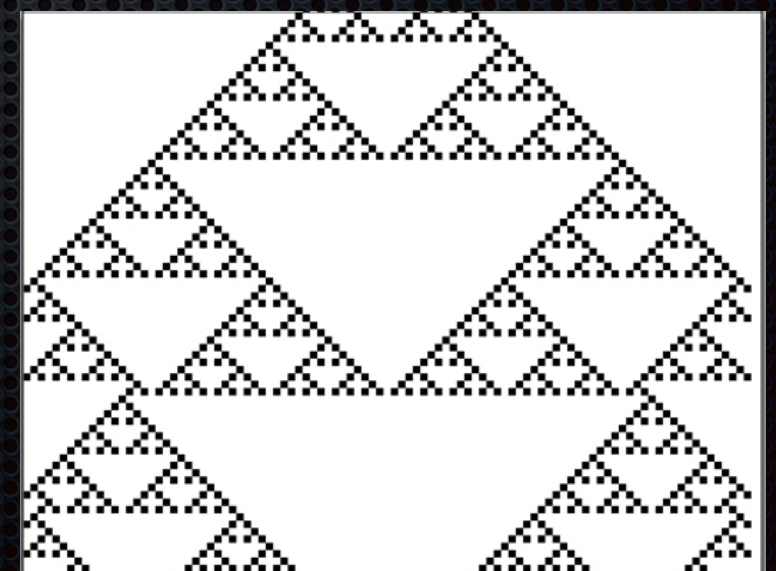
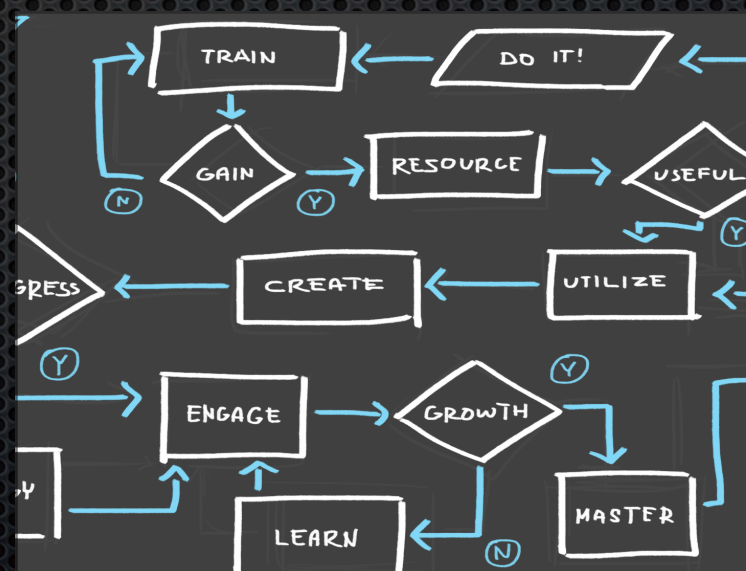
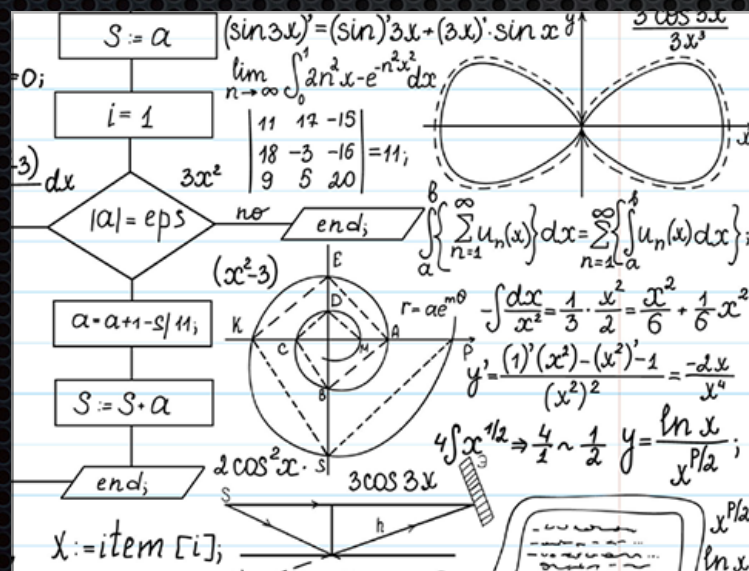


Complex Algorithms

David Hackbarth

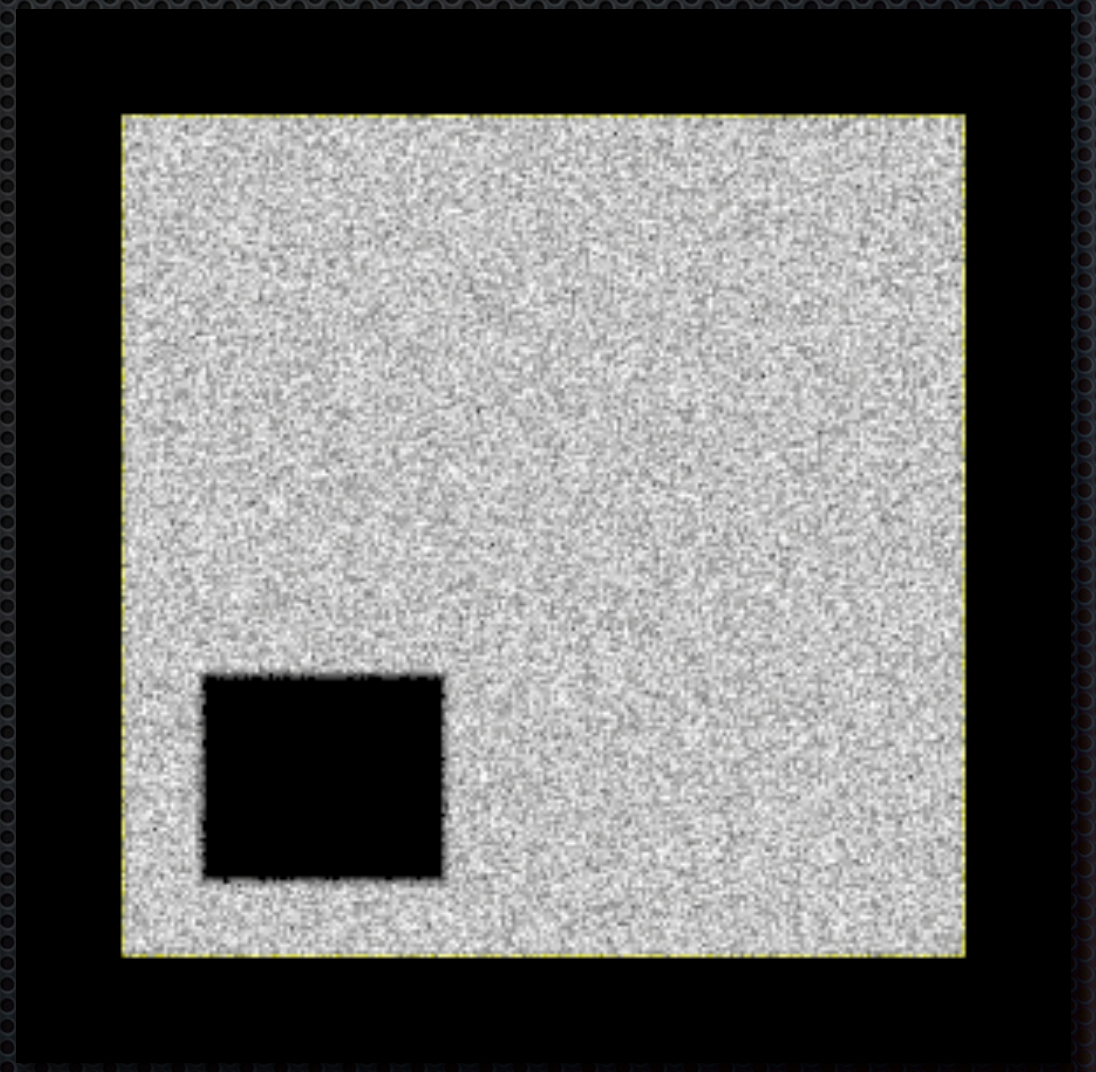


Cellular Automata

- ✦ computation model
- ✦ automata theory
- ✦ discovered in 1940s
- ✦ evolved in 1970s and 1980s

Cellular Automata

- ✦ grid of cells
- ✦ can be infinite
- ✦ state for every cell
- ✦ evaluate neighbors
- ✦ apply rules
- ✦ changed over time



Cellular Automata

- ✦ physics simulation
- ✦ biology
- ✦ procedural generation
- ✦ ai
- ✦ Conway's Game of Life



Conway's Game of Life

- ✧ cellular automata
- ✧ no input
- ✧ different configurations/
initial states
- ✧ 2d - squared cells
- ✧ two states



Conway's Game of Life

■ Rules

1. Any live cell with fewer than two live neighbors dies, as if by underpopulation.
2. Any live cell with two or three live neighbors lives on to the next generation.
3. Any live cell with more than three live neighbors dies, as if by overpopulation.
4. Any dead cell with exactly three live neighbors becomes a live cell, as if by reproduction.

