

What are we doing here?

Paul Blasi
Jaysen Spurlock

April 27, 2015

Table of Contents

Project

Server

Client

1 Project

2 Server

3 Client

Project

Project

Server

Client

Conway's game of life...

Project

Project

Server

Client

Conway's game of life... ON STEROIDS!!!

Project

Project

Server

Client

We wanted to make a semi-realistic guided evolutionary algorithm that interacted with other organisms (guided by other players)

Project

Project

Server

Client

We wanted to make a semi-realistic guided evolutionary algorithm that interacted with other organisms (guided by other players)

- Cellular Automata

Project

Project

Server

Client

We wanted to make a semi-realistic guided evolutionary algorithm that interacted with other organisms (guided by other players)

- Cellular Automata
- Rules based on organism traits

Project

Project

Server

Client

We wanted to make a semi-realistic guided evolutionary algorithm that interacted with other organisms (guided by other players)

- Cellular Automata
- Rules based on organism traits
- Traits evolved with focus from user

Project

Project

Server

Client

We wanted to make a semi-realistic guided evolutionary algorithm that interacted with other organisms (guided by other players)

- Cellular Automata
- Rules based on organism traits
- Traits evolved with focus from user
- Victory condition: 80% biomass on the island

Organism traits

Project

Server

Client

There are four pairs of traits that are mutually exclusive,

Organism traits

Project

Server

Client

There are four pairs of traits that are mutually exclusive,

Reproduction \iff Lifespan

Organism traits

Project

Server

Client

There are four pairs of traits that are mutually exclusive,

Reproduction	\Longleftrightarrow	Lifespan
Strength	\Longleftrightarrow	Mobility

Organism traits

Project

Server

Client

There are four pairs of traits that are mutually exclusive,

Reproduction	\iff	Lifespan
Strength	\iff	Mobility
Prey	\iff	Predator

Organism traits

Project

Server

Client

There are four pairs of traits that are mutually exclusive,

Reproduction	\iff	Lifespan
Strength	\iff	Mobility
Prey	\iff	Predator
Herd	\iff	Solitary

Organism traits

Project

Server

Client

There are four pairs of traits that are mutually exclusive,

Reproduction	\longleftrightarrow	Lifespan
Strength	\longleftrightarrow	Mobility
Prey	\longleftrightarrow	Predator
Herd	\longleftrightarrow	Solitary

and one simple trait, Senses, which determines the chances of one organism detecting another.

Organism traits

Project
Server
Client

There are four pairs of traits that are mutually exclusive,

Reproduction	\iff	Lifespan
Strength	\iff	Mobility
Prey	\iff	Predator
Herd	\iff	Solitary

and one simple trait, Senses, which determines the chances of one organism detecting another.

These traits are evolved on the client and used in the CA rules on the server.

Server

Project

Server

Client

- Representation
- Movement
- Sensing
- Competition

Representation

Project

Server

Client

- List of players

Representation

Project

Server

Client

- List of players
- Array for valid map positions
 - *Borrowing some ideas from fractal landscapes...*

Representation

Project

Server

Client

- List of players
- Array for valid map positions
 - *Borrowing some ideas from fractal landscapes...*
- Array for pheromone values
 - *Commandeering some ideas from ACO...*

Representation

Project

Server

Client

- List of players
- Array for valid map positions
 - *Borrowing some ideas from fractal landscapes...*
- Array for pheromone values
 - *Commandeering some ideas from ACO...*
- Array for critter positions
 - *Stealing a concept from CA...*
 - For speed's sake, we also keep a list of positions with each player.

Movement

Project

Server

Client

- Pick Square
 - Odds based on Herd/Solitary v. species pheromones, as well as Prey/Predator v. other pheromones

Movement

Project

Server

Client

- Pick Square
 - Odds based on Herd/Solitary v. species pheromones, as well as Prey/Predator v. other pheromones
- Move Critter
 - Update various positions

Movement

Project

Server

Client

- Pick Square
 - Odds based on Herd/Solitary v. species pheromones, as well as Prey/Predator v. other pheromones
- Move Critter
 - Update various positions
- Update Pheromones
 - Shift value right 1, OR with 128

Sensing

Project

Server

Client

- Determine Predator
 - Higher Predatory rating wins this one; if they're matched, we pick at random.

Sensing

Project

Server

Client

- Determine Predator
 - Higher Predatory rating wins this one; if they're matched, we pick at random.
- Determine sensitivity
 - Perform a “luck check” against the predator's senses to determine whether an encounter happens.

Sensing

Project

Server

Client

- Determine Predator
 - Higher Predatory rating wins this one; if they're matched, we pick at random.
- Determine sensitivity
 - Perform a “luck check” against the predator's senses to determine whether an encounter happens.
- Determine wariness
 - Another luck check, to see whether the prey reacts first.

Competition

Project

Server

Client

- Combat style (Speed or Strength)
 - Determined by winner of second luck check

Competition

Project

Server

Client

- Combat style (Speed or Strength)
 - Determined by winner of second luck check
- TO THE DEATH!
 - The loser of the final luck check dies.

Competition

Project

Server

Client

- Combat style (Speed or Strength)
 - Determined by winner of second luck check
- TO THE DEATH!
 - The loser of the final luck check dies.
 - We assume the prey are REALLY good at counter-attacks.

- Evolution
- GUI

Evolution

Project

Server

Client

- Variable population

Evolution

Project

Server

Client

- Variable population
- Organism traits evolved

Evolution

Project

Server

Client

- Variable population
- Organism traits evolved
- Lifespan and reproduction rate defined by traits

Evolution

Project

Server

Client

- Variable population
- Organism traits evolved
- Lifespan and reproduction rate defined by traits
- Fitness function defined by player via "Focus Points"

GUI (Tkinter FTW!)

Project

Server

Client

Tkinter basics

GUI (Tkinter FTW!)

Project

Server

Client

Tkinter basics

- Comes with most vanilla Python distributions

GUI (Tkinter FTW!)

Project

Server

Client

Tkinter basics

- Comes with most vanilla Python distributions
- Very basic GUI construction

GUI (Tkinter FTW!)

Project

Server

Client

Tkinter basics

- Comes with most vanilla Python distributions
- Very basic GUI construction
- Allows for creation of images

GUI (Tkinter FTW!)

Project
Server
Client

