

Package ‘ggtikz’

November 4, 2021

Title Post-Process 'ggplot2' Plots with 'TikZ' Code Using Plot Coordinates

Version 0.1.0

Description Annotation of 'ggplot2' plots with arbitrary 'TikZ' code, using absolute data or relative plot coordinates.

License MIT + file LICENSE

URL <https://github.com/osthomas/ggtikz>

BugReports <https://github.com/osthomas/ggtikz/issues>

Encoding UTF-8

RoxygenNote 7.1.1

Imports dplyr, grid, ggplot2, tikzDevice

Suggests stringr, rmarkdown, knitr, testthat (>= 3.0.0), covr, magick

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

Author Oliver Thomas [aut, cre]

Maintainer Oliver Thomas <oliver.thomas@sgbm.uni-freiburg.de>

Repository CRAN

Date/Publication 2021-11-04 19:30:02 UTC

R topics documented:

discretize	2
get_padding_from_elements	2
ggtikz	3
ggtikzAnnotation	4
ggtikzCanvas	5
ggtikzTransform	7
ggtikzUninfinite	8
gg_to_npc.ggtikzCanvas	8

set_ggtikz_unclip_hook	9
split_coord	9
unclip	10
unclip_tikz	10
uninfinite_coord	11

Index 12

discretize *Replace Infinites by discrete values*

Description

The replacement values correspond to the edges of the available coordinate space

Usage

```
discretize(coord_values, xrange, yrange)
```

Arguments

coord_values	numeric. The coordinate x and y values, potentially containing Inf or -Inf
xrange	Numeric vector of length 2, minimum and maximum values in the x direction
yrange	Numeric vector of length 2, minimum and maximum values in the y direction

get_padding_from_elements
Calculate length of padding from plot elements

Description

To prevent overlap with panel borders or axis lines, annotations are clipped to a viewport that is reduced in size by the width of these lines. They depend on the current plot theme.

Usage

```
get_padding_from_elements(  
  gg_plot,  
  elements_t,  
  elements_r,  
  elements_b,  
  elements_l  
)
```

Arguments

<code>gg_plot</code>	A ggplot2 object.
<code>elements_t</code>	character vector with names of elements to consider for padding at the <i>top</i>
<code>elements_r</code>	character vector with names of elements to consider for padding on the <i>right</i>
<code>elements_b</code>	character vector with names of elements to consider for padding at the <i>bottom</i>
<code>elements_l</code>	character vector with names of elements to consider for padding on the <i>left</i>

Value

A vector `grid::units` of paddings for t, r, b, l (in pt)

See Also

[uninfinite_coord](#) for construction of the complete replaced coordinate.

<code>ggtikz</code>	<i>Create a canvas and add a TikZ annotation.</i>
---------------------	---

Description

This is a helper function for quick one-step annotations. It creates a `ggtikzCanvas` from a `ggplot`, adds one annotation to it, and optionally draws the plot and the annotations.

Usage

```
ggtikz(gg_plot, ..., draw = TRUE)
```

Arguments

<code>gg_plot</code>	A ggplot object on which annotations should be made.
<code>...</code>	Passed to ggtikzAnnotation .
<code>draw</code>	TRUE or FALSE. Should <code>gg_plot</code> and the resulting annotation be drawn immediately? A <code>tikz</code> device needs to be open.

Details

For finer control, see `ggtikzCanvas()` and `ggtikzAnnotation()`.

Value

A `ggtikzCanvas` object with one `ggtikzAnnotation` (specified in `...`) already added. If `draw = TRUE`, the `gg_plot` and the annotations are drawn to the currently active device. This must be a `tikzDevice`, or an error will be raised.

See Also

[ggtikzCanvas](#) for creating a canvas which can store multiple annotations.

[ggtikzAnnotation](#) for creating an annotation, which can then be added to a canvas.

Examples

```
## Not run:
library(ggplot2)
library(tikzDevice)
library(ggtikz)
p <- ggplot(mtcars, aes(displ, mpg)) + geom_point()
out <- tempfile(fileext = ".tikz")
tikz(out)
# Add a red circle in the middle of the plot.
ggtikz(p, "\\fill[red] (0.5,0.5) circle (2mm);", xy="plot")
dev.off()

## End(Not run)
```

ggtikzAnnotation

Prepare a TikZ annotation for a ggplot.

Description

`ggtikzAnnotation` objects are meant to be added to a `ggtikzCanvas` object.

