Package ‘colorblindcheck’

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Title Check Color Palettes for Problems with Color Vision Deficiency
Version 1.0.0
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**

```r
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**

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

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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

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: 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.
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)
```

---

**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
    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

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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