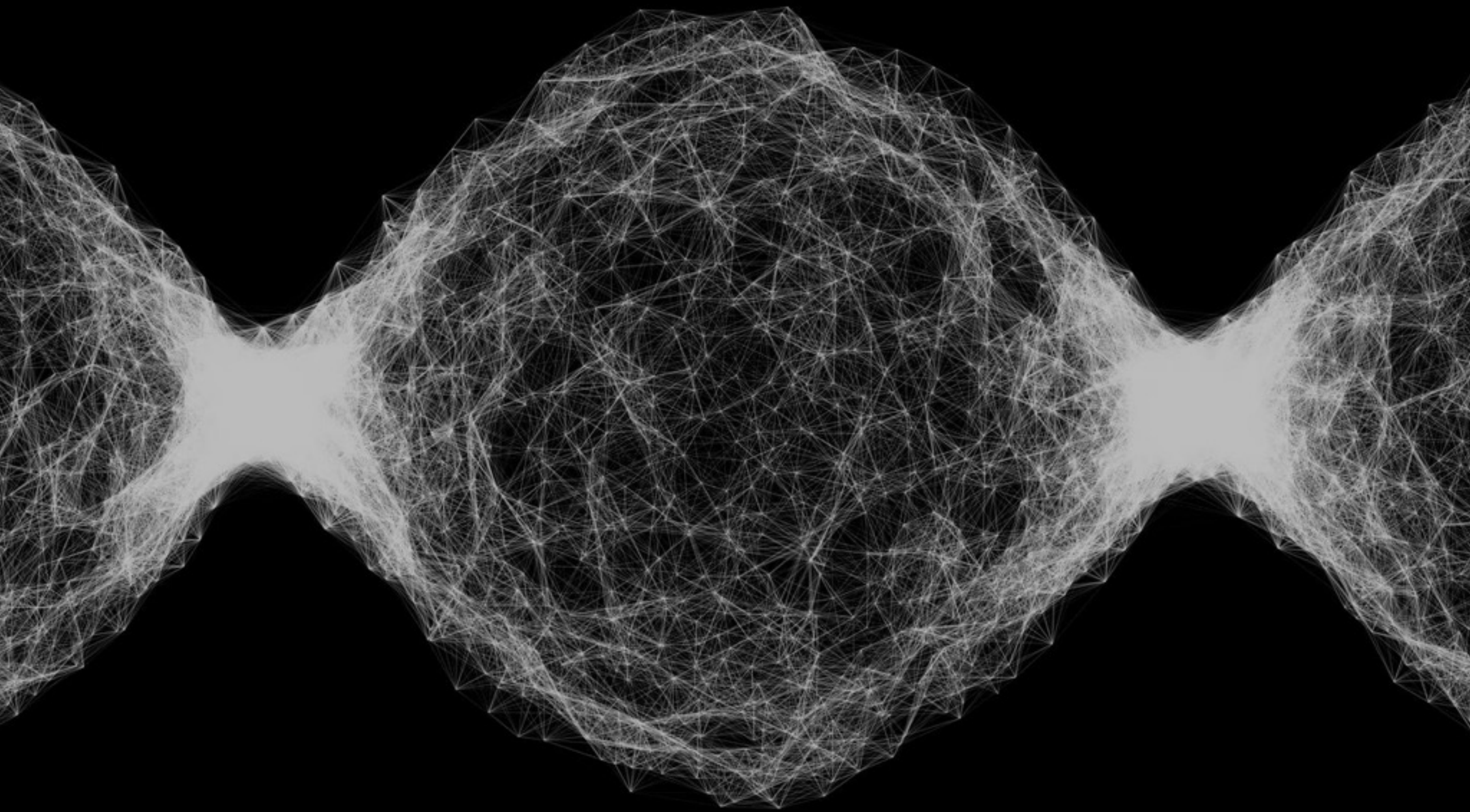
Introduction to Generative Art



generative art

a practical guide using processing

matt pearson

foreword by marius watz

MANNING

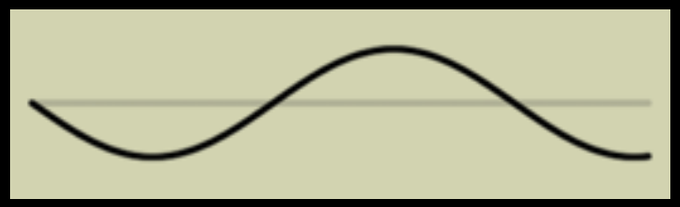
What is Generative Art?

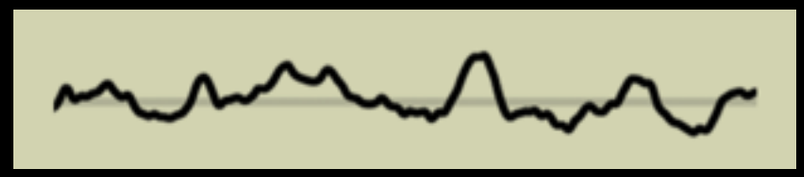
- Art creation involves autonomous system and certain kind of randomness.
- Algorithmic Art
- Abstract pattern

Content will be covered today.

- Some functions generating random-like value.
- Some abstract patterns.
- Some works.

Why we need random-like value generator in generative art?