Usage

```
ggtikzAnnotation(
  tikz_code,
  x = c("data", "panel"),
  y = c("data", "panel"),
  xy = NULL,
  panelx = NULL,
  paneley = NULL,
  transform = TRUE,
  replace_inf = TRUE,
  clip = "on"
)
```

Arguments

<code>tikz_code</code>	The tikz code to use for annotation. Backslashes must be escaped!
<code>x</code>	Reference frame for the x coordinates. Either "data" or "panel".
<code>y</code>	Reference frame for the y coordinates. Either "data" or "panel".
<code>xy</code>	Reference frame for both x and y coordinates. Trumps x and y. Either "data" or "panel" or "plot".

panelx	x position of the panel to use as coordinate reference, starting from the left, 1-based.
panely	y position of the panel to use as coordinate reference, starting from the top, 1-based.
transform	Should TikZ coordinates be transformed according to the scale transformation? If TRUE, coordinates in <code>tikz_code</code> are replaced by the transformation of the x/y scale, as appropriate. Coordinates components with physical lengths are not changed. See ggtikzTransform for details.
replace_inf	Should annotation coordinates containing 'Inf' or '-Inf' be adjusted so these values correspond to the edge of the available space? This is analogous to the behavior of <code>ggplot</code> when infinite values are encountered. See also ggtikzUninfinite
clip	Should annotations be clipped to the panel boundaries? See the <code>clip</code> argument to viewport

Details

This function prepares TikZ annotations in a form understandable to a `ggtikzCanvas` object. An annotation can be added to multiple `ggtikzCanvas` objects, provided that each underlying `ggplot` object has the necessary panels to know what to do with this information.

Value

A `ggtikzAnnotation` object, which can be added to a `ggtikzCanvas` object.

See Also

[grid.tikzAnnotate](#) for annotation of base graphics

[ggtikz](#) for a helper function for quick one-step annotations.

[ggtikzCanvas](#) for information about initiating the annotation process.

`ggtikzCanvas`

Create a canvas to store TikZ annotations to a `ggplot`.

Description

Annotations can be made relative to the whole plot, to a panel, or to data coordinates (of individual panels).

Usage

```
ggtikzCanvas(gg_plot)
```

Arguments

`gg_plot` A `ggplot` object on which annotations should be made.

Details

This function provides a canvas for TikZ annotations, and does not draw anything by itself. Its purpose is to provide information about the underlying ggplot object for coordinate calculations.

Value

A ggtikzCanvas object, to which annotations can be added.

See Also

[grid.tikzAnnotate](#) for annotation of base graphics.

[ggtikz](#) for a helper function for quick one-step annotations.

[ggtikzAnnotation](#) for more information about creating and adding ggtikz annotations.

Examples

```
## Not run:
library(ggplot2)
library(tikzDevice)
library(ggtikz)
p <- ggplot(mtcars, aes(displacement, mpg)) + geom_point()

# Create a TikZ canvas on the plot
canvas <- ggtikzCanvas(p)

# Create annotations to add to the canvas

# Circle in the center of the plot
annotation1 <- ggtikzAnnotation(
  "\\fill[red] (0.5,0.5) circle (2mm);",
  xy = "plot")

# Arrow to data coordinate (400,20)
annotation2 <- ggtikzAnnotation(
  "\\draw[<-] (400,20) -- ++(0,2.5);",
  xy = "data", panelx = 1, pannely = 1)

out <- tempfile(fileext = ".tikz")
tikz(out)
# First, draw the original plot
p
# Then, add the annotations to the canvas and draw it
canvas + annotation1 + annotation2
dev.off()

## End(Not run)
```

ggtikzTransform	<i>Transform TikZ coordinates according to scale transformations</i>
-----------------	--

Description

ggtikzTransform extracts coordinates definitions in an annotation's TikZ code and transforms them with the transformer functions stored in the underlying plot's x or y scales, respectively.

Usage

```
ggtikzTransform(ggtikzCanvas, ggtikzAnnotation)
```

Arguments

ggtikzCanvas A link{ggtikzCanvas} object.
ggtikzAnnotation A link{ggtikzAnnotaton} object.

Details

This function does not have to called directly. It is automatically called when annotations are added to a canvas, if transform = TRUE in the ggtikzAnnotation construction call.

Coordinates components with physical lengths are not changed. For a plot with a linear x scale and a log10-transformed y scale,

- the TikZ coordinate (10,10) becomes (10,1),
- the TikZ coordinate (10cm,10) becomes (10cm,1),
- the TikZ coordinate (10,10cm) becomes (10,10cm)
- the TikZ coordinate (0,0) will raise an error.

Value

A link{ggtikzAnnotation} object, with transformations applied to the coordinates in the TikZ code.

ggtikzUninfinite	<i>Replace Inf in TikZ coordinates</i>
------------------	--

Description

Infinite values in TiKZ coordinate specifications are replaced by values corresponding to the edge of the available coordinate space. This allows placement of annotations at the very edge of a panel without knowing its precise coordinates. This is useful for annotations which extend to the panel boundaries, but also make use of specific coordinates.

Usage

```
ggtikzUninfinite(ggtikzCanvas, ggtikzAnnotation)
```

Arguments

ggtikzCanvas	A link{ggtikzCanvas} object.
ggtikzAnnotation	A link{ggtikzAnnotaton} object.

