Package: BagWhiskerPlot (via r-universe)

May 16, 2026

Type Package

Title Bag-and-Whisker Plot

Version 0.1.1

Depends MASS

Description Implementation of the Bag-and-Whisker Plot for bivariate data. Provides a single user-facing function bag_whisker() that wraps the computation and plotting helpers in this package. For more details, please refer to the paper ``The Bag-and-Whisker Plot: A New Bagplot for Bivariate Data" by Qin, Gang, Tong and Cui (2025) <doi:10.48550/arXiv.2512.06314>.

Encoding UTF-8

LazyData true

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.3

Imports ggplot2, parallel

License GPL-3

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

Repository https://seanq31.r-universe.dev

Date/Publication 2026-05-16 14:03:59 UTC

RemoteUrl https://github.com/seanq31/bagwhiskerplot

RemoteRef HEAD

RemoteSha d9a240a358f758ffdb751d4d619797bae528dbb1

Contents

bag_whisker *Bag-and-whisker plot implementation, with outlier detection under different type-I error controls*

Description

Compute and draw a bag-and-whisker plot of bivariate data that highlights outliers under different type-I error controls. This is a thin user-facing wrapper around the internal computation and ggplot2-based plotting helpers in this package.

Usage

```
bag_whisker(
  x,
  y,
  type1 = "unadjusted",
  q = 0.1,
  normal_inlier = FALSE,
  normal_outter = FALSE,
  asymp_dist_pv = "chisq",
  center_type = "hdepth",
  factor = 3,
  na.rm = FALSE,
  approx.limit = 300,
  show.outlier = TRUE,
  show.whiskers = TRUE,
  show.looppoints = TRUE,
  show.bagpoints = TRUE,
  show.loophull = FALSE,
  show.baghull = TRUE,
  create.plot = TRUE,
  add = FALSE,
  pch = 1,
  cex = 0.6,
  naive_bag = FALSE,
  dkmethod = 1,
  precision = 1,
  n_cores = 1,
  verbose = FALSE,
  debug.plots = "no",
  timing = FALSE,
  col.loophull = "#aaccff",
  col.looppoints = "#3355ff",
  col.baghull = "#D3D3D3",
  col.bagpoints = "#000088",
  transparency = FALSE,
  show.center = TRUE,
```

```
  show.fence_mag_bag = TRUE,
  ...
)
```

Arguments

x, y	Numeric vectors giving the coordinates of the bivariate sample. You can either supply both x and y, or a two-column matrix / data frame via x and leave y missing.
type1	Character string specifying the type-I error control used in the multiple-testing step. One of "unadjusted", "FWER", "FDR", or "PFER", default "unadjusted".
q	Numeric, the control level for the multiple testing procedure, default 0.1.
normal_inlier	Logical; if TRUE, the bag is calculated based on a normal reference distribution instead of a depth-based bag, default FALSE.
normal_outter	Logical; if TRUE, the fence is calculated based on a normal reference distribution, otherwise it is obtained by magnifying the bag, default FALSE.
asymp_dist_pv	Character string; asymptotic distribution used for p-value calculation, default "chisq".
center_type	Character string; center definition, default "hdepth".
factor	Numeric; the factor lambda for "unadjusted" that controls how far the bag is magnified to obtain the fence, default 3.
na.rm	Logical; if TRUE, rows with missing values are removed, otherwise medians are used to impute, default FALSE.
approx.limit	Integer; threshold above which a subsample is used for approximating the bagplot computation, default 300.
show.outlier	Logical; if TRUE, identified outliers are shown in the plot, default TRUE.
show.whiskers	Logical; if TRUE, whisker segments are added to the plot, default TRUE.
show.looppoints	Logical; if TRUE, data points classified as belonging to the loop are shown, default TRUE.
show.bagpoints	Logical; if TRUE, data points classified as inside the bag are shown, default TRUE.
show.loophull	Logical; if TRUE, the convex hull of the loop is drawn, default FALSE.
show.baghull	Logical; if TRUE, the convex hull of the bag is drawn, default TRUE.
create.plot	Logical; if TRUE, a plot is created for the computed bag-and-whisker representation, default TRUE.
add	Logical; if TRUE, graphical elements are added to the current plot; otherwise a new plot is started, default FALSE.
pch, cex	Graphical parameters forwarded to the plotting method to control point character and expansion.
naive_bag	Logical; if TRUE, the bag is computed without expansion, default FALSE.
dkmethod	Integer in 1:2; depth kernel method, default 1.
precision	Numeric; controls precision of hull expansion, default 1.

n_cores	Integer or NULL. If greater than 1 or NULL, uses a parallel backend (via parallel::makeCluster()) for some calculation intensive loops. If NULL, uses parallel::detectCores() - 1 cores (minimum 1). Default 1.
verbose	Logical; if TRUE, progress messages from the computational engine are printed, default FALSE.
debug.plots	Character string; controls generation of additional diagnostic plots for debugging, default no.
timing	Logical; if TRUE, prints a simple timing summary and adds a timings component (named numeric vector, elapsed seconds) to the returned object, default FALSE.
col.loophull	Fill colour used for the loop hull.
col.looppoints	Point colour used for the loop points.
col.baghull	Fill colour used for the bag hull.
col.bagpoints	Point colour used for the bag points.
transparency	Logical; if TRUE, semi-transparent fills are used for the bag and loop hulls, default FALSE.
show.center	Logical; if TRUE, the chosen center of the data is highlighted in the plot, default TRUE.
show.fence_mag_bag	Logical; if TRUE, the fence by magnifying the bag is visualised, default TRUE.
...	Passed on to the S3 method plot.bagWhiskerPlot() when create.plot = TRUE.