Deterministic Random

parameter

Functions generating random-like value

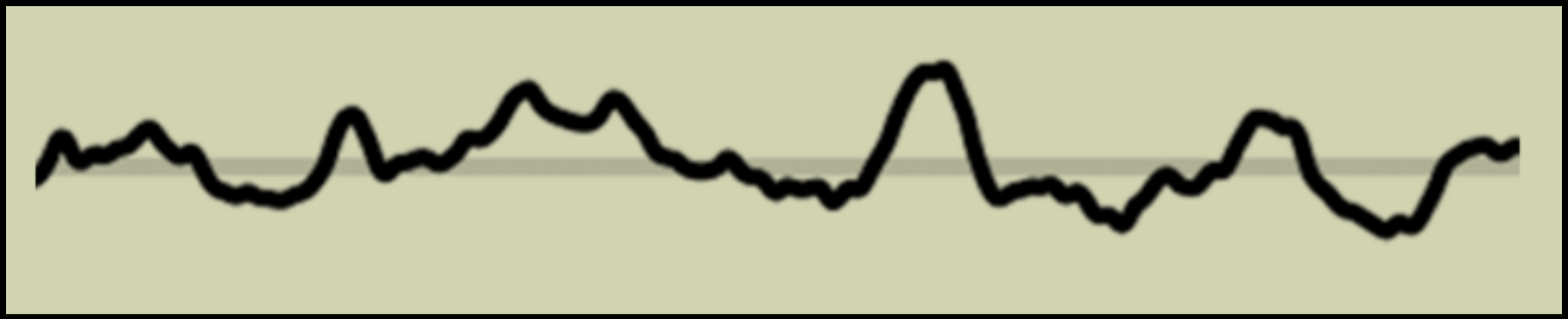
- random
- perlin noise
- hybrid

Random example - line fluctuation

iterative variance

Perlin Noise

Line fluctuation with 1D Perlin noise

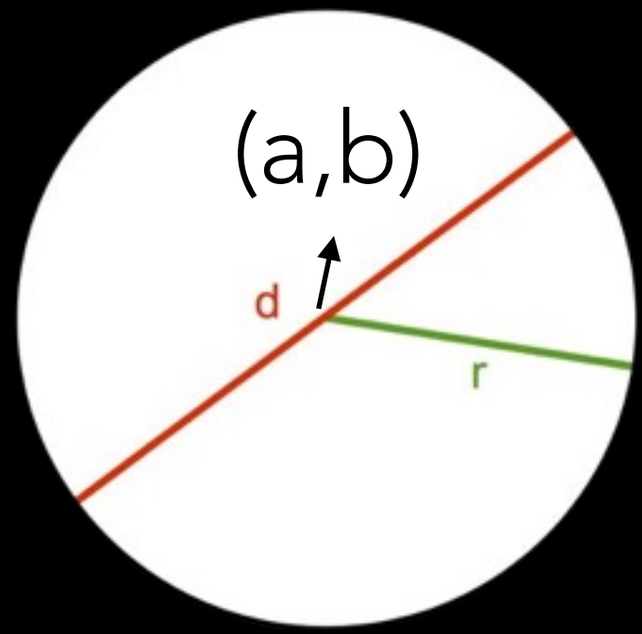


Make your own noise function

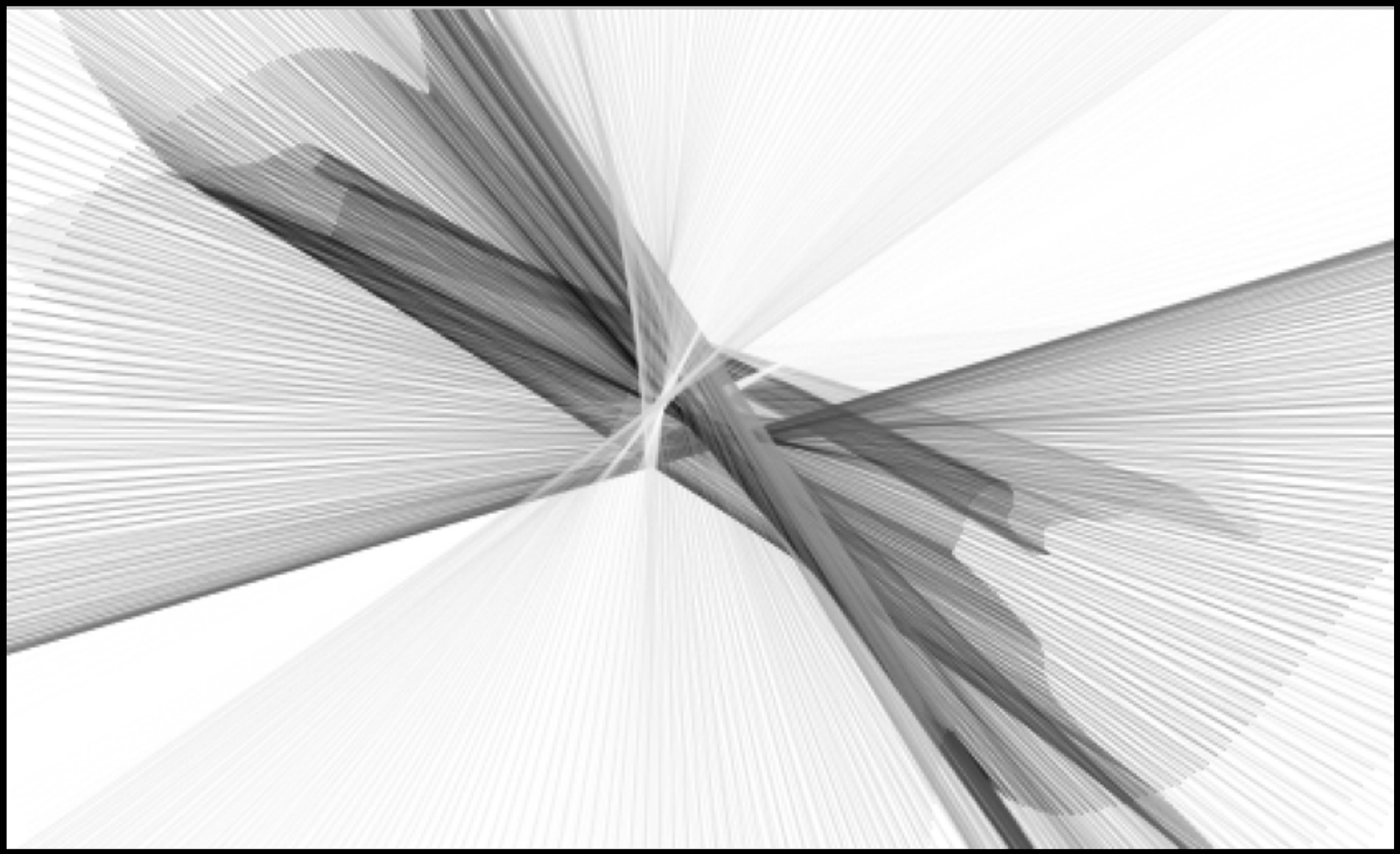
- 0.3 * random(1) + 0.7 * noise(1)
- pow(sin(val), random(3))
- …

Rotational Drawing

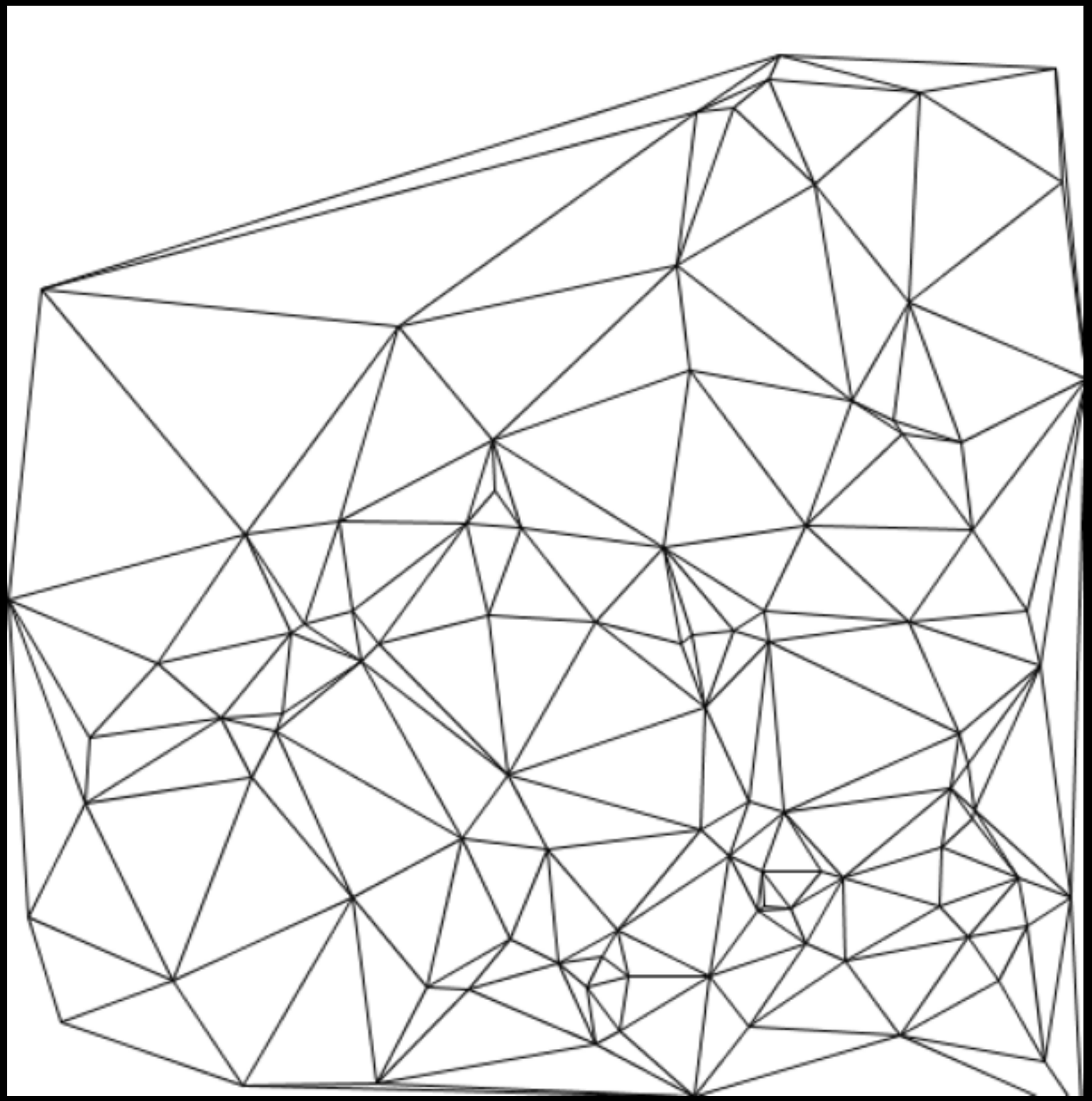
- (x-a)^2 + (y-b)^2 = r^2
- x = a + r*sin(t)
  y = b + r*cos(t)



