

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 question that I asked when choosing my topic for my research project, was although each of these pathfinding algorithms are good in their own merit where should one be chosen over the other and is there a scenario where each one is applicable? In this paper I will research this problem using various scenarios and different kinds of programming techniques to present cases for each algorithm ones where maybe D\* (dynamic A\*) is more preferable than A\* and the inverse of that where A\* is more preferable than D\*. This will be backed up by Data I provide using various test cases acquired using my own code. This paper focuses on the pro’s and cons of each algorithm and will display them in equal manner so the reader can clearly understand the problems of both in certain situations and how they may be the perfect solution in other situations.

# Project Introduction and/or Research Question

In computer games development, developers may be faced with a problem with how to get their character from a to b. when faced with this problem they may then come to the solution of adding a pathfinding algorithm to safely get their character from a to b. This is a problem core to gaming as a whole. In finding the solution to this problem they could potentially find several solutions using various different algorithms where this problem becomes more difficult to solve as a whole is when they have an everchanging game world with various objects getting destroyed in front of the player on their designed grid. This may for instance destroy a node in the grid and as such they have to perhaps change their path for getting to the chosen end point safely and as quickly as possible.

This is why I chose this topic as a comparison between the two pathfinding algorithms A\* and D\* has a very big impact on developers as in games development the speed of such algorithms is extremely important and each algorithm shines in different scenarios to others. It will do this as in my project I will return the most optimal algorithm to the user. For instance, this will be done us using big O notation. I will also compare parts of the individual algorithms themselves and see where they compare or differ or even how they approach a problem.

My end goal of this research topic is to comprehensively and conclusively come to to the most optimal decision for the reader of this project and then in turn they will be able to go and implement the algorithm most suited to their problem which will in turn optimise their games speed and along side that be able to understand each algorithm in such detail that they won’t have any problem explaining it to others either.

Research question? what is the effect of having A\* on a dynamic game world?

Summarize the main contributions of the project.

Technologies to be used:

SFML -2.5.1

Visual Studio 2022

C++

SQL

# 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 ( adding all links here for now )

<https://core.ac.uk/download/pdf/235050716.pdf> - Path Planning Algorithm using D\* Heuristic Method Based on PSO in Dynamic Environment Firas A. Raheema \*, Umniah I. Hameedb

<https://medium.com/@nicholas.w.swift/easy-a-star-pathfinding-7e6689c7f7b2> -Nicholas Swift Feb 27 2017

<http://www.cs.cmu.edu/~ggordon/likhachev-etal.anytime-dstar.pdf> - Maxim Likhachev† , Dave Ferguson† , Geoff Gordon† , Anthony Stentz† , and Sebastian Thrun‡

<https://www.ri.cmu.edu/pub_files/pub3/stentz_anthony__tony__1994_2/stentz_anthony__tony__1994_2.pdf> -Anthony Stentz

# Appendices

Replace this text with Appendices.

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