COS30002 Artificial Intelligence for Games

Semester 1, 2023
Learning Summary Report

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Declaration

I declare that this portfolio is my individual work. I have not copied from any other student's work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part of this submission been written for me by another person or software service.

Signature: Luke Valentino

Self-Assessment Details

The following checklists provide an overview of my self-assessment for this unit.

	Pass (P)	Credit (C)	Distinction (D)	High Distinction (Low HD) | (High HD)	
Self-Assessment (please tick)	✓				

Self-assessment Statement

	Included? (tick)
Learning Summary Report	✓
Complete Pass (“core”) task work, approved in Canvas	✓

Minimum Pass Checklist

	Included? (tick)
Additional non-core task work (or equivalent) in a private repository and accessible to staff account.	
Spike Extension Report (for spike extensions) in Canvas	
Custom Project plan (for D and/or low HD), and/or High HD Research Plan document in Canvas (optional)	

Credit Checklist, in addition to Pass Checklist

	Included? (tick)
Custom Project Distinction Plan document, approved in Canvas	
All associated work (code, data etc.) available to staff (private repository), for non-trivial custom program(s) of own design	
Custom Project “D” level documents in Canvas, to document the program(s) (structure chart etc) including links to repository areas	

Distinction Checklist, in addition to Credit Checklist

	Included? (tick)
Custom Project “HD” level documents in Canvas, to document the program(s) (structure chart etc) including links to repository areas	

Low High Distinction Checklist, in addition to Distinction Checklist

	Included? (tick)
High Distinction Plan document, approved in Canvas	
High Distinction Report document, in Canvas, which includes links to repository assets	
All associated work (code, data etc.) available to staff (private repository) for your research work	

High High Distinction (Research) Checklist, in addition to D/Low HD Checklist

Introduction

This report summarises what I learnt in COS30002 AI for games. It includes a self-assessment against the criteria described in the unit outline, a justification of the pieces included, details of the coverage of the unit intended learning outcomes, and a reflection on my learning.

Overview of Pieces Included

This section outlines the pieces that I have included in my portfolio…

1P – Lab – BitBucket Setup

2P – Lab – FSM and Python

3P – Lab – Tic-Tac-Toe

4P – Spike – Graphs, Search and Rules

5P – Lab – Graphs, Paths and Search

6P – Spike – Navigation with Graphs

7P – Lab – Goal Oriented Behaviour & SGI

8P – Spike – Goal-Oriented Action Planning (GOAP)

9P – Lab – PlanetWars

10P – Spike – Tactical Analysis with PlanetWars

11P – Lab – Steering 1 – Seek, Arrive, Flee

12P – Lab – Steering 2 - Wander and Paths

13P – Spike – Tactical Steering (Hide!)

14P – Spike - Emergent Group Behaviour

15P – Spike – Agent Marksmanship

16P – Spike – Soldier on Patrol

Coverage of the Intended Learning Outcomes

This section outlines how the pieces I have included demonstrate the depth of my understanding in relation to each of the unit's intended learning outcomes.

ILO 1: Software Development for Game AI

"Discuss and implement software development techniques to support the creation of AI behaviour in games"

- *4P*
- *6P*
- *8P*
- *10P*
- *13P*
- *14P*
- *15P*
- *16P*

ILO 2: Graphs and Path Planning

"Understand and utilise a variety of graph and path planning techniques."

- *4P*
- *5P*
- *6P*
- *8P*
- *13P*
- *15P*
- *16P*

ILO 3: Force-based Agent Movement

"Create realistic movement for agents using steering force models."

- *11P*
- *12P*
- *13P*
- *14P*
- *15P*
- *16P*

ILO 4: Goals and Planning Actions

"Create agents that are capable of planning actions in order to achieve goals."

- *2P*
- *7P*
- *8P*
- *9P*
- *10P*
- *13P*
- *15P*
- *16P*

ILO 5: Combine AI Techniques

"Combine AI techniques to create more advanced game AI."

- *9P*
- *10P*
- *11P*
- *13P*
- *14P*

- *15P*
- *16P*

Reflection

The most important things I leant:

The most important things I learnt in this unit were how to manipulate steering forces and how to implement physics simulations.

The things that helped me most were:

Swinburne Lecture Materials: In every PDF there was something useful, the code snippets were particularly helpful.

Swinburne Maths and Physics PDF: this pdf was very helpful is helping me understand some of the physics I needed to implement. Without it I wouldn't have understood as much about what I was reading in the lectures.

I found the following topics particularly challenging:

The topic I found the most challenging was the Spike 06. I found it very challenging as I was so unsure of how to attack the problem. It was quite a difficult task, but completing it did make the later tasks easier to comprehend.

I found the following topics particularly interesting:

I thought all of the topics were very interesting, but I particularly enjoyed the last 4 spikes. Being able to manipulate the agents steering, making them exhibit different behaviours, and making them attack was a very fun way to learn these concepts.

I feel I learnt these topics, concepts, and/or tools really well:

I felt like I learnt the pathfinding and marksmanship very well.

I still need to work on the following areas:

I think I still need to work on my knowledge of steering. Although I do understand it, I believe I could still understand it better as there are some grey areas.

My progress in this unit was …:

My progress on this unit was a bit up and down, I fell behind a bit early and completed the majority of my work towards the end of semester. This was in part because I was stuck on Spike 06 as well as I mismanaged my time between uni and other commitments.

This unit will help me in the future:

The ability to implement search algorithms is an incredibly important skill to develop and I believe this unit did help me develop that.

If I did this unit again I would do the following things differently:

I would do more of the work earlier and I would ask for help with problems I am stuck with in the discord. If I had the chance I would like to go for the D/HD project as there are lots of interesting ideas I would like to implement.

Other…:

No other points to demonstrate my learning, but thanks for a great unit! Probably the most enjoyable and interesting unit I have completed!

Conclusion

In summary, I believe that I have clearly demonstrate that my portfolio is sufficient to be awarded a …. grade.