Generative Art

Slides by Professor Dan Vogel.


iclicker

Jackson Pollock

Generative Art

Generative art refers to **art** that in whole or in part has been created with the use of an **autonomous system**. An autonomous system in this context is generally one that is non-human and can independently determine features of an **artwork** that would otherwise require decisions made directly by the **artist**.

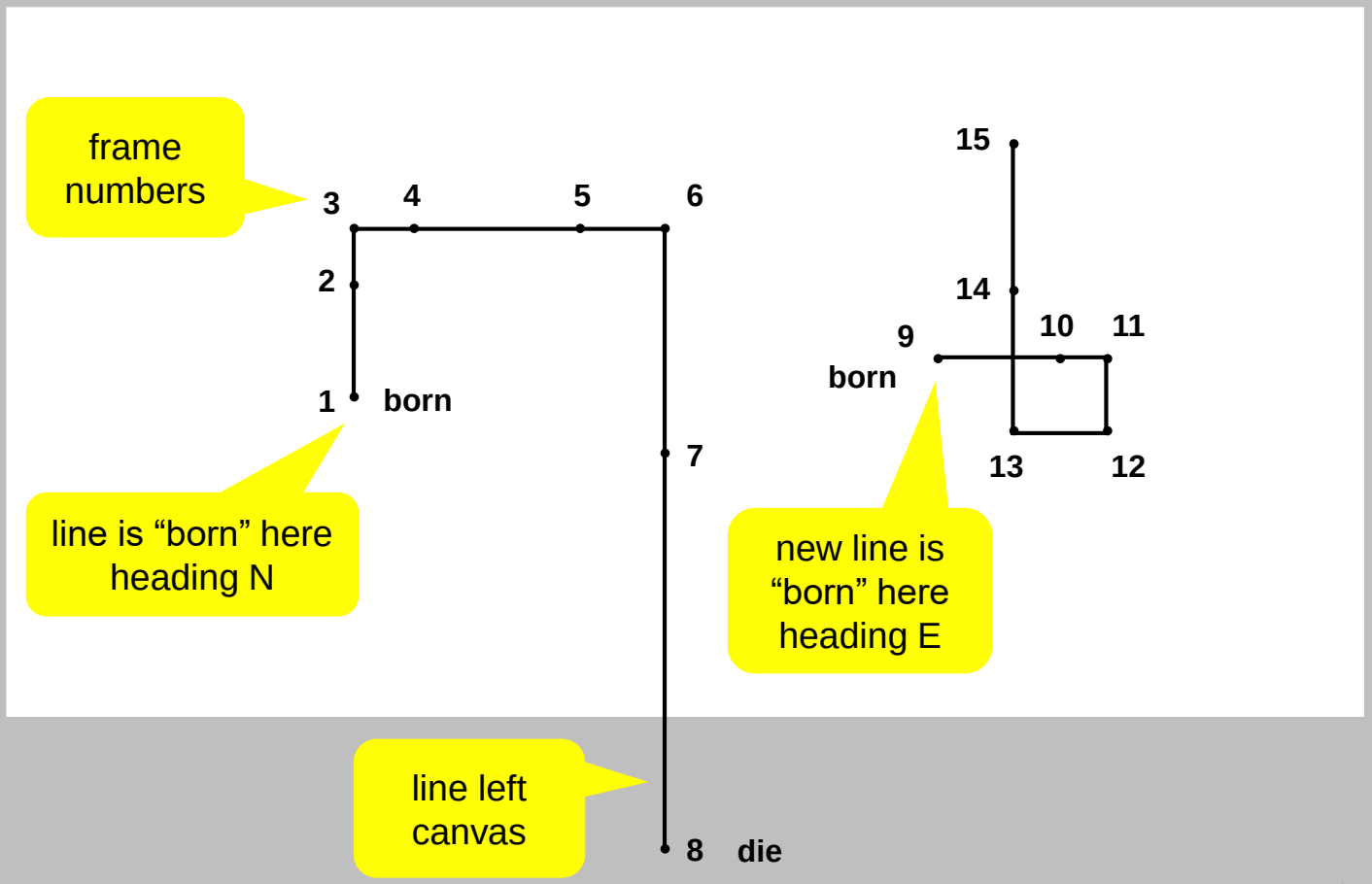
https://en.wikipedia.org/wiki/Generative_art

