Luca Damasco

15-112 Term Project Proposal

For my term project I would like to create a user-customizable version of the 1981 Namco-Midway Arcade game Galaga. On it’s own, Galaga has some interesting complexities from complex score generation to animated enemy formations and attack patterns. I will aim to emulate and in some cases improve the game in these areas while allowing the user to generate their own movement paths and enemies creating a customized version of the classic game.

**Main Problems:**

* **Complex Scoring:** While many people approach the game Galaga as simply a “Shoot-Em-Up” type game, their are many complexities hidden within the scoring system. Each enemy needs to have basic point values but the user should also be awarded additional points for the proximity of the enemy to the user, how many enemies the user destroys and how many enemies attack a user during any given formation.

The first problem, proximity, can be easily solved by creating a function which awards points by using the distance formula. This should be easily implemented alongside base score values.

The second and third problems here are a bit more difficult seeing as how these statistics must be generated based on enemy movement paths as different amounts of enemies will be used during each “dive bomb”. I will have to create some sort of counter which ties the number of enemies in a formation to the specific formation on the screen.

* **Enemy Path-Movement:** The enemies in Galaga move in formation along paths which seem to be hardcoded into the game. They move smoothly and in formation, providing difficult yet predictable outcomes to the user. These paths may look simple however they require knowledge of the user’s location and all available paths to that user.

I will attempt to solve this problem by generating lists of points between the enemy and the user and using the connections of those points to generate angles of rotation, speed and distance traveled by the enemies. this will improve upon galaga’s current system of enemy movement because it will not be possible for the user to hide from enemy attacks indefinitely.

* **User Generated Content:** By allowing users to generate their own enemies and path movement, I am opening up this game to a lot of possible bugs and efficiency problems.

The first problem in this respect will be optimizing user generated paths for gameplay and creating transformations of those paths to allow the user’s enemy’s to feel more life like and not move the exact same way each time. If a user creates paths which are invalid or contain too much data they could cause the game to run slow or create in game experiences which are not fun for the user.

I will most likely have to create a general enemy class which can take in the input of the user and simply “blit” the character they draw to the path they create and the transformed paths the game creates.

**Modules and Technologies:**

I will be using Python 2.7 and Pygame 1.9. In the submitted files I have included my basic galaga demo which includes sound, player movement and commands, as well as time based animation and atmospheric events generated with pygame.