Package 'alabaster.spatial'

November 13, 2025

Title Save and Load Spatial 'Omics Data to/from File

Description Save SpatialExperiment objects and their images into file artifacts, and load them back into memory.
This is a more portable alternative to serialization of such objects into RDS files.
Each artifact is associated with metadata for further interpretation;
downstream applications can enrich this metadata with context-specific properties.

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Depends SpatialExperiment, alabaster.base

Imports methods, utils, grDevices, S4Vectors, alabaster.sce, rhdf5

Suggests testthat, knitr, rmarkdown, BiocStyle, DropletUtils, magick, png, digest

VignetteBuilder knitr

RoxygenNote 7.3.2

biocViews DataImport, DataRepresentation

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Author Aaron Lun [aut, cre]

Maintainer Aaron Lun <infinite.monkeys.with.keyboards@gmail.com>

Contents

loadSpatialImage *Load a spatial image*

Description

Load an image as a SpatialImage or subclass thereof.

Usage

```
loadSpatialImage(img.info, project)
```

Arguments

img.info	Named list containing the metadata for this assay.
project	Object specifying the project of interest.

Value

A SpatialImage containing the image data (or a reference to it).

Author(s)

Aaron Lun

Examples

```
example(read10xVisium, echo=FALSE)
img <- imgData(spe)$data[[1]]

tmp <- tempfile()
dir.create(tmp)
meta <- stageObject(img, tmp, "whee")

out <- loadSpatialImage(meta, tmp)
```

readSpatialExperiment *Read a SpatialExperiment from disk*

Description

Read a SpatialExperiment object from its on-disk representation.

Usage

```
readSpatialExperiment(path, metadata, ...)
```

Arguments

path	String containing a path to a directory, itself created using the saveObject method for SpatialExperiment objects.
metadata	Named list of metadata for this object, see readObjectFile for details.
...	Further arguments passed to readSingleCellExperiment and internal altReadObject calls.

Value

A SpatialExperiment object.

Author(s)

Aaron Lun

See Also

"saveObject,SpatialExperiment-method", to save a SpatialExperiment to disk.

Examples

```
library(SpatialExperiment)
example(read10xVisium, echo=FALSE)

tmp <- tempfile()
saveObject(spe, tmp)
readObject(tmp)
```

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saveObject,SpatialExperiment-method

Save a spatial experiment

Description

Save a SpatialExperiment object to its on-disk representation.

Usage

```
## S4 method for signature 'SpatialExperiment'
saveObject(x, path, ...)
```

Arguments

x	A SpatialExperiment object.
path	String containing the path to a directory in which to save x.
...	Additional named arguments to pass to specific methods.

Details

Currently, only PNG and TIFF image formats are supported in the imgData. All other images will be re-saved as PNG.

Value

x is saved to path and NULL is invisibly returned.

Author(s)

Aaron Lun

See Also

readSpatialExperiment, to read the SpatialExperiment back into the R session.

Examples

```
library(SpatialExperiment)
example(read10xVisium, echo=FALSE)

tmp <- tempfile()
saveObject(spe, tmp)
list.files(tmp, recursive=TRUE)
```

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stageSpatialImage *Stage images for upload*

Description

These methods are deprecated and are only documented here for back-compatibility purposes.

Usage

```
## S4 method for signature 'VirtualSpatialImage'
stageObject(x, dir, path, child = FALSE, ...)

## S4 method for signature 'StoredSpatialImage'
stageObject(x, dir, path, child = FALSE, ...)

## S4 method for signature 'RemoteSpatialImage'
stageObject(x, dir, path, child = FALSE, ...)
```

Arguments

x	A SpatialImage object.
dir	String containing a path to a directory.
path	String containing a relative path inside a directory.
child	Logical scalar indicating whether x is a child of another object.
...	Further arguments, ignored.

Details

Each of the different methods will take advantage of any existing files to avoid an actual save. For example, the RemoteSpatialImage method will download the file directly to `path`, while the StoredSpatialImage method will create a link or copy the file. The SpatialImage method will fall back to saving the raster directly as a PNG.

Value

An image file is created at `file.path(dir, path)`, possibly after appending an appropriate file extension.

The return value should be a named list containing at least:

- `$schema`, a string specifying the schema to use to validate the metadata. This may have a `package` attribute to specify the package where the schema lives (in its `inst/schemas` directory).
- `path`, a string containing the path to the file containing the assay contents. This should start with the input `path` but can be followed by any necessary file extensions.
- `child`, whether this is a child resource of a larger object.

Other fields can be provided and will be included in the metadata, provided that they are recognized by the specified schema.

Author(s)

Aaron Lun

Examples

```
example(read10xVisium, echo=FALSE)
(img <- imgData(spe)$data[[1]])

# Doing a local run:
tmp <- tempfile()
dir.create(tmp)
stageObject(img, tmp, "whee")

# Forcing a re-save:
Y <- as(img, "LoadedSpatialImage")
stageObject(Y, tmp, "foo")
```

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