

# Package ‘aRtsy’

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**Title** Randomized Generative Art

**Description** Implements generative art using ggplot2.

**Version** 0.1.0

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**BugReports** <https://github.com/koenderks/aRtsy/issues>

**URL** <https://github.com/koenderks/aRtsy>

**Imports** dplyr, ggplot2, ggpubr, Rcpp, reshape2

**LinkingTo** Rcpp, RcppArmadillo

**Language** en-US

**License** GPL-3

**Encoding** UTF-8

**RoxygenNote** 7.1.1

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paint_ant	<i>Paint Langton's Ant on a Canvas</i>
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## 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](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')
```

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paint\_arcs

*Paint Arcs on a Canvas*

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**Description**

This function paints arcs.

**Usage**

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

**Arguments**

background	a character specifying the color used for the background.
n	an integer specifying how many paintings should be put on the canvas.
nrow	(optional) number of rows on the canvas
ncol	(optional) number of columns on the canvas.
dir	a character specifying which direction the arcs turn.
color	a character 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'))
```

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paint_circlemap	<i>Paint a Circle Map on a Canvas</i>
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**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')
```

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paint_mondriaan	<i>Paint a Mondriaan on a Canvas</i>
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**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)
```

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`paint_planet`*Paint a Planet on a Canvas*

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**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**

<code>colors</code>	a character specifying the colors used for the planets
<code>threshold</code>	a character specifying the threshold for a color take.
<code>iterations</code>	the number of iterations of the planets
<code>starprob</code>	the probability of drawing a star in outer space.
<code>fade</code>	the fading factor.
<code>radius</code>	a numeric (vector) specifying the radius of the planet(s).
<code>center.x</code>	the x-axis coordinate(s) for the center(s) of the planet(s).
<code>center.y</code>	the y-axis coordinate(s) for the center(s) of the planet(s).
<code>light_right</code>	whether to draw the light from the right or the left.
<code>seed</code>	the seed for the painting.
<code>width</code>	the width of the painting in pixels.
<code>height</code>	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\_strokes

*Paint Strokes on a Canvas***Description**

This function creates a painting that resembles paint 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 chance 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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