DEEP BLUE

DEEP BLUE (COMPUTER)
(born 1993) United States of America

Deep Blue is a chess computer designed and produced by the computer company IBM. Deep Blue's programming code is written in C and runs under the AIX operating system. Its hardware architecture is somewhat based off of that of Chiptest (Computer). It won a game against Garry Kasparov on February 10, 1996, marking the first time a chess computer has ever beaten a reigning world champion under regular time controls. It was then upgraded and played a six-game match against Garry Kasparov in May of 1997. It won 3.5-2.5, marking the first time a chess computer has ever beaten a reigning world champion in a match under standard tournament rules and time controls. Garry Kasparov demanded a rematch which IBM did not accept and IBM retired Deep Blue. Its knowledge was fine-tuned by the Grandmaster Joel Benjamin, its opening book was supplied by Miguel Illescas Cordoba, John Fedorowicz and Nick de Firmian, and Jerry Brodie and Murray Campbell were also part of the IBM team. Randy Moulic and C J Tan managed the team.

Deep Blue, computer chess-playing system designed by IBM in the early 1990s. As the successor to Chiptest and Deep Thought, earlier purpose-built chess computers, Deep Blue was designed to succeed where all others had failed. In 1996 it made history by defeating Russian grandmaster Garry Kasparov in one of their six games—the first time a computer had won a game against a world champion under tournament conditions. In the 1997 rematch, it won the deciding sixth game in only 19 moves; its 3.5–2.5 victory (it won two games and had three draws) marked the first time a current world champion had lost a match to a computer under tournament conditions. In its final configuration, the IBM RS6000/SP computer used 256 processors working in tandem, with an ability to evaluate 200 million chess positions per second.

Deep Blue versus Garry Kasparov was a pair of six-game chess matches between world chess champion Garry Kasparov and an IBM supercomputer called Deep Blue. The first match was played in Philadelphia in 1996 and won by Kasparov. The second was played in New York City in 1997 and won by Deep Blue. The 1997 match was the first defeat of a reigning world chess champion by a computer under tournament conditions.


v

First match

- February 10, 1996: took place in Philadelphia, Pennsylvania
- Result: **Kasparov** Deep Blue (4–2)

tournament regulations

Second match (rematch)

- May 11, 1997: held in New York City, New York
- Result: **Deep Blue**–Kasparov (3½–2½)
- Record set: First computer program to defeat a world champion in a *match* under tournament regulations

Deep Blue's win was seen as symbolically significant, a sign that artificial intelligence was catching up to human intelligence, and could defeat one of humanity's great intellectual champions. Later analysis tended to play down Kasparov's loss as a result of uncharacteristically bad play on Kasparov's part, and play down the intellectual value of chess as a game that can be defeated by brute force.

In December 2016, discussing the match in a podcast with neuroscientist Sam Harris, Kasparov advised of a change of heart in his views of this match. Kasparov stated: "While writing the book I did a lot of research – analyzing the games with modern computers, also soul-searching – and I changed my conclusions. I am not writing any love letters to IBM, but my respect for the Deep Blue team went up, and my opinion of my own play, and Deep Blue's play, went down. Today you can buy a chess engine for your laptop that will beat Deep Blue quite easily."[

Deep Blue's victory switched the canonical example of a game where humans outmatched machines to the ancient Chinese game of Go, a game of simple rules and far more possible moves than chess, which requires more intuition and is less susceptible to brute force.[6] Go is widely played in China, South Korea, and Japan, and was considered one of the four arts of the Chinese scholar in antiquity. Go programs were able to defeat only amateur players until 2015, when Google DeepMind's Alpha Go program surprisingly defeated Lee Sedol in the match AlphaGo versus Lee Sedol. While Deep Blue mainly relied on brute computational force to evaluate millions of positions, **AlphaGo also relied on neural networks and reinforcement learning.**

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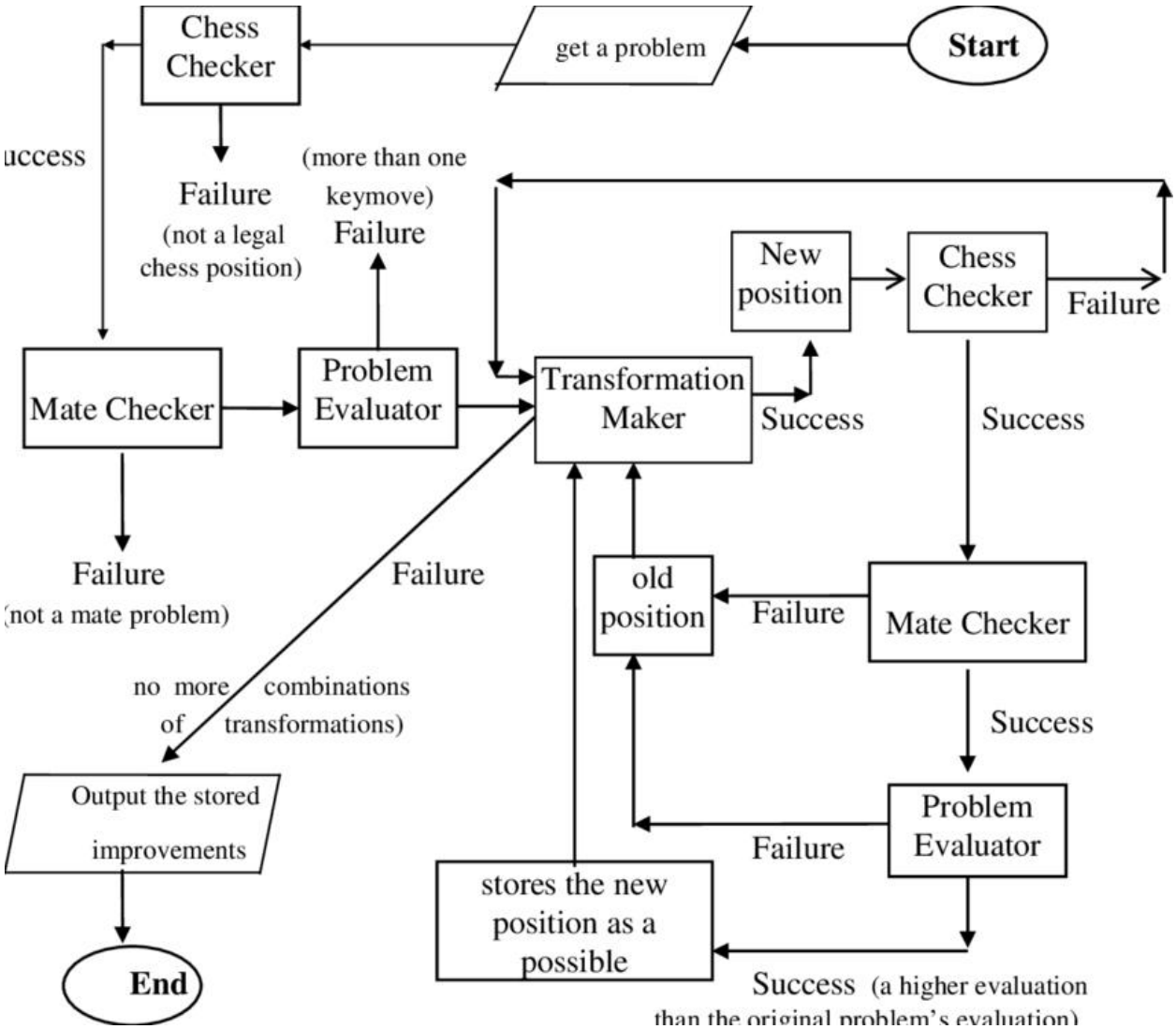
Start
get a problem
Chess Checker
uccess
Failure
(not a legal chess position)
(more than one keymove)
Failure
New position
Chess Checker
Failure
Mate Checker
Problem Evaluator
Transformation Maker
Success
Success
Failure
(not a mate problem)
Failure
old position
Failure
Mate Checker
no more combinations of transformations)
Success
Output the stored improvements
Problem Evaluator
Failure
stores the new position as a possible
End
Success (a higher evