Package 'marimekko'

May 8, 2026

Title Marimekko Plots for 'ggplot2'

Version 0.1.0

Description Create marimekko (mosaic) plots as a 'ggplot2' layer. Column widths encode marginal proportions of one categorical variable and segment heights encode conditional proportions of a second categorical variable.

License MIT + file LICENSE

Encoding UTF-8

RoxygenNote 7.3.3

Depends R (>= 4.1.0)

Imports ggplot2 (>= 3.5.0)

Suggests knitr, pkgdown, plotly, rmarkdown, testthat (>= 3.0.0), vdiffr (>= 1.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

Collate 'marimekko-package.R' 'geom-marimekko.R' 'fortify-marimekko.R' 'stat-marimekko-tiles.R' 'theme-marimekko.R'

NeedsCompilation no

Author Dawid Kałędkowski [aut, cre] (ORCID: <https://orcid.org/0000-0001-9533-457X>)

Maintainer Dawid Kałędkowski <dawid.kaledkowski@gmail.com>

Repository CRAN

Date/Publication 2026-03-16 16:40:09 UTC

Contents

`fortify_marimekko` *Compute marimekko tile rectangles as a data frame*

Description

Compute marimekko tile rectangles as a data frame

Usage

```
fortify_marimekko(
  data,
  formula,
  weight = NULL,
  gap = 0.01,
  gap_x = NULL,
  gap_y = NULL,
  standardize = FALSE
)
```

Arguments

`data`	A data frame.
`formula`	A one-sided formula specifying the mosaic hierarchy, using the same syntax as `geom_marimekko()`. Example: `~ Class | Survived`.
`weight`	Name of the weight variable (unquoted or string), or `NULL` for unweighted counts. Default `NULL`.
`gap`	Numeric. Size of gap between tiles. Default `0.01`.
`gap_x`	Numeric. Horizontal gap. Overrides gap for x. Default `NULL`.
`gap_y`	Numeric. Vertical gap. Overrides gap for y. Default `NULL`.
`standardize`	Logical. Equal-width columns. Default `FALSE`.

Value

A data frame with columns for each formula variable, plus `fill`, `colour`, `xmin`, `xmax`, `ymin`, `ymax`, `x`, `y`, `weight`, `.proportion`, `.marginal`, and `.residuals`.

Examples

```
titanic <- as.data.frame(Titanic)
fortify_marimekko(titanic, formula = ~ Class | Survived, weight = Freq)

# 3-variable formula
fortify_marimekko(titanic, formula = ~ Class | Survived | Sex, weight = Freq)
```

`geom_marimekko` *Generalized mosaic plot with formula-based variable nesting*

Description

Generalized mosaic plot with formula-based variable nesting

Usage

```
geom_marimekko(
  mapping = NULL,
  data = NULL,
  formula = NULL,
  gap = 0.01,
  gap_x = NULL,
  gap_y = NULL,
  colour = NULL,
  alpha = 0.9,
  show_percentages = FALSE,
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE,
  ...
)
```

Arguments

`mapping`	Aesthetic mapping. Optionally accepts `fill` and `weight` for pre-aggregated data. If `fill` is not specified, it defaults to the last variable in the formula. The `fill` variable controls tile colour and does not need to appear in the formula.
`data`	A data frame.
`formula`	A one-sided formula specifying the mosaic hierarchy. See the sections above for a detailed explanation. Quick reference: • `~ a | b` — h(a), v(b). Standard mosaic. • `~ a | b | c` — h(a), v(b), h(c). Alternating mosaic. • `~ a + b | c` — h(a), h(b), v(c). Double decker.

- `~ a | b + c` — h(a), v(b), v(c). Multiple vertical variables.

`gap`	Numeric. Gap between tiles as fraction of plot area. Default `0.01`.
`gap_x`	Numeric. Horizontal gap override. Default `NULL` (uses `gap`).
`gap_y`	Numeric. Vertical gap override. Default `NULL` (uses `gap`).
`colour`	Tile border colour. Default `NULL` (no border). Can also be mapped via `aes(colour = variable)`.
`alpha`	Tile transparency. Default `0.9`.
`show_percentages`	Logical. If `TRUE`, appends marginal percentage to each x-axis label. Default `FALSE`.
`na.rm`	Logical. Remove missing values. Default `FALSE`.
`show.legend`	Logical. Show legend. Default `NA`.
`inherit.aes`	Logical. Inherit aesthetics from `ggplot()`. Default `TRUE`.
`...`	Additional arguments passed to the layer.

Value

A list of ggplot2 layers (geom + axis scales).

