

Fast and Furious Game Playing : Monte Carlo Drift

Specifications report

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The MCTS algorithm has been chosen in order to develop our artificial intelligence. However, in order to improve its efficiency, we will need to tweak it a bit. The main problem is the branching factor¹ of the Arimaa game which average is 17 281 and reaches about 22 000 after 10 moves.

Game	Average number of possible moves
Othello	8
Chess	35
Game of Go	250
Arimaa	17 281

The reason why the branching factor of a game is so important is because it ecreases greatly the space that has to be searched in order to guess what will happend multiples moves ahead. In chess after 6 moves, the number of positions evaluated are about 35^6 which is roughly equivalent to 1,8 billions. In Arimaa, after 3 turns (yours, the opponent and yours again), if you were the explore all positions, you would need to evaluate around 5,2 trillions² boards (2000 times more than chess with half the number of moves).

¹In a tree, the branching factor is the number of children at each node.

²1 trillion = 1 thousand billions = 10^{12} .