

Package ‘phantasusLite’

May 9, 2024

Type Package

Title Loading and annotation RNA-seq counts matrices

Version 1.2.0

Description PhantasusLite – a lightweight package with helper functions of general interest extracted from phantasus package. In particular it simplifies working with public RNA-seq datasets from GEO by providing access to the remote HSDS repository with the precomputed gene counts from ARCHS4 and DEE2 projects.

Depends R (>= 4.2)

Imports data.table, rhdf5client(>= 1.25.1), httr, stringr, stats, utils, Biobase, methods

biocViews GeneExpression, Transcriptomics, RNASeq

License MIT + file LICENSE

Encoding UTF-8

LazyData true

RoxygenNote 7.3.1

Suggests testthat (>= 3.0.0), knitr, rmarkdown, BiocStyle, rhdf5, GEOquery

VignetteBuilder knitr

Config/testthat/edition 3

URL <https://github.com/ctlab/phantasusLite/>

BugReports <https://github.com/ctlab/phantasusLite/issues>

git_url <https://git.bioconductor.org/packages/phantasusLite>

git_branch RELEASE_3_19

git_last_commit c542b29

git_last_commit_date 2024-04-30

Repository Bioconductor 3.19

Date/Publication 2024-05-08

Author Rita Sablina [aut],
 Maxim Kleverov [aut],
 Alexey Sergushichev [aut, cre]

Maintainer Alexey Sergushichev <alsergbox@gmail.com>

Contents

createH5	2
createIndexH5	3
createIndexH5Remote	3
createMetaH5	4
createPriorityH5	4
getCountsMetaPart	5
getHSDSFileList	5
getIndexRemote	6
gsmToChunk	6
inferCondition	7
inferConditionImpl	7
loadCountsFromH5FileHSDS	8
loadCountsFromHSDS	8
readGct	9
removeRepeatWords	10
updateARCHS4meta	10
updateDEE2meta	11
updateIndexH5	11
validateCountsCollection	12
writeGct	12
Index	13

createH5	<i>Creates metafiles for HDF5-files</i>
----------	---

Description

Creates metafiles for HDF5-files

Usage

```
createH5(data, file, dataset_name)
```

Arguments

data	contains metadata
file	contains file name
dataset_name	contains dataset name

Value

Returns NULL

createIndexH5	<i>Writes indexes to the file</i>
---------------	-----------------------------------

Description

Writes indexes to the file

Usage

```
createIndexH5(data, file)
```

Arguments

data	contains metadata
file	contains the file name

Value

Returns NULL

createIndexH5Remote	<i>Creates HDF5-file with indexes</i>
---------------------	---------------------------------------

Description

Creates HDF5-file with indexes

Usage

```
createIndexH5Remote(  
  url,  
  collections = c("archs4", "dee2"),  
  destfile = "index.h5"  
)
```

Arguments

url	contains URL to the root of counts files
collections	vector of collection names to process
destfile	where to put resulting index file

Value

Returns NULL

createMetaH5	<i>Converts collection meta.txt files to meta.h5, putting them to the respective collection folders</i>
--------------	---

Description

Converts collection meta.txt files to meta.h5, putting them to the respective collection folders

Usage

```
createMetaH5(counts_dir)
```

Arguments

counts_dir	contains directory name
------------	-------------------------

Value

Returns NULL

createPriorityH5	<i>Creates HDF5-File with priority</i>
------------------	--

Description

Creates HDF5-File with priority

Usage

```
createPriorityH5(counts_dir, force = FALSE, verbose = FALSE)
```

Arguments

counts_dir	contains counts directory
force	logical value which lets function replace existing priority file
verbose	logical value which determines a content of the output.

Value

Returns NULL

getCountsMetaPart	<i>Gets list with metadata</i>
-------------------	--------------------------------

Description

Gets list with metadata

Usage

```
getCountsMetaPart(counts_dir, collection_name, verbose)
```

Arguments

counts_dir	contains counts directory
collection_name	contains name of the collection
verbose	logical value which determines a content of the output.

