

Evolution Simulation using Robots

To Run

```
python search.py
```

Goal of the Project

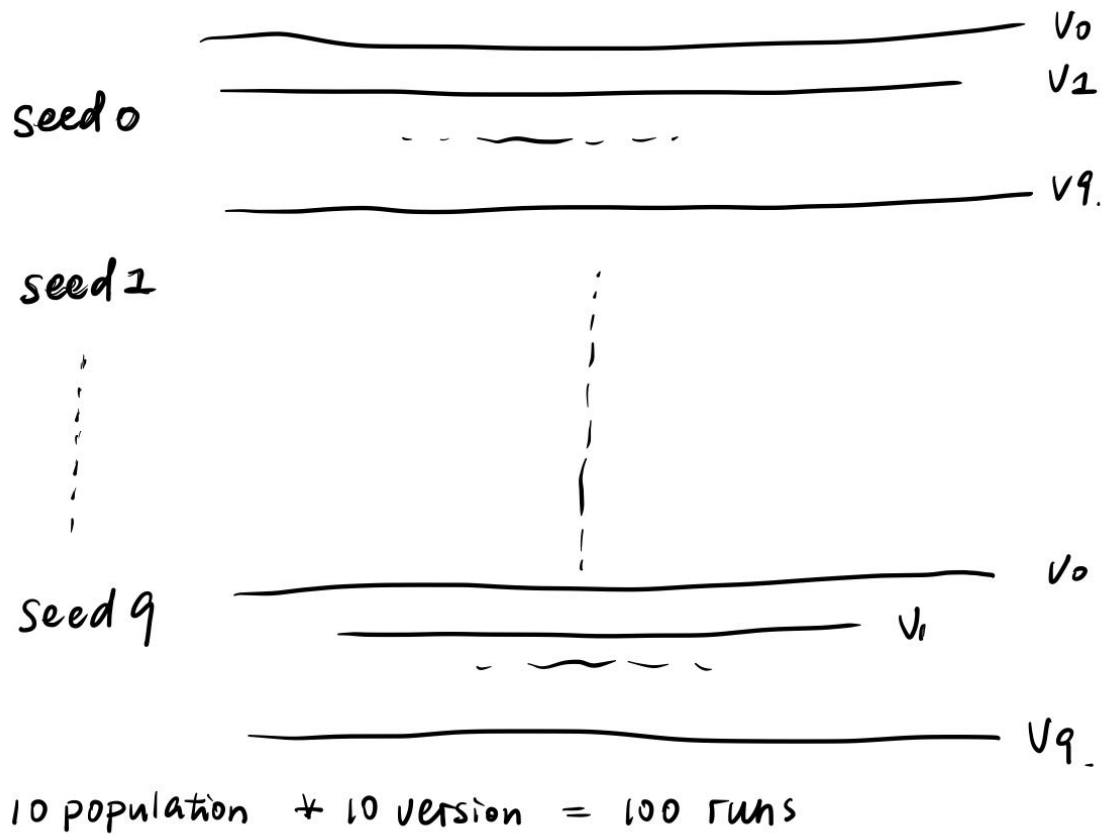
The project aims to simulate the process of evolution. What is life and how does life forms evolve in a world? While people mainly believe in the idea of "Survival of the fitness" from Darwinism, it is hard to evolve robots in this way. With the use of computation, I can simulate how robots would evolve in a world dedicated to one single goal: To walk/crawl/swim to the furthest in limited time.

Methods

Population and random seed

Evolution cannot be viewed only at one only population. Also, how the first creature is simulated is very important while I want to simulate with inheritance. Therefore, I used random seed, which indicates how random works (how random numbers are generated), to make sure that every population has a unique start.

Because each step of mutation would generate different results - I try my best to capture all the variable ways of mutation by having 10 versions of the population evolve at the same time so it's like while every random seed is a universe, there are 10 versions of the universes at the same time.



Updated 5 ways to randomly modify and mutate:

1. Change the weights
2. Add a Sensor
3. Remove a Sensor
4. Add a link
5. Remove a link

Results

Credit

CS396 Northwestern University, Winter 2023 r/ludobots Pyrosim Pybullet Karl Sims