Package 'colorBlindness'

March 16, 2020

Type Package

Title Safe Color Set for Color Blindness

Version 0.1.6

Description Provide the safe color set for color blindness,
the simulator of protanopia, deuteranopia.
The color sets are collected from:
Wong, B. (2011) <doi:10.1038/nmeth.1618>,
<http://mkweb.bcgsc.ca/biovis2012/>, and
<http://geog.uoregon.edu/datagraphics/color_scales.htm>.
The simulations of the appearance of the colors to color-deficient
viewers were based on algorithms in
Vienot, F., Brettel, H. and Mollon, J.D. (1999)
<doi:10.1002/(SICI)1520-6378(199908)24:4%3C243::AID-COL5%3E3.0.CO;2-3>.
The cvdPlot() function to generate 'ggplot' grobs of simulations
were modified from <https://github.com/clauswilke/colorblindr>.

Depends R(>= 3.6)

Imports ggplot2, grDevices, methods, cowplot, colorspace, graphics,
gridGraphics, gtable, grid

Suggests knitr, reshape2, stats, png

biocViews Visualization

License GPL (>= 2)

Encoding UTF-8

LazyData true

VignetteBuilder knitr

RoxygenNote 7.0.2

NeedsCompilation no

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Repository CRAN

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R topics documented:

`availableColors` *available colors*

Description

export available colors

Usage

```
availableColors()
```

Value

a character vector contain safe colors.

Examples

```
availableColors()
```

availablePalette *Available color palette*

Description

List all the available color palettes.

Usage

```
availablePalette()
```

Value

a character vector contain available color palettes.

Examples

```
availablePalette()
```

BLACK *safe colors*

Description

color blindness safe colors

Usage

```
BLACK

ORANGE

SKY_BLUE

BLUISH_GREEN

YELLOW

BLUE

VERMILLION

REDDISH_PURPLE

safeColors
```

Format

An object of class `character` of length 1.

References

Wong, B. (2011) <doi:10.1038/nmeth.1642> Wong, B. (2011) <doi:10.1038/nmeth.1618>

Examples

```
safeColors
```

`colorNames` *available color variable*

Description

export available color names

Usage

```
colorNames()
```

Value

a character vector contain safe colors.

Examples

```
colorNames()
```

`cvdPlot` *Show color-deficiency simulations of a plot*

Description

Plot the color-deficiency simulations for ggplot grob.

Usage

```
cvdPlot(
  plot = last_plot(),
  layout = c("origin", "deuteranope", "protanope", "desaturate")
)
```

Arguments

plot	The grob to be plotted.
layout	The sub-figure types. the choices are origin, deuteranope, protanope, desaturate, and enhanced, enhanced.deuteranope, enhanced.protanope, enhanced.desaturate.

Details

This function is modified from <https://github.com/clauswilke/colorblindr>

Value

An object of ggplot.

Examples

```
cvdPlot(displayColors(safeColors))
cvdPlot(displayColors(paletteMartin))
```

---

cvdSimulator *simulate color vision deficiency*

Description

Transformation of R colors by simulating color vision deficiencies.

Usage

```
cvdSimulator(col, type = "deuteranope")
```

Arguments

col	character. A vector of colors.
type	Deficiency type, "protanope" or "deuteranope"

Details

Here use Vienot's methods but not Gustavo's methods (implemented in colorspace::simulate_cvd).

Value

colors.

References

Vienot, F., Brettel, H. and Mollon, J.D. (1999) <doi:10.1002/(SICI)1520-6378(199908)24:4 Sharma, G., Wu, W. and Dalal, E.N. (2005) <doi:10.1002/col.20070>

Examples

```
cvdSimulator(safeColors)
```

`displayAvailablePalette` *Display available palette*

Description

Display all the available color palettes.

Usage

```
displayAvailablePalette(...)
```

Arguments

`...`	parameters could be used by geom_tile.

Value

an ggplot object

Examples

```
displayAvailablePalette()
```

`displayColors` *display colors*

Description

Display the given colors

Usage

```
displayColors(col, ...)

displayAllColors(col, types = c("deuteranope", "protanope", "desaturate"), ...)
```

Arguments

`col`	color set to display
`...`	parameters could be used by geom_tile.
`types`	the type of color vision deficiency.

Value

an ggplot object

Examples

```
displayColors(safeColors)
displayColors(paletteMartin)
displayAllColors(safeColors, color="white")
displayAllColors(paletteMartin, color="white")
```

---

grobify *convert plot to grob*

Description

use grid.grabExpr or plot_to_gtable to convert plot to grob

Usage

```
grobify(plot)
```

Arguments

plot	plots

Value

grob object.

