ...)

Arguments
- data  data set using
- mapping aesthetics being used
- ...  other arguments being sent to stat_density

Author(s)
Barret Schloerke

Examples
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
data(tips, package = "reshape")
p_(ggally_facetdensity(tips, mapping = ggplot2::aes(x = total_bill, y = sex)))
p_(ggally_facetdensity(
  tips,
  mapping = ggplot2::aes_string(y = "total_bill", x = "sex", color = "sex")
))

--

ggally_facetdensitystrip  Density or tiles plot with facets

Description
Make tile plot or density plot as compact as possible.

Usage
ggally_facetdensitystrip(data, mapping, ..., den_strip = FALSE)

Arguments
- data  data set using
- mapping aesthetics being used
- ...  other arguments being sent to either geom_histogram or stat_density
- den_strip  boolean to decide whether or not to plot a density strip(TRUE) or a facet density(FALSE) plot.
ggally_facethist

Author(s)
Barret Schloerke

Examples
example(ggally_facetdensity)
example(ggally_denstrip)

---

**ggally_facethist**  
*Faceted histogram*

Description
Display subsetted histograms of the data in different panels.

Usage

```r
ggally_facethist(data, mapping, ...)
```

Arguments
- **data**: data set using
- **mapping**: aesthetics being used
- **...**: parameters sent to `stat_bin()`

Author(s)
Barret Schloerke

Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_facethist(tips, mapping = ggplot2::aes(x = tip, y = sex)))
p_(ggally_facethist(tips, mapping = ggplot2::aes_string(x = "tip", y = "sex"), binwidth = 0.1))
```
ggally_nostic_cooksd

Description
A function to display stats::cooks.distance.

Usage
ggally_nostic_cooksd(
  data,
  mapping,
  ..., linePosition = pf(0.5, length(attr(data, "var_x")), nrow(data) - length(attr(data, "var_x"))),
  lineColor = brew_colors("grey"),
  lineType = 2
)

Arguments
data, mapping, ..., lineColor, lineType
  parameters supplied to ggally_nostic_line
linePosition 4 / n is the general cutoff point for Cook’s Distance
Details

A line is added at $F_p, n - p(0.5)$ to display the general cutoff point for Cook’s Distance.


Value

`ggplot2` plot object

See Also

`stats::cooks.distance`

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

dt <- broomify(stats::lm(mpg ~ wt + qsec + am, data = mtcars))
p_(ggally_nostic_cooksd(dt, ggplot2::aes(wt, .cooksd)))

description

A function to display stats::influence’s hat information against a given explanatory variable.

Usage

```r
ggally_nostic_hat(
  data,
  mapping,
  ..., 
  linePosition = 2 * sum(eval_data_col(data, mapping$y))/nrow(data),
  lineColor = brew_colors("grey"),
  lineSize = 0.5,
  lineAlpha = 1,
  lineType = 2,
  avgLinePosition = sum(eval_data_col(data, mapping$y))/nrow(data),
  avgLineColor = brew_colors("grey"),
  avgLineSize = lineSize,
  avgLineAlpha = lineAlpha,
  avgLineType = 1
)
```
Arguments

- `data`: supplied directly to `ggally_nostic_line`
- `linePosition`, `lineColor`, `lineSize`, `lineAlpha`, `lineType` parameters supplied to `ggplot2::geom_line` for the cutoff line
- `avgLinePosition`, `avgLineColor`, `avgLineSize`, `avgLineAlpha`, `avgLineType` parameters supplied to `ggplot2::geom_line` for the average line

Details

As stated in `stats::influence` documentation:
- `hat`: a vector containing the diagonal of the 'hat' matrix.
- The diagonal elements of the 'hat' matrix describe the influence each response value has on the fitted value for that same observation.
- A suggested "cutoff" line is added to the plot at a height of 2 * p / n and an expected line at a height of p / n. If either `linePosition` or `avgLinePosition` is `NULL`, the respective line will not be drawn.

Value

- `ggplot2` plot object

See Also

- `stats::influence`

Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

dt <- broomify(stats::lm(mpg ~ wt + qsec + am, data = mtcars))

p_((ggally_nostic_hat(dt, ggplot2::aes(wt, .hat))))
```

Description

If a non-null `linePosition` value is given, a line will be drawn before the given `continuous_geom` or `combo_geom` is added to the plot.

Usage

```r
ggally_nostic_line(
  data,
  mapping,
  ...
  linePosition = NULL,
  lineColor = "red",
  lineSize = 0.5,
)```
ggally_nostic_resid

```r
ggplot2::geom_point,
combo_geom = ggplot2::geom_boxplot,
mapColorToFill = TRUE
)
```

Arguments

- `data`: supplied directly to `ggplot2::ggplot(data,mapping)`
- `...`: parameters supplied to `continuous_geom` or `combo_geom`
- `linePosition`, `lineColor`, `lineSize`, `lineAlpha`, `lineType`: parameters supplied to `ggplot2::geom_line`
- `continuous_geom`: `ggplot2` geom that is executed after the line is (possibly) added and if the x data is continuous
- `combo_geom`: `ggplot2` geom that is executed after the line is (possibly) added and if the x data is discrete
- `mapColorToFill`: boolean to determine if combo plots should cut the color mapping to the fill mapping

Details

Functions with a color in their name have different default color behavior.

Value

- `ggplot2` plot object

Description

If non-null pVal and sigma values are given, confidence interval lines will be added to the plot at the specified pVal percentiles of a N(0, sigma) distribution.

Usage

```r
ggally_nostic_resid(
data,
mapping,
...,
linePosition = 0,
lineColor = brew_colors("grey"),
lineSize = 0.5,
lineAlpha = 1,
lineType = 1,
lineConfColor = brew_colors("grey"),
lineConfSize = lineSize,
```
lineConfAlpha = lineAlpha,
lineConfType = 2,
pVal = c(0.025, 0.975),
sigma = attr(data, "broom_glance")$sigma,
se = TRUE,
method = "auto",
formula = y ~ x
)

Arguments

data, mapping, ...
  parameters supplied to ggally_nostic_line
linePosition, lineColor, lineSize, lineAlpha, lineType
  parameters supplied to ggplot2::geom_line
lineConfColor, lineConfSize, lineConfAlpha, lineConfType
  parameters supplied to the confidence interval lines
pVal
  percentiles of a N(0, sigma) distribution to be drawn
sigma
  sigma value for the pVal percentiles
se
  boolean to determine if the confidence intervals should be displayed
method, formula
  parameters supplied to ggplot2::geom_smooth. Defaults to "auto" and "y ~ x"

Value

ggplot2 plot object

See Also

stats::residuals

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

dt <- broomify(stats::lm(mpg ~ wt + qsec + am, data = mtcars))
p_(ggally_nostic_resid(dt, ggplot2::aes(wt, .resid)))
Usage

```r
ggally_nostic_se_fit(
  data,
  mapping,
  ..., lineColor = brew_colors("grey"),
  linePosition = NULL
)
```

Arguments

data, mapping, ..., lineColor
  parameters supplied to `ggally_nostic_line`

linePosition
  base comparison for a perfect fit

Details

As stated in `stats::predict` documentation:

If the logical 'se.fit' is 'TRUE', standard errors of the predictions are calculated. If the numeric argument 'scale' is set (with optional "df"), it is used as the residual standard deviation in the computation of the standard errors, otherwise this is extracted from the model fit.

Since the se.fit is TRUE and scale is unset by default, the standard errors are extracted from the model fit.

A base line of 0 is added to give reference to a perfect fit.

Value

`ggplot2` plot object

See Also

`stats::influence`

Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

dt <- broomify(stats::lm(mpg ~ wt + qsec + am, data = mtcars))
p_(ggally_nostic_se_fit(dt, ggplot2::aes(wt, .se.fit)))
```

Description

A function to display `stats::influence`'s sigma value.
Usage

ggally_nostic_sigma(
  data,
  mapping,
  ...,
  lineColor = brew_colors("grey"),
  linePosition = attr(data, "broom_glance")$sigma
)

Arguments

data, mapping, ..., lineColor
  parameters supplied to ggally_nostic_line

linePosition
  line that is drawn in the background of the plot. Defaults to the overall model’s sigma value.

Details

As stated in stats::influence documentation:
sigma: a vector whose i-th element contains the estimate of the residual standard deviation obtained when the i-th case is dropped from the regression. (The approximations needed for GLMs can result in this being ‘NaN’.)

A line is added to display the overall model’s sigma value. This gives a baseline for comparison.

Value

ggplot2 plot object

See Also

stats::influence

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

dt <- broomify(stats::lm(mpg ~ wt + qsec + am, data = mtcars))

p_(ggally_nostic_sigma(dt, ggplot2::aes(wt, .sigma)))

ggally_nostic_std_resid

Description

If non-null pVal and sigma values are given, confidence interval lines will be added to the plot at the specified pVal locations of a N(0, 1) distribution.

Usage

ggally_nostic_std_resid(data, mapping, ..., sigma = 1)
**Arguments**

- `data`, `mapping`, ...
  Parameters supplied to `ggally_nostic_resid`
- `sigma`  
  Sigma value for the pVal percentiles. Set to 1 for standardized residuals

**Value**

`ggplot2` plot object

**See Also**

`stats::rstandard`

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

dt <- broomify(stats::lm(mpg ~ wt + qsec + am, data = mtcars))
p_(ggally_nostic_std_resid(dt, ggplot2::aes(wt, .std.resid)))
```
ggally_ratio

Mosaic plot

Description
Plots the mosaic plot by using fluctuation.

Usage
```r
ggally_ratio(
data,  
mapping = do.call(ggplot2::aes_string, as.list(colnames(data)[1:2])),  
...,  
floor = 0,  
ceiling = NULL  
)
```

Arguments
data    data set using
mapping aesthetics being used. Only x and y will be used and both are required
...     passed to `geom_tile(...)`
floor   don’t display cells smaller than this value
ceiling max value to scale frequencies. If any frequency is larger than the ceiling, the
        fill color is displayed darker than other rectangles

Author(s)
Barret Schloerke

Examples
```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_ratio(tips, ggplot2::aes(sex, day)))
p_(ggally_ratio(tips, ggplot2::aes(sex, day)) + ggplot2::coord_equal())

# only plot tiles greater or equal to 20 and scale to a max of 50
p_(ggally_ratio(  
tips, ggplot2::aes(sex, day),  
floor = 20, ceiling = 50  
) + ggplot2::theme(aspect.ratio = 4/2))
```
Description

Add a smoothed condition mean with a given scatter plot.

Usage

```r
ggally_smooth(
  data,
  mapping,
  ..., 
  method = "lm",
  formula = y ~ x,
  se = TRUE,
  shrink = TRUE
)
```

```r
ggally_smooth_loess(data, mapping, ...)
```

```r
ggally_smooth_lm(data, mapping, ...)
```

Arguments

- **data**: data set using
- **mapping**: aesthetics being used
- **method, se**: parameters supplied to `geom_smooth`
- **formula, ...**: other arguments to add to `geom_smooth`
- **shrink**: boolean to determine if y range is reduced to range of points or points and error ribbon

Details

Y limits are reduced to match original Y range with the goal of keeping the Y axis the same across plots.

Author(s)

Barret Schloerke

Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_smooth(tips, mapping = ggplot2::aes(x = total_bill, y = tip)))
p_(ggally_smooth(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "tip")))
p_(ggally_smooth(tips, mapping = ggplot2::aes_string(x = "total_bill", y = "tip", color = "sex")))
```
ggally_statistic  Generalized text display

Description
Generalized text display

Usage

\[
\text{ggally_statistic}(\\text{data}, \\
\text{mapping}, \\
\text{text}_\text{fn}, \\
\text{title}, \\
\text{na.rm} = \text{NA}, \\
\text{display.grid} = \text{FALSE}, \\
\text{justify.labels} = "\text{right}";, \\
\text{justify.text} = "\text{left}";, \\
\text{sep} = ": ", \\
\text{family} = "\text{mono}"; \\
\text{title.args} = \text{list()}, \\
\text{group.args} = \text{list()}, \\
\text{align.percent} = 0.5, \\
\text{title.hjust} = 0.5, \\
\text{group.hjust} = 0.5 \\
) \\
\]

Arguments

- **data**: data set using
- **mapping**: aesthetics being used
- **text_fn**: function that takes in \(x\) and \(y\) and returns a text string
- **title**: title text to be displayed
- **na.rm**: logical value which determines if NA values are removed. If TRUE, no warning message will be displayed.
- **display_grid**: if TRUE, display aligned panel grid lines. If FALSE (default), display a thin panel border.
- **justify_labels**: justify argument supplied when formatting the labels
- **justify_text**: justify argument supplied when formatting the returned \(text\_fn(x,y)\) values
- **sep**: separation value to be placed between the labels and text
- **family**: font family used when displaying all text. This value will be set in title_args or group_args if no family value exists. By using "mono", groups will align with each other.
- **title_args**: arguments being supplied to the title's \texttt{geom_text}() function
- **group_args**: arguments being supplied to the split-by-color group's \texttt{geom_text}() function
- **align_percent**: relative align position of the text. When title_hjust = 0.5 and group_hjust = 0.5, this should not be needed to be set.
ggally_summarise_by

title_hjust, group_hjust

hjust sent to geom_text() for the title and group values respectively. Any
hjust value supplied in title_args or group_args will take precedence.

See Also

ggally_cor

ggally_summarise_by Summarize a continuous variable by each value of a discrete variable

Description

Display summary statistics of a continuous variable for each value of a discrete variable.

Usage

ggally_summarise_by(
  data,
  mapping,
  text_fn = weighted_median_iqr,
  text_fn_vertical = NULL,
  ...
)

weighted_median_iqr(x, weights = NULL)

weighted_mean_sd(x, weights = NULL)

Arguments

data data set using

mapping aesthetics being used

text_fn function that takes an x and weights and returns a text string

text_fn_vertical function that takes an x and weights and returns a text string, used when x is
discrete and y is continuous. If not provided, will use text_fn, replacing spaces by carriage returns.

... other arguments passed to geom_text(...) 

x a numeric vector

weights an optional numeric vectors of weights. If NULL, equal weights of 1 will be taken
into account.

Details

weighted_median_iqr computes weighted median and interquartile range.

weighted_mean_sd computes weighted mean and standard deviation.

Author(s)

Joseph Larmarange
Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

if (require(Hmisc)) {
  data(tips, package = "reshape")
  p_(ggally_summarise_by(tips, mapping = aes(x = total_bill, y = day)))
  p_(ggally_summarise_by(tips, mapping = aes(x = day, y = total_bill)))
  # colour is kept only if equal to the discrete variable
  p_(ggally_summarise_by(tips, mapping = aes(x = total_bill, y = day, color = day)))
  p_(ggally_summarise_by(tips, mapping = aes(x = total_bill, y = day, color = sex)))
  p_(ggally_summarise_by(tips, mapping = aes(x = day, y = total_bill, color = day)))
  # custom text size
  p_(ggally_summarise_by(tips, mapping = aes(x = total_bill, y = day), size = 6))
  # change statistic to display
  p_(ggally_summarise_by(tips, mapping = aes(x = total_bill, y = day), text_fn = weighted_mean_sd))
  # custom stat function
  weighted_sum <- function(x, weights = NULL) {
    if (is.null(weights)) weights <- 1
    paste0("Total : ", round(sum(x * weights, na.rm = TRUE), digits = 1))
  }
  p_(ggally_summarise_by(tips, mapping = aes(x = total_bill, y = day), text_fn = weighted_sum))
}

---

ggally_table

Display a table of the number of observations

Description

Plot the number of observations as a table. Other statistics computed by stat_cross could be used (see examples).

Usage

ggally_table(
  data,
  mapping,
  keep.zero.cells = FALSE,
  ..., 
  geom_tile_args = NULL
)

ggally_tableDiag(
  data,
  mapping,
  keep.zero.cells = FALSE,
  ..., 
  geom_tile_args = NULL
)
Arguments

data      data set using
mapping   aesthetics being used
keep.zero.cells
               If TRUE, display cells with no observation.
...        other arguments passed to geom_text(...)
geom_tile_args other arguments passed to geom_tile(...)

Note

The colour aesthetic is taken into account only if equal to x or y.

