Package 'BibPlots'

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Title Plot Functions for Use in Bibliometrics

Version 0.0.8

Description Currently, the package provides several functions for plotting and analyzing bibliometric data (JIF, Journal Impact Factor, and paper percentile values), beamplots with citations and percentiles, and three plot functions to visualize the result of a reference publication year spectroscopy (RPYS) analysis performed in the free software 'CRExplorer' (see <http://crexplorer.net>). Further extension to more plot variants is planned.

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R topics documented:

`beamplot` *Create a beamplot using raw citations from a WoS download*

Description

Create a beamplot using raw citations from a WoS download. Use the format "Other File Format –> Tab-delimited (Win, UTF-8)" and provide the downloaded file name. a simple weighting of citation counts is also available for comparison of older with newer publications.

Usage

```
beamplot(wos_file, do_weight = FALSE, ...)
```

Arguments

`wos_file`	is the file name of the downloaded WoS export in the format Tab-delimited (Win, UTF-8).
`do_weight`	is a boolean to spcify if citation counts should be weighted with their age. The older the publication, the smaller the weight. The weight depends on on the difference between the year until that citations are counted (i.e., the current calendar year in the case of WoS downloads) and the publication year. A weighting factor of 1 is used for a difference of 0, 1/2 for a difference of 1, ..., and 1/11 for differences of ten or more.
`...`	further parameters passed to stripchart.

Details

beamplot(wos_file="WoS_savedrecs.txt", do_weight=boolean) Only the argument wos_file is mandatory. The argument do_weight is optional and FALSE by default.

Literature:

- Haunschild, R., Bornmann, L., & Adams, J. (2019). R package for producing beamplots as a preferred alternative to the h index when assessing single researchers (based on downloads from Web of Science), Scientometrics, DOI 10.1007/s11192-019-03147-3, preprint: https://arxiv.org/abs/1905.09095

Examples

```
## Not run: beamplot("WoS_savedrecs.txt")
```

beamplot_scopus *Create a beamplot using raw citations from a Scopus download*

Description

Create a beamplot using raw citations from a Scopus download. Use the CSV/Excel format and provide the downloaded file name. A simple weighting of citation counts is also available for comparison of older with newer publications.

Usage

```
beamplot_scopus(scopus_file, do_weight = FALSE, ...)
```

Arguments

scopus_file	is the file name of the downloaded Scopus export in the format CSV/Excel.
do_weight	is a boolean to spcify if citation counts should be weighted with their age. The older the publication, the smaller the weight. The weight depends on on the difference between the year until that citations are counted (i.e., the current calendar year in the case of Scopus downloads) and the publication year. A weighting factor of 1 is used for a difference of 0, 1/2 for a difference of 1, ..., and 1/11 for differences of ten or more.
...	further parameters passed to stripchart.

Details

beamplot_scopus(scopus_file="Scopus.csv", do_weight=boolean) Only the argument scopus_file is mandatory. The argument do_weight is optional and FALSE by default.

Literature:

- Haunschild, R., Bornmann, L., & Adams, J. (2019). R package for producing beamplots as a preferred alternative to the h index when assessing single researchers (based on downloads from Web of Science), Scientometrics, DOI 10.1007/s11192-019-03147-3, preprint: https://arxiv.org/abs/1905.09095

Examples

```
## Not run: beamplot_scopus("Scopus.csv")
```

DAMBibPlot *Create a difference against mean plot using journal and paper percentile values*

Description

Provide journal and paper percentile values in a data frame, e.g. df, and the function call DAMBibPlot(df) creates the difference against mean plot. DAMBibPlot takes some optional arguments to modify its behaviour, see arguments and details.

Usage

```
DAMBibPlot(
  df,
  off_set = 0,
  print_stats = TRUE,
  do_plot = TRUE,
  digits = 1,
  ...
)
```

Arguments

df	data frame with journal and paper percentiles
off_set	determines the location of additional plotted information (number of points in each quadrant), values between 0 and 40 might be useful (optional parameter). The default value is 0.
print_stats	boolean variable (optional parameter) which determines if the additional statistical values are printed to the R console (T: yes print, F: no do not print). The default value is T.
do_plot	boolean variable (optional parameter) which determines if the difference against mean plot is actually produced (T: yes plot, F: no do not plot). The default value is T.
digits	integer value to determine the number of desired digits after the decimal point for statistical values (optional parameter). The default value is 1.
...	additional arguments to pass to the plot function

Details

DAMBibPlot(df=data_frame, off_set=numeric_value, print_stats=boolean, do_plot=boolean) Only the argument df is necessary. All other aruments are optional.

