Package ‘bpDir’

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Type Package

Title Boxplots for Directional Data

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Description Functions for drawing boxplots for data on (the boundary of) a unit circle (i.e., circular and axial data), from Buttarazzi D., Pandolfo G., Porzio G.C. (2018) <doi:10.1111/biom.12889>.

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AxialBoxplot

Description

Draw a boxplot for axial data

Usage

AxialBoxplot(A, template = "degrees", place = "none", marg =
   "large", stack = FALSE, H = FALSE, shrink = 1.5, units
   = "degrees", constant = "optimal", mirror = TRUE)

Arguments

A numeric; a vector of class circular in units=c("degrees", "radians")
template character; graphical parameter to set the template to be used in the plot. Options are "degrees"(default), "radians" and "geographics". If NULL, a generic template can be defined, with angles displayed according to the graphical parameter place.
place character; graphical parameter. Active only when template = NULL to add an additional generic template either "outside" or "inside" the circle. If place = "none"(default), no additional template is plotted.
marg character; graphical parameter to set the plot region to either "large"(default) or "small", expressed in number of lines of text.
stack If TRUE and H=FALSE, then far out values are stacked on the circumference.
H logical; graphical parameter to specify if observations between the hinges and the whiskers are plotted. Default is FALSE.
shrink numeric; graphical parameter to control the size of the plotted circle. Default is 1.5. Larger values shrink the circle, while smaller values enlarge the circle.
units character; graphical parameter to select the unit of measure to be displayed on the axes when template = NULL and place=c("inside", "outside"). Options are "degrees"(default) or "radians".
constant numeric; the boxplot multiplying factor (or "constant") that determines how far the fences extend out from the box. When "optimal"(default), it ensures the probability that an observation falls outside the fences (i.e., it will be a far out value) is 0.7% under a von Mises distribution (see Web Appendix A in Butterazzi et al., 2018).
mirror If TRUE, then a second axial boxplot will be plotted on the opposite semi-circle.

Details

The arguments stack, shrink are parameters passed to plot.circular.
CircularBoxplot

Value

- farout: a vector of class circular in radians, containing the values of the points lying outside the whiskers.
- constant: the value of the constant used to draw the boxplot.

Author(s)

Davide Buttarazzi

References


Examples

```r
set.seed(1)
#install.packages("circular")
require(circular)
#install.packages("plotrix")
require(plotrix)
theta <- circular::rvonmises(100, circular(pi/2), 3, control.circular=list(units="radians"))
axialTheta <- circular(theta, modulo = "pi")
AxialBoxplot(axialTheta, template = "radians", mirror = FALSE)
```

CircularBoxplot  Circular Box-and-Wisker Plot

Description

The CircularBoxplot function produces a box-and-whisker-plot for circular data.

Usage

```r
CircularBoxplot ( A, template="degrees", place="none", units="degrees", marg="large", shrink = 1.5, H=FALSE, stack=FALSE, constant="optimal")
```

Arguments

- **A**: numeric; a vector of class circular in units=c("degrees", "radians")
- **template**: character; graphical parameter to set the template to be used in the plot. Options are "degrees"(default), "radians" and "geographics". If NULL, a generic template can be defined, with angles displayed according to the graphical parameter place.
- **place**: character; graphical parameter. Active only when template = NULL to add an additional generic template either "outside" or "inside" the circle. If place = "none"(default), no additional template is plotted.
CircularBoxplot

units character; graphical parameter to select the unit of measure to be displayed on the axes when template = NULL and place=c("inside", "outside"). Options are "degrees"(default) or "radians".

marg character; graphical parameter to set the plot region to either "large"(default) or "small", expressed in number of lines of text.

shrink numeric; graphical parameter to control the size of the plotted circle. Default is 1.5. Larger values shrink the circle, while smaller values enlarge the circle.

H logical; graphical parameter to specify if observations between the hinges and the whiskers are plotted. Default is FALSE.

stack If TRUE and H=FALSE, then far out values are stacked on the circumference.

constant numeric; the boxplot multiplying factor (or "constant") that determines how far the fences extend out from the box. When "optimal"(default), it ensures the probability that an observation falls outside the fences (i.e., it will be a far out value) is 0.7% under a von Mises distribution (see Web Appendix A in Buttarazzi et al., 2018).

Details

The arguments stack, shrink are parameters passed to plot.circular.

Value

farout a vector of class circular in radians, containing the values of the points lying outside the whiskers.

statistics a dataframe of summary statistics in degrees: circular median, hinges and whiskers.

constant the value of the constant used to draw the boxplot.

Author(s)

Davide Buttarazzi

References


Examples

# Circular Boxplot on Vanishing directions of homing pigeons
#install.packages("circular")
#install.packages("plotrix")
require(circular)
require(plotrix)
#help(fisherB12c)
data(fisherB12c)
CircularBoxplot(fisherB12c, template="geographics")
CircularTukeyDepth  

Circular Tukey Depth

Description
Empirical depth ranking based on Tukey’s ranking procedure (Tukey, 1977) adapted to the circular setting (Buttarazzi et al, 2018).

Usage
CircularTukeyDepth(x)

Arguments
x  numeric; a vector of class circular in units=c("degrees", "radians")

Value
depth  a two column matrix of circular observations with corresponding depth value
median  the depth-based circular median as an object of class circular
iqr  the depth-based circular inter-quartile range as an object of class circular

Author(s)
Davide Buttarazzi

References

See Also
CircularBoxplot

Examples
#install.packages("circular")
require(circular)
data1 <- rvonmises(50, circular(pi/2), 5)
CircularTukeyDepth(data1)
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