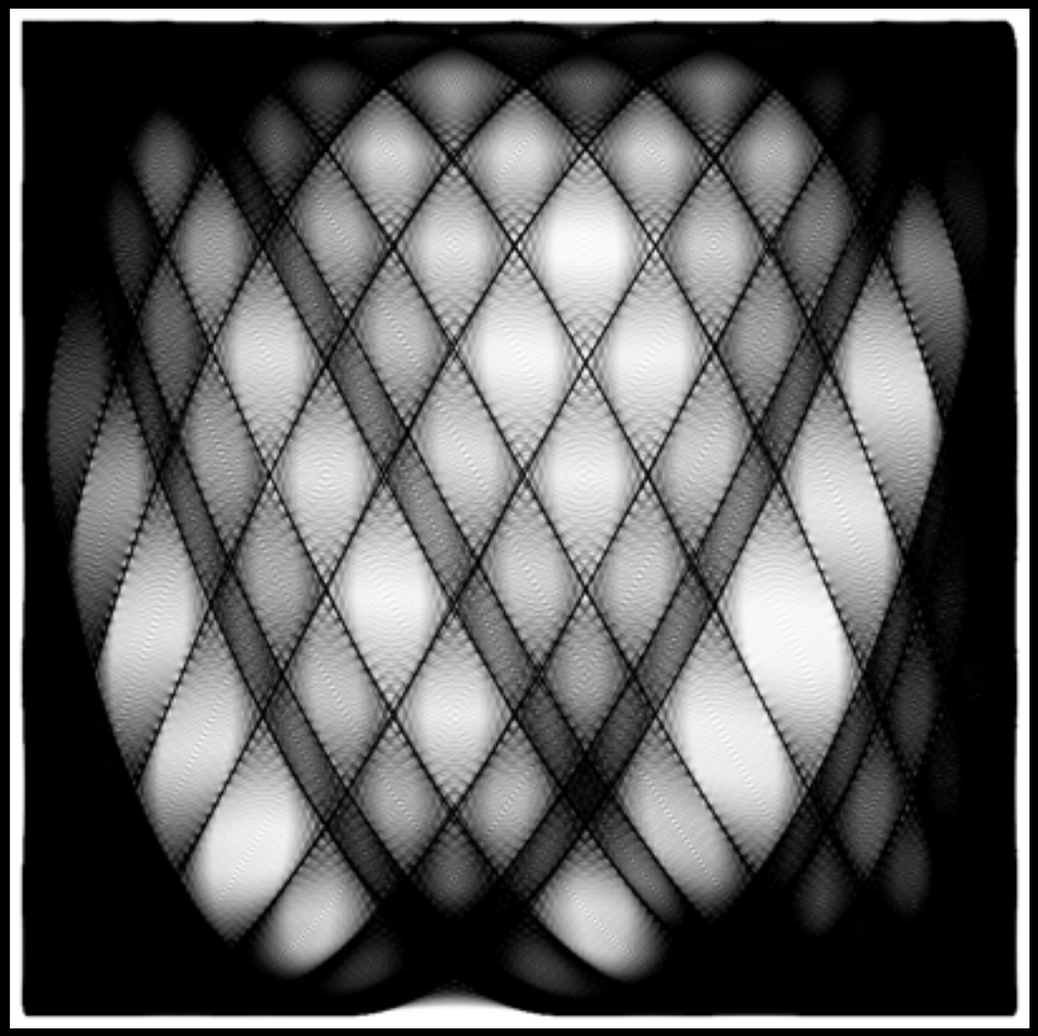
Clock Wave

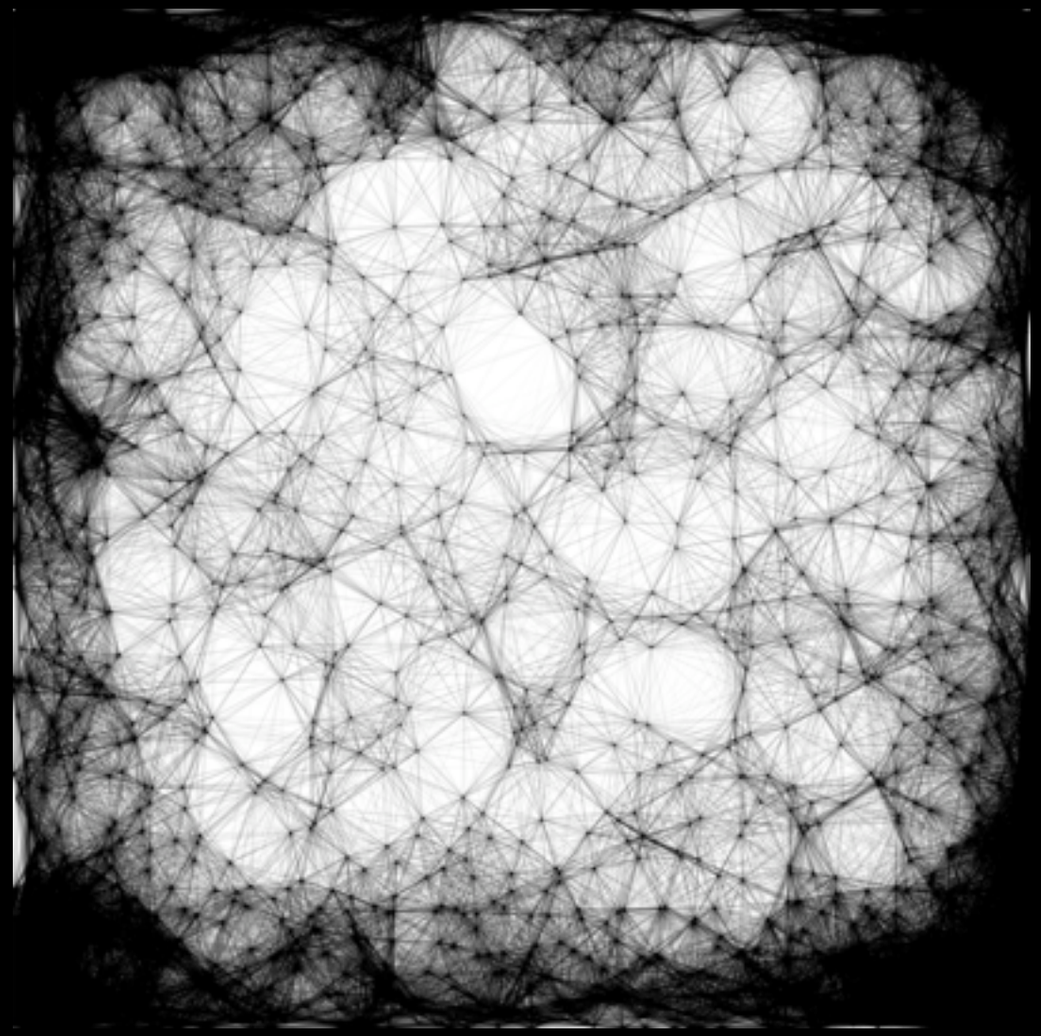


Mesh - Delaunay Diagram



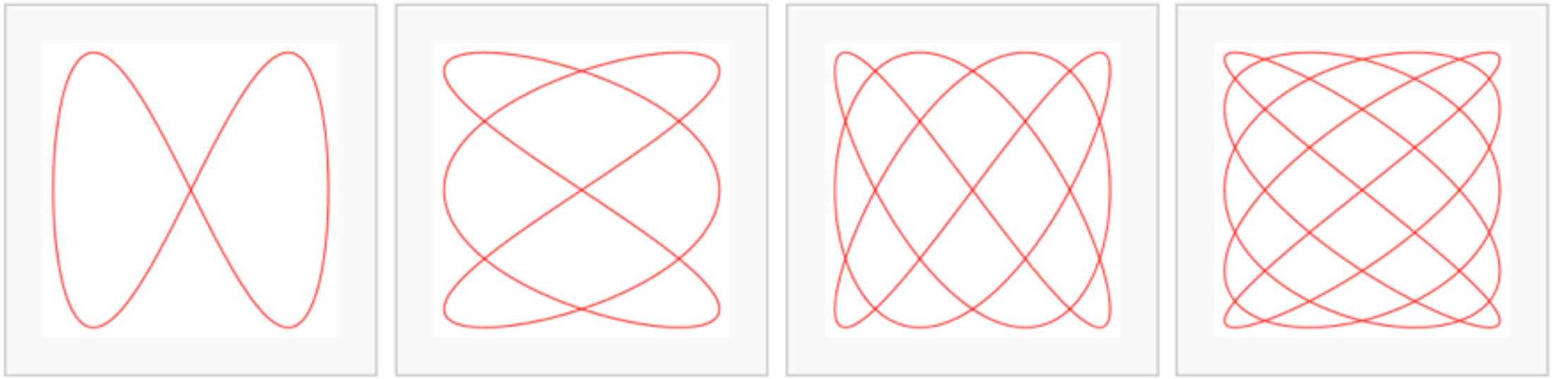
Lissajous Figures





Lissajous Figures