How To Draw With Code: Casey Reas
https://youtu.be/_8DMEHxOLQE

Generative Rules

1. start at random position with random N, S, E, or W direction
2. each frame, decide if the line should turn 90° clockwise
3. draw a line of random length in current direction
4. if the line leaves the canvas, kill it and start a new one

Example of Generated Lines



Lines are Drawn by an “Agent”

```
class Agent {
  float x;
  float y;
  // 0 is N, 1 is E, 2 is S, 3 is W
  int direction;
  boolean dead;

  Agent() {
    ...
  }

  void update() {
    ...
  }
}
```

way to keep track of direction

Lines are Drawn by an “Agent”

```
Agent a;

void setup() {
  ...

  // create agent
  a = new Agent();
}

void draw() {
  // update the agent
  a.update();

  ...
}
```

1. start at random position with
random N, S, E, or W direction

```
Agent() {
  x = random(width);
  y = random(height);
  direction = int(random(0, 4));
  dead = false;
}
```

0, 1, 2, or 3

2. each frame, decide if the line should turn 90° clockwise

```
void update() {
  ...

  // decide if it changes direction
  if (random(100) < probTurn) {
    direction = (direction + 1) % 4;
  }

  ...
```

probability of changing direction

modulo 4 wraps direction back to 0

3. draw a line of random length in current direction

```
void update() {
    // save current position
    int px = x;
    int py = y;

    float step = random(1, maxStep);
    // step in the current direction
    if (direction == 0) {
      y -= step;
    } else if (direction == 1) {
      x += step;
    } else if (direction == 2) {
      y += step;
    } else if (direction == 3) {
      x -= step;
    }
    line(px, py, x, y);
```

change x or y depending on current direction

4. if the line leaves the canvas, kill it …

```
void update() {
    ...
    // kill if it leaves the canvas
    if (x < 0 || x > width || y < 0 || y > height) {
      dead = true;
    }
```

… and start a new one

```
  void draw() {
    ...
    // create a new agent if this one died
    if (a.dead) {
       a = new Agent();
    }
```

