

Lab – Autonomous Steering

Seek, Arrive and Flee

The aim of this lab is to use and extend a basic model of steering movement for autonomously moving agents. The behaviours of *Seek*, *Arrive* and *Flee* will be used and will form the basis of other *compound* steering behaviours used in later work.

By the end of this lab you should be familiar with, able to describe and use the Seek, Arrive and Flee steering behaviours, and ready to extend the model presented.

Download Pyglet and the Lab Code

Make sure python is installed. Make sure the pyglet module is installed (<http://www.pyglet.org>) Download the lab05.zip file from blackboard and extract to your favourite work location.

Explore

If all is working ok, you should be able to execute the script and see an agent “steering” through a simple toroid game space. You can change steering mode by pressing keys 1 to 5. Not all keys work at the moment (see tasks later). The agent code initially has only `Seek()` and `Arrive()` for one speed setting and you’ll be adding more to this.

Task 1

Have a look at the code:

- Identify the classes/objects used, and in particular understand “who contains what”.
- Draw a simple UML style model on paper to represent this for yourself and check this with your tutor to make sure your understanding is correct. This will save you tears – honest!

Note: Two hashes `##` have been added to the code to help identify some of the areas you need to modify or change in Task 2. Your editor “Search” feature is your friend!

Task 2

Add the following features to the code:

- Be able to add additional agents (or multiples) to the world by pressing a key.
- Complete the `Flee()` behaviour. It is very similar to the `Seek()` code – copy and adapt.
- Add a “panic distance” to the `Flee()` code so that it only “kicks in” when the agent is close to the flee location.
- Add additional arrive deceleration speeds. (There should be three. You could add more.)
- Change the physical properties of the agents. For example, `Mass`, `MaxSpeed`... friction?

Extensions

- Try adding “Pursuit” so that one moving agent will pursue another moving agent. The world already has some variables ready to help with this. You will need to nominate the agent your other agent(s) will pursue.
- Just for fun, you could update the shape of the agent.
- Consider how you could implement different limits on forward, side and reverse steering force (acceleration) instead of a single uniform limit.

Save your work for use in later labs as well as your final portfolio.