

FAF.FIA16.1 Spring 2021

Lab 2: Flocking Behaviour

Handed out: February 2, 2021

Fighting with sapient rocks

Following your good results on your previous project, the manager asked you to help some colleagues at “LemML” with a problem (their emails take ages to answer – it’s like they’re in another universe!). In their neighbouring system, starships are being attacked by some strange creatures, living on asteroids and thrusting themselves towards people’s ships. From the conversation that follows, you learn that they need some expertise to create a simulation of these attacks, to teach pilots how to deal with these creatures.

You are given a tool developed by a guy called Ijon (run it [here](#)), which should provide a good basis for the simulation, so you can expand on that. You learn that *Solanum tuberosum* (the name given to these creatures) exhibit flocking behaviour when undisturbed, as described in [this paper](#). *S. tuberosum* also can exhibit evading behavior, thus trying to evade any unknown objects, like starships and their missiles, while still flocking (much like a school of fish attacked by a predator). When attacking, they thrust their asteroid towards a starship, aiming to collide and destroy them, while still evading collision with other asteroids (similar to a bunch of people trying to fit in a bus). What triggers them to switch between behaviors remains unknown, so it’s up to you how your simulation will handle that.

You are asked to write a program that could simulate such behaviours. The mandatory task is to simulate their calm behavior which is their most encountered behavior. When finished with that, continue with their evading and attacking behavior, thus yielding a more complete simulation of *S. tuberosum*’s behavior patterns. Play around with different parameters (e.g. asteroid number and speed, or boid coherence, separation and alignment) to create a visually pleasant (if not truthful) simulation.

Reporting

At the end of this lab, you will need to submit your *source code* and a *report* describing what you have implemented. The report and link to a publicly available repository with the source code must be uploaded on [Else](#), in the according assignment activity. Any code repository should contain a *readme* file ([here’s](#) a tutorial on what to consider when making a good one). **Be aware that you should not publish the provided code online, since this would violate Coursera’s honor code. As such, your repository should only contain the libraries that you have developed for the flocking behaviour.**

Good Luck!