Package 'causalverse'

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Type Package

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Title Causality in Clarity

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Maintainer The package maintainer <mikenguyen.contact@gmail.com>

Description CausalVerse: An R toolkit expediting causal research & analysis. Streamlines complex methodologies, empowering users to unveil causal relationships with precision. Your go-to for insightful causality exploration..

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Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.2.3

Suggests knitr,
rmarkdown,
testthat (>= 3.0.0)

Config/testthat/edition 3

Imports ggplot2 (>= 3.4.2),
ggthemes (>= 4.2.4),
tidyverse (>= 2.0.0),
lubridate (>= 1.9.2),
rio (>= 0.5.29),
xtable (>= 1.8.4),
dplyr (>= 1.1.1),
tidyr (>= 1.3.0),
scales (>= 1.2.1),
gridExtra (>= 2.3),
systemfit (>= 1.1.30),
Hotelling (>= 1.0.8),
MatchIt (>= 4.5.4),
rlang (>= 1.1.1),
fixest (>= 0.11.1)

VignetteBuilder knitr

R topics documented:

`ama_export_fig` *Function to export a figure with AMA theme*

Description

This function applies a custom theme to a ggplot2 figure and exports it to a given path. It exports both an archived version with the current date and a current version without a date.

Usage

```
ama_export_fig(figure, filename, filepath)
```

Arguments

`figure`	A ggplot2 object.
`filename`	A character string specifying the filename without the extension.
`filepath`	A character string specifying the directory to save the file.

Examples

```
## Not run:
test_plot <- ggplot(mpg, aes(x=displ, y=hwy)) + geom_point()  # Create a ggplot2 plot
filename <- "sample_plot"  # Define a filename
filepath <- tempdir()  # Define a path using a temporary directory
ama_export_fig(test_plot, filename, filepath)  # Call the ama_export_fig function

## End(Not run)
```

`ama_export_tab` *Function to export a table with AMA style*

Description

This function exports the provided table in both Excel (`.xlsx`) and LaTeX (`.tex`) formats. The table is archived with the current date in the filename for the Excel version, while the LaTeX version is saved with just the specified filename.

Usage

```
ama_export_tab(table, filename, filepath, caption = NULL)
```

Arguments

table	A data frame or matrix.
filename	A character string specifying the filename without the extension.
filepath	A character string specifying the directory to save the file.
caption	A character string specifying the caption for the table.

Examples

```
## Not run:
data(mtcars)  # Load the mtcars dataset
ama_export_tab(mtcars[1:5, 1:5], "sample_table", tempdir(), "Sample Caption for mtcars")

## End(Not run)
```

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ama_labs *Custom Label Formatting for ggplot2: American Marketing Association Style*

Description

This function provides custom label formatting for ggplot2 based on the guidelines set by the American Marketing Association.

Usage

```
ama_labs(
  title = NULL,
  subtitle = NULL,
  caption = NULL,
  x = NULL,
  y = NULL,
  fill = NULL,
  color = NULL,
  ...
)
```

Arguments

title	Plot title.
subtitle	Plot subtitle.
caption	Plot caption.
x	X-axis label.
y	Y-axis label.
fill	Fill legend title.
color	Color legend title.
...	Additional arguments to be passed to `ggplot2::labs()`.

Value

Modified labels for a ggplot2 plot.

Examples

```
## Not run:
library(ggplot2)
ggplot(mtcars, aes(mpg, wt)) + geom_point() +
ama_labs(title = "Sample Plot") +
ama_theme()

## End(Not run)
```

`ama_scale_color` *Custom Color Scale for ggplot2: American Marketing Association Style*

Description

This function provides a custom color scale for ggplot2 plots based on the guidelines set by the American Marketing Association.

Usage

```
ama_scale_color(
  use_color = FALSE,
  palette_name = "OkabeIto",
  grayscale_limits = c(0.2, 0.8)
)
```

Arguments

`use_color`	Logical. If TRUE, uses color, otherwise uses grayscale.
`palette_name`	Character. Name of the color palette to use.
`grayscale_limits`	Numeric vector. Limits for the grayscale gradient.

