

Package ‘ggpedigree’

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Title Visualizing Pedigrees with 'ggplot2' and 'plotly'

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Description Provides plotting functions for visualizing pedigrees in behavior genetics and kinship research. The package complements 'BGmisc' [Garri-son et al. (2024) <[doi:10.21105/joss.06203](https://doi.org/10.21105/joss.06203)>] by rendering pedigrees using the 'ggplot2' framework and offers a modern alternative to the base-graphics pedigree plot in 'kinship2' [Sin-nwell et al. (2014) <[doi:10.1159/000363105](https://doi.org/10.1159/000363105)>]. Features include support for duplicated individuals, complex mating structures, integration with simulated pedigrees, and layout customization.

License GPL-3

URL <https://github.com/R-Computing-Lab/ggpedigree/>,
<https://r-computing-lab.github.io/ggpedigree/>

BugReports <https://github.com/R-Computing-Lab/ggpedigree/issues>

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ASOIAF	<i>A pedigree of ice and fire</i>
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Description

A structured dataset of fictional characters derived from the Song of Ice and Fire universe by George R. R. Martin. The character relationships were partially based on a GEDCOM file publicly posted in the [Westeros.org forum](https://asoiaf.westeros.org/index.php?/topic/88863-all-the-family-trees/), and were updated based on publicly available summaries from [A Wiki of Ice and Fire](https://awoiaf.westeros.org/index.php/Main_Page). This dataset was created for educational and illustrative purposes, such as demonstrating pedigree construction, relationship tracing, and algorithmic logic in family-based data. It includes no narrative content or protected expression from the original works. No rights to the characters, names, or intellectual property of George R. R. Martin or HBO are claimed, and the dataset is not intended to represent any real individuals or families.

Usage

data(ASOIAF)

Format

A data frame with 679 observations

Details

The variables are as follows:

- id: Person identification variable
- momID: ID of the mother
- dadID: ID of the father
- name: Name of the person
- sex: Biological sex
- twinID: ID of the twin, if applicable
- zygosity: Zygosity of the twin, if applicable. mz is monozygotic; dz is dizygotic

buildPlotConfig	<i>build Config</i>
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Description

This function builds a configuration list for ggPedigree plots. It merges a default configuration with user-specified settings, ensuring all necessary parameters are set.

Usage

```
buildPlotConfig(default_config, config, function_name = "ggPedigree")
```

Arguments

`default_config` A list of default configuration parameters.

`config` A list of user-specified configuration parameters.

`function_name` The name of the function for which the configuration is being built.

Value

A complete configuration list with all necessary parameters.

calculateConnections *Calculate connections for a pedigree dataset*

Description

Computes graphical connection paths for a pedigree layout, including parent-child, sibling, and spousal connections. Optionally processes duplicate appearances of individuals (marked as ‘extra’) to ensure relational accuracy.

Usage

```
calculateConnections(
  ped,
  config = list(),
  spouseID = "spouseID",
  personID = "personID",
  momID = "momID",
  famID = "famID",
  twinID = "twinID",
  dadID = "dadID"
)
```

Arguments

ped	A data frame containing the pedigree data. Needs personID, momID, and dadID columns
config	List of configuration parameters. Currently unused but passed through to internal helpers.
spouseID	Character string specifying the column name for spouse IDs. Defaults to "spouseID".
personID	Character string specifying the column name for individual IDs. Defaults to "personID".
momID	Character string specifying the column name for mother IDs. Defaults to "momID".
famID	Character string specifying the column name for family IDs. Defaults to "famID".
twinID	Character string specifying the column name for twin IDs. Defaults to "twinID".
dadID	Character string specifying the column name for father IDs. Defaults to "dadID".

Value

A ‘data.frame’ containing connection points and midpoints for graphical rendering. Includes:

- ‘x_pos’, ‘y_pos’: positions of focal individual
- ‘x_dad’, ‘y_dad’, ‘x_mom’, ‘y_mom’: parental positions (if available)

- 'x_spouse', 'y_spouse': spousal positions (if available)
- 'x_midparent', 'y_midparent': midpoint between parents
- 'x_mid_sib', 'y_mid_sib': sibling group midpoint
- 'x_mid_spouse', 'y_mid_spouse': midpoint between spouses

calculateCoordinates *Calculate coordinates for plotting individuals in a pedigree*

Description

Extracts and modifies the x and y positions for each individual in a pedigree data frame using the align.pedigree function from the 'kinship2' package. It returns a data.frame with positions for plotting.

Usage

```
calculateCoordinates(
  ped,
  personID = "personID",
  momID = "momID",
  dadID = "dadID",
  spouseID = "spouseID",
  sexVar = "sex",
  twinID = "twinID",
  code_male = NULL,
  config = list()
)
```

Arguments

ped	A data frame containing the pedigree data. Needs personID, momID, and dadID columns
personID	Character string specifying the column name for individual IDs. Defaults to "personID".
momID	Character string specifying the column name for mother IDs. Defaults to "momID".
dadID	Character string specifying the column name for father IDs. Defaults to "dadID".
spouseID	Character. Name of the column in 'ped' for the spouse ID variable.
sexVar	Character. Name of the column in 'ped' for the sex variable.
twinID	Character string specifying the column name for twin IDs. Defaults to "twinID".
code_male	Value used to indicate male sex. Defaults to NULL.
config	List of configuration options:

code_male Default is 1. Used by BGmisc::recodeSex().
ped_packed Logical, default TRUE. Passed to 'kinship2_align.pedigree'.
ped_align Logical, default TRUE. Align generations.
ped_width Numeric, default 15. Controls spacing.

