Package: iSEEfier (via r-universe)

June 26, 2024

Title Streamlining the creation of initial states for starting an iSEE instance

Version 1.1.0

Description iSEEfier provides a set of functionality to quickly and intuitively create, inspect, and combine initial configuration objects. These can be conveniently passed in a straightforward manner to the function call to launch iSEE() with the specified configuration. This package currently works seamlessly with the sets of panels provided by the iSEE and iSEEu packages, but can be extended to accommodate the usage of any custom panel (e.g. from iSEEde, iSEEpathways, or any panel developed independently by the user).

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Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.1

Imports iSEE, iSEEu, methods, ggplot2, igraph, rlang, stats, SummarizedExperiment, SingleCellExperiment, visNetwork, BiocBaseUtils

Suggests knitr, rmarkdown, scater, scRNAseq, org.Mm.eg.db, scuttle, BiocStyle, testthat (>= 3.0.0)

biocViews CellBasedAssays, Clustering, DimensionReduction, FeatureExtraction, GUI, GeneExpression, ImmunoOncology, ShinyApps, SingleCell, Software, Transcription, Transcriptomics, Visualization

URL https://github.com/NajlaAbassi/iSEEfier

BugReports https://github.com/NajlaAbassi/iSEEfier/issues

Config/testthat/edition 3

VignetteBuilder knitr

Repository https://bioc.r-universe.dev

RemoteUrl https://github.com/bioc/iSEEfier

RemoteRef HEAD

RemoteSha c6001d4fc6dc04632af3916f021ef092bf75f2a7

Contents

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constants-iSEEfier   *Constant values used throughout iSEEfier*

Description

Constant values used throughout iSEEfier

Usage

```
iSEE_panel_colors
```

Format

An object of class `character` of length 17.

Panel colors

- color values (as string character or hex value) for the panels included by default in `iSEE` and `iSEEu`

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glue_initials   *Glue together initial objects into one*

Description

Glue a set of `initial` configuration objects, combining them into a single valid `initial` set.

Usage

```
glue_initials(
  ...,
  remove_duplicate_panels = TRUE,
  verbose = TRUE,
  custom_panels_allowed = NULL
)
```

Arguments

`...`	A set of `initial` list objects (in the format that is required to be passed as a parameter in the call to `iSEE::iSEE()`) - just as in the behavior of the `c()`/`paste()` function
`remove_duplicate_panels`	
	Logical, defaults to `TRUE`. Defines the behavior to remove panels detected as duplicated. Can be relevant upon concatenating mid to large sets of panels.
`verbose`	Logical, defaults to `TRUE`. If on, prints out a series of informative messages to describe the actions undertaken upon running.
`custom_panels_allowed`	
	Character vector, defaults to `NULL`. Can be used to specify additional panels to be allowed in the concatenation.

Details

The usage of `custom_panels_allowed` can be especially relevant when one creates one or more custom panels, with a specific name that needs to be indicated in this parameter. For example, if using a panel of class FancyPlotPanel and one called FancyTablePanel, the value for `custom_panels_allowed` should be set to `c("FancyPlotPanel", "FancyTablePanel")`.

It is worth mentioning that `iSEE::iSEE()` is actually able to handle the automatic renaming of panels that could be detected as duplicated. This can basically relax the requirement on the "uniqueness" of the configured panels, with the only caveat of having to think of how the *transmissions* between panels will be handled; nevertheless, most users might not even need to face this situation.

Value

A single `initial` list object, in the format that is required to be passed as a parameter in the call to `iSEE::iSEE()`, concatenating the values provided as input.

Examples

```
## Load a dataset and preprocess this quickly
sce <- scRNAseq::RichardTCellData()
sce <- scuttle::logNormCounts(sce)
sce <- scater::runPCA(sce)
sce <- scater::runTSNE(sce)
## Select some features and aspects to focus on
gene_list_1 <- c("ENSMUSG00000026581")
gene_list_2 <- c("ENSMUSG00000005087", "ENSMUSG00000015437")
cluster <- "stimulus"
```

```
group <- "single cell quality"
initial1 <- iSEEinit(sce = sce,
                     features = gene_list_1,
                     clusters = cluster,
                     groups = group)
initial2 <- iSEEinit(sce = sce,
                     features = gene_list_2,
                     clusters = cluster,
                     groups = group)
initials_merged <- glue_initials(initial1,
                                 initial2)
view_initial_tiles(initial1)
view_initial_tiles(initial2)
view_initial_tiles(initials_merged)

## Continue your exploration directly within iSEE!
if (interactive())
  iSEE(sce, initial = initial_merged)
```

---

iSEEinit   *iSEEinit: Create an initial state of an iSEE instance for gene expres-*
                                  sion visualization

Description

iSEEinit() defines the initial setup of an iSEE instance, recommending tailored visual elements
to effortlessly illustrate the expression of a gene list in a single view.