Author(s)

Joseph Larmarange

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggally_table(tips, mapping = aes(x = smoker, y = sex)))
p_(ggally_table(tips, mapping = aes(x = day, y = time)))
p_(ggally_table(tips, mapping = aes(x = smoker, y = sex, colour = smoker)))

# colour is kept only if equal to x or y
p_(ggally_table(tips, mapping = aes(x = smoker, y = sex, colour = day)))

# diagonal version
p_(ggally_tableDiag(tips, mapping = aes(x = smoker)))

# custom label size and color
p_(ggally_table(tips, mapping = aes(x = smoker, y = sex), size = 16, color = "red"))

# display column proportions
p_(ggally_table(
  tips,
  mapping = aes(x = day, y = sex, label = scales::percent(after_stat(col.prop)))
))

# draw table cells
p_(ggally_table(
  tips,
  mapping = aes(x = smoker, y = sex),
  geom_tile_args = list(colour = "black", fill = "white")
))

# Use standardized residuals to fill table cells
p_(ggally_table(
  as.data.frame(Titanic),
  mapping = aes(  
    x = Class, y = Survived, weight = Freq,
    fill = after_stat(stdres),
    label = scales::percent(after_stat(col.prop), accuracy = .1)
))
ggally_text

Description

Plot text for a plot.

Usage

ggally_text(
  label,
  mapping = ggplot2::aes(color = "black"),
  xP = 0.5,
  yP = 0.5,
  xrange = c(0, 1),
  yrange = c(0, 1),
  ...
)

Arguments

label text that you want to appear
mapping aesthetics that don’t relate to position (such as color)
xP horizontal position percentage
yP vertical position percentage
xrange range of the data around it. Only nice to have if plotting in a matrix
yrange range of the data around it. Only nice to have if plotting in a matrix
... other arguments for geom_text

Author(s)

Barret Schloerke

Examples

# Small function to display plots only if it’s interactive
p_ <- GGally::print_if_interactive

p_(ggally_text("Example 1"))
p_(ggally_text("Example\nTwo", mapping = ggplot2::aes(size = 15), color = I("red")))
ggally_trends

Trends line plot

Description
Plot trends using line plots. For continuous y variables, plot the evolution of the mean. For binary y variables, plot the evolution of the proportion.

Usage

\[
\text{ggally_trends}(\text{data}, \text{mapping}, \ldots, \text{include_zero} = \text{FALSE})
\]

Arguments
- `data`: data set using
- `mapping`: aesthetics being used
- `...`: other arguments passed to `geom_line(...)`
- `include_zero`: Should 0 be included on the y-axis?

Author(s)
Joseph Larmarange

Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
tips_f <- tips
tips_f$day <- factor(tips$day, c("Thur", "Fri", "Sat", "Sun"))

# Numeric variable
p_(ggally_trends(tips_f, mapping = aes(x = day, y = total_bill)))
p_(ggally_trends(tips_f, mapping = aes(x = day, y = total_bill, colour = time)))

# Binary variable
p_(ggally_trends(tips_f, mapping = aes(x = day, y = smoker)))
p_(ggally_trends(tips_f, mapping = aes(x = day, y = smoker, colour = sex)))

# Discrete variable with 3 or more categories
p_(ggally_trends(tips_f, mapping = aes(x = smoker, y = day)))
p_(ggally_trends(tips_f, mapping = aes(x = smoker, y = day, color = sex)))

# Include zero on Y axis
p_(ggally_trends(tips_f, mapping = aes(x = day, y = total_bill), include_zero = TRUE))
p_(ggally_trends(tips_f, mapping = aes(x = day, y = smoker), include_zero = TRUE))

# Change line size
p_(ggally_trends(tips_f, mapping = aes(x = day, y = smoker, colour = sex), size = 3))

# Define weights with the appropriate aesthetic
d <- as.data.frame(Titanic)
```
ggbivariate

Display an outcome using several potential explanatory variables

Description

ggbivariate is a variant of ggduo for plotting an outcome variable with several potential explanatory variables.

Usage

ggbivariate(
  data,
  outcome,
  explanatory = NULL,
  mapping = NULL,
  types = NULL,
  ...
  rowbar_args = NULL
)

Arguments

data dataset to be used, can have both categorical and numerical variables
outcome name or position of the outcome variable (one variable only)
explanatory names or positions of the explanatory variables (if NULL, will take all variables other than outcome)
mapping additional aesthetic to be used, for example to indicate weights (see examples)
types custom types of plots to use, see ggduo
... additional arguments passed to ggduo (see examples)
rowbar_args additional arguments passed to ggally_rowbar (see examples)

Author(s)

Joseph Larmarange

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(tips, package = "reshape")
p_(ggbivariate(tips, "smoker", c("day", "time", "sex", "tip")))

# Personalize plot title and legend title
p_(ggbivariate(
  ggally_trends(  
    d,  
    mapping = aes(x = Class, y = Survived, weight = Freq, color = Sex),  
    include_zero = TRUE  
  ))
ggcoef  

Model coefficients with broom and ggplot2 

Description  
Plot the coefficients of a model with broom and ggplot2.

Usage  

ggcoef(  
  x,  
  mapping = aes_string(y = "term", x = "estimate"),  
  conf.int = TRUE,  
  conf.level = 0.95,  
  exponentiate = FALSE,  
  exclude_intercept = FALSE,  
  vline = TRUE,  
  vline_intercept = "auto",  
  vline_color = "gray50",  
  vline_linetype = "dotted",  
  vline_size = 1,  
  errorbar_color = "gray25",  
  ...  
)
errorbar_height = 0,
errorbar_linetype = "solid",
errorbar_size = 0.5,
sort = c("none", "ascending", "descending"),
...
)

Arguments

x a model object to be tidied with tidy or a data frame (see Details)
mapping default aesthetic mapping
conf.int display confidence intervals as error bars?
conf.level level of confidence intervals (passed to tidy if x is not a data frame)
extponentiate if TRUE, x-axis will be logarithmic (also passed to tidy if x is not a data frame)
exclude_intercept should the intercept be excluded from the plot?
vline print a vertical line?
vline_intercept xintercept for the vertical line. "auto" for x = 0 (or x = 1 if exponentiate is TRUE)
vline_color color of the vertical line
vline_linetype line type of the vertical line
vline_size size of the vertical line
errorbar_color color of the error bars
errorbar_height height of the error bars
errorbar_linetype line type of the error bars
errorbar_size size of the error bars
sort "none" (default) do not sort, "ascending" sort by increasing coefficient value, or "descending" sort by decreasing coefficient value
... additional arguments sent to geom_point

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

library(broom)
reg <- lm(Sepal.Length ~ Sepal.Width + Petal.Length + Petal.Width, data = iris)
p_(ggcoef(reg))
d <- as.data.frame(Titanic)
reg2 <- glm(Survived ~ Sex + Age + Class, family = binomial, data = d, weights = d$Freq)
ggcoef(reg2, exponentiate = TRUE)
ggcoef(
  reg2, exponentiate = TRUE, exclude_intercept = TRUE,
  errorbar_height = .2, color = "blue", sort = "ascending"
)
**ggcorr**  
**Correlation matrix**

**Description**
Function for making a correlation matrix plot, using *ggplot2*. The function is directly inspired by Tian Zheng and Yu-Sung Su’s corrplot function in the ‘arm’ package. Please visit http://github.com/briatte/ggcorr for the latest version of ggcorr, and see the vignette at https://briatte.github.io/ggcorr/ for many examples of how to use it.

**Usage**

```r
ggcorr(
  data,  
  method = c("pairwise", "pearson"),
  cor_matrix = NULL,
  nbbreaks = NULL,
  digits = 2,
  name = "",
  low = "#3B9AB2",
  mid = "#EEEEEE",
  high = "#F21A00",
  midpoint = 0,
  palette = NULL,
  geom = "tile",
  min_size = 2,
  max_size = 6,
  label = FALSE,
  label_alpha = FALSE,
  label_color = "black",
  label_round = 1,
  label_size = 4,
  limits = c(-1, 1),
  drop = is.null(limits) || identical(limits, FALSE),
  layout.exp = 0,
  legend.position = "right",
  legend.size = 9,
  ...  
)
```

**Arguments**

- **data**  
a data frame or matrix containing numeric (continuous) data. If any of the columns contain non-numeric data, they will be dropped with a warning.

- **method**  
a vector of two character strings. The first value gives the method for computing covariances in the presence of missing values, and must be (an abbreviation of) one of "everything", "all.obs", "complete.obs", "na.or.complete" or "pairwise.complete.obs". The second value gives the type of correlation coefficient to compute, and must be one of "pearson", "kendall" or "spearman". See *cor* for details. Defaults to c("pairwise", "pearson").
the named correlation matrix to use for calculations. Defaults to the correlation matrix of data when data is supplied.

the number of breaks to apply to the correlation coefficients, which results in a categorical color scale. See "Note". Defaults to NULL (no breaks, continuous scaling).

the number of digits to show in the breaks of the correlation coefficients: see cut for details. Defaults to 2.

a character string for the legend that shows the colors of the correlation coefficients. Defaults to "" (no legend name).

the lower color of the gradient for continuous scaling of the correlation coefficients. Defaults to "#3B9AB2" (blue).

the midpoint color of the gradient for continuous scaling of the correlation coefficients. Defaults to "#EEEEEE" (very light grey).

the upper color of the gradient for continuous scaling of the correlation coefficients. Defaults to "#F21A00" (red).

the midpoint value for continuous scaling of the correlation coefficients. Defaults to 0.

if nbbreaks is used, a ColorBrewer palette to use instead of the colors specified by low, mid and high. Defaults to NULL.

the geom object to use. Accepts either "tile", "circle", "text" or "blank".

when geom has been set to "circle", the minimum size of the circles. Defaults to 2.

when geom has been set to "circle", the maximum size of the circles. Defaults to 6.

whether to add correlation coefficients to the plot. Defaults to FALSE.

whether to make the correlation coefficients increasingly transparent as they come close to 0. Also accepts any numeric value between 0 and 1, in which case the level of transparency is set to that fixed value. Defaults to FALSE (no transparency).

the color of the correlation coefficients. Defaults to "grey75".

the decimal rounding of the correlation coefficients. Defaults to 1.

the size of the correlation coefficients. Defaults to 4.

bounding of color scaling for correlations, set limits = NULL or FALSE to remove

if using nbbreaks, whether to drop unused breaks from the color scale. Defaults to FALSE (recommended).

a multiplier to expand the horizontal axis to the left if variable names get clipped. Defaults to 0 (no expansion).

where to put the legend of the correlation coefficients: see theme for details. Defaults to "bottom".

the size of the legend title and labels, in points: see theme for details. Defaults to 9.

other arguments supplied to geom_text for the diagonal labels.
Note

Recommended values for the `nbreaks` argument are 3 to 11, as values above 11 are visually difficult to separate and are not supported by diverging ColorBrewer palettes.

Author(s)

Francois Briatte, with contributions from Amos B. Elberg and Barret Schloerke

See Also

cor and corrplot in the arm package.

Examples

# Small function to display plots only if it's interactive
define_p(ggally::print_if_interactive)

# Basketball statistics provided by Nathan Yau at Flowing Data.

define_p(ggcorr(dt[, -1]))

# Labeled output, with coefficient transparency.
define_p(ggcorr(dt[, -1],
               label = TRUE,
               label_alpha = TRUE))

# Custom options.
define_p(ggcorr(
    dt[, -1],
    name = expression(rho),
    geom = "circle",
    max_size = 10,
    min_size = 2,
    size = 3,
    hjust = 0.75,
    nbreaks = 6,
    angle = -45,
    palette = "PuOr" # colorblind safe, photocopy-able
))

# Supply your own correlation matrix
define_p(ggcorr(
    data = NULL,
    cor_matrix = cor(dt[, -1], use = "pairwise")
))

---

**ggduo**  
**ggplot2** generalized pairs plot for two columns sets of data

Description

Make a matrix of plots with a given data set with two different column sets
Usage

```r
ggduo(
  data,
  mapping = NULL,
  columnsX = 1:ncol(data),
  columnsY = 1:ncol(data),
  title = NULL,
  types = list(continuous = "smooth_loess", comboVertical = "box_no_facet",
               comboHorizontal = "facethist", discrete = "count"),
  axisLabels = c("show", "none"),
  columnLabelsX = colnames(data[columnsX]),
  columnLabelsY = colnames(data[columnsY]),
  labeller = "label_value",
  switch = NULL,
  xlab = NULL,
  ylab = NULL,
  showStrips = NULL,
  legend = NULL,
  cardinality_threshold = 15,
  progress = NULL,
  xProportions = NULL,
  yProportions = NULL,
  legends = stop("deprecated")
)
```

Arguments

data
  data set using. Can have both numerical and categorical data.

mapping
  aesthetic mapping (besides x and y). See `aes()`. If mapping is numeric, columns
  will be set to the mapping value and mapping will be set to NULL.

columnsX, columnsY
  which columns are used to make plots. Defaults to all columns.

title, xlab, ylab
  title, x label, and y label for the graph

types
  see Details

axisLabels
  either "show" to display axisLabels or "none" for no axis labels

columnLabelsX, columnLabelsY
  label names to be displayed. Defaults to names of columns being used.

labeller
  labeller for facets. See `labellers`. Common values are "label_value" (de-
  fault) and "label_parsed".

switch
  switch parameter for facet_grid. See `ggplot2::facet_grid`. By default, the
  labels are displayed on the top and right of the plot. If "x", the top labels
  will be displayed to the bottom. If "y", the right-hand side labels will be displayed
  to the left. Can also be set to "both"

showStrips
  boolean to determine if each plot's strips should be displayed. NULL will default
  to the top and right side plots only. TRUE or FALSE will turn all strips on or off
  respectively.

legend
  May be the two objects described below or the default NULL value. The legend
  position can be moved by using `ggplot2`'s theme element `pm + theme(legend.position
  = "bottom")`
**a numeric vector of length 2** provides the location of the plot to use the legend for the plot matrix’s legend. Such as `legend = c(3,5)` which will use the legend from the plot in the third row and fifth column.

**a single numeric value** provides the location of a plot according to the display order. Such as `legend = 3` in a plot matrix with 2 rows and 5 columns displayed by column will return the plot in position `c(1,2)`.

**a object from `grab_legend()`** a predetermined plot legend that will be displayed directly.

cardinality_threshold
maximum number of levels allowed in a character / factor column. Set this value to NULL to not check factor columns. Defaults to 15.

progress
NULL (default) for a progress bar in interactive sessions with more than 15 plots, TRUE for a progress bar, FALSE for no progress bar, or a function that accepts at least a plot matrix and returns a new progress: `::progress_bar`. See `ggmatrix_progress`.

xProportions, yProportions
Value to change how much area is given for each plot. Either NULL (default), numeric value matching respective length, `grid::unit` object with matching respective length or “auto” for automatic relative proportions based on the number of levels for categorical variables.

legends
deprecated

Details

types is a list that may contain the variables ‘continuous’, ‘combo’, ‘discrete’, and ‘na’. Each element of the list may be a function or a string. If a string is supplied, if a string is supplied, it must be a character string representing the tail end of a `ggally_NAME` function. The list of current valid `ggally_NAME` functions is visible in a dedicated vignette.

**continuous** This option is used for continuous X and Y data.

**comboHorizontal** This option is used for either continuous X and categorical Y data or categorical X and continuous Y data.

**comboVertical** This option is used for either continuous X and categorical Y data or categorical X and continuous Y data.

**discrete** This option is used for categorical X and Y data.

**na** This option is used when all X data is NA, all Y data is NA, or either all X or Y data is NA.

If 'blank' is ever chosen as an option, then ggdq will produce an empty plot.

If a function is supplied as an option, it should implement the function api of `function(data,mapping,...){#make ggplot2 plot}`. If a specific function needs its parameters set, `wrap(fn,param1 = val1,param2 = val2)` the function with its parameters.

Examples

```r
# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(baseball, package = "plyr")

