Package 'ximage'

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Title Draw Images of Raster Data and Related Adornments

Version 0.1.0

Description Draw images easily, set up a plot with an image, specify where that image should be placed. Image plot by default
reflects the index of the image data itself, or can be specified in simple extent terms 'xmin,xmax,ymin,ymax'. Numeric matrices, integer arrays, byte arrays, character arrays, and native rasters are (or will be) supported. A combination of image() and rasterImage() from the 'graphics' package with their good features in one place.

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Language en-US

Depends R (>= 2.10)

LazyData true

Suggests knitr, rmarkdown, spelling, testthat (>= 3.0.0)

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VignetteBuilder knitr

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URL https://github.com/hypertidy/ximage

BugReports https://github.com/hypertidy/ximage/issues

NeedsCompilation no

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Repository CRAN

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Contents

`logo_a` *R logo as an RGB image*

Description

Data obtained from png package.

Details

`logo_n` A matrix of colour values in native raster form.

`logo_a` An array of RGB colour values.

Examples

```
ximage(logo_n, asp = .3)
ximage(logo_a, extent = c(8, 18, 60, 80), add = TRUE)
rect(8, 60, 18, 80)
```

`topo` *topographic elevation*

Description

Data obtained from GEBCO 2019, via whatarelief package from AAD COG (GeoTIFF).

Details

A matrix of global elevation values in a smallish matrix, extent is -180,180,-90,90, crs is "OGC:CRS84".

Examples

```
ximage(topo, extent = c(-180, 180, -90, 90))
ximage(logo_n, extent = c(135, 155, -48, -30), add = TRUE)
```

xcontour *Contour matrix data and draw*

Description

Like contour() but to work with `ximage()`

Usage

```
xcontour(x, extent = NULL, ..., add = FALSE)
```

Arguments

x	something we can contour
extent	optional, numeric xmin,xmax,ymin,ymax
...	Arguments passed on to `ximage`
	`zlim` optional, absolute range of data to map colours to (maintains comparable colours across plots); values outside display as 'na.col'; single-band numeric data only
	`xlab` x axis label, empty by default
	`ylab` y axis label, empty by default
	`col` colours to map single-band data to
	`breaks` a set of finite numeric breakpoints for the colours, one more break than colour (if not, colours are interpolated to fit)
	`alpha` optional constant opacity in `[0, 1]` (or vector/matrix, recycled) applied on top of any existing alpha channel; not supported for nativeRaster input
	`na.col` colour for missing values, default "transparent"
add	add to plot, or start afresh

Details

Input may be a matrix or a list from `gdal_raster_data()` in the vapour package or from `read_ds()` in the gdalraster package.

Value

nothing, called for its side effect of creating or adding to a plot

Examples

```
#EPSG:27200 see https://github.com/mdsumner/volcano
ex <- c(2667400, 2668010, 6478700, 6479570)
v <- volcano[nrow(volcano):1, ncol(volcano):1]
ximage(v, extent = ex, asp = 1)

xcontour(v, add = TRUE, extent = ex, col = "white")
xrect(ex, add = TRUE, border = "hotpink", lwd = 5)
```

`ximage` *Plot an image*

Description

ximage combines the best of `graphics::image()` and `graphics::rasterImage()`.

Usage

```
ximage(
  x,
  extent = NULL,
  zlim = NULL,
  add = FALSE,
  ...,
  xlab = NULL,
  ylab = NULL,
  col = hcl.colors(96, "YlOrRd", rev = TRUE),
  breaks = NULL,
  alpha = NULL,
  na.col = "transparent"
)
```

Arguments

`x`	matrix, array, raw or character matrix, native raster (nativeRaster, or raster), or list as output by GDAL reader functions
`extent`	optional, numeric xmin,xmax,ymin,ymax
`zlim`	optional, absolute range of data to map colours to (maintains comparable colours across plots); values outside display as 'na.col'; single-band numeric data only
`add`	add to plot, or start afresh
`...`	passed to plot when `add = FALSE`
`xlab`	x axis label, empty by default
`ylab`	y axis label, empty by default
`col`	colours to map single-band data to
`breaks`	a set of finite numeric breakpoints for the colours, one more break than colour (if not, colours are interpolated to fit)
`alpha`	optional constant opacity in `[0, 1]` (or vector/matrix, recycled) applied on top of any existing alpha channel; not supported for nativeRaster input
`na.col`	colour for missing values, default "transparent"

Details

`ximage()` is a combination those graphics function with the the best features in one.

