Chess is a board game of strategic skill for two players, played on a chequered board on which each playing piece is moved according to precise rules. The object is to put the opponent's king under a direct attack from which escape is impossible (checkmate).

# Three simple definitions from completely non-specialists’ point of view:

1. A.I. is the study of making computers smart.
2. A.I. is the study of making computer models of human intelligence; and finally
3. A.I. is the study concerned with building machines that simulate human behaviour.

Definitions from specialists’ point of view:

Definition 1: The first definition we consider is by Elaine Rich, the author of the book entitled ‘Artificial Intelligence’. It states:

Artificial Intelligence is the study of how to make computers do things, at which, at the moment, people are better.

Definition 2: We consider a definition obtained by rephrasing and combining the two definitions, viz., the first by Bruce G. Buchannan as given in ‘Encyclopaedia Britannica’ and the second by BUCHANIN & SHORTLIFFE as given in Rule-Based Expert Systems. It states:

AI is the branch of computer science that deals with symbolic rather than numeric processing and non-algorithmic methods including the rules of thumb or heuristics instead of algorithms as techniques for solving problems.

Definition 3: again by Elaine Rich [1] is more technical and involves some concepts from Theory of Computation. It sates:

Artificial Intelligence is the study of techniques for solving exponentially hard problems in polynomial time exploiting knowledge about the problem domain.

Definition 4: The definition, by Barr and Feigenbaum in ‘The Handbook of Artificial Intelligence’ is as given below.

Artificial Intelligence is the part of computer science concerned with designing intelligent computer systems, i.e., systems that exhibit the characteristics we associate with intelligence in human behaviour.

Definition 5: Shalkoff says:

‘Perhaps broadest definition is that AI is a field of study that seeks to explain and emulate intelligent behaviour in terms of computational processes’.

Perhaps the most common type of chess software are programs that simply play chess. You make a move on the board, and the AI calculates and plays a response, and back and forth until one player resigns or is checkmated.

Sounds simple but it’s not, as human it is easier to understand and perceive a chess board, its pieces, and the rules and identifying the best move in a given situation, teaching it to a computer is a difficult task.

Making an ai to do said task is even more difficult,

It is easy to generate all possible moves in a given board, this can be accomplished in ai using Min-Max Algorithm.

Small explanation of min max algo & pseudo-code & diagram.

It is easy to generate all possible moves in a given board, this can be accomplished in ai using Negated Min-Max Algorithm.

Small explanation of nega max algo & pseudo-code & diagram.

But not all generated moves are good or useful some may even be the worst possible moves also called as inaccurate moves. To eliminate such inaccurate moves ai uses Alph-Beta Pruning algo.

Small explanation of Alph-Beta Pruning algo & pseudo-code & diagram.

Even the elimination of inaccurate moves requires calculation as to how the move is bad, these calculation however can be a waste of time, i.e. the time ai can utilize in calculating good moves is being consumed in eliminating inaccurate moves. This time can be minimized by improving upon the Alph-Beta Pruning algo by coupling it with quiscience algo

Small explanation of quiscience algo & pseudo-code & diagram.

The time of eliminating inaccurate moves and calculating good moves can be further improved by the ai by implementing move ordering algo.

Small explanation of move ordering algo & pseudo-code & diagram.

Principle variation

Zw search

Zorbist hashing

Conclusion