Package ‘RImageJROI’

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Title Read and Write 'ImageJ' Region of Interest (ROI) Files

Description Provides functions to read and write 'ImageJ' (<https://imagej.net>)
Region of Interest (ROI) files, to plot the ROIs and to convert them to
'spatstat' (<https://spatstat.org/>) spatial patterns.

Version 0.1.3

URL https://github.com/davidcsterratt/RImageJROI

BugReports https://github.com/davidcsterratt/RImageJROI/issues

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Imports spatstat.geom

Suggests png, testthat

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Repository CRAN

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`ij2spatstat` *Convert ’ijroi’ and ’ijzip’ objects to spatstat spatial patterns*

Description

Converts `ijroi` and `ijzip` objects to a list of spatstat.geom spatial patterns.

Usage

```
ij2spatstat(
  X,
  window = NULL,
  pattern.type = NULL,
  unitname = NULL,
  scale = 1,
  return.type = FALSE,
  convert.only = NULL
)
```

Arguments

`X` `ijroi` or `ijzip` object to be converted.

`window` the window for returned spatial patterns. Can be an `owin` object defining a common window for all returned patterns, a character string `'range'` leading to a common window based `range` of all returned patterns, or `NULL` (default) leading to separate windows for each pattern.

`pattern.type` a character string specifying the desired pattern type to be returned (`ppp`, `psp` or `owin`). Works only if `X` is an `ijroi` object. Ignored otherwise. Defaults to an appropriate pattern type depending on the ROI type (see ’Details’).

`unitname` Name of the unit of length for the resulting window(s) (see `owin`).

`scale` A numeric value defining the scale of photograph in pixels / `unitname`. Defaults to 1.

`return.type` should the type of ROI object(s) be returned in addition to spatstat.geom spatial patterns? Defaults to `FALSE`.

`convert.only` a character vector specifying the `strType` of ROI objects to be converted (see `plot.ijroi` for possible pattern types). Pattern types not mentioned will not be converted. Works only if `X` is an `ijzip` object. Ignored otherwise.

Details

The function converts ijroi and ijzip objects to spatstat.geom spatial patterns for further calculations with the objects. By default, areal types ("rect", "oval", "ELLIPSE", "polygon") are converted to owin objects. Line types ("line" (including "ARROW"), "freeline", "polyline", "angle", "freehand" (excluding "ELLIPSE")) are converted to psp objects and "point" types to ppp objects.

Value

Returns a list of spatstat.geom patterns of approperiate type (see 'Details'). If `return.type = TRUE` returns a list with two levels specifying the spatstat.geom pattern and the ROI type.

Author(s)

Mikko Vihtakari

See Also

`read.ijroi` `read.ijzip`

Examples

```
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "ijzip.zip")
x <- read.ijzip(file)
ij2spatstat(x)
```

`plot.ijroi` *Plot ijroi object*

Description

Plots ImageJ ROI objects using the 'base' graphics package.

Usage

```
## S3 method for class 'ijroi'
plot(x, add = FALSE, xlab = "", ylab = "", main = "", asp = 1, ...)
```

Arguments

`x` The `ijroi` object.

`add` Whether to add to an existing plot.

`xlab` a title for the x axis: `title`.

`ylab` a title for the y axis: `title`.

`main` an overall title for the plot: `title`.

`asp` numeric defining the aspect ratio y/x: see `plot.window`. Defaults to 1.

`...` Additional parameters.

Details

ImageJ ROI objects created with following tools are plotted using following graphics commands:

- Rectangle tool ("rect") rect. Plotted based on coordinates.
- Oval selections ("oval") polygon. Plotted based on equation.
- Freehand selections ("freehand") lines. Plotted based on coordinates.
- Elliptical selections ("freehand", "ELLIPSE") lines. Plotted based on equation.
- Point Tool and Multi-Point Tool ("point") points. Plotted based on coordinates.
- Straight Line ("line") lines. Plotted based on coordinates.
- Arrow tool ("line", "ARROW") arrows. Plotted based on coordinates. Stroke width passed to lwd argument.
- Segmented Line ("polyline") lines. Plotted based on coordinates.
- Freehand Line ("freeline") lines. Plotted based on coordinates.