Value

A data frame with one or more rows per person, each containing:

- 'x_order', 'y_order': Grid indices representing layout rows and columns.
- 'x_pos', 'y_pos': Continuous coordinate positions used for plotting.
- 'nid': Internal numeric identifier for layout mapping.
- 'extra': Logical flag indicating whether this row is a secondary appearance.

computeDistance	<i>Compute distance between two points</i>
-----------------	--

Description

This function calculates the distance between two points in a 2D space using Minkowski distance. It can be used to compute Euclidean or Manhattan distance. It is a utility function for calculating distances in pedigree layouts. Defaults to Euclidean distance if no method is specified.

Usage

```
computeDistance(method = "euclidean", x1, y1, x2, y2, p = NULL)
```

Arguments

method	Character. Method of distance calculation. Options are "euclidean", "cityblock", and "Minkowski".
x1	Numeric. X-coordinate of the first point.
y1	Numeric. Y-coordinate of the first point.
x2	Numeric. X-coordinate of the second point.
y2	Numeric. Y-coordinate of the second point.
p	Numeric. The order of the Minkowski distance. If NULL, defaults to 2 for Euclidean and 1 for Manhattan. If Minkowski method is used, p should be specified.

countOffspring	<i>Count offspring of each individual</i>
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Description

Count offspring of each individual

Usage

```
countOffspring(ped, personID = "ID", momID = "momID", dadID = "dadID")
```

Arguments

ped	A data frame containing the pedigree information
personID	character. Name of the column in ped for the person ID variable
momID	character. Name of the column in ped for the mother ID variable
dadID	character. Name of the column in ped for the father ID variable

Value

A data frame with an additional column, offspring, that contains the number of offspring for each individual

Examples

```
library(BGmisc)
data("potter")
countOffspring(potter,
  personID = "personID",
  momID = "momID", dadID = "dadID"
)
```

countSiblings	<i>Count siblings of each individual</i>
---------------	--

Description

Count siblings of each individual

Usage

```
countSiblings(ped, personID = "ID", momID = "momID", dadID = "dadID")
```

Arguments

ped	A data frame containing the pedigree information
personID	character. Name of the column in ped for the person ID variable
momID	character. Name of the column in ped for the mother ID variable
dadID	character. Name of the column in ped for the father ID variable

Value

A data frame with an additional column, siblings, that contains the number of siblings for each individual

Examples

```
library(BGmisc)
data("potter")
countSiblings(potter, personID = "personID")
```

generateSpouseList	<i>Generate a spouseslist matrix</i>
--------------------	--------------------------------------

Description

Generate a spouseslist matrix

Usage

```
generateSpouseList(
  ped,
  personID = "personID",
  momID = "momID",
  dadID = "dadID",
  spouseID = "spouseID"
)
```

Arguments

ped	A data frame containing the pedigree information
personID	Character. Name of the column in ped for the person ID variable
momID	Character. Name of the column in ped for the mother ID variable
dadID	Character. Name of the column in ped for the father ID variable
spouseID	Character. Name of the column in ped for the spouse ID variable

Value

A spouseslist matrix

Examples

```
library(BGmisc)
data("potter")
generateSpouseList(potter,
  personID = "personID",
  momID = "momID", dadID = "dadID", spouseID = "spouseID"
)
```

getDefaultPlotConfig *Shared Default Plotting Configuration*

Description

Centralized configuration list used by all gg-based plotting functions. Returns a named list of default settings used by all gg-based plotting functions. This configuration can be overridden by supplying a list of key-value pairs to plotting functions such as 'ggPedigree()', 'ggRelatednessMatrix()', and 'ggPhenotypeByDegree()'. Each key corresponds to a configurable plot, layout, or aesthetic behavior.

Usage

```
getDefaultPlotConfig(
  function_name = "getDefaultPlotConfig",
  personID = "personID",
  status_column = NULL,
  alpha_default = 1,
  apply_default_scales = TRUE,
  apply_default_theme = TRUE,
  segment_default_color = "black",
  color_palette_default = c("#440154FF", "#FDE725FF", "#21908CFF"),
  color_palette_low = "#000004FF",
  color_palette_mid = "#56106EFF",
  color_palette_high = "#FCFDBFFF",
  color_scale_midpoint = 0.5,
  color_scale_theme = "ggthemes::calc",
  alpha = alpha_default,
  plot_title = NULL,
  plot_subtitle = NULL,
  value_rounding_digits = 5,
  code_male = 1,
  code_na = NA,
  code_female = 0,
  label_include = TRUE,
  label_column = "personID",
  label_method = "geom_text",
  label_max_overlaps = 25,
  label_nudge_x = 0,
```

```

label_nudge_y = 0.15,
label_nudge_y_flip = TRUE,
label_segment_color = NA,
label_text_angle = 0,
label_text_size = 3,
label_text_color = "black",
label_text_family = "sans",
point_size = 4,
outline_include = FALSE,
outline_multiplier = 1.25,
outline_additional_size = 0,
outline_alpha = 1,
outline_color = "black",
tooltip_include = TRUE,
tooltip_columns = c("ID1", "ID2", "value"),
axis_x_label = NULL,
axis_y_label = NULL,
axis_text_angle_x = 90,
axis_text_angle_y = 0,
axis_text_size = 9,
axis_text_color = "black",
axis_text_family = "sans",
generation_height = 1,
generation_width = 1,
ped_packed = TRUE,
ped_align = TRUE,
ped_width = 15,
segment_linewidth = 0.5,
segment_linetype = 1,
segment_lineend = "round",
segment_linejoin = "round",
segment_offspring_color = segment_default_color,
segment_parent_color = segment_default_color,
segment_self_color = segment_default_color,
segment_sibling_color = segment_default_color,
segment_spouse_color = segment_default_color,
segment_mz_color = segment_default_color,
segment_mz_linetype = segment_linetype,
segment_mz_alpha = 1,
segment_mz_t = 0.6,
segment_self_linetype = "dotdash",
segment_self_linewidth = 0.5 * segment_linewidth,
segment_self_alpha = 0.5,
segment_self_angle = 90,
segment_self_curvature = -0.2,
sex_color_include = TRUE,
sex_legend_title = "Sex",
sex_shape_labels = c("Female", "Male", "Unknown"),

