Package ‘nflplotR’

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Description

In conjunction with the `ggplot2::theme` system, the following `element_` functions enable images in non-data components of the plot, e.g. axis text.

- `element_nfl_logo()`: draws NFL team logos instead of their abbreviations.
- `element_nfl_wordmark()`: draws NFL team wordmarks instead of their abbreviations.
- `element_nfl_headshot()`: draws NFL player headshots instead of their GSIS IDs.
- `element_path()`: draws images from valid image URLs instead of the URL.

Usage

```r
element_nfl_logo(
  alpha = NULL,
  colour = NA,
  hjust = NULL,
  vjust = NULL,
  color = NULL,
  size = 0.5
)
```

```r
element_nfl_wordmark(
  alpha = NULL,
  colour = NA,
  hjust = NULL,
  vjust = NULL,
  color = NULL,
  size = 0.5
)
```

```r
element_nfl_headshot(
  alpha = NULL,
  colour = NA,
  hjust = NULL,
  vjust = NULL,
  color = NULL,
  size = 0.5
)
```
element

colour = NA,
hjust = NULL,
vjust = NULL,
color = NULL,
size = 0.5
)

element_path(
    alpha = NULL,
    colour = NA,
hjust = NULL,
vjust = NULL,
color = NULL,
size = 0.5
)

Arguments

alpha The alpha channel, i.e. transparency level, as a numerical value between 0 and 1.
colour, color The image will be colorized with this color. Use the special character "b/w" to set it to black and white. For more information on valid color names in ggplot2 see https://ggplot2.tidyverse.org/articles/ggplot2-specs.html?q=colour#colour-and-fill.
hjust, vjust The horizontal and vertical adjustment respectively. Must be a numerical value between 0 and 1.
size The output grob size in cm (!).

Details

The elements translate NFL team abbreviations or NFL player GSIS IDs into logo images or player headshots, respectively.

Value

An S3 object of class element.

See Also

geom_nfl_logos(), geom_nfl_headshots(), geom_nfl_wordmarks(), and geom_from_path() for more information on valid team abbreviations, player IDs, and other parameters.

Examples

library(nflplotR)
library(ggplot2)
team_abbr <- valid_team_names()
# remove conference logos from this example
team_abbr <- team_abbr[!team_abbr %in% c("AFC", "NFC", "NFL")]

df <- data.frame(
    random_value = runif(length(team_abbr), 0, 1),
    teams = team_abbr
)

# use logos for x-axis
ggplot(df, aes(x = teams, y = random_value)) +
    geom_col(aes(color = teams, fill = teams), width = 0.5) +
    scale_color_nfl(type = "secondary") +
    scale_fill_nfl(alpha = 0.4) +
    theme_minimal() +
    theme(axis.text.x = element_nfl_logo())

# use logos for y-axis
ggplot(df, aes(y = teams, x = random_value)) +
    geom_col(aes(color = teams, fill = teams), width = 0.5) +
    scale_color_nfl(type = "secondary") +
    scale_fill_nfl(alpha = 0.4) +
    theme_minimal() +
    theme(axis.text.y = element_nfl_logo())

#############################################################################
# Headshot Examples
#############################################################################
library(nflplotR)
library(ggplot2)

# Silence an nflreadr message that is irrelevant here
old <- options(nflreadr.cache_warning = FALSE)

dfh <- data.frame(
    random_value = runif(9, 0, 1),
    player_gsis = c("00-0033873",
                     "00-0026498",
                     "00-0035228",
                     "00-0031237",
                     "00-0036355",
                     "00-0019596",
                     "00-0033077",
                     "00-0012345",
                     "00-0031280")
)

# use headshots for x-axis
ggplot(dfh, aes(x = player_gsis, y = random_value)) +
    geom_col(width = 0.5) +
    theme_minimal() +
    theme(axis.text.x = element_nfl_headshot())

# use headshots for y-axis
# Restore old options
options(old)

---

## Description

This geom is used to plot NFL images instead of points in a ggplot. It requires x, y aesthetics as well as a path.

## Usage

```r
geom_from_path(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  ...
)
```

## Arguments

- **mapping**: Set of aesthetic mappings created by `aes()` or `aes_()`. If specified and `inherit.aes = TRUE` (the default), it is combined with the default mapping at the top level of the plot. You must supply `mapping` if there is no plot mapping.
- **data**: The data to be displayed in this layer. There are three options:
  - If `NULL`, the default, the data is inherited from the plot data as specified in the call to `ggplot()`.
  - A `data.frame`, or other object, will override the plot data. All objects will be fortified to produce a data frame. See `fortify()` for which variables will be created.
  - A function will be called with a single argument, the plot data. The return value must be a `data.frame`, and will be used as the layer data. A function can be created from a formula (e.g. `head(.x,10)`).
- **stat**: The statistical transformation to use on the data for this layer, as a string.
- **position**: Position adjustment, either as a string, or the result of a call to a position adjustment function.
Other arguments passed on to `ggplot2::layer()`. These are often aesthetics, used to set an aesthetic to a fixed value. See the below section "Aesthetics" for a full list of possible arguments.

**na.rm**
If FALSE, the default, missing values are removed with a warning. If TRUE, missing values are silently removed.

**show.legend**
logical. Should this layer be included in the legends? NA, the default, includes if any aesthetics are mapped. FALSE never includes, and TRUE always includes. It can also be a named logical vector to finely select the aesthetics to display.

**inherit.aes**
If FALSE, overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn’t inherit behaviour from the default plot specification, e.g. `borders()`.

### Value

A ggplot2 layer (`ggplot2::layer()`) that can be added to a plot created with `ggplot2::ggplot()`.

