

### Deepmind's Alpha-Go AI:

- In Chess, at each game state, the approximate number of possible moves is 35 vs 250 in Go
- The estimated total number of possible games for Go is  $10^{1761}$  compared to  $10^{120}$  for chess
- AlphaGo uses Monte Carlo Tree Search for searching the game tree
- The Basic idea in MCTS is to run many game simulations, and store some metrics such as how often each node is visited, and how often did this lead to a win
- For large simulations, MCTS converges to optimal play
- AlphaGo uses 2 main components : Value Network and Policy Networks.
- Value network provides information about the probability of winning the game given the current state
- Policy Networks provide information about which action to take, given the current state of the game
- AlphaGo uses a mixture of information of value network + simulation result
- The strengths of various AIs are as follows:

AI name	Elo rating
Distributed AlphaGo (2015)	3140
AlphaGo (2015)	2890
CrazyStone	1929
Zen	1888
Pachi	1298
Fuego	1148
GnuGo	431

**Reference:** <https://www.tastehit.com/blog/google-deepmind-alphago-how-it-works/>