```

```
sex_color_palette = color_palette_default,
sex_shape_female = 16,
sex_shape_male = 15,
sex_shape_unknown = 18,
sex_shape_include = TRUE,
sex_legend_show = TRUE,
status_include = TRUE,
status_code_affected = 1,
status_code_unaffected = 0,
status_label_affected = "Affected",
status_label_unaffected = "Unaffected",
status_alpha_affected = 1,
status_alpha_unaffected = 0,
status_color_palette = c(color_palette_default[1], color_palette_default[2]),
status_color_affected = "black",
status_color_unaffected = color_palette_default[2],
status_shape_affected = 4,
status_legend_title = "Affected",
status_legend_show = FALSE,
overlay_shape = 4,
overlay_code_affected = 1,
overlay_code_unaffected = 0,
overlay_label_affected = "Affected",
overlay_label_unaffected = "Unaffected",
overlay_alpha_affected = 1,
overlay_alpha_unaffected = 0,
overlay_color = "black",
overlay_include = FALSE,
overlay_legend_title = "Overlay",
overlay_legend_show = FALSE,
focal_fill_include = FALSE,
focal_fill_legend_show = TRUE,
focal_fill_personID = 1,
focal_fill_legend_title = "Focal Fill",
focal_fill_high_color = "#FDE725FF",
focal_fill_mid_color = "#9F2A63FF",
focal_fill_low_color = "#0D082AFF",
focal_fill_scale_midpoint = color_scale_midpoint,
focal_fill_method = "gradient",
focal_fill_component = "additive",
focal_fill_n_breaks = NULL,
focal_fill_na_value = "black",
focal_fill_shape = 21,
focal_fill_force_zero = FALSE,
focal_fill_use_log = FALSE,
focal_fill_hue_range = c(0, 360),
focal_fill_chroma = 50,
focal_fill_lightness = 50,
```

```

    focal_fill_hue_direction = "horizontal",
    focal_fill_viridis_option = "D",
    focal_fill_viridis_begin = 0,
    focal_fill_viridis_end = 1,
    focal_fill_viridis_direction = 1,
    focal_fill_color_values = c("#052f60", "#e69f00", "#56b4e9", "#009e73", "#f0e442",
      "#0072b2", "#d55e00", "#cc79a7"),
    focal_fill_labels = c("Low", "Mid", "High"),
    filter_n_pairs = 500,
    filter_degree_min = 0,
    filter_degree_max = 7,
    drop_classic_kin = FALSE,
    drop_non_classic_sibs = TRUE,
    use_only_classic_kin = TRUE,
    use_relative_degree = TRUE,
    group_by_kin = TRUE,
    match_threshold_percent = 10,
    max_degree_levels = 12,
    grouping_column = "mtdna_factor",
    annotate_include = TRUE,
    annotate_x_shift = -0.1,
    annotate_y_shift = 0.005,
    ci_include = TRUE,
    ci_ribbon_alpha = 0.3,
    tile_color_palette = c("white", "gold", "red"),
    tile_interpolate = TRUE,
    tile_color_border = NA,
    tile_cluster = TRUE,
    tile_geom = "geom_tile",
    tile_na_rm = FALSE,
    tile_linejoin = "mitre",
    matrix_diagonal_include = TRUE,
    matrix_upper_triangle_include = FALSE,
    matrix_lower_triangle_include = TRUE,
    matrix_sparse = FALSE,
    matrix_isChild_method = "partialparent",
    return_static = TRUE,
    return_widget = FALSE,
    return_interactive = FALSE,
    return_midparent = FALSE,
    hints = NULL,
    relation = NULL,
    debug = FALSE,
    override_many2many = FALSE,
    optimize_plotly = TRUE,
    ...
  )

```

Arguments

function_name	The name of the function calling this configuration.
personID	The column name for person identifiers in the data.
status_column	The column name for affected status in the data.
alpha_default	Default alpha transparency level.
apply_default_scales	Whether to apply default color scales.
apply_default_theme	Whether to apply default ggplot2 theme.
segment_default_color	A character string for the default color of segments in the plot.
color_palette_default	A character vector of default colors for the plot.
color_palette_low	Color for the low end of a gradient.
color_palette_mid	Color for the midpoint of a gradient.
color_palette_high	Color for the high end of a gradient.
color_scale_midpoint	Midpoint value for continuous color scales.
color_scale_theme	Name of the color scale used (e.g., "ggthemes::calc").
alpha	Default alpha transparency for plot elements.
plot_title	Main title of the plot.
plot_subtitle	Subtitle of the plot.
value_rounding_digits	Number of digits to round displayed values.
code_male	Integer/string code for males in data.
code_na	optional Integer/string code for missing values in data.
code_female	optional Integer/string code for females in data.
label_include	Whether to display labels on plot points.
label_column	Column to use for text labels.
label_method	Method used for labeling (e.g., ggrepel, geom_text).
label_max_overlaps	Maximum number of overlapping labels.
label_nudge_x	Horizontal nudge for label text.
label_nudge_y	Vertical nudge for label text.
label_nudge_y_flip	TRUE. Whether to flip the nudge y value to be negative. The plot is reversed vertically, so this is needed to nudge labels up instead of down.

label_segment_color Segment color for label connectors.

label_text_angle Text angle for labels.

label_text_size Font size for labels.

label_text_color Color of the label text.

label_text_family Font family for label text.

point_size Size of points drawn in plot.

outline_include Whether to include outlines around points.

outline_multiplier Multiplier to compute outline size from point size.

outline_additional_size Additional size added to outlines.

outline_alpha Alpha transparency for point outlines.

outline_color Color used for point outlines.

tooltip_include Whether tooltips are shown in interactive plots.

tooltip_columns Columns to include in tooltips.

axis_x_label Label for the X-axis.

axis_y_label Label for the Y-axis.

axis_text_angle_x Angle of X-axis text.

axis_text_angle_y Angle of Y-axis text.

axis_text_size Font size of axis text.

axis_text_color Color of axis text.

axis_text_family Font family for axis text.

generation_height Vertical spacing of generations.

generation_width Horizontal spacing of generations.

ped_packed Whether the pedigree should use packed layout.

ped_align Whether to align pedigree generations.

ped_width Plot width of the pedigree block.

segment_linewidth Line width for segments.