### Aesthetics

`geom_nfl_logos()` understands the following aesthetics (required aesthetics are in bold):

- **x** - The x-coordinate.
- **y** - The y-coordinate.
- **path** - a file path, url, raster object or bitmap array. See `magick::image_read()` for further information.
- **alpha = NULL** - The alpha channel, i.e. transparency level, as a numerical value between 0 and 1.
- **colour = NULL** - The image will be colorized with this colour. Use the special character "b/w" to set it to black and white. For more information on valid colour names in ggplot2 see [https://ggplot2.tidyverse.org/articles/ggplot2-specs.html?q=colour#colour-and-fill](https://ggplot2.tidyverse.org/articles/ggplot2-specs.html?q=colour#colour-and-fill)
- **angle = 0** - The angle of the image as a numerical value between 0° and 360°.
- **hjust = 0.5** - The horizontal adjustment relative to the given x coordinate. Must be a numerical value between 0 and 1.
- **vjust = 0.5** - The vertical adjustment relative to the given y coordinate. Must be a numerical value between 0 and 1.
- **width = 1.0** - The desired width of the image innpc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is width = 0.1 (see below examples).
- **height = 1.0** - The desired height of the image innpc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is height = 0.1 (see below examples).
**geom_lines**

**ggplot2 Layer for Horizontal and Vertical Reference Lines**

**Description**

These geoms can be used to draw horizontal or vertical reference lines in a ggplot. They use the data in the aesthetics `v_var` and `h_var` to compute their median or mean and draw the as a line.

```r
library(ggplot2)
library(nflplotR)

# create x-y-coordinates of a pentagon and add nflverse logo urls
df <- data.frame(
a = c(sin(2 * pi * (0:4) / 5), 0),
b = c(cos(2 * pi * (0:4) / 5), 0),
url = c(
  "https://github.com/nflverse/nflfastR/raw/master/man/figures/logo.png",
  "https://github.com/nflverse/nflseedR/raw/master/man/figures/logo.png",
  "https://github.com/nflverse/nflverse/raw/main/man/figures/logo.png"
)
)

# plot images directly from url
ggplot(df, aes(x = a, y = b)) +
  geom_from_path(aes(path = url), width = 0.15) +
  coord_cartesian(xlim = c(-2, 2), ylim = c(-1.3, 1.5)) +
  theme_void()

# plot images directly from url and apply transparency
ggplot(df, aes(x = a, y = b)) +
  geom_from_path(aes(path = url), width = 0.15, alpha = 0.5) +
  coord_cartesian(xlim = c(-2, 2), ylim = c(-1.3, 1.5)) +
  theme_void()

# It is also possible and recommended to use the underlying Geom inside a
# ggplot2 annotation
ggplot() +
  annotate(
    nflplotR::GeomFromPath,
    x = 0,
    y = 0,
    width = 0.4
  ) +
  theme_minimal()
```
Usage

geom_median_lines(
  mapping = NULL,
  data = NULL,
  ..., 
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE
)

geom_mean_lines(
  mapping = NULL,
  data = NULL,
  ..., 
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE
)

Arguments

mapping Set of aesthetic mappings created by aes() or aes_().
data The data to be displayed in this layer. There are three options:
  If NULL, the default, the data is inherited from the plot data as specified in the
call to ggplot().
  A data.frame, or other object, will override the plot data. All objects will be
  fortified to produce a data frame. See fortify() for which variables will be
  created.
  A function will be called with a single argument, the plot data. The return
  value must be a data.frame, and will be used as the layer data. A function
  can be created from a formula (e.g. ~ head(.x,10)).
...
  Other arguments passed on to layer(). These are often aesthetics, used to set
  an aesthetic to a fixed value, like colour = "red" or size = 3. They may also
  be parameters to the paired geom/stat.
na.rm If FALSE, the default, missing values are removed with a warning. If TRUE,
  missing values are silently removed.
show.legend logical. Should this layer be included in the legends? NA, the default, includes if
  any aesthetics are mapped. FALSE never includes, and TRUE always includes. It
  can also be a named logical vector to finely select the aesthetics to display.
inherit.aes If FALSE, overrides the default aesthetics, rather than combining with them.
  This is most useful for helper functions that define both data and aesthetics and
  shouldn’t inherit behavior from the default plot specification.

Value

A ggplot2 layer (ggplot2::layer()) that can be added to a plot created with ggplot2::ggplot().
Aesthetics

`geom_median_lines()` and `geom_mean_lines()` understand the following aesthetics (at least one of the bold aesthetics is required):

- **v_var** - The variable for which to compute the median/mean that is drawn as vertical line.
- **h_var** - The variable for which to compute the median/mean that is drawn as horizontal line.
- **alpha = NA** - The alpha channel, i.e. transparency level, as a numerical value between 0 and 1.
- **color = "red"** - The color of the drawn lines.
- **linetype = 2** - The linetype of the drawn lines.
- **size = 0.5** - The size of the drawn lines.

See Also

The underlying ggplot2 geoms `geom_hline()` and `geom_vline()`

Examples

```r
library(nflplotR)
library(ggplot2)

# inherit top level aesthetics
ggplot(mtcars, aes(x = disp, y = mpg, h_var = mpg, v_var = disp)) +
  geom_point() +
  geom_median_lines() +
  geom_mean_lines(color = "blue") +
  theme_minimal()

# draw horizontal line only
ggplot(mtcars, aes(x = disp, y = mpg, h_var = mpg)) +
  geom_point() +
  geom_median_lines() +
  geom_mean_lines(color = "blue") +
  theme_minimal()

# draw vertical line only
ggplot(mtcars, aes(x = disp, y = mpg, v_var = disp)) +
  geom_point() +
  geom_median_lines() +
  geom_mean_lines(color = "blue") +
  theme_minimal()

# choose your own value
ggplot(mtcars, aes(x = disp, y = mpg)) +
  geom_point() +
  geom_median_lines(v_var = 400, h_var = 15) +
  geom_mean_lines(v_var = 150, h_var = 30, color = "blue") +
  theme_minimal()
```
Description

This geom is used to plot NFL player headshots instead of points in a ggplot. It requires x, y aesthetics as well as a valid NFL player gsis id.

