Package ‘hextri’

April 22, 2016

Type Package
Title Hexbin Plots with Triangles
Version 0.6
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Description Display hexagonally binned scatterplots for multi-class data, using coloured triangles to show class proportions.
License MIT + file LICENSE
Imports hexbin, graphics, FNN, grid, grDevices
Suggests lattice, knitr, datasets
VignetteBuilder knitr
NeedsCompilation no
Repository CRAN
Date/Publication 2016-04-22 08:40:09

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hexclass Hexagonal binning with classes

Description

Displays a hexagonally-binned scatterplot with coloured subtriangles to indicate number of observations in each class. With a single class, gives a base-graphics version of the ordinary hexbin plot.
Usage

```
hextri(x,...)  # Default S3 method:  
hextri(x, y, class, colours, nbins = 10, border =  
TRUE, diffuse=FALSE, style=c("alpha","size"), weights=NULL,  
sorted=!diffuse, ...)  
# S3 method for class 'formula'  
hextri(x, data=parent.frame(), class,colours, nbins=10,  
border=TRUE, diffuse=FALSE, style=c("alpha","size"), weights=NULL, sorted=!diffuse, 
  xlab=NULL, ylab=NULL,...)
```

Arguments

- `x` Coordinates of points, or for the formula method, a model formula
- `y` coordinates
- `data` The class and weights arguments are looked up here, in addition to the formula itself
- `class` Factor giving class membership for points
- `colours` Vector of colors (number, name, or hashtag format) giving the colours for each class
- `nbins` Number of bins in the x-axis direction
- `border` Include a narrow transparent border around each triangle and hexagon
- `diffuse` Pass on rounding error to nearest not-yet-drawn hexes so that rare classes get represented
- `style` Represent data by hexagon size or by alpha-blending
- `weights` If not NULL, sampling weights or frequency weights. The hexbin plot will be based on the sum of weights in the hex
- `sorted` Should the triangles be sorted into a consistent order within each hex? More attractive but can cause 3-d artifacts and may be less accurate.
- `xlab, ylab` Specify to override the formula-based defaults
- `...` Passed to the plot call that sets up the plot region

Details

Uses the Sainte-Lague method to apportion counts to triangles, ensuring the counts round to exactly six triangles per hexagon.

The binning/aspect ratio are adjusted to give regular hexagons on the figure region set by `plot(x,y)`. If you reshape the window you will need to redraw the plot.

Value

A list with components `x, y, and col` suitable as input to `polygon()`

Author(s)

Thomas Lumley
See Also

sainte_lague

Examples

```r
xx<-rnorm(1000)
yy<-rnorm(1000)
cc<-cut(xx+yy,c(-Inf,-.4,0,.4,Inf))

plot(xx,yy,col=1:4)[cc)
hextri(xx,yy,cc,1:4,nbins=20,border=TRUE,style="size")
```

```r
## formula method
data(NHANES, package="hexbin")
hextri(Weight~Age, class=Smoke, col=c("red","orange","green","grey40"),
data=NHANES, style="size",nbins=20, main="Smoking")
legend("topright",fill=c("red","orange","green","grey40"),
      legend=c("Current","Past","Never","unknown"),bty="n")

## using the return value of hextri
rval<-hextri(xx,yy,cc,1:4,nbins=20,border=TRUE,style="alpha")
plot(y~x, data=rval,type="n")
with(rval, polygon(x,y,col=col,border=NA))

## diffusion
xx<-runif(10000)
yy<-runif(10000)
cc<-rep(1:3,c(4750,4750,500))
hextri(xx,yy,cc,2:4,border=TRUE,diffuse=FALSE,style="size")
hextri(xx,yy,cc,2:4,border=TRUE,diffuse=TRUE,sorted=TRUE, style="size")
hextri(xx,yy,cc,2:4,border=TRUE,diffuse=TRUE,style="size",weights=cc)
```

panel.hextri  

*A lattice panel function for hexagonal binning with classes*

Description

Displays a hexagonally-binned scatterplot with coloured subtriangles to indicate number of observations in each class. Uses the Sainte-Lague method to apportion counts to triangles, ensuring the counts round to exactly six triangles per hexagon.

Usage

```r
panel.hextri(x, y, groups, subscripts, colours, nbins = 10, border = TRUE,
            diffuse = FALSE, style = c("alpha", "size"), weights = NULL,
            sorted=FALSE, diffuse, shape = 1, ...)
```
Arguments

- **x, y**: point coordinates for the subset being plotted.
- **groups**: A factor giving the class identity for all points (will be filled in automatically by `xyplot`).
- **subscripts**: Vector selecting the elements of `groups` that are in the panel (will be filled in automatically by `xyplot`).
- **colours**: Vector of colors (number, name, or hashtag format) giving the colours for each class.
- **nbins**: Number of bins along the x axis.
- **border**: If TRUE, leave a transparent border around each element drawn.
- **diffuse**: If TRUE, pass on rounding error to nearest not-yet-drawn hexes so that rare classes get represented.
- **style**: Represent data by hexagon size or by alpha-blending.
- **weights**: If not NULL, sampling weights or frequency weights. The hexbin plot will be based on the sum of weights in the hex.
- **sorted**: Sort the triangles into a consistent order within each hex?
- **shape**: Aspect ratio for each hex.
- **...**: because you have to.

Value

A panel

Author(s)

Thomas Lumley

See Also

- `hextri` is the base-graphics plot

Examples

```r
library(lattice)
xx<-rnorm(1000)
yy<-rnorm(1000)
cc<-cut(xx*yy, c(-Inf,-.4,0,.4,Inf))
zz<-cut(xx+yy, c(-Inf,-1,0,1,Inf))

plot(xx,yy,col=(1:4)[cc])
xyplot(yy~xx|zz, panel=panel.hextri,groups=cc,colours=1:4,style="size",nbins=10)

data(airquality)
airquality$O3group<-with(airquality, cut(Ozone, c(0,18,60,Inf)))

xyplot(Temp~Solar.R|equal.count(Wind,4), groups=O3group, panel=panel.hextri,
data=na.omit(airquality),colours=c("royalblue","grey60","goldenrod"),
```
Description

Originally an algorithm for proportional allocation of seats to parties in elections, used here to assign the six triangles in each hex to classes.

Usage

sainte_lague(votes, nseats)

Arguments

votes Vector of `votes` for each party, non-negative numeric values
nseats Single integer giving the number of seats to be allocated (6, here)

Value

Numeric vector of length nseats giving the class membership for each seat, with an error attribute giving the rounding errors for each party.

References


See Also

hextri

Examples

sainte_lague(c(100, 200, 300, 50), 6)
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