# Keep players from 1990-1995 with at least one at bat
# Add how many singles a player hit
# (must do in two steps as X1b is used in calculations)
```

dt <- transform(
  subset(baseball, year >= 1990 & year <= 1995 & ab > 0),
  X1b = h - Z2b - X3b - hr
)

# Add
# the player's batting average,
# the player's slugging percentage,
# and the player's on base percentage
# Make factor a year, as each season is discrete
dt <- transform(
  dt,
  batting_avg = h / ab,
  slug = (X1b + 2*X2b + 3*X3b + 4*hr) / ab,
  on_base = (h + bb + hbp) / (ab + bb + hbp),
  year = as.factor(year)
)

pm <- ggduo(
  dt,
  c("year", "g", "ab", "lg"),
  c("batting_avg", "slug", "on_base"),
  mapping = ggplot2::aes(color = lg)
)

# Prints, but
# there is severe over plotting in the continuous plots
# the labels could be better
# want to add more hitting information
p_(pm)

# address overplotting issues and add a title
pm <- ggduo(
  dt,
  c("year", "g", "ab", "lg"),
  c("batting_avg", "slug", "on_base"),
  columnLabelsX = c("year", "player game count", "player at bat count", "league"),
  columnLabelsY = c("batting avg", "slug %", "on base %"),
  title = "Baseball Hitting Stats from 1990-1995",
  mapping = ggplot2::aes(color = lg),
  types = list(
    # change the shape and add some transparency to the points
    continuous = wrap("smooth_loess", alpha = 0.50, shape = "+")
  ),
  showStrips = FALSE
)

p_(pm)

# Use "auto" to adapt width of the sub-plots
pm <- ggduo(
  dt,
  c("year", "g", "ab", "lg"),
  c("batting_avg", "slug", "on_base"),
  mapping = ggplot2::aes(color = lg),
  xProportions = "auto"
)
# Custom widths & heights of the sub-plots
pm <- ggduo(
  dt,
  c("year", "g", "ab", "lg"),
  c("batting_avg", "slug", "on_base"),
  mapping = ggplot2::aes(color = lg),
  xProportions = c(6, 4, 3, 2),
  yProportions = c(1, 2, 1)
)

p_(pm)

# Example derived from:
## R Data Analysis Examples | Canonical Correlation Analysis. UCLA: Institute for Digital
## Research and Education.
## from http://www.stats.idre.ucla.edu/r/dae/canonical-correlation-analysis
## "Example 1. A researcher has collected data on three psychological variables, four
## academic variables (standardized test scores) and gender for 600 college freshman.
## She is interested in how the set of psychological variables relates to the academic
## variables and gender. In particular, the researcher is interested in how many
## dimensions (canonical variables) are necessary to understand the association between
## the two sets of variables."
data(pyschademic)
summary(pyschademic)

(psych_variables <- attr(pyschademic, "psychology"))
(academic_variables <- attr(pyschademic, "academic"))

## Within correlation
p_(ggpairs(pyschademic, columns = psych_variables))
p_(ggpairs(pyschademic, columns = academic_variables))

## Between correlation
loess_with_cor <- function(data, mapping, ..., method = "pearson") {
  x <- eval_data_col(data, mapping$x)
  y <- eval_data_col(data, mapping$y)
  cor <- cor(x, y, method = method)
  ggally_smooth_loess(data, mapping, ...) +
  ggplot2::geom_label(
    data = data.frame(
      x = min(x, na.rm = TRUE),
      y = max(y, na.rm = TRUE),
      lab = round(cor, digits = 3)
    ),
    mapping = ggplot2::aes(x = x, y = y, label = lab),
    hjust = 0, vjus = 1,
    size = 5, fontface = "bold",
    inherit.aes = FALSE # do not inherit anything from the ...
  )
}

pm <- ggduo(
  psychademic,
  rev(psych_variables), academic_variables,
  types = list(continuous = loess_with_cor),
)
showStrips = FALSE
}
suppressWarnings(p_(pm)) # ignore warnings from loess

# add color according to sex
pm <- ggduo(
  psychademic,
  mapping = ggplot2::aes(color = sex),
  rev(psych_variables), academic_variables,
  types = list(continuous = loess_with_cor),
  showStrips = FALSE,
  legend = c(5,2)
)
suppressWarnings(p_(pm))

# add color according to sex
pm <- ggduo(
  psychademic,
  mapping = ggplot2::aes(color = motivation),
  rev(psych_variables), academic_variables,
  types = list(continuous = loess_with_cor),
  showStrips = FALSE,
  legend = c(5,2)
) +
  ggplot2::theme(legend.position = "bottom")
suppressWarnings(p_(pm))

---

**ggfacet**

Single **ggplot2** plot matrix with **facet_grid**

**Description**

Single **ggplot2** plot matrix with **facet_grid**

**Usage**

```r
ggfacet(
  data,
  mapping = NULL,
  columnsX = 1:ncol(data),
  columnsY = 1:ncol(data),
  fn = ggally_points,
  ..., columnLabelsX = names(data[columnsX]),
  columnLabelsY = names(data[columnsY]),
  xlab = NULL,
  ylab = NULL,
  title = NULL,
  scales = "free"
)
```
Arguments

data data.frame that contains all columns to be displayed. This data will be melted before being passed into the function fn

mapping aesthetic mapping (besides x and y). See aes()
columnsX columns to be displayed in the plot matrix
columnsY rows to be displayed in the plot matrix
fn function to be executed. Similar to ggpairs and ggduo, the function may either be a string identifier or a real function that wrap understands.
... extra arguments passed directly to fn
columnLabelsX, columnLabelsY column and row labels to display in the plot matrix
xlab, ylab, title plot matrix labels
scales parameter supplied to ggplot2::facet_grid. Default behavior is "free"

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
if (requireNamespace("chemometrics", quietly = TRUE)) {
  data(NIR, package = "chemometrics")
  NIR_sub <- data.frame(NIR$yGlcEtOH, NIR$xNIR[,1:3])
  str(NIR_sub)
  x_cols <- c("X1115.0", "X1120.0", "X1125.0")
  y_cols <- c("Glucose", "Ethanol")

  # using ggduo directly
  p <- ggduo(NIR_sub, x_cols, y_cols, types = list(continuous = "points"))
  p_(p)

  # using ggfacet
  p <- ggfacet(NIR_sub, x_cols, y_cols)
  p_(p)

  # add a smoother
  p <- ggfacet(NIR_sub, x_cols, y_cols, fn = 'smooth_loess')
  p_(p)

  # same output
  p <- ggfacet(NIR_sub, x_cols, y_cols, fn = ggally_smooth_loess)
  p_(p)

  # Change scales to be the same in for every row and for every column
  p <- ggfacet(NIR_sub, x_cols, y_cols, scales = "fixed")
  p_(p)
}

gglegend

**gglegend**

Plot only legend of plot function

**Description**

Plot only legend of plot function

**Usage**

`gglegend(fn)`

**Arguments**

- `fn` this value is passed directly to an empty `wrap` call. Please see `wrap` for more details.

**Value**

A function that when called with arguments will produce the legend of the plotting function supplied.

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

# display regular plot
p_(ggally_points(iris, ggplot2::aes(Sepal.Length, Sepal.Width, color = Species)))

# Make a function that will only print the legend
points_legend <- gglegend(ggally_points)
p_(points_legend(iris, ggplot2::aes(Sepal.Length, Sepal.Width, color = Species)))

# produce the sample legend plot, but supply a string that 'wrap' understands
same_points_legend <- gglegend("points")
identical(
  attr(attr(points_legend, "fn"), "original_fn"),
  attr(attr(same_points_legend, "fn"), "original_fn")
)

# Complicated examples
custom_legend <- wrap(gglegend("points"), size = 6)
p_(custom_legend(iris, ggplot2::aes(Sepal.Length, Sepal.Width, color = Species)))

# Use within ggpairs
pm <- ggpairs(iris, 1:2, mapping = ggplot2::aes(color = Species),
  upper = list(continuous = gglegend("points"))
)
p_(pm)

# Place a legend in a specific location
pm <- ggpairs(iris, 1:2, mapping = ggplot2::aes(color = Species))
# Make the legend
pm[1,2] <- points_legend(iris, ggplot2::aes(Sepal.Width, Sepal.Length, color = Species))
p_(pm)

Description

Make a generic matrix of `ggplot2` plots.

Usage

```r
ggmatrix(
plots,
nrow, ncol,
xAxisLabels = NULL,
yAxisLabels = NULL,
title = NULL,
xlab = NULL,
ylab = NULL,
byrow = TRUE,
showStrips = NULL,
showXAxisPlotLabels = TRUE,
showYAxisPlotLabels = TRUE,
labeller = NULL,
switch = NULL,
xProportions = NULL,
yProportions = NULL,
progress = NULL,
data = NULL,
gg = NULL,
legend = NULL
)
```

Arguments

- `plots` list of plots to be put into matrix
- `nrow, ncol` number of rows and columns
- `xAxisLabels, yAxisLabels` strip titles for the x and y axis respectively. Set to `NULL` to not be displayed
- `title, xlab, ylab` title, x label, and y label for the graph. Set to `NULL` to not be displayed
- `byrow` boolean that determines whether the plots should be ordered by row or by column
- `showStrips` boolean to determine if each plot’s strips should be displayed. `NULL` will default to the top and right side plots only. `TRUE` or `FALSE` will turn all strips on or off respectively.
showAxisPlotLabels, showXAxisPlotLabels, showYAxisPlotLabels
booleans that determine if the plots axis labels are printed on the X (bottom) or Y (left) part of the plot matrix. If showAxisPlotLabels is set, both showXAxisPlotLabels and showYAxisPlotLabels will be set to the given value.

labeller
labeller for facets. See labellers. Common values are "label_value" (default) and "label_parsed".

switch
switch parameter for facet_grid. See ggpplot2::facet_grid. By default, the labels are displayed on the top and right of the plot. If "x", the top labels will be displayed to the bottom. If "y", the right-hand side labels will be displayed to the left. Can also be set to "both"

xProportions, yProportions
Value to change how much area is given for each plot. Either NULL (default), numeric value matching respective length, or grid::unit object with matching respective length

progress
NULL (default) for a progress bar in interactive sessions with more than 15 plots, TRUE for a progress bar, FALSE for no progress bar, or a function that accepts at least a plot matrix and returns a new progress::progress_bar. See ggmatrix_progress.

data
data set using. This is the data to be used in place of `ggally_data` if the plot is a string to be evaluated at print time

gg
ggplot2 theme objects to be applied to every plot

legend
May be the two objects described below or the default NULL value. The legend position can be moved by using ggpplot2's theme element pm + theme(legend.position = "bottom")

- a numeric vector of length 2 provides the location of the plot to use the legend for the plot matrix's legend. Such as legend = c(3,5) which will use the legend from the plot in the third row and fifth column
- a single numeric value provides the location of a plot according to the display order. Such as legend = 3 in a plot matrix with 2 rows and 5 columns displayed by column will return the plot in position c(1,2)
- a object from grab_legend() a predetermined plot legend that will be displayed directly

Memory usage

Now that the print.ggmatrix method uses a large gtable object, rather than print each plot independently, memory usage may be of concern. From small tests, memory usage fluctuates around object.size(data) * 0.3 * length(plots). So, for a 80Mb random noise dataset with 100 plots, about 2.4 Gb of memory needed to print. For the 3.46 Mb diamonds dataset with 100 plots, about 100 Mb of memory was needed to print. The benefits of using the ggplot2 format greatly outweigh the price of about 20

Author(s)
Barret Schloerke

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

plotList <- list()
for (i in 1:6) {
  plotList[[i]] <- ggally_text(paste("Plot ", i, sep=""))
}

pm <- ggmatrix(
  plotList,
  2, 3,
  c("A", "B", "C"),
  c("D", "E"),
  byrow = TRUE
)
p_(pm)

pm <- ggmatrix(
  plotList,
  2, 3,
  xAxisLabels = c("A", "B", "C"),
  yAxisLabels = NULL,
  byrow = FALSE,
  showXAxisPlotLabels = FALSE
)
p_(pm)

---

**ggmatrix_gtable**  
**ggmatrix gtable**  
**object**

**Description**

Specialized method to print the `ggmatrix` object.

**Usage**

```r
ggmatrix_gtable(
  pm,
  ..., 
  progress = NULL,
  progress_format = formals(ggmatrix_progress)$format
)
```

**Arguments**

- `pm`  
  *ggmatrix* object to be plotted
- `...`  
  ignored
- `progress`, `progress_format`
  Please use the 'progress' parameter in your `ggmatrix`-like function. See `ggmatrix_progress` for a few examples. These parameters will soon be deprecated.

**Author(s)**

Barret Schloerke
Examples

data(tips, package = "reshape")
pm <- ggpairs(tips, c(1,3,2), mapping = ggplot2::aes_string(color = "sex"))
ggmatrix_gtable(pm)

Description

Experimental

Usage

ggmatrix_location(pm, location = NULL, rows = NULL, cols = NULL)

Arguments

- **pm**: `ggmatrix` plot object
- **location**: "all", TRUE  All row and col combinations
  "none"  No row and column combinations
  "upper"  Locations where the column value is higher than the row value
  "lower"  Locations where the row value is higher than the column value
  "diag"  Locations where the column value is equal to the row value
  matrix or data.frame  matrix values will be converted into data.frames.
  - A data.frame with the exact column names c("row","col")
  - A data.frame with the number of rows and columns matching the plot matrix object provided. Each cell will be tested for a "truthy" value to determine if the location should be kept.
- **rows**: numeric vector of the rows to be used. Will be used with cols if location is NULL
- **cols**: numeric vector of the cols to be used. Will be used with rows if location is NULL

Details

Convert many types of location values to a consistent data.frame of row and col values.

Value

Data frame with columns c("row","col") containing locations for the plot matrix
Examples

```r
pm <- ggpairs(reshape::tips, 1:3)

# All locations
ggmatrix_location(pm, location = "all")
ggmatrix_location(pm, location = TRUE)

# No locations
ggmatrix_location(pm, location = "none")

# "upper" triangle locations
ggmatrix_location(pm, location = "upper")

# "lower" triangle locations
ggmatrix_location(pm, location = "lower")

# "diag" locations
ggmatrix_location(pm, location = "diag")

# specific rows
ggmatrix_location(pm, rows = 2)

# specific columns
ggmatrix_location(pm, cols = 2)

# row and column combinations
ggmatrix_location(pm, rows = c(1,2), cols = c(1,3))

# matrix locations
mat <- matrix(TRUE, ncol = 3, nrow = 3)
mat[1,1] <- FALSE
locs <- ggmatrix_location(pm, location = mat)
## does not contain the 1,1 cell
locs

# Use the output of a prior ggmatrix_location
ggmatrix_location(pm, location = locs)
```

Description

**ggmatrix** default progress bar

Usage

```r
ggmatrix_progress(
  format = " plot: [:plot_i,:plot_j] [:bar]:percent est::eta ",
  clear = TRUE,
  show_after = 0,
  ...
)
```

```r
```
Arguments

format, clear, show_after, ...
parameters supplied directly to `progress::progress_bar$new()`

Value

function that accepts a plot matrix as the first argument and ... for future expansion. Internally, the plot matrix is used to determine the total number of plots for the progress bar.

Examples

```r
p_ <- GGally::print_if_interactive

pm <- ggpairs(iris, 1:2, progress = ggmatrix_progress())
p_(pm)

# does not clear after finishing
pm <- ggpairs(iris, 1:2, progress = ggmatrix_progress(clear = FALSE))
p_(pm)
```

Description

Function for plotting network objects using `ggplot2`, now replaced by the `ggnet2` function, which provides additional control over plotting parameters. Please visit [http://github.com/briatte/ggnet](http://github.com/briatte/ggnet) for the latest version of ggnet2, and [https://briatte.github.io/ggnet](https://briatte.github.io/ggnet) for a vignette that contains many examples and explanations.

Usage

```r
ggnet(
  net,
  mode = "fruchtermanreingold",
  layout.par = NULL,
  layout.exp = 0,
  size = 9,
  alpha = 1,
  weight = "none",
  weight.legend = NA,
  weight.method = weight,
  weight.min = NA,
  weight.max = NA,
  weight.cut = FALSE,
  group = NULL,
  group.legend = NA,
  node.group = group,
  node.color = NULL,
  node.alpha = alpha,
  segment.alpha = alpha,
  segment.color = "grey50",
)```
Arguments

net an object of class network, or any object that can be coerced to this class, such as an adjacency or incidence matrix, or an edge list: see edgelist.constructors and network for details. If the object is of class igraph and the intergraph package is installed, it will be used to convert the object: see asNetwork for details.

mode a placement method from those provided in the sna package: see gplot.layout for details. Also accepts the names of two numeric vertex attributes of net, or a matrix of numeric coordinates, in which case the first two columns of the matrix are used. Defaults to the Fruchterman-Reingold force-directed algorithm.

layout.par options to be passed to the placement method, as listed in gplot.layout. Defaults to NULL.

layout.exp a multiplier to expand the horizontal axis if node labels get clipped: see expand_range for details. Defaults to 0 (no expansion).

size size of the network nodes. If the nodes are weighted, their area is proportionally scaled up to the size set by size. Defaults to 9.

alpha a level of transparency for nodes, vertices and arrows. Defaults to 1.

weight the weighting method for the nodes, which might be a vertex attribute or a vector of size values. Also accepts "indegree", "outdegree", "degree" or "freeman" to size the nodes by their unweighted degree centrality ("degree" and "freeman" are equivalent): see degree for details. All node weights must be positive. Defaults to "none" (no weighting).

weight.legend the name to assign to the legend created by weight. Defaults to NA (no name).

weight.method see weight

weight.min whether to subset the network to nodes with a minimum size, based on the values of weight. Defaults to NA (preserves all nodes).

