

# Package ‘tableExtra’

October 14, 2022

**Title** Draws an Awesome Table

**Version** 1.0.1

**Description** An easy-to-use tool for drawing paper-quality tables with double-information encoded in grobs shapes and colors.

**License** Apache License (>= 2.0)

**Encoding** UTF-8

**RoxygenNote** 7.1.2

**Suggests** testthat, dplyr, tibble

**Depends** R (>= 3.5.0)

**Imports** gtable, grid

**NeedsCompilation** no

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**Repository** CRAN

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draw_table_extra	<i>Graphical display of a table with grobs of varying scales and colours.</i>
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### Description

Draw a table containing grobs of varying sizes and colors encoding two different kinds of information. The column names and row names of the table are displayed on the top and left sides of the table respectively.

### Usage

```
draw_table_extra(
  dscale,
  theme,
  output,
  dcolor = NULL,
  dscale_min = NULL,
  dscale_max = NULL,
  cols_more = NULL,
  rows_more = NULL,
  dscale_title_legend = "Scale title",
  dcolor_title_legend = "Color title",
  margin_x = unit(1, "inches"),
  margin_y = unit(1, "inches")
)
```

### Arguments

dscale	a matrix containing the values defining the grobs scales.
theme	a list of theme parameters. Use an instance of <code>ttheme_awesome</code> .
output	path to output file. Only pdf supported for now.
dcolor	(optional) a matrix of size (n,m) containing the values defining the grobs colors.
dscale_min	(optional) value for setting the minimum scale size of foreground grobs. Entries in the dscale matrix below dscale_min will have a scale of 0 (no grob).
dscale_max	(optional) value for setting the maximum scale size of foreground grobs. Entries in the dscale matrix above dscale_max will have a scale of 1.
cols_more	(optional) a named list of additional rows (top-part) of the plot for describing the columns. The list names will be used as row headers.
rows_more	(optional) a named list of additional columns (right-part) of the plot for describing the rows. The list names will be used as column headers.
dscale_title_legend	(optional) title for the colorbar providing a legend for scales.
dcolor_title_legend	(optional) title for the colorbar providing a legend for colors

margin_x	(optional) use it to fine-tune the width of the plot if some elements are not displayed correctly.
margin_y	(optional) use it to fine-tune the height of the plot if some elements are not displayed correctly.

**Value**

No return value, the last instruction calls `graphics.off()` in order to write the plot to the .pdf file specified via output argument.

**Author(s)**

Yoann Pradat

**See Also**

[ttheme\\_awesome\(\)](#), [gtable\\_table\(\)](#), [gtable\\_legend\(\)](#)

**Examples**

```
library(dplyr)
library(tableExtra)
library(tibble)

# load data
load(system.file("testdata", "pcawg_counts.rda", package="tableExtra"))
load(system.file("testdata", "sbs_aetiologies.rda", package="tableExtra"))

pcawg_plot_data <- function(){
  scale_breaks <- seq(from=0, to=1, by=0.1)
  color_palette <- c("#ffc651", "#ffa759", "#ff8962", "#ff6b6b", "#cc6999", "#9968c8",
                    "#6767f8", "#4459ce", "#224ba5", "#013d7c")
  color_breaks <- c(0, 0.05, 0.1, 0.25, 0.5, 1, 2.5, 5, 10, 25, 1e6)
  color_bg <- c("#f8f9fa", "#e9ecef")

  theme <- ttheme_awesome(base_size=12,
                          rep_mode="col",
                          core_size=5,
                          scale_breaks=scale_breaks,
                          color_palette=color_palette,
                          color_breaks=color_breaks,
                          core=list(bg_params=list(fill=color_bg)))

  # define dscale and cols_more from PCAWG data
  dscale <- pcawg_counts %>%
    group_by(Cancer.Types) %>%
    mutate(n=n()) %>%
    summarize_at(vars(-Sample.Names, -Accuracy), ~sum(.x>0)) %>%
    mutate_at(vars(-Cancer.Types, -n), ~./n)

  cols_more <- list("n"=dscale$n)
```

```

dscale$n <- NULL
dscale <- column_to_rownames(.data=dscale, var="Cancer.Types")
dscale <- t(as.matrix(dscale))

# define dcolor and rows_more from PCAWG data
mask <- sbs_aetiologies$Signature %in% rownames(dscale)
rows_more <- list("Aetiology"=sbs_aetiologies[mask, "Aetiology"])

dcolor <- pcawg_counts %>%
  group_by(Cancer.Types) %>%
  summarize_at(vars(-Sample.Names, -Accuracy), ~median(.[.!=0]*1e6/3.2e9)) %>%
  replace(is.na(.),0)

dcolor <- column_to_rownames(.data=dcolor, var="Cancer.Types")
dcolor <- t(as.matrix(dcolor))

list(dscale=dscale, dcolor=dcolor, cols_more=cols_more, rows_more=rows_more, theme=theme)
}

# tables needed for the plot and graphical parameters in `theme`
plot_data <- pcawg_plot_data()

# draw
output <- file.path(tempdir(),"table_extra_pcawg.pdf")
draw_table_extra(dscale=plot_data$dscale, theme=plot_data$theme, output=output,
  dcolor=plot_data$dcolor, cols_more=plot_data$cols_more,
  rows_more=plot_data$rows_more,
  dscale_title_legend="Prop of tumors with the signature",
  dcolor_title_legend="Median mut/Mb due to signature")