$$x = A\sin(at + \delta), \quad y = B\sin(bt),$$



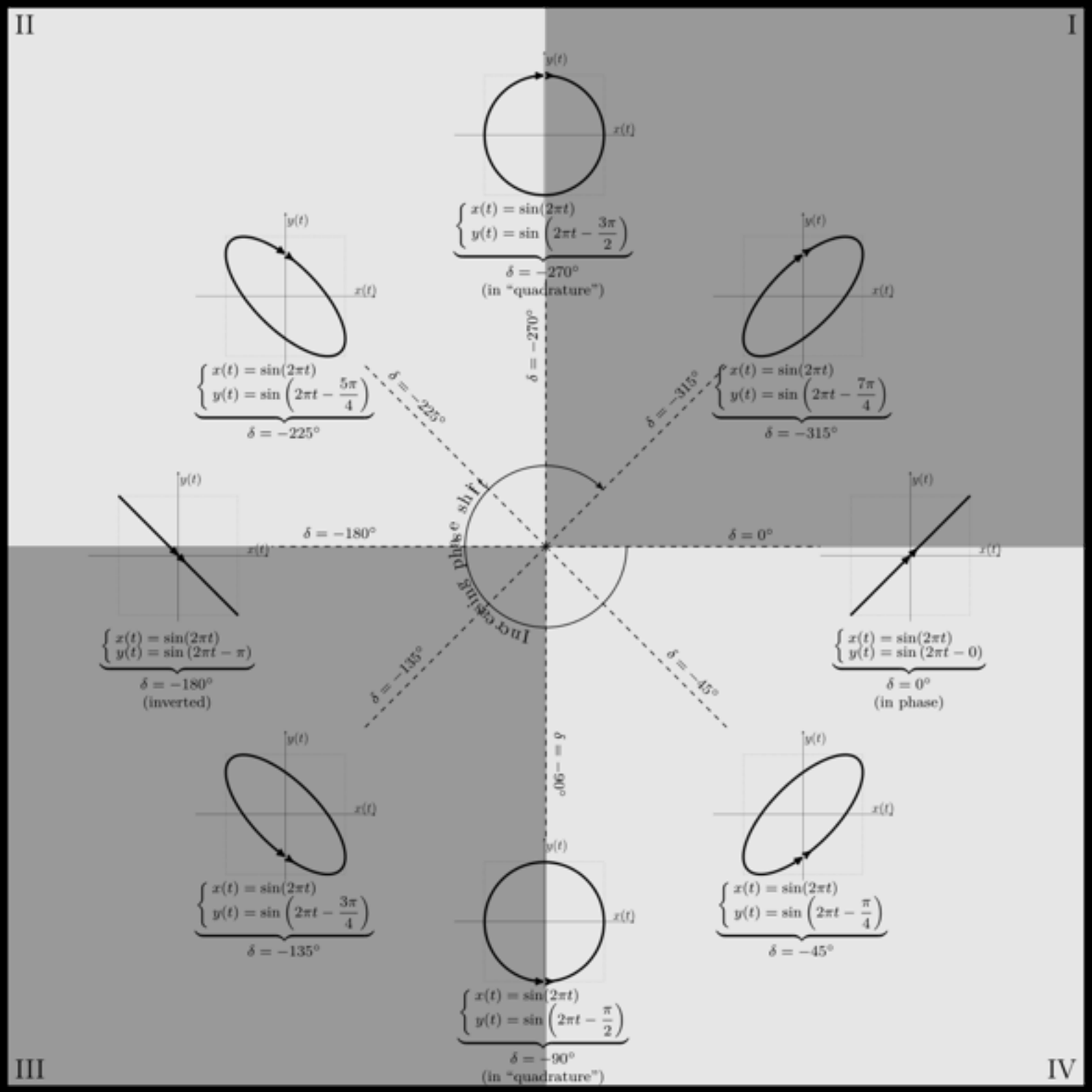
$a = 1$, $b = 2$ (1:2)

$a = 3$, $b = 2$ (3:2)

$a = 3$, $b = 4$ (3:4)

$a = 5$, $b = 4$ (5:4)