weight.max whether to subset the network to nodes with a maximum size, based on the values of weight. Defaults to NA (preserves all nodes).
weight.cut: whether to cut the size of the nodes into a certain number of quantiles. Accepts TRUE, which tries to cut the sizes into quartiles, or any positive numeric value, which tries to cut the sizes into that many quantiles. If the size of the nodes do not contain the specified number of distinct quantiles, the largest possible number is used. See quantile and cut for details. Defaults to FALSE (does nothing).

group: the groups of the nodes, either as a vector of values or as a vertex attribute. If set to mode on a bipartite network, the nodes will be grouped as "actor" if they belong to the primary mode and "event" if they belong to the secondary mode.

group.legend: the name to assign to the legend created by group.

node.group: see group

node.color: a vector of character strings to color the nodes with, holding as many colors as there are levels in node.group. Defaults to NULL, which will assign grayscale colors to each group.

node.alpha: transparency of the nodes. Inherits from alpha.

segment.alpha: the level of transparency of the edges. Defaults to alpha, which defaults to 1.

segment.color: the color of the edges, as a color value, a vector of color values, or as an edge attribute containing color values. Defaults to "grey50".

segment.label: the labels to plot at the middle of the edges, as a single value, a vector of values, or as an edge attribute. Defaults to NULL (no edge labels).

segment.size: the size of the edges, in points, as a single numeric value, a vector of values, or as an edge attribute. Defaults to 0.25.

arrow.size: the size of the arrows for directed network edges, in points. See arrow for details. Defaults to 0 (no arrows).

arrow.gap: a setting aimed at improving the display of edge arrows by plotting slightly shorter edges. Accepts any value between 0 and 1, where a value of 0.05 will generally achieve good results when the size of the nodes is reasonably small. Defaults to 0 (no shortening).

arrow.type: the type of the arrows for directed network edges. See arrow for details. Defaults to "closed".

label: whether to label the nodes. If set to TRUE, nodes are labeled with their vertex names. If set to a vector that contains as many elements as there are nodes in net, nodes are labeled with these. If set to any other vector of values, the nodes are labeled only when their vertex name matches one of these values. Defaults to FALSE (no labels).

label.nodes: see label

label.size: the size of the node labels, in points, as a numeric value, a vector of numeric values, or as a vertex attribute containing numeric values. Defaults to size / 2 (half the maximum node size), which defaults to 6.

label.trim: whether to apply some trimming to the node labels. Accepts any function that can process a character vector, or a strictly positive numeric value, in which case the labels are trimmed to a fixed-length substring of that length: see substr for details. Defaults to FALSE (does nothing).

legend.size: the size of the legend symbols and text, in points. Defaults to 9.

legend.position: the location of the plot legend(s). Accepts all legend.position values supported by theme. Defaults to "right".
names deprecated: see group.legend and size.legend
quantize.weights deprecated: see weight.cut
subset.threshold deprecated: see weight.min
top8.nodes deprecated: this functionality was experimental and has been removed entirely from ggnet
trim.labels deprecated: see label.trim
...
other arguments passed to the geom_text object that sets the node labels: see geom_text for details.

Details

The degree centrality measures that can be produced through the weight argument will take the directedness of the network into account, but will be unweighted. To compute weighted network measures, see the tnet package by Tore Opsahl (help("tnet",package = "tnet").

Author(s)

Moritz Marbach and Francois Briatte, with help from Heike Hofmann, Pedro Jordano and Ming-Yu Liu

See Also

ggnet2 in this package, gplot in the sna package, and plot.network in the network package

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

library(network)

# random adjacency matrix
x <- 10
dyads <- x * (x - 1)
density <- x / dyads
m <- matrix(0, nrow = x, ncol = x)
dimnames(m) <- list(letters[1:x], letters[1:x])
m[row(m) != col(m)] <- runif(dyads) < density

# random undirected network
n <- network::network(m, directed = FALSE)
n

ggnet(n, label = TRUE, alpha = 1, color = "white", segment.color = "black")

# random groups
g <- sample(letters[1:3], 10, replace = TRUE)
g

# color palette
p <- c("a" = "steelblue", "b" = "forestgreen", "c" = "tomato")
p_(ggnet(n, node.group = g, node.color = p, label = TRUE, color = "white"))

# edge arrows on a directed network
p_(ggnet(network(m, directed = TRUE), arrow.gap = 0.05, arrow.size = 10))

---

**Description**

Function for plotting network objects using `ggplot2`, with additional control over graphical parameters that are not supported by the `ggnet` function. Please visit [http://github.com/briatte/ggnet](http://github.com/briatte/ggnet) for the latest version of ggnet2, and [https://briatte.github.io/ggnet](https://briatte.github.io/ggnet) for a vignette that contains many examples and explanations.

**Usage**

```r
ggnet2(
  net,
  mode = "fruchtermanreingold",
  layout.par = NULL,
  layout.exp = 0,
  alpha = 1,
  color = "grey75",
  shape = 19,
  size = 9,
  max_size = 9,
  na.rm = NA,
  palette = NULL,
  alpha.palette = NULL,
  alpha.legend = NA,
  color.palette = palette,
  color.legend = NA,
  shape.palette = NULL,
  shape.legend = NA,
  size.palette = NULL,
  size.legend = NA,
  size.zero = FALSE,
  size.cut = FALSE,
  size.min = NA,
  size.max = NA,
  label = FALSE,
  label.alpha = 1,
  label.color = "black",
  label.size = max_size/2,
  label.trim = FALSE,
  node.alpha = alpha,
  node.color = color,
  node.label = label,
  node.shape = shape,
)```
node.size = size,
edge.alpha = 1,
edge.color = "grey50",
edge.lty = "solid",
edge.size = 0.25,
edge.label = NULL,
edge.label.alpha = 1,
edge.label.color = label.color,
edge.label.fill = "white",
edge.label.size = max_size/2,
arrow.size = 0,
arrow.gap = 0,
arrow.type = "closed",
legend.size = 9,
legend.position = "right",
...)

Arguments

net an object of class network, or any object that can be coerced to this class, such as an adjacency or incidence matrix, or an edge list: see edgeset.constructors and network for details. If the object is of class igraph and the intergraph package is installed, it will be used to convert the object: see asNetwork for details.

mode a placement method from those provided in the sna package: see gplot.layout for details. Also accepts the names of two numeric vertex attributes of net, or a matrix of numeric coordinates, in which case the first two columns of the matrix are used. Defaults to the Fruchterman-Reingold force-directed algorithm.

layout.par options to be passed to the placement method, as listed in gplot.layout. Defaults to NULL.

layout.exp a multiplier to expand the horizontal axis if node labels get clipped: see expand_range for details. Defaults to 0 (no expansion).

alpha the level of transparency of the edges and nodes, which might be a single value, a vertex attribute, or a vector of values. Also accepts "mode" on bipartite networks (see 'Details'). Defaults to 1 (no transparency).

color the color of the nodes, which might be a single value, a vertex attribute, or a vector of values. Also accepts "mode" on bipartite networks (see 'Details'). Defaults to grey75.

shape the shape of the nodes, which might be a single value, a vertex attribute, or a vector of values. Also accepts "mode" on bipartite networks (see 'Details'). Defaults to 19 (solid circle).

size the size of the nodes, in points, which might be a single value, a vertex attribute, or a vector of values. Also accepts "indegree", "outdegree", "degree" or "freeman" to size the nodes by their unweighted degree centrality ("degree" and "freeman" are equivalent): see degree for details. All node sizes must be strictly positive. Also accepts "mode" on bipartite networks (see 'Details'). Defaults to 9.

max_size the maximum size of the node when size produces nodes of different sizes, in points. Defaults to 9.
na.rm whether to subset the network to nodes that are not missing a given vertex attribute. If set to any vertex attribute of net, the nodes for which this attribute is NA will be removed. Defaults to NA (does nothing).

palette the palette to color the nodes, when color is not a color value or a vector of color values. Accepts named vectors of color values, or if RColorBrewer is installed, any ColorBrewer palette name: see brewer.pal and http://colorbrewer2.org/ for details. Defaults to NULL, which will create an array of grayscale color values if color is not a color value or a vector of color values.

alpha.palette the palette to control the transparency levels of the nodes set by alpha when the levels are not numeric values. Defaults to NULL, which will create an array of alpha transparency values if alpha is not a numeric value or a vector of numeric values.

alpha.legend the name to assign to the legend created by alpha when its levels are not numeric values. Defaults to NA (no name).

color.palette see palette

color.legend the name to assign to the legend created by palette. Defaults to NA (no name).

shape.palette the palette to control the shapes of the nodes set by shape when the shapes are not numeric values. Defaults to NULL, which will create an array of shape values if shape is not a numeric value or a vector of numeric values.

shape.legend the name to assign to the legend created by shape when its levels are not numeric values. Defaults to NA (no name).

size.palette the palette to control the sizes of the nodes set by size when the sizes are not numeric values.

size.legend the name to assign to the legend created by size. Defaults to NA (no name).

size.zero whether to accept zero-sized nodes based on the value(s) of size. Defaults to FALSE, which ensures that zero-sized nodes are still shown in the plot and its size legend.

size.cut whether to cut the size of the nodes into a certain number of quantiles. Accepts TRUE, which tries to cut the sizes into quartiles, or any positive numeric value, which tries to cut the sizes into that many quantiles. If the size of the nodes do not contain the specified number of distinct quantiles, the largest possible number is used. See quantile and cut for details. Defaults to FALSE (does nothing).

size.min whether to subset the network to nodes with a minimum size, based on the values of size. Defaults to NA (preserves all nodes).

size.max whether to subset the network to nodes with a maximum size, based on the values of size. Defaults to NA (preserves all nodes).

label whether to label the nodes. If set to TRUE, nodes are labeled with their vertex names. If set to a vector that contains as many elements as there are nodes in net, nodes are labeled with these. If set to any other vector of values, the nodes are labeled only when their vertex name matches one of these values. Defaults to FALSE (no labels).

label.alpha the level of transparency of the node labels, as a numeric value, a vector of numeric values, or as a vertex attribute containing numeric values. Defaults to 1 (no transparency).

label.color the color of the node labels, as a color value, a vector of color values, or as a vertex attribute containing color values. Defaults to "black".
label.size  the size of the node labels, in points, as a numeric value, a vector of numeric values, or as a vertex attribute containing numeric values. Defaults to max_size / 2 (half the maximum node size), which defaults to 4.5.

label.trim  whether to apply some trimming to the node labels. Accepts any function that can process a character vector, or a strictly positive numeric value, in which case the labels are trimmed to a fixed-length substring of that length: see `substr` for details. Defaults to FALSE (does nothing).

node.alpha  see alpha
node.color  see color
node.label  see label
node.shape  see shape
node.size  see size
edge.alpha  the level of transparency of the edges. Defaults to the value of alpha, which defaults to 1.

edge.color  the color of the edges, as a color value, a vector of color values, or as an edge attribute containing color values. Defaults to "grey50".

edge.lty  the linetype of the edges, as a linetype value, a vector of linetype values, or as an edge attribute containing linetype values. Defaults to "solid".

edge.size  the size of the edges, in points, as a numeric value, a vector of numeric values, or as an edge attribute containing numeric values. All edge sizes must be strictly positive. Defaults to 0.25.

edge.label  the labels to plot at the middle of the edges, as a single value, a vector of values, or as an edge attribute. Defaults to NULL (no edge labels).

edge.label.alpha  the level of transparency of the edge labels, as a numeric value, a vector of numeric values, or as an edge attribute containing numeric values. Defaults to 1 (no transparency).

edge.label.color  the color of the edge labels, as a color value, a vector of color values, or as an edge attribute containing color values. Defaults to `label.color`, which defaults to "black".

edge.label.fill  the background color of the edge labels. Defaults to "white".

edge.label.size  the size of the edge labels, in points, as a numeric value, a vector of numeric values, or as an edge attribute containing numeric values. All edge label sizes must be strictly positive. Defaults to max_size / 2 (half the maximum node size), which defaults to 4.5.

arrow.size  the size of the arrows for directed network edges, in points. See `arrow` for details. Defaults to 0 (no arrows).

arrow.gap  a setting aimed at improving the display of edge arrows by plotting slightly shorter edges. Accepts any value between 0 and 1, where a value of 0.05 will generally achieve good results when the size of the nodes is reasonably small. Defaults to 0 (no shortening).

arrow.type  the type of the arrows for directed network edges. See `arrow` for details. Defaults to "closed".

legend.size  the size of the legend symbols and text, in points. Defaults to 9.
legend.position

the location of the plot legend(s). Accepts all legend.position values supported by theme. Defaults to "right".

... other arguments passed to the geom_text object that sets the node labels: see geom_text for details.

Details

The degree centrality measures that can be produced through the size argument will take the directedness of the network into account, but will be unweighted. To compute weighted network measures, see the tnet package by Tore Opsahl (help("tnet", package = "tnet").)

The nodes of bipartite networks can be mapped to their mode by passing the "mode" argument to any of alpha, color, shape and size, in which case the nodes of the primary mode will be mapped as "actor", and the nodes of the secondary mode will be mapped as "event".

Author(s)

Moritz Marbach and Francois Briatte, with help from Heike Hofmann, Pedro Jordano and Ming-Yu Liu

See Also

ggnet in this package, gplot in the sna package, and plot.network in the network package

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

library(network)

# random adjacency matrix
x <- 10
ndyads <- x * (x - 1)
density <- x / ndyads
m <- matrix(0, nrow = x, ncol = x)
dimnames(m) <- list(letters[1:x], letters[1:x])
m[ row(m) != col(m) ] <- runif(ndyads) < density
m

# random undirected network
n <- network::network(m, directed = FALSE)
n
p_(ggnet2(n, label = TRUE))
p_(ggnet2(n, label = TRUE, shape = 15))
p_(ggnet2(n, label = TRUE, shape = 15, color = "black", label.color = "white"))

# add vertex attribute
x = network.vertex.names(n)
x = ifelse(x %in% c("a", "e", "i"), "vowel", "consonant")
n %v% "phono" = x

p_(ggnet2(n, color = "phono"))
p_(ggnet2(n, color = "phono", palette = c("vowel" = "gold", "consonant" = "grey"))))
```r
p_(ggnet2(n, shape = "phono", color = "phono"))

if (require(RColorBrewer)) {

  # random groups
  n %v% "group" <- sample(LETTERS[1:3], 10, replace = TRUE)
  p_(ggnet2(n, color = "group", palette = "Set2"))
}

# random weights
n %e% "weight" <- sample(1:3, network.edgecount(n), replace = TRUE)
  p_(ggnet2(n, edge.size = "weight", edge.label = "weight"))

# edge arrows on a directed network
  p_(ggnet2(network(m, directed = TRUE), arrow.gap = 0.05, arrow.size = 10))

# Padgett's Florentine wedding data
data(flo, package = "network")
flo

  p_(ggnet2(flo, label = TRUE))
  p_(ggnet2(flo, label = TRUE, label.trim = 4, vjust = -1, size = 3, color = 1))
  p_(ggnet2(flo, label = TRUE, size = 12, color = "white"))
```

---

**ggnetworkmap**  

*Network plot map overlay*

**Description**

Plots a network with ggplot2 suitable for overlay on a ggmap plot or ggplot2

**Usage**

```r
ggnetworkmap(
  gg,
  net,
  size = 3,
  alpha = 0.75,
  weight,
  node.group,
  node.color = NULL,
  node.alpha = NULL,
  ring.group,
  segment.alpha = NULL,
  segment.color = "grey",
  great.circles = FALSE,
  segment.size = 0.25,
  arrow.size = 0,
  label.nodes = FALSE,
  label.size = size/2,
  ...
)
```
Arguments

- **gg**: an object of class `ggplot`.
- **net**: an object of class `network`, or any object that can be coerced to this class, such as an adjacency or incidence matrix, or an edge list. See `edgeset.constructors` and `network` for details. If the object is of class `igraph` and the `intergraph` package is installed, it will be used to convert the object: see `asNetwork` for details.

- **size**: size of the network nodes. Defaults to 3. If the nodes are weighted, their area is proportionally scaled up to the size set by `size`.
- **alpha**: a level of transparency for nodes, vertices and arrows. Defaults to 0.75.
- **weight**: if present, the unquoted name of a vertex attribute in `data`. Otherwise nodes are unweighted.
- **node.group**: NULL, the default, or the unquoted name of a vertex attribute that will be used to determine the color of each node.
- **node.color**: If `node.group` is null, a character string specifying a color.
- **node.alpha**: transparency of the nodes. Inherits from `alpha`.
- **ring.group**: if not `NULL`, the default, the unquoted name of a vertex attribute that will be used to determine the color of each node border.
- **segment.alpha**: transparency of the vertex links. Inherits from `alpha`.
- **segment.color**: color of the vertex links. Defaults to "grey".
- **great.circles**: whether to draw edges as great circles using the `geosphere` package. Defaults to `FALSE`.
- **segment.size**: size of the vertex links, as a vector of values or as a single value. Defaults to 0.25.
- **arrow.size**: size of the vertex arrows for directed network plotting, in centimeters. Defaults to 0.
- **label.nodes**: label nodes with their vertex names attribute. If set to `TRUE`, all nodes are labelled. Also accepts a vector of character strings to match with vertex names.
- **label.size**: size of the labels. Defaults to `size / 2`.
- **...**: other arguments supplied to `geom_text` for the node labels. Arguments pertaining to the title or other items can be achieved through `ggplot2` methods.

Details

This is a descendant of the original `ggnet` function. `ggnet` added the innovation of plotting the network geographically. However, `ggnet` needed to be the first object in the `ggplot` chain. `ggnetworkmap` does not. If passed a `ggplot` object as its first argument, such as output from `gmap`, `ggnetworkmap` will plot on top of that chart, looking for vertex attributes `lon` and `lat` as coordinates. Otherwise, `ggnetworkmap` will generate coordinates using the Fruchterman-Reingold algorithm.

This is a function for plotting graphs generated by `network` or `igraph` in a more flexible and elegant manner than permitted by `gnet`. The function does not need to be the first plot in the `ggplot` chain, so the graph can be plotted on top of a map or other chart. Segments can be straight lines, or plotted as great circles. Note that the great circles feature can produce odd results with arrows and with vertices beyond the plot edges; this is a `ggplot2` limitation and cannot yet be fixed. Nodes can have two color schemes, which are then plotted as the center and ring around the node. The color schemes are selected by adding `scale_fill_` or `scale_color_` just like any other `ggplot2` plot. If there are no rings, `scale_color_` sets the color of the nodes. If there are rings, `scale_color_` sets the color of the rings, and `scale_fill_` sets the color of the centers. Note that additional arguments in the `...` are passed to `geom_text` for plotting labels.
Examples

# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
invisible(lapply(c("ggplot2", "maps", "network", "sna"), base::library, character.only = TRUE))

## Example showing great circles on a simple map of the USA

airports <- read.csv("http://datasets.flowingdata.com/tuts/maparcs/airports.csv", header = TRUE)
rownames(airports) <- airports$iata

# select some random flights
set.seed(1234)
flights <- data.frame(
  origin = sample(airports[200:400,]$iata, 200, replace = TRUE),
  destination = sample(airports[200:400,]$iata, 200, replace = TRUE)
)

# convert to network
flights <- network(flights, directed = TRUE)

# add geographic coordinates
flights %v% "lat" <- airports[network.vertex.names(flights), "lat"]
flights %v% "lon" <- airports[network.vertex.names(flights), "long"]

# drop isolated airports
delete.vertices(flights, which(degree(flights) < 2))

# compute degree centrality
flights %v% "degree" <- degree(flights, gmode = "digraph")

# add random groups
flights %v% "mygroup" <- sample(letters[1:4], network.size(flights), replace = TRUE)

# create a map of the USA
usa <- ggplot(map_data("usa"), aes(x = long, y = lat)) +
  geom_polygon(aes(group = group), color = "grey65",
               fill = "#f9f9f9", size = 0.2)

# overlay network data to map
p <- ggnetworkmap(
  usa, flights, size = 4, great.circles = TRUE,
  node.group = mygroup, segment.color = "steelblue",
  ring.group = degree, weight = degree
)

## Exploring a community of spambots found on Twitter
## Data by Amos Elberg: see ?twitter_spambots for details

data(twitter_spambots)
# create a world map
world <- fortify(map("world", plot = FALSE, fill = TRUE))
world <- ggplot(world, aes(x = long, y = lat)) +
  geom_polygon(aes(group = group), color = "grey65",
  fill = "#f9f9f9", size = 0.2)

# view global structure
p <- ggnetworkmap(world, twitter_spambots)
p_(p)

# domestic distribution
p <- ggnetworkmap(net = twitter_spambots)
p_(p)

# topology
p <- ggnetworkmap(net = twitter_spambots, arrow.size = 0.5)
p_(p)

# compute indegree and outdegree centrality
twitter_spambots %v% "indegree" <- degree(twitter_spambots, cmode = "indegree")
twitter_spambots %v% "outdegree" <- degree(twitter_spambots, cmode = "outdegree")

p <- ggnetworkmap(
  net = twitter_spambots,
  arrow.size = 0.5,
  node.group = indegree,
  ring.group = outdegree, size = 4
  ) +
  scale_fill_continuous("Indegree", high = "red", low = "yellow") +
  labs(color = "Outdegree")
p_(p)

# show some vertex attributes associated with each account
p <- ggnetworkmap(
  net = twitter_spambots,
  arrow.size = 0.5,
  node.group = followers,
  ring.group = friends,
  size = 4,
  weight = indegree,
  label.nodes = TRUE, vjust = -1.5
  ) +
  scale_fill_continuous("Followers", high = "red", low = "yellow") +
  labs(color = "Friends") +
  scale_color_continuous(low = "lightgreen", high = "darkgreen")
p_(p)

---

**ggnostic**

Plot matrix of statistical model diagnostics

**Description**

Plot matrix of statistical model diagnostics
Usage

gnostic(
  model,
  ..., 
  columnsX = attr(data, "var_x"),
  columnsY = c(".resid", ".sigma", ".hat", ".cooksD"),
  columnLabelsX = attr(data, "var_x_label"),
  columnLabelsY = gsub("\./", ".", gsub("\^\./", ".", columnsY)),
  xlab = "explanatory variables",
  ylab = "diagnostics",
  title = paste(deparse(model$call, width.cutoff = 500L), collapse = "\n"),
  continuous = list(default = ggally_points, .fitted = ggally_points, .se.fit = 
gally_nostic_se_fit, .resid = gally_nostic_resid, .hat = gally_nostic_hat, .sigma 
  = gally_nostic_sigma, .cooksD = gally_nostic_cooksD, .std.resid = 
gally_nostic_std_resid),
  combo = list(default = ggally_box_no_facet, fitted = ggally_box_no_facet, .se.fit = 
gally_nostic_se_fit, .resid = gally_nostic_resid, .hat = gally_nostic_hat, .sigma 
  = gally_nostic_sigma, .cooksD = gally_nostic_cooksD, .std.resid = 
gally_nostic_std_resid),
  discrete = list(default = ggally_ratio, .fitted = ggally_ratio, .se.fit = 
gally_nostic_se_fit, .resid = gally_nostic_resid, .hat = gally_nostic_hat, .sigma 
  = gally_nostic_sigma, .cooksD = gally_nostic_cooksD, .std.resid = 
gally_nostic_std_resid),
  progress = NULL,
  data = broomify(model)
)

Arguments

model statistical model object such as output from stats::lm or stats::glm
... arguments passed directly to ggduo
columnsX columns to be displayed in the plot matrix. Defaults to the predictor columns of the model
columnsY rows to be displayed in the plot matrix. Defaults to residuals, leave one out sigma value, diagonal of the hat matrix, and Cook’s Distance. The possible values are the response variables in the model and the added columns provided by broom::augment(model). See details for more information.
columnLabelsX, columnLabelsY column and row labels to display in the plot matrix
xlab, ylab, title plot matrix labels passed directly to ggmatrix
continuous, combo, discrete list of functions for each y variable. See details for more information.
progress NULL (default) for a progress bar in interactive sessions with more than 15 plots, TRUE for a progress bar, FALSE for no progress bar, or a function that accepts at least a plot matrix and returns a new progress::progress_bar. See ggmatrix_progress

data data defaults to a ‘broomify’ed model object. This object will contain information about the X variables, Y variables, and multiple broom outputs. See broomify(model) for more information.
ggnostic

`columnsY`

broom::`augment()` collects data from the supplied model and returns a data.frame with the following columns (taken directly from broom documentation). These columns are the only allowed values in the `columnsY` parameter to `ggnostic`.

- `.resid` Residuals
- `.hat` Diagonal of the hat matrix
- `.sigma` Estimate of residual standard deviation when corresponding observation is dropped from model
- `.cooksD` Cooks distance, `cooks.distance`
- `.fitted` Fitted values of model
- `.se.fit` Standard errors of fitted values
- `.std.resid` Standardized residuals

**response variable name** The response variable in the model may be added. Such as "mpg" in the model `lm(mpg ~ ., data = mtcars)`

### ‘continuous’, ‘combo’, ‘discrete’ types

Similar to ggduo and ggpairs, functions may be supplied to display the different column types. However, since the Y rows are fixed, each row has its own corresponding function in each of the plot types: continuous, combo, and discrete. Each plot type list can have keys that correspond to the broom::`augment()` output: `.fitted`, `.resid`, `.std.resid`, `.sigma`, `.se.fit`, `.hat`, `.cooksD`. An extra key, "default", is used to plot the response variables of the model if they are included. Having a function for each diagnostic allows for very fine control over the diagnostics plot matrix. The functions for each type list are wrapped into a switch function that calls the function corresponding to the y variable being plotted. These switch functions are then passed directly to the `types` parameter in ggduo.

### Examples

```r
# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(mtcars)

# use mtcars dataset and alter the 'am' column to display actual name values
mtc <- mtcars
mtc$am <- c("0" = "automatic", "1" = "manual")[as.character(mtc$am)]

# step the complete model down to a smaller model
mod <- stats::step(stats::lm(mpg ~ ., data = mtc), trace = FALSE)

# display using defaults
pm <- ggnostic(mod)
p_(pm)

# color by am value
pm <- ggnostic(mod, mapping = ggplot2::aes(color = am))
p_(pm)

# turn resid smooth error ribbon off
pm <- ggnostic(mod, continuous = list(.resid = wrap("nostic_resid", se = FALSE)))
p_(pm)
```
## plot residuals vs fitted in a ggpairs plot matrix

dt <- broomify(mod)

pm <- ggpairs(
  dt, c(".fitted", ".resid"),
  columnLabels = c("fitted", "residuals"),
  lower = list(continuous = ggally_nostic_resid)
)

p_(pm)

---

### Description

Make a matrix of plots with a given data set

### Usage

```r
ggpairs(
  data, 
  mapping = NULL, 
  columns = 1:ncol(data), 
  title = NULL, 
  upper = list(continuous = "cor", combo = "box_no_facet", discrete = "count", na = "na"), 
  lower = list(continuous = "points", combo = "facethist", discrete = "facetbar", na = "na"), 
  diag = list(continuous = "densityDiag", discrete = "barDiag", na = "naDiag"), 
  params = NULL, 
  ..., 
  xlab = NULL, 
  ylab = NULL, 
  axisLabels = c("show", "internal", "none"), 
  columnLabels = colnames(data[columns]), 
  labeller = "label_value", 
  switch = NULL, 
  showStrips = NULL, 
  legend = NULL, 
  cardinality_threshold = 15, 
  progress = NULL, 
  proportions = NULL, 
  legends = stop("deprecated")
)
```

### Arguments

- **data**: data set using. Can have both numerical and categorical data.
- **mapping**: aesthetic mapping (besides x and y). See `aes()`. If mapping is numeric, columns will be set to the mapping value and mapping will be set to NULL.
columns which columns are used to make plots. Defaults to all columns.
title, xlab, ylab title, x label, and y label for the graph
upper see Details
lower see Details
diag see Details
params deprecated. Please see \texttt{wrap.fn.with.param.arg}
... deprecated. Please use \texttt{mapping}
axisLabels either "show" to display axisLabels, "internal" for labels in the diagonal plots, or "none" for no axis labels
columnLabels label names to be displayed. Defaults to names of columns being used.
labeller labeller for facets. See \texttt{labellers}. Common values are "label.value" (default) and "label.parsed".
switch switch parameter for facet\_grid. See \texttt{ggplot2::facet.grid}. By default, the labels are displayed on the top and right of the plot. If "x", the top labels will be displayed to the bottom. If "y", the right-hand side labels will be displayed to the left. Can also be set to "both"
showStrips boolean to determine if each plot’s strips should be displayed. NULL will default to the top and right side plots only. TRUE or FALSE will turn all strips on or off respectively.
legend May be the two objects described below or the default NULL value. The legend position can be moved by using \texttt{ggplot2}'s theme element \texttt{pm + theme(legend.position = "bottom")}
a \textbf{numeric vector of length 2} provides the location of the plot to use the legend for the plot matrix’s legend. Such as \texttt{legend = c(3,5)} which will use the legend from the plot in the third row and fifth column
a \textbf{single numeric value} provides the location of a plot according to the display order. Such as \texttt{legend = 3} in a plot matrix with 2 rows and 5 columns displayed by column will return the plot in position \texttt{c(1,2)}
a \textbf{object from \texttt{grab.legend()}} a predetermined plot legend that will be displayed directly
cardinality\_threshold maximum number of levels allowed in a character / factor column. Set this value to NULL to not check factor columns. Defaults to 15
progress NULL (default) for a progress bar in interactive sessions with more than 15 plots, TRUE for a progress bar, FALSE for no progress bar, or a function that accepts at least a plot matrix and returns a new \texttt{progress::progress_bar}. See \texttt{ggmatrix_progress}
proportions Value to change how much area is given for each plot. Either NULL (default), numeric value matching respective length, grid::\texttt{unit} object with matching respective length or "auto" for automatic relative proportions based on the number of levels for categorical variables.
legends deprecated

Details

\texttt{upper} and \texttt{lower} are lists that may contain the variables 'continuous', 'combo', 'discrete', and 'na'. Each element of the list may be a function or a string. If a string is supplied, it must be a character string representing the tail end of a \texttt{ggally\_NAME} function. The list of current valid \texttt{ggally\_NAME} functions is visible in a dedicated vignette.
This option is used for continuous X and Y data.
- **combo**: This option is used for either continuous X and categorical Y data or categorical X and continuous Y data.
- **discrete**: This option is used for categorical X and Y data.
- **na**: This option is used when all X data is NA, all Y data is NA, or either all X or Y data is NA.

The diag list is a list that may only contain the variables 'continuous', 'discrete', and 'na'. Each element of the diag list is a string implementing the following options:

- **continuous**: exactly one of ('densityDiag', 'barDiag', 'blankDiag'). This option is used for continuous X data.
- **discrete**: exactly one of ('barDiag', 'blankDiag'). This option is used for categorical X and Y data.
- **na**: exactly one of ('naDiag', 'blankDiag'). This option is used when all X data is NA.

If 'blank' is ever chosen as an option, then ggpairs will produce an empty plot.

If a function is supplied as an option to `upper`, `lower`, or `diag`, it should implement the function api of `function(data,mapping,...){#make ggplot2 plot}`. If a specific function needs its parameters set, `wrap(fn, param1 = val1, param2 = val2)` the function with its parameters.

### Value

- **ggmatrix** object that if called, will print

### Author(s)

Barret Schloerke, Jason Crowley, Di Cook, Heike Hofmann, Hadley Wickham

### References


### See Also

- `wrap`, `v1_ggmatrix_theme`

### Examples

```r
# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

## Quick example, with and without colour
data(flea)
ggpairs(flea, columns = 2:4)
pm <- ggpairs(flea, columns = 2:4, ggplot2::aes(colour=species))
p_(pm)