Literature:

- Bland, J. M., & Altman, D. G. (1986). Statistical Methods for Assessing Agreement between Two Methods of Clinical Measurement. Lancet, 1(8476), 307-310, https://www.ncbi.nlm.nih.gov/pubmed/2868172

Cleveland, W. S. (1985). The elements of graphing data. Monterey, CA: Wadsworth Advanced Books and Software.

- Bornmann, L., & Haunschild, R. (2017). Plots for visualizing paper impact and journal impact of single researchers in a single graph, DOI: 10.1007/s11192-018-2658-1, preprint: https://arxiv.org/abs/1707.04050

An example data frame is provided as `example_researcher` in the package. It can be used to create a difference against mean plot using default values.

Examples

```
data(example_researcher)

DAMBibPlot(example_researcher)
```

---

example_researcher *Example data set from publication for scatter plot and difference against mean plot*

Description

Contains the data set (`example_researcher`).

---

inv_perc_beamplot *Create a beamplot using inverted percentile values*

Description

Create a beamplot using inverted percentile values.

Usage

```
inv_perc_beamplot(rd, au_name = "Example Researcher", ...)
```

Arguments

`rd`	is a dataframe with two columns: (i) publication year and (ii) inverted percentile value with one row per paper/dataset.
`au_name`	is the name of the researcher this beamplot belongs to.
`...`	further parameters passed to stripchart.

Details

inv_perc_beamplot(rd, au_name='Name of researcher') Only the rd is argument mandatory. It has to be a dataframe with two columns: (i) publication year and (ii) inverted percentile value with one row per paper/dataset.

Literature:

- Haunschild, R., Bornmann, L., & Adams, J. (2019). R package for producing beamplots as a preferred alternative to the h index when assessing single researchers (based on downloads from Web of Science), Scientometrics, DOI 10.1007/s11192-019-03147-3, preprint: https://arxiv.org/abs/1905.09095 - Bornmann, L. & Marx, W. (2014a). Distributions instead of single numbers: percentiles and beam plots for the assessment of single researchers. Journal of the American Society of Information Science and Technology, 65(1), 206–208 - Bornmann, L. & Marx, W. (2014b). How to evaluate individual researchers working in the natural and life sciences meaningfully? A proposal of methods based on percentiles of citations. Scientometrics, 98(1), 487-509. DOI: 10.1007/s11192-013-1161-y. - Bornmann, L., & Haunschild, R. (2018). Plots for visualizing paper impact and journal impact of single researchers in a single graph. Scientometrics, 115(1), 385-394. DOI: 10.1007/s11192-018-2658-1.

Examples

```
## Not run: inv_perc_beamplot(rd, au_name='Name of researcher')
```

---

jpscatter *Create a scatter plot using journal and paper percentile values*

Description

Provide journal and paper percentile values in a data frame, e.g. df, and the function call jpscatter(df) creates the scatter plot. The function jpscatter takes some optional arguments to modify its behaviour, see arguments and details.

Usage

```
jpscatter(df, off_set = 0, print_stats = TRUE, do_plot = TRUE, digits = 1, ...)
```

Arguments

df	data frame with journal and paper percentiles
off_set	determines the location of additional plotted information (number of points in each quadrant), values between 0 and 40 might be useful (optional parameter). The default value is 0.
print_stats	boolean variable (optional parameter) which determines if the additional statistical values are printed to the R console (T: yes print, F: no do not print). The default value is T.

do_plot	boolean variable (optional parameter) which determines if the scatter plot is actually produced (T: yes plot, F: no do not plot). The default value is T.
digits	integer value to determine the number of desired digits after the decimal point for statistical values (optional parameter). The default value is 1.
...	additional arguments to pass to the plot function

Details

jpscatter(df=data_frame, off_set=numeric_value, print_stats=boolean, do_plot=boolean, digits=integer) Only the argument df is necessary. All other aruments are optional.

Literature:

- Bornmann, L., & Haunschild, R. (2017). Plots for visualizing paper impact and journal impact of single researchers in a single graph, DOI: 10.1007/s11192-018-2658-1, preprint: https://arxiv.org/abs/1707.04050

An example data frame is provided as `example_researcher` in the package. It can be used to create a scatter plot using default values.

