<http://unityblob.s3-website-eu-west-1.amazonaws.com/>

**Project Description**

The software is an evolutionary simulator, dealing with observations of mimicked natural evolutions. The scope of the project is to produce a system that can be used to study evolution in a limited environment where the user can intervene and change the parameters. Particular interest is placed on creature and group behaviour, and population dynamics.

The project involves building a tool which allows visualisation of an environment and enables users to interact with various parameters in the environment. It is intended as an educational tool to allow users to better understand evolutionary dynamics. Creatures called “blobs” evolve in this simulated environment by having techniques used in Genetic Algorithms applied to their DNA. This DNA described their characteristics and behaviour.

**Installation**

Built using the Unity development platform, the project is meant to run on as many platforms as possible.

On Windows, it is available in browser via the Unity Web Player (unsupported on Google Chrome). It is also available as a standalone executable.

On Linux/Unix based systems it can be run in the browser using Pipelight (<http://pipelight.net/cms/installation.html>)

On Mac, it runs in the browser via the Unity Web Player, or as a standalone.

**Controls**

Camera Movement: *Arrow Keys*

Zoom: *+ / - / Scroll wheel*

Selection: *Left Mouse Click*

Add Blobs: *Shift* + *Left Mouse Button*

Add Food: *Shift* + *Right Mouse Button*

**Interface**

The simulation can be started by pressing the “Start” button, paused by pressing “Pause” which replaces “Start”, or reset to a blank state by pressing “Reset”.

The creatures involved in the simulation are represented by the blue “blobs”. Their patience (the time it takes until a certain “blob” moves to a new area in search for food) is encoded in the brightness of each particular “blob”. Food is represented as the green dots. Food spawns in clusters, which have a limited lifetime. The various sliders on the right control the properties of the environment.

The graph is used to show the population in red, the average patience in blue, and the average energy needed for reproduction in green.

**Experiments to perform**

1. Without modifying the parameters, what can be said about the population size over a long period of time?

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| Population seems to be stabilising after a while. It gets stable after a long period of time. |

1. Tweak the food spawning rate. Make observations about the population size.

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| Population drops off significantly once food spawn rate is decreased, using an approximate 1:1 correlation. |

1. Does the size of the food clusters seem to impact the average patience of the population?

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| Patience is slightly modified based on the size of food clusters. From max to min, it shows a small drop over a few generations. |

1. What are the effects of a sudden influx in population size? (*Shift* + *Left Mouse Button* to add more blobs)

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| Population starts decreasing shortly after the influx, to levels that are below previous maximum population size. Over time, it returns to the previous value. Other parameters seem unaffected. |

1. What are the effects of creating a very dense food cluster? (*Shift* + *Right Mouse Button* to add food)

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| Population starts growing (a line explodes on screen), after which it reaches its maximum. Curious to see what happens when adding both food and blobs. |

**Questionnaire**

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| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| 1. The interface is intuitive |  |  |  | x |  |
| 1. I am able to draw conclusions from the simulation |  |  | x |  |  |
| 1. The controls are easy to use |  |  |  |  | x |
| 1. I am given enough information |  | x |  |  |  |
| 1. The software is responsive |  |  |  | x |  |
| 1. The interface is aesthetically pleasing |  |  | x |  |  |
| 1. Information is conveyed effectively | x |  |  |  |  |

**General Feedback**

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| Good simulation. Overall appropriate controls. Intuitive interface. |

**Feature you would like added**

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| Adding both population and food at the same time.  Graph is nice, but you don’t label the axis nor give any numerical reference to components.  Long-term analysis features, comparing different ‘states’ in the simulation. |