Computational Evolution Project Plan

We aim to model an environment with several creatures living inside it. We then hope to perform experiments on the system and investigate a particular event in evolutionary history for example the Cambrian Explosion.

Week 1

Set up basic classes such as Environment, Creature etc. to simulate single-species reproduction. Also set up necessary classes to output this information to an image using the libraries PyGame and PyTMX.

Week 2

Connect the two elements made in week 1 to improve debugging given the large amount of data. Implement resources, natural variation of genetic parameters and output of data to ‘save files’ for subsequent analysis.

Week 3-4

Implement loading from save-state files so that longer experiments can be run conveniently. Incorporate analysis of these save-state files such that useful results can be extracted from the experiments run in week 7-8. Implement more intelligent motion of creatures to allow for more complex scenarios to emerge.

Week 5-6

Implement multiple species and look out for emerging predator-prey relationships. Allow for species to be defined during an experiment automatically based upon parameters straying a particular distance from the original species definition.

Week 7-8

Investigate the effects of sudden/gradual changes such as lack of resources (primordial Mars) or the extinction of a predator (extinction of the dinosaurs). Observe how this changes the environment and if the system follows what happened historically.