Package ‘colorblindcheck’

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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 be-
tween 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/>.

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

**Usage**

```r
def pausele_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**: original 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.
palette_dist

**Examples**

```r
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)
```

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**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 simulation of the color vision deficiency - deuteranopia, protanopia, and tritanopia.

**Usage**

```r
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" (deuteranomaly), 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
palette_plot

Examples

```r
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

```r
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

```r
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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