Package ‘FField’

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Type Package
Title Force field simulation for a set of points
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Description Force field simulation of interaction of set of points. Very useful for placing text labels on graphs, such as scatterplots.
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FField-package Force field simulation for a set of points

Description

Force field simulation of interaction of set of points. Very useful for placing text labels on graphs, such as scatterplots.
DETAILS

FFieldPtRep(): Performs force field simulation of mutual repulsion by set of points.

FFieldPtRepDemo(): Demonstrates the utility of FFieldPtRep for placing labels in a scatterplot.

AUTHOR(S)

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SEE ALSO

FFieldPtRep FFieldPtRepDemo

EXAMPLES

# Repel points
coords <-
FFieldPtRep(coords = cbind(mtcars$wt * 100 / max(mtcars$wt),
                       mtcars$mpg * 100 / max(mtcars$mpg)),
           rep.fact = 40)
head(mtcars)
head(coords)

# Demo
FFieldPtRepDemo()

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DESCRIPTION

Force field simulation of interaction of set of points.

USAGE

FFieldPtRep(coords,
             rep.fact = 20,
             rep.dist.lmt = 10,
             attr.fact = 0.2,
             adj.max = 0.1,
             adj.lmt = 0.5,
             iter.max = 10000)
**Arguments**

- `coords`: matrix or data.frame consisting of two columns (x and y coordinates).
- `rep.fact`: repulsion force factor.
- `rep.dist.lmt`: repulsion distance limit.
- `attr.fact`: attraction force factor.
- `adj.max`: maximum position adjustment at each iteration.
- `adj.lmt`: position adjustment limit at which the simulation stops.
- `iter.max`: the maximum number of iterations beyond which simulation will end and a warning will be reported.

**Details**

Points experience repulsion from one another and attraction to their original positions. Repulsion is inversely proportional to the square of the distance. Attraction is directly proportional to the distance. Very useful for placing text labels on graphs, such as scatterplots. Depending on the nature of the plot, parameters may need to be massaged for the simulation to converge. Assumes 1x1 coordinate aspect ratio and re-scaling of inputs may be needed. Default arguments are appropriate for adjusting 20-30 labels on a 100x100 area.

**See Also**

- FField-package
- FFieldPtRepDemo

**Examples**

```r
library(ggplot2)

# Normalize coordinates to maintain constant aspect ratio
x.fact <- 100 / max(mtcars$wt)
y.fact <- 100 / max(mtcars$mpg)

# Repel points
coords <- FFieldPtRep(coords = cbind(mtcars$wt * x.fact,
                                 mtcars$mpg * y.fact),
                       rep.fact = 40)

# Convert back to plot coordinates
x.t <- coords$x / x.fact
y.t <- coords$y / y.fact

# Sample plot with repelled labels
p2 <- (ggplot(mtcars, aes(x = wt,
                           y = mpg,
                           label = rownames(mtcars)))
       + geom_point()
       + geom_text(x = x.t,
                    y = y.t))
```
Demonstrates force field simulation of interaction of set of points to place labels on a scatterplot.

Usage

FFieldPtRepDemo()

Details

Points experience repulsion from one another and attraction to their original positions. Coordinates are normalized and unadjusted and adjusted plots provided.

See Also

FField-package FFieldPtRep

Examples

FFieldPtRepDemo()
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