`segment_linetype` Line type for segments.

`segment_lineend` Line end type for segments.

`segment_linejoin` Line join type for segments.

`segment_offspring_color` Color for offspring segments.

`segment_parent_color` Color for parent segments.

`segment_self_color` Color for self-loop segments.

`segment_sibling_color` Color for sibling segments.

`segment_spouse_color` Color for spouse segments.

`segment_mz_color` Color for monozygotic twin segments.

`segment_mz_linetype` Line type for MZ segments.

`segment_mz_alpha` Alpha for MZ segments.

`segment_mz_t` Tuning parameter for MZ segment layout.

`segment_self_linetype` Line type for self-loop segments.

`segment_self_linewidth` Width of self-loop segment lines.

`segment_self_alpha` Alpha value for self-loop segments.

`segment_self_angle` Angle of self-loop segment.

`segment_self_curvature` Curvature of self-loop segment.

`sex_color_include` Whether to color nodes by sex.

`sex_legend_title` Title of the sex legend.

`sex_shape_labels` Labels used in sex legend.

`sex_color_palette` A character vector of colors for sex.

`sex_shape_female` Shape for female nodes.

`sex_shape_male` Shape for male nodes.

`sex_shape_unknown` Shape for unknown sex nodes.

`sex_shape_include` Whether to display the shape for sex variables

`sex_legend_show` Whether to display sex in the legend

`status_include` Whether to display affected status.

`status_code_affected` Value that encodes affected status.

`status_code_unaffected` Value that encodes unaffected status.

`status_label_affected` Label for affected status.

`status_label_unaffected` Label for unaffected status.

`status_alpha_affected` Alpha for affected individuals.

`status_alpha_unaffected` Alpha for unaffected individuals. Default is 0 (transparent).

`status_color_palette` A character vector of colors for affected status.

`status_color_affected` Color for affected individuals.

`status_color_unaffected` Color for unaffected individuals.

`status_shape_affected` Shape for affected individuals.

`status_legend_title` Title of the status legend.

`status_legend_show` Whether to show the status legend.

`overlay_shape` Shape used for overlaying points in the plot. Default is 4 (cross).

`overlay_code_affected` Code for affected individuals in overlay. Default is 1.

`overlay_code_unaffected` Code for unaffected individuals in overlay. Default is 0.

`overlay_label_affected` Label for affected individuals in overlay. Default is "Affected".

`overlay_label_unaffected` Label for unaffected individuals in overlay. Default is "Unaffected".

`overlay_alpha_affected` Alpha for affected individuals in overlay. Default is 1.

`overlay_alpha_unaffected` Alpha for unaffected individuals in overlay. Default is 0.

`overlay_color` Color for overlay points. Default is "black".

overlay_include
Whether to include overlay points in the plot. Default is FALSE.

overlay_legend_title
Title of the overlay legend. Default is "Overlay".

overlay_legend_show
Whether to show the overlay legend. Default is FALSE.

focal_fill_include
Whether to fill focal individuals.

focal_fill_legend_show
Whether to show legend for focal fill.

focal_fill_personID
ID of focal individual.

focal_fill_legend_title
Title of focal fill legend.

focal_fill_high_color
High-end color for focal gradient.

focal_fill_mid_color
Midpoint color for focal gradient.

focal_fill_low_color
Low-end color for focal gradient.

focal_fill_scale_midpoint
Midpoint for focal fill scale.

focal_fill_method
Method used for focal fill gradient. Options are 'steps', 'steps2', 'step', 'step2', 'viridis_c', 'viridis_d', 'viridis_b', 'manual', 'hue', 'gradient2', 'gradient'.

focal_fill_component
Component type for focal fill.

focal_fill_n_breaks
Number of breaks in focal fill scale.

focal_fill_na_value
Color for NA values in focal fill.

focal_fill_shape
Shape used for focal fill points.

focal_fill_force_zero
Whether to force zero to NA in focal fill.

focal_fill_use_log
Whether to use log scale for focal fill.

focal_fill_hue_range
Hue range for focal fill colors.

focal_fill_chroma
Chroma value for focal fill colors.

focal_fill_lightness
Lightness value for focal fill colors.

focal_fill_hue_direction
Direction of focal fill gradient.

`focal_fill_viridis_option`
 Option for viridis color scale.

`focal_fill_viridis_begin`
 Start of viridis color scale.

`focal_fill_viridis_end`
 End of viridis color scale.

`focal_fill_viridis_direction`
 Direction of viridis color scale (1 for left to right, -1 for right to left).

`focal_fill_color_values`
 A character vector of colors for focal fill.

`focal_fill_labels`
 Labels for focal fill colors.

`filter_n_pairs` Threshold to filter maximum number of pairs.

`filter_degree_min`
 Minimum degree value used in filtering.

`filter_degree_max`
 Maximum degree value used in filtering.

`drop_classic_kin`
 Whether to exclude classic kin categories.

`drop_non_classic_sibs`
 Whether to exclude non-classic sibs.

`use_only_classic_kin`
 Whether to restrict analysis to classic kinship.

`use_relative_degree`
 Whether to use relative degrees instead of absolute.

`group_by_kin` Whether to group output by kinship group.