Usage

```r
geom_nfl_headshots(
    mapping = NULL,
    data = NULL,
    stat = "identity",
    position = "identity",
    ...,
    na.rm = FALSE,
    show.legend = FALSE,
    inherit.aes = TRUE
)
```

Arguments

- **mapping**: Set of aesthetic mappings created by `aes()` or `aes_()`. If specified and `inherit.aes = TRUE` (the default), it is combined with the default mapping at the top level of the plot. You must supply `mapping` if there is no plot mapping.
- **data**: The data to be displayed in this layer. There are three options:
  - If `NULL`, the default, the data is inherited from the plot data as specified in the call to `ggplot()`.
  - A `data.frame`, or other object, will override the plot data. All objects will be fortified to produce a data frame. See `fortify()` for which variables will be created.
  - A function will be called with a single argument, the plot data. The return value must be a `data.frame`, and will be used as the layer data. A function can be created from a formula (e.g. `~ head(.x, 10)`).
- **stat**: The statistical transformation to use on the data for this layer, as a string.
- **position**: Position adjustment, either as a string, or the result of a call to a position adjustment function.
- **...**: Other arguments passed on to `ggplot2::layer()`. These are often aesthetics, used to set an aesthetic to a fixed value. See the below section "Aesthetics" for a full list of possible arguments.
- **na.rm**: If FALSE, the default, missing values are removed with a warning. If TRUE, missing values are silently removed.
show.legend logical. Should this layer be included in the legends? NA, the default, includes if any aesthetics are mapped. FALSE never includes, and TRUE always includes. It can also be a named logical vector to finely select the aesthetics to display.

inherit.aes If FALSE, overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn’t inherit behaviour from the default plot specification, e.g. borders().

Value

A ggplot2 layer (ggplot2::layer()) that can be added to a plot created with ggplot2::ggplot().

Aesthetics

geom_nfl_headshots() understands the following aesthetics (required aesthetics are in bold):

- **x** - The x-coordinate.
- **y** - The y-coordinate.
- **player_gsis** - The players’ NFL gsis id.
- **alpha = NULL** - The alpha channel, i.e. transparency level, as a numerical value between 0 and 1.
- **colour = NULL** - The image will be colorized with this colour. Use the special character "b/w" to set it to black and white. For more information on valid colour names in ggplot2 see https://ggplot2.tidyverse.org/articles/ggplot2-specs.html?q=colour#colour-and-fill
- **angle = 0** - The angle of the image as a numerical value between 0° and 360°.
- **hjust = 0.5** - The horizontal adjustment relative to the given x coordinate. Must be a numerical value between 0 and 1.
- **vjust = 0.5** - The vertical adjustment relative to the given y coordinate. Must be a numerical value between 0 and 1.
- **width = 1.0** - The desired width of the image in npc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is width = 0.075 (see below examples).
- **height = 1.0** - The desired height of the image in npc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is height = 0.1 (see below examples).

Examples

library(nflplotR)
library(ggplot2)
# Silence an nflreadr message that is irrelevant here
old <- options(nflreadr.cache_warning = FALSE)

df <- data.frame(
    a = rep(1:3, 3),
    b = sort(rep(1:3, 3), decreasing = TRUE),
)
player_gsis = c("00-0033873",
            "00-0026498",
            "00-0035228",
            "00-0031237",
            "00-0036355",
            "00-0019596",
            "00-0033077",
            "00-0012345",
            "00-0031280"),
player_name = c("P.Mahomes",
            "M.Stafford",
            "K.Murray",
            "T.Bridgewater",
            "J.Herbert",
            "T.Brady",
            "D.Prescott",
            "Non.Match",
            "D.Carr")
)

# set a custom fill colour for one player
df$colour <- ifelse(df$a == 2 & df$b == 2, NA, "b/w")

# scatterplot of the headshots
ggplot(df, aes(x = a, y = b)) +
  geom_nfl_headshots(aes(player_gsis = player_gsis), height = 0.2) +
  geom_label(aes(label = player_name), nudge_y = -0.35, alpha = 0.5) +
  coord_cartesian(xlim = c(0.75, 3.25), ylim = c(0.7, 3.25)) +
  theme_void()

# apply alpha as constant
ggplot(df, aes(x = a, y = b)) +
  geom_nfl_headshots(aes(player_gsis = player_gsis), height = 0.2, alpha = 0.5) +
  geom_label(aes(label = player_name), nudge_y = -0.35, alpha = 0.5) +
  coord_cartesian(xlim = c(0.75, 3.25), ylim = c(0.7, 3.25)) +
  theme_void()

# apply colour as an aesthetic
ggplot(df, aes(x = a, y = b)) +
  geom_nfl_headshots(aes(player_gsis = player_gsis, colour = colour), height = 0.2) +
  geom_label(aes(label = player_name), nudge_y = -0.35, alpha = 0.5) +
  coord_cartesian(xlim = c(0.75, 3.25), ylim = c(0.7, 3.25)) +
  scale_colour_identity() +
  theme_void()

# Restore old options
options(old)
**Description**

This geom is used to plot NFL team and conference logos instead of points in a ggplot. It requires x, y aesthetics as well as a valid NFL team abbreviation. The latter can be checked with `valid_team_names()`.

**Usage**

```r
geom_nfl_logos(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  ..., 
  na.rm = FALSE,
  show.legend = FALSE,
  inherit.aes = TRUE
)
```

**Arguments**

- **mapping**: Set of aesthetic mappings created by `aes()` or `aes()`. If specified and `inherit.aes` = TRUE (the default), it is combined with the default mapping at the top level of the plot. You must supply mapping if there is no plot mapping.

- **data**: The data to be displayed in this layer. There are three options:
  - If NULL, the default, the data is inherited from the plot data as specified in the call to `ggplot()`.
  - A data.frame, or other object, will override the plot data. All objects will be fortified to produce a data frame. See `fortify()` for which variables will be created.
  - A function will be called with a single argument, the plot data. The return value must be a data.frame, and will be used as the layer data. A function can be created from a formula (e.g. `~ head(.x,10)`).