Value

list with metadata

getHSDSFileList	<i>Returns list of all HDF5-files on HSDS-server</i>
-----------------	--

Description

Returns list of all HDF5-files on HSDS-server

Usage

```
getHSDSFileList(  
  url = "https://alserglab.wustl.edu/hsds/?domain=/counts",  
  directory = NULL  
)
```

Arguments

url	containing url of the server and root domain.
directory	containing name of the directory

Value

List of all HDF5-files on the server or all files of the collection

Examples

```
url <- 'https://alserglab.wustl.edu/hsds/?domain=/counts'
getHSDSFileList(url)
```

getIndexRemote	<i>Creates a data table with indexes and chunks of samples in remote HDF5-files</i>
----------------	---

Description

Creates a data table with indexes and chunks of samples in remote HDF5-files

Usage

```
getIndexRemote(url, collections)
```

Arguments

url	contains url to the root of counts files
collections	contains names of the collections

Value

table with samples, indexes and chunks in all HDF5-files

gsmToChunk	<i>Gets chunk from GSE identifiers.</i>
------------	---

Description

Gets chunk from GSE identifiers.

Usage

```
gsmToChunk(samples)
```

Arguments

samples	containing a list of samples
---------	------------------------------

Value

list of chunks

inferCondition	<i>Adds condition to the annotation.</i>
----------------	--

Description

Adds condition to the annotation.

Usage

```
inferCondition(es)
```

Arguments

es contains ExpressionSet object

Value

Annotated ExpressionSet with conditions and replicates

Examples

```
ess <- GEOquery::getGEO("GSE143903")
es <- ess[[1]]
es <- inferCondition(es)
es$condition # contains inferred groups
es$replicate # contains inferred replicate numbers
```

inferConditionImpl	<i>Creates condition from the samples titles</i>
--------------------	--

Description

Creates condition from the samples titles

Usage

```
inferConditionImpl(gse_titles)
```

Arguments

gse_titles contains titles

Value

List of conditions and replicates

`loadCountsFromH5FileHSDS`*Load count matrix from remote HDF5-file*

Description

Load count matrix from remote HDF5-file

Usage

```
loadCountsFromH5FileHSDS(  
  es,  
  url = "https://alserglab.wustl.edu/hsds/?domain=/counts",  
  file,  
  sampleIndexes = NULL  
)
```

Arguments

<code>es</code>	containing ExpressionSet loaded from GEO. Contains empty expression matrix.
<code>url</code>	containing url of the server and root domain.
<code>file</code>	containing name of the file (relative to the root domain)
<code>sampleIndexes</code>	containing sample indexes list

Value

ExpressionSet object with loaded count matrix

Examples

```
ess <- GEOquery::getGEO("GSE53053")  
es <- ess[[1]]  
url <- 'https://alserglab.wustl.edu/hsds/?domain=/counts'  
file <- "/dee2/mmusculus_star_matrix_20240409.h5"  
es <- loadCountsFromH5FileHSDS(es, url, file)
```

`loadCountsFromHSDS`*Load count matrix from HDF5-files.*

Description

Load count matrix from HDF5-files.

Usage

```
loadCountsFromHSDS(  
  es,  
  url = "https://alserglab.wustl.edu/hsds/?domain=/counts"  
)
```

Arguments

`es` containing ExpressionSet loaded from GEO. Contains empty expression matrix.
`url` containing url of the server and root domain.

Value

ExpressionSet with loaded count matrix

Examples

```
ess <- GEOquery::getGEO("GSE85653")  
es <- ess[[1]]  
url <- 'https://alserglab.wustl.edu/hsds/?domain=/counts'  
es <- loadCountsFromHSDS(es, url)
```

readGct	<i>Reads ExpressionSet from a GCT file.</i>
---------	---

Description

Only versions 1.2 and 1.3 are supported.

