Here is the final version I am submitting. I have included the best AI I have managed to evolve, named fromcryo2.dna . To see it in action, start the game. Type 3, press enter. type fromcryo, hit enter. hit n, press enter. It should now be playing the contents of that file.

When playing, there are some things to know. Up, down, left, and right move the ship. z shoots. Holding shift will slow down your ship, and show your hit location (I call this focus mode). Which brings up another point... to die, you only have to be hit in the small central area of your ship.

There are still some issues with the code, the main thing being a memory leak I never had time to find. The memory leak isn't an issue until you play with the genetic algorithm. It leaks around 1Mb per generation, so keep that in mind when setting number of generations for a GA run :) (Update Sunday 12/10: I found the memory leak! Not a problem any more!)

The only other thing I would work on at this point is adding more waves to the game. As it stands, there are only 3 enemy waves. Oh well. These three waves do a good job of showing off the AI, so it's not a problem.

Oh. And adding Lua. If I had more time I would make the level setup and enemy states scripted via Lua, instead of hardcoded.

This project has so inspired me to branch off to 3 new projects: One I'm tentatively titling GenStruct. In this one, there will be a physics simulation, and you will evolve structures using a genetic algorithm based on different fitness values such as height. Another project involves basically using the AI I developed for this project, and using it as an enemy. I will evolve different sets of variables based on different fitnesses, as different enemies. It might also be fun to pit these bots against one another. The third project is simply taking this code here, cleaning it up, and making a full game out of it.

-Nathan