- **stat**: The statistical transformation to use on the data for this layer, as a string.

- **position**: Position adjustment, either as a string, or the result of a call to a position adjustment function.

- **...**: Other arguments passed on to `ggplot2::layer()`. These are often aesthetics, used to set an aesthetic to a fixed value. See the below section "Aesthetics" for a full list of possible arguments.

- **na.rm**: If FALSE, the default, missing values are removed with a warning. If TRUE, missing values are silently removed.

- **show.legend**: logical. Should this layer be included in the legends? NA, the default, includes if any aesthetics are mapped. FALSE never includes, and TRUE always includes. It can also be a named logical vector to finely select the aesthetics to display.

- **inherit.aes**: If FALSE, overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn’t inherit behaviour from the default plot specification, e.g. `borders()`.
Value

A ggplot2 layer (ggplot2::layer()) that can be added to a plot created with ggplot2::ggplot().

Aesthetics

geom_nfl_logos() understands the following aesthetics (required aesthetics are in bold):

- **x** - The x-coordinate.
- **y** - The y-coordinate.
- **team_abbr** - The team abbreviation. Should be one of valid_team_names(). The function tries to clean team names internally by calling nflreadr::clean_team_abbrs()
- **alpha = NULL** - The alpha channel, i.e. transparency level, as a numerical value between 0 and 1.
- **colour = NULL** - The image will be colorized with this colour. Use the special character "b/w" to set it to black and white. For more information on valid colour names in ggplot2 see https://ggplot2.tidyverse.org/articles/ggplot2-specs.html?q=colour#colour-and-fill
- **angle = 0** - The angle of the image as a numerical value between 0° and 360°.
- **hjust = 0.5** - The horizontal adjustment relative to the given x coordinate. Must be a numerical value between 0 and 1.
- **vjust = 0.5** - The vertical adjustment relative to the given y coordinate. Must be a numerical value between 0 and 1.
- **width = 1.0** - The desired width of the image in npc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is width = 0.075 (see below examples).
- **height = 1.0** - The desired height of the image in npc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is height = 0.1 (see below examples).

Examples

```r
library(nflplotR)
library(ggplot2)

team_abbr <- valid_team_names()
# remove conference logos from this example
team_abbr <- team_abbr[!team_abbr %in% c("AFC", "NFC", "NFL")]

df <- data.frame(  
a = rep(1:8, 4),
  b = sort(rep(1:4, 8), decreasing = TRUE),
  teams = team_abbr
)

# keep alpha == 1 for all teams including an "A"
matches <- grepl("A", team_abbr)
```

```r
```
```r
# apply alpha via an aesthetic from inside the dataset `df`
# please note that you have to add scale_alpha_identity() to use the alpha
# values in your dataset!
ggplot(df, aes(x = a, y = b)) +
  geom_nfl_logos(aes(team_abbr = teams, width = 0.075) +
  geom_label(aes(label = teams, nudge_y = -0.35, alpha = 0.5) +
  theme_void()

# apply alpha and colour via an aesthetic from inside the dataset `df`
# please note that you have to add scale_alpha_identity() as well as
# scale_color_identity() to use the alpha and colour values in your dataset!
ggplot(df, aes(x = a, y = b)) +
  geom_nfl_logos(aes(team_abbr = teams, width = 0.075) +
  geom_label(aes(label = teams, nudge_y = -0.35, alpha = 0.5) +
  scale_alpha_identity() +
  scale_color_identity() +
  theme_void()

# apply alpha as constant for all logos
ggplot(df, aes(x = a, y = b)) +
  geom_nfl_logos(aes(team_abbr = teams, width = 0.075, alpha = 0.6) +
  geom_label(aes(label = teams, nudge_y = -0.35, alpha = 0.5) +
  theme_void()

# it’s also possible to plot conference logos
conf <- data.frame(a = 1:2, b = 0, teams = c("AFC", "NFC"))
ggplot(conf, aes(x = a, y = b)) +
  geom_nfl_logos(aes(team_abbr = teams, width = 0.3) +
  geom_label(aes(label = teams, nudge_y = -0.4, alpha = 0.5) +
  coord_cartesian(xlim = c(0.5, 2.5), ylim = c(-0.75, .75)) +
  theme_void()
```

**Description**

This geom is used to plot NFL team wordmarks instead of points in a ggplot. It requires x, y aesthetics as well as a valid NFL team abbreviation. The latter can be checked with `valid_team_names()`. 

---

**geom_nfl_wordmarks**

This geom is used to plot NFL team wordmarks instead of points in a ggplot. It requires x, y aesthetics as well as a valid NFL team abbreviation. The latter can be checked with `valid_team_names()`. 

---

**ggplot2 Layer for Visualizing NFL Team Wordmarks**

This geom is used to plot NFL team wordmarks instead of points in a ggplot. It requires x, y aesthetics as well as a valid NFL team abbreviation. The latter can be checked with `valid_team_names()`. 

---

**Description**

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**geom_nfl_wordmarks**

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**ggplot2 Layer for Visualizing NFL Team Wordmarks**

This geom is used to plot NFL team wordmarks instead of points in a ggplot. It requires x, y aesthetics as well as a valid NFL team abbreviation. The latter can be checked with `valid_team_names()`. 

---

**Description**

This geom is used to plot NFL team wordmarks instead of points in a ggplot. It requires x, y aesthetics as well as a valid NFL team abbreviation. The latter can be checked with `valid_team_names()`.
Usage

geom_nfl_wordmarks(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  ..., 
  na.rm = FALSE,
  show.legend = FALSE,
  inherit.aes = TRUE
)

Arguments

mapping  Set of aesthetic mappings created by aes() or aes_(). If specified and inherit.aes = TRUE (the default), it is combined with the default mapping at the top level of the plot. You must supply mapping if there is no plot mapping.

data      The data to be displayed in this layer. There are three options:
            If NULL, the default, the data is inherited from the plot data as specified in the call to ggplot().
            A data.frame, or other object, will override the plot data. All objects will be fortified to produce a data frame. See fortify() for which variables will be created.
            A function will be called with a single argument, the plot data. The return value must be a data.frame, and will be used as the layer data. A function can be created from a formula (e.g. ~ head(.x,10)).

stat      The statistical transformation to use on the data for this layer, as a string.

position  Position adjustment, either as a string, or the result of a call to a position adjustment function.