Value

A link{ggtikzAnnotation} object, with Infinities in coordinates replaced by finite values.

gg_to_npc.ggtikzCanvas	<i>Convert data coordinates to npc coordinates.</i>
------------------------	---

Description

Convert data coordinates to npc coordinates.

Usage

```
## S3 method for class 'ggtikzCanvas'
gg_to_npc(self, coord, panelx, pany)
```

Arguments

self	a ggtikzCanvas object
coord	A numeric vector of length 2, with the x coordinate to convert at coord[1] and the y coordinate to convert at coord[2]
panelx	X position (column) of the panel holding the data
pany	X position (row) of the panel holding the data

Value

The input coordinates from `coord` converted to `npc` coordinates in the form of a numeric vector of length 2. (0,0) corresponds to the lower left corner of the viewport containing the `ggplot` panel specified by `panelx` and `panely`, and (1,1) corresponds to the upper right corner.

```
set_ggtikz_unclip_hook
```

Unclip plots produced by the `tikzDevice`.

Description

By default, plots produced with the `tikzDevice` are clipped to the plot area, which also clips `ggtikzAnnotations` extending beyond the plot boundaries. This function removes the `'clip'` and `'use as bounding box'` options in a `tikz` file.

Usage

```
set_ggtikz_unclip_hook()
```

```
unset_ggtikz_unclip_hook()
```

Value

Called for side effects - the `unclip` knitr hook is set or unset, respectively.

See Also

[unclip](#), the hook that is being set.

```
split_coord
```

Split a TikZ coordinate.

Description

Split a TikZ coordinate.

Usage

```
split_coord(coord)
```

Arguments

`coord` Coordinate string of the form "(x,y)"

Value

A character vector of length 2: The x and y components of the coordinate. These may contain spaces.

unclip	<i>knitr hook to remove clipping from plots produced with the tikzDevice.</i>
--------	---

Description

Note that the chunk options `unclip = TRUE` and `external = FALSE` must be set for the hook to come into effect!

Usage

```
unclip(before, options)
```

Arguments

before	see knit_hooks
options	see knit_hooks

Value

Called for side effect. The files containing tikz plots are edited and overwritten.

See Also

[set_ggtikz_unclip_hook](#) to set the knitr hook.
[unclip_tikz](#), the workhorse function for this hook.

unclip_tikz	<i>Unclip a plot produced by the tikzDevice.</i>
-------------	--

Description

By default, plots produced with the `tikzDevice` are clipped to the plot area, which also clips `ggtikz` annotations extending beyond the plot boundaries. This function removes the `'clip'` and `'use as bounding box'` options in a tikz file.

Usage

```
unclip_tikz(fpath)
```

Arguments

fpath	Path to the tikz file
-------	-----------------------

Details

This function can be used for manual post-processing, however, see [set_ggtikz_unclip_hook](#) to set the corresponding knitr hook.

Value

Called for side effect. The file at `fpath` is edited and overwritten.

See Also

[set_ggtikz_unclip_hook](#) to set the knitr hook.

uninfinite_coord	<i>Replace infinite values in TikZ coordinates</i>
------------------	--

Description

Infinite values are replaced with the minimum or maximum value of the padding in the x or y direction, respectively. Additionally, the adjusted coordinate is padded so that it lies just next to the panel borders and axis lines without overlap.

Usage

```
uninfinite_coord(coord, xrange, yrange)
```

```
uninfinite_tikz(tikz_code, xrange, yrange)
```

Arguments

coord	TikZ coordinate
xrange	Numeric vector of length 2, minimum and maximum values in the x direction
yrange	Numeric vector of length 2, minimum and maximum values in the y direction
tikz_code	The TikZ code to replace Infinite values in.

Value

The adjusted TikZ coordinate with padding, as a string.

Index

discretize, [2](#)

get_padding_from_elements, [2](#)

gg_to_npc.ggtikzCanvas, [8](#)

ggtikz, [3](#), [5](#), [6](#)

ggtikzAnnotation, [3](#), [4](#), [4](#), [6](#)

ggtikzCanvas, [3–5](#), [5](#), [8](#)

ggtikzTransform, [5](#), [7](#)

ggtikzUninfinite, [5](#), [8](#)

grid.tikzAnnotate, [5](#), [6](#)

knit_hooks, [10](#)

set_ggtikz_unclip_hook, [9](#), [10](#), [11](#)

split_coord, [9](#)

unclip, [9](#), [10](#)

unclip_tikz, [10](#), [10](#)

uninfinite_coord, [3](#), [11](#)

uninfinite_tikz (uninfinite_coord), [11](#)

unset_ggtikz_unclip_hook
(set_ggtikz_unclip_hook), [9](#)

viewport, [5](#)