All graphics allow the additional parameters from appropriate functions. Aspect ratio (asp) is 1 by default leading to correct representation of ImageJ objects. If correct representation is not important, set asp = NA to use the R base-graphics default setting.

Author(s)

David Sterratt, Mikko Vihtakari

See Also

read.ijroi, read.ijzip, plot.ijzip

Examples

```
# type 0 'polygon' ROIs are plotted using lines()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "polygon.roi")
x <- read.ijroi(file)
plot(x, col = "red")

# type 1 'rect' ROIs are plotted using rect()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "rect.roi")
x <- read.ijroi(file)
plot(x, border = "red")

# type 2 'oval' ROIs are plotted using polygon()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "oval.roi")
x <- read.ijroi(file)
plot(x, border = "red")

# type 3 'line' ROIs (among others listed in 'details') are plotted using lines()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "line.roi")
x <- read.ijroi(file)
plot(x, col = "red")

# type 3 arrows are a subtype of 'line'. Plotted using arrows(). The stroke width is
# carried over. To change width, use lwd argument
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "arrow.roi")
x <- read.ijroi(file)
plot(x, col = "red")

# type 4 'freeline' ROIs are plotted using lines()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "freehand_line.roi")
x <- read.ijroi(file)
plot(x, col = "red")

# type 5 'polyline' ROIs are plotted using lines()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "segmented_line.roi")
x <- read.ijroi(file)
plot(x, col = "red")

# type 7 'freehand' selection ROIs are plotted using lines()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "freehand_selection.roi")
x <- read.ijroi(file)
plot(x, col = "red")

# type 7 Objects created using 'Elliptical selections' tool are also saved as
# 'freehand', but with subtype 'ELLIPSE'. The coordinates for this type are flawed
# and plotting is done using equation for an ellipse
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "elliptical.roi")
x <- read.ijroi(file)
plot(x, border = "red")
lines(x$coords[,1], x$coords[,2]) ## plotted based on coordinates.

# type 10 'point' ROIs are plotted using points()
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "multi_point.roi")
x <- read.ijroi(file)
plot(x, col = "red")

# If following is shown as a (round) circle, asp = 1
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "circle.roi")
x <- read.ijroi(file)
plot(x, border = "red")

# text is stored as type 'rect' with subtype 'TEXT'. Currently
# only the outlining rectangle is returned
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "text.roi")
x <- read.ijroi(file)
plot(x, border = "red")
```

plot.ijzip *Plot ijzip object*

Description

Plots .zip files containing ImageJ ROI objects using the 'base' graphics package.

Usage

```
## S3 method for class 'ijzip'
plot(x, add = FALSE, xlab = "", ylab = "", main = "", asp = 1, ...)
```

Arguments

`x`	The `ijzip` object.
`add`	Whether to add to an existing plot.
`xlab`	a title for the x axis: see `title`.
`ylab`	a title for the y axis: see `title`.
`main`	an overall title for the plot: see `title`.
`asp`	numeric defining the aspect ratio y/x: see `plot.window`. Defaults to 1.
`...`	Arguments to be passed to methods, such as graphical parameters (see `par`).

Details

The function loops `plot.ijroi` plotting function over all elements in `x`. See `plot.ijroi` for further details.

Author(s)

Mikko Vihtakari, David Sterratt

See Also

`read.ijzip`, `plot.ijroi`

Examples

```
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "ijzip.zip")
x <- read.ijzip(file)
plot(x)
```

`print.ijroi` *Print* `ijroi` *objects*

Description

Print `ijroi` objects

Usage

```
## S3 method for class 'ijroi'
print(x, all = FALSE, ...)
```

Arguments

`x`	`ijroi` object to be printed.
`all`	logical indicating whether to print all information from ijroi object as opposed to a subset of relevant information. Defaults to `FALSE`.
`...`	further arguments passed to `print`.