Lissajous Figures

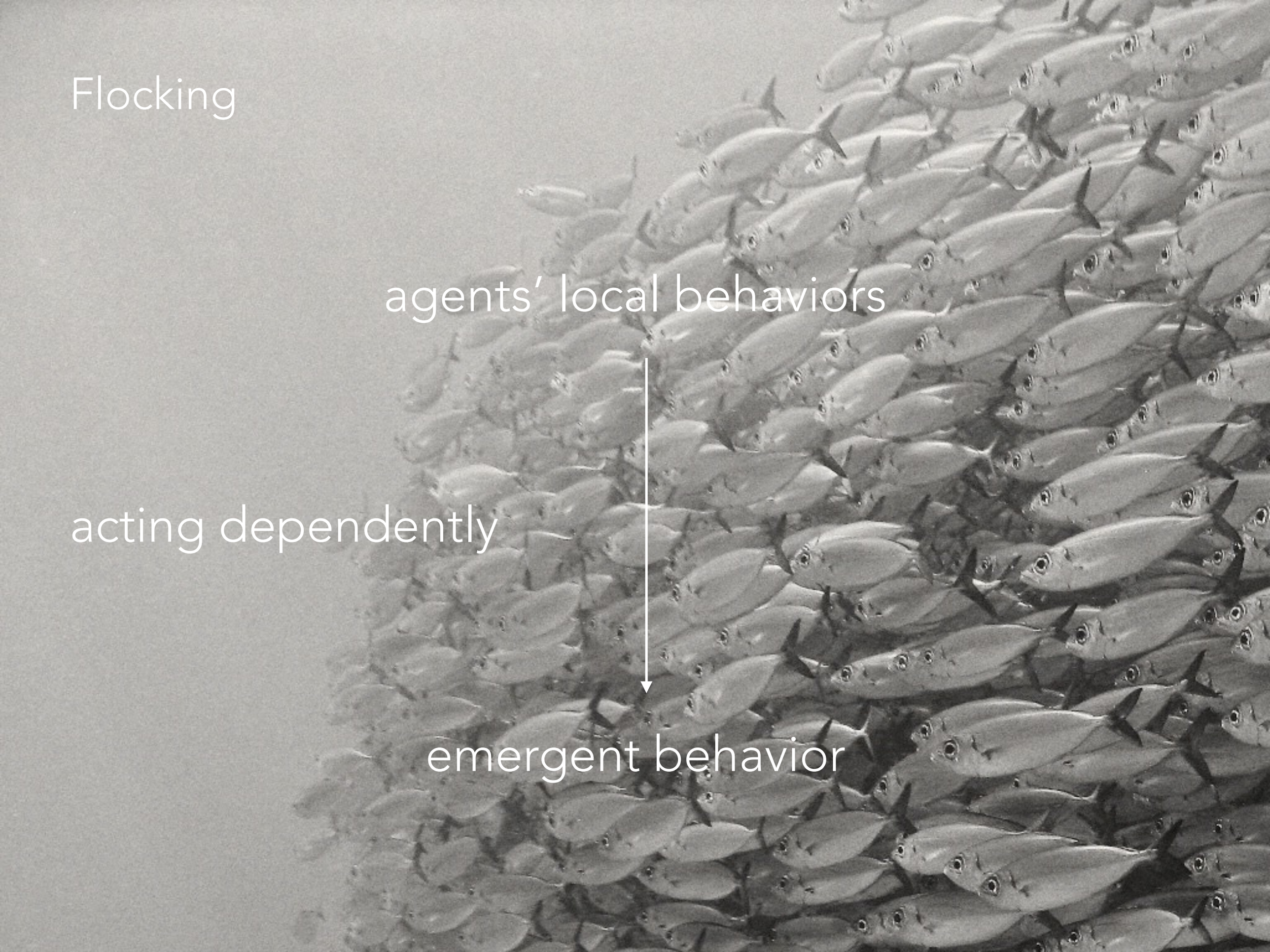


Flocking

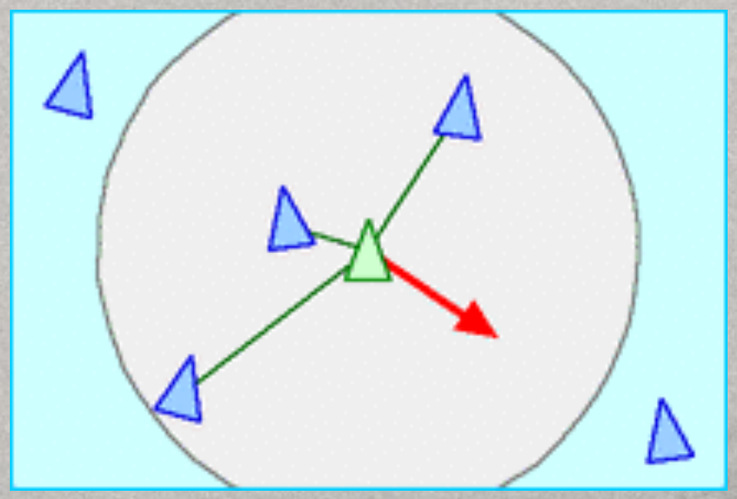
agents' local behaviors

acting dependently

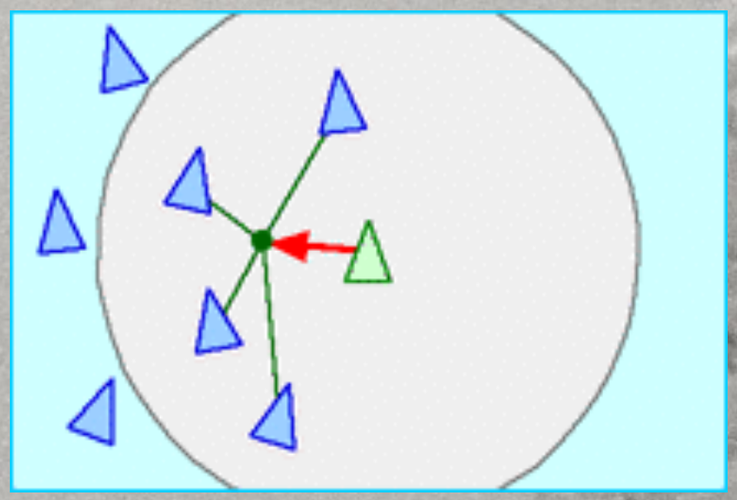
emergent behavior



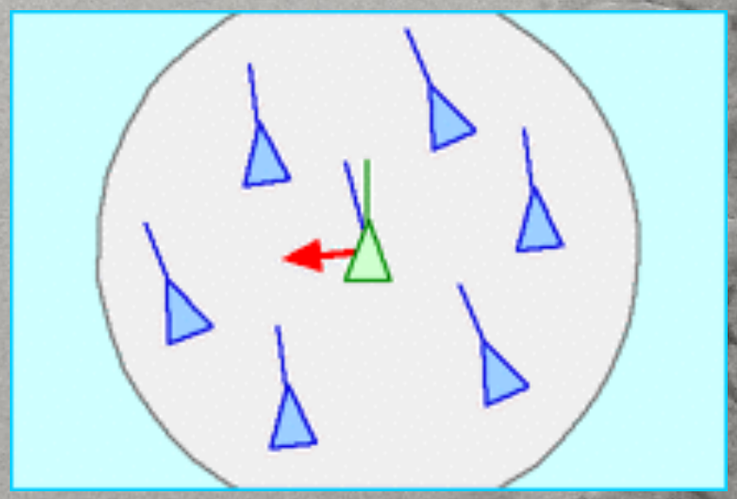
Flocking - Boids



Separation: steer to avoid crowding local flockmates



Alignment: steer towards the average heading of local flockmates