How the formula works

The formula uses two operators to encode the full partitioning hierarchy in a single expression:

`|` **(pipe)** Separates nesting levels. Each `|` switches the splitting direction, alternating horizontal, vertical, horizontal, vertical, and so on. The first variable (or group) listed is the **outermost** split — it partitions the entire plot area. Each subsequent level partitions the tiles created by the previous level.

`+` **(plus)** Groups variables at the **same** nesting level. All variables joined by `+` share the same splitting direction and are applied sequentially within that level. The first `+` variable partitions the current tiles, then the second `+` variable further subdivides those tiles, still in the same direction.

Reading order — outermost to innermost

The formula is read left to right, from the coarsest (outermost) partition to the finest (innermost):

`~ a | b` First split the plot horizontally by `a` (columns whose widths reflect marginal proportions of `a`). Then, within each column, split vertically by `b` (rows whose heights reflect conditional proportions of `b` given `a`). This is the classic two-variable marimekko / mosaic plot.

`~ a | b | c` Horizontal by `a`, then vertical by `b`, then horizontal again by `c`. Three levels of nesting with alternating directions (h $\rightarrow$ v $\rightarrow$ h).

`~ a + b | c` Horizontal by `a`, then horizontal again by `b` (same direction because `+` groups them), then vertical by `c`. This is the **double decker** pattern — all horizontal splits first, with a single vertical split at the end.

`~ a | b + c` Horizontal by `a`, then vertical by `b`, then vertical again by `c`. Two vertical variables nested within each column.

Computed variables

The stat computes the following variables that can be accessed with `ggplot2::after_stat()`:

`.proportion` Conditional proportion of the tile within its immediate parent. For a formula `~ a | b`, this is the proportion of `b` within each level of `a`, i.e. $P(b \mid a)$. Values sum to 1 within each parent tile. Useful for mapping to `alpha` to fade tiles by their local share: `aes(alpha = after_stat(.proportion))`.

`.marginal` Joint (marginal) proportion of the tile relative to the whole dataset, i.e. n_{cell}/N. Values sum to 1 across all tiles. Used internally for x-axis percentage labels when `show_percentages = TRUE`, and can be mapped to aesthetics to emphasise cells by overall frequency.

`.residuals` Pearson residual measuring departure from statistical independence between the horizontal and vertical variable groups. Computed as $(O - E)/\sqrt{E}$, where O is the observed cell count and E is the count expected under independence. Positive values indicate the cell is **more** frequent than expected; negative values indicate **less** frequent. When only one direction (all horizontal or all vertical) is present, `.residuals` is set to 0. Map to `alpha` or `fill` to highlight deviations: `aes(alpha = after_stat(abs(.residuals)))`.

Examples

```
library(ggplot2)

titanic <- as.data.frame(Titanic)

# 2-variable mosaic
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, weight = Freq),
    formula = ~ Class | Survived
  )

# 3-variable mosaic (h -> v -> h)
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, weight = Freq),
    formula = ~ Class | Survived | Sex
  )

# Multi-variable fill with interaction()
ggplot(titanic) +
  geom_marimekko(
    aes(fill = interaction(Sex, Survived), weight = Freq),
    formula = ~ Class | Sex + Survived
  )

# Fade tiles by conditional proportion
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, alpha = after_stat(.proportion), weight = Freq),
    formula = ~ Class | Survived
  ) +
```

```
  guides(alpha = "none")

# Highlight cells that deviate from independence
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, alpha = after_stat(abs(.residuals)), weight = Freq),
    formula = ~ Class | Survived
  ) +
  guides(alpha = "none")
```

`geom_marimekko_label` *Add labels with background to a marimekko plot*

Description

Add labels with background to a marimekko plot

Usage

```
geom_marimekko_label(
  mapping = NULL,
  data = NULL,
  position = "identity",
  ...,
  size = 3.5,
  colour = "black",
  fill = alpha("white", 0.7),
  label.padding = unit(0.15, "lines"),
  na.rm = FALSE,
  show.legend = FALSE,
  inherit.aes = FALSE
)
```

Arguments

`mapping`	Set of aesthetic mappings. Only `label` is required. Use `ggplot2::after_stat()` for computed variables.
`data`	A data frame. Default `NULL` (uses plot data; tile positions come from `geom_marimekko()`).
`position`	Position adjustment. Default `"identity"`.
`...`	Additional arguments passed to the layer.
`size`	Text size. Default `3.5`.
`colour`	Text colour. Default `"white"` for text, `"black"` for labels.
`fill`	Label background colour. Default `alpha("white", 0.7)`.
`label.padding`	Amount of padding around label. Default `ggplot2::unit(0.15, "lines")`.
`na.rm`	Logical. Remove missing values. Default `FALSE`.
`show.legend`	Logical. Show legend. Default `FALSE`.
`inherit.aes`	Logical. Inherit aesthetics. Default `FALSE`.

