Package 'colorblindcheck'

May 13, 2023

Title Check Color Palettes for Problems with Color Vision Deficiency

Version 1.0.2

Description Compare color palettes with simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia.
It includes calculation of distances between colors, and creating summaries of differences between a color palette and simulations of color vision deficiencies.
This work was inspired by the blog post at <http://www.vis4.net/blog/2018/02/automate-colorblind-checking/>.

Imports colorspace, methods, spacesXYZ

Suggests rcartocolor, testthat, knitr, rmarkdown, covr, vdiffr

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Encoding UTF-8

RoxygenNote 7.2.3

VignetteBuilder knitr

URL https://jakubnowosad.com/colorblindcheck/

BugReports https://github.com/Nowosad/colorblindcheck/issues

NeedsCompilation no

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R topics documented:

palette_bivariate_plot *Plot Bivariate Palette And Its Color Vision Deficiencies*

Description

Plot of the original input bivariate palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia.

Usage

```
palette_bivariate_plot(x, severity = 1)
```

Arguments

x	A vector of hexadecimal color descriptions
severity	Severity of the color vision defect, a number between 0 and 1

Value

A plot with the original input palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia

See Also

palette_plot

Examples

```
palette_bivariate_plot(x = rcartocolor::carto_pal(4, "Sunset"))
```

palette_check *Compare Palette with Color Vision Deficiencies*

Description

Comparision of the original input palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia.

Usage

```
palette_check(
  x,
  tolerance = NULL,
  plot = FALSE,
  bivariate = FALSE,
  severity = 1,
  ...
)
```

Arguments

`x` A vector of hexadecimal color descriptions

`tolerance` The minimal value of acceptable difference between the colors to distinguish between them. As the default, minimal distance between colors in the original input palette is given.

`plot` If TRUE, display a plot comparing the original input palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia

`bivariate` If TRUE (and plot = TRUE), display a bivariate plot (plot where colors are located in columns and rows) comparing the original input palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia

`severity` Severity of the color vision defect, a number between 0 and 1

`...` Other arguments passed on to `palette_dist()` to control the color metric

Value

A data.frame with 4 observations and 8 variables:

- name: orginal input color palette (normal), deuteranopia, protanopia, and tritanopia
- n: number of colors
- tolerance: minimal value of acceptable difference between the colors to distinguish between them
- ncp: number of color pairs
- ndcp: number of differentiable color pairs (color pairs with distances above the tolerance value)
- min_dist: minimal distance between colors
- mean_dist: average distance between colors
- max_dist: maximal distance between colors

Additionally, a plot comparing the original input palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia can be shown.

Examples

```
rainbow_pal = rainbow(n = 7)
rainbow_pal
palette_check(rainbow_pal, plot = TRUE)

x = rcartocolor::carto_pal(11, "Vivid")
palette_check(x)
palette_check(x, plot = TRUE)
palette_check(x, tolerance = 1)
palette_check(x, tolerance = 10, metric = 1976)
palette_check(x, plot = TRUE, severity = 0.5)

y = rcartocolor::carto_pal(4, "Sunset")
palette_check(y, plot = TRUE, bivariate = TRUE, severity = 0.5)
```

palette_dist *Distance Between Colors*

Description

Calculation of the distances between the colors in the input palette. It also allows for calculation of the distances between the colors in a simulations of the color vision deficiency - deuteranopia, protanopia, and tritanopia.

Usage

```
palette_dist(x, cvd = NULL, severity = 1, metric = 2000)
```

Arguments

x	A vector of hexadecimal color descriptions
cvd	A type of color vision deficiency (CVD): "pro" (protanomaly), "deu" (deutanomaly), or "tri" (tritanomaly)
severity	Severity of the color vision defect, a number between 0 and 1
metric	A vector of color metric specifiers. Valid values are '1976', '1994', and '2000' (default), which refer to the year the metric was recommended by the CIE

Value

A matrix of distances between the original input palette and a simulation of the selected color vision deficiency - deuteranopia, protanopia, and tritanopia

Examples

```
rainbow_pal = rainbow(n = 7)
rainbow_pal
palette_dist(rainbow_pal)
palette_dist(rainbow_pal, cvd = "deu")

x = rcartocolor::carto_pal(11, "Vivid")
palette_dist(x)
palette_dist(x, cvd = "pro", severity = 1)
palette_dist(x, cvd = "pro", severity = 0.2)
```

`palette_plot` *Plot Palette And Its Color Vision Deficiencies*

Description

Plot of the original input palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia.

Usage

```
palette_plot(x, severity = 1)
```

Arguments

`x`	A vector of hexadecimal color descriptions
`severity`	Severity of the color vision defect, a number between 0 and 1

Value

A plot with the original input palette and simulations of color vision deficiencies - deuteranopia, protanopia, and tritanopia

See Also

palette_bivariate_plot

Examples

```
rainbow_pal = rainbow(n = 7)
rainbow_pal
palette_plot(rainbow_pal)

palette_plot(x = rcartocolor::carto_pal(7, "Sunset"))
palette_plot(x = rcartocolor::carto_pal(11, "Safe"))
palette_plot(x = rcartocolor::carto_pal(7, "Earth"))
palette_plot(x = rcartocolor::carto_pal(11, "Vivid"))
```

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