Value

A color scale for a ggplot2 plot.

Examples

```
## Not run:
library(ggplot2)
ggplot(mtcars, aes(mpg, wt, color = gear)) + geom_point(size = 4) + ama_scale_color()

## End(Not run)
```

ama_scale_fill *Custom Fill Scale for ggplot2: American Marketing Association Style*

Description

This function provides a custom fill scale for ggplot2 plots based on the guidelines set by the American Marketing Association.

Usage

```
ama_scale_fill(
  use_color = FALSE,
  palette_name = "OkabeIto",
  grayscale_limits = c(0.2, 0.8)
)
```

Arguments

use_color	Logical. If TRUE, uses color, otherwise uses grayscale.
palette_name	Character. Name of the color palette to use.
grayscale_limits	Numeric vector. Limits for the grayscale gradient.

Value

A fill scale for a ggplot2 plot.

Examples

```
## Not run:
library(ggplot2)
ggplot(mtcars, aes(mpg, wt, fill = gear)) +
geom_point(shape = 21, size = 4) +
ama_scale_fill()

## End(Not run)
```

ama_theme *Custom Theme for ggplot2: American Marketing Association Style*

Description

This function provides a custom theme for ggplot2 following the guidelines set by the American Marketing Association.

Usage

```
ama_theme(
  base_size = 16,
  base_family = "sans",
  title_size = ggplot2::rel(1.2),
  axis_title_size = ggplot2::rel(1.2),
  legend_title_size = ggplot2::rel(0.6),
  legend_text_size = ggplot2::rel(0.6),
  axis_text_size = ggplot2::rel(1),
  ...
)
```

Arguments

base_size	Base font size.
base_family	Font family. Use "sans" for Arial and "serif" for Times New Roman.
title_size	Title font size as a relative value.
axis_title_size	Axis title font size as a relative value.
legend_title_size	Legend title font size as a relative value.
legend_text_size	Legend text font size as a relative value.
axis_text_size	Axis text font size as a relative value.
...	Additional theme elements to be passed to ggplot2::theme().

Value

A ggplot2 theme.

Examples

```
## Not run:
library(ggplot2)
# Using Arial font
ggplot(mtcars, aes(mpg, wt)) + geom_point() + ama_theme()
# Using Times New Roman font
ggplot(mtcars, aes(mpg, wt)) + geom_point() + ama_theme(base_family = "serif")

## End(Not run)
```

---

plot_coef_par_trends *Plot Coefficients of Parallel Trends*

Description

This function generates coefplots or iplots based on fixest outputs, allowing the user to visualize interaction coefficients with ease.

Usage

```
plot_coef_par_trends(
  data,
  dependent_vars,
  time_var,
  unit_treatment_status,
  unit_id_var,
  plot_type = "coefplot",
  combined_plot = TRUE,
  legend_position = "bottomleft",
  legend_title = "Legend Title",
  legend_args = list(),
  plot_args = list()
)
```

Arguments

data	Data frame containing the data to be used in the model.
dependent_vars	Named list of dependent variables to model and their respective labels.
time_var	Name of the time variable in the data.
unit_treatment_status	Name of the treatment status variable.
unit_id_var	Name of the unit identification variable.
plot_type	Type of plot to generate. Either "coefplot" or "iplot".
combined_plot	Logical indicating whether to combine plots for all dependent variables.
legend_position	Position of the legend on the plot.
legend_title	Title for the legend.
legend_args	List of additional arguments to customize the legend.
plot_args	List of additional arguments to customize the plot.

Value

A plot visualizing interaction coefficients.

