Package ‘scplot’

June 3, 2023

Type Package

Title Plot Function for Single-Case Data Frames

Version 0.3.3

Date 2023-6-03

Description Add-on for the 'scan' package that creates plots from single-case data frames ('scdf'). It includes functions for styling single-case plots, adding phase-based lines to indicate various statistical parameters, and predefined themes for presentations and publications. More information and in depth examples can be found in the online book "Analyzing Single-Case Data with R and 'scan" Jürgen Wilbert (2023) <https://jazznbass.github.io/scan-Book/>.

Depends R (>= 3.5.0)

Imports ggplot2, scan (>= 0.57.0), stats, utils, mblm

Suggests rmarkdown, knitr

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.2.3

NeedsCompilation no

Author Juergen Wilbert [aut, cre] (<https://orcid.org/0000-0002-8392-2873>)

Maintainer Juergen Wilbert <juergen.wilbert@uni-potsdam.de>

Repository CRAN

Date/Publication 2023-06-03 09:00:02 UTC

R topics documented:

scplot-package .................................................. 2
add_arrow .................................................. 2
add_grid .................................................. 4
add_labels ................................................ 4
add_legend ............................................... 5
add_marks .............................................. 6
A collection of procedures for visualizing single-case data. It is an add-on package for the `scan` package.

**Author(s)**

Juergen Wilbert [aut, cre]

**Description**

Add arrows to an scplot
add_arrow

Usage

add_arrow(
  object,
  case = 1,
  x0,
  y0,
  x1,
  y1,
  color = "black",
  angle = 30,
  length = unit(5, "points"),
  type = "open",
  ends = "last",
  linewidth = 0.7
)

Arguments

object        An scplot object (class scplot) returned from the scplot() function.

case         Numerical vector with the case number or character string. case = "all" for all cases.

x0           Origin x position of the line.

y0           Origin y position of the line.

x1           End x position of the line.

y1           End y position of the line.

color        A character string or a number defining the color of an element.

angle        Angle (in [0,360])

length       Size of the arrow angels.

type         One of "open" or "closed" indicating whether the arrow head should be a closed triangle.

ends         One of "last", "first", or "both", indicating which ends of the line to draw arrow heads.

linewidth    A number with the width of the line.

Value

An object of class scplot (see scplot()) with added element arrows.

Examples

data(exampleAB, package = "scan")
p1 <- scplot(exampleAB$Anja) |> add_arrow(case = 1, 2, 70, 6, 55, color = "darkred")
**add_grid**

*Add grid to an scplot*

### Description

Add grid to an scplot

### Usage

```r
add_grid(object, ...)
```

### Arguments

- **object**: An scplot object (class `scplot`) returned from the `scplot()` function.
- **...**: Line arguments (see `element_line()`)

### Value

An object of class `scplot` (see `scplot()`).

### See Also

- `element_line()`

### Examples

```r
data(exampleAB, package = "scan")
p1 <- scplot(exampleAB$Anja) |> set_theme("minimal") |> add_grid(color = "grey70")
```

---

**add_labels**

*Add value labels to an scplot*

### Description

Add value labels to an scplot

### See Also

- `element_line()`
add_legend

Usage

add_labels(
  object,
  nudge_y = 5,
  nudge_x = 0,
  round = NULL,
  text = list(),
  background = list(),
  variable = ".dvar",
  padding = NULL
)

Arguments

object An scplot object (class scplot) returned from the scplot() function.
nudge_y Offset on the y-axis.
nudge_x Offset on the x-axis.
round Number of digits of the labels.
text List with text parameters ("family", "face", "colour", "size", "hjust", "vjust", "angle", "lineheight", "margin"). See element_text().
background A list with background styling arguments (fill, color, size, linetype).
variable Name of the dataline variable to apply the style.
padding Padding size around text.

Value

An object of class scplot (see scplot()) with added/changed element labels.

Description

Add a legend to an scplot

Usage

add_legend(
  object,
  labels = NULL,
  section_labels = c("Lines", "Phases"),
  case = 1,
  position = "right",
  datalines = TRUE,
  statlines = TRUE,
add_marks

Arguments

object  An scplot object (class scplot) returned from the scplot() function.
labels  A character vector. Replaces the automatically build labels. When a vector element is NA, the corresponding element will not be replaced (e.g. c(NA, "Variable 2", NA, "Variable 4")).
section_labels  A character vector of length two. The labels for the lines section and phase section.
case  Numerical vector with the case number or character string. case = "all" for all cases.
position  The position ("none", "left", "right", "bottom", "top", or two-element numeric vector)
datalines  If TRUE, a legend for the datalines is generated.
statlines  If TRUE, a legend for the statlines is generated.
phases  If TRUE, a legend for the phases is generated.
title  A list with text style parameters for the title.
text List with text parameters ("family", "face", "colour", "size", "hjust", "vjust", "angle", "lineheight", "margin"). See element_text().
background  A list with background styling arguments (fill, color, size, linetype).

Value

An object of class scplot (seescplot()) with changed element legend.

Description

Add marks to an scplot

Usage

add_marks(object, case = 1, positions, color = "red")
add_ridge

size = 1,
shape = 1,
variable = ".dvar"
)

Arguments

object An scplot object (class scplot) returned from the scplot() function.
case Numerical vector with the case number or character string. case = "all" for all
cases.
positions Either a vector indicating the points to be highlighted or a character string with
a logical expression (e.g. values < mean(values))
color A character string or a number defining the color of an element.
size Text size relative to the base text size.
shape Number. See pch graphical parameter on par help page par().
variable Name of the dataline variable to apply the style.

Details

If positions is an object returned from an outlier analysis (outlier()), the corresponding outliers
are marked.

Value

An object of class scplot (see scplot()) with changed element marks.

Examples

library(scan)
p1 <- scplot(exampleA1B1A2B2Moritz) |> add_marks(positions = c(1,5,10,14))
p1 <- scplot(Huber2014) |> add_marks(positions = outlier(Huber2014))

add_ridge Add a ridge to an scplot

Description

Add a ridge to an scplot

Usage

add_ridge(object, color = "grey98", variable = ".dvar")
**add_statline**

**Arguments**

- **object**: An scplot object (class scplot) returned from the scplot() function.
- **color**: A character string or a number defining the color of an element.
- **variable**: Name of the dataline variable to apply the style.

**Value**

An object of class scplot (see scplot()) with changed element ridges.

**Description**

Add a statline to an scplot

**Usage**

```r
add_statline(
  object, 
  stat = c("mean", "median", "min", "max", "quantile", "sd", "mad", "trend", "trendA", 
             "trendA bisplit", "trendA trisplit", "trendA theil-sen", "movingMean", "moving mean", 
             "moving median", "movingMedian", "loreg", "lowess", "loess"), 
  phase = NULL, 
  color = NULL, 
  linewidth = NULL, 
  linetype = NULL, 
  variable = NULL, 
  ... 
)
```

**Arguments**

- **object**: An scplot object (class scplot) returned from the scplot() function.
- **stat**: A character string for defining a statistical line or curve to be plotted.
- **phase**: Either a numeric or a character vector specifying the reference phase (see details)
- **color**: A character string or a number defining the color of an element.
- **linewidth**: A number with the width of the line.
- **linetype**: A character string with the line type: "solid", "dashed", "dotted"
- **variable**: Name of the dataline variable to apply the style.
- **...**: additional parameters passed to the statistical function.
Details

The phase argument defines the reference phase for some statistical functions ("median", "mean", "min", "max", "quantile"). The default is NULL which calculates and plots statistics for each phase separately. The arguments takes a numeric vector (phase number(s)) or a character vector (phase name(s)). When more than one phase is defines, statistics are based on the combined values of these phases. Various methods for an extrapolated trend line exist: "trendA" is based on an OLS regression, "trendA theil-sen" on a nonparametric regression, and "trendA bisplit" / "trendA trisplit" are two median based approaches. Some of the functions defined in stats have additional arguments. The mean() function has a trim argument (e.g. trim = 0.1). quantile() has a proportion argument (e.g. prob = 0.75 for calculating the 75% quantile). moving mean and moving median have a lag argument (e.g. lag = 2). The local-regression curve function "lowess" (or "loreg") has a proportion argument (e.g. f = 0.5; see lowess()) and the local-regression curve function "loess" has a span argument (e.g. span = 0.75; see loess()).

Value

An object of class scplot (see scplot()) with changed element statlines.

Description

Add test to an scplot

Usage

add_text(
  object, label,
  case = 1, x, y,
  color = "black",
  size = 1,
  angle = 0,
  hjust = 0.5,
  vjust = 0.5,
  face = 1
)

Arguments

  object  An scplot object (class scplot) returned from the scplot() function.
  label   A Character vector with text labels.
  case    Numerical vector with the case number or character string. case = "all" for all cases.
x = x position
y = y position
color = A character string or a number defining the color of an element.
size = Text size relative to the base text size.
age = Angle (in [0,360])
hjust = Horizontal justification (in [0,1])
vjust = Vertical justification (in [0,1])
face = Font face ("plain", "italic", "bold", "bold.italic")

Value
An object of class scplot (see `scplot()`) with a changed texts element.

---

**add_title**

Add title and caption to an scplot

**Description**
Add title and caption to an scplot

**Usage**

```
add_title(object, label, ...)
add_caption(object, label, ...)
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>object</td>
<td>An scplot object (class scplot) returned from the scplot() function.</td>
</tr>
<tr>
<td>label</td>
<td>A Character vector with text labels.</td>
</tr>
<tr>
<td>...</td>
<td>List with text parameters (&quot;family&quot;, &quot;face&quot;, &quot;colour&quot;, &quot;size&quot;, &quot;hjust&quot;, &quot;vjust&quot;, &quot;angle&quot;, &quot;lineheight&quot;, &quot;margin&quot;). See <code>element_text()</code>.</td>
</tr>
</tbody>
</table>

**Value**
An object of class scplot (see `scplot()`) with changed title and caption elements.
as_ggplot

as_ggplot

Creates a ggplot2 object from an scplot() object

Description

Creating a ggplot2 object from an scplot() object

Usage

as_ggplot(scplot)

Arguments

scplot An scplot object

Details

as_ggplot() is used when you want to return a ggplot2 object for further use with external ggplot functions.

Value

A ggplot2 plot object.

element_point

Point element

Description

In conjunction with ggplot an object to represent point attributes.

Usage

element_point(colour = NULL, size = NULL, shape = NULL, color = NULL)

Arguments

size Relative size.
shape Point shape.
color, colour Point colour.

Value

An object of class c("element_point", "element").
new_theme

Create a new scplot theme

Description
Create a new scplot theme

Usage
new_theme()

Arguments
object An scplot object (class scplot) returned from the scplot() function.

Value
An scplot-theme object
An object of class scplot-theme which can be used with the set_theme() function.

Examples
data(exampleABC, package = "scan")
my_theme <- new_theme() |> set_panel(color = "red") |> set_base_text(size = 12, color = "blue") |> set_dataline(color = "darkred", linewidth = 2) p1 <- scplot(exampleABC) |> set_theme(my_theme)

scplot

Plot single-case data

Description
This function provides a plot of a single-case or multiple single-cases.

Usage
scplot(scdf)

Arguments
scdf A single-case data-frame object (scdf).
Value

An object of class scplot containing the single-case data (element scdf), and information about the plot style (element theme).

Author(s)

Juergen Wilbert

Description

Set plot and panel background of an scplot

Usage

set_background(object, ...)

set_panel(object, ...)

Arguments

object

An scplot object (class scplot) returned from the scplot() function.

...  

List with rectangle parameters ("fill", "colour", "linewidth", "linetype"). See element_rect().

Value

An object of class scplot (see scplot()).

Examples

data(exampleAB, package = "scan")
pl <- scplot(exampleAB) |> 
set_background(fill = "lightblue", colour = "darkblue", linewidth = 1.5) |> 
set_panel(fill = "deepskyblue", color = "darkblue", linewidth = 0.3)
set_base_text  
Set base text parameters of an scplot

Description
Set base text parameters of an scplot

Usage
set_base_text(object, ...)

Arguments
- **object**: An scplot object (class scplot) returned from the scplot() function.
- **...**: List with text parameters ("family", "face", "colour", "size", "hjust", "vjust", "angle", "lineheight", "margin"). See element_text().

Value
An object of class scplot (see scplot()).

set_casenames  
Set casenames of an scplot

Description
Set casenames of an scplot

Usage
set_casenames(object, labels = NULL, position = NULL, background = list(), ...)

Arguments
- **object**: An scplot object (class scplot) returned from the scplot() function.
- **labels**: A Character vector with text labels.
- **position**: Either "topleft", "bottomleft", "topright", "bottomright", "strip-right", "strip-top", or a numerical vector of length 2 with the x and y position (e.g. c(19, 20)).
- **background**: A list with background styling arguments (fill, color, size, linetype).
- **...**: List with text parameters ("family", "face", "colour", "size", "hjust", "vjust", "angle", "lineheight", "margin"). See element_text().

Value
An object of class scplot (see scplot()) with a changed casenames element.
set_dataline

Set data lines of an scplot

Description

Either set aesthetics of the default data line or add another data line.

Usage

set_dataline(object, variable = NULL, line, point, type = "continuous", ...)  
add_dataline(...)

Arguments

- **object**: An scplot object (class `scplot`) returned from the `scplot()` function.
- **variable**: String. The name of a new variable for adding a new line. If left empty, the aesthetics of the default data line are changed.
- **line**: List with line parameters ("colour", "linewidth", "linetype", "lineend", "arrow"). See `element_line()`.
- **point**: A list with point parameters ("colour", "size", "shape"). See `element_point()`.
- **type**: Either "continuous" or "discrete"
- **...**: As a shortcut, arguments passed here are bundled as line arguments (see `element_line()`).

Value

An object of class `scplot` (see `scplot()`) with a changed datalines element.

See Also

`element_line()`, `element_point()`

Examples

data(exampleAB_add, package = "scan")
pl <- scplot(exampleAB_add) |>  
set_dataline("depression", color = "darkblue")
set_phasenames   Set phasenames of an scplot

Description
Set phasenames of an scplot

Usage
set_phasenames(object, labels = NULL, position = NULL, ...)

Arguments
object   An scplot object (class scplot) returned from the scplot() function.
labels   A Character vector with text labels.
position Character string either 'left', 'center', or 'none'.
...      List with text parameters ("family", "face", "colour", "size", "hjust", "vjust", "angle", "lineheight", "margin"). See element_text().

Value
An object of class scplot (see scplot()) with a changed phasenames element.

set_separator   Set separator line in an scplot

Description
Set separator line in an scplot

Usage
set_separator(object, ...)

Arguments
object   An scplot object (class scplot) returned from the scplot() function.
...      List with line parameters ("colour", "linewidth", "linetype").

Value
An object of class scplot (see scplot()).
**set_theme**

Add a theme of to an scplot

**Description**

Possible themes are: 'basic', 'grid', 'default', 'small', 'tiny', 'big', 'minimal', 'dark', 'sienna', 'phase_color', 'phase_shade', 'grid2'.

**Usage**

```r
set_theme(object, theme, ...)  
add_theme(...)  
```

**Arguments**

- **object**: An scplot object (class `scplot`) returned from the `scplot()` function.
- **theme**: A character string with a predefined graphical theme or a theme object created with `new_theme()`.
- **...**: Further character strings or scplot-theme objects that are "added" on top.

**Value**

An object of class `scplot` (see `scplot()`) with a changed theme element.

---

**set_theme_element**  

Set a theme element

**Description**

Set a theme element

**Usage**

```r
set_theme_element(object, ...)  
```

**Arguments**

- **object**: An scplot object (class `scplot`) returned from the `scplot()` function.
- **...**: various style parameter
set_theme_element

Details


The elements are of the following classes:

- text = c("element_text", "element")
- plot.background = c("element_rect", "element")
- panel.spacing.y = c("simpleUnit", "unit", "unit_v2")
- dataline = "list"
- datapoint = "list"
- statline = c("element_line", "element")
- axis.expand.x = "numeric"
- axis.expand.y = "numeric"
- axis.line.x = c("element_line", "element")
- axis.line.y = c("element_line", "element")
- axis.ticks.length = c("simpleUnit", "unit", "unit_v2")
- axis.ticks = c("element_line", "element")
- axis.title.y = c("element_text", "element")
- axis.title.x = c("element_text", "element")
- axis.text.x = c("element_text", "element")
- axis.text.y = c("element_text", "element")
- plot.title = c("element_text", "element")
- plot.caption = c("element_text", "element")
- plot.margin = c("margin", "simpleUnit", "unit", "unit_v2")
- casenames = c("element_text", "element")
- casenames.strip = c("element_rect", "element")
- casenames.background = c("element_rect", "element")
- casenames.position = "character"
- phasenames = c("element_text", "element")
- phasenames.position.x = "character"
- separators = c("element_line", "element")
- separators.extent = "character"
- label.text = c("element_text", "element")
- label.background = c("element_rect", "element")
set_xaxis

- label.padding = "numeric", grid = c("element_line", "element"),
- legend.position = "character",
- legend.background = c("element_rect", "element"),
- legend.text = c("element_text", "element"),
- legend.title = c("element_text", "element"),
- legend.margin = c("margin", "simpleUnit", "unit", "unit_v2")

Value

An object of class scplot (see scplot()) with a changed theme element.

Examples

data(exampleABC, package = "scan")
p1 <- scplot(exampleABC) |> 
  set_theme_element(
    axis.ticks.length = unit(0, "points"),
    axis.line.y = element_line(color = "darkred", linewidth = 2),
    panel.background = element_rect(color = "darkblue", linewidth = 1),
    panel.spacing.y = unit(0, "points"),
    phasenames = element_text(color = "#00000000")
  )

set_xaxis

Set axis parameters of an scplot

Description

Set axis parameters of an scplot

Usage

set_xaxis(
  object,
  limits = NULL,
  increment = NULL,
  increment_from = NULL,
  line = NULL,
  expand = NULL,
  ...
)

set_yaxis(
  object,
  limits = NULL,
  increment = NULL,
  increment_from = NULL,
set_xlabel

Arguments

object: An scplot object (class scplot) returned from the scplot() function.
limits: Lower and upper limits of the axis (e.g., limits = c(0, 20) sets the axis to a scale from 0 to 20). With multiple single-cases you can use limits = c(0, NA) to scale the axis from 0 to the maximum of each case. limits is not set by default, which makes scplot set a proper scale based on the given data.
increment: An integer. Increment of the x-axis. 1: each mt value will be printed, 2: every other value, 3: every third values etc.
increment_from: Number from which increment starts to count. Usually set to 0 if you want marks like 1,5,10,15....
line: List with line parameters ("colour", "linewidth", "linetype", "lineend", "arrow"). See element_line().
expand: Vector with two values.
...
Further styling arguments: color, size, face, family, hjust, vjust, lineheight, angle, linetype, lineend, arrow, fill, margin.

Value

An object of class scplot (see scplot()) with changed xaxis and yaxis elements.

---

set_xlabel

Set label for axis

Description

Set label for axis

Usage

set_xlabel(object, label = NULL, ...)

set_ylabel(object, label = NULL, ...)

Arguments

object: An scplot object (class scplot) returned from the scplot() function.
label: A Character vector with text labels.
...
Further styling arguments: color, size, face, family, hjust, vjust, lineheight, angle, linetype, lineend, arrow, fill, margin.
**set_xlabel**

**Value**

An object of class `scplot` (see `scplot()`) with a changed xlabel or ylabel element.
Index

* package
  scplot-package, 2

  add_arrow, 2
  add_caption (add_title), 10
  add_dataline (set_dataline), 15
  add_grid, 4
  add_labels, 4
  add_legend, 5
  add_marks, 6
  add_ridge, 7
  add_statline, 8
  add_text, 9
  add_theme (set_theme), 17
  add_title, 10
  as_ggplot, 11

  element_line(), 4, 15, 20
  element_point(), 11
  element_point(), 15
  element_rect(), 13
  element_text(), 5, 6, 10, 14, 16
  extract_theme (new_theme), 12

  loess(), 9
  lowess(), 9

  mean(), 9

  new_theme, 12
  new_theme(), 17

  outlier(), 7

  par(), 7

  quantile(), 9

  scplot, 12
  scplot(), 3–11, 13–17, 19–21
  scplot-package, 2