...       Other arguments passed on to ggplot2::layer(). These are often aesthetics, used to set an aesthetic to a fixed value. See the below section "Aesthetics" for a full list of possible arguments.

na.rm     If FALSE, the default, missing values are removed with a warning. If TRUE, missing values are silently removed.

show.legend  logical. Should this layer be included in the legends? NA, the default, includes if any aesthetics are mapped. FALSE never includes, and TRUE always includes. It can also be a named logical vector to finely select the aesthetics to display.

inherit.aes  If FALSE, overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn’t inherit behaviour from the default plot specification, e.g. borders().

Value

A ggplot2 layer (ggplot2::layer()) that can be added to a plot created with ggplot2::ggplot().
Aesthetics

geom_nfl_wordmarks() understands the following aesthetics (required aesthetics are in bold):

- **x** - The x-coordinate.
- **y** - The y-coordinate.
- **team_abbr** - The team abbreviation. Should be one of valid_team_names(). The function tries to clean team names internally by calling nflreadr::clean_team_abbrs().
- **alpha = NULL** - The alpha channel, i.e. transparency level, as a numerical value between 0 and 1.
- **colour = NULL** - The image will be colorized with this colour. Use the special character "b/w" to set it to black and white. For more information on valid colour names in ggplot2 see https://ggplot2.tidyverse.org/articles/ggplot2-specs.html?q=colour#colour-and-fill
- **angle = 0** - The angle of the image as a numerical value between 0° and 360°.
- **hjust = 0.5** - The horizontal adjustment relative to the given x coordinate. Must be a numerical value between 0 and 1.
- **vjust = 0.5** - The vertical adjustment relative to the given y coordinate. Must be a numerical value between 0 and 1.
- **width = 1.0** - The desired width of the image in npc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is width = 0.1 (see below examples).
- **height = 1.0** - The desired height of the image in npc (Normalised Parent Coordinates). The default value is set to 1.0 which is big but it is necessary because all used values are computed relative to the default. A typical size is height = 0.1 (see below examples).

Examples

library(nflplotR)
library(ggplot2)

team_abbr <- valid_team_names()
# remove conference logos from this example
team_abbr <- team_abbr[!team_abbr %in% c("AFC","NFC","NFL")]

df <- data.frame(
  a = rep(1:8, 4),
  b = sort(rep(1:4, 8), decreasing = TRUE),
  teams = team_abbr
)

# keep alpha == 1 for all teams including an "A"
matches <- grepl("A", team_abbr)
df$alpha <- ifelse(matches, 1, 0.2)
# also set a custom fill colour for the non "A" teams
df$colour <- ifelse(matches, NA, "gray")

# scatterplot of all wordmarks
ggplot(df, aes(x = a, y = b)) +
  geom_nfl_wordmarks(aes(team_abbr = teams), width = 0.12) +
  geom_label(aes(label = teams), nudge_y = -0.20, alpha = 0.5) +
  scale_x_continuous(expand = expansion(add = 0.5)) +
  theme_void()

# apply alpha via an aesthetic from inside the dataset 'df'
# please note that you have to add scale_alpha_identity() to use the alpha
# values in your dataset!
 ggplot(df, aes(x = a, y = b)) +
  geom_nfl_wordmarks(aes(team_abbr = teams, alpha = alpha), width = 0.12) +
  geom_label(aes(label = teams), nudge_y = -0.20, alpha = 0.5) +
  scale_x_continuous(expand = expansion(add = 0.5)) +
  scale_alpha_identity() +
  theme_void()

# apply alpha and colour via an aesthetic from inside the dataset 'df'
# please note that you have to add scale_alpha_identity() as well as
# scale_color_identity() to use the alpha and colour values in your dataset!
 ggplot(df, aes(x = a, y = b)) +
  geom_nfl_wordmarks(aes(team_abbr = teams, alpha = alpha, colour = colour), width = 0.12) +
  geom_label(aes(label = teams), nudge_y = -0.20, alpha = 0.5) +
  scale_x_continuous(expand = expansion(add = 0.5)) +
  scale_alpha_identity() +
  scale_color_identity() +
  theme_void()

# apply alpha as constant for all logos
 ggplot(df, aes(x = a, y = b)) +
  geom_nfl_wordmarks(aes(team_abbr = teams), width = 0.12, alpha = 0.6) +
  geom_label(aes(label = teams), nudge_y = -0.20, alpha = 0.5) +
  scale_x_continuous(expand = expansion(add = 0.5)) +
  theme_void()

---

**ggpreview**

Preview ggplot in Specified Dimensions

**Description**

This function previews a ggplot in its actual dimensions in order to see how it will look when saved. It is also significantly faster than the default preview in RStudio for ggplots created using nflplotR.

