Computer Games Development

SRS and Project Report

Year IV

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**Lei Shi of IT Carlow** who advised me to include alternate (standard) path finding algorithms and a way to show how efficient each was, so I could show the importance of my specific algorithm.

**Project Abstract**

The problem is creating an algorithm for multiple agents to get to their own destination without getting in each other's way and increasing travel distance. Path finding algorithm work under the assumption that nothing in the same space will move, so in a situation where multiple agents will be moving through each agents has to redo paths for the unknown new position of other agents before each movement. This will also cause unnecessary movement along soon to be abandoned paths. A solution to this problem is having all the path together and fixing the conflicts before any agents starts down the wrong path.(This paragraph does point out how my algorithm may be better for process time but my project is focused on the efficiency of the paths created not on the efficiency of creating them)

**Project Introduction**

I chose this topic because of my interest of seeing AIs react to one another while still trying to achieve its own specific goal. The algorithm could be used in warehouses with automated workers, where having shorter paths increases the amount of product they can move. It could be used in games to have many NPCs walking past each other in a more natural movement.

**Background**

The game “Cities: Skylines” is a city building game where you must build the houses, shops and roads to connect everything together. Part of the game is to build the road network so not only can you get from any building to any other, but also to avoid causing bottle necks which lead traffic jams. The idea of an A.I. car having to take the highway because too many A.I. cars were clogging up the city let to idea of an A.I. algorithm to control multiple agents.

**Project Description**

The project is a grid world with goals, blocks and agents who want to get to their goals and can’t go through blocks. The user control when the agents move and can change the type of pathing they will use.(changing pathing will reset agents). There are numbers to display the number of moves, the pathing being used and an average movement for all agents. There are 5 different path finding algorithms, the first two are simply to show how complex an algorithm needs to be to just get each agent to their goals. The third algorithm has each agent calculate it’s next move and then moving before anything else. This algorithm works by treating the other agents as blocks. The fourth just calculated the full path at the start ignoring other agents, to show the best possible paths. The fifth algorithm and the main focus of the project gets the best paths, finds the conflict and calculates the best alternates paths with no conflicts.

The technical achievement of this project was the algorithm for multiple agents that either matches or does better then a single algorithm for each agent.

I personally have a much better understanding of paths and editing paths to avoid specific locations.

**Overview**

***Philosophy***

Philosophical point #1

This game is trying to do this and that.  Fundamentally I am trying to achieve something that has never been achieved before.  Or.  This game will not try and change the world.  We are ripping off the competition so exactly that I can’t believe it.  The world will be shocked at how we are using an existing engine with new art.

Philosophical point #2

Our game only runs on Compaq computers.  The reason for this is such and such.  We believe the world is coming to **an** end anyhow so what difference does it make?

Philosophical point #3

When you create some of these overarching philosophical points about your design, say whatever you want.  Also, feel free to change it to “My game design goals” or whatever you like to call it.

Common Questions

What is the game?

Describe the game is a paragraph.  This is the answer to the most common question that you will be asked.  What are you working on?

Why create this game?

Why are you creating this game?  Do you love 3D shooters?  Do you think there is a hole in the market for Jell-O tossing midgets?

Where does the game take place?

Describe the world that your game takes place in.  Simple as that.  Help frame it in the reader’s mind by spending a few sentences on it here.  You can go into lengthy detail later in a section solely dedicated to describing the world.  Remember that we want to keep this part of the design light and readable.

What do I control?

Describe what the player will control.  You will be in charge of a band of rabid mutant fiddle players.  If you want you can switch on the AI and turn it into a fish bowl simulation.

Page BreakHow many characters do I control?

If this applies talk a little more about the control choices.  Remember to add answers to questions that you think the reader will ask.  This is totally dependent on your design.

What is the main focus?

Now that we know where the game takes place and what the player controls.  What are they supposed to achieve in this world?  Angry fiddle players take over the U.N. building.  Be careful not to add a bunch of salesmanship here.  Your design wants to stay light and informative.

What’s different?

Tell them what is different from the games that are attempting this in the market right now.  This question comes up a lot.

**Define the Application**

**What is the application supposed to do?**

This shows the effectiveness of an overhead algorithm controlling multiple path rather than separate path finding algorithm.

**Who is going to be using this application?**

Delivey services that have all their product in a warehouse and want the products out as quickly as possible.

**Metrics**

The project itself proves the effectiveness of the important algorithm i created.

**Is there a precedent for this application? (Your inspiration):**

A few games use similar ideas but as the effectiveness isn’t that important in a fake world it tends to be the less effective multiple different algorithms rather than an algorithm like mine.

**Project Review and Conclusions**

Being able to actually make the final algorithm and not being too process heavy is clearly good. Having other algorithm in the project, helps highlight the usefulness of the algorithm.

If the project was made with the idea of randomisation, it would better show the versatility of the algorithm, possible even allow the user to set up the game during runtime. Even more advanced mechanics like having a first goal(to collect something) and second goal(drop off).

**References**

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**Web-site**

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