---

paletteMartin *Palette for color blindness*

Description

The palette could be used for heatmap or pie graph

Usage

```
paletteMartin

Green2Magenta16Steps

Blue2DarkRed12Steps

Blue2DarkRed18Steps

Blue2OrangeRed14Steps

Blue2DarkOrange12Steps

Blue2DarkOrange18Steps

Blue2Green14Steps

Brown2Blue10Steps

Brown2Blue12Steps

Blue2Gray8Steps

Blue2Orange8Steps

Blue2Orange10Steps

Blue2Orange12Steps

ModifiedSpectralScheme11Steps

LightBlue2DarkBlue7Steps

LightBlue2DarkBlue10Steps

PairedColor12Steps

SteppedSequential5Steps
```

Format

An object of class `character` of length 15.

Details

The names of the palette is approximal color name.

Green2Magenta16Steps: Useful for generic diverging data.

Blue2DarkRed12/18Steps: Useful for temperature-like data, with a subjective interpretation (blue=cold, red=hot) Blue2OrangeRed14Steps: Useful as an alternative to the red/blue temperature scale.

Blue2DarkOrange12/18Steps: Useful for data without a specific subjective color association.

Blue2Green14Steps: Useful for data with a winter (blue) vs. summer (green) association.

Brown2Blue10/12Steps: Useful for data with a dry (brown) vs. wet (blue) association.

Blue2Gray8Steps: Useful in particular for diverging data like cloudiness anomalies.

Blue2Orange8/10/12Steps: Useful for data like sea-level pressure, with ansubjective association (blue=low, wet, orange=high, dry)

ModifiedSpectralScheme11Steps: An alternative to the spectral scheme (no green)

LightBlue2DarkBlue7/10Steps: Useful for precipitation-like data.

PairedColor12Steps: Attempt at a categorical color scale with colors that may be distinguishable to all viewers

SteppedSequential5Steps: Useful for portraying levels-within-categories

Source

<http://mkweb.bcgsc.ca/biovis2012/>

<http://geog.uoregon.edu/datagraphics/color_scales.htm>

References

Light A, Bartlein PJ (2004). "The End of the Rainbow? Color Schemes for Improved Data Graphics." EOS Transactions of the American Geophysical Union, 85(40), 385.

Examples

```
paletteMartin
Green2Magenta16Steps
Blue2DarkRed12Steps
Blue2DarkRed18Steps
Blue2OrangeRed14Steps
Blue2DarkOrange12Steps
Blue2DarkOrange18Steps
Blue2Green14Steps
Brown2Blue10Steps
Brown2Blue12Steps
Blue2Gray8Steps
Blue2Orange8Steps
Blue2Orange10Steps
Blue2Orange12Steps
ModifiedSpectralScheme11Steps
LightBlue2DarkBlue7Steps
LightBlue2DarkBlue10Steps
PairedColor12Steps
SteppedSequential5Steps
```

replacePlotColor *replace the colors for plots*

Description

replace the colors of plots to meet the requirment of publication. Replacing red with magenta or green with turquoise. Replacing all the colored symbols in the legend.

Usage

```
replacePlotColor(plot)
```

Arguments

plot	The grob to be plotted.

Value

an object of gtable.

Examples

```
replacePlotColor(displayColors(c("Red", "Green", "blue")))
```

setPDFopt *Auxiliary funciton to set width of pdf for journals*

Description

Set the pdf width and height for journals.

Pre-sets of width for figures.

Usage

```
setPDFopt(
  width = c("1col", "1.5col", "0.5col", "2col"),
  presets = PRESETS$science
)

PRESETS
```

Arguments

width	columns.
presets	The pre-setting of width,height,family,font for pdf. Available choices: 0.5col, 1col, 1.5col, 2col.

Format

An object of class `list` of length 4.

Details

The family will be Helvetica. The font will be 8. The width and height will be same.

science: 0.5col=1.78 inches (4.52 cm.); 1col=3.54 inches (9 cm.); 1.5col=5 inches (12.7 cm.); 2col=7.25 inches (18.4 cm.). nature: 0.5col=2.28 inches (5.8 cm.); 1col=3.39 inches (8.6 cm.); 1.5col=4.76 inches (12.1 cm.); 2col=7 inches (17.8 cm.). cell: 0.5col=1.78 inches (4.52 cm.); 1col=3.35 inches (8.5 cm.); 1.5col=4.49 inches (11.4 cm.); 2col=6.85 inches (17.4 cm.). CA: A Cancer Journal for Clinicians 0.5col=1.62 inches (4.1 cm.); 1col=3.25 inches (8.25 cm.); 1.5col=3.87 inches (9.8 cm.); 2col=6.75 inches (17.1 cm.).

Value

A named list of all the defaults. If any arguments are supplied the return values are the old values and the result has the visibility flag turned off.

References

<http://www.sciencemag.org/sites/default/files/Figure_prep_guide.pdf>

<https://images.nature.com/full/nature-assets/aj/artworkguidelines.pdf>

Examples

```
op <- setPDFopt("1col")
```

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