`match_threshold_percent`
 Kinbin matching threshold as a percentage.

`max_degree_levels`
 Maximum number of degree levels to show.

`grouping_column`
 Name of column used for grouping.

`annotate_include`
 Whether to include annotations.

`annotate_x_shift`
 Horizontal shift applied to annotation text.

`annotate_y_shift`
 Vertical shift applied to annotation text.

`ci_include` Whether to show confidence intervals.

`ci_ribbon_alpha`
 Alpha level for CI ribbons.

`tile_color_palette`
 Color palette for matrix plots.

`tile_interpolate`
 Whether to interpolate colors in matrix tiles.

tile_color_border	Color border for matrix tiles.
tile_cluster	Whether to sort by clusters the matrix.
tile_geom	Geometry type for matrix tiles (e.g., "geom_tile", "geom_raster").
tile_na_rm	Whether to remove NA values in matrix tiles.
tile_linejoin	Line join type for matrix tiles.
matrix_diagonal_include	Whether to include diagonal in matrix plots.
matrix_upper_triangle_include	Whether to include upper triangle in matrix plots.
matrix_lower_triangle_include	Whether to include lower triangle in matrix plots.
matrix_sparse	Whether matrix input is sparse.
matrix_isChild_method	Method used for isChild matrix derivation.
return_static	Whether to return a static plot.
return_widget	Whether to return a widget object.
return_interactive	Whether to return an interactive plot.
return_midparent	Whether to return midparent values in the plot.
hints	Optional hints to pass along to kinship2::autohint
relation	Optional relation to pass along to kinship2::pedigree
debug	Whether to enable debugging mode.
override_many2many	Whether to override many-to-many link logic.
optimize_plotly	Whether to optimize the plotly output for speed.
...	Additional arguments for future extensibility.

Value

A named list of default plotting and layout parameters.

ggPedigree

Plot a custom pedigree diagram

Description

Generates a ggplot2-based diagram of a pedigree using custom coordinate layout, calculated relationship connections, and flexible styling via 'config'. It processes the data using 'ped2fam()'. This function supports multiple families and optionally displays affected status and sex-based color/shape.

Usage

```
ggPedigree(  
  ped,  
  famID = "famID",  
  personID = "personID",  
  momID = "momID",  
  dadID = "dadID",  
  spouseID = "spouseID",  
  matID = "matID",  
  patID = "patID",  
  twinID = "twinID",  
  status_column = NULL,  
  focal_fill_column = NULL,  
  tooltip_columns = NULL,  
  overlay_column = NULL,  
  return_widget = FALSE,  
  config = list(),  
  debug = FALSE,  
  hints = NULL,  
  interactive = FALSE,  
  phantoms = FALSE,  
  ...  
)  
  
ggpedigree(  
  ped,  
  famID = "famID",  
  personID = "personID",  
  momID = "momID",  
  dadID = "dadID",  
  spouseID = "spouseID",  
  matID = "matID",  
  patID = "patID",  
  twinID = "twinID",  
  status_column = NULL,  
  focal_fill_column = NULL,  
  tooltip_columns = NULL,  
  overlay_column = NULL,  
  return_widget = FALSE,  
  config = list(),  
  debug = FALSE,  
  hints = NULL,  
  interactive = FALSE,  
  phantoms = FALSE,  
  ...  
)
```

Arguments

ped	A data frame containing the pedigree data. Needs personID, momID, and dadID columns
famID	Character string specifying the column name for family IDs. Defaults to "famID".
personID	Character string specifying the column name for individual IDs. Defaults to "personID".
momID	Character string specifying the column name for mother IDs. Defaults to "momID".
dadID	Character string specifying the column name for father IDs. Defaults to "dadID".
spouseID	Character string specifying the column name for spouse IDs. Defaults to "spouseID".
matID	Character string specifying the column name for maternal lines Defaults to "matID".
patID	Character string specifying the column name for paternal lines Defaults to "patID".
twinID	Character string specifying the column name for twin IDs. Defaults to "twinID".
status_column	Character string specifying the column name for affected status. Defaults to NULL.
focal_fill_column	Character string specifying the column name for focal fill color.
tooltip_columns	Character vector of column names to show when hovering. Defaults to c("personID", "sex"). Additional columns present in 'ped' can be supplied – they will be added to the Plotly tooltip text. Defaults to NULL, which uses the default tooltip columns.
overlay_column	Character string specifying the column name for overlay alpha values.
return_widget	Logical; if TRUE (default) returns a plotly htmlwidget. If FALSE, returns the underlying plotly object (useful for further customization before printing).
config	A list of configuration options for customizing the plot. See getDefaultPlotConfig for details. The list can include: code_male Integer or string. Value identifying males in the sex column. (typically 0 or 1) Default: 1. segment_spouse_color, segment_self_color Character. Line colors for respective connection types. segment_sibling_color, segment_parent_color, segment_offspring_color Character. Line colors for respective connection types. label_text_size, point_size, segment_linewidth Numeric. Controls text size, point size, and line thickness. generation_height Numeric. Vertical spacing multiplier between generations. Default: 1. shape_unknown, shape_female, shape_male, status_shape_affected Integers. Shape codes for plotting each group.

	sex_shape_labels Character vector of labels for the sex variable. (default: c("Female", "Male", "Unknown"))
	unaffected, affected Values indicating unaffected/affected status.
	sex_color_include Logical. If TRUE, uses color to differentiate sex.
	label_max_overlaps Maximum number of overlaps allowed in repelled labels.
	label_segment_color Color used for label connector lines.
debug	Logical. If TRUE, prints debugging information. Default: FALSE.
hints	Data frame with hints for layout adjustments. Default: NULL.
interactive	Logical. If TRUE, generates an interactive plot using 'plotly'. Default: FALSE.
phantoms	Logical. If TRUE, adds phantom parents for individuals without parents.
...	Additional arguments passed to 'ggplot2' functions.