Examples

```
data(example_researcher)

jpscatter(example_researcher)
```

---

ncr_comp *Create a spectrogram using data from the free software CRExplorer*

Description

Provide the contents of CSV files from the 'CRExplorer' in data frames, e.g. df1 and df2, and the function call ncr_comp(df1, df2, py1, py2) creates a plot with both sets of NCR values. Here, py1 and py2 are the lowest and highest publication year to be used in the plot. The function ncr_comp takes some optional arguments to modify its behaviour, see arguments and details.

Usage

```
ncr_comp(
  df1,
  df2,
  py1,
  py2,
  col_cr = "red",
  smoothing = TRUE,
  par_pch = 20,
  ...
)
```

Arguments

df1	data frame 1 with reference publication year and number of cited references, e. g., as exported from the CRExplorer (File > Export > CSV (Graph)).
df2	data frame 2 with reference publication year and number of cited references, e. g., as exported from the CRExplorer (File > Export > CSV (Graph)).
py1	determines lowest reference publication year which should be shown in the graph.
py2	determines highest reference publication year which should be shown in the graph.
col_cr	character color name value to determine color of the line and points of the number of cited references (optional parameter). The default value is "red".
smoothing	boolean variable (optional parameter) which determines if the lines of the spectrogram are smoothed or not. (T: yes apply smoothing, F: no do not apply smoothing). The default value is T.
par_pch	integer value to set the point type (optional parameter). The default value is 20.
...	additional arguments to pass to the plot, points, and lines functions.

Details

ncr_comp <- function(df1, df2, py1, py2, col_cr = "red", smoothing = TRUE, par_pch = 20, ...) Only the arguments df1, df2, py1, and py2 are necessary. All other aruments are optional. Please use the function `legend` to add a user-defined legend The solid curve represents the data from df1 and the dotted curve represents the data from df2.

Literature:

- Thor, A., Bornmann, L., Marx, W., Haunschild, R., Leydesdorff, L., & Mutz, Ruediger (2017). Website of the free software 'CRExplorer', http://www.crexplorer.net

---

perc_beamplot *Create a beamplot using percentile values*

Description

Create a beamplot using percentile values.

Usage

```
perc_beamplot(rd, au_name = "Example Researcher", ...)
```

Arguments

rd	is a dataframe with two columns: (i) publication year and (ii) percentile value with one row per paper/dataset.
au_name	is the name of the researcher this beamplot belongs to.
...	further parameters passed to stripchart.

Details

perc_beamplot(rd, au_name='Name of researcher') Only the rd is argument mandatory. It has to be a dataframe with two columns: (i) publication year and (ii) percentile value with one row per paper/dataset.

Literature:

- Haunschild, R., Bornmann, L., & Adams, J. (2019). R package for producing beamplots as a preferred alternative to the h index when assessing single researchers (based on downloads from Web of Science), Scientometrics, DOI 10.1007/s11192-019-03147-3, preprint: https://arxiv.org/abs/1905.09095 - Bornmann, L. & Marx, W. (2014a). Distributions instead of single numbers: percentiles and beam plots for the assessment of single researchers. Journal of the American Society of Information Science and Technology, 65(1), 206–208 - Bornmann, L. & Marx, W. (2014b). How to evaluate individual researchers working in the natural and life sciences meaningfully? A proposal of methods based on percentiles of citations. Scientometrics, 98(1), 487-509. DOI: 10.1007/s11192-013-1161-y. - Bornmann, L., & Haunschild, R. (2018). Plots for visualizing paper impact and journal impact of single researchers in a single graph. Scientometrics, 115(1), 385-394. DOI: 10.1007/s11192-018-2658-1.

Examples

```
## Not run: perc_beamplot(rd, au_name='Name of researcher')
```

---

rpys *Create a spectrogram using data from the free software CRExplorer*

Description

Provide the contents of the CSV (Graph) file from the 'CRExplorer' in a data frame, e.g. df, and the function call rpys(df, py1, py2) creates the spectrogram. Here, py1 and py2 are the lowest and highest publication year to be used in the plot. The function rpys takes some optional arguments to modify its behaviour, see arguments and details.

