

Research Review - Deep Blue

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Deep Blue is the chess machine that defeated then-reigning World Chess Champion Garry Kasparov in a six-game match in 1997.

History

By the mid-1980s computer chess programs began challenging and occasionally beating grandmasters it remained unclear whether they could ever defeat the world's best in 1996 after seven years of research and development a team at IBM believed they were ready to challenge the Russian chess grandmaster Garry Kasparov. This was suspense beyond anything the world of chess had ever known Garry Kasparov 34 years old a cheerful and confident player throughout a dominating career hovered over his pieces in the deciding game of a match with an implacable challenger deep blue. The afternoon of May eleventh 1997 game six the deciding game deep blue challenges Kasparov's brain with an array of 256 processors that can examine 200 million possible moves every second. Game six deep blue analyzing millions of possible scenarios has led Kasparov into making a poor move Kasparov is rattled he defends what he can but it's clear that the computer will reliably do what he himself would do and he recognizes that he has already lost on deep blues 19th move the champion resigns for people watching around the world the unthinkable happen the computer defeated the grandmaster.

System

Deep Blue is a massively parallel system designed for carrying out chess game tree searches. The system is composed of a 30-node (30-processor) IBM RS/6000 SP computer and 480 single-chip chess search engines, with 16 chess chips per SP processor. The SP system consists of 28 nodes with 120 MHz P2SC processors, and 2 nodes with 135 MHz P2SC processors. The nodes communicate with each other via a high speed switch. All nodes have 1 GB of RAM, and 4 GB of disk. During the 1997 match with Kasparov, the system ran the AIX® 4.2 operating system. The chess chips in Deep Blue are each capable of searching 2 to 2.5 million chess positions per second, and communicate with their host node via a microchannel bus.

- a single-chip chess search engine,
- a massively parallel system with multiple levels of parallelism,
- a strong emphasis on search extensions,
- a complex evaluation function, and
- effective use of a Grandmaster game database.