Value

A 'ggplot' object rendering the pedigree diagram.

Examples

```
library(BGmisc)
data("potter")
ggPedigree(potter, famID = "famID", personID = "personID")

data("hazard")
ggPedigree(hazard, famID = "famID", personID = "ID", config = list(code_male = 0))
```

ggPedigreeInteractive *Interactive pedigree plot (Plotly wrapper around ggPedigree)*

Description

Generates an interactive HTML widget built on top of the static ggPedigree output. All layout, styling, and connection logic are inherited from ggPedigree(); this function simply augments the plot with Plotly hover, zoom, and pan functionality.

Usage

```
ggPedigreeInteractive(
  ped,
  famID = "famID",
  personID = "personID",
  momID = "momID",
  dadID = "dadID",
  patID = "patID",
  matID = "matID",
  twinID = "twinID",
```

```

    status_column = NULL,
    tooltip_columns = NULL,
    focal_fill_column = NULL,
    overlay_column = NULL,
    config = list(optimize_plotly = TRUE),
    debug = FALSE,
    return_widget = TRUE,
    phantoms = FALSE,
    ...
)

```

```

ggpedigreeInteractive(
  ped,
  famID = "famID",
  personID = "personID",
  momID = "momID",
  dadID = "dadID",
  patID = "patID",
  matID = "matID",
  twinID = "twinID",
  status_column = NULL,
  tooltip_columns = NULL,
  focal_fill_column = NULL,
  overlay_column = NULL,
  config = list(optimize_plotly = TRUE),
  debug = FALSE,
  return_widget = TRUE,
  phantoms = FALSE,
  ...
)

```

```

ggpedigreeinteractive(
  ped,
  famID = "famID",
  personID = "personID",
  momID = "momID",
  dadID = "dadID",
  patID = "patID",
  matID = "matID",
  twinID = "twinID",
  status_column = NULL,
  tooltip_columns = NULL,
  focal_fill_column = NULL,
  overlay_column = NULL,
  config = list(optimize_plotly = TRUE),
  debug = FALSE,
  return_widget = TRUE,
  phantoms = FALSE,
)

```

```
    ...  
  )
```

Arguments

<code>ped</code>	A data frame containing the pedigree data. Needs <code>personID</code> , <code>momID</code> , and <code>dadID</code> columns
<code>famID</code>	Character string specifying the column name for family IDs. Defaults to "famID".
<code>personID</code>	Character string specifying the column name for individual IDs. Defaults to "personID".
<code>momID</code>	Character string specifying the column name for mother IDs. Defaults to "momID".
<code>dadID</code>	Character string specifying the column name for father IDs. Defaults to "dadID".
<code>patID</code>	Character string specifying the column name for paternal lines Defaults to "patID".
<code>matID</code>	Character string specifying the column name for maternal lines Defaults to "matID".
<code>twinID</code>	Character string specifying the column name for twin IDs. Defaults to "twinID".
<code>status_column</code>	Character string specifying the column name for affected status. Defaults to NULL.
<code>tooltip_columns</code>	Character vector of column names to show when hovering. Defaults to <code>c("personID", "sex")</code> . Additional columns present in 'ped' can be supplied – they will be added to the Plotly tooltip text. Defaults to NULL, which uses the default tooltip columns.
<code>focal_fill_column</code>	Character string specifying the column name for focal fill color.
<code>overlay_column</code>	Character string specifying the column name for overlay alpha values.
<code>config</code>	A list of configuration options for customizing the plot. See <code>getDefaultPlotConfig</code> for details. The list can include: <code>code_male</code> Integer or string. Value identifying males in the sex column. (typically 0 or 1) Default: 1. <code>segment_spouse_color</code>, <code>segment_self_color</code> Character. Line colors for respective connection types. <code>segment_sibling_color</code>, <code>segment_parent_color</code>, <code>segment_offspring_color</code> Character. Line colors for respective connection types. <code>label_text_size</code>, <code>point_size</code>, <code>segment_linewidth</code> Numeric. Controls text size, point size, and line thickness. <code>generation_height</code> Numeric. Vertical spacing multiplier between generations. Default: 1. <code>shape_unknown</code>, <code>shape_female</code>, <code>shape_male</code>, <code>status_shape_affected</code> Integers. Shape codes for plotting each group. <code>sex_shape_labels</code> Character vector of labels for the sex variable. (default: <code>c("Female", "Male", "Unknown")</code>)

	unaffected, affected Values indicating unaffected/affected status.
	sex_color_include Logical. If TRUE, uses color to differentiate sex.
	label_max_overlaps Maximum number of overlaps allowed in repelled labels.
	label_segment_color Color used for label connector lines.
debug	Logical. If TRUE, prints debugging information. Default: FALSE.
return_widget	Logical; if TRUE (default) returns a plotly htmlwidget. If FALSE, returns the underlying plotly object (useful for further customization before printing).
phantoms	Logical. If TRUE, adds phantom parents for individuals without parents.
...	Additional arguments passed to 'ggplot2' functions.

Value

A plotly htmlwidget (or plotly object if 'return_widget = FALSE')

Examples

```
library(BGmisc)
data("potter")
ggPedigreeInteractive(potter, famID = "famID", personID = "personID")
```

ggPhenotypeByDegree *Plot correlation of genetic relatedness by phenotype*

Description

This function plots the phenotypic correlation as a function of genetic relatedness.