1. Allow arrays with RGB/A.
2. Allow matrix with character (named colours, or hex) or raw (Byte) values
3. Allow list output from vapour or gdalraster, a list with numeric values, hex character, or nativeRaster
4. Plot in 0,ncol 0,nrow by default
5. Override default with extent (xmin, xmax, ymin, ymax)
6. Allow general numeric values.
7. Start a plot from scratch without setting up a plot to paint to.
8. Plot by default in 0,ncol,0,nrow if unspecified.

Data orientation is "raster order", the first cell is the top-left of the displayed image, following scan lines down the page (see the package vignette on orientation).

Colour mapping via 'col', 'breaks', and 'zlim' applies to single-band numeric data only. Multi-band (grey/alpha, RGB, RGBA) data is scaled automatically: values within 0,1 are used as-is, within 0,255 are divided by 255, and anything else is rescaled by the finite range of the colour bands. Missing values (NA, NaN) display as 'na.col' in all cases.

Value

invisibly, a list with 'x' (the colour data as plotted) and 'extent' (xmin, xmax, ymin, ymax used, the 0,ncol 0,nrow index space of the input if not supplied)

Examples

```
ximage(volcano)
ximage(as.raster(matrix(0:1, 49, 56)))
v <- volcano
v[v > 180] <- NA
ximage(v, na.col = "hotpink")
```

---

xrect *Rectangles*

Description

Draw rectangles from four columnns xmin,xmax,ymin,ymax

Usage

```
xrect(x, add = FALSE, ..., asp = 1L)
```

Arguments

x	four columns worth of rectangles
add	instantiate a plot or add to existing (default is add = FALSE)
...	arguments passed to rect()
asp	aspect ratio, defaults to 1

Details

Calls rect(), but will instantiate a plot if add = FALSE.

Value

nothing, called for side effect of creating or adding to a plot

Examples

```
xrect(runif(100))
xrect(sort(runif(100)))
xrect(runif(100), col = hcl.colors(25, alpha = seq(.2, .8, length.out = 25)))

ex <- c(0.2, 0.8, .2, .6)
xrect(ex, add = TRUE, lwd = 5, lty = 2)
```

---

xtext *Label the cells of a matrix in place*

Description

Draw the values of a matrix as text labels, each at the centre of its cell in the same layout used by ximage(). The first cell of the matrix is the top-left label, and each row of the matrix is a line of labels reading left to right down the page ("raster order").

Usage

```
xtext(x, extent = NULL, add = FALSE, cex = NULL, fit = 0.9, ...)
```

Arguments

x	a matrix of values to draw as labels, or a reader-output list
extent	optional, numeric xmin,xmax,ymin,ymax (defaults to the 0,ncol 0,nrow index space of the matrix)
add	add to plot, or start afresh
cex	text size, computed to fit the cells if not supplied
fit	fraction of the cell the largest label should occupy when 'cex' is computed, default 0.9
...	arguments passed to text(), for example 'col'

Details

Text size is chosen automatically to fit the largest label within a cell, scaled by 'fit' (use 'cex' to override). Labels that are NA are not drawn.

Input may be a matrix (values are used as labels via `format()`), or a list in the style of vapour or gdalraster reader output (a row-major vector with 'dimension'/'extent' attributes, or a 'gis' attribute).

Value

invisibly, a list with 'x', 'y' (label positions), 'labels', and 'cex' as used

Examples

```
m <- matrix(1:12, 3, byrow = TRUE)
ximage(m)
xtext(m, add = TRUE)

## the label positions are cell centres in the extent
ximage(volcano, extent = c(0, 1, 0, 1))
xtext(volcano[seq(1, 87, by = 8), seq(1, 61, by = 6)],
      extent = c(0, 1, 0, 1), add = TRUE, col = "white")
```

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