Usage

```
rpys(
  df,
  py1 = min(df$Year),
  py2 = max(df$Year),
  col_cr = "red",
  col_med = "blue",
  smoothing = TRUE,
  par_pch = 20,
  plot_NCR = TRUE,
  plot_Med = TRUE,
  ...
)
```

Arguments

df	data frame with reference publication year, number of cited references, and median deviation as exported from the CRExplorer (File > Export > CSV (Graph)).
py1	determines lowest reference publication year which should be shown in the graph (optional parameter).
py2	determines highest reference publication year which should be shown in the graph (optional parameter).
col_cr	character color name value to determine color of the line and points of the number of cited references (optional parameter). The default value is "red".
col_med	character color name value to determine color of the line and points of the median deviation (optional parameter). The default value is "blue".
smoothing	boolean variable (optional parameter) which determines if the lines of the spectrogram are smoothed or not. (T: yes apply smoothing, F: no do not apply smoothing). The default value is T.
par_pch	integer value to set the point type (optional parameter). The default value is 20.
plot_NCR	boolean variable (optional parameter) which determines the NCR curve should be plotted.
plot_Med	boolean variable (optional parameter) which determines the median deviation curve should be plotted.
...	additional arguments to pass to the plot, points, and lines functions.

Details

rpys(df=data_frame, py1=integer_value, py2=integer_value, smoothing=boolean, col_cr=character_color_name, col_med=character_color_name, par_pch=integer, plot_NCR=boolean, plot_Med=boolean, ...) Only the argument df is necessary. All other aruments are optional.

Literature:

- Thor, A., Bornmann, L., & Haunschild, R. (2021). Website of the free software 'CRExplorer', http://www.crexplorer.net - Thor, A., Bornmann, L., & Haunschild, R. (2018). CitedReferencesExplorer (CRExplorer) manual. Retrieved December 19, 2019, from https://andreas-thor.github.io/cre/manual.pdf

An example data frame is provided as `rpys_example_data` in the package. It can be used to create an example spectrogram.

Examples

```
data(rpys_example_data)

rpys(rpys_example_data, 1935, 2010)
```

rpys_bl *Create a spectrogram with bars and lines using data from the free software CRExplorer*

Description

Provide the contents of the CSV (Graph) file from the 'CRExplorer' in a data frame, e.g. df, and the function call rpys_bl(df) creates a spectrogram. Previously, you should use the function rpys for a plain line graph to determin the proper parameters, e.g., x_offset and x_range. Determination of the proper x_offset and x_range is a bit tricky. Usage of a wrong value of x_range will cause an error. Usage of a wrong value of x_offset will produce a plot. However, the line for the median deviation and the bars might not be at the proper location. First, adjust x_range if necessary, and second, adjust x_offset so that the x axis is properly aligned with the line and bars. Comapare the plot from rpys_bl with your data and the plot from the function rpys. The function rpys_bl takes some optional arguments to modify its behaviour, see arguments and details.

Usage

```
rpys_bl(
  df,
  py1 = min(df$Year),
  py2 = max(df$Year),
  x_range = py2 - py1 + 1,
  col_cr = "grey",
  col_med = "blue",
  col_ol = "red",
  smoothing = TRUE,
  par_mar = c(5, 5, 1, 5),
  x_offset = 0,
  x_min = py1,
  x_max = py2,
  x_step1 = 10,
  x_step2 = 5,
  y1_min = 0,
  y1_max = max(df$NCR),
  y1_step = (max(df$NCR) - min(df$NCR))/5,
  y2_min = min(df$Median.5),
  y2_max = max(df$Median.5),
  y2_step = (max(df$Median.5) - min(df$Median.5))/5,
  lx = median(df$Year),
  ly = median(df$Median.5),
  pl_offset = (max(df$NCR) - min(df$NCR))/50,
  bar_border = "white",
  outliers = 2,
  lpos = 3,
  pl_cex = 0.9,
  TFmin = py1,
```

```
  TFmax = py2,
  plot_NCR = TRUE,
  plot_Med = TRUE,
  ...
)
```

