COMP 521
Winter 2015

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Project Proposal

Topics

Genetic algorithm and physics simulation: I am interested in applying techniques from a subfield of artificial intelligence called “evolutionary algorithm”. There are two main parts I will need to focus on. First, the genetic aspect which includes two processes: reproduction between the test subjects, and making offspring with crossover and mutation. Second, the selecting aspect. This selection process is important in the success of evolution. I plan on implementing a physics-based (visual) simulation which will act as the fitness function and will determine the selection of the best individuals.

Implementation

My simulation will most likely be more basic than the reference below. It will not be advanced muscle-based locomotion in 3 dimensions but will definitely incorporate some sort of realistic motion in 2 dimensions. I expect a significant part of the work will be building the simulation environment. In order to help with that, I will rely on an existing physics engine, most likely Unity as I have built up a fair amount of experience with it in this course already.

Challenges

It is likely (though I do not yet know to what degree) that most starting values will not work and the algorithm will be stuck either in a local maximum or not targeted enough. Therefore another big part of this project will consist of tweaking the values and algorithms to make the evolution successful.

References / Inspiration

Flexible Muscle-Based Locomotion for Bipedal Creatures in 2013 by three researchers, including Michiel van de Panne of UBC.