

Computer Games Development

Project Report

Year IV

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[Date of Submission]

[Declaration form to be attached]

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# Acknowledgements

I would like to thank the following people who assisted in completing this project including;

John Doe of ACME who kindly agreed to …

I would also like to thank ICME for use of ….

Use this template when writing your research report. As a rule of thumb, the report should be of the order of 10 pages (about 250 words/page).

# Project Abstract

The purpose of my project is to investigate and compare the advantages and disadvantages of two different training mechanisms of Artificial Neural Networks (ANN) in the context of interacting with a game world: Backpropagation and Reinforcement Learning respectively.

During this Project, I will attempt to identify the most appropriate way to teach an ANN to navigate and interact with a game. To do this, I decided to have the ANN try and play through an endless obstacle course. My reasoning is that acting in a way a player would, will provide the ANN with a large enough number of inputs and variables to contend with, allowing me to better identify the more appropriate training method as a result.

# Project Introduction and/or Research Question

I’ve chosen to investigate and compare two training methods for artificial neural networks within the context of a game: Backpropagation and Reinforcement Learning respectively.

What sparked this interest was the AI of the Alien in Alien: Isolation. Throughout the game, the developers managed to simulate the feeling of the Alien getting smarter and learning the players playstyle. In reality, this was achieved using 2 different AI and the Alien’s own behaviour tree which was unlocked as the player made their way through the game.

But that made me begin to think about an enemy ANN that actually learned how a player goes through their playthrough of a game. Many games over the years have used the concept of a pursuer chasing the player; Resident Evil 2, Metroid Fusion, and Alien: Isolation as mentioned earlier are but a few examples. But what kind of experiences could you build for the players if the pursuers in these games could adjust dynamically? But that sparked another question; what would be the best way to train an AI that would interact with a game environment? Thus, the ultimate aim of this investigation is to see which of the two methods I have selected would prove to be more appropriate.

# Literature Review

Replace this text with an appropriate Literature Review.

The literature review places your research in context. You aren’t the first person to investigate or research a particular topic. Present a short literature review with the following goals:

* Give the reader a good overview of the key concepts;
* Describe the most relevant work (in your own words) that other people have done in this area;
* Use proper academic writing with references.
* Show how the existing work influenced your project.

# Evaluation and Discussion

Replace this text with Results and Discussion.

Describe the results using diagrams such as graphs etc. as appropriate, and discuss what the results mean.

Example: Results indicate that once the threshold gets over a certain point it significantly reduces player performance and player experience

**Project Milestones**

Replace this text with Project Milestones.

Key project milestone dates and measurement on schedule, was project schedule adhered to, effectively planned for delivery on-time or ahead of schedule if appropriate.

**Major Technical Achievements**

What are your major technical achievements?

**Project Review**

What went right? What went wrong? What (if anything) is still outstanding/missing (i.e., still left to do)? If starting again, how would you approach this project differently? What advice would you have for someone attempting a similar project in the future? Were your technology choices the right or wrong ones? If you chose the wrong technology, provide justifications for why you think this. What were the implications of your technology choices?

# Conclusions

summarise your work and findings.

**Future Work**

Indicate what might be some next steps to try (if a student next year was going to undertake a project in this area what might be an interesting thing for him/her to examine?).

# References

# Appendices

Replace this text with Appendices.

This might include ethics application and other relevant material e.g. copy of any questionnaires used.