# Note: colour should be categorical, else you will need to reset
# the upper triangle to use points instead of trying to compute corr

data(tips, package = "reshape")
pm <- ggpairs(tips[, 1:3])
p_(pm)
```
pm <- ggpairs(tips, 1:3, columnLabels = c("Total Bill", "Tip", "Sex"))
p_(pm)

pm <- ggpairs(tips, upper = "blank")
p_(pm)

## Plot Types
# Change default plot behavior
pm <- ggpairs(
  tips[, c(1, 3, 4, 2)],
  upper = list(continuous = "density", combo = "box_no_facet"),
  lower = list(continuous = "points", combo = "dot_no_facet")
)
p_(pm)

## Axis Label Variations
# Only Variable Labels on the diagonal (no axis labels)
pm <- ggpairs(tips[, 1:3], axisLabels="internal")
p_(pm)

## Facet Label Variations
# Default:
df.x <- rnorm(100)
df.y <- df.x + rnorm(100, 0, 0.1)
df <- data.frame(x = df.x, y = df.y, c = sqrt(df.x^2 + df.y^2))

pm <- ggpairs(
  df,
  columnLabels = c("alpha[foo]", "alpha[bar]", "sqrt(alpha[foo]^2 + alpha[bar]^2)")
)
p_(pm)

## Use sample of the diamonds data
data(diamonds, package="ggplot2")
diamonds.samp <- diamonds[sample(1:dim(diamonds)[1], 1000), ]

# Different aesthetics for different plot sections and plot types
pm <- ggpairs(
  diamonds.samp[, 1:5],
  mapping = ggplot2::aes(color = cut),
  upper = list(continuous = wrap("density", alpha = 0.5), combo = "box_no_facet"),
  lower = list(continuous = wrap("points", alpha = 0.3), combo = wrap("dot_no_facet", alpha = 0.4)),
  title = "Diamonds"
)
p_(pm)

## Supply Raw Functions (may be user defined functions!)
pm <- ggpairs(
  tips[, c(1, 3, 4, 2)],
  upper = list(continuous = ggally_density, combo = ggally_box_no_facet),
  lower = list(continuous = ggally_points, combo = ggally_dot_no_facet)
)
p_(pm)

## Use sample of the diamonds data
data(diamonds, package="ggplot2")
diamonds.samp <- diamonds[sample(1:dim(diamonds)[1], 1000), ]

# Different aesthetics for different plot sections and plot types
pm <- ggpairs(
  diamonds.samp[, 1:5],
  mapping = ggplot2::aes(color = cut),
  upper = list(continuous = wrap("density", alpha = 0.5), combo = "box_no_facet"),
  lower = list(continuous = wrap("points", alpha = 0.3), combo = wrap("dot_no_facet", alpha = 0.4)),
  title = "Diamonds"
)
p_(pm)

## Axis Label Variations
# Only Variable Labels on the diagonal (no axis labels)
pm <- ggpairs(tips[, 1:3], axisLabels="internal")
p_(pm)

## Facet Label Variations
# Default:
df.x <- rnorm(100)
df.y <- df.x + rnorm(100, 0, 0.1)
df <- data.frame(x = df.x, y = df.y, c = sqrt(df.x^2 + df.y^2))

pm <- ggpairs(
  df,
  columnLabels = c("alpha[foo]", "alpha[bar]", "sqrt(alpha[foo]^2 + alpha[bar]^2)")
)
p_(pm)

## Parsed labels:
pm <- ggpairs(
  df,
  columnLabels = c("alpha[foo]", "alpha[bar]", "sqrt(alpha[foo]^2 + alpha[bar]^2)")))
ggparcoord

labeller = "label_parsed"
)
p_(pm)

## Plot Insertion Example
custom_car <- ggpairs(mtcars[, c("mpg", "wt", "cyl")], upper = "blank", title = "Custom Example")
# ggplot example taken from example(geom_text)
plot <- ggplot2::ggplot(mtcars, ggplot2::aes(x=wt, y=mpg, label=rownames(mtcars)))
plot <- plot +
  ggplot2::geom_text(ggplot2::aes(colour=factor(cyl)), size = 3) +
  ggplot2::scale_colour_discrete(l=40)
custom_car[1, 2] <- plot
personal_plot <- ggally_text("ggpairs allows you\ninto put in your\nrown plot.\nLike that one.\n<---")
custom_car[1, 3] <- personal_plot
p_(custom_car)

## Remove binwidth warning from ggplot2
# displays warning about picking a better binwidth
pm <- ggpairs(tips, 2:3)
p_(pm)
# no warning displayed
pm <- ggpairs(tips, 2:3, lower = list(combo = wrap("facethist", binwidth = 0.5)))
p_(pm)
# no warning displayed with user supplied function
pm <- ggpairs(tips, 2:3, lower = list(combo = wrap(ggally_facethist, binwidth = 0.5)))
p_(pm)

## Remove panel grid lines from correlation plots
pm <- ggpairs(
  flea, columns = 2:4,
  upper = list(continuous = wrap(ggally_cor, displayGrid = FALSE))
)
p_(pm)

## Custom with/height of subplots
pm <- ggpairs(tips, columns = c(2, 3, 5))
p_(pm)

pm <- ggpairs(tips, columns = c(2, 3, 5), proportions = "auto")
p_(pm)

pm <- ggpairs(tips, columns = c(2, 3, 5), proportions = c(1, 3, 2))
p_(pm)

---

**ggparcoord**

**Parallel coordinate plot**

**Description**

A function for plotting static parallel coordinate plots, utilizing the `ggplot2` graphics package.
Usage

```r
ggparcoord(
  data,
  columns = 1:ncol(data),
  groupColumn = NULL,
  scale = "std",
  scaleSummary = "mean",
  centerObsID = 1,
  missing = "exclude",
  order = columns,
  showPoints = FALSE,
  splineFactor = FALSE,
  alphaLines = 1,
  boxplot = FALSE,
  shadeBox = NULL,
  mapping = NULL,
  title = ""
)
```

Arguments

- `data` the dataset to plot
- `columns` a vector of variables (either names or indices) to be axes in the plot
- `groupColumn` a single variable to group (color) by
- `scale` method used to scale the variables (see Details)
- `scaleSummary` if `scale=="center"`, summary statistic to univariately center each variable by
- `centerObsID` if `scale=="centerObs"`, row number of case plot should univariately be centered on
- `missing` method used to handle missing values (see Details)
- `order` method used to order the axes (see Details)
- `showPoints` logical operator indicating whether points should be plotted or not
- `splineFactor` logical or numeric operator indicating whether spline interpolation should be used. Numeric values will multiplied by the number of columns, `TRUE` will default to cubic interpolation, `AsIs` to set the knot count directly and `0`, `FALSE`, or non-numeric values will not use spline interpolation.
- `alphaLines` value of alpha scaler for the lines of the parcoord plot or a column name of the data
- `boxplot` logical operator indicating whether or not boxplots should underlay the distribution of each variable
- `shadeBox` color of underlying box which extends from the min to the max for each variable (no box is plotted if `shadeBox == NULL`)
- `mapping` `aes` string to pass to `ggplot` object
- `title` character string denoting the title of the plot

Details

`scale` is a character string that denotes how to scale the variables in the parallel coordinate plot. Options:
• std: univariately, subtract mean and divide by standard deviation
• robust: univariately, subtract median and divide by median absolute deviation
• uniminmax: univariately, scale so the minimum of the variable is zero, and the maximum is one
• globalminmax: no scaling is done; the range of the graphs is defined by the global minimum and the global maximum
• center: use uniminmax to standardize vertical height, then center each variable at a value specified by the scaleSummary param
• centerObs: use uniminmax to standardize vertical height, then center each variable at the value of the observation specified by the centerObsID param

missing is a character string that denotes how to handle missing values. Options:
• exclude: remove all cases with missing values
• mean: set missing values to the mean of the variable
• median: set missing values to the median of the variable
• min10: set missing values to 10% below the minimum of the variable
• random: set missing values to value of randomly chosen observation on that variable

order is either a vector of indices or a character string that denotes how to order the axes (variables) of the parallel coordinate plot. Options:
• (default): order by the vector denoted by columns
• (given vector): order by the vector specified
• anyClass: order variables by their separation between any one class and the rest (as opposed to their overall variation between classes). This is accomplished by calculating the F-statistic for each class vs. the rest, for each axis variable. The axis variables are then ordered (decreasing) by their maximum of k F-statistics, where k is the number of classes.
• allClass: order variables by their overall F statistic (decreasing) from an ANOVA with groupColumn as the explanatory variable (note: it is required to specify a groupColumn with this ordering method). Basically, this method orders the variables by their variation between classes (most to least).
• skewness: order variables by their sample skewness (most skewed to least skewed)
• Outlying: order by the scagnostic measure, Outlying, as calculated by the package scagnostics. Other scagnostic measures available to order by are Skewed, Clumpy, Sparse, Striated, Convex, Skinny, Stringy, and Monotonic. Note: To use these methods of ordering, you must have the scagnostics package loaded.

Value

ggplot object that if called, will print

Author(s)

Jason Crowley, Barret Schloerke, Di Cook, Heike Hofmann, Hadley Wickham
## ggparcoord

### Examples

```r
# small function to display plots only if it's interactive
p_ <- ggally::print_if_interactive

# use sample of the diamonds data for illustrative purposes
data(diamonds, package="ggplot2")
diamonds.samp <- diamonds[sample(1:dim(diamonds)[1], 100),]

# basic parallel coordinate plot, using default settings
p <- ggparcoord(data = diamonds.samp, columns = c(1, 5:10))
p_(p)

# this time, color by diamond cut
p <- ggparcoord(data = diamonds.samp, columns = c(1, 5:10), groupColumn = 2)
p_(p)

# underlay univariate boxplots, add title, use uniminmax scaling
p <- ggparcoord(data = diamonds.samp, columns = c(1, 5:10), groupColumn = 2,
               scale = "uniminmax", boxplot = TRUE, title = "Parallel Coord. Plot of Diamonds Data")
p_(p)

# utilize ggplot2 aes to switch to thicker lines
p <- ggparcoord(data = diamonds.samp, columns = c(1, 5:10), groupColumn = 2,
               title = "Parallel Coord. Plot of Diamonds Data", mapping = ggplot2::aes(size = 1)) +
     ggplot2::scale_size_identity()
p_(p)

# basic parallel coord plot of the msleep data, using 'random' imputation and
# coloring by diet (can also use variable names in the columns and groupColumn
# arguments)
data(msleep, package="ggplot2")
p <- ggparcoord(data = msleep, columns = 6:11, groupColumn = "vore", missing =
               "random", scale = "uniminmax")
p_(p)

# center each variable by its median, using the default missing value handler,
# 'exclude'
p <- ggparcoord(data = msleep, columns = 6:11, groupColumn = "vore", scale =
               "center", scaleSummary = "median")
p_(p)

# with the iris data, order the axes by overall class (Species) separation using
# the anyClass option
p <- ggparcoord(data = iris, columns = 1:4, groupColumn = 5, order = "anyClass")
p_(p)

# add points to the plot, add a title, and use an alpha scalar to make the lines
# transparent
p <- ggparcoord(data = iris, columns = 1:4, groupColumn = 5, order = "anyClass",
               showPoints = TRUE, title = "Parallel Coordinate Plot for the Iris Data",
               alphalines = 0.3)
p_(p)

# color according to a column
iris2 <- iris
iris2$alphaLevel <- c("setosa" = 0.2, "versicolor" = 0.3, "virginica" = 0)[iris2$Species]
```

### ggparcoord

```r
p <- ggparcoord(data = iris2, columns = 1:4, groupColumn = 5, order = "anyClass",
showPoints = TRUE, title = "Parallel Coordinate Plot for the Iris Data",
alphaLines = "alphaLevel")
p_(p)
```

```r
## Use splines on values, rather than lines (all produce the same result)
columns <- c(1, 5:10)
p <- ggparcoord(diamonds.samp, columns, groupColumn = 2, splineFactor = TRUE)
p_(p)
p <- ggparcoord(diamonds.samp, columns, groupColumn = 2, splineFactor = 3)
p_(p)
splineFactor <- length(columns) * 3
p <- ggparcoord(diamonds.samp, columns, groupColumn = 2, splineFactor = I(splineFactor))
p_(p)
```

### ggscatmat

**Traditional scatterplot matrix for purely quantitative variables**

**Description**

This function makes a scatterplot matrix for quantitative variables with density plots on the diagonal and correlation printed in the upper triangle.

**Usage**

```r
ggscatmat(
data, 
columns = 1:ncol(data), 
color = NULL, 
alpha = 1, 
corMethod = "pearson"
)
```

**Arguments**

- **data**
  - a data matrix. Should contain numerical (continuous) data.

- **columns**
  - an option to choose the column to be used in the raw dataset. Defaults to 1:ncol(data).

- **color**
  - an option to group the dataset by the factor variable and color them by different colors. Defaults to NULL, i.e. no coloring. If supplied, it will be converted to a factor.

- **alpha**
  - an option to set the transparency in scatterplots for large data. Defaults to 1.

- **corMethod**
  - method argument supplied to `cor`

**Author(s)**

Mengjia Ni, Di Cook
Examples

```r
# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(flea)

p_(ggscatmat(flea, columns = 2:4))
p_(ggscatmat(flea, columns = 2:4, color = "species"))
```

## ggsurv

### Survival curves

**Description**

This function produces Kaplan-Meier plots using `ggplot2`. As a first argument it needs a `survfit` object, created by the `survival` package. Default settings differ for single stratum and multiple strata objects.

### Usage

```r
ggsurv(
  s,
  CI = "def",
  plot.cens = TRUE,
  surv.col = "gg.def",
  cens.col = "gg.def",
  lty.est = 1,
  lty.ci = 2,
  size.est = 0.5,
  size.ci = size.est,
  cens.size = 2,
  cens.shape = 3,
  back.white = FALSE,
  xlab = "Time",
  ylab = "Survival",
  main = "",
  order.legend = TRUE
)
```

### Arguments

- **s**: an object of class `survfit`
- **CI**: should a confidence interval be plotted? Defaults to `TRUE` for single stratum objects and `FALSE` for multiple strata objects.
- **plot.cens**: mark the censored observations?
- **surv.col**: colour of the survival estimate. Defaults to black for one stratum, and to the default `ggplot2` colours for multiple strata. Length of vector with colour names should be either 1 or equal to the number of strata.
- **cens.col**: colour of the points that mark censored observations.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>lty.est</td>
<td>Linetype of the survival curve(s). Vector length should be either 1 or equal to the number of strata.</td>
</tr>
<tr>
<td>lty.ci</td>
<td>Linetype of the bounds that mark the 95% CI.</td>
</tr>
<tr>
<td>size.est</td>
<td>Line width of the survival curve</td>
</tr>
<tr>
<td>size.ci</td>
<td>Line width of the 95% CI</td>
</tr>
<tr>
<td>cens.size</td>
<td>Point size of the censoring points</td>
</tr>
<tr>
<td>cens.shape</td>
<td>Shape of the points that mark censored observations.</td>
</tr>
<tr>
<td>back.white</td>
<td>If TRUE the background will not be the default grey of ggplot2 but will be white with borders around the plot.</td>
</tr>
<tr>
<td>xlab</td>
<td>The label of the x-axis.</td>
</tr>
<tr>
<td>ylab</td>
<td>The label of the y-axis.</td>
</tr>
<tr>
<td>main</td>
<td>The plot label.</td>
</tr>
<tr>
<td>order.legend</td>
<td>Boolean to determine if the legend display should be ordered by final survival time</td>
</tr>
</tbody>
</table>

**Value**

An object of class `ggplot`

**Author(s)**

Edwin Thoen

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

if (require(survival) && require(scales)) {
  data(lung, package = "survival")
  sf.lung <- survival::survfit(Surv(time, status) ~ 1, data = lung)
  p_ (ggsurv(sf.lung))
}

# Multiple strata examples
sf.sex <- survival::survfit(Surv(time, status) ~ sex, data = lung)
pl.sex <- ggsurv(sf.sex)
p_(pl.sex)

# Adjusting the legend of the ggsurv fit
p_(pl.sex +
  ggplot2::guides(linetype = FALSE) +
  ggplot2::scale_colour_discrete(
    name = 'Sex',
    breaks = c(1,2),
    labels = c('Male', 'Female')))

# Multiple factors
lung2 <- plyr::mutate(lung, older = as.factor(age > 60))
sf.sex2 <- survival::survfit(Surv(time, status) ~ sex + older, data = lung2)
pl.sex2 <- ggsurv(sf.sex2)
p_(pl.sex2)
```
# Change legend title
p_(pl.sex2 + labs(color = "New Title", linetype = "New Title"))

# We can still adjust the plot after fitting
data(kidney, package = "survival")
sf.kid <- survival::survfit(Surv(time, status) ~ disease, data = kidney)
pl.kid <- ggsurv(sf.kid, plot.cens = FALSE)
p_(pl.kid)

# Zoom in to first 80 days
p_(pl.kid + ggplot2::coord_cartesian(xlim = c(0, 80), ylim = c(0.45, 1)))

# Add the diseases names to the plot and remove legend
p_(pl.kid +
  ggplot2::annotate(
    "text",
    label = c("PKD", "Other", "GN", "AN"),
    x = c(90, 125, 5, 60),
    y = c(0.8, 0.65, 0.55, 0.30),
    size = 5,
    colour = scales::hue_pal(
      h = c(0, 360) + 15,
      c = 100,
      l = 65,
      h.start = 0,
      direction = 1
    )(4)
  ) +
  ggplot2::guides(color = FALSE, linetype = FALSE))

---

## ggtable

Cross-tabulated tables of discrete variables

### Description

ggtable is a variant of ggduo for quick cross-tabulated tables of discrete variables.

