

MAT 259A Assignment 2

Visualizing check-out frequency of book titles over several years via the movement of simulated agents in a 3D space

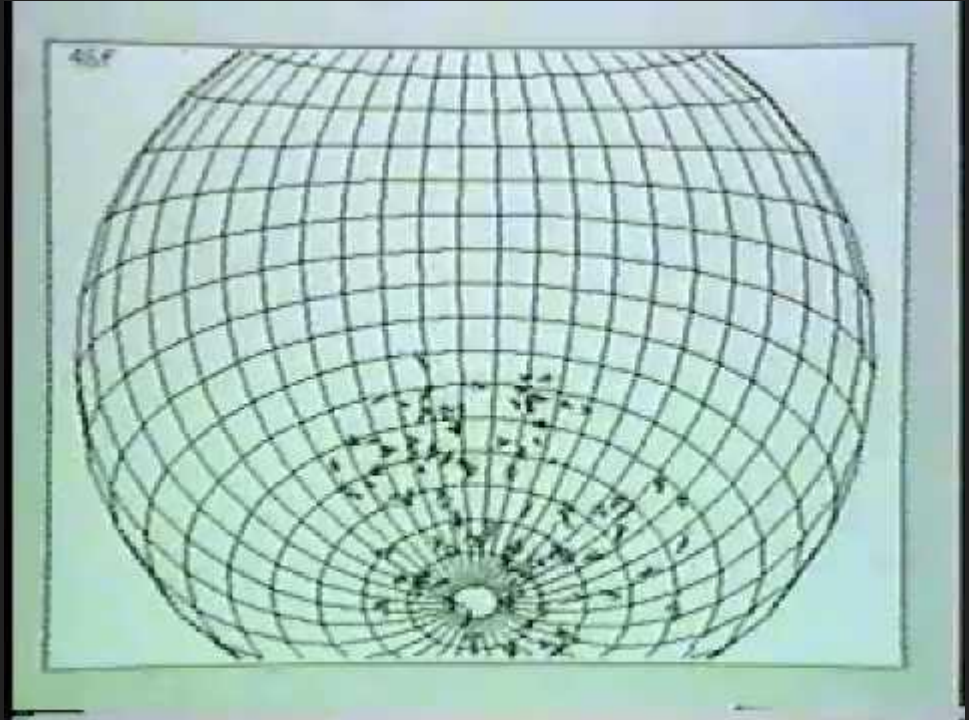
Stejara Dinulescu

Boids algorithm (Craig Reynolds, 1986)

Simulates the flocking behaviors of birds with three simple rules:

- Separation (steer to avoid crowding local flockmates)
- Alignment (steer towards the average heading of local flockmates)
- Cohesion (steer towards the average position of local flockmates)

Algorithm can be extended, but even just these three rules gives:



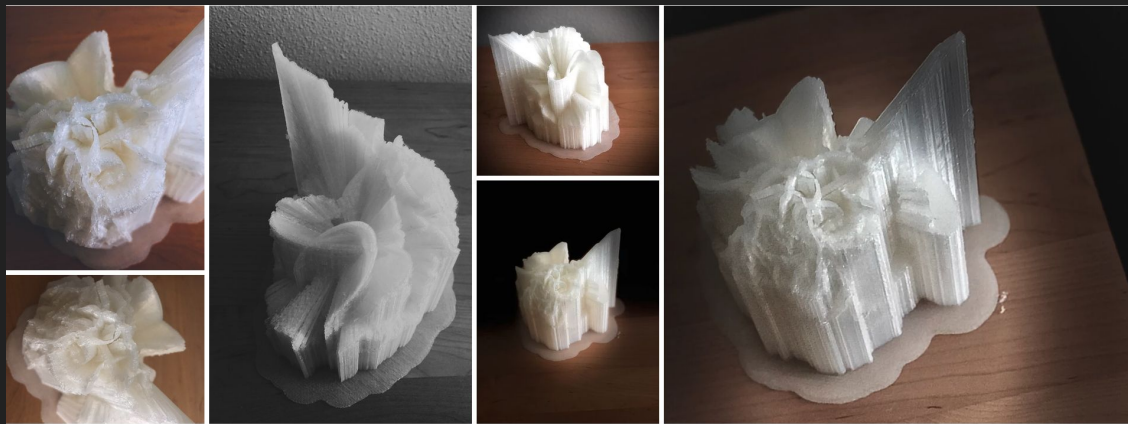
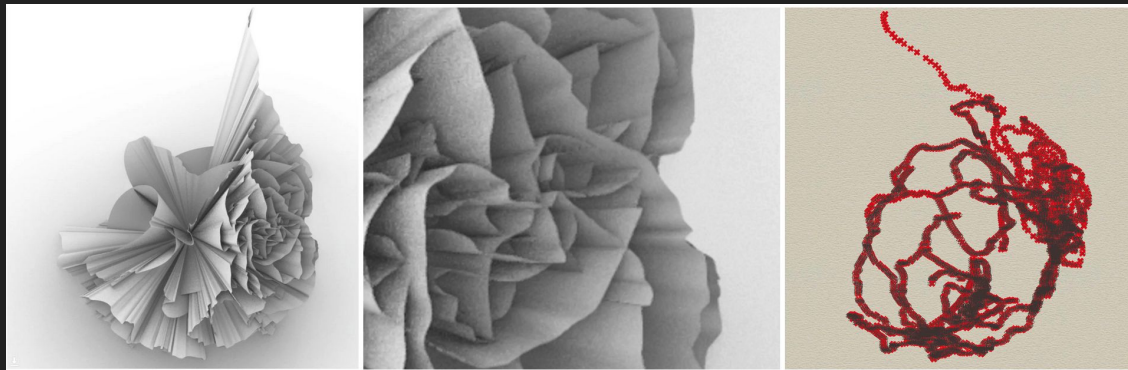
Side note if anyone wants a tutorial in processing...



