Package ‘morgenstemning’

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Title  Color schemes compatible with red-green color perception difficulties

Description  This package is a port of the MATLAB colourmap functions accompanying the paper M. Geissbuehler and T. Lasser, “How to display data by color schemes compatible with red-green color perception deficiencies,” Opt. Express 21, 9862-9874 (2013) to R.

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URL  https://github.com/ajdm/morgenstemning

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Suggests  testthat

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ametrine

Create a colorblind-safe vector of \( n \) quasi-isoluminent colors.

Description

Create a colorblind-safe vector of \( n \) quasi-isoluminent colors.

Usage

```r
ametrine(n = 256, mincolor = NULL, maxcolor = NULL, invert = FALSE, alpha = 1)
```

Arguments

- **n**: the number of colors to be in the palette.
- **mincolor**: a color with which to replace the lower end of the scale.
- **maxcolor**: a color with which to replace the upper end of the scale.
- **invert**: logical indicating whether the palette should be inverted.
- **alpha**: the alpha transparency for the palette.

Details

The colormap is almost isoluminant and perceived by those with a red-green color perception deficiency as a roughly linear ramp between blue and yellow. However, the colormap has been enriched with a red control point for those with normal color vision. In order to improve contrast, this colormap is slightly unbalanced in luminence, unlike isolum.

Value

A character vector of color names. This can be used either to create a user-defined color palette for subsequent graphics by `palette(cv)`, a `col` = specification in graphics functions or in `par`.

See Also

- `palettes` and `colors`.

Examples

```r
require(graphics)
# A color wheel
pie(rep(1,12), col=ametrine(12))
```
isolum

Create a colorblind-safe vector of \( n \) isoluminent colors.

Description

Create a colorblind-safe vector of \( n \) isoluminent colors.

Usage

\begin{verbatim}
isolum(n = 256, mincolor = NULL, maxcolor = NULL, invert = FALSE, 
gamma = 1.8, alpha = 1)
\end{verbatim}

Arguments

- \( n \): the number of colors to be in the palette.
- \( \text{mincolor} \): a color with which to replace the lower end of the scale.
- \( \text{maxcolor} \): a color with which to replace the upper end of the scale.
- \( \text{invert} \): logical indicating whether the palette should be inverted.
- \( \text{gamma} \): the exponent to use for each channel when converting to greyscale, such that 
\[ \text{grey} = \left(\text{red}^{\gamma} + \text{green}^{\gamma} + \text{blue}^{\gamma}\right)^{1/\gamma}. \]
- \( \text{alpha} \): the alpha transparency for the palette.

Details

The colormap is isoluminent and perceived by those with a red-green color perception deficiency as a linear ramp between blue and yellow. However, the colormap has been enriched with a red control point for those with normal color vision, with the shade carefully chosen to avoid creating a non-linear ramp for those with red-green color perception deficiency. As the color map is isoluminent, it will appear as one shade of grey across the entire range when printed on a black & white printer.

Value

A character vector of color names. This can be used either to create a user-defined color palette for subsequent graphics by \texttt{palette(cv)}, a \texttt{col} = specification in graphics functions or in \texttt{par}.

See Also

- \texttt{palettes} and \texttt{colors}.

Examples

\begin{verbatim}
require(graphics)
# A color wheel
pie(rep(1,12), col=isolum(12))
\end{verbatim}
morgenstemning

Create a colorblind-safe vector of \( n \) contiguous colors.

Description

Create a colorblind-safe vector of \( n \) contiguous colors.

Usage

```r
morgenstemning(n = 256, mincolor = NULL, maxcolor = NULL,
               invert = FALSE, gamma = 1.8, alpha = 1)
```

Arguments

- \( n \)  
  the number of colors to be in the palette.
- \( \text{mincolor} \)  
  a color with which to replace the lower end of the scale.
- \( \text{maxcolor} \)  
  a color with which to replace the upper end of the scale.
- \( \text{invert} \)  
  logical indicating whether the palette should be inverted.
- \( \text{gamma} \)  
  the exponent to use for each channel when converting to greyscale, such that  
  \[
  \text{grey} = \left(\text{red}^{\text{gamma}} + \text{green}^{\text{gamma}} + \text{blue}^{\text{gamma}}\right)^{1/\text{gamma}}.
  \]
- \( \text{alpha} \)  
  the alpha transparency for the palette.

Details

The colormap increases linearly in lightness (such as a pure black to white map) but incorporates additional colors that help to emphasise the transitions and hence enhance the perception of the data. It is designed to be printer-friendly both for color printers and black & white printers.

Value

A character vector of color names. This can be used either to create a user-defined color palette for subsequent graphics by \( \text{palette}(\text{cv}) \), a \( \text{col} = \) specification in graphics functions or in \( \text{par} \).

See Also

- \text{palettes} and \text{colors}.

Examples

```r
require(graphics)
# A color wheel
pie(rep(1,12), col=morgenstemning(12))
```
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