Usage

```
ggPhenotypeByDegree(
  df,
  y_var,
  y_se = NULL,
  y_stem_se = NULL,
  y_ci_lb = NULL,
  y_ci_ub = NULL,
  config = list(),
  data_prep = TRUE,
  ...
)
```

Arguments

<code>df</code>	Data frame containing pairwise summary statistics. Required columns: addRel_min Minimum relatedness per group addRel_max Maximum relatedness per group n_pairs Number of pairs at that relatedness cnu Indicator for shared nuclear environment (1 = yes, 0 = no) mtdna Indicator for shared mitochondrial DNA (1 = yes, 0 = no)
<code>y_var</code>	Name of the y-axis variable column (e.g., "r_pheno_rho").
<code>y_se</code>	Name of the standard error column (e.g., "r_pheno_se").
<code>y_stem_se</code>	Optional; base stem used to construct SE ribbon bounds. (e.g., "r_pheno")
<code>y_ci_lb</code>	Optional; lower bound for confidence interval (e.g., "r_pheno_ci_lb").
<code>y_ci_ub</code>	Optional; upper bound for confidence interval (e.g., "r_pheno_ci_ub").
<code>config</code>	A list of configuration overrides. Valid entries include: filter_n_pairs Minimum number of pairs to include (default: 500) filter_degree_min Minimum degree of relatedness (default: 0) filter_degree_max Maximum degree of relatedness (default: 7) plot_title Plot title plot_subtitle Plot subtitle color_scale Palettee color scale name (e.g., "ggthemes::calc") use_only_classic_kin If TRUE, only classic kin are shown group_by_kin If TRUE, use classic kin × mtDNA for grouping drop_classic_kin If TRUE, remove classic kin rows drop_non_classic_sibs If TRUE, remove non-classic sibs (default: TRUE) annotate_include If TRUE, annotate mother/father/sibling points annotate_x_shift Relative x-axis shift for annotations annotate_y_shift Relative y-axis shift for annotations point_size Size of geom_point points (default: 1) use_relative_degree If TRUE, x-axis uses degree-of-relatedness scaling grouping_column Grouping column name (default: mtdna_factor) value_rounding_digits Number of decimal places for rounding (default: 2) match_threshold_percent Tolerance % for matching known degrees max_degree_levels Maximum number of degrees to consider
<code>data_prep</code>	Logical; if TRUE, performs data preparation steps.
<code>...</code>	Additional arguments passed to 'ggplot2' functions.

Value

A ggplot object containing the correlation plot.

ggRelatednessMatrix *Plot a relatedness matrix as a heatmap (ggpedigree style)*

Description

Plots a relatedness matrix using ggplot2 with config options.

Usage

```
ggRelatednessMatrix(
  mat,
  config = list(),
  interactive = FALSE,
  tooltip_columns = NULL,
  personID = "personID",
  ...
)

ggrelatednessmatrix(
  mat,
  config = list(),
  interactive = FALSE,
  tooltip_columns = NULL,
  personID = "personID",
  ...
)
```

Arguments

<code>mat</code>	A square numeric matrix of relatedness values (precomputed, e.g., from <code>ped2add</code>).
<code>config</code>	A list of graphical and display parameters. See Details for available options.
<code>interactive</code>	Logical; if TRUE, returns an interactive plotly object.
<code>tooltip_columns</code>	A character vector of column names to include in tooltips.
<code>personID</code>	Character; name of the column containing unique person identifiers.
<code>...</code>	Additional arguments passed to ggplot2 layers.

Details

Config options include:

matrix_color_palette A vector of colors for the heatmap (default: Reds scale)
color_scale_midpoint Numeric midpoint for diverging color scale (default: 0.25)
plot_title Plot title
matrix_cluster Logical; should rows/cols be clustered (default: TRUE)
axis_x_label, axis_y_label Axis labels
axis_text_size Axis text size

Value

A ggplot object displaying the relatedness matrix as a heatmap.

Examples

```
# Example relatedness matrix
set.seed(123)
mat <- matrix(runif(100, 0, 1), nrow = 10)
rownames(mat) <- paste0("ID", 1:10)
colnames(mat) <- paste0("ID", 1:10)

# Plot the relatedness matrix
ggRelatednessMatrix(mat,
  config = list(
    matrix_color_palette = c("white", "gold", "red"),
    color_scale_midpoint = 0.5,
    matrix_cluster = TRUE,
    plot_title = "Relatedness Matrix",
    axis_x_label = "Individuals",
    axis_y_label = "Individuals",
    axis_text_size = 8
  )
)
```

optimizePedigree

Optimize Pedigree Plot

Description

Optimize a pedigree plot by rounding coordinates to reduce file size.

Usage

```
optimizePedigree(p, config = list(), plot_type = c("plotly", "static"))
```

Arguments

<code>p</code>	A plotly or ggplot object representing the pedigree plot.
<code>config</code>	A list of configuration parameters, including 'value_rounding_digits'.
<code>plot_type</code>	A string indicating the type of plot: "plotly" or "static". Default is "plotly". @return The optimized plot object with rounded coordinates. @keywords internal @aliases optimisePedigree

optimizePlotlyPedigree

Optimize Plotly Pedigree Plot

Description

Optimize a Plotly pedigree plot by rounding coordinates to reduce file size.

Usage

```
optimizePlotlyPedigree(p, config = list())
```

Arguments

p A plotly object representing the pedigree plot.

config A list of configuration parameters, including 'value_rounding_digits'.

