Summary

We will be creating a simulation environment for flying a squadron of planes. Individual behavior for a plane includes being able to navigate to a goal location on the ground or circle around a goal location in the air. In order for planes to fly around other planes without exploding we will impose a collision avoidance behavior. Some other group behaviors we might include are the classic V formation and a targeted kamikaze attack.

What assignment(s) are you building on top of?

We are largely building on top of the social forces assignment. Although the character animation assignment will likely be used as well.

What is your novel technical contribution? What algorithm / technique / novel interaction will you implement as part of your project?

The first novel algorithm we will implement is 3D navigation. This will likely be done with a some RRT variant since we need to plan paths for dynamic agents. In addition to the obvious gravity and ground friction, we need to model aerodynamic forces: drag, lift, and thrust. Furthermore, we can't apply behavioral forces in the conventional way as planes can only apply force in the direction they are facing. Thus, plane behaviors will need to be modeled by manipulation both steering and thrust.

How will you demonstrate and evaluate your system?

We will set up a relatively flat scene with at least two different levels of elevation. We can then perform various tests having planes fly and land at different elevations as well as circle around goal in mid-air.

Adjustment request to final project grade allocation:

Decrease from 30% to 20%