```

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gtable\_extra

*Grob underlying graphical display of a table with grobs of varying scales and colours.*


---

## Description

The code is inspired by the tableGrob function gridExtra.

## Usage

```

gtable_extra(
  dscale,
  dcolor = NULL,
  dscale_min = NULL,
  dscale_max = NULL,
  rows = rownames(dscale),
  cols = colnames(dscale),
  rows_more = NULL,
  cols_more = NULL,

```

```
  theme = ttheme_awesome(),  
  vp = NULL  
)
```

### Arguments

<code>dscale</code>	a matrix containing the values defining the grobs scales.
<code>dcolor</code>	(optional) a matrix of size (n,m) containing the values defining the grobs colors.
<code>dscale_min</code>	(optional) value for setting the minimum scale size of foreground grobs. Entries in the <code>dscale</code> matrix below <code>dscale_min</code> will have a scale of 0 (no grob).
<code>dscale_max</code>	(optional) value for setting the maximum scale size of foreground grobs. Entries in the <code>dscale</code> matrix above <code>dscale_max</code> will have a scale of 1.
<code>rows</code>	(optional) a character vector.
<code>cols</code>	(optional) a character vector.
<code>rows_more</code>	(optional) a named list of additional columns (right-part) of the plot for describing the rows. The list names will be used as column headers.
<code>cols_more</code>	(optional) a named list of additional rows (top-part) of the plot for describing the columns. The list names will be used as row headers.
<code>theme</code>	a list of theme parameters. Use an instance of <code>ttheme_awesome</code> .
<code>vp</code>	optional viewport.

### Value

A `gtable` object.

### Author(s)

Yoann Pradat

### See Also

[ttheme\\_awesome\(\)](#)

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`gtable_legend`

*Build a grob containing a legend.*

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### Description

Build a grob with a legend inside.

**Usage**

```

gtable_legend(
  d,
  labels,
  widths,
  heights,
  fg_fun,
  fg_params,
  bg_fun = NULL,
  bg_params = NULL,
  title_x = NULL,
  title_y = NULL,
  title_label = "Title",
  title_gp = gpar(fontsize = 10),
  labels_pad = -1,
  labels_gp = gpar(fontsize = 6),
  padding = 0.3,
  size_unit = "mm",
  name = "legend",
  vp = NULL,
  orientation = c("horizontal", "vertical"),
  ...
)

```

**Arguments**

<code>d</code>	data.frame or matrix
<code>labels</code>	tick labels displayed at legend tick marks
<code>widths</code>	optional unit.list specifying the grob widths
<code>heights</code>	optional unit.list specifying the grob heights
<code>fg_fun</code>	grob-drawing function
<code>fg_params</code>	named list of params passed to <code>fg_fun</code>
<code>bg_fun</code>	grob-drawing function
<code>bg_params</code>	named list of params passed to <code>bg_fun</code>
<code>title_x</code>	unit specifying the x position of the title
<code>title_y</code>	unit specifying the x position of the title
<code>title_label</code>	character vector
<code>title_gp</code>	graphical parameters of the title
<code>labels_pad</code>	padding between the text labels
<code>labels_gp</code>	graphical parameters of the text labels
<code>padding</code>	numeric vector specifying the padding between adjacent cells.
<code>size_unit</code>	character vector defining the unit used for sizes. See <code>grid::unit</code> for all possible specifications

name	name of the grob
vp	optional viewport
orientation	choose 'horizontal' or 'vertical'
...	additional parameters passed to add_table_params.

