Package 'forestploter'

November 21, 2022

Title Create Flexible Forest Plot

Version 0.2.3

Description Create forest plot based on the layout of the data. Confidence interval in multiple columns by groups can be done easily. Editing plot, inserting/adding text, applying theme to the plot and much more.

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URL https://github.com/adayim/forestploter

BugReports https://github.com/adayim/forestploter/issues

Encoding UTF-8

RoxygenNote 7.2.1

Imports grid, gridExtra, gtable

Suggests rmarkdown, knitr, vdiffr, testthat (>= 3.0.0), covr

VignetteBuilder knitr

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R topics documented:

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add_border *Add border to cells*

Description

Add border to any cells at any side.

add_underline is a wrapper of add_border can be used to add underline to cells.

Usage

```
add_border(
  plot,
  row = NULL,
  col = NULL,
  part = c("body", "header"),
  where = c("bottom", "left", "top", "right"),
  gp = gpar(lwd = 2)
)

add_underline(
  plot,
  row = NULL,
  col = NULL,
  part = c("body", "header"),
  gp = gpar(lwd = 2)
)
```

Arguments

plot	A forest plot object.
row	A numeric value or vector indicating row number to add border. This is corresponding to the data row number. Remember to account for any text inserted. A border will be drawn to all rows if this is omitted.
col	A numeric value or vector indicating the columns to add border. A border will be drawn to all columns if this is omitted.
part	The border will be added to "body" (default) or "header".
where	Where to draw the border of the cell, possible values are "bottom" (default), "left", "top" and "right"
gp	An object of class "gpar", graphical parameter to be passed to segmentsGrob.

Value

A gtable object.

See Also

gpar segmentsGrob gtable_add_grob

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add_text *Add text to forest plot*

Description

This function can be used to add text to forest plot. The text can be span to multiple rows and columns. The height of the row will be changed accordingly if the text is added to only one row. The width of the text may exceeds the columns provided if the text is too long.

Usage

```
add_text(
  plot,
  text,
  row = NULL,
  col = NULL,
  part = c("body", "header"),
  just = c("center", "left", "right"),
  gp = gpar(),
  padding = unit(1, "mm")
)
```

Arguments

plot	A forest plot object.
text	A character or expression vector, see textGrob.
row	Row to add the text, this will be ignored if the part is "header".
col	A numeric value or vector indicating the columns the text will be added. The text will span over the column if a vector is given.
part	Part to add text, body (default) or header.
just	The justification of the text, "center" (default), "left" or "right".
gp	An object of class "gpar", this is the graphical parameter settings of the text. See gpar.
padding	Padding of the text, default is unit(1, "mm")

Value

A gtable object.

See Also

gtable gpar textGrob gtable_add_grob

edit_plot *Edit forest plot*

Description

This function is used to edit the graphical parameter of text and background of the forest plot.

Usage

```
edit_plot(
  plot,
  row = NULL,
  col = NULL,
  part = c("body", "header"),
  which = c("text", "background", "ci"),
  gp
)
```

Arguments

plot	A forest plot object.
row	A numeric value or vector indicating row number to edit in the dataset. Will edit the whole row if left blank for the body. This will be ignored if the part is "header".
col	A numeric value or vector indicating column to edit in the dataset. Will edit the whole column if left blank.
part	Part to edit, "body" (default) or "header".
which	Which element to edit, "text", "background" or "ci" (confidence interval). This will not edit diamond shaped summary CI, please change it with forest_theme. Also, change in ci will not have any impact on the legend.
gp	Pass gpar parameters, see gpar. It should be passed as gpar(col = "red"). For which = "ci", please refer to forest_theme ci_* parameters for the editable elements.

Value

A gtable object.

See Also

gpar editGrob forest_theme

forest *Forest plot*

Description

A data frame will be used for the basic layout of the forest plot. Graphical parameters can be set using the forest_theme function.

