Artificial Intelligence

Project #2

## Advanced Steering Behaviours & Path Following: Flocking and Formations

### Due: Febuary 24th at 11:59 pm

This assignment will show off your skills in developing formation behaviours with a group of entities, maintaining the formation shape, flocking, and path following.

**Project will be marked as ZERO if the following are not included:**

**README file including how to build and run your program. Include all key binds.**

**Must include a video demonstration of your assignment working.**

**Game must not crash while running**

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| # | Item | Mark |
| 1 | Generate 12 of the same entities in your scene.   * They can’t just be spheres, you need to be able to see which way the entity is facing. * Objects need to collide. You can use a sphere around the entity for handling simple collisions | / 10 |
| Formation Behaviours | | |
| 2 | Develop 5 different formation shapes. Each formation must be bound to a key press from 1-5. When this number key is pressed, the formation will be formed by all the entities on the screen:   * 1 = Circle * 2 = V * 3 = Square * 4 = Line * 5 = Two Rows | / 25 |
| Flocking | | |
| 3 | Bind a key event to perform flocking when key 6 is pressed.   * Bind keys to increase and decrease the weights for cohesion, separation and alignment of the flocks, but maintain a sum of 1.0 for all of the weights. * When any of these keys are pressed, output the new values for all 3 weights and the total to ether the console or the game’s UI.   Flocking must be calculated in local flocks. | / 25 |
| 4 | Bind a key event to regroup to the last designated formation after a flocking action has been called to key 7. | / 5 |
| Path Following | | |
| 5 | Start following the path when key 8 is pressed.   * The path must contain at least 5 turns and not a straight line. * Each turn (node) of the path should visually be represented by a shape. The current node the entities are travelling to should be a different color than the rest. (no collision needed) * Formation must be maintained * All agents designate positions are rotated to reflect the current direction the formation is heading. | / 15 |
| 6 | Reverse the path following when key 9 is pressed. | / 10 |
| 7 | Stop following the path when key 0 is pressed   * All agents must steer to their normal designated position in the formation. | / 10 |
| Bonuses | | |
| 8 | Flocking follows the path when key - or + is pressed. | / 10 |
| Total | | |
|  |  | / 100 |