Package 'ggart'

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Title Generative Art with 'ggplot2'

Description Mimics the ideas of multiple generative artists in the ggplot2 language.

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BugReports https://github.com/koenderks/ggart/issues

URL https://github.com/koenderks/ggart

Imports dplyr, ggplot2, ggpubr, Rcpp, reshape2

LinkingTo Rcpp, RcppArmadillo

Language en-US

License GPL-3

Encoding UTF-8

RoxygenNote 7.1.1

R topics documented:

paint_ant *Paint Langton's Ant on a Canvas*

Description

This function paints Langton's Ant. Langton's ant is a two-dimensional universal Turing machine with a very simple set of rules but complex emergent behavior.

Usage

```
paint_ant(colors, background = '#fafafa', iterations = 1e7,
          seed = 1, width = 200, height = 200)
```

Arguments

colors	a character (vector) specifying the colors for the ant.
background	a character specifying the color of the background.
iterations	the number of iterations of the ant.
seed	the seed for the painting.
width	the width of the painting in pixels.
height	the height of the painting in pixels.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

References

https://en.wikipedia.org/wiki/Langton%27s_ant

See Also

paint_strokes paint_function paint_turmite paint_mondriaan

Examples

```
paint_ant(colors = '#000000', background = '#fafafa')
```

paint_arcs *Paint Arcs on a Canvas*

Description

This function paints arcs.

Usage

```
paint_arcs(colors, background = '#fdf5e6', n = 1, nrow = NULL, ncol = NULL,
           dir = 'right', starts = 'clockwise')
```

Arguments

background	a character string specifying the color used for the background.
n	an integer specifying how many paintings should be put on the canvas.
nrow	an (optional) integer specifying the number of rows on the canvas.
ncol	an (optional) integer specifying the number of columns on the canvas.
dir	a character string specifying which direction the arcs turn. Can be one of "right" (default) or "left".
starts	a character sting specifying where the arcs should start. Can be one of "clockwise" (default) or "random".
color	a character vector specifying the 3 colors used for the arcs.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

See Also

paint_strokes paint_turmite paint_ant paint_mondriaan

Examples

```
paint_arcs(colors = c('black', 'red', 'yellow'), n = 9)
```

paint_circlemap *Paint a Circle Map on a Canvas*

Description

This function is my attempt at a circle map.

Usage

```
paint_circlemap(colors, x_min = 0, x_max = 12.56, y_min = 0, y_max = 1,
                iterations = 10, width = 1500, height = 1500)
```

Arguments

colors	a character specifying the color used for the function shape.
x_min	a numeric value specifying the minimum value for the x-axis.
x_max	a numeric value specifying the maximum value for the x-axis.
y_min	a numeric value specifying the minimum value for the y-axis.
y_max	a numeric value specifying the maximum value for the y-axis.
seed	the seed for the painting.
width	the width of the painting in pixels.
height	the height of the painting in pixels.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

References

https://linas.org/art-gallery/circle-map/circle-map.html

See Also

paint_strokes paint_turmite paint_ant paint_mondriaan

Examples

```
paint_circlemap(colors = c('black', 'red', 'yellow'))
```

paint_function *Paint Functions on a Canvas*

Description

This function paints functions and mimics the functionality of the generativeart package.

Usage

```
paint_function(color, background = '#fafafa', seed = 1)
```

Arguments

color	a character specifying the color used for the function shape.
background	a character specifying the color used for the background.
seed	the seed for the painting.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

References

https://github.com/cutterkom/generativeart

See Also

paint_strokes paint_turmite paint_ant paint_mondriaan

Examples

```
paint_function(color = '#000000', background = '#fafafa')
```

paint_mondriaan *Paint a Mondriaan on a Canvas*

Description

This function paints a Mondriaan.

Usage

```
paint_mondriaan(colors, background = '#000000', cuts = 50, ratio = 1.618,
                seed = 1, width = 100, height = 100)
```

Arguments

colors	a character vector specifying the colors used in the squares.
background	a character specifying the color used for the background (borders).
cuts	the number of cuts to make.
ratio	the 1:1 ratio for each cut.
seed	the seed for the painting.
width	the width of the painting in pixels.
height	the height of the painting in pixels.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

See Also

paint_strokes paint_turmite paint_ant paint_function

Examples

```
paint_mondriaan(colors = c('white', 'red', 'yellow', 'blue'), seed = 5)
```

---

paint_planet *Paint a Planet on a Canvas*

Description

This function paints one or multiple planets.