**Usage**

```r
 ggpreview(
   plot = ggplot2::last_plot(),
   width = NA,
   height = NA,
)```
asp = NULL,
dpi = 300,
device = "png",
units = c("in", "cm", "mm", "px"),
scale = 1,
limitsize = TRUE,
bg = NULL,
...
)

**Arguments**

- **plot**  
  Plot to save, defaults to last plot displayed.

- **width**  
  Plot size in units ("in", "cm", "mm", or "px"). If not supplied, uses the size of current graphics device.

- **height**  
  Plot size in units ("in", "cm", "mm", or "px"). If not supplied, uses the size of current graphics device.

- **asp**  
  The aspect ratio of the plot calculated as width / height. If this is a numeric value (and not NULL) the height of the plot will be recalculated to height = width / asp.

- **dpi**  
  Plot resolution. Also accepts a string input: "retina" (320), "print" (300), or "screen" (72). Applies only to raster output types.

- **device**  
  Device to use. Can either be a device function (e.g. `png`), or one of "eps", "ps", "tex" (pictex), "pdf", "jpeg", "tiff", "png", "bmp", "svg" or "wmf" (windows only).

- **units**  
  Plot size in units ("in", "cm", "mm", or "px"). If not supplied, uses the size of current graphics device.

- **scale**  
  Multiplicative scaling factor.

- **limitsize**  
  When TRUE (the default), `ggsave()` will not save images larger than 50x50 inches, to prevent the common error of specifying dimensions in pixels.

- **bg**  
  Background colour. If NULL, uses the plot background fill value from the plot theme.

- **...**  
  Other arguments passed on to the graphics device function, as specified by `device`.

**Value**

No return value, called for side effects.

**Examples**

```r
library(nflplotR)
library(ggplot2)

team_abbr <- valid_team_names()
# remove conference logos from this example
```
```r
team_abbr <- team_abbr[!team_abbr %in% c("AFC", "NFC", "NFL")]

df <- data.frame(
    random_value = runif(length(team_abbr), 0, 1),
    teams = team_abbr
)

# use logos for x-axis
# note that the plot is assigned to the object "p"
p <- ggplot(df, aes(x = teams, y = random_value)) +
    geom_col(aes(color = teams, fill = teams), width = 0.5) +
    scale_color_nfl(type = "secondary") +
    scale_fill_nfl(alpha = 0.4) +
    theme_minimal() +
    theme(axis.text.x = element_nfl_logo())

# preview p with defined width and aspect ratio (only available in RStudio)
if (rstudioapi::isAvailable()){
    ggpreview(p, width = 5, asp = 16/9)
}
```

---

**nfl_team_tiers**  
Create NFL Team Tiers

**Description**

This function sets up a ggplot to visualize NFL team tiers.

**Usage**

```
nfl_team_tiers(
    data,  
    title = "NFL Team Tiers, 2021 as of Week 4",  
    subtitle = "created with the nflplotR Tiermaker",  
    caption = NULL,  
    tier_desc = c("1" = "Super Bowl", "2" = "Very Good", "3" = "Medium", "4" = "Bad", "5" = "What are they doing?", "6" = "", "7" = ""),  
    presort = FALSE,  
    alpha = 0.8,  
    width = 0.075,  
    no_line_below_tier = NULL,  
    devel = FALSE
)
```

**Arguments**

- **data**  
  A data frame that has to include the variables `tier_no` (the number of the tier starting from the top tier no. 1) and `team_abbr` (the team abbreviation). `team_abbr` should be one of `valid_team_names()` and the function tries to
clean team names internally by calling `nflreadr::clean_team_abbrs()`. If data includes the variable `tier_rank`, these ranks will be used within each tier. Otherwise, if `presort = FALSE`, the function will assume that data is already sorted and if `presort = TRUE`, teams will be sorted alphabetically within tiers.

**title**  
The title of the plot. If `NULL`, it will be omitted.

**subtitle**  
The subtitle of the plot. If `NULL`, it will be omitted.

**caption**  
The caption of the plot. If `NULL`, it will be omitted.

**tier_desc**  
A named vector consisting of the tier descriptions. The names must equal the tier numbers from `tier_no`.

**presort**  
If `FALSE` (the default) the function assumes that the teams are already sorted within the tiers. Will otherwise sort alphabetically.

**alpha**  
The alpha channel of the logos, i.e. transparency level, as a numerical value between 0 and 1.

**width**  
The desired width of the logo in `npc` (Normalised Parent Coordinates).

**no_line_below_tier**  
Vector of tier numbers. The function won’t draw tier separation lines below these tiers. This is intended to be used for tiers that shall be combined (see examples).

**devel**  
Determines if logos shall be rendered. If `FALSE` (the default), logos will be rendered on each run. If `TRUE` the team abbreviations will be plotted instead of the logos. This is much faster and helps with the plot development.

**Value**

A plot object created with `ggplot2::ggplot()`.

**Examples**

```r
library(ggplot2)
library(dplyr, warn.conflicts = FALSE)
teams <- valid_team_names()
# remove conference logos from this example
teams <- teams[!teams %in% c("AFC", "NFC", "NFL")]

# Build the team tiers data frame
# This is completely random!
df <- data.frame(
  tier_no = sample(1:5, length(teams), replace = TRUE),
  team_abbr = teams
) %>%
dplyr::group_by(tier_no) %>%
dplyr::mutate(tier_rank = sample(1:n(), n()))

# Plot team tiers
nfl_team_tiers(df)

# Create a combined tier which is useful for tiers with lots of teams that
```
# should be split up in two or more rows. This is done by setting an empty
# string for the tier 5 description and removing the tier separation line
# below tier number 4.
# This example also shows how to turn off the subtitle and add a caption
nfl_team_tiers(df, 
  subtitle = NULL, 
  caption = "This is the caption", 
  tier_desc = c("1" = "Super Bowl", 
                "2" = "Very Good", 
                "3" = "Medium", 
                "4" = "A Combined Tier", 
                "5" = ""), 
  no_line_below_tier = 4)

# For the development of the tiers, it can be useful to turn off logo image
# rendering as this can take quite a long time. By setting 'devel = TRUE', the
# logo images are replaced by team abbreviations which is much faster
nfl_team_tiers(df, 
  tier_desc = c("1" = "Super Bowl", 
                "2" = "Very Good", 
                "3" = "", 
                "4" = "A Combined Tier", 
                "5" = ""), 
  no_line_below_tier = c(2, 4), 
  devel = TRUE)

---

**scale_axes_nfl**  
**Axis Scales for NFL Team Logos**

**Description**

These functions map NFL team names to their team logos and make them available as axis labels

**Usage**

```r
scale_x_nfl(
  ..., 
  expand = ggplot2::waiver(), 
  guide = ggplot2::waiver(), 
  position = "bottom", 
  size = 12
)
```

