

Artificial Intelligence Coursework

Our task was to implement a computer player for a simplified version of the game Quoridor. The first task was to create a player that would run simulations of a game with random moves and would choose the most promising move from the simulation. This was achieved by recording how many times a move was chosen first and how many times this resulted in a win. Unfortunately I was not able to fully implement this player and as a result was not able to complete the other tasks. However through my research and understanding of the algorithms used I was able to make some predictions.

Two of the AI players provided ran using slightly different versions of minimax algorithms, these chose moves based on a calculation between the best move a player could make and what move the opponent could make on their next turn. This is a strategic approach to the game and is similar to the way a skilled human would play.

This method's effectiveness is determined by the amount of moves possible and the time available. There are large numbers of moves available and ranking these takes time. If time was not considered a factor then the algorithm could exhaustively evaluate every legal move and choose the absolute best move at every situation. However in reality and in the interest of fairness (and games being a reasonable length) a time limit must be imposed, this restricts the number of moves evaluated and could end up with a bad move being considered as the best option when the time runs out.

The random approach selects the move that led to a win the most times, as the opponents moves in this simulated game are also random, less time is spent evaluating moves and many more simulations can be run in the same time limit as a minimax player. This gives a more accurate result and could mean that the random player has the advantage over a minimax player in games with a short time limit. However the random player can suffer from similar issues to the minimax player, the scenario exists where all the moves simulated are considered bad moves, but eventually lead to a win in the simulated game, making a single bad move against a minimax player in the simplified game could cause irreparable damage.

I believe that the minimax approach is the best way to play. This sort of game is strategic and defense matters just as much as attack. The random player has no concept of strategy and while a move may be ranked highly during simulations it is not necessarily the best move to play against an opponent and may leave the player vulnerable.