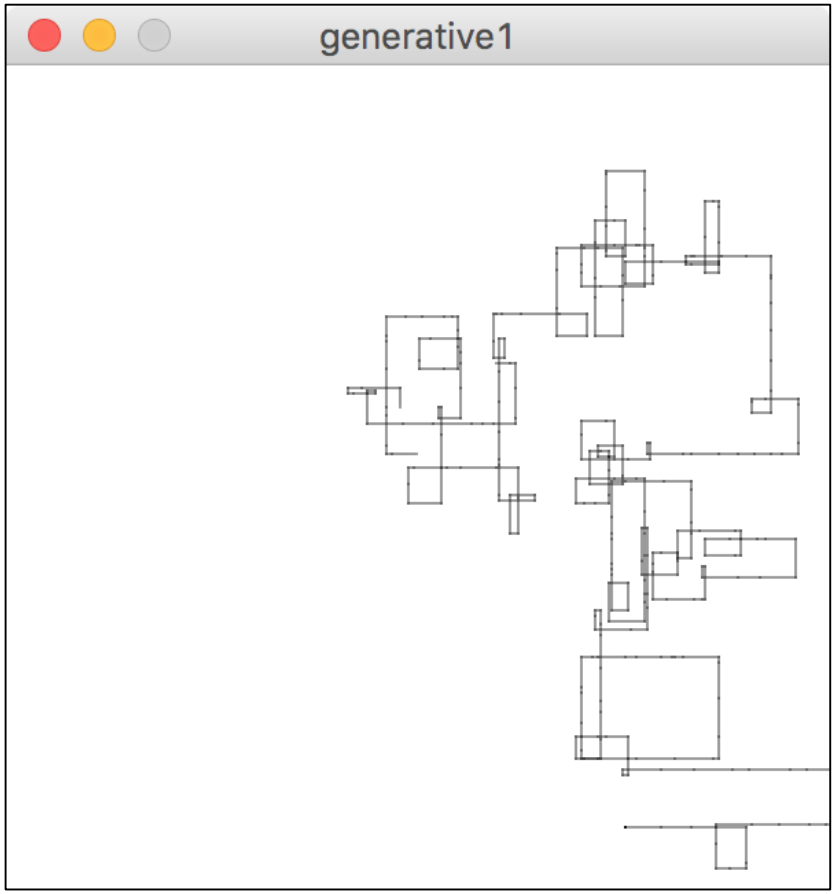
generative1

start at random position with random N, S, E, or W direction

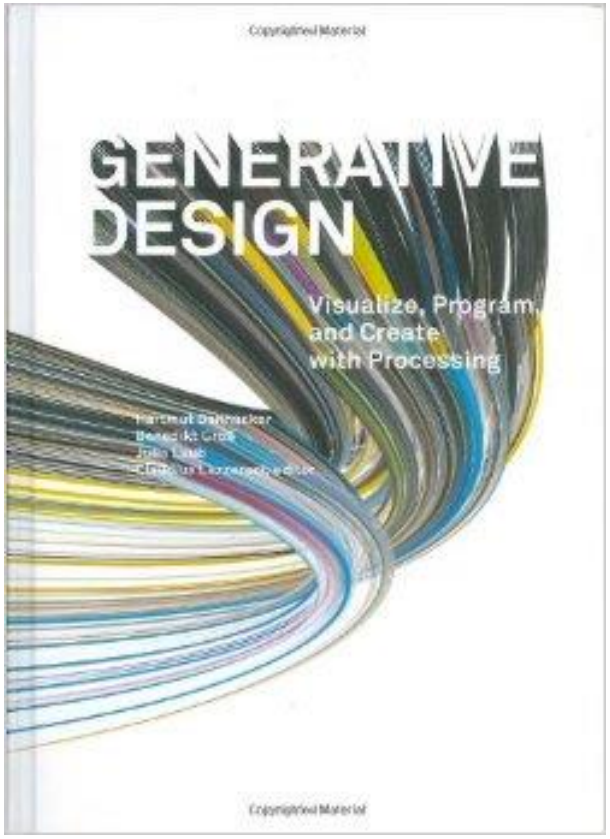
each frame, decide if the line should turn 90° clockwise

draw a line of random length in current direction

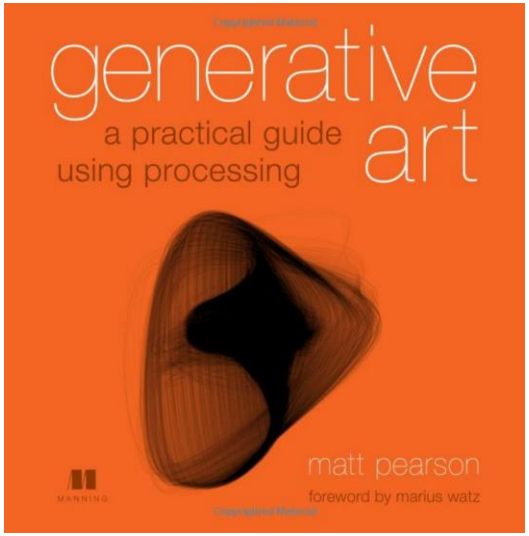
if the line leaves the canvas, kill it and start a new one



More Generative Art



Bohnacker, H., Gross, B., & Laub, J. (2012). *Generative Design: Visualize, Program, and Create with Processing*. http://www.generative-gestaltung.de/code



Pearson, M. (2011). *Generative Art* (1 edition). Shelter Island, NY : London: Manning Publications. https://www.manning.com/books/generative-art