

## **Spike: Emergent Group Behaviour**

### **Context:**

Cohesion, separation and alignment are three basic steering forces that can be used to create emergent group behaviours.

### **Knowledge/Skill Gap:**

The developer needs to know how to create distinct emergent group behaviours using basic steering forces and parameter values.

### **Goals/Deliverables:** [CODE] + [SPIKE REPORT]

Create a group agent steering behaviour simulation that is able to demonstrate distinct modes of emergent group behaviour. In particular, the simulation must:

- Include cohesion, separation and alignment steering behaviours
- Include basic wandering behaviours
- Use weighted-sum to combine all steering behaviours
- Support the adjustment of parameters for each steering force while running
- *Spike outcome report and working code (with key instructions).*

**Start-End Period:** Week 6 – Week 7

### **Planning notes:**

- Use the existing lab code, copy and create a new project
- Extend the code to support multiple agents and new keyboard input
- Create display code that can show the current parameter values you need
- Create code that can, for each agent, identify its immediate "neighbours" and gather the average heading, the centre position etc as needed

### **Extensions:**

- What happens when agents can't overlap? How does this change the parameter settings you discovered earlier? To test this you'll need to add code that stops agents overlapping each other.
- Add a predator agent that all other agents avoid. eg A large "shark" which lots of little fish avoid.
- Add walls that agents try avoid. You'll need to implement "feelers" or a similar type of wall avoidance method. What properties are needed to get the pool of agents circling
- Create different agent group "types" (zombies/aliens/soldiers etc) and investigate some of the emergent behaviour between group types.