Usage

```
paint_planet <- function(colors, threshold = 4, iterations = 200,
                         starprob = 0.01, fade = 0.2,
                         radius = NULL, center.x = NULL, center.y = NULL,
                         seed = 1, width = 1500, height = 1500)
```

Arguments

colors	a character specifying the colors used for the planets
threshold	a character specifying the threshold for a color take.
iterations	the number of iterations of the planets
starprob	the probability of drawing a star in outer space.
fade	the fading factor.
radius	a numeric (vector) specifying the radius of the planet(s).

center.x	the x-axis coordinate(s) for the center(s) of the planet(s).
center.y	the y-axis coordinate(s) for the center(s) of the planet(s).
light_right	whether to draw the light from the right or the left.
seed	the seed for the painting.
width	the width of the painting in pixels.
height	the height of the painting in pixels.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

See Also

paint_strokes paint_function paint_ant paint_mondriaan

Examples

```
# Sun behind Earth and Moon
colors = list(c("khaki1", "lightcoral", "lightsalmon"),
              c("dodgerblue", "forestgreen", "white"),
              c("gray", "darkgray", "beige"))
painting <- paint_planet(colors, radius = c(800, 400, 150),
                         center.x = c(1, 500, 1100),
                         center.y = c(1400, 500, 1000),
                         starprob = 0.005)
```

---

paint_ribbons *Paint A Triangle with Lines on a Canvas*

Description

This function paints triangles and lines.

Usage

```
paint_ribbons(colors, background = '#fdf5e6', seed = 1)
```

Arguments

colors	a character (vector) specifying the colors for the lines.
background	a character specifying the color of the background.
triangle	logical. Whether to draw the triangle itself.
seed	the seed for the painting.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

See Also

paint_strokes paint_turmite paint_ant paint_mondriaan

Examples

```
paint_ribbons(colors = c("forestgreen", "firebrick", "dodgerblue", "goldenrod"))
```

---

paint_strokes *Paint Strokes on a Canvas*

Description

This function creates a painting that resembles paints strokes. The algorithm is based on the simple idea that each next point on the grid has a chance to take over the color of an adjacent colored point but also has a change of generating a new color.

Usage

```
paint_strokes(colors, neighbors = 1, p = 0.01, iterations = 1,
                      seed = 1, width = 500, height = 500, side = FALSE)
```

Arguments

colors	a character (vector) specifying the colors used for the strokes.
neighbors	the number of neighbors a block considers when taking over a color. More neighbors fades the painting.
p	the probability of selecting a new color at each block. A higher probability adds more noise to the painting.
iterations	the number of iterations on the painting. More iterations fade the painting.
seed	the seed for the painting.
width	the width of the painting in pixels.
height	the height of the painting in pixels.
side	whether to turn the painting on its side.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

See Also

paint_turmite paint_function paint_ant paint_mondriaan

Examples

```
paint_strokes(colors = c('#fafafa', '#000000'))
```

---

paint_turmite *Paint a Turmite on a Canvas*

Description

This function paints a turmite. A turmite is a Turing machine which has an orientation in addition to a current state and a "tape" that consists of a two-dimensional grid of cells. The algorithm is simple: 1) turn on the spot (left, right, up, down) 2) change the color of the square 3) move forward one square.

Usage

```
paint_turmite(color, background = '#fafafa', p = 0.5, iterations = 1e7,
                     seed = 1, width = 1500, height = 1500)
```

Arguments

color	a character specifying the color used for the turmite.
background	a character specifying the color used for the background.
p	the probability of a state switch within the turmite.
iterations	the number of iterations of the turmite.
seed	the seed for the painting.
width	the width of the painting in pixels.
height	the height of the painting in pixels.

Value

A ggplot object containing the painting.

Author(s)

Koen Derks, <koen-derks@hotmail.com>

References

https://en.wikipedia.org/wiki/Turmite

See Also

paint_strokes paint_function paint_ant paint_mondriaan

Examples

```
paint_turmite(color = "#000000", background = "#fafafa")
```

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