Usage

```
forest(
  data,
  est,
  lower,
  upper,
  sizes = 0.4,
  ref_line = ifelse(x_trans %in% c("log", "log2", "log10"), 1, 0),
  vert_line = NULL,
  ci_column,
  is_summary = NULL,
  xlim = NULL,
  ticks_at = NULL,
  ticks_digits = 1L,
  arrow_lab = NULL,
  x_trans = "none",
  xlab = NULL,
  footnote = NULL,
  title = NULL,
  nudge_y = 0,
  theme = NULL
)
```

Arguments

data	Data to be displayed in the forest plot
est	Point estimation. Can be a list for multiple columns and/or multiple groups. If the length of the list is larger than then length of ci_column, then the values reused for each column and considered as different groups.
lower	Lower bound of the confidence interval, same as est.
upper	Upper bound of the confidence interval, same as est.
sizes	Size of the point estimation box, can be a unit, vector or a list. If the value is not unique, this will first calculate square root of the reciprocal of size, then devide by overall maximum calculated value.
ref_line	X-axis coordinates of zero line, default is 1. Provide an atomic vector if different reference line for each ci_column is desired.

vert_line	Numerical vector, add additional vertical line at given value. Provide a list of numerical vector element if different vertical line for each ci_column is desired.
ci_column	Column number of the data the CI will be displayed.
is_summary	A logical vector indicating if the value is a summary value, which will have a diamond shape for the estimate. Can not be used with multiple group forestplot.
xlim	Limits for the x axis as a vector of length 2, i.e. c(low, high). It will take the minimum and maximum of the lower and upper value if not provided. This will apply to all CI columns if provided, and will be calculated automatically for each column if not provided. This should be a list with the same length of ci_column if different xlim for different column is desired.
ticks_at	Set X-axis tick-marks point. This will apply to all CI columns if provided, and will be calculated automatically for each column if not provided. This should be a list if different ticks_at for different column is desired. Although many efforts have been made to automatically get a pretty ticks break, it will not give a perfect solution, especially if 'log2' and 'log10' defined for x_trans. Please provide this value if possible.
ticks_digits	Number of digits for the x-axis, default is 1L. This should be a numerical vector if different rounding will be applied to different column. If an integer is specified, for example 1L, trailing zeros after the decimal mark will be dropped. Specify numeric, for example 1, to keep the trailing zero after the decimal mark.
arrow_lab	Labels for the arrows, string vector of length two (left and right). The theme of arrow will inherit from the x-axis. This should be a list if different arrow labels for each column is desired.
x_trans	Change axis scale, Allowed values are one of c("none", "log", "log2", "log10"). Default is "none", no transformation will be applied. The formatted label will be used for scale = "log2" or "log10", change this in x_trans. Set this to "log" if x-axis tick marks assume values are exponential, e.g. for logistic regression (OR), survival estimates (HR), Poisson regression etc.
xlab	X-axis labels, it will be put under the x-axis. An atomic vector should be provided if different xlab for different column is desired.
footnote	Footnote for the forest plot, will be aligned at left bottom of the plot. Please adjust the line length with line break to avoid the overlap with the arrow and/or x-axis.
title	The text for the title.
nudge_y	Horizontal adjustment to nudge groups by, must be within 0 to 1.
theme	Theme of the forest plot, see forest_theme for details.

Value

A gtable object.

See Also

gtable tableGrob forest_theme

Examples

```
# Read provided sample example data
dt <- read.csv(system.file("extdata", "example_data.csv", package = "forestploter"))

# Keep needed columns
dt <- dt[,1:6]

# indent the subgroup if there is a number in the placebo column
dt$Subgroup <- ifelse(is.na(dt$Placebo),
                      dt$Subgroup,
                      paste0("   ", dt$Subgroup))

# NA to blank or NA will be transformed to carachter.
dt$Treatment <- ifelse(is.na(dt$Treatment), "", dt$Treatment)
dt$Placebo <- ifelse(is.na(dt$Placebo), "", dt$Placebo)
dt$se <- (log(dt$hi) - log(dt$est))/1.96

# Add blank column for the forest plot to display CI.
# Adjust the column width with space.
dt$` ` <- paste(rep(" ", 20), collapse = " ")

# Create confidence interval column to display
dt$`HR (95% CI)` <- ifelse(is.na(dt$se), "",
                           sprintf("%.2f (%.2f to %.2f)",
                                   dt$est, dt$low, dt$hi))

# Define theme
tm <- forest_theme(base_size = 10,
                   refline_col = "red",
                   footnote_col = "#636363",
                   footnote_fontface = "italic")

p <- forest(dt[,c(1:3, 8:9)],
            est = dt$est,
            lower = dt$low,
            upper = dt$hi,
            sizes = dt$se,
            ci_column = 4,
            ref_line = 1,
            arrow_lab = c("Placebo Better", "Treatment Better"),
            xlim = c(0, 4),
            ticks_at = c(0.5, 1, 2, 3),
        footnote = "This is the demo data. Please feel free to change\nanything you want.",
            theme = tm)

# Print plot
plot(p)
```

`forestploter` *Create Forest Plot*

Description

This package uses gtable and gridExtra to overlay forest plots.