### Usage

ggtable(
data,
columnsX = 1:ncol(data),
columnsY = 1:ncol(data),
cells = c("observed", "prop", "row.prop", "col.prop", "expected", "residuals", "stdres"),
fill = c("none", "stdres", "residuals"),
mapping = NULL,
...
Arguments

data: dataset to be used, can have both categorical and numerical variables

columnsX, columnsY: names or positions of which columns are used to make plots. Defaults to all columns.

cells: Which statistic should be displayed in table cells?

fill: Which statistic should be used for filling table cells?

mapping: additional aesthetic to be used, for example to indicate weights (see examples)

...: additional arguments passed to ggduo (see examples)

Author(s)

Joseph Larmarange

Examples

# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
if (require(Hmisc)) {
  data(tips, package = "reshape")
p_(ggtable(tips, "smoker", c("day", "time", "sex")))

  # displaying row proportions
  p_(ggtable(tips, "smoker", c("day", "time", "sex"), cells = "row.prop"))

  # filling cells with standardized residuals
  p_(ggtable(tips, "smoker", c("day", "time", "sex"), fill = "stdres", legend = 1))

  # if continuous variables are provided, just displaying some summary statistics
  p_(ggtable(tips, c("smoker", "total_bill"), c("day", "time", "sex", "tip")))

  # specifying weights
  d <- as.data.frame(Titanic)
p_(ggtable(
    d, "Survived",
    c("Class", "Sex", "Age"),
    mapping = aes(weight = Freq),
    cells = "row.prop",
    fill = "stdres"
  ))
}

Description

GGally implementation of ts.plot. Wraps around the ggduo function and removes the column strips.
glyphplot

Usage

ggts(..., columnLabelsX = NULL, xlab = "time")

Arguments

... supplied directly to ggduo
columnLabelsX remove top strips for the X axis by default
xlab defaults to "time"

Value

ggmatrix object

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
p_(ggts(pigs, "time", c("gilts", "profit", "s_per_herdz", "production", "herdz")))

glyphplot  Glyph plot class

Description

Glyph plot class

Usage

glyphplot(data, width, height, polar, x_major, y_major)

is.glyphplot(x)

## S3 method for class 'glyphplot'
x[...]

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

Arguments

data A data frame containing variables named in x_major, x_minor, y_major and y_minor.
height, width The height and width of each glyph. Defaults to 95% of the resolution of the data. Specify the width absolutely by supplying a numeric vector of length 1, or relative to the
polar A logical of length 1, specifying whether the glyphs should be drawn in polar coordinates. Defaults to FALSE.
x_major, y_major The name of the variable (as a string) for the major x and y axes. Together, the
x glyphplot to be printed
... ignored
Create the data needed to generate a glyph plot.

Usage

```r
glyphs(
  data,
  x_major,  # The name of the variable (as a string) for the major x axis.
  x_minor,  # The name of the variable (as a string) for the minor x axis.
  y_major,  # The name of the variable (as a string) for the major y axis.
  y_minor,  # The name of the variable (as a string) for the minor y axis.
  polar = FALSE,  # A logical of length 1, specifying whether the glyphs should be drawn in polar coordinates. Defaults to FALSE.
  height = ggplot2::rel(0.95),  # The height of each glyph. Defaults to 95% of the resolution of the data. Specify the height absolutely by supplying a numeric vector of length 1, or relative to the
  width = ggplot2::rel(0.95),  # The width of each glyph. Defaults to 95% of the resolution of the data. Specify the width absolutely by supplying a numeric vector of length 1, or relative to the
  y_scale = identity,  # The scaling function to be applied to each set of minor values within a grid cell. Defaults to identity so that no scaling is performed.
  x_scale = identity
)
```

Arguments

- **data**: A data frame containing variables named in `x_major`, `x_minor`, `y_major` and `y_minor`.
- **x_major, x_minor, y_major, y_minor**: The name of the variable (as a string) for the major and minor x and y axes. Together, each unique
- **polar**: A logical of length 1, specifying whether the glyphs should be drawn in polar coordinates. Defaults to FALSE.
- **height, width**: The height and width of each glyph. Defaults to 95% of the resolution of the data. Specify the height absolutely by supplying a numeric vector of length 1, or relative to the
- **y_scale, x_scale**: The scaling function to be applied to each set of minor values within a grid cell. Defaults to identity so that no scaling is performed.
Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

data(nasa)
nasaLate <- nasa[
  nasa$date >= as.POSIXct("1998-01-01") &
  nasa$lat >= 20 &
  nasa$lat <= 40 &
  nasa$long >= -80 &
  nasa$long <= -60
  ]
temp.gly <- glyphs(nasaLate, "long", "day", "lat", "surftemp", height=2.5)
p_(ggplot2::ggplot(temp.gly, ggplot2::aes(gx, gy, group = gid)) +
  add_ref_lines(temp.gly, color = "grey90") +
  add_ref_boxes(temp.gly, color = "grey90") +
  ggplot2::geom_path() +
  ggplot2::theme_bw() +
  ggplot2::labs(x = "", y = "")

---

grab_legend

Grab the legend and print it as a plot

Description

Grab the legend and print it as a plot

Usage

grab_legend(p)

## S3 method for class 'legend_guide_box'
print(x, ..., plotNew = FALSE)

Arguments

p ggplot2 plot object
x legend object that has been grabbed from a ggplot2 object
... ignored
plotNew boolean to determine if the 'grid.newpage()' command and a new blank rectangle should be printed

Examples

# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

library(ggplot2)
histPlot <- qplot(
  x = Sepal.Length,
  data = iris,
  fill = Species,
### Description
This data extract is taken from Hadley Wickham’s `productplots` package. The original description follows, with minor edits.

### Usage
```r
data(happy)
```

### Format
A data frame with 51020 rows and 10 variables

### Details
The data is a small sample of variables related to happiness from the General Social Survey (GSS). The GSS is a yearly cross-sectional survey of Americans, run from 1972. We combine data for 25 years to yield 51,020 observations, and of the over 5,000 variables, we select nine related to happiness:

- age. age in years: 18–89.
- degree. highest education: It high school, high school, junior college, bachelor, graduate.
- finrela. relative financial status: far above, above average, average, below average, far below.
- happy. happiness: very happy, pretty happy, not too happy.
- health. health: excellent, good, fair, poor.
- marital. marital status: married, never married, divorced, widowed, separated.
- sex. sex: female, male.
- wtsall. probability weight. 0.43–6.43.

### References
is_horizontal  

**Check if plot is horizontal**

**Description**

Check if plot is horizontal

**Usage**

```r
is_horizontal(data, mapping, val = "y")

is_character_column(data, mapping, val = "y")
```

**Arguments**

- **data**: data used in ggplot2 plot
- **mapping**: ggplot2 `aes()` mapping
- **val**: key to retrieve from mapping

**Value**

Boolean determining if the data is a character-like data

**Examples**

```r
is_horizontal(iris, ggplot2::aes(Sepal.Length, Species)) # TRUE
is_horizontal(iris, ggplot2::aes(Sepal.Length, Species), "x") # FALSE
is_horizontal(iris, ggplot2::aes(Sepal.Length, Sepal.Width)) # FALSE
```

lowertriangle  

**lowertriangle - rearrange dataset as the preparation of ggscatmat function**

**Description**

function for making the melted dataset used to plot the lowertriangle scatterplots.

**Usage**

```r
lowertriangle(data, columns = 1:ncol(data), color = NULL)
```

**Arguments**

- **data**: a data matrix. Should contain numerical (continuous) data.
- **columns**: an option to choose the column to be used in the raw dataset. Defaults to `1:ncol(data)`
- **color**: an option to choose a factor variable to be grouped with. Defaults to `(NULL)`
**mapping_color_to_fill**

**Author(s)**

Mengjia Ni, Di Cook

**Examples**

```r
data(flea)
head(lowertriangle(flea, columns= 2:4))
head(lowertriangle(flea))
head(lowertriangle(flea, color="species"))
```

---

**mapping_color_to_fill  Aesthetic mapping color fill**

**Description**

Replace the fill with the color and make color NULL.

**Usage**

```r
mapping_color_to_fill(current)
```

**Arguments**

- `current` the current aesthetics

---

**mapping_string  Aes name**

**Description**

Aes name

**Usage**

```r
mapping_string(aes_col)
```

**Arguments**

- `aes_col` Single value from `ggplot2::aes(...)`

**Value**

character string

**Examples**

```r
mapping <- ggplot2::aes(Petal.Length)
mapping_string(mapping$x)
```
Mapping Swap x and y

### Description

Swap x and y mapping

### Usage

```r
mapping_swap_x_y(mapping)
```

### Arguments

- **mapping**: output of `ggplot2::aes(...)`

### Value

Aes mapping with the x and y values switched

### Examples

```r
mapping <- ggplot2::aes(Petal.Length, Sepal.Width)
mapping
mapping_swap_x_y(mapping)
```

---

### Model Response Variables

Model term names

### Description

Retrieve either the response variable names, the beta variable names, or beta variable names. If the model is an object of class 'lm', by default, the beta variable names will include anova significance stars.

### Usage

```r
model_response_variables(model, data = broom::augment(model))
model_beta_variables(model, data = broom::augment(model))
model_beta_label(model, data = broom::augment(model), lmStars = TRUE)
```

### Arguments

- **model**: model in question
- **data**: equivalent to `broom::augment(model)`
- **lmStars**: boolean that determines if stars are added to labels

### Value

character vector of names
nasa

Data from the Data Expo JSM 2006.

Description
This data was provided by NASA for the competition.

Usage
data(nasa)

Format
A data frame with 41472 rows and 17 variables

Details
The data shows 6 years of monthly measurements of a 24x24 spatial grid from Central America:

• time integer specifying temporal order of measurements
• x, y, lat, long spatial location of measurements.
• cloudhigh, cloudlow, cloudmid, ozone, pressure, surftemp, temperature are the various satellite measurements.
• date, day, month, year specifying the time of measurements.
• id unique ide for each spatial position.

References

pigs

United Kingdom Pig Production

Description
This data contains about the United Kingdom Pig Production from the book 'Data' by Andrews and Herzberg. The original data can be on Statlib: http://lib.stat.cmu.edu/datasets/Andrews/T62.1

Usage
data(pigs)

Format
A data frame with 48 rows and 8 variables
Details

The time variable has been added from a combination of year and quarter

- time \( \text{year} + (\text{quarter} - 1) / 4 \)
- year year of production
- quarter quarter of the year of production
- gilts number of sows giving birth for the first time
- profit ratio of price to an index of feed price
- s_per_herdz ratio of the number of breeding pigs slaughtered to the total breeding herd size
- production number of pigs slaughtered that were reared for meat
- herdz breeding herd size

References


print.ggmatrix

Print ggmatrix object

Description

Print method taken from ggplot2::print.ggplot and altered for a ggmatrix object

Usage

```r
## S3 method for class 'ggmatrix'
print(x, newpage = is.null(vp), vp = NULL, ...)
```

Arguments

- `x` plot to display
- `newpage` draw new (empty) page first?
- `vp` viewport to draw plot in
- `...` arguments passed onto ggmatrix_gtable

Author(s)

Barret Schloerke

Examples

data(tips, package = "reshape")
pMat <- ggpairs(tips, c(1,3,2), mapping = ggplot2::aes_string(color = "sex"))
pMat # calls print(pMat), which calls print.ggmatrix(pMat)
Description

Small function to print a plot if the R session is interactive or in a CI build

Usage

print_if_interactive(p)

Arguments

p plot to be displayed

psychademic UCLA canonical correlation analysis data

Description

This data contains 600 observations on eight variables

Usage

data(psychademic)

Format

A data frame with 600 rows and 8 variables

Details

• locus_of_control - psychological
• self_concept - psychological
• motivation - psychological. Converted to four character groups
• read - academic
• write - academic
• math - academic
• science - academic
• female - academic. Dropped from original source
• sex - academic. Added as a character version of female column

References

**putPlot**

*Insert a plot into a ggmatrix object*

**Description**

Function to place your own plot in the layout.

**Usage**

```r
putPlot(pm, value, i, j)
```

```
## S3 replacement method for class 'ggmatrix'
pm[i, j, ...] <- value
```

**Arguments**

- `pm`: ggally object to be altered
- `value`: ggplot object to be placed
- `i`: row from the top
- `j`: column from the left
- `...`: ignored

**Author(s)**

Barret Schloerke

**See Also**

`getPlot`

**Examples**

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

custom_car <- ggpairs(mtcars[, c("mpg", "wt", "cyl")], upper = "blank", title = "Custom Example")

# ggplot example taken from example(geom_text)
plot <- ggplot2::ggplot(mtcars, ggplot2::aes(x=wt, y=mpg, label=rownames(mtcars)))
plot <- plot +
  ggplot2::geom_text(ggplot2::aes(colour=factor(cyl)), size = 3) +
  ggplot2::scale_colour_discrete(l=40)

custom_car[1, 2] <- plot

custom_car[1, 3] <- personal_plot

custom_car[2,1] <- NULL

custom_car[3,1] <- "blank" # the same as storing null

custom_car[3,2] <- NULL

p_(custom_car)
```
remove_color_unless_equal

Remove colour mapping unless found in select mapping keys

Description
Remove colour mapping unless found in select mapping keys

Usage
remove_color_unless_equal(mapping, to = c("x", "y"))

Arguments
- mapping: output of ggplot2::aes(...)
- to: set of mapping keys to check

Value
Aes mapping with colour mapping kept only if found in selected mapping keys.

Examples
mapping <- aes(x = sex, y = age, colour = sex)
mapping <- aes(x = sex, y = age, colour = region)
remove_color_unless_equal(mapping)

rescale01
Rescaling functions

Description
Rescaling functions

Usage
- range01(x)
- max1(x)
- mean0(x)
- min0(x)
- rescale01(x, xlim = NULL)
- rescale11(x, xlim = NULL)
Arguments

- `x` numeric vector
- `xlim` value used in range

---

**scag_order**

*Find order of variables*

Description

Find order of variables based on a specified scagnostic measure by maximizing the index values of that measure along the path.

Usage

```r
scag_order(scag, vars, measure)
```

Arguments

- `scag` scagnostics object
- `vars` character vector of the variables to be ordered
- `measure` scagnostics measure to order according to

Value

character vector of variable ordered according to the given scagnostic measure

Author(s)

Barret Schloerke

---

**scatmat**

*Plots the lowertriangle and density plots of the scatter plot matrix.*

Description

Function for making scatterplots in the lower triangle and diagonal density plots.

Usage

```r
scatmat(data, columns = 1:ncol(data), color = NULL, alpha = 1)
```

Arguments

- `data` a data matrix. Should contain numerical (continuous) data.
- `columns` an option to choose the column to be used in the raw dataset. Defaults to 1:ncol(data)
- `color` an option to group the dataset by the factor variable and color them by different colors. Defaults to NULL
- `alpha` an option to set the transparency in scatterplots for large data. Defaults to 1.
Author(s)
Mengjia Ni, Di Cook

Examples

# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
data(flea)
p_(scatmat(flea, columns=2:4))
p_(scatmat(flea, columns= 2:4, color="species"))

signif_stars

Description
Calculate significance stars

Usage

signif_stars(x, three = 0.001, two = 0.01, one = 0.05, point = 0.1)

Arguments

x numeric values that will be compared to the point, one, two, and three values
three threshold below which to display three stars
two threshold below which to display two stars
one threshold below which to display one star
point threshold below which to display one point (NULL to deactivate)

Value
character vector containing the appropriate number of stars for each x value

Author(s)
Joseph Larmarange

Examples

x <- c(0.5, 0.1, 0.05, 0.01, 0.001)
signif_stars(x)
signif_stars(x, one = .15, point = NULL)
singleClassOrder  

**Order axis variables**

**Description**

Order axis variables by separation between one class and the rest (most separation to least).

**Usage**

`singleClassOrder(classVar, axisVars, specClass = NULL)`

**Arguments**

- `classVar`: class variable (vector from original dataset)
- `axisVars`: variables to be plotted as axes (data frame)
- `specClass`: character string matching to level of `classVar`; instead of looking for separation between any class and the rest, will only look for separation between this class and the rest

**Value**

character vector of names of `axisVars` ordered such that the first variable has the most separation between one of the classes and the rest, and the last variable has the least (as measured by F-statistics from an ANOVA)

**Author(s)**

Jason Crowley

---

skewness  

**Sample skewness**

**Description**

Calculate the sample skewness of a vector while ignoring missing values.

**Usage**

`skewness(x)`

**Arguments**

- `x`: numeric vector

**Value**

sample skewness of `x`

**Author(s)**

Jason Crowley
**stat_cross**  
*Compute cross-tabulation statistics*

**Description**

Computes statistics of a 2-dimensional matrix using `augment.htest` from `broom`.

**Usage**

