

NEA Project

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Chess Engine

UTC Reading

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Contents

[Section 1: Analysis 2](#_Toc150978515)

[Project Description 2](#_Toc150978516)

# Section 1: Analysis

## Project Description

Chess is not a solved game, by any means. After just three moves, there are over one hundred and twenty million possibilities. So at this point in time, we don’t possess the processing power, or memory, to compute every single possibility in chess. However, we can look moves into the future, using computers to find the ‘best move’. Now using this computer, we can improve ourselves further, by using it to check our games, or playing against it. Therefore in my project, I will be creating a ‘Chess Engine’ that gives evaluations of positions and output the ‘best move’, as well as being able to play different difficulties of the engine. You will also be able to play against other people on your network, access a leaderboard and many other features.

## Background and Research

The top three chess engines in the world are Stockfish, Komodo Dragon and Fat Fritz (Champion, Stockfish in Depth, n.d.). So I will delve into how each of these engines have been coded, and see different techniques that have been previously used.

### Stockfish

Stockfish uses something called ‘Bitboards’. As a chessboard is made up of 64 sqaures, the positions of a given piece can be stored in a 64 bit variable. Every bit corresponding to a square. Therefore if it is set to 1, then a piece is present.

# References

Champion, A. (n.d.). *Stockfish in Depth*. Retrieved from https://towardsdatascience.com/dissecting-stockfish-part-1-in-depth-look-at-a-chess-engine-7fddd1d83579

Champion, A. (n.d.). *Top 5 Chess Engines*. Retrieved from https://royalchessmall.com/en-gb/blogs/blog/5-best-chess-engines