Cohesion: steer to move toward the average position of local flockmates

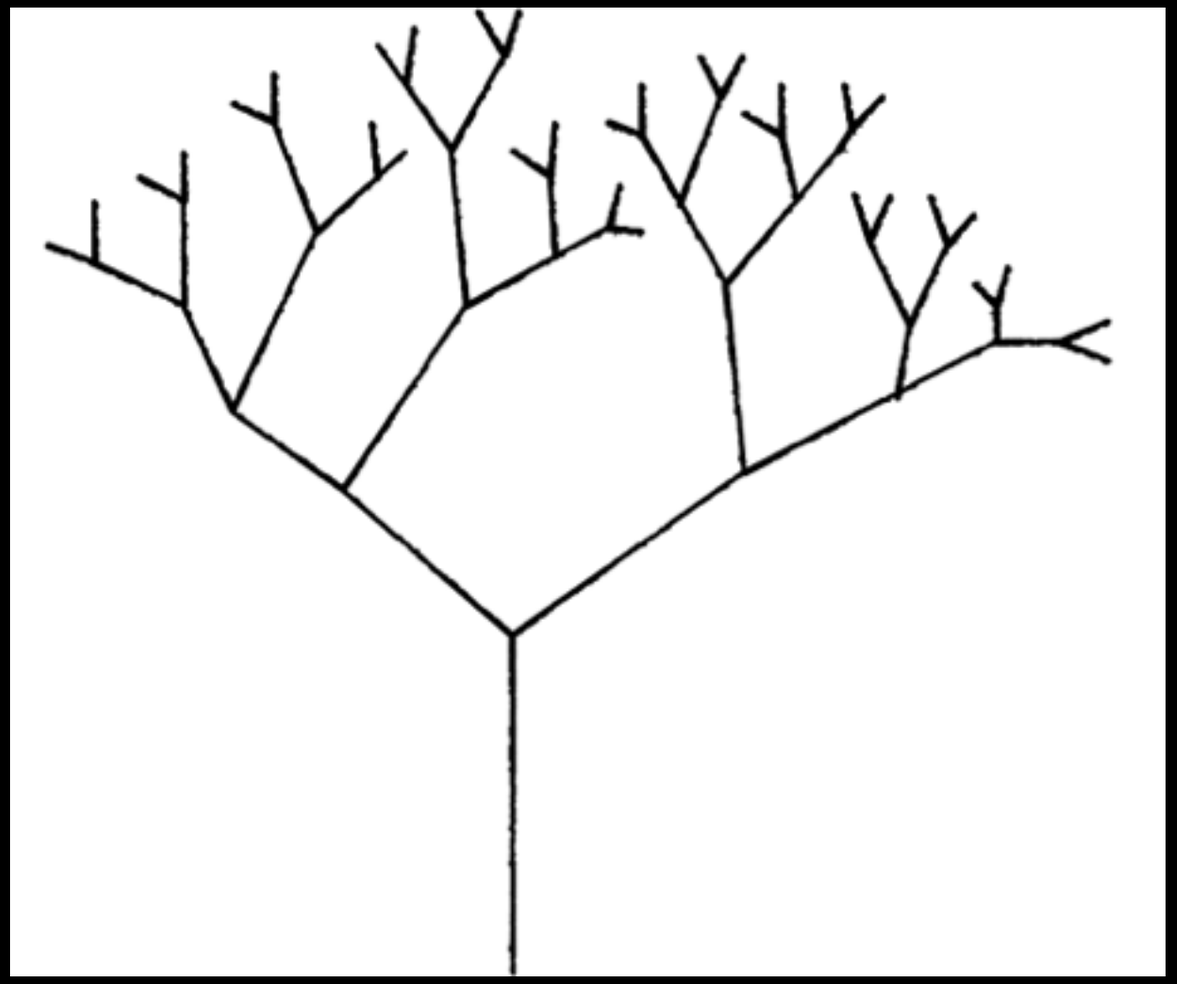
Flocking - Boids

Demo

Fractal

a rough or fragmented geometric shape that can be split into parts, each of which is (at least approximately) a reduced-size copy of the whole.

Benoit Mandelbrot, 1975



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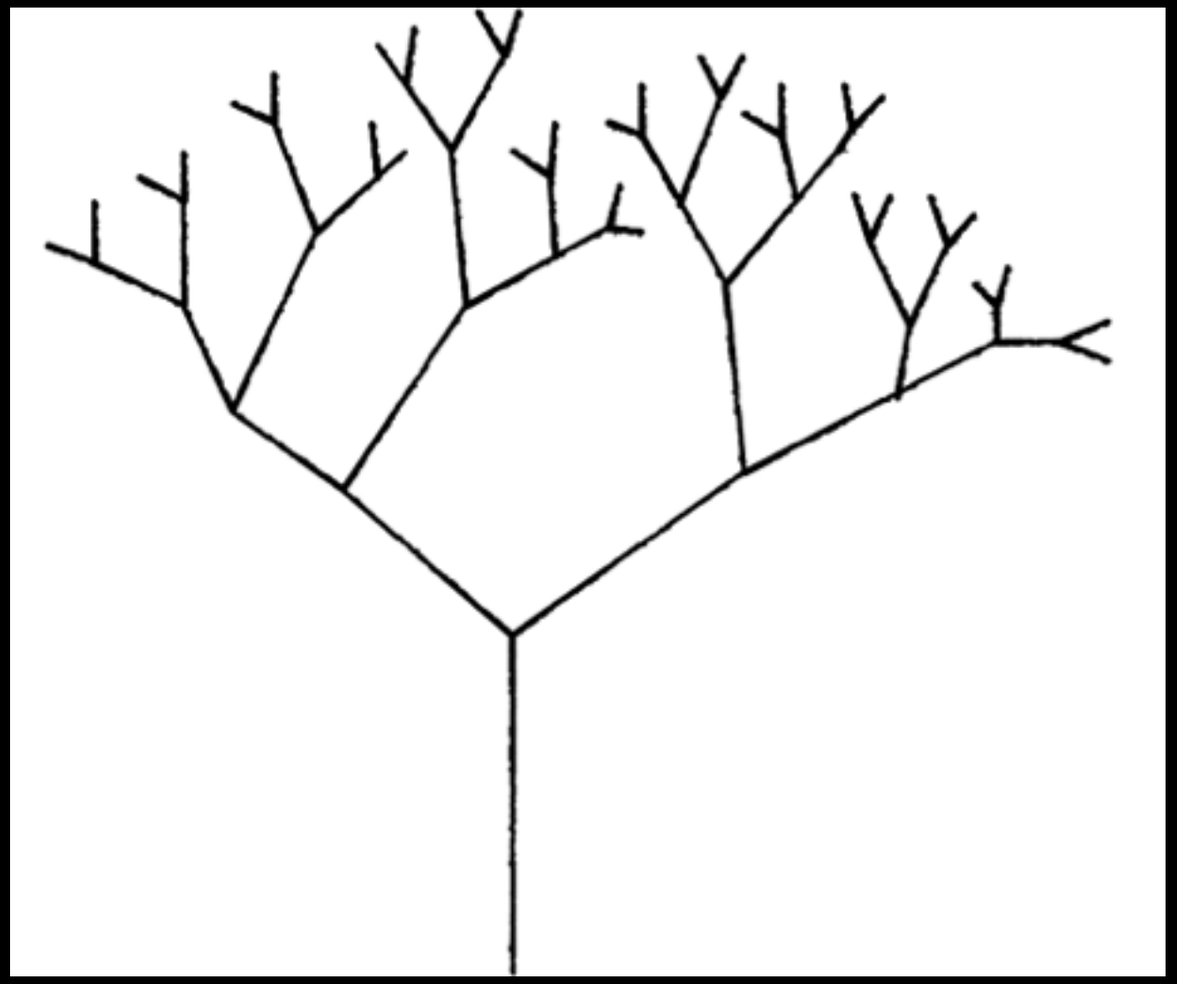
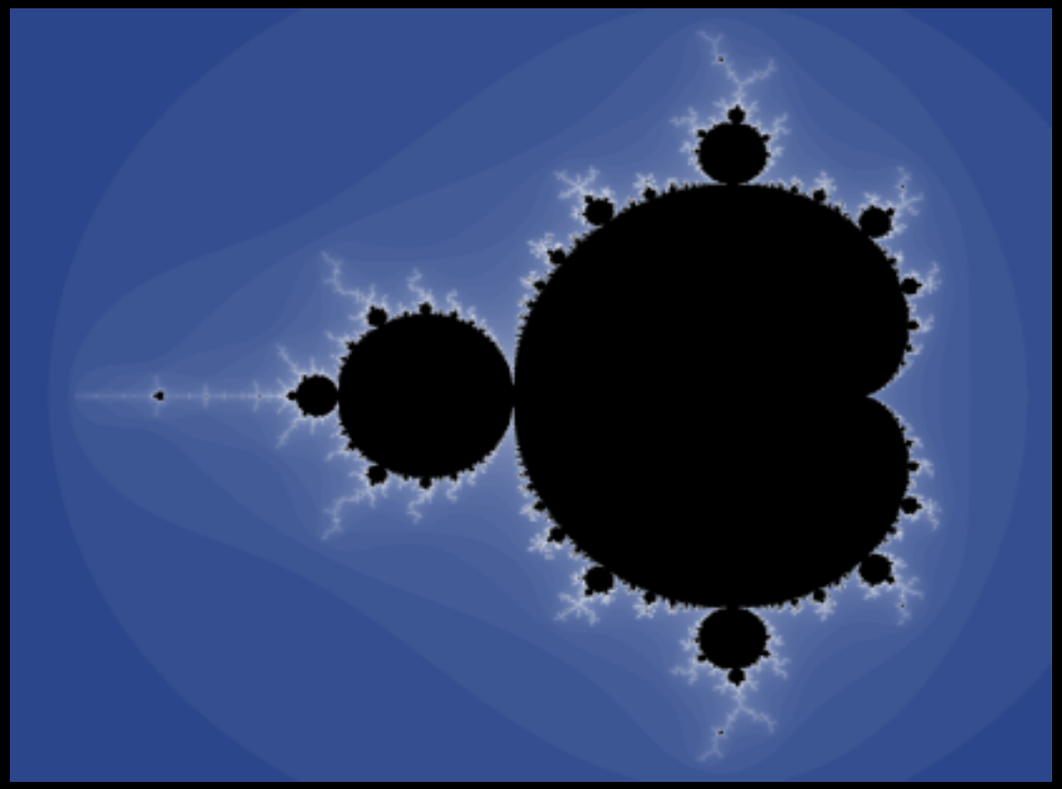
Fractal