```r
scale_y_nfl(
  ..., 
  expand = ggplot2::waiver(), 
  guide = ggplot2::waiver(), 
  position = "left",
```


```r
size = 12
)

scale_x_nfl_headshots(
  ..., expand = ggplot2::waiver(),
  guide = ggplot2::waiver(),
  position = "bottom",
  size = 20
)

scale_y_nfl_headshots(
  ..., expand = ggplot2::waiver(),
  guide = ggplot2::waiver(),
  position = "left",
  size = 30
)
```

### Arguments

... Arguments passed on to `discrete_scale`

- **palette** A palette function that when called with a single integer argument (the number of levels in the scale) returns the values that they should take (e.g., `scales::hue_pal()`).

- **breaks** One of:
  - NULL for no breaks
  - waiver() for the default breaks (the scale limits)
  - A character vector of breaks
  - A function that takes the limits as input and returns breaks as output.
    Also accepts rlang lambda function notation.

- **limits** One of:
  - NULL to use the default scale values
  - A character vector that defines possible values of the scale and their order
  - A function that accepts the existing (automatic) values and returns new ones. Also accepts rlang lambda function notation.

- **drop** Should unused factor levels be omitted from the scale? The default, TRUE, uses the levels that appear in the data; FALSE uses all the levels in the factor.

- **na.translate** Unlike continuous scales, discrete scales can easily show missing values, and do so by default. If you want to remove missing values from a discrete scale, specify `na.translate = FALSE`.

- **na.value** If `na.translate = TRUE`, what aesthetic value should the missing values be displayed as? Does not apply to position scales where NA is always placed at the far right.

- **aesthetics** The names of the aesthetics that this scale works with.
scale_name  The name of the scale that should be used for error messages associated with this scale.
name  The name of the scale. Used as the axis or legend title. If waiver(), the default, the name of the scale is taken from the first mapping used for that aesthetic. If NULL, the legend title will be omitted.
labels  One of:
  • NULL  for no labels
  • waiver()  for the default labels computed by the transformation object
  • A character vector giving labels (must be same length as breaks)
  • A function that takes the breaks as input and returns labels as output.
    Also accepts rlang lambda function notation.
super  The super class to use for the constructed scale
expand  For position scales, a vector of range expansion constants used to add some padding around the data to ensure that they are placed some distance away from the axes. Use the convenience function expansion() to generate the values for the expand argument. The defaults are to expand the scale by 5% on each side for continuous variables, and by 0.6 units on each side for discrete variables.
guide  A function used to create a guide or its name. See guides() for more information.
position  For position scales, The position of the axis. left or right for y axes,
bottom or top for x axes.
size  The logo size in pixels. It is applied as height for an x-scale and as width for an y-scale.

Details
The scale translates the NFL team abbreviations into raw image html and places the html as axis labels. Because of the way ggplots are constructed, it is necessary to adjust the theme() after calling this scale. This can be done by calling theme_x_nfl() or theme_y_nfl() or alternatively by manually changing the relevant axis.text to ggtext::element_markdown(). However, this will only work if an underlying dependency, “gridtext”, is installed with a newer version than 0.1.4

Value
A discrete ggplot2 scale created with ggplot2::scale_x_discrete() or ggplot2::scale_y_discrete().

See Also
tHEME_X_NFL(), THEME_Y_NFL()

Examples

library(nflplotR)
library(ggplot2)

team_abbr <- valid_team_names()
# remove conference logos from this example
team_abbr <- team_abbr[!team_abbr %in% c("AFC", "NFC")]

df <- data.frame(
  random_value = runif(length(team_abbr), 0, 1),
  teams = team_abbr
)

if (utils::packageVersion("gridtext") > "0.1.4"){
  # use logos for x-axis
  ggplot(df, aes(x = teams, y = random_value)) +
  geom_col(aes(color = teams, fill = teams), width = 0.5) +
  scale_color_nfl(type = "secondary") +
  scale_fill_nfl(alpha = 0.4) +
  scale_x_nfl() +
  theme_minimal() +
  # theme_x_nfl requires gridtext version > 0.1.4
  theme_x_nfl()

  # use logos for y-axis
  ggplot(df, aes(y = teams, x = random_value)) +
  geom_col(aes(color = teams, fill = teams), width = 0.5) +
  scale_color_nfl(type = "secondary") +
  scale_fill_nfl(alpha = 0.4) +
  scale_y_nfl() +
  theme_minimal() +
  # theme_y_nfl requires gridtext version > 0.1.4
  theme_y_nfl()
}

#############################################################################
# Headshot Examples
#############################################################################
library(nflplotR)
library(ggplot2)

# Silence an nflreadr message that is irrelevant here
old <- options(nflreadr.cache_warning = FALSE)

dfh <- data.frame(
  random_value = runif(9, 0, 1),
  player_gsis = c("00-0033873",
                  "00-0026498",
                  "00-0035228",
                  "00-0031237",
                  "00-0036355",
                  "00-0019596",
                  "00-0033077",
                  "00-0012345",
                  "00-0031280")
)

if (utils::packageVersion("gridtext") > "0.1.4"){
  # use headshots for x-axis

ggplot(dfh, aes(x = player_gsis, y = random_value)) +
  geom_col(width = 0.5) +
  scale_x_nfl_headshots() +
  theme_minimal() +
  # theme_x_nfl requires gridtext version > 0.1.4
  theme_x_nfl()

# use headshots for y-axis
ggplot(dfh, aes(y = player_gsis, x = random_value)) +
  geom_col(width = 0.5) +
  scale_y_nfl_headshots() +
  theme_minimal() +
  # theme_y_nfl requires gridtext version > 0.1.4
  theme_y_nfl()

}  
# Restore old options
options(old)

---

scale_nfl

Scales for NFL Team Colors

Description

These functions map NFL team names to their team colors in color and fill aesthetics

Usage

scale_color_nfl(
  type = c("primary", "secondary"),
  values = NULL,
  ...
  aesthetics = "colour",
  breaks = ggplot2::waiver(),
  na.value = "grey50",
  guide = NULL,
  alpha = NA
)

scale_colour_nfl(
  type = c("primary", "secondary"),
  values = NULL,
  ...
  aesthetics = "colour",
  breaks = ggplot2::waiver(),
  na.value = "grey50",
  guide = NULL,
  alpha = NA
)
scale_fill_nfl(
  type = c("primary", "secondary"),
  values = NULL,
  ...
  aesthetics = "fill",
  breaks = ggplot2::waiver(),
  na.value = "grey50",
  guide = NULL,
  alpha = NA
)

Arguments

- **type**
  One of "primary" or "secondary" to decide which colortype to use.

- **values**
  If NULL (the default) use the internal team color vectors. Otherwise a set of aesthetic values to map data values to. The values will be matched in order (usually alphabetical) with the limits of the scale, or with breaks if provided. If this is a named vector, then the values will be matched based on the names instead. Data values that don’t match will be given na.value.

- **...**
  Arguments passed on to discrete_scale

- **palette**
  A palette function that when called with a single integer argument (the number of levels in the scale) returns the values that they should take (e.g., scales::hue_pal()).

- **limits**
  One of:
  - NULL to use the default scale values
  - A character vector that defines possible values of the scale and their order
  - A function that accepts the existing (automatic) values and returns new ones. Also accepts rlang lambda function notation.

- **drop**
  Should unused factor levels be omitted from the scale? The default, TRUE, uses the levels that appear in the data; FALSE uses all the levels in the factor.

- **na.translate**
  Unlike continuous scales, discrete scales can easily show missing values, and so by default. If you want to remove missing values from a discrete scale, specify na.translate = FALSE.

- **scale_name**
  The name of the scale that should be used for error messages associated with this scale.

- **name**
  The name of the scale. Used as the axis or legend title. If waiver(), the default, the name of the scale is taken from the first mapping used for that aesthetic. If NULL, the legend title will be omitted.

- **labels**
  One of:
  - NULL for no labels
  - waiver() for the default labels computed by the transformation object
  - A character vector giving labels (must be same length as breaks)
scale_nfl

- A function that takes the breaks as input and returns labels as output. Also accepts rlang lambda function notation.

guide A function used to create a guide or its name. See guides() for more information.

super The super class to use for the constructed scale

aesthetics Character string or vector of character strings listing the name(s) of the aesthetic(s) that this scale works with. This can be useful, for example, to apply colour settings to the colour and fill aesthetics at the same time, via aesthetics = c("colour","fill").

breaks One of:
- NULL for no breaks
- waiver() for the default breaks (the scale limits)
- A character vector of breaks
- A function that takes the limits as input and returns breaks as output

na.value The aesthetic value to use for missing (NA) values

guide A function used to create a guide or its name. If NULL (the default) no guide will be plotted for this scale. See ggplot2::guides() for more information.

alpha Factor to modify color transparency via a call to scales::alpha(). If NA (the default) no transparency will be applied. Can also be a vector of alphas. All alpha levels must be in range [0,1].

Examples