```r
stat_cross(
  mapping = NULL,
  data = NULL,
  geom = "point",
  position = "identity",
  ..., 
  na.rm = TRUE,
  show.legend = NA,
  inherit.aes = TRUE,
  keep.zero.cells = FALSE
)
```

**Arguments**

- `mapping`  
  Set of aesthetic mappings created by `aes()` or `aes_()`. If specified and `inherit.aes = TRUE` (the default), it is combined with the default mapping at the top level of the plot. You must supply `mapping` if there is no plot mapping.

- `data`  
  The data to be displayed in this layer. There are three options:  
  - If `NULL`, the default, the data is inherited from the plot data as specified in the call to `ggplot()`.  
  - A `data.frame`, or other object, will override the plot data. All objects will be fortified to produce a data frame. See `fortify()` for which variables will be created.  
  - A function will be called with a single argument, the plot data. The return value must be a `data.frame`, and will be used as the layer data. A function can be created from a formula (e.g. `~ head(.x,10)`).

- `geom`  
  Override the default connection between `geom_point` and `stat_prop`.

- `position`  
  Position adjustment, either as a string, or the result of a call to a position adjustment function.

- `...`  
  Other arguments passed on to `layer()`. These are often aesthetics, used to set an aesthetic to a fixed value, like `colour = "red"` or `size = 3`. They may also be parameters to the paired geom/stat.

- `na.rm`  
  If `TRUE`, the default, missing values are removed with a warning. If `FALSE`, missing values are silently removed.

- `show.legend`  
  Logical. Should this layer be included in the legends? `NA`, the default, includes if any aesthetics are mapped. `FALSE` never includes, and `TRUE` always includes. It can also be a named logical vector to finely select the aesthetics to display.

- `inherit.aes`  
  If `FALSE`, overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn’t inherit behaviour from the default plot specification, e.g. `borders()`.
keep.zero.cells

If TRUE, cells with no observations are kept.

Aesthetics

stat_prop requires the x and the y aesthetics.

Computed variables

- **observed** number of observations in x,y
- **prop** proportion of total
- **row.prop** row proportion
- **col.prop** column proportion
- **expected** expected count under the null hypothesis
- **residuals** Pearson’s residual
- **stdres** standardized residual

Examples

```r
# Small function to display plots only if it’s interactive
p_ <- GGally::print_if_interactive

d <- as.data.frame(Titanic)

# plot number of observations
p_(ggplot(d) +
aes(x = Class, y = Survived, weight = Freq, size = after_stat(observed)) +
stat_cross() +
scale_size_area(max_size = 20))

# custom shape and fill colour based on chi-squared residuals
p_(ggplot(d) +
aes(
  x = Class, y = Survived, weight = Freq,
  size = after_stat(observed), fill = after_stat(stdres)
) +
stat_cross(shape = 22) +
scale_fill_steps2(breaks = c(-3, -2, 2, 3), show.limits = TRUE) +
scale_size_area(max_size = 20))

# plotting the number of observations as a table
p_(ggplot(d) +
aes(
  x = Class, y = Survived, weight = Freq, label = after_stat(observed)
) +
geom_text(stat = "cross"))

# Row proportions with standardized residuals
p_(ggplot(d) +
aes(
  x = Class, y = Survived, weight = Freq,
  label = scales::percent(after_stat(row.prop)),
  size = NULL, fill = after_stat(stdres)
) +
stat_cross(shape = 22, size = 30) +
```
stat_prop

```
geom_text(stat = "cross") +
scale_fill_steps2(breaks = c(-3, -2, 2, 3), show.limits = TRUE) +
facet_grid(Sex ~ .) +
labs(fill = "Standardized residuals") +
theme_minimal())
```

# can work with continuous or character variables
data(tips, package = "reshape")
p_(ggplot(tips) +
aes(x = tip, y = as.character(day), size = after_stat(observed)) +
stat_cross(alpha = .1, color = "blue") +
scale_size_area(max_size = 12))

---

stat_prop  
Compute proportions according to custom denominator

**Description**

stat_prop is a variation of stat_count allowing to compute custom proportions according to the by aesthetic defining the denominator (i.e. all proportions for a same value of by will sum to 1). The by aesthetic should be a factor.

**Usage**

```
stat_prop(
  mapping = NULL,
  data = NULL,
  geom = "bar",
  position = "fill",
  ..., width = NULL,
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE
)
```

**Arguments**

- **mapping**  
  Set of aesthetic mappings created by `aes()` or `aes()`. If specified and `inherit.aes` = TRUE (the default), it is combined with the default mapping at the top level of the plot. You must supply mapping if there is no plot mapping.

- **data**  
  The data to be displayed in this layer. There are three options:
  - NULL, the default, the data is inherited from the plot data as specified in the call to `ggplot()`.
  - A data.frame, or other object, will override the plot data. All objects will be fortified to produce a data frame. See `fortify()` for which variables will be created.
  - A function will be called with a single argument, the plot data. The return value must be a data.frame, and will be used as the layer data. A function can be created from a formula (e.g. `~ head(.x,10)`).

- **geom**  
  Override the default connection between `geom_bar` and stat_prop.
position

Position adjustment, either as a string, or the result of a call to a position adjustment function.

...  

Other arguments passed on to \texttt{layer()}. These are often aesthetics, used to set an aesthetic to a fixed value, like \texttt{colour = "red"} or \texttt{size = 3}. They may also be parameters to the paired geom/stat.

width

Bar width. By default, set to 90\% of the resolution of the data.

na.rm

If \texttt{FALSE}, the default, missing values are removed with a warning. If \texttt{TRUE}, missing values are silently removed.

show.legend

logical. Should this layer be included in the legends? \texttt{NA}, the default, includes if any aesthetics are mapped. \texttt{FALSE} never includes, and \texttt{TRUE} always includes. It can also be a named logical vector to finely select the aesthetics to display.

inherit.aes

If \texttt{FALSE}, overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn’t inherit behaviour from the default plot specification, e.g. \texttt{borders()}.

Aesthetics

\texttt{stat\_prop} requires the \texttt{by} aesthetic and this \texttt{by} aesthetic should be a factor.

Computed variables

\textbf{count} number of points in bin

\textbf{prop} computed proportion

Author(s)

Joseph Larmarange

See Also

\texttt{stat\_count}

Examples

\begin{verbatim}
# Small function to display plots only if it’s interactive
p_ <- GGally::print_if_interactive

d <- as.data.frame(Titanic)

p <- ggplot(d) +
aes(x = Class, fill = Survived, weight = Freq, by = Class) +
geom_bar(position = "fill") +
geom_text(stat = "prop", position = position_fill(.5))

p_(p)

p_(p + facet_grid(~ Sex))

p_(ggplot(d) +
aes(x = Class, fill = Survived, weight = Freq) +
geom_bar(position = "dodge") +
geom_text(
  aes(by = Survived), stat = "prop",
  position = position_dodge(.9), vjust = "bottom"
))
\end{verbatim}
stat_weighted_mean

Compute weighted y mean

Description

This statistic will compute the mean of y aesthetic for each unique value of x, taking into account weight aesthetic if provided.

Usage

stat_weighted_mean(
  mapping = NULL,
  data = NULL,
  geom = "point",
  position = "identity",
  ...
)

Arguments

mapping Set of aesthetic mappings created by aes() or aes_. If specified and inherit.aes = TRUE (the default), it is combined with the default mapping at the top level of the plot. You must supply mapping if there is no plot mapping.

data The data to be displayed in this layer. There are three options:
If NULL, the default, the data is inherited from the plot data as specified in the call to ggplot().
A data.frame, or other object, will override the plot data. All objects will be fortified to produce a data frame. See fortify() for which variables will be created.
A function will be called with a single argument, the plot data. The return value must be a data.frame, and will be used as the layer data. A function can be created from a formula (e.g. ~ head(.x,10)).

geom Use to override the default connection between geom_histogram()/geom_freqpoly() and stat_bin().

position Position adjustment, either as a string, or the result of a call to a position adjustment function.
Other arguments passed on to `layer()`. These are often aesthetics, used to set an aesthetic to a fixed value, like `colour = "red"` or `size = 3`. They may also be parameters to the paired geom/stat.

`na.rm` If FALSE, the default, missing values are removed with a warning. If TRUE, missing values are silently removed.

`orientation` The orientation of the layer. The default (NA) automatically determines the orientation from the aesthetic mapping. In the rare event that this fails it can be given explicitly by setting `orientation` to either "x" or "y". See the Orientation section for more detail.

`show.legend` logical. Should this layer be included in the legends? NA, the default, includes if any aesthetics are mapped. FALSE never includes, and TRUE always includes. It can also be a named logical vector to finely select the aesthetics to display.

`inherit.aes` If FALSE, overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn’t inherit behaviour from the default plot specification, e.g. `borders()`.

### Computed variables

- `y` weighted y (numerator / denominator)
- `numerator` numerator
- `denominator` denominator

### Examples

```r
# Small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive
data(tips, package = "reshape")
p_(ggplot(tips) +
  aes(x = day, y = total_bill) +
  geom_point())
p_(ggplot(tips) +
  aes(x = day, y = total_bill) +
  stat_weighted_mean())
p_(ggplot(tips) +
  aes(x = day, y = total_bill, group = 1) +
  stat_weighted_mean(geom = "line"))
p_(ggplot(tips) +
  aes(x = day, y = total_bill, colour = sex, group = sex) +
  stat_weighted_mean(geom = "line"))
p_(ggplot(tips) +
  aes(x = day, y = total_bill, fill = sex) +
  stat_weighted_mean(geom = "bar", position = "dodge"))

# computing a proportion on the fly
p_(ggplot(tips) +
  aes(x = day, y = as.integer(smoker == "Yes"), fill = sex) +
  stat_weighted_mean(geom = "bar", position = "dodge") +
  scale_y_continuous(labels = scales::percent))
```
# taking into account some weights

d <- as.data.frame(Titanic)

```r
p <- ggplot(d) +
aes(x = Class, y = as.integer(Survived == "Yes"), weight = Freq, fill = Sex) + geom_bar(stat = "weighted_mean", position = "dodge") +
scale_y_continuous(labels = scales::percent) + labs(y = "Survived")
```

## Not run:

cuse <- read.table("https://data.princeton.edu/wws509/datasets/cuse.dat", header = TRUE)
cuse$n <- cuse$notUsing + cuse$using
cuse$prop <- cuse$using / cuse$n

ggplot(cuse) +
aes(x = education, y = prop, weight = n) +
stat_weighted_mean()

ggplot(cuse) +
aes(x = age, y = prop, weight = n, color = education) +
stat_weighted_mean()

ggplot(cuse) +
geom_bar(stat = "weighted_mean")

# add percentages above each bar

ggplot(cuse) +
aes(x = age, y = prop, weight = n, fill = education) +
stat_weighted_mean(geom = "bar") +
geom_text(aes(label = scales::percent(after_stat(y))), stat = "weighted_mean", vjust = 0) +
facet_grid(~ education)

## End(Not run)

---

str.ggmatrix  

### Description

View the condensed version of the `ggmatrix` object. The attribute "class" is ALWAYS altered to 
"_class" to avoid recursion.

### Usage

```r
## S3 method for class 'ggmatrix'
str(object, ..., raw = FALSE)
```

### Arguments

- `object`  
  `ggmatrix` object to be viewed

  ...

  passed on to the default `str` method
raw boolean to determine if the plots should be converted to text or kept as original objects

<table>
<thead>
<tr>
<th>twitter_spambots</th>
<th>Twitter spambots</th>
</tr>
</thead>
</table>

**Description**

A network of spambots found on Twitter as part of a data mining project.

**Usage**

```r
data(twitter_spambots)
```

**Format**

An object of class network with 120 edges and 94 vertices.

**Details**

Each node of the network is identified by the Twitter screen name of the account and further carries five vertex attributes:

- location user’s location, as provided by the user
- lat latitude, based on the user’s location
- lon longitude, based on the user’s location
- followers number of Twitter accounts that follow this account
- friends number of Twitter accounts followed by the account

**Author(s)**

Amos Elberg

---

**uppertriangle**  
Rearrange dataset as the preparation of `ggscatmat` function

**Description**

Function for making the dataset used to plot the uppertriangle plots.

**Usage**

```r
uppertriangle(
  data,  
columns = 1:ncol(data),
color = NULL,
corMethod = "pearson"
)
```
Arguments

data a data matrix. Should contain numerical (continuous) data.
columns an option to choose the column to be used in the raw dataset. Defaults to 1:ncol(data)
color an option to choose a factor variable to be grouped with. Defaults to (NULL)
corMethod method argument supplied to cor

Author(s)
Mengjia Ni, Di Cook

Examples

data(flea)
head(uppertriangle(flea, columns=2:4))
head(uppertriangle(flea))
head(uppertriangle(flea, color="species"))

v1_ggmatrix_theme Modify a ggmatrix object by adding an ggplot2 object to all

Description
Modify a ggmatrix object by adding an ggplot2 object to all

Usage
v1_ggmatrix_theme()

Examples
# Small function to display plots only if it’s interactive
p_ <- GGally::print_if_interactive
p_(ggpairs(iris, 1:2) + v1_ggmatrix_theme())
# move the column names to the left and bottom
p_(ggpairs(iris, 1:2, switch = "both") + v1_ggmatrix_theme())

vig_ggally View GGally vignettes

Description
This function will open the directly to the vignette requested. If no name is provided, the index of all GGally vignettes will be opened.

Usage
vig_ggally(name)
Arguments

name Vignette name to open. If no name is provided, the vignette index will be opened

Details

This method allows for vignettes to be hosted remotely, reducing GGally's package size, and installation time.

Examples

```r
# View 'ggnostic' vignette
ggally("ggnostic")

# View all vignettes by GGally
ggally()
```

Description

Wraps a function with the supplied parameters to force different default behavior. This is useful for functions that are supplied to ggpairs. It allows you to change the behavior of one function, rather than creating multiple functions with different parameter settings.

Usage

```r
wrap_fn_with_param_arg(
  funcVal,
  params = NULL,
  funcArgName = deparse(substitute(funcVal))
)
```

```r
wrapp(funcVal, params = NULL, funcArgName = deparse(substitute(funcVal)))
```

```r
wrap(funcVal, ..., funcArgName = deparse(substitute(funcVal)))
```

```r
wrap_fn_with_params(funcVal, ..., funcArgName = deparse(substitute(funcVal)))
```

Arguments

- **funcVal**: function that the params will be applied to. The function should follow the api of `function(data, mapping, ...)()`. `funcVal` is allowed to be a string of one of the ggally_NAME functions, such as "points" for ggally_points or "facetdensity" for ggally_facetdensity.
- **params**: named vector or list of parameters to be applied to the `funcVal`
- **funcArgName**: name of function to be displayed
- **...**: named parameters to be supplied to `wrap_fn_with_param_arg`
Details

`wrap` is identical to `wrap_fn_with_params`. These functions take the new parameters as arguments.

`wrap_fn_with_param_arg` is identical to `wrap_fn_with_param_arg`. These functions take the new parameters as a single list.

The `params` and `fn` attributes are there for debugging purposes. If either attribute is altered, the function must be re-wrapped to have the changes take effect.

Value

A function `a function(data,mapping,...){}` that will wrap the original function with the parameters applied as arguments.

Examples

```r
# small function to display plots only if it's interactive
p_ <- GGally::print_if_interactive

# example function that prints 'val'
fn <- function(data, mapping, val = 2) {
  print(val)
}
fn(data = NULL, mapping = NULL) # 2

# wrap function to change default value 'val' to 5 instead of 2
wrapped_fn1 <- wrap(fn, val = 5)
wrapped_fn1(data = NULL, mapping = NULL) # 5
# you may still supply regular values
wrapped_fn1(data = NULL, mapping = NULL, val = 3) # 3

# wrap function to change 'val' to 5 using the arg list
wrapped_fn2 <- wrap_fn_with_param_arg(fn, params = list(val = 5))
wrapped_fn2(data = NULL, mapping = NULL) # 5

# change parameter settings in ggpairs for a particular function
## Goal output:
regularPlot <- ggally_points(    iris,    ggplot2::aes(Sepal.Length, Sepal.Width),    size = 5, color = "red")
p_(regularPlot)

# Wrap ggally_points to have parameter values size = 5 and color = 'red'
w_ggally_points <- wrap(ggally_points, size = 5, color = "red")
wrappedPlot <- w_ggally_points(    iris,    ggplot2::aes(Sepal.Length, Sepal.Width))
p_(wrappedPlot)

# Double check the aes parameters are the same for the geom_point layer
identical(regularPlot$layers[[1]]$aes_params, wrappedPlot$layers[[1]]$aes_params)

# Use a wrapped function in ggpairs
pm <- ggpairs(iris, 1:3, lower = list(continuous = wrap(ggally_points, size = 5, color = "red")))
```
p_(pm)

pm <- ggpairs(iris, 1:3, lower = list(continuous = w_ggally_points))
p_(pm)
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