Value

A ggplot2 layer.

Examples

```
library(ggplot2)

titanic <- as.data.frame(Titanic)
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, weight = Freq),
    formula = ~ Class | Survived
  ) +
  geom_marimekko_label(aes(label = after_stat(weight)))
```

---

geom_marimekko_text *Add text labels to a marimekko plot*

Description

Add text labels to a marimekko plot

Usage

```
geom_marimekko_text(
  mapping = NULL,
  data = NULL,
  position = "identity",
  ...,
  size = 3.5,
  colour = "white",
  na.rm = FALSE,
  show.legend = FALSE,
  inherit.aes = FALSE
)
```

Arguments

mapping	Set of aesthetic mappings. Only `label` is required. Use `ggplot2::after_stat()` for computed variables.
data	A data frame. Default `NULL` (uses plot data; tile positions come from `geom_marimekko()`).
position	Position adjustment. Default `"identity"`.
...	Additional arguments passed to the layer.
size	Text size. Default `3.5`.
colour	Text colour. Default `"white"` for text, `"black"` for labels.

na.rm	Logical. Remove missing values. Default FALSE.
show.legend	Logical. Show legend. Default FALSE.
inherit.aes	Logical. Inherit aesthetics. Default FALSE.

Value

A ggplot2 layer.

Examples

```
library(ggplot2)

titanic <- as.data.frame(Titanic)
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, weight = Freq),
    formula = ~ Class | Survived
  ) +
  geom_marimekko_text(aes(label = after_stat(weight)))
```

---

marimekko_pal *Unikko-inspired colour palette*

Description

A character vector of 8 bold colours inspired by Marimekko's iconic Unikko poppy pattern. Vibrant, high-contrast tones suited for categorical data visualisation.

Usage

```
marimekko_pal
```

Format

An object of class character of length 8.

`StatMarimekkoTiles` *Retrieve computed tile positions from a marimekko layer*

Description

Retrieve computed tile positions from a marimekko layer

Usage

```
StatMarimekkoTiles
```

Format

An object of class `StatMarimekkoTiles` (inherits from `Stat`, `ggproto`, `gg`) of length 2.

Usage with custom geoms

Use `StatMarimekkoTiles` as the `stat` argument in `ggplot2::layer()` to pair the tile data with any geom. The only requirement is that `geom_marimekko()` must appear **before** the custom layer so that tile positions are computed first.

See Also

`geom_marimekko()`, `geom_marimekko_text()`, `geom_marimekko_label()`, `fortify_marimekko()`

Examples

```
library(ggplot2)

titanic <- as.data.frame(Titanic)

# Bubble overlay — point size encodes tile count
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, weight = Freq),
    formula = ~ Class | Survived, alpha = 0.4
  ) +
  layer(
    stat = StatMarimekkoTiles,
    geom = GeomPoint,
    mapping = aes(size = after_stat(weight)),
    data = titanic,
    position = "identity",
    show.legend = FALSE,
    inherit.aes = FALSE,
    params = list(colour = "white", alpha = 0.7)
  ) +
  scale_size_area(max_size = 12)
```

```
# Residual markers — colour and size show deviation from independence
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, weight = Freq),
    formula = ~ Class | Survived
  ) +
  layer(
    stat = StatMarimekkoTiles,
    geom = GeomPoint,
    mapping = aes(
      size = after_stat(abs(.residuals)),
      colour = after_stat(ifelse(.residuals > 0, "over", "under"))
    ),
    data = titanic,
    position = "identity",
    show.legend = TRUE,
    inherit.aes = FALSE,
    params = list(alpha = 0.8)
  ) +
  scale_colour_manual(
    values = c(over = "tomato", under = "steelblue"),
    name = "Deviation"
  ) +
  scale_size_continuous(range = c(1, 8), name = "|Residual|")
```

`theme_marimekko` *Minimal theme for marimekko plots*

Description

Removes x-axis gridlines and adjusts spacing for mosaic plots. Also applies the marimekko_pal fill scale.

Usage

```
theme_marimekko(base_size = 12, ...)
```

Arguments

`base_size`	Base font size. Default 12.
`...`	Arguments passed to `ggplot2::theme_minimal()`.

Value

A ggplot2 theme.

Examples

```
library(ggplot2)

titanic <- as.data.frame(Titanic)
ggplot(titanic) +
  geom_marimekko(
    aes(fill = Survived, weight = Freq),
    formula = ~ Class | Survived
  ) +
  theme_marimekko()
```

Index