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

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Repository CRAN

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Contents

`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)
```

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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

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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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