Author(s)

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See Also

grid,gridExtra

`forest_theme` *Forest plot default theme*

Description

Default theme for the forest plot, but can pass other parameters. The parameters will be passed to corresponding elements of the forest plot.

- `ci_*`Control the graphical parameters of confidence intervals
- `legend_*`Control the graphical parameters of legend
- `xaxis_*`Control the graphical parameters of x-axis
- `refline_*`Control the graphical parameters of reference line
- `vertline_*`Control the graphical parameters of vertical line
- `summary_*`Control the graphical parameters of diamond shaped summary CI
- `footnote_*`Control the graphical parameters of footnote
- `title_*`Control the graphical parameters of title
- `arrow_*`Control the graphical parameters of arrow

See gpar for more details.

Usage

```
forest_theme(
  base_size = 12,
  base_family = "",
  ci_pch = 15,
  ci_col = "black",
  ci_alpha = 1,
  ci_fill = NULL,
  ci_lty = 1,
  ci_lwd = 1,
  ci_Theight = NULL,
  legend_name = "Group",
  legend_position = "right",
```

```
  legend_value = "",
  xaxis_lwd = 0.6,
  xaxis_cex = 1,
  refline_lwd = 1,
  refline_lty = "dashed",
  refline_col = "grey20",
  vertline_lwd = 1,
  vertline_lty = "dashed",
  vertline_col = "grey20",
  summary_fill = "#4575b4",
  summary_col = "#4575b4",
  footnote_cex = 0.6,
  footnote_fontface = "plain",
  footnote_col = "black",
  title_just = c("left", "right", "center"),
  title_cex = 1.2,
  title_fontface = "bold",
  title_col = "black",
  title_fontfamily = base_family,
  arrow_type = c("open", "closed"),
  arrow_label_just = c("start", "end"),
  arrow_length = 0.05,
  arrow_lwd = xaxis_lwd,
  arrow_fill = "black",
  arrow_col = arrow_fill,
  arrow_cex = xaxis_cex,
  ...
)
```

Arguments

base_size	The size of text
base_family	The font family
ci_pch	Shape of the point estimation. It will be reused if the forest plot is grouped.
ci_col	Color of the CI. A vector of color should be provided for the grouped forest plot. An internal color set will be if only not.
ci_alpha	Scalar value, alpha channel for transparency of point estimation. A small vertical line will be added to indicate the point estimation if this is not equals to 1.
ci_fill	Color fill the point estimation. A vector of color should be provided for the grouped forest plot. If this is NULL (default), the value will inherit from "ci_col". This is valid only if ci_pch within 15:25.
ci_lty	Line type of the CI. A vector of line type should be provided for the grouped forest plot.
ci_lwd	Line width of the CI. A vector of line type should be provided for the grouped forest plot.

ci_Theight	A unit specifying the height of the T end of CI. If set to NULL (default), no T end will be drawn.
legend_name	Title of the legend.
legend_position	Position of the legend, "right", "top", "bottom" or "none" to suppress the legend.
legend_value	Legend labels (expressions). A vector should be provided for the grouped forest plot. A "Group 1" etc will be created if not a vector for a grouped forest plot.
xaxis_lwd	Line width for x-axis.
xaxis_cex	Multiplier applied to font size for x-axis.
refline_lwd	Line width for reference line.
refline_lty	Line type for reference line.
refline_col	Line color for the reference line.
vertline_lwd	Line width for extra vertical line. A vector can be provided for each vertical line, and the values will be recycled if no enough values are given.
vertline_lty	Line type for extra vertical line. Works same as vertline_lwd.
vertline_col	Line color for the extra vertical line. Works same as vertline_lwd.
summary_fill	Color for filling the summary diamond shape.
summary_col	Color for borders of the summary diamond shape.
footnote_cex	Multiplier applied to font size for footnote.
footnote_fontface	The font face for footnote.
footnote_col	Color of the footnote.
title_just	The justification of the title, default is 'left'.
title_cex	Multiplier applied to font size for title.
title_fontface	The font face for title, default is 'bold'.
title_col	Color of title.
title_fontfamily	Font family of title.
arrow_type	Type of the arrow below x-axis, see arrow.
arrow_label_just	The justification of the arrow label relative to arrow. Control the arrow label to align to the starting point of the arrow "start" (default) or the ending point of the arrow "end".
arrow_length	The length of the arrow head, default is 0.05. See arrow.
arrow_lwd	Line width of the arrow, same as xaxis_lwd by default.
arrow_fill	Filling color of the arrow head, default is "black".
arrow_col	Line and text color of the arrow, same as arrow_fill by default.
arrow_cex	Multiplier applied to font size for arrow label, same as xaxis_cex by default.
...	Other parameters passed to table. See tableGrob for details.

