Spike: 7

Title: Emergent Group Behaviour

Author: Steven Efthimiadis, 1627406

Goals / deliverables:

Create a

Technologies, Tools, and Resources used:

- Knowledge of python
  - https://docs.python.org/3/tutorial/
- Python Interpreter
  - Visual Studio
    - https://www.visualstudio.com/downloads/
- Knowledge of how an agents can interact in groups
  - https://ilearn.swin.edu.au/bbcswebdav/pid-6302928-dt-content-rid-34403398_2/courses/2017-HS1-COS30002-220387/Autonomously%20Moving%20Agents.ppt.pdf

Tasks undertaken:

- Created a function which groups agents together.
  - Must be within a radius of agent 0
  - Change colours once in the radius
- Created force variables for separation, cohesion and alignment within the world.
- Created functions for separation, cohesion and alignment
- Added each force individually to the agent.
  - Then applied the amount force from the world to increase/ decrease the factor of each force
- Added the ability to increase/ decrease each of the forces and radius

What we found out:

- The agents will wander around until they are within the radius of agent 0
  - Once they become neighbours they change to the colour blue
  - When they leave the neighbourhood, they turn back to orange
- You can increase and decrease the radius and the separation/ cohesion / alignment forces
- When you increase the separation force:
  - If an agent wanders into the radius. Bot agents react and separate
  - If there are multiple agents, they all go separate ways
  - When the separation factor is high enough the agents will be frozen to avoid people
- When you increase alignment:
  - If an agent wanders into the radius it aligns itself with agent 0
  - These agents traverse north east across the world
- When you increase cohesion:
  - When an agent wanders into the radius it will aligns it's heading with agent 0

Open issues/ Risks:

- When you increase the separation factor, agent 0 likes to hide in the corners of the world if the world is made larger 800x600
- In cohesion it looks like they have an increased jitter value even when you don't increase it

Notes:

Agent Modes

1. Seek (default)
2. Neighbourhood

Key Binds

A – Append agent
Q – Increase separation
W – Decrease separation
E – Increase cohesion
R – Decrease cohesion
T – Increase alignment
Y – Decrease alignment
U – Increase radius
I – Decrease radius
O – Reset to beginning values
J – Show agent information

Appendix

Figure 1.1 Separation

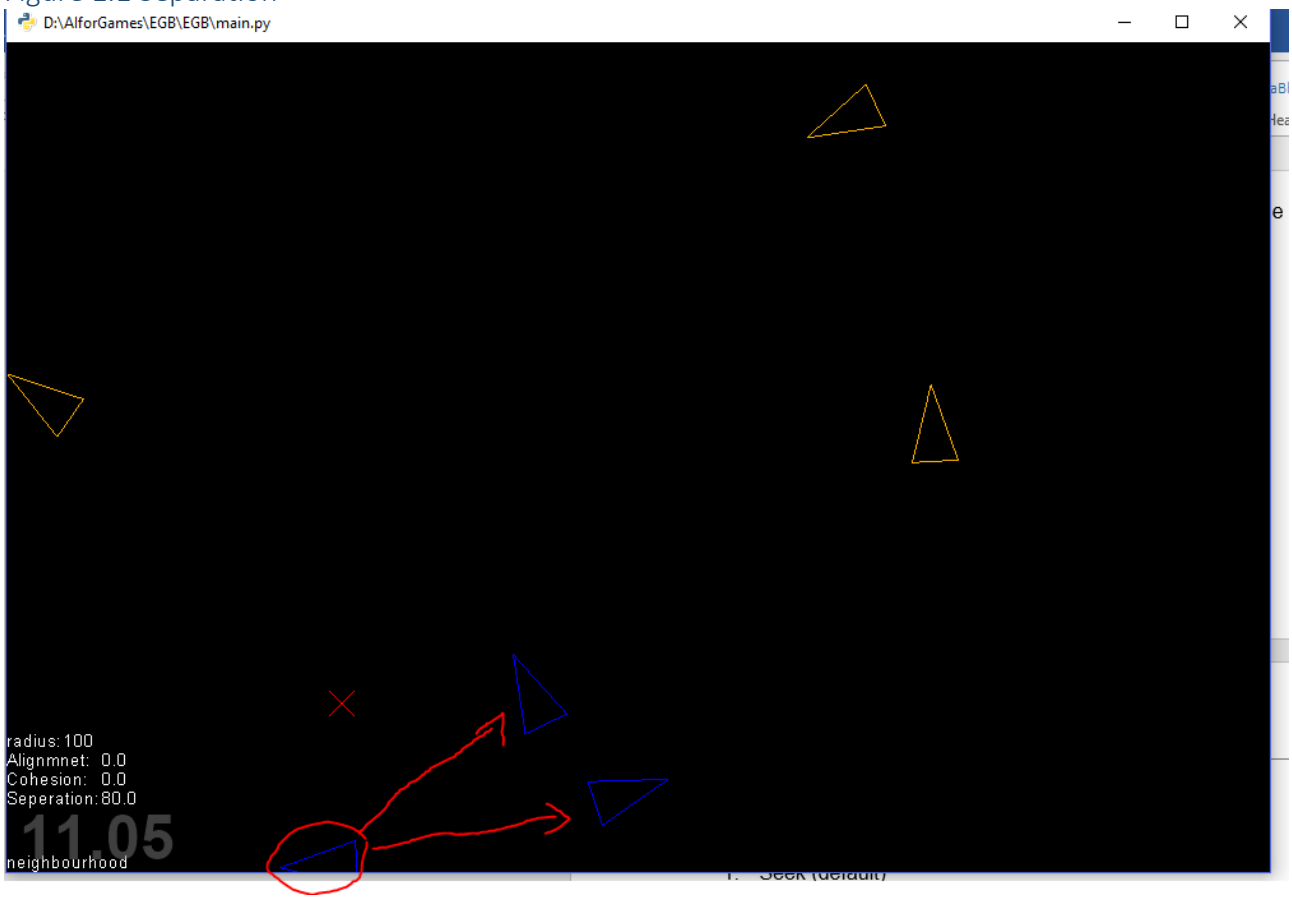

Figure 1.2.1 Cohesion

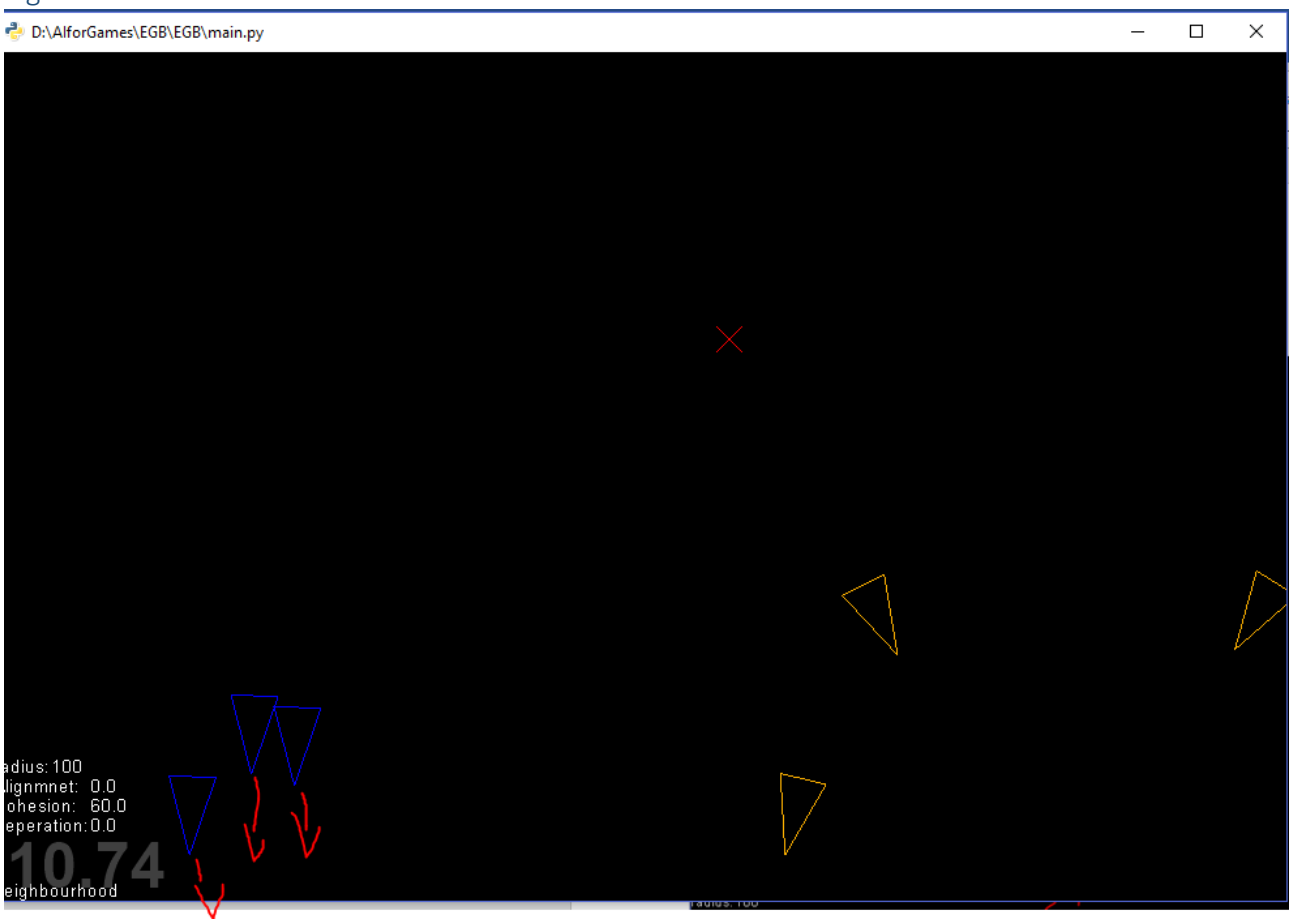

Figure 1.2.2 Cohesion

Figure 1.3 Alignment