

Package ‘alabaster.spatial’

November 5, 2024

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.

Version 1.7.0

Date 2024-10-16

License MIT + file LICENSE

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

git_url <https://git.bioconductor.org/packages/alabaster.spatial>

git_branch devel

git_last_commit 00724f5

git_last_commit_date 2024-10-29

Repository Bioconductor 3.21

Date/Publication 2024-11-05

Author Aaron Lun [aut, cre]

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

Contents

loadSpatialImage	2
readSpatialExperiment	3
saveObject,SpatialExperiment-method	4
stageSpatialImage	5

loadSpatialImage	<i>Load a spatial image</i>
------------------	-----------------------------

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)
```

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)
```

stageSpatialImage	<i>Stage images for upload</i>
-------------------	--------------------------------

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:

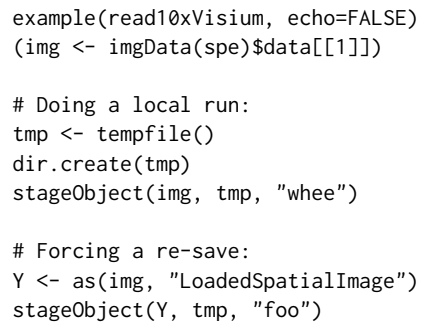
- `$schema`, a string specifying the schema to use to validate the metadata. This may have a `package` attribute to specify the package where the schema lives (in its `inst/schemas` directory).
- `path`, a string containing the path to the file containing the assay contents. This should start with the 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)
The image contains R code for the stageSpatialImage package. It starts with an example function call: example(read10xVisium, echo=FALSE) followed by (img <- imgData(spe)$data[[1]]). Then, it shows a local run: # Doing a local run: tmp <- tempfile(), dir.create(tmp), stageObject(img, tmp, "whee"). Finally, it shows forcing a re-save: # Forcing a re-save: Y <- as(img, "LoadedSpatialImage"), stageObject(Y, tmp, "foo").  
(img <- imgData(spe)$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")
```

Index

altReadObject, [3](#)
imgData, [4](#)
loadSpatialExperiment
 (readSpatialExperiment), [3](#)
loadSpatialImage, [2](#)
readObjectFile, [3](#)
readSingleCellExperiment, [3](#)
readSpatialExperiment, [3, 4](#)
RemoteSpatialImage, [5](#)
saveObject, [3](#)
saveObject, SpatialExperiment-method, [4](#)
SpatialExperiment, [3, 4](#)
SpatialImage, [2, 5](#)
stageObject, RemoteSpatialImage-method
 (stageSpatialImage), [5](#)
stageObject, SpatialExperiment-method
 (saveObject, SpatialExperiment-method),
 [4](#)
stageObject, StoredSpatialImage-method
 (stageSpatialImage), [5](#)
stageObject, VirtualSpatialImage-method
 (stageSpatialImage), [5](#)
stageSpatialImage, [5](#)
StoredSpatialImage, [5](#)