**Project Title:** Line Racing: The use of pathfinding algorithms in games

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**Abstract.**

If you haven't heard of Tron already, don’t panic, it just means you didn’t spend your whole childhood playing video games. That’s right, Tron is an old arcade video game originally released well before I even took my first breath. So what does this have to do with my project? Well, Codingame.com took inspiration from this classic arcade game and designed the line racing problem. "In this game your are a program driving the legendary tron light cycle and fighting against other programs on the game grid." The rules go as follows; battles are fought between two players on a grid; on each players turn they decide which direction to move; if their decision isn't made fast enough, is an incorrect move or leads off the grid/into an occupied cell, they lose. the game continues until one player is left.

The aim of my project was to design a program capable of challenging this line racing problem and also gain a better understanding, through research, of how Ai and pathfinding is used in games. At first I looked at tackling the problem using the A\* search algorithm, but I quickly ran into issues and realized it wasn't a well suited algorithm for this particular problem. The issue being that the solution needed to account for the problem being a two player game. Therefore I decided it was best to use the Minimax algorithm, to find a solution, which utilizes maximizing your payoff while minimizing your opponents when applied to a two player game.