**Value**

A gtable object.

**Author(s)**

Yoann Pradat

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tableExtra	<i>An easy-to-use tool for drawing paper-quality tables.</i>
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**Description**

tableExtra provides a function to draw a table with grobs of varying size and colors to represent two different types of information about multiple variables in multiple samples. The package was originally developed to reproduce Figure 3 of Alexandrov, L.B., Kim, J., Haradhvala, N.J. et al. The repertoire of mutational signatures in human cancer. *Nature* 578, 94–101 (2020). doi: [10.1038/s4158602019433](https://doi.org/10.1038/s4158602019433)

**Author(s)**

Yoann Pradat

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ttheme_awesome	<i>Define theme for awesome table plot.</i>
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**Description**

Define theme for awesome table plot.

**Usage**

```
ttheme_awesome(
  base_size = 8,
  base_colour = "black",
  base_family = "",
  core_size = 10,
  scale_breaks = 10,
  scale_ratio = 0.25,
  color_palette = "black",
```

```

color_breaks = NULL,
rep_mode = "col",
parse = FALSE,
size_unit = "mm",
padding = c(0.3, 0.3),
show_legend = TRUE,
legend_position = NULL,
legend_layout = NULL,
legend_x = NULL,
legend_y = NULL,
legend_width = NULL,
legend_height = NULL,
legend_scale = 1.5,
legend_title_fontsize = 12,
legend_labels_fontsize = 10,
legend_labels_pad = -1.2,
...
)

```

### Arguments

<code>base_size</code>	default font size
<code>base_colour</code>	default font colour
<code>base_family</code>	default font family
<code>core_size</code>	cell size for core background grobs
<code>scale_breaks</code>	number of size categories for core foreground grobs or numeric vector of bin breaks
<code>scale_ratio</code>	ratio of minimum to maximum core foreground grobs sizes
<code>color_palette</code>	color palette for core foreground grobs
<code>color_breaks</code>	bin breaks for color palette for core foreground grobs
<code>rep_mode</code>	'col' or 'row'. Used when recycling <code>fg_params</code> or <code>bg_params</code> to make a matrix of params.
<code>parse</code>	logical, default behaviour for parsing text as plotmath
<code>size_unit</code>	character vector defining the unit used for sizes. See <code>grid::unit</code> for all possible specifications.
<code>padding</code>	length-2 vector specifying the horizontal and vertical padding of text within each cell
<code>show_legend</code>	(optional) set to <code>FALSE</code> to not draw any legend.
<code>legend_position</code>	(optional) choose between 'top_left', 'top_center' and 'top_right'.
<code>legend_layout</code>	(optional) Only 'columnwise' is supported for now.
<code>legend_x</code>	(optional) x position in 'npc' units of the left bottom corner of the viewport defining the scale legend. If <code>NULL</code> , the function will try to set it automatically using <code>legend_position</code> .



legend_y	(optional) y position in 'npc' units of the left bottom corner of the viewport defining the scale legend. If NULL, the function will try to set it automatically.
legend_width	(optional) width in 'npc' units of the viewport(s) defining legend(s). If NULL, the function will try to set it automatically.
legend_height	(optional) height in 'npc' units of the viewport(s) defining legend(s). If NULL, the function will try to set it automatically.
legend_scale	(optional) Scale factor that defines the size of the legend colorbar cells relatively to the main plot cells.
legend_title_fontsize	(optional) if NULL, font size is set to theme\$colhead\$fontsize.
legend_labels_fontsize	(optional) if NULL, font size is set to theme\$colhead\$fontsize.
legend_labels_pad	(optional) padding between the legend labels.
...	extra parameters added to the theme list

**Value**

a list of lists with each sublist defining parameters for the corresponding part of the plot. The parts are

- **core**: defines all graphical parameters for the grobs sizes, shapes and background of the table.
- **colhead**: defines all graphical parameters for the table column labels.
- **colmore**: defines all graphical parameters for the additional column descriptors.
- **rowhead**: defines all graphical parameters for the table row labels.
- **rowmore**: defines all graphical parameters for the additional row descriptors.
- **legend**: defines all graphical parameters for the legend.

**Author(s)**

Yoann Pradat

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