Examples

```
library(fixest)
data("base_did")

# Sample call to the function:
plot_coef_par_trends(
  data = base_did,
  dependent_vars = c(y = "Outcome 1", x1 = "Outcome 2"),
  time_var = "period",
  unit_treatment_status = "treat",
  unit_id_var = "id",
  plot_type = "coefplot",
  combined_plot = TRUE,
  plot_args = list(main = "Interaction coefficients Plot"),
  legend_title = "Metrics",
```

```
  legend_position = "bottomleft"
)

plot_coef_par_trends(
  data = base_did,
  dependent_vars = c(y = "Outcome 1", x1 = "Outcome 2"),
  time_var = "period",
  unit_treatment_status = "treat",
  unit_id_var = "id",
  plot_type = "coefplot",
  combined_plot = FALSE
)
```

`plot_density_by_treatment` *Plot Density by Treatment*

Description

This function creates a list of ggplot density plots for specified variables by treatment groups.

Usage

```
plot_density_by_treatment(
  data,
  var_map,
  treatment_var,
  theme_use = causalverse::ama_theme(),
  ...
)
```

Arguments

`data`	A data frame containing the variables to plot and a treatment variable.
`var_map`	A named list mapping the column names in the data to display names for plotting.
`treatment_var`	A named vector where the name is the treatment column in the data and the value is the legend title.
`theme_use`	ggplot2 theme. Defaults to `ggplot2::theme_minimal()`.
`...`	Additional arguments to be passed to `geom_density`.

Value

A list of ggplot objects for each variable in `var_map`.

Examples

```
## Not run:
data(mtcars)
data <- mtcars %>%
  dplyr::select(mpg, cyl) %>%
  dplyr::rowwise() %>%
```

```
  dplyr::mutate(treatment = sample(c(0,1), 1, replace = TRUE)) %>%
  dplyr::ungroup()

plots <- plot_density_by_treatment(
  data = data,
  var_map = list("mpg" = "Var 1",
                 "cyl" = "Var 2"),
  treatment_var = c("treatment" = "Treatment Name\nin Legend")
)

## End(Not run)
```

`plot_par_trends` *Plot Parallel Trends*

Description

Plots parallel trends for given metrics.

Usage

```
plot_par_trends(
  data,
  metrics_and_names,
  treatment_status_var,
  time_var,
  conf_level = 0.95,
  non_negative = FALSE,
  display_CI = TRUE,
  output_format = "plot",
  smoothing_method = NULL,
  title_prefix = "Parallel Trends for",
  theme_use = causalverse::ama_theme()
)
```

Arguments

`data`	A data frame containing the data to plot.
`metrics_and_names`	A named list of metrics to plot.
`treatment_status_var`	The variable indicating treatment status.
`time_var`	The variable indicating time.
`conf_level`	Confidence level for confidence intervals (default is 0.95).
`non_negative`	Logical; if TRUE, sets negative lower confidence bounds to 0.
`display_CI`	Logical; if TRUE, displays confidence intervals.
`output_format`	Format of the output; "plot" returns a list of ggplots, "data.frame" returns a data frame.
`smoothing_method`	Method to use for smoothing; NULL means no smoothing.

title_prefix	A character string specifying the prefix for the plot title (default is "Parallel Trends for").
theme_use	Custom theme that follows ggplots2

Value

A list of ggplot objects or a data frame.

Examples

```
## Not run:
library(tidyverse)
data <- expand.grid(entity = 1:100, time = 1:10) %>%
  dplyr::arrange(entity, time) %>%
  dplyr::mutate(
    treatment = ifelse(entity <= 50, "Treated", "Control"),
    outcome1 = 0.5 * time + rnorm(n(), 0, 2) + ifelse(treatment == "Treated", 0, 0),
    outcome2 = 3 + 0.3 * time + rnorm(n(), 0, 1) + ifelse(treatment == "Treated", 0, 2)
  )
results <- plot_par_trends(
  data = data,
  metrics_and_names = list(outcome1 = "Outcome 1", outcome2 = "Outcome 2"),
  treatment_status_var = "treatment",
  time_var = list(time = "Time"),
  smoothing_method = "loess"
)
library(gridExtra)
gridExtra::grid.arrange(grobs = results, ncol = 1)

## End(Not run)
```

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