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.

Suggests ggplot2, gridExtra

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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)

Grigori Kapoustin

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()
```

FFieldPtRep *Force field simulation for a set of points*

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 masaged 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

```
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)
```

```
    + geom_segment(data = mtcars,
                   xend = x.t,
                   yend = y.t)
    + ggtitle("After"))
p2
```

`FFieldPtRepDemo` *Label placement using force field simulation*

Description

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()
```

Index