Usage

```
readGct(gct)
```

Arguments

`gct` Path to gct file

Value

ExpressionSet object

Examples

```
es <- readGct(system.file("extdata/testdata/gct/test.gct", package="phantasusLite"))
```

removeRepeatWords	<i>Removes repeated words from conditions</i>
-------------------	---

Description

Removes repeated words from conditions

Usage

```
removeRepeatWords(titles)
```

Arguments

titles	contains titles
--------	-----------------

Value

titles without repeated words

updateARCHS4meta	<i>Creates meta.txt file, which describes typical archs4 and archs4Zoo files.</i>
------------------	---

Description

Creates meta.txt file, which describes typical archs4 and archs4Zoo files.

Usage

```
updateARCHS4meta(  
  archDir = file.path(getOption("phantasusCacheDir"), "counts/archs4")  
)
```

Arguments

archDir	path to directory with arch4 .h5 files.
---------	---

Value

Returns NULL

updateDEE2meta	<i>Creates meta.txt file, which describes typical dee2 files.</i>
----------------	---

Description

Creates meta.txt file, which describes typical dee2 files.

Usage

```
updateDEE2meta(  
  destDir = file.path(getOption("phantasusCacheDir"), "counts/dee2")  
)
```

Arguments

destDir path to directory with DEE2 .h5 files.

Value

Returns NULL

updateIndexH5	<i>Updates indexes from HDF5-files</i>
---------------	--

Description

Updates indexes from HDF5-files

Usage

```
updateIndexH5(counts_dir, force = FALSE, verbose = FALSE)
```

Arguments

counts_dir contains counts directory
force logical value which lets function replace existing index file
verbose logical value which determines a content of the output.

Value

Returns NULL

validateCountsCollection
Validates counts collection

Description

Validates counts collection

Usage

```
validateCountsCollection(collectionDir, verbose = FALSE)
```

Arguments

collectionDir contains directory name
verbose logical value which determines a content of the output.

Value

false if collection is not valid

writeGct *Saves ExpressionSet to a GCT file (version 1.3).*

Description

Saves ExpressionSet to a GCT file (version 1.3).

Usage

```
writeGct(es, file, gzip = FALSE)
```

Arguments

es ExpressionSet object to save
file Path to output gct file
gzip Whether to gzip apply gzip-compression for the output file#'

Value

Result of the closing file (as in 'close()' function')

Examples

```
es <- readGct(system.file("extdata/testdata/gct/test.gct", package="phantasusLite"))
out <- tempfile(fileext = ".gct.gz")
writeGct(es, out, gzip=TRUE)
```

Index

* **internal**

- createH5, [2](#)
- createIndexH5, [3](#)
- createIndexH5Remote, [3](#)
- createMetaH5, [4](#)
- createPriorityH5, [4](#)
- getCountsMetaPart, [5](#)
- getIndexRemote, [6](#)
- gsmToChunk, [6](#)
- inferConditionImpl, [7](#)
- removeRepeatWords, [10](#)
- updateARCHS4meta, [10](#)
- updateDEE2meta, [11](#)
- updateIndexH5, [11](#)
- validateCountsCollection, [12](#)

- createH5, [2](#)
- createIndexH5, [3](#)
- createIndexH5Remote, [3](#)
- createMetaH5, [4](#)
- createPriorityH5, [4](#)

- getCountsMetaPart, [5](#)
- getHSDSFileList, [5](#)
- getIndexRemote, [6](#)
- gsmToChunk, [6](#)

- inferCondition, [7](#)
- inferConditionImpl, [7](#)

- loadCountsFromH5FileHSDS, [8](#)
- loadCountsFromHSDS, [8](#)

- readGct, [9](#)
- removeRepeatWords, [10](#)

- updateARCHS4meta, [10](#)
- updateDEE2meta, [11](#)
- updateIndexH5, [11](#)

- validateCountsCollection, [12](#)

- writeGct, [12](#)