

# Package ‘tableExtra’

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**Title** Draws an Awesome Table

**Version** 1.0.1

**Description** Draws an awesome table.

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

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**Suggests** testthat,  
dplyr,  
tibble

**Depends** R (>= 3.5.0)

**Imports** gtable,  
grid

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draw_table_extra	<i>Graphical display of a table with circles of varying scales and colours. Draw a heatmap of size (m,n) with cells containing circles of varying size and color. The column names are displayed on the top side and are defined by colnames(dscale). Similarly, row names are displayed left side and defined by rownames(dscale).</i>
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## Description

Render a gtable containing circle grobs representing a numeric matrix.

## 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

<code>dscale</code>	a matrix of size (n,m) containing the values defining the circles' scales.
<code>theme</code>	a list of theme parameters. Use an instance of <code>theme_awesome</code> .
<code>output</code>	path to output file. Only pdf supported for now.
<code>dcolor</code>	(optional) a matrix of size (n,m) containing the values defining the circles' 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>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>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>dscale_title_legend</code>	(optional) title for the colorbar providing a legend for scales.
<code>dcolor_title_legend</code>	(optional) title for the colorbar providing a legend for colors.
<code>margin_x</code>	(optional) use it to fine-tune the width of the plot if some elements are not displayed correctly.
<code>margin_y</code>	(optional) use it to fine-tune the height of the plot if some elements are not displayed correctly.

## Value

An grob object.

## Author(s)

Yoann Pradat

**See Also**

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

**Examples**

```
## Not run:
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 <- "table_extra_grob_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")

graphics.off()

## End(Not run)
```

---

```
get_table_extra_dimensions
```

*Get width and height of the plot*

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## Description

Compute the width and height in user-specified unit required for drawing the plot.

## Usage

```
get_table_extra_dimensions(
  dscale,
  dcolor,
  theme,
  rows_more = NULL,
  cols_more = NULL,
  unit = "inches",
  dscale_title_legend = NULL,
  dcolor_title_legend = NULL,
  margin_x = unit(1, "inches"),
  margin_y = unit(1, "inches")
)
```

## Arguments

<code>dscale</code>	a matrix of size (n,m) containing the values defining the circles' scales.
<code>dcolor</code>	(optional) a matrix of size (n,m) containing the values defining the circles' colors.
<code>theme</code>	a list of theme parameters. Use an instance of <code>ttheme_awesome</code> .
<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>unit</code>	(optional) choose any unit that is valid for <code>grid::unit</code> .
<code>dscale_title_legend</code>	(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**

a list with the width and the height

**Author(s)**

Yoann Pradat

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gtable_legend	<i>Build a grob containing a legend.</i>
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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 fg_fun
<code>bg_fun</code>	grob-drawing function
<code>bg_params</code>	named list of params passed to bg_fun
<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
<code>name</code>	name of the grob
<code>vp</code>	optional viewport
<code>orientation</code>	choose 'horizontal' or 'vertical'
<code>...</code>	additional parameters passed to <code>add_table_params</code> .

**Value**

A gtable.

**Author(s)**

Yoann Pradat

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<code>gtable_rbind</code>	<i>rbind two or more gtables</i>
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**Description**

rbind two or more gtables  
 cbind two or more gtables

**Usage**

```
gtable_rbind(..., size = "max", height = NULL, z = NULL)

gtable_cbind(..., size = "max", width = NULL, z = NULL)
```

**Arguments**

...	gtables
size	how should the widths be calculated? <ol style="list-style-type: none"> <li>1. max maximum of all widths</li> <li>2. min minimum of all widths</li> <li>3. first widths/heights of first gtable</li> <li>4. last widths/heights of last gtable</li> </ol>
height	padding height between grobs
z	optional z level
width	padding width between grobs

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table_extra_grob	<i>Grob underlying graphical display of a table with circles of varying scales and colours. The code is inspired by the tableGrob function gridExtra</i>
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**Description**

Create a gtable containing circle grobs representing a numeric matrix.

**Usage**

```
table_extra_grob(
  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**

dscale	a matrix
dcolor	(optional) a matrix
dscale_min	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	value for setting the maximum scale size of foreground grobs. Entries in the dscale matrix above dscale_max will have a scale of 0 (no grob).
rows	(optional) a character vector
cols	(optional) a character vector
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.

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.
theme	list of theme parameters
vp	optional viewport

**Value**

An R object of class grob

**Author(s)**

Yoann Pradat

**See Also**

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

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tableExtra	<i>tableExtra: A package for awesome 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](#)

**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 = T,
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 FALSE 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 NULL, the function will try to set it automatically using <code>legend_position</code> .
<code>legend_y</code>	(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.
<code>legend_width</code>	(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

**Author(s)**

Yoann Pradat

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