Package 'RcppColors'

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Type Package

Title 'C++' Header Files for Color Conversion and Color Mappings

Version 0.1.1

Maintainer Stéphane Laurent <laurent_step@outlook.fr>

Description Provides 'C++' header files to deal with color conversion from some color spaces to hexadecimal with 'Rcpp', and exports some color mapping functions for usage in R. Also exports functions to convert colors from the 'HSLuv' color space for usage in R. 'HSLuv' is a human-friendly alternative to HSL.

License GPL-3

URL https://github.com/stla/RcppColors

BugReports https://github.com/stla/RcppColors/issues

Imports Rcpp (>= 1.0.8)

LinkingTo Rcpp

Encoding UTF-8

RoxygenNote 7.2.1

NeedsCompilation yes

Author Stéphane Laurent [cre, aut], Scott Spencer [aut]

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R topics documented:

`RcppColors-package` *'C++' header files for conversion from some color spaces to hexadecimal.*

Description

This package is mainly intended to be used with 'Rcpp', but it also provides some R functions for color conversion and color mappings.

Details

See README for a description of the available 'C++' functions and how to use the package.

Author(s)

Stéphane Laurent.

Maintainer: Stéphane Laurent <laurent_step@outlook.fr>

`colorMap1` *Color mappings functions*

Description

Functions mapping each complex number to a color.

Usage

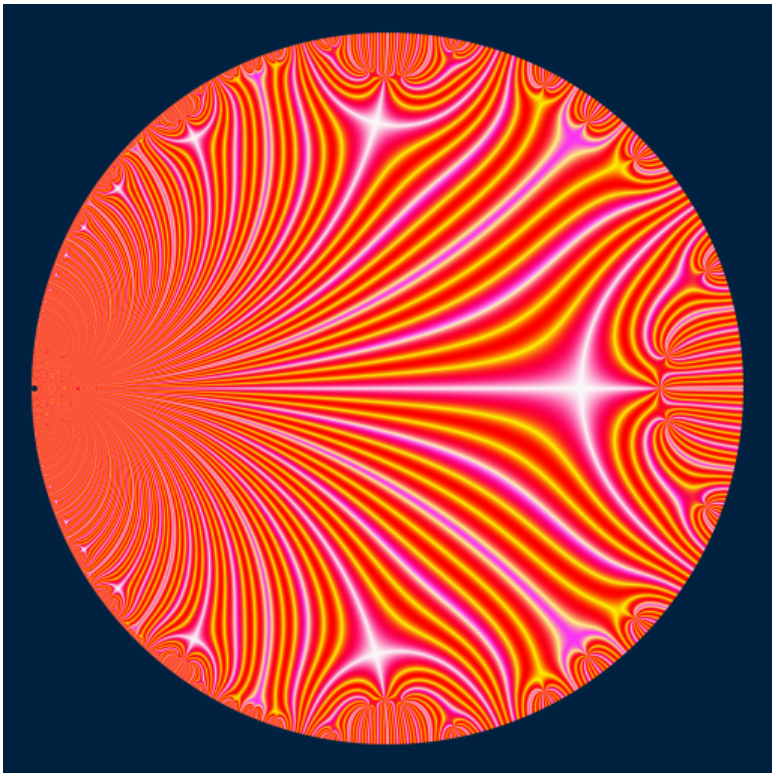
```
colorMap1(
  Z,
  bkgcolor = "#15191e",
  nancolor = "#000000",
  reverse = c(FALSE, FALSE, FALSE)
)

colorMap2(
  Z,
  bkgcolor = "#15191e",
  nancolor = "#000000",
  reverse = c(FALSE, FALSE, FALSE)
)
```

Arguments

`Z`	complex number, vector or matrix
`bkgcolor`	background color; it is applied for the `NA` values of `Z`
`nancolor`	color for infinite and `NaN` values
`reverse`	logical vector of length three; for each color component (e.g. R, G, B), whether to reverse it (e.g. `R -> 255-R`)

Value

A string or a character vector or a character matrix, having the same size as `Z`. Each entry is a color given by a hexadecimal string.



Examples

```
library(RcppColors)

iota <- function(z){
  (z + 1i) / (1i*z + 1)
}
f <- function(z){
  q <- exp(2i * pi * z)
  r <- q - 4*q^2 + 2*q^3 + 8*q^4 - 5*q^5 - 8*q^6 + 6*q^7 - 23*q^9
  r / Mod(r)
```

```
}
g <- function(z){
  ifelse(
    Mod(z) >= 1,
    NA_complex_,
    f(iota(Conj(z)))
  )
}

x <- y <- seq(-1, 1, len = 1500)
W <- outer(y, x, function(x, y) complex(real = x, imaginary = y))
Z <- g(W)
image <- colorMap1(Z)

opar <- par(mar = c(0,0,0,0), bg = "#15191E")
plot(
  c(-100, 100), c(-100, 100), type = "n",
  xlab = "", ylab = "", axes = FALSE, asp = 1
)
rasterImage(image, -100, -100, 100, 100)
par(opar)
```

`hsluv` *HSLuv color specification*

Description

Converts a color given in HSLuv coordinates to a hexadecimal string or a RGB color specification

Usage

```
hsluv(h = 360, s = 100, l = 100, alpha = NULL)

hsluv2rgb(h = 360, s = 100, l = 100)
```

Arguments

`h`	the hue, a number between `0` and `360`
`s`	the saturation, a number between `0` and `100`
`l`	the lightness, a number between `0` and `100`
`alpha`	opacity, a number between `0` and `1`, or `NULL`

Value

The `hsluv` function returns a hexadecimal string representing a color, and the `hsluv2rgb` returns the RGB coordinates of this color, a named vector of three integers between `0` and `255`.

Examples

```
saturation <- 100
f <- Vectorize(
  function(x, y){
    z <- complex(real = x, imaginary = y)
    modulus <- Mod(z)
    if(modulus > 1){
      return("#ffffff")
    }
    radians <- Arg(z)
    if(radians < 0){
      radians <- radians + 2*pi
    }
    degrees <- 360 * radians / 2 / pi
    hsluv(h = degrees, s = saturation, l = 100*modulus)
  }
)

x <- y <- seq(-1, 1, length.out = 200L)
image <- outer(x, y, f)

opar <- par(mar = c(0, 0, 0, 0))
plot(NULL, xlim = c(-1, 1), ylim = c(-1, 1), asp = 1)
rasterImage(image, -1, -1, 1, 1)
par(opar)
```

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