Value

A list.

See Also

tableGrob forest textGrob gpar arrow segmentsGrob linesGrob pointsGrob legendGrob

---

get_wh *Get widths and height the forestplot*

Description

get_wh can be used to find the correct width and height of the forestplot for saving, as the width and height is difficult to fit for saving.

Usage

```
get_wh(plot, unit = c("in", "cm", "mm"))
```

Arguments

plot	A forest plot object.
unit	Unit of the plot size in units ("in", "cm", or "mm")to be saved.

Value

A named vector of width and height

Examples

```
## Not run:
 dt <- read.csv(system.file("extdata", "example_data.csv", package = "forestploter"))
 dt <- dt[1:6,1:6]

 dt$` ` <- paste(rep(" ", 20), collapse = " ")

 p <- forest(dt[,c(1:3, 7)],
             est = dt$est,
             lower = dt$low,
             upper = dt$hi,
             ci_column = 4)

# get_wh example
p_wh <- get_wh(p)
pdf('test.pdf',width = p_wh[1], height = p_wh[2])
plot(p)
dev.off()

## End(Not run)
```

`insert_text` *Insert text to forest plot*

Description

This function can be used to insert text to forest plot. Remember to adjust for the row number if you have added text before, including header. This is achieved by inserted new row(s) to the plot and will affect the row number. A text vector can be inserted to multiple columns or rows.

Usage

```
insert_text(
  plot,
  text,
  row = NULL,
  col = NULL,
  part = c("body", "header"),
  just = c("center", "left", "right"),
  before = TRUE,
  gp = gpar(),
  padding = unit(1, "mm")
)
```

Arguments

`plot`	A forest plot object.
`text`	A character or expression vector, see `textGrob`.
`row`	Row to insert the text, this will be ignored if the `part` is "header".
`col`	A numeric value or vector indicating the columns the text will be added. The text will span over the column if a vector is given.
`part`	Part to insert text, body (default) or header.
`just`	The justification of the text, `"center"` (default), `"left"` or `"right"`.
`before`	Indicating the text will be inserted before or after the row.
`gp`	An object of class `"gpar"`, this is the graphical parameter settings of the text. See `gpar`.
`padding`	Padding of the text, default is `unit(1, "mm")`

Value

A `gtable` object.

See Also

`gpar` `textGrob` `gtable_add_grob`

makeci *Create confidence interval grob*

Description

Create confidence interval grob

Usage

```
makeci(
  est,
  lower,
  upper,
  pch,
  sizes = 1,
  gp = gpar(),
  t_height = NULL,
  xlim = c(0, 1),
  nudge_y = 0,
  name = NULL
)
```

Arguments

est	Point estimation. Can be a list for multiple columns and/or multiple groups. If the length of the list is larger than then length of ci_column, then the values reused for each column and considered as different groups.
lower	Lower bound of the confidence interval, same as est.
upper	Upper bound of the confidence interval, same as est.
pch	Numeric or character vector indicating what sort of plotting symbol to use. See pointsGrob.
sizes	Size of the point estimation box, can be a unit, vector or a list. If the value is not unique, this will first calculate square root of the reciprocal of size, then devide by overall maximum calculated value.
gp	Graphical parameters. Please refer to forest_theme for more details.
t_height	The height confidence interval line end vertices. If value is NULL (default), no vertices will be drawn.
xlim	Limits for the x axis as a vector of length 2, i.e. c(low, high). It will take the minimum and maximum of the lower and upper value if not provided. This will apply to all CI columns if provided, and will be calculated automatically for each column if not provided. This should be a list with the same length of ci_column if different xlim for different column is desired.
nudge_y	Horizontal adjustment to nudge groups by, must be within 0 to 1.
name	name of the grob.

Value

A gTree object

`print.forestplot` *Draw plot*

Description

Print or draw forestplot.

Usage

```
## S3 method for class 'forestplot'
print(x, autofit = FALSE, ...)

## S3 method for class 'forestplot'
plot(x, autofit = FALSE, ...)
```

Arguments

`x`	forestplot to display
`autofit`	If true, the plot will be autofit.
`...`	other arguments not used by this method

Value

Invisibly returns the original forestplot.

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