```r
library(nflplotR)
library(ggplot2)

team_abbr <- valid_team_names()
# remove conference logos from this example
team_abbr <- team_abbr[!team_abbr %in% c("AFC", "NFC", "NFL")]

df <- data.frame(
  random_value = runif(length(team_abbr), 0, 1),
  teams = team_abbr
)
ggplot(df, aes(x = teams, y = random_value)) +
  geom_col(aes(color = teams, fill = teams), width = 0.5) +
  scale_color_nfl(type = "secondary") +
  scale_fill_nfl(alpha = 0.4) +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1))
```
theme_nfl

Theme for NFL Team Logos

Description

These functions are convenience wrappers around a theme call that activates markdown in x-axis and y-axis labels using \texttt{ggtext::element_markdown()}.  

Usage

\begin{verbatim}
theme_x_nfl()

theme_y_nfl()
\end{verbatim}

Details

These functions are a wrapper around the function calls \texttt{ggplot2::theme(axis.text.x = ggtext::element_markdown())} as well as \texttt{ggplot2::theme(axis.text.y = ggtext::element_markdown())}. They are made to be used in conjunction with \texttt{scale_x_nfl()} and \texttt{scale_y_nfl()} respectively.

Value

A ggplot2 theme created with \texttt{ggplot2::theme()}.  

See Also

\texttt{theme_x_nfl()}, \texttt{theme_y_nfl()}

Examples

\begin{verbatim}
library(nflplotR)
library(ggplot2)

team_abbr <- valid_team_names()
# remove conference logos from this example
team_abbr <- team_abbr[!team_abbr %in% c("AFC", "NFC", "NFL")]

if (utils::packageVersion("gridtext") > "0.1.4"){
    df <- data.frame(
        random_value = runif(length(team_abbr), 0, 1),
        teams = team_abbr
    )

    ggplot(df, aes(x = teams, y = random_value)) +
    geom_col(aes(color = teams, fill = teams), width = 0.5) +
    scale_color_nfl(type = "secondary") +
    scale_fill_nfl(alpha = 0.4) +
    scale_x_nfl(alpha = 0.4) +
    theme_minimal() +
\end{verbatim}
valid_team_names

Output Valid NFL Team Abbreviations

Description
Output Valid NFL Team Abbreviations

Usage
valid_team_names(exclude_duplicates = TRUE)

Arguments
exclude_duplicates
If TRUE (the default) the list of valid team abbreviations will exclude duplicates related to franchises that have been moved

Value
A vector of type "character".

Examples
# List valid team abbreviations excluding duplicates
valid_team_names()

# List valid team abbreviations excluding duplicates
valid_team_names(exclude_duplicates = FALSE)
Index

aes(), 5, 8, 10, 13, 16
aes_(), 5, 8, 10, 13, 16
borders(), 6, 11, 13, 16
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