Complex Game Systems Assignment –

*“Snake” w/ Genetic Algorithm*

Purpose of the System:

The purpose of this system is to teach an AI how to play a simplified variant of the video game Snake. The random spawning of the apples will be taken out and replaced by set places to give the AI an easier time.

Additional Libraries needed:

Currently unknown.

If the system is to be a Library (Redistributable Static or Dynamic Linker) or as Redistributable Source Code:

Mathematical operations used:

Advanced algorithms to be implemented:

A genetic algorithm will be used to implement a version of learning onto an AI and teach it how to play Snake.

How the system will be integrated into the Application:

Rules for the Application (Snake Game):

* Genomes will consist of collections of movement instructions.
  + These instructions (chromosomes) will consist of a directional input (Up, Down, Right, Left) as well as an integer representing how many moves to let the snake continue by itself.
* Fitness throughout the generations will be judged on the number of apples acquired and the distance to the next apple.
  + (Number of Apples) + Normalize (Distance to apple)
* Apple locations will not be randomized between generations and will spawn in the same place every time.
* Snakes will die if either they collide with the walls or themselves or if they do not make progress within a time limit.