

Package ‘OpenRepGrid.ic’

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Title Interpretive Clustering for Repertory Grids

Type Package

LazyLoad yes

Description Shiny UI to identify cliques of related constructs in repertory grid data.
See Burr, King, & Heckmann (2020) <[doi:10.1080/14780887.2020.1794088](https://doi.org/10.1080/14780887.2020.1794088)> for a description
of the interpretive clustering (IC) method.

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Imports graphics, grDevices, utils, shiny, shinyjs, shinyBS,
shinythemes, shinyWidgets, shinydashboard, shinydashboardPlus
(>= 2.0.0), shinycssloaders, shinyFeedback, rintrojs,
formattable, openxlsx, DT, magrittr, dplyr, stringr, reshape2,
scales, splines, igraph, tidyr, withr, RColorBrewer, tidyverse

Suggests knitr, rmarkdown, covr, testthat

Encoding UTF-8

URL <https://github.com/markheckmann/OpenRepGrid.ic>

BugReports <https://github.com/markheckmann/OpenRepGrid.ic/issues>

RoxygenNote 7.3.0

NeedsCompilation no

Author Mark Heckmann [aut, cre, cph] (ORCID:
<<https://orcid.org/0000-0002-0736-7417>>),
Viv Burr [aut],
Nigel King [aut]

Maintainer Mark Heckmann <heckmann.mark@gmail.com>

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calculate_similarity	<i>Calculate similarity matrix</i>
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Description

Calculate similarity matrix

Usage

calculate_similarity(x, min_matches = 6, align_poles = TRUE)

Arguments

- | | |
|-------------|---|
| x | Grid data. |
| min_matches | Minimal number of matches to considers constructs as related. |
| align_poles | Align positive poles on the right and negative poles on the left. |

check_excel_input	<i>Check if Excel input file contains valid data</i>
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Description

Check if Excel input file contains valid data

Usage

check_excel_input(x)

Arguments

- | | |
|---|-----------------------------|
| x | Data from Excel input file. |
|---|-----------------------------|

check_excel_input_test	<i>Check if Excel input file contains valid data</i>
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Description

Check if Excel input file contains valid data

Usage

check_excel_input_test(x)

Arguments

x	Data from Excel input file.
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create_excel_output	<i>Create output Excel file</i>
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Description

Loads the supplied workbook and adds calculations

Usage

create_excel_output(file, data = list())

Arguments

file	Path to workbook.
data	Named list of data objects to add to Excel file. The following contents are expected: TODO

Value

Path to saved file.

ic	<i>Launch app in browser</i>
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Description

Launch app in browser

Usage

```
ic(display.mode = "auto", launch.browser = TRUE)
```

Arguments

display.mode auto by default, can also be showcase. See [runApp](#).

launch.browser Boolean, set TRUE (default) to open the app in the browser. See [runApp](#).

Examples

```
if (interactive()) {
  ic()
}
```

network_graph_images	<i>Build network graph plots</i>
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Description

Detects maximal cliques and saves images of network graphs into tempfile. Tempfile paths and info on cliques are returned.

Usage

```
network_graph_images(
  x,
  min_clique_size = 3,
  show_edges = TRUE,
  min_matches = 6,
  label_wrap_width = 15,
  label_max_length = -1,
  indicate_direction = show_edges,
  colorize_direction = TRUE,
  colorize_cliques = TRUE,
  colorize_poles = TRUE,
  align_poles = TRUE,
  alpha = 0.1,
```

```

    valence_prefix = FALSE,
    border_default = "#987824",
    fill_default = "#00000008",
    image_border_color = grey(0.6),
    seed = 0
)

```

Arguments

x	A dataframe with a grid.
min_clique_size	Minimal size of cliques to be considered.
show_edges	Whether to show edges in plot.
min_matches	Minimal number of matching scores between constructs to be marked as related.
label_wrap_width	Width of wrapped element label text.
label_max_length	Trim element label at max length characters.
indicate_direction, colorize_direction	Indicate direction of relatedness by edge label +/- and edge color (red, green). Only applied if show_edges = TRUE.
colorize_cliques	Draw cliques in different colors? (default TRUE).
colorize_poles	Colorize positive/negative/neutral poles as red, green, and gray respectively (default TRUE).
align_poles	Align preferred poles on the same side.
alpha	Alpha color value for cliques fillings (default .1).
valence_prefix	Add (+/-) pole prefix to indicate preference. Empty means no preference.
border_default, fill_default	Default border and fill color of polygon encircling clique constructs. Used when colorize_cliques is FALSE. Use NA for no color.
image_border_color	Color of border around generated graph images. If NULL or NA no border is drawn.
seed	Seed number passed to set.seed. Will determine the orientation of the graph.

Description

The **OpenRepGrid.ic** package implements *Interpretive Clustering (IC)* as outlined in Burr, King, and Heckmann (2020). The authors describe a variant of construct clustering which uses a procedure from graph theory called **maximal cliques enumeration**. Given a similarity measure, in our case the number of matching scores between two constructs, a network graph of relatedness between constructs is construed. A clique is a group of constructs which are all mutually related, given some cut-off criterion for relatedness (e.g. 6 matching scores in a grid with 7 elements). While the paper also describes an offline approach to identify the construct cliques, this software automates the process. Under the hood, the package uses the *igraph* package for clique identification.

The package also contains a shiny based UI you can start via the function `ic()`. Visit <http://ic.openrepgrid.org> for an online version. An introduction to the software is also available on [YouTube](#). Below you find an example of how to process a repgrid in an Excel file using code only.

Author(s)

Maintainer: Mark Heckmann <heckmann.mark@gmail.com> ([ORCID](#)) [copyright holder]

Authors:

- Viv Burr
- Nigel King

References

Burr, V. King, N. & Heckmann, M. (2020) The qualitative analysis of repertory grid data: Interpretive Clustering, *Qualitative Research in Psychology*, [doi:10.1080/14780887.2020.1794088](#)

See Also

Useful links:

- <https://github.com/markheckmann/OpenRepGrid.ic>
- Report bugs at <https://github.com/markheckmann/OpenRepGrid.ic/issues>

Examples

```
# The shiny package is just a small UI wrapper around the
# the workhorse core functions. Here is how to call them.

library(tidyverse)
library(openxlsx)
library(igraph)
library(OpenRepGrid.ic)

file <- system.file("extdata", "sylvia.xlsx", package = "OpenRepGrid.ic")
file_out <- str_replace(file, ".xlsx$", " CLIQUES.xlsx") %>% basename

x <- read.xlsx(file)          # read grid
tests <- check_excel_input(x) # check if input format is correct
l <- network_graph_images(x, min_clique_size = 3,
```

```
                show_edges = TRUE,
                min_matches = 6) # produce images
file_tmp <- create_excel_output(file, l) # create Excel file
# file.show(file_tmp) # not run during tests

# open images saved as temp files (as shown in output Excel file)
file.show(l$img_all_constructs)
file.show(l$img_all_constructs_full_labels)
file.show(l$img_all_constructs_separate_poles)

file.show(l$img_cliques_only)
file.show(l$img_cliques_only_full_labels)
file.show(l$img_cliques_only_separate_poles)

# calculation results used in network_graph_images
# some of them are also contained in Excel file
s <- calculate_similarity(x)
s
```

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