

sdmay18-04: Animal Locomotion and Behavior Simulated by Genetic Algorithms

Week 5 Report

October 3 - October 16

Team Members

Rob Quinn — *Project lead, Sim lead programmer, client communications*

Luke Oetken — *Simulation programmer, Status reporter*

Andrew McKeighan — *Simulation programmer*

Joe Kuczek — *Full stack web, SCRUM master*

Joe Sogard — *Web lead, Backend programmer*

Kenneth Black — *Simulation programmer, Machine Learning*

Summary of Progress this Report

The main developments our group worked on the past two weeks were setting up the machine learning frameworks and tools we plan to use, and testing our current model with new versions of Unity which are required for the ML-Agents framework we plan to use. We were able to set up the learning environment on PC and Mac and get it working for example projects, to learn how the framework works. We learned that the most recent version of Unity (2017.2) has physics issues that will interfere with our project, so for now we are limited to using version 2017.1, which should be fine. We also learned we must use Nvidia Cuda Toolkit 8.0 and cuDNN 6.0 for our purposes. We also further discussed what our requirements will be for the website part of the project, and how these may change depending on the features we use from ml-agents.

Pending Issues

The most recent version of of Unity 2017.2 has physics issues that interfere with our project. The changes were made for efficiency rather than consistency, and right now consistency is what we need for the project. We can use 2017.1 until these issues are resolved.

Plans for Upcoming Reporting Period

We plan to begin the conversion of our current Unity simulation to a ml-agents environment, which will likely be a lengthy process. The web engineers will begin to set up the initial database and web components for the website, though these will likely evolve as the project develops.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Rob Quinn	Testing newly released Unity versions and physics stability (2017.2 unstable).	4	25
Luke Oetken	Setup cuda, tensorflow, got Unity ml-agents examples working in Windows, worked on getting environment setup in macOS, researched how ml-agents environment components work.	7	23

Andrew McKeighan	Research on genetic algorithms	4	17
Joe Kuczek	Updated website with design documents, researched front-end data interfaces.	4	17
Joe Sogard	Update website team information, research tech-stack development practices	4	16
Kenneth Black	Looked through different ml-agent designs for the project. (i.e how to structure the brain and muscles)	4	16