Arguments

df	data frame with reference publication year, number of cited references, and median deviation as exported from the CRExplorer (File > Export > CSV (Graph)).
py1	determines lowest reference publication year which should be shown on the x axis (optional parameter). The default is the minimum RPY.
py2	determines highest reference publication year which should be shown on the x axis (optional parameter). The default is the maximum RPY.
x_range	is the range of the x axis (optional parameter). The default is py2-py1+1.
col_cr	is a character color name value to determine color of the bars of the number of cited references (optional parameter). The default value is "grey".
col_med	is a character color name value to determine color of the line of the median deviation (optional parameter). The default value is "blue".
col_ol	is a character color name value to determine color of the outlier labels (optional parameter). The default value is "red".
smoothing	boolean variable (optional parameter) which determines if the lines of the spectrogram are smoothed or not. (T: yes apply smoothing, F: no do not apply smoothing). The default value is T.
par_mar	integer vector to set the margins (optional parameter). The default value is c(5, 5, 1, 5).
x_offset	determines the x axis offset to adjust the median deviation curve properly (optional parameter). The default is 0.
x_min	determines lowest reference publication year which should be shown on the x axis (optional parameter). The default is the minimum RPY.
x_max	determines highest reference publication year which should be shown on the x axis (optional parameter). The default is the maximum RPY.
x_step1	is the interval of major x tics (optional parameter).
x_step2	is the interval of minor x tics (optional parameter).
y1_min	is the minimum left y axis value (optional parameter).
y1_max	is the maximum left y axis value (optional parameter).
y1_step	is the interval left y axis (optional parameter).
y2_min	is the minimum right y axis value (optional parameter).
y2_max	is the maximum right y axis value (optional parameter).
y2_step	is the interval right y axis (optional parameter).
lx	is the x position of the legend (optional parameter).
ly	is the y position of the legend according to the right y axis (optional parameter).

pl_offset	is the offset of the year label (optional parameter).
bar_border	is the color around the bars (optional parameter).
outliers	is an integer that indicates if outliers should be detected (optional parameter): (0: no outlier detection, 1: outliers are detected and marked, 2: only extreme outliers are detected and marked)
lpos	is an integer that determines the position of the outlier year label around the point (optional parameter). Values of 1, 2, 3, and 4, respectively indicate positions below, to the left of, above, and to the right of the specified coordinates.
pl_cex	is the cex value of the year labels (optional parameter).
TFmin	is the first year that should be used for outlier detection according to Tukey's fences.
TFmax	is the last year that should be used for outlier detection according to Tukey's fences.
plot_NCR	boolean variable (optional parameter) which determines the NCR curve should be plotted.
plot_Med	boolean variable (optional parameter) which determines the median deviation curve should be plotted.
...	additional arguments to pass to the plot function.

Details

rpys_bl(df=data_frame, py1=integer_value, py2=integer_value, x_range=integer_value, smoothing=boolean, col_cr=character_color_name, col_med=character_color_name, col_ol=character_color_name, par_mar=integer_vector, plot_NCR=boolean, plot_Med=boolean, x_offset=integer_value, x_min=integer_value, x_max=integer_value, x_step1=integer_value, x_step2=integer_value, y1_min=integer_value, y1_max=integer_value, y1_step=integer_value, y2_min=integer_value, y2_max=integer_value, y2_step=integer_value, lx=integer_value, ly=integer_value, pl_offset=integer_value, bar_border=string_value, outliers=integer_value, lpos=integer_value, pl_cex=floating_point_value, TFmin=integer_value,TFmax=integer_value, ...) Only the argument df is necessary. All other aruments are optional, but many should be provided to produce nice plots.

Literature:

- Thor, A., Bornmann, L., & Haunschild, R. (2021). Website of the free software 'CRExplorer', http://www.crexplorer.net - Thor, A., Bornmann, L., & Haunschild, R. (2018). CitedReferencesExplorer (CRExplorer) manual. Retrieved December 19, 2019, from https://andreas-thor.github.io/cre/manual.pdf - Tukey, J. W. (1977). Exploratory data analysis. Boston, MA, USA: Addison-Wesley Publishing Company.

An example data frame is provided as `rpys_example_data` in the package. It can be used to create an example spectrogram.

Examples

```
data(rpys_example_data)

rpys_bl(rpys_example_data)

rpys_bl(rpys_example_data, x_min=1930, x_max=2020, x_range=91, x_offset=1, lx=1926, ly=135,
```

```
y1max=300, y1_step=50, y2_min=-150, y2_max=150, y2_step=25, lpos=1)

rpys_bl(rpys_example_data, py1=1930, py2=2020, x_offset=1, lx=1926, ly=135, y1max=300,
y1_step=50, y2_min=-150, y2_max=150, y2_step=25, lpos=1)
```

`rpys_example_data` *Example data set for the rpys function*

Description

Contains the data sets (`rpys_example_data`).

Index