Usage

```
iSEEinit(
  sce,
  features,
  reddim_type = "TSNE",
  clusters = colnames(colData(sce))[1],
  groups = colnames(colData(sce))[1],
  add_markdown_panel = FALSE,
  add_dynamicTable_panel = FALSE
)
```

Arguments

sce	SingleCellExperiment object
features	A character vector containing a list of genes
reddim_type	A string vector containing the dimensionality reduction type
clusters	A character string containing the name of the clusters/cell-type/state...(as listed in the colData of the sce)

groups   A character string of the groups/conditions...(as it appears in the colData of the
         sce)

add_markdown_panel

         A logical indicating whether or not to include the MarkdownBoard panel in the
         initial configuration

add_dynamicTable_panel

         A logical indicating whether or not the DynamicMarkerTable and linked panels
         should be included in the initial configuration

Value

A list of "Panel" objects specifying the initial state of iSEE instance

Examples

```
sce <- scRNAseq::RichardTCellData()
sce <- scuttle::logNormCounts(sce)
sce <- scater::runPCA(sce)
sce <- scater::runTSNE(sce)
gene_list <- c("ENSMUSG00000026581",
               "ENSMUSG00000005087",
               "ENSMUSG00000015437")
cluster <- "stimulus"
group <- "single cell quality"
initial <- iSEEinit(sce = sce, features = gene_list, clusters = cluster, groups = group)
```

---

iSEEnrich   *iSEEnrich*

Description

iSEEnrich() creates an initial state of an iSEE instance for interactive exploration of feature sets
extracted from GO and KEGG database, displaying all associated genes in a RowDataTable panel.

Usage

```
iSEEnrich(
  sce,
  collection = c("GO", "KEGG"),
  organism = "org.Hs.eg.db",
  gene_identifier = "ENTREZID"
)
```

Arguments

sce   SingleCellExperiment object

collection   A character vector specifying the gene set collections of interest (GO,KEGG)

organism   A character string of the org.*.eg.db package to use to extract mappings of gene
                  sets to gene IDs.

gene_identifier

                  A character string specifying the identifier to use to extract gene IDs for the
                  organism package

Value

A list of "Panel" objects specifying the initial state of iSEE instance

Examples

```
sce <- scRNAseq::RichardTCellData()
sce <- scuttle::logNormCounts(sce)
sce <- scater::runPCA(sce)
GO_collection <- "GO"
Mm_organism <- "org.Mm.eg.db"
gene_id <- "SYMBOL"
results <- iSEEnrich(sce = sce,
                     collection = GO_collection,
                     organism = Mm_organism,
                     gene_identifier = gene_id)
```

---

view_initial_network   *View an initial object as a network*

Description

Translates the layout of the initial configuration object as a networks, representing panels as
nodes and links between them as edges.

Usage

```
view_initial_network(initial, plot_format = c("igraph", "visNetwork", "none"))
```

Arguments

initial   An initial list object, in the format that is required to be passed as a parameter
                  in the call to iSEE::iSEE().

plot_format   Character string, one of igraph, visNetwork, or none. Defaults to igraph.
                  Determines the format of the visual representation generated as a side effect of
                  this function - it can be the output of the plot() function for igraph objects, or
                  an interactive widget created via visNetwork::visNetwork().

Details

Panels are the nodes, with color and names to identify them easily. The connections among panels are represented through directed edges. This can be a compact visualization to obtain an overview for the configuration, without the need of fully launching the app and loading the content of all panels

This function is particularly useful with mid-to-large `initial` objects, as they can be quickly generated in a programmatic manner via the `iSEEinit()` provided in this package.

Value

An `igraph` object, underlying the visual representation provided.

See Also

view_initial_tiles()

Examples

```
## Load a dataset and preprocess this quickly
sce <- scRNAseq::RichardTCellData()
sce <- scuttle::logNormCounts(sce)
sce <- scater::runPCA(sce)
sce <- scater::runTSNE(sce)
## Select some features and aspects to focus on
gene_list <- c("ENSMUSG00000026581", "ENSMUSG00000005087", "ENSMUSG00000015437")
cluster <- "stimulus"
group <- "single cell quality"
initial <- iSEEinit(sce = sce,
                    features = gene_list,
                    clusters = cluster,
                    groups = group)

g_init <- view_initial_network(initial)
g_init

view_initial_network(initial, plot_format = "visNetwork")

## Continue your exploration directly within iSEE!
if (interactive())
  iSEE(sce, initial = initial)
```

---

view_initial_tiles   *View an initial object as a set of tiles*

Description

Previews the layout of the `initial` configuration object in a graphical form.

Usage

```
view_initial_tiles(initial)
```

Arguments

initial   An `initial` list object, in the format that is required to be passed as a parameter in the call to `iSEE::iSEE()`.

Details

Tiles are used to represent the panel types, and reflect the values of their width. This can be a compact visualization to obtain an overview for the configuration, without the need of fully launching the app and loading the content of all panels

This function is particularly useful with mid-to-large `initial` objects, as they can be quickly generated in a programmatic manner via the `iSEEinit()` provided in this package.

Value

A `ggplot` object, representing a schematic view for the `initial` object.

See Also

`view_initial_network()`

Examples

```
## Load a dataset and preprocess this quickly
sce <- scRNAseq::RichardTCellData()
sce <- scuttle::logNormCounts(sce)
sce <- scater::runPCA(sce)
sce <- scater::runTSNE(sce)
## Select some features and aspects to focus on
gene_list <- c("ENSMUSG00000026581",
               "ENSMUSG00000005087",
               "ENSMUSG00000015437")
cluster <- "stimulus"
group <- "single cell quality"
initial <- iSEEinit(sce = sce,
                    features = gene_list,
                    clusters = cluster,
                    groups = group)

view_initial_tiles (initial)

## Continue your exploration directly within iSEE!
if (interactive())
  iSEE(sce, initial = initial)
```

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