Tidepool - Evolution Simulator

HCI TEAM PROJECT

Team 03
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Overview

- Browser-based evolution simulator
- Users are given the ability to interact with a population of artificial creatures
- Intended to help people understand natural selection and genetic algorithms
- Environment consists of:
  - creatures which can move, interact, survive, and evolve
  - evolvable mechanisms for determining creature behavior
  - multiple means of evaluating evolution fitness
- Analysis of population statistics can provide insight on creature behavior

Existing and Related Simulators

Keiwan Creatures

- Creatures use bones, joints, muscles
- Tasks include running jumping climbing
- Evolution uses neural net and genetic algorithm

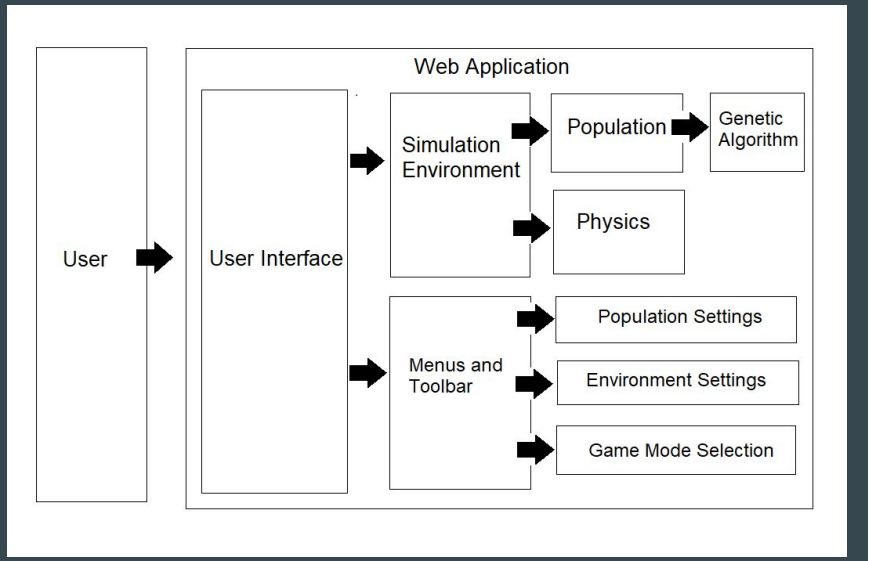
https://keiwan.itch.io/evolution

Genetic Cars 2

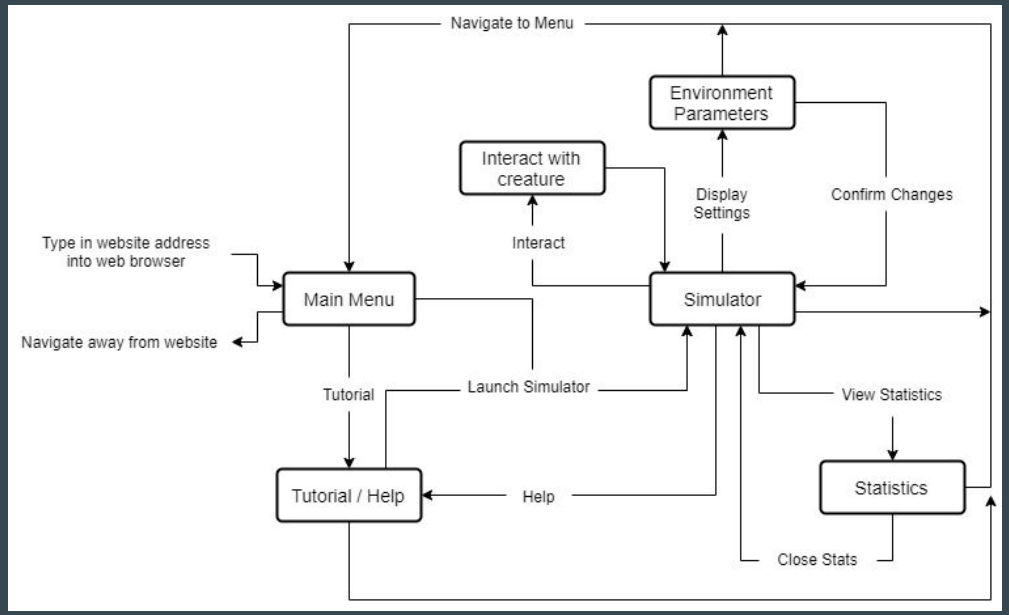
- Creatures consist of two wheels and a body
- Task traveling as far as possible over a rugged terrain
- Evolution uses genetic algorithm

https://rednuht.org/genetic_cars_2/

High Level Design



System-Level Structural Diagram



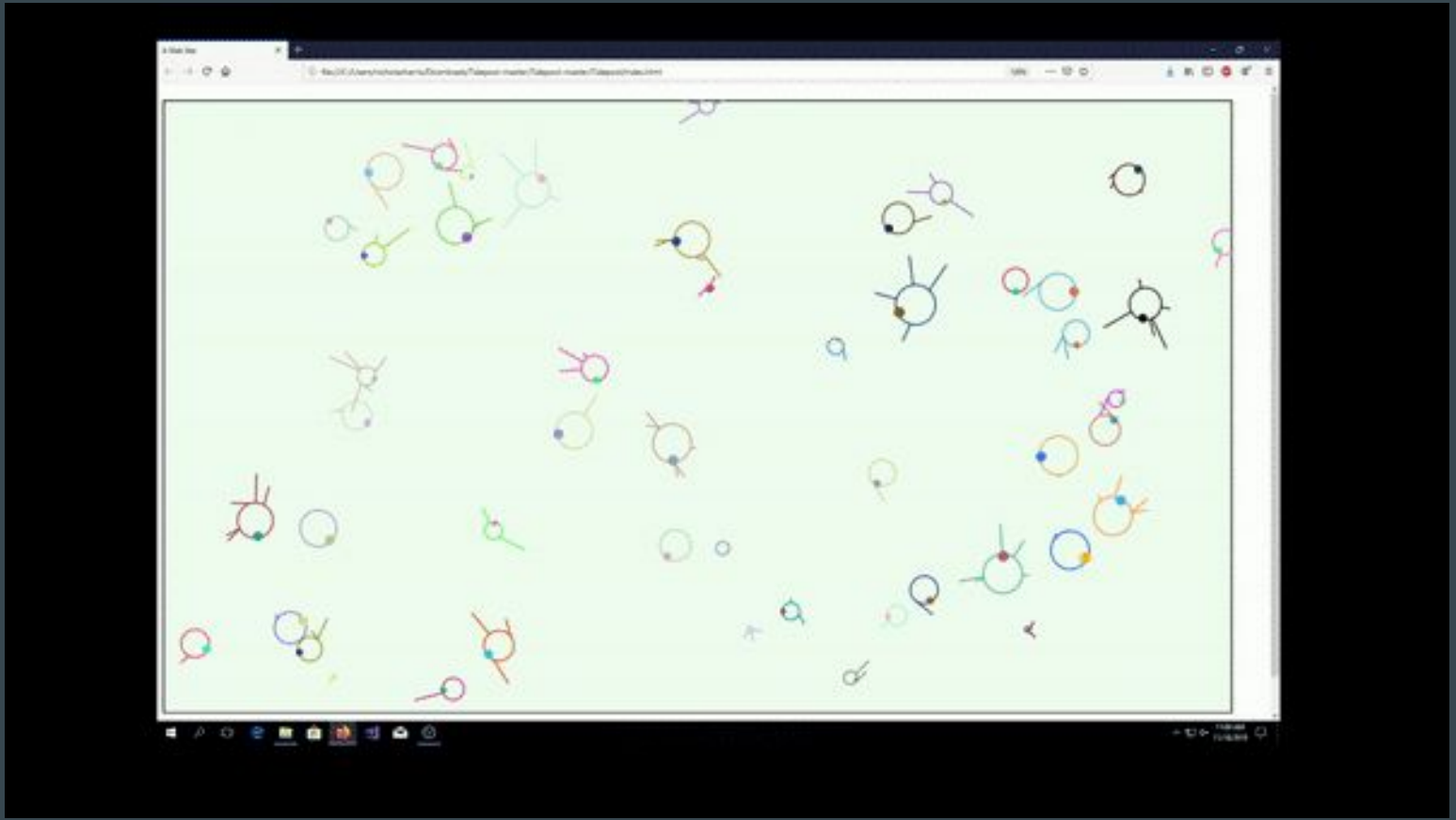
Behavioral Diagram

Target Audience

- Students
  - Teach the principles of evolution
  - Demonstrate the genetic algorithm

- Game Players
  - Emphasize interactive nature of project
  - Replayability - new population settings, new and interesting outcomes

What We Have Now



Going Forward

Questions?