Value

The optimized plotly object with rounded coordinates.

pedigree

Create a pedigree or pedigreeList object

Description

Create a pedigree or pedigreeList object

Usage

```
pedigree(
  id,
  dadid,
  momid,
  sex,
  affected,
  status,
  relation,
  famid,
  missid,
  max_message_n = 5
)

## S3 method for class 'pedigreeList'
x[... , drop = FALSE]
```

```
## S3 method for class 'pedigree'
x[... , drop = FALSE]

## S3 method for class 'pedigree'
print(x, ...)

## S3 method for class 'pedigreeList'
print(x, ...)
```

Arguments

<code>id</code>	Identification variable for individual
<code>dadid</code>	Identification variable for father. Founders' parents should be coded to NA, or another value specified by <code>missid</code> .
<code>momid</code>	Identification variable for mother. Founders' parents should be coded to NA, or another value specified by <code>missid</code> .
<code>sex</code>	Gender of individual noted in 'id'. Either character ("male", "female", "unknown", "terminated") or numeric (1="male", 2="female", 3="unknown", 4="terminated") data is allowed. For character data the string may be truncated, and of arbitrary case.
<code>affected</code>	A variable indicating affection status. A multi-column matrix can be used to give the status with respect to multiple traits. Logical, factor, and integer types are converted to 0/1 representing unaffected and affected, respectively. NAs are considered missing.
<code>status</code>	Censor/Vital status (0="censored", 1="dead")
<code>relation</code>	A matrix with 3 required columns (<code>id1</code> , <code>id2</code> , <code>code</code>) specifying special relationship between pairs of individuals. Codes: 1=Monozygotic twin, 2=Dizygotic twin, 3=Twin of unknown zygosity, 4=Spouse. (The last is necessary in order to place a marriage with no children into the plot.) If <code>famid</code> is given in the call to create pedigrees, then <code>famid</code> needs to be in the last column of the relation matrix. Note for tuples of ≥ 3 with a mixture of zygosity, the plotting is limited to showing pairwise zygosity of adjacent subjects, so it is only necessary to specify the pairwise zygosity, in the order the subjects are given or appear on the plot.
<code>famid</code>	An optional vector of family identifiers. If it is present the result will contain individual pedigrees for each family in the set, which can be extracted using subscripts. Individuals need to have a unique id <i>within</i> family.
<code>missid</code>	The founders are those with no father or mother in the pedigree. The <code>dadid</code> and <code>momid</code> values for these subjects will either be NA or the value of this variable. The default for <code>missid</code> is 0 if the <code>id</code> variable is numeric, and "" (empty string) otherwise.
<code>max_message_n</code>	max number of individuals to list in error messages
<code>x</code>	pedigree object in print and subset methods
<code>...</code>	optional arguments passed to internal functions
<code>drop</code>	logical, used in subset function for dropping dimensionality

Value

An object of class pedigree or pedigreeList Containing the following items: famid id index mindex sex affected status relation

Author(s)

Terry Therneau

plotPedigree	<i>plotPedigree A wrapped function to plot simulated pedigree from function simulatePedigree. This function require the installation of package kinship2.</i>
--------------	---

Description

plotPedigree A wrapped function to plot simulated pedigree from function simulatePedigree. This function require the installation of package kinship2.

Usage

```
plotPedigree(
  ped,
  code_male = NULL,
  verbose = FALSE,
  affected = NULL,
  cex = 0.5,
  col = 1,
  symbolsize = 1,
  branch = 0.6,
  packed = TRUE,
  align = c(1.5, 2),
  width = 8,
  density = c(-1, 35, 65, 20),
  mar = c(2.1, 1, 2.1, 1),
  angle = c(90, 65, 40, 0),
  keep.par = FALSE,
  pconnect = 0.5,
  ...
)
```

Arguments

ped	The simulated pedigree dataframe from function simulatePedigree. Or a pedigree dataframe with the same colnames as the dataframe simulated from function simulatePedigree.
code_male	This optional input allows you to indicate what value in the sex variable codes for male. Will be recoded as "M" (Male). If NULL, no recoding is performed.

verbose	logical If TRUE, prints additional information. Default is FALSE.
affected	This optional parameter can either be a string specifying the column name that indicates affected status or a numeric/logical vector of the same length as the number of rows in 'ped'. If NULL, no affected status is assigned.
cex	The font size of the IDs for each individual in the plot.
col	The color of the symbols in the plot.
symbolsize	The size of the symbols in the plot.
branch	The length of the branches in the plot.
packed	logical. If TRUE, the pedigree is drawn in a more compact form.
align	A numeric vector of length 2 indicating the alignment penalties for parents and spouses.
width	The width of the plot.
density	A numeric vector indicating the shading density for different affected statuses.
mar	A numeric vector of length 4 indicating the margins of the plot.
angle	A numeric vector indicating the shading angles for different affected statuses.
keep.par	logical. If TRUE, the current graphical parameters are preserved.
pconnect	A numeric value indicating the proportion of the pedigree to connect.
...	Additional arguments passed to <code>kinship2::plot.pedigree</code>

Value

A plot of the provided pedigree

redsquirrels

Kluane Red Squirrel Data

Description

A tidy data frame of life-history and reproductive metrics for 7,799 individual red squirrels from the Kluane Red Squirrel Project (1987–present). Each row corresponds to one squirrel with associated pedigree links and reproductive success summaries. The original data are published under a CC0 1.0 Universal Public Domain Dedication:

Usage

```
data(redsquirrels)
```

Format

'redsquirrels' A data frame with 7799 rows and 16 columns:

personID Unique identifier for each squirrel

momID, dadID Unique identifiers for each squirrel's parents

sex Biological sex of the squirrel

famID Unique identifier for each family. Derived from ped2fam

byear Birth year of the squirrel

dyear Death year of the squirrel

lrs lifetime reproductive success for the squirrel

ars_mean Mean annual reproductive success for the squirrel

ars_max Maximum ARS value for the squirrel

ars_med Median ARS value for the squirrel

ars_min Minimum ARS value for the squirrel

ars_sd Standard deviation of ARS values for the squirrel

ars_n Number of ARS values for the squirrel

year_first First year of ARS data for the squirrel

year_last Last year of ARS data for the squirrel ...

Details

McFarlane, S. Eryn; Boutin, Stan; Humphries, Murray M. et al. (2015). Data from: Very low levels of direct additive genetic variance in fitness and fitness components in a red squirrel population [Dataset]. Dryad. <<https://doi.org/10.5061/dryad.n5q05>>

Source

<<https://doi.org/10.5061/dryad.n5q05>>

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