

Deep Blue Research Review

The Deep Blue research describes the techniques and the rationale behind the Deep Blue chess machine. The Deep Blue chess machine defeated the World Chess Champion Garry Kasparov in a six-game match in 1997.

The Deep Blue machine was not the first effort in building a world-class chess machine. Nonetheless, some of the features which made it different from others were: a significantly enhanced evaluation function (from 6400 features to over 8000), increased per chip search speed (2–2.5 million positions per second), and better tools for debugging the game agent.

Deep Blue was a massively parallel system designed for carrying out chess game tree searches. The gist of how it worked goes as follows: a master level searches top levels of the tree, delegates leaf positions to workers, and finally these workers delegate their leafs to chess chips which search the last available levels of the tree.

The research describes techniques of the system as a whole and goes into more details to describe the evaluation function of the search tree. The evaluation function used many features (roughly 8000) and it was essentially a sum of each of the feature values. It also goes into more details of one of those features and describes the heuristics it used to score a particular game state. The game agent used ideas from previous chess programs such as quiescence search, iterative deepening, transposition tables, and NegaScout.

The Deep Blue research is a great example that serves as a basis to understanding the complexities behind building a successful game agent. During the development process, many software and hardware choices had to be made, and many others were left unexplored which could have resulted in better/worse results. This paper is also a great way to look for inspiration for the many possibilities that are available for creating a compelling game agent.