**Heterogeneous and Cloud Computing**

**Project Proposal**

**Due: Wed, Nov 19 2014 By 5:00 PM (EST)**

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| **Objective**: A substantial project maybe submitted instead of taking the final exam for the course. The submitted project must meet the following requirements:   * Approval by Nov 19 2014 (5:00 PM EST): Submit a short project proposal document in response this posting (see proposal content below). Next meet with your instructor (for about 10 minutes) during office hours do review the proposal and obtain approval. Note: your instructor will spend at least 5 minutes searching for similar sounding information on the Internet to assess originality and acceptability. * Project elements: The project project must include OpenCL or Map-Reduce operations (or a combination). The project must preferably be in C++. However, other languages are acceptable if suitably justified in during proposal approval. * Project size: The project must be of reasonable scope and size. Estimate at least 10-15 hours for successful completion of the project. * Presentation: The project submission will require the following artifacts:   + Source code   + A power point presentation   + A demonstration of the project and presentation (during class or during office hours) * Deadline is Wed, Dec 10 2014 (5:00 PM EST): The projects must be completed, submitted, and presented by the deadline. This is a hard deadline for grade submission and there is no room for extensions or delays. |

# Project Question

State the question that you are aiming to answer via this project. Here are a few example questions:

* Is the average daily temperature in Ohio significantly different now than in the 1980s?
* What the smallest problem size needed to realize statistically significant performance gains by parallelizing a traveling sales person problem?
* What is the minimum size of a search image to be used to realize performance gains of an OpenCL image search program?

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| I want to create a project that is a simulation of predator-prey particles. The predator-prey relationship is similar to that in nature. There would be extra rules about avoiding predators and going after prey in the flocking code. I will use both OpenCL and OpenGL. OpenCl will allow me to process the rules faster and OpenGL will allow me to visually see how the simulation is going. The question I want to answer is will the given population sizes cause the environment to become unstable. Meaning will the predators cause the prey to go extinct and that the predators will then starve off, is there too many prey, etc? And if it becomes stable how many generations did it take? |

# Proposed Approach

Briefly describe the proposed approach for answering the question that you have put forth. The approach should outline the following information:

* Data sources and brief description of the data. Estimate of data size/volume.
* Strategy/algorithm to be used for answering the question.

Data sources would be text files. The files would include the starting populations. The first ones would be considered the bottom of the food chain and each additional line would be the next level up in the food chain. The flocking algorithm (Separation, Alignment, Cohesion, and own rules) will be used. Separation has each particle avoid its neighbors. Alignment has the particle steer its heading to the average of the group. Cohesion has the particle steer to the center of the average position of the neighbors. These and the custom rules are weighted to determine how the particle will behave. I would have the populations of each particle type increase at a set time interval by 1.5.

# Results

Indicate the type/content of figures, graphs, and other tabular data to be collected and generated for answering the question. You may hand draw figures, make a picture with your phone, and place the image in this document.

The data I would collect would be how many generations it would take for stabilization / destabilization. I will also record the state of the state of the particles at every new generation. This will allow me to create a play back that will show the state of the environment visually.

# Submission

Once you have filled-in this document upload it to Niihka and discuss the proposal during regularly scheduled office hours.