

Task Definition:

This chess bot is a system that evaluates chessboard states and determines the best move for the current player using a model trained by a convolutional neural network. The input is a hot-encoded 3D array capturing the positions of all pieces on the board and the legal moves for the current board state. The output is a predicted legal move in Universal Chess Interface (UCI) format which specifies the piece to move and its destination square.

Literature Review:

The most famous chess bot stockfish uses a brute-force search for optimal moves and is able to predict the best moves 30 or more moves deep. This has the weakness of requiring extensive computational resources but is very effective.

The Chess bot I created, on the other hand, is very lightweight. It is trained on human games using a convolutional network. Using human data can introduce biases to the model possibly leading to suboptimal patterns.

Analysis:

CPL is a measure of the average error in centipawns compared to the optimal move. The problem is despite my model's relatively good CPL it does not perform well against Stockfish. The reason is that even when stockfish is told to play at lower levels it does so by deliberately introducing errors because my model does not capitalize on the inaccuracies stockfish introduces it does not perform well. This is because it focuses on single move optimization not strategy.

Networks. Game Theory: How Stockfish Mastered Chess : Networks Course blog for INFO 2040/CS 2850/Econ 2040/SOC 2090. (n.d.).

<https://blogs.cornell.edu/info2040/2022/09/30/game-theory-how-stockfish-mastered-chess/>