The Coding Train on Youtube
(Daniel Shiffman)

memoriae (2020)

Motion throughout the
lifetime of an agent is
an embodied memory



mySQL Query (pseudocode)

→ *RESEARCH QUESTION*: What is the checkout frequency over time of books whose titles contain mention of either embodied memory or generational memory?

SELECT for all data entry rows (columns == check out, date, time, get the count)

WHERE title contains

(Memory | Memories) &&

[(Embodiment | Embodied) | (Generation | Generational)]

If there is time, I may do more queries and toggle different data query visualizations using ControlP5 library

Inspiration and Program Flow

Taking inspiration from the memory retrieval experiences of a friend who has space-time synesthesia → his experience of time and memory was spatial

If he wanted to retrieve a memory from high school, or from last week, he would see time chronologically on a wheel around him.

I will store daily check-out frequency values in an arraylist for each book title (using Object-Oriented programming paradigm).

Bare Bones Entry Class

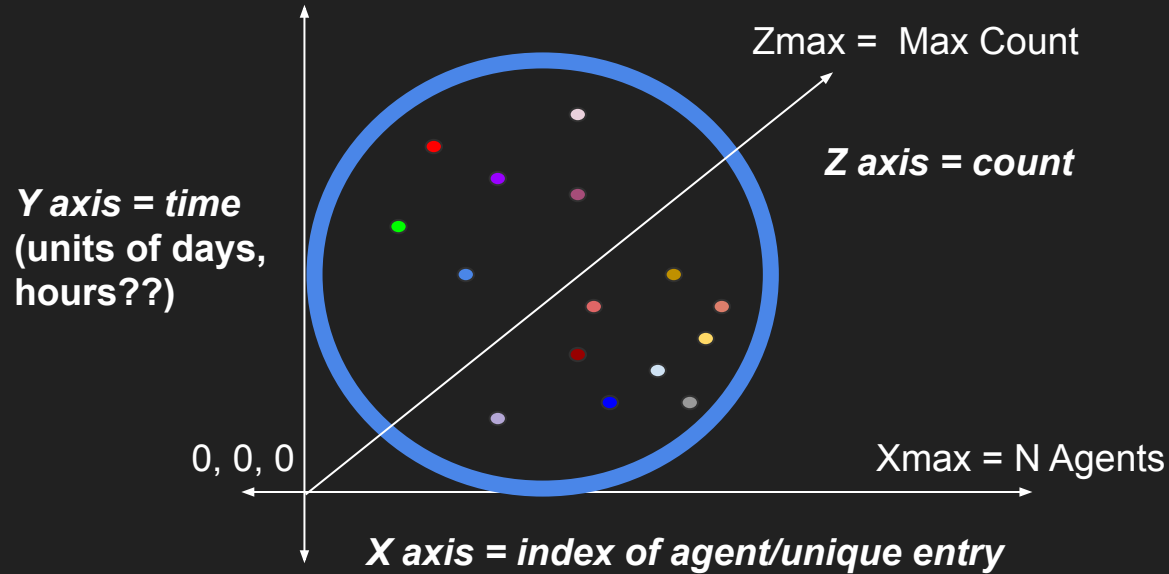
```
class Entry {  
  
    String title;  
    int[] countsOverTime;  
    // size of array = 365 * (endYear - startYear)  
  
}
```

Main Program

```
Entry[] entries; // size = however many  
entries comes out of query  
void setup() {  
    // create entry objects and fill array  
}  
...
```

3D Visualization

$$Y_{\max} = 365 * (\text{endYear} - \text{startYear})$$



Program will animate through all of the different positions of each agent over time, which will lead to different forms morphing from the visualization.

Agent “trails” will be visualized so that you can see the course of its movement through time.

Each agent will be a different color to clearly distinguish between them.