Natural Evolution

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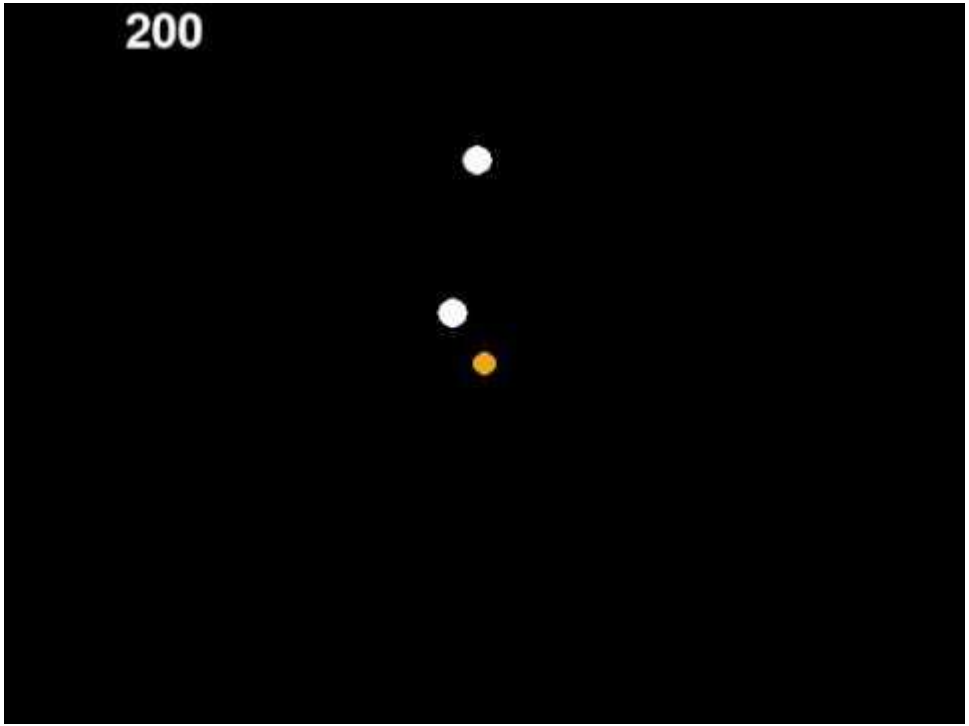
Background Video

- Self selecting Blobs (Hopefully!) (Maybe.) (We'll talk about this.)
- White dots: Blobs
- Orange dot: Food
- Currently have a scoring function
    - If they die closer to the food, they get a better score.



Key Question Group 1

What do you think of natural selection vs. artificial selection?

Guiding Questions:

- Pros and cons of each? Challenges of each?
- Artificial selection, then natural selection after making progress
- What more compelling problems could natural evolution be used for (e.x. games, other optimizations)?

Key Question 2

How would you implement genomes in code?

- How to store the genes for each Blob?
- Best way to turn those genes into behavior?

Our Current Solution

- DNA stored as a matrix of (initially) random coefficients
- Multiply the DNA matrix by a vector of the environmental conditions for resulting behavior

$$\begin{pmatrix} a & b & c & d \\ e & f & g & h \end{pmatrix} \cdot \begin{pmatrix} X_B \\ Y_B \\ X_F \\ Y_F \end{pmatrix}$$

$[a, b, c, d, e, f, g, h]$ -> DNA constants (individual to a Blob)

$[X_B, Y_B]$ -> coordinates of Blob's center

$[X_F, Y_F]$ -> coordinates of food's center

- Fitness is evaluated, next generation is randomized average of previous one

coo00OOOL BEANS

burrito

Thnks yall