Details

This function is the only exported user-facing entry point of the package. It calls the internal computational engine compute.bagWhiskerPlot() and then, by default, plots the resulting object using a ggplot2-based implementation of the S3 method plot.bagWhiskerPlot().

Value

An object of class "bagWhiskerPlot" containing the bag-plot decomposition and outlier information. When show = TRUE, the object is returned invisibly after drawing the plot.

---

plot.bagWhiskerPlot *Plot a bag-whisker plot using ggplot2*

Description

Produce a bag-whisker plot from a bagWhiskerPlot object using **ggplot2**. This is the plotting backend used by bag_whisker() to render the bag, loop, fence, and whisker elements, with optional highlights for outliers and the center.

Usage

```
## S3 method for class 'bagWhiskerPlot'
plot(
  x,
  show.outlier = TRUE,
  show.whiskers = TRUE,
  show.looppoints = TRUE,
  show.bagpoints = TRUE,
  show.loophull = FALSE,
  show.baghull = TRUE,
  show.fence_mag_bag = TRUE,
  add = FALSE,
  pch = 16,
  cex = 0.4,
  verbose = FALSE,
  col.loophull = "#aaccff",
  col.looppoints = "#3355ff",
  col.baghull = "#7799ff",
  col.bagpoints = "#000088",
  col.fence_mag_bag = "#CC33CC",
  transparency = FALSE,
  show.center = TRUE,
  whisker.fade = TRUE,
  whisker.n = 10,
  whisker.alpha.start = 0.4,
  whisker.alpha.end = 0,
  whisker.end.prop = 0.7,
  main = NULL,
  ...
)
```

Arguments

x	A bagWhiskerPlot object as returned by bag_whisker (or related constructors).
show.outlier	Logical; if TRUE, identified outliers are shown in the plot.
show.whiskers	Logical; if TRUE, whisker segments are added to the plot.
show.looppoints	Logical; if TRUE, data points classified as belonging to the loop are shown.
show.bagpoints	Logical; if TRUE, data points classified as inside the bag are shown.
show.loophull	Logical; if TRUE, the convex hull of the loop is drawn.
show.baghull	Logical; if TRUE, the convex hull of the bag is drawn.
show.fence_mag_bag	Logical; if TRUE, the fence obtained by magnifying the bag (data-adaptive threshold) is visualised.
add	Logical; if TRUE, graphical elements are added to an existing ggplot object supplied via ... (see Details). If FALSE, a new plot is created and printed.

pch	Plotting character (shape) used for points.
cex	Numeric scaling factor for point sizes and (in 2D) whisker line width.
verbose	Logical; currently unused, reserved for possible diagnostic messages.
col.loophull	Fill color for the loop hull polygon.
col.looppoints	Color for loop-region points.
col.baghull	Fill color for the bag hull polygon.
col.bagpoints	Color for bag-region points.
col.fence_mag_bag	Color for the magnified fence polygon.
transparency	Logical; if TRUE, semi-transparent versions of the hull colors are used.
show.center	Logical; if TRUE, the chosen center of the data is highlighted in the plot.
whisker.fade	Logical; if TRUE, whisker segments are drawn as multiple short segments with fading alpha towards their ends.
whisker.n	Integer; number of subsegments used per whisker when whisker.fade = TRUE.
whisker.alpha.start	Numeric in [0, 1] giving the starting alpha for faded whiskers (near the outer point).
whisker.alpha.end	Numeric in [0, 1] giving the ending alpha for faded whiskers (near the bag or center).
whisker.end.prop	Numeric in [0, 1] controlling how far along the whisker the fade is applied; values close to 1 fade along most of the whisker.
main	Optional main title for the plot.
...	Additional arguments passed on to the underlying **ggplot2** scales or base plot. In particular, xlim and ylim can be supplied to control axis limits. When add = TRUE, gg or base_gg can be supplied as an existing ggplot object to which the layers are added.

Details

The function is a plot method for bagWhiskerPlot objects and relies on **ggplot2** for rendering.

Value

A ggplot object representing the bag-whisker plot, returned invisibly. The plot is drawn as a side effect when add = FALSE or when add = TRUE with an existing ggplot object.

See Also

bag_whisker, bp_build_layers, **ggplot2**

Index