Author(s)

Mikko Vihtakari, David Sterratt

See Also

`read.ijroi`

`read.ijroi` *Read an ImageJ ROI file*

Description

Read an ImageJ ROI file. This returns a structure containing the ImageJ data.

Usage

```
read.ijroi(file, verbose = FALSE)
```

Arguments

`file`	Name of ImageJ ROI file to read
`verbose`	Whether to report information

Value

A structure of class `ijroi` containing the ROI information

Author(s)

David Sterratt

See Also

`plot.ijroi` for plotting single ROI objects.

`read.ijzip` for reading several ROI objects from .zip files.

Examples

```
library(png)
path <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi")
im <- as.raster(readPNG(file.path(path, "imagej-logo.png")))
plot(NA, NA, xlim=c(0, ncol(im)), ylim=c(nrow(im), 0), asp=1)
rasterImage(im, 0,  nrow(im), ncol(im), 0, interpolate=FALSE)
r <- read.ijroi(file.path(path, "rect.roi"))
plot(r, TRUE)
r <- read.ijroi(file.path(path, "polygon.roi"))
plot(r, TRUE)
r <- read.ijroi(file.path(path, "oval.roi"))
plot(r, TRUE)
```

read.ijzip *Read ImageJ zip file containing several ROI files*

Description

A wrapper function, which reads a zip file containing ImageJ ROI files using read.ijroi function.

Usage

```
read.ijzip(file, names = TRUE, list.files = FALSE, verbose = FALSE)
```

Arguments

file	zip file containing a collection of ImageJ ROI files
names	Logical, indicating whether the ROI file names should be used as names for the elements in the list (see Return). If FALSE a sequence of names specifying the type of ROI is automatically generated.
list.files	logical, indicating whether a data.frame of ROI files in file should be returned instead of a list of results. Defaults to FALSE. If TRUE equals to unzip(file, list = TRUE).
verbose	Whether to report information (see read.ijroi).

Value

An object of class ijzip containing a list of the coordinates and types of ImageJ ROIs. Each element is named after option specified in names.

Author(s)

Mikko Vihtakari

See Also

read.ijroi, plot.ijzip.

Examples

```
file <- file.path(system.file(package = "RImageJROI"), "extdata", "ijroi", "ijzip.zip")
x <- read.ijzip(file)
plot(x)
```

RImageJROI *Read and write ImageJ Region of Interest (ROI) files*

Description

Provides functions to read and write ImageJ (https://imagej.net/) Region of Interest (ROI) files, to plot the ROIs and to convert them as spatstat (https://spatstat.org/) spatial patterns.

Details

ImageJ ROI files can be read into R using the `read.ijroi` and `read.ijzip` functions, resulting in `ijroi` and `ijzip` objects.

The objects can be plotted using generic `plot` command and converted to spatstat.geom spatial patterns by using `ij2spatstat` function.

The `ijroi` and `ijzip` objects can be written to file using the `write.ijroi` and `write.ijzip` functions.

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write.ijroi *Write an ImageJ ROI file.*

Description

Write an ImageJ ROI file.

Usage

```
write.ijroi(file, roi, verbose = TRUE)
```

Arguments

`file`	Name of ImageJ ROI file to write
`roi`	A structure of class `ijroi` containing the ROI information
`verbose`	Whether to report information

See Also

`read.ijroi` for reading an ROI file

write.ijzip *Write ImageJ zip file containing several ROI files*

Description

Write or add to a zip archive containing ImageJ ROI files using the write.ijroi function.

Usage

```
write.ijzip(file, roi, verbose = TRUE)
```

Arguments

file	zip archive to write that will contain a collection of ImageJ ROI files
roi	A list of ROIs
verbose	Whether to report information

See Also

write.ijroi

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