In mathematics or computer science, the concept can refer to

Recursion



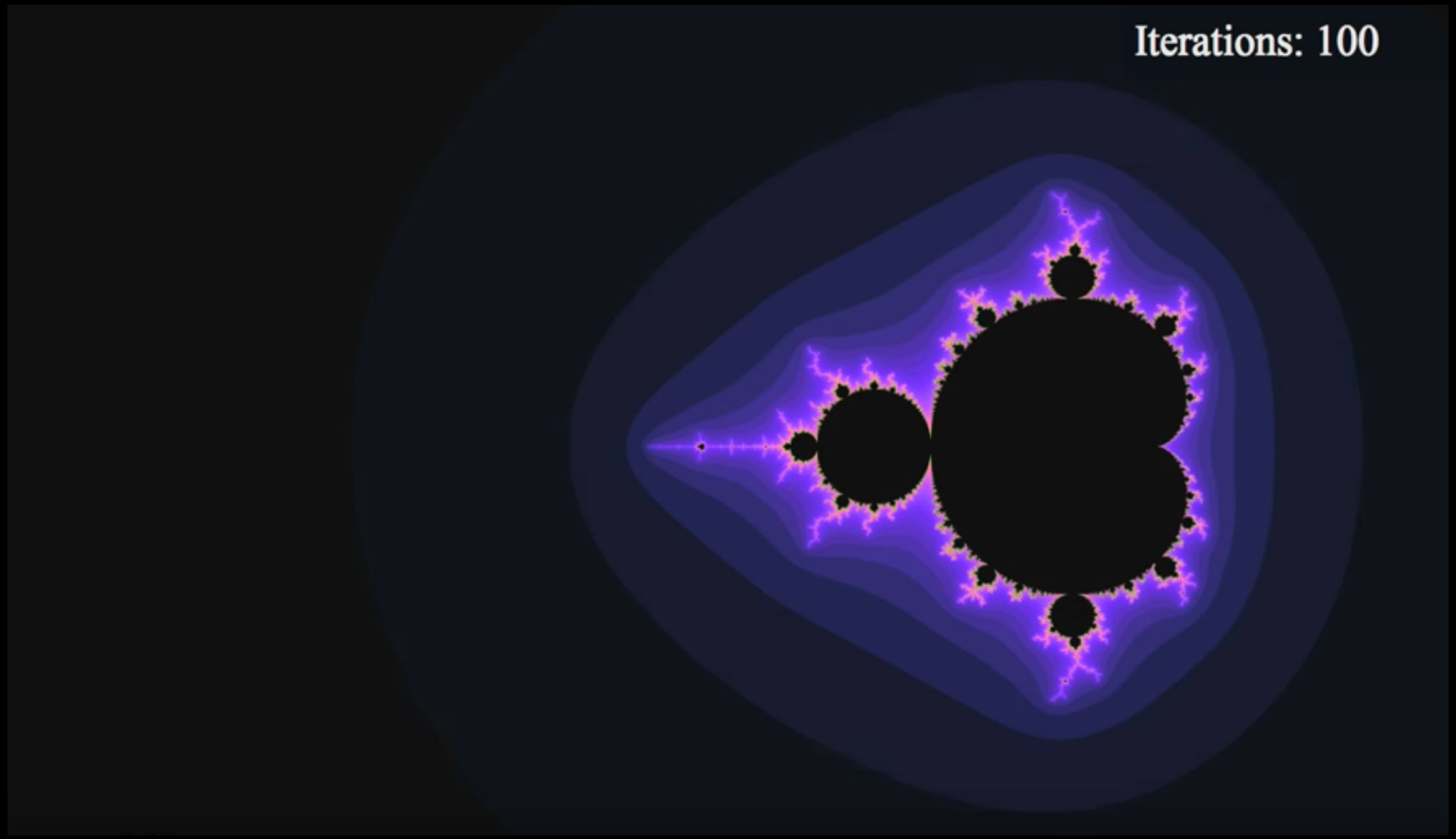
Fractal - The Mandelbrot Set



$$z(0) = z, \quad z(n+1) = z(n)*z(n) + z, \quad n=0,1,2, \ldots \quad (1)$$

the complex numbers belong to this set as long as
the iteration remains bounded even if n approaches infinity

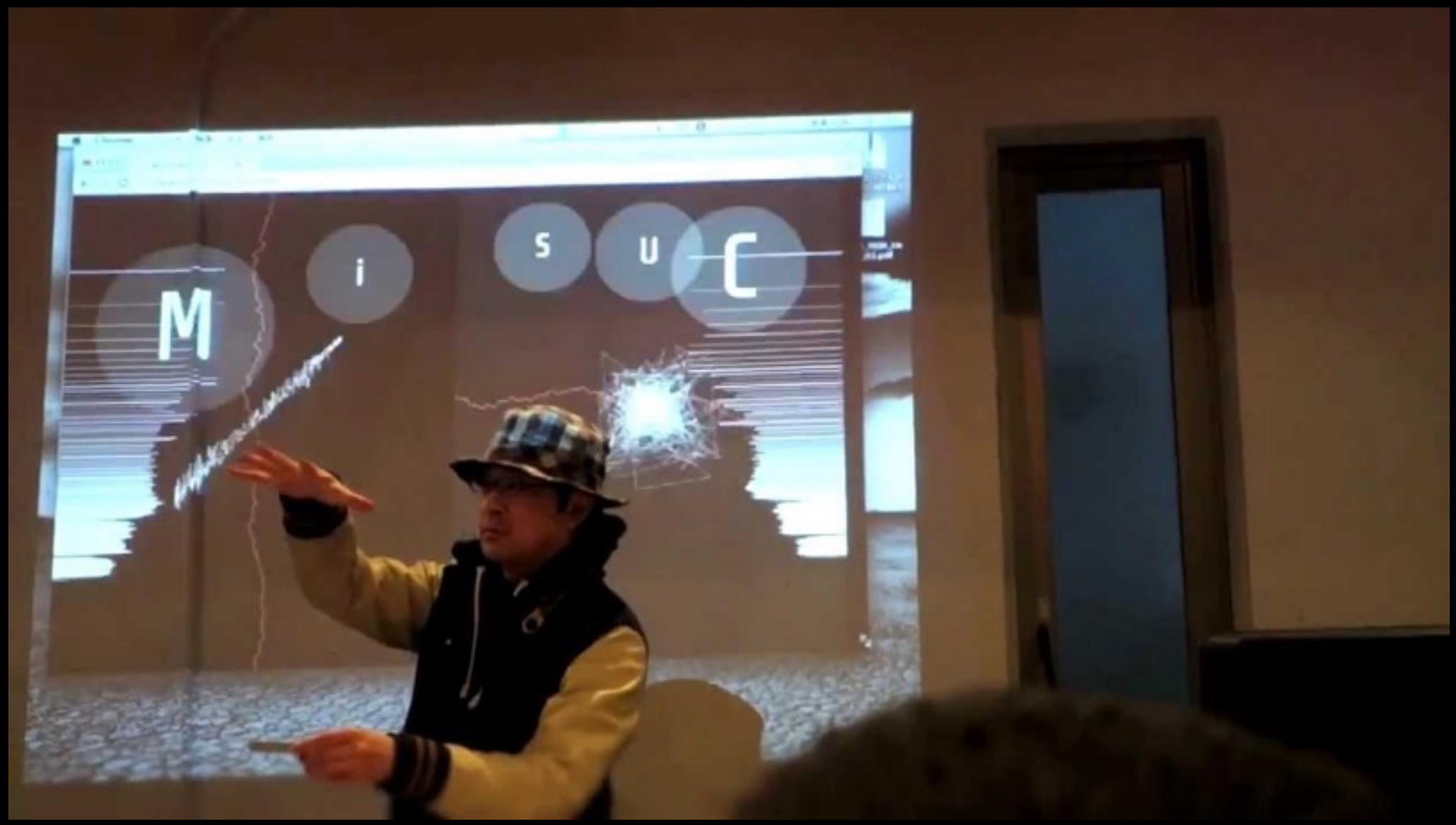
Fractal - Mandelbrot Zoom



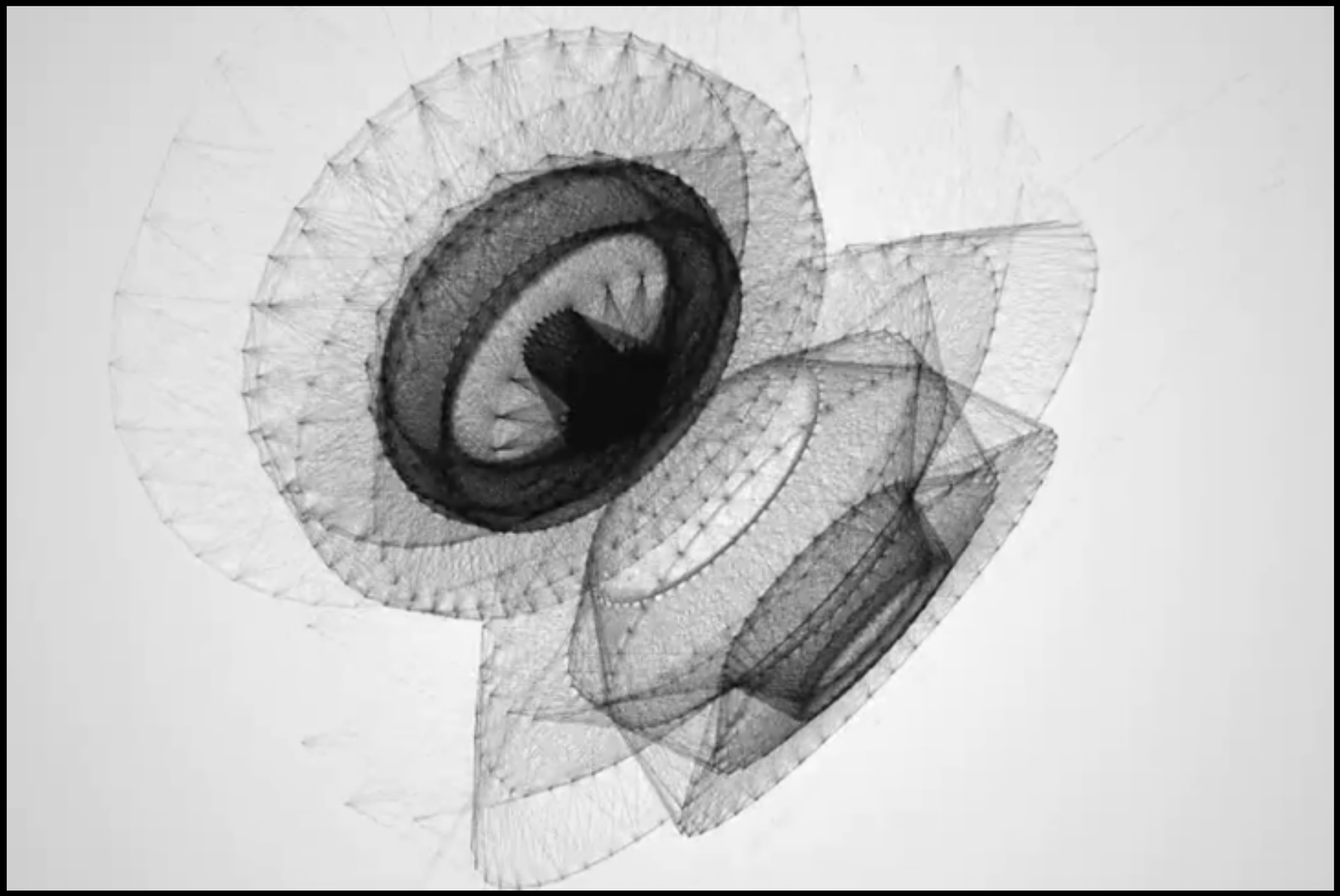
Fractal - Mandelbrot Set

DEMO

Other Things You Can Try - Integrate With Interaction



Other Things You Can Try - Combine other Effect



Other Things You Can Try - Projection, VR, other output