Package 'swimplot'

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Title Tools for Creating Swimmers Plots using 'ggplot2'

Description Used for creating swimmers plots with functions to customize the bars, add points, add lines, add text, and add arrows.

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License GPL-3

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`ClinicalTrial.AE` *Clinical Trial: Adverse events*

Description

A dataset containing the adverse event information from a simulated clinical trial

Usage

```
ClinicalTrial.AE
```

Format

A data frame with 11 rows and 6 variables:

id Patient id

time Time of an adverse event (AE)

event Type of adverse event (AE)

Sex Patient Sex

Age Age of patient at trial entry date

Related Likelihood the treatment is related to the adverse event

---

`ClinicalTrial.Arm` *Clinical Trial: Treatment*

Description

A dataset containing the treatment arm information from a simulated clinical trial

Usage

```
ClinicalTrial.Arm
```

Format

A data frame with 53 rows and 6 variables:

id Patient id

Arm Treatment Arm

End_trt Time since enrollment to the end of treatment, in months

Continued_treatment Continued treatment past end of follow up

Sex Patient Sex

Age Age of patient at trial entry date

ClinicalTrial.Response *Clinical Trial: Response*

Description

A dataset containing the response information from a simulated clinical trial

Usage

```
ClinicalTrial.Response
```

Format

A data frame with 36 rows and 7 variables:

id Patient id

Response_start Time of starting response, in months since enrollment

Response_end Time of ending response, in months since enrollment

Response Type of response, CR = Complete response, and PR = Partial response

Continued_response Continued response past end of follow up

Sex Patient Sex

Age Age of patient at trial entry date

ClinicalTrial.Stage *Clinical Trial: Stage*

Description

A dataset containing the Stage information from a simulated clinical trial

Usage

```
ClinicalTrial.Stage
```

Format

A data frame with 36 rows and 2 variables:

id Patient id

Stage Patients clinical stage at enrollment of the study (either Early Stage or Late Stage)

line_df_to_point_df *Formats a dataframe of line to add points*

Description

This function formats a dataframe; used with swimmer_lines

Usage

```
line_df_to_point_df(df_lines, start = "start", end = "end", cont = NULL)
```

Arguments

df_lines	a dataframe
start	start column name
end	end column name
cont	continue column name

Value

a dataframe in a format for adding points to a swimmers plot

swimmer_arrows *Adding arrows to a swimmers plot*

Description

This function allows you to add arrows to a swimmers plot created with swimmer_plot

Usage

```
swimmer_arrows(
  df_arrows,
  id = "id",
  arrow_start = "end",
  cont = NULL,
  adj.y = 0,
  name_col = NULL,
  arrow_positions = c(0.1, 1),
  angle = 30,
  length = 0.1,
  type = "closed",
  ...
)
```

Arguments

df_arrows	a data frame
id	column name for id, default is 'id'
arrow_start	column name with the arrow locations default is "end"
cont	a column name including an indicator of which ids have an arrow (NA is no arrow); when NULL will use all use all of df_arrows
adj.y	amount to adjust the line within the box vertically (default is 0, line is in the centre of each bar)
name_col	a column name to map the arrow colour
arrow_positions	a vector of the distance from the arrow start to end, default is c(0.1,1)
angle	the angle of the arrow head in degrees (smaller numbers produce narrower, pointier arrows). Essentially describes the width of the arrow head. Default is 30
length	a unit specifying the length of the arrow head (from tip to base in inches (default is 0.1)'
type	one of "open" or "closed" indicating whether the arrow head should be a closed triangle. Default is 'closed'
...	additional geom_segment() arguments

Value

a swimmer plot with arrows

See Also

swimmer_plot swimmer_points swimmer_lines swimmer_lines swimmer_points_from_lines swimmer_text

Examples

```
#Mapping the arrows to the bars



swim_plot <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order
= 'Arm')



swim_plot_with_arrows <- swim_plot+
swimmer_arrows(df_arrows=ClinicalTrial.Arm,id='id',arrow_start='End_trt',
cont = 'Continued_treatment',name_col='Arm',show.legend = FALSE,type =
"open",cex=1.25)
```

```
 swim_plot_with_arrows+
ggplot2::scale_color_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"),drop=FALSE)+
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab('Time (Days)')




#Mapping the arrows to lines

#Start with a base swimmer plot with lines and points


swim_plot <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order
= 'Arm')+ swimmer_lines(df_lines=ClinicalTrial.Response,id='id',start =
'Response_start',end='Response_end',name_col='Response',size=3)+
swimmer_points_from_lines(df_lines=ClinicalTrial.Response,id='id',start =
'Response_start',end = 'Response_end',cont =
'Continued_response',name_col='Response',size=4)


# Then add arrows to the plot

  swim_plot_with_arrows <- swim_plot+
swimmer_arrows(df_arrows=ClinicalTrial.Response,id='id',arrow_start='Response_end',
cont = 'Continued_response',name_col='Response',show.legend = FALSE,type =
"open",cex=1.25)


# Add ggplot layers to improve the plot's aesthetic

swim_plot_with_arrows+
ggplot2::scale_color_manual(name="Response",values=c("grey20","grey80"))+
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab('Time (Days)')+
ggplot2::guides(fill = ggplot2::guide_legend(override.aes = list(shape =
NA)))+
ggplot2::scale_shape_manual(name='',values=c(17,15),breaks =
c('Response_start','Response_end'),labels=c('Response Start','Response End'))
```

`swimmer_lines` *Adding lines to a swimmers plot*

Description

This function allows you to add lines to a swimmers plot created with swimmer_plot

Usage

```
swimmer_lines(
  df_lines,
  id = "id",
  start = "start",
  end = "end",
  adj.y = 0,
  name_linetype = NULL,
  name_col = NULL,
  name_size = NULL,
  name_alpha = NULL,
  ...
)
```

Arguments

df_lines	a data frame
id	column name for id, default is 'id'
start	column name with the line start locations
end	column name with the line end locations
adj.y	amount to adjust the line within the box vertically (default is 0, line is in the centre of each bar)
name_linetype	a column name to map the line type
name_col	a column name to map the line colour
name_size	a column name to map the line size
name_alpha	a column name to map the line transparency
...	additional geom_segment() arguments

Value

a swimmer plot with lines

See Also

swimmer_plot swimmer_points swimmer_lines swimmer_points_from_lines swimmer_arrows swimmer_text

Examples

```
#Start with a base swimmer plot
swim_plot <-
```

```
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')


# Then add lines to the plot

swim_plot_with_lines <- swim_plot +
swimmer_lines(df_lines=ClinicalTrial.Response,id='id',start =
'Response_start',end='Response_end',name_col='Response',size=3)


# Add ggplot layers to improve the plot's aesthetic

swim_plot_with_lines +
ggplot2::scale_color_manual(name="Response",values=c("grey20","grey80"))+
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab('Time (Days)')
```

---

swimmer_plot *Creating the base of a swimmers plot*

Description

This function allows you to create swimmers plots with bars, includes options to have the bars change colours and create stratified plots

Usage

```
swimmer_plot(
  df,
  id = "id",
  end = "end",
  start = "start",
  name_fill = NULL,
  name_col = NULL,
  name_alpha = NULL,
  increasing = TRUE,
  id_order = NULL,
  stratify = FALSE,
  base_size = 11,
  identifiers = TRUE,
  ...
)
```

Arguments

df	a data frame
id	column name for id, default is 'id'

end	column name with the bar lengths (or bar end positions if bars change colour), default is 'end'
start	column name with the bar start positions (only required when there are gaps between sections of bars, or bars which do not start at zero), default is 'start'
name_fill	a column name to map the bar fill
name_col	a column name to map the bar colour
name_alpha	a column name to map the bar transparency
increasing	Binary to specify bars in increasing order (Default is TRUE)
id_order	order of the bars by id, can input a column name to sort by, or the ids in order.
stratify	a list of column names to stratify by
base_size	the base size for the plot, default is 11
identifiers	Binary to specify patient identifiers are included in the y axis (default is TRUE)
...	additional geom_col() arguments

Value

a swimmer plot with bars

See Also

swimmer_points swimmer_lines swimmer_lines swimmer_points_from_lines swimmer_arrows swimmer_text

Examples

```
swim_plot <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')

# Add ggplot layers to improve the plot's aesthetic

swim_plot +
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab('Time (Days)')



#Example with Stratification

swim_plot_stratify <- swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',
col="black",alpha=0.75,width=.8,base_size = 18,stratify= c('Age','Sex'))

swim_plot_stratify +
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab('Time (Days)')
```

```
#Example when there are gaps between the bars and bars do not start at zero

#Both a start and end time need to be specified when there are gaps between sections of bars

Gap_data <- data.frame(patient_ID=c('ID:3','ID:1','ID:1','ID:1','ID:2',
                                    'ID:2','ID:2','ID:3','ID:3','ID:2'),
                       start=c(10,1,2,7,2,10,14,5,0,22),
                       end=c(20,2,4,10,7,14,22,7,3,26),
                       treatment=c("A","B","C","A","A","C","A","B","C",NA))

swimmer_plot(df=Gap_data,id='patient_ID',name_fill="treatment",col=1,identifiers=FALSE,
id_order = c('ID:1','ID:2','ID:3')) +
ggplot2::theme_bw()+ggplot2::scale_fill_manual(name="Treatment",
values=c("A"="#e41a1c", "B"="#377eb8","C"="#4daf4a",na.value=NA),breaks=c("A","B","C"))+
 ggplot2::scale_y_continuous(breaks=c(0:26))
```

`swimmer_points` *Adding points to a swimmers plot*

Description

This function allows you to add points to a swimmers plot created with `swimmer_plot`

Usage

```
swimmer_points(
  df_points,
  id = "id",
  time = "time",
  adj.y = 0,
  name_shape = NULL,
  name_col = NULL,
  name_size = NULL,
  name_fill = NULL,
  name_stroke = NULL,
  name_alpha = NULL,
  ...
)
```

Arguments

`df_points`	a data frame
`id`	column name for id, default is 'id'
`time`	column name with the point locations
`adj.y`	amount to adjust the point within the box vertically (default is 0, point is in the centre of each bar)

name_shape	a column name to map the point shape
name_col	a column name to map the point colour
name_size	a column name to map the point size
name_fill	a column name to map the point fill
name_stroke	a column name to map the point stroke
name_alpha	a column name to map the point transparency
...	additional geom_point() arguments

Value

a swimmer plot with points

See Also

swimmer_plot swimmer_lines swimmer_lines swimmer_points_from_lines swimmer_arrows swimmer_text

Examples

```
#Start with a base swimmer plot

swim_plot <-
 swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')


# Then add points to the plot

swim_plot_with_points <- swim_plot + swimmer_points(df_points=
ClinicalTrial.AE,id='id',time='time',name_shape =
'event',size=3,fill='white',col='black')



# Add ggplot layers to improve the plot's aesthetic

swim_plot_with_points + ggplot2::scale_shape_manual(name="Adverse
event",values=c(21,24,17),breaks=c('AE','SAE','Death'))+
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab('Time (Days)')



##Another example with the colour and shape mapped to different columns

#Start with a base swimmer plot

swim_plot <-
```

```
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')


swim_plot +
 swimmer_points(df_points=ClinicalTrial.AE,id='id',time='time',name_shape =
                'event',fill='white',name_col = 'Related',size=5)+
 ggplot2::scale_shape_manual(name="Adverse event",values=c(16,17,18),breaks=c('AE','SAE','Death'))+
 ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
 ggplot2::ylab('Time (Days)') +
 ggplot2::scale_color_manual(name="Likelihood related to treatment",values=c(1,'grey52','grey90'))
```

`swimmer_points_from_lines` *Adding points to a swimmers plot which match up with lines*

Description

This function will create points at the beginning and end of line to match with `swimmer_lines`.

Usage

```
swimmer_points_from_lines(
  df_lines,
  id = "id",
  start = "start",
  end = "end",
  cont = NULL,
  adj.y = 0,
  name_shape = "type",
  name_col = NULL,
  name_size = NULL,
  name_fill = NULL,
  name_stroke = NULL,
  name_alpha = NULL,
  ...
)
```

Arguments

`df_lines`	a data frame
`id`	column name for id, default is 'id'
`start`	column name where the line starts, default is 'start'
`end`	column name where the line ends, default is 'end'

cont	a column name of which lines continue (NA is does not continue) these will not have a point at the end of the line
adj.y	amount to adjust the point within the box vertically (default is 0, point is in the centre of each bar)
name_shape	a column name to map the point shape
name_col	a column name to map the point colour
name_size	a column name to map the point size
name_fill	a column name to map the point fill
name_stroke	a column name to map the point stroke
name_alpha	a column name to map the point transparency
...	additional geom_point() arguments

Value

a swimmer plot with points matching the lines

See Also

swimmer_plot swimmer_points swimmer_lines swimmer_lines swimmer_arrows swimmer_text

Examples

```
#Start with a base swimmer plot


swim_plot <-swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black"
,id_order= 'Arm')


# Then add lines to the plot

swim_plot_with_lines <- swim_plot +
swimmer_lines(df_lines=ClinicalTrial.Response,id='id',start =
'Response_start',end='Response_end',name_col='Response',size=3)

# Add points to the start and end of the lines

swim_plot_with_lines_and_points <- swim_plot_with_lines+
swimmer_points_from_lines(df_lines=ClinicalTrial.Response,id='id',start =
'Response_start',end = 'Response_end', cont =
'Continued_response',name_col='Response',size=4)

# Add ggplot layers to improve the plot's aesthetic

swim_plot_with_lines_and_points +
ggplot2::scale_color_manual(name="Response",values=c("grey20","grey80"))+
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
```

```
ggplot2::ylab('Time (Days)')+
ggplot2::guides(fill = ggplot2::guide_legend(override.aes = list(shape =
NA)))+
ggplot2::scale_shape_manual(name='',values=c(17,15),breaks =
c('Response_start','Response_end'),labels=c('Response Start','Response End'))
```

`swimmer_text` *Adding text to a swimmers plot*

Description

This function allows you to add text to a swimmers plot created with `swimmer_plot`

Usage

```
swimmer_text(
  df_text,
  id = "id",
  start = "start",
  label = "label",
  name_col = NULL,
  name_size = NULL,
  name_alpha = NULL,
  name_fontface = NULL,
  adj.y = 0,
  adj.x = 0,
  ...
)
```

Arguments

`df_text`	a data frame
`id`	column name for id, default is 'id'
`start`	column name with the text start locations (if there is no start column will default 0 for all text)
`label`	a column with the text to be added to the plot
`name_col`	a column name to map the text colour
`name_size`	a column name to map the text size
`name_alpha`	a column name to map the text transparency
`name_fontface`	a column name to map the text fontface ("plain", "bold", "italic", "bold.italic" can all be used)
`adj.y`	amount to adjust the text within the box vertically (default is 0, text is in the centre of each bar)
`adj.x`	amount to adjust the text within the box horizontally (default is 0, text starts at the origin)
`...`	additional geom_text() arguments

Value

a swimmer plot with text on the bars

See Also

swimmer_plot swimmer_points swimmer_lines swimmer_points_from_lines swimmer_arrows

Examples

```
#Start with a base swimmer plot

swim_plot <-
 swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',
 name_fill='Arm',col="black",id_order='Arm',alpha=0.6)


# Then add text to the plot



swim_plot_with_text <- swim_plot +   swimmer_text(df_text =
ClinicalTrial.Stage,label = 'Stage',size=3,
fontface=ifelse(ClinicalTrial.Stage$Stage=="Early Stage","bold","plain"))


# Add ggplot layers to improve the plot's aesthetic

swim_plot_with_text +
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab('Time (Days)')
```

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