

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

Spring Report 3

February 10 - February 23

Team Members

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

Joe Sogard — *Web lead, Backend programmer*

Joe Kuczek — *Full stack web, SCRUM master*

Luke Oetken — *Simulation programmer, Machine Learning, Status reporter*

Andrew McKeighan — *Simulation programmer*

Kenneth Black — *Simulation programmer, Machine Learning*

Summary of Progress this Report

After assigning new responsibilities related to our modified project scope last report period, our team was able to focus on individual tasks to enhance the project's current functionality as well as add new features.

The simulation programmers worked on extending the genetic algorithm learning process to make it more efficient and natural. This included adding genetic crossover so that children genomes could be created from two parent genomes, mutation tweaks to make mutations more realistic, and continued fitness function development to improve the reward system of the algorithm. Work was also done on our next animal model, which will be a raptor.

The web programmers developed a front-end for the project website and worked on refining its functionality and responsiveness. They also worked on back-end restructuring and continuous automated testing of the API.

Our team also finalized our project proposal revision to focus on physical character animation in video-games. We feel this new purpose fits the project very well, and will make project goals more clear and well-defined.

Pending Issues

There are no pending issues for this report period.

Plans for Upcoming Reporting Period

We plan to continue learning algorithm refinements to make the simulated animal movements look as realistic as possible. We will also focus on eliminating physics inconsistencies, and testing the new raptor model. We hope to have a finished page on the website that shows information from the simulation regarding character data and runs.

Individual Contributions

Team Member	Contribution	Bi-Weekly Hours	Total Hours
Rob Quinn	Preparing new character model. Character rigging. Working on skeleton.	7	52
Joe Sogard	Researched possibility of moving backend to more stable/modular language. Restructured backend to more modular object-oriented design. Started work on Continuous Automated Testing of API.	9	51
Joe Kuczek	Created front-end design for website, made website mobile-responsive. Added API calls for test data and populated species and family tables.	8	42
Luke Oetken	Implemented saving best k genomes per generation. Added uniform crossover for random combinations of two parent genomes.	6	56
Andrew McKeighan	Rewriting and debugging scoring. Helping modeling character.	7	40
Kenneth Black	Add limits to muscles, Added granularity to mutation, researched new mutation options.	7	41