<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?

|  |
| --- |
| Grows very rapidly, stables out and starts going down slowly. After that it stays rather stable |

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

|  |
| --- |
| Lowering spawn rate greatly lowers population, making it higher has the opposite effect. |

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

|  |
| --- |
| No |

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

|  |
| --- |
| Population increasing rapidly, but when done with adding blobs it dies down again and stables out again after a few moments.  Patience seemed to increase slightly when more blobs got added, this also stables out while the population dies off. |

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

|  |
| --- |
| Greatly increases population, reprod slightly decreasing and patience slightly increasing. These all seem to stable out again. |

**Questionnaire**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 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**

|  |
| --- |
| Lines in graph overlap with diagram legend.  When not in fullscreen shift+right opens the browser menu. This can get rather frustrating when trying to add a large amount of clusters. |

**Features you would like added**

|  |
| --- |
| A place to see controls, other than this the interface seems intuitive.  A way to not have the browser thing open when shift + right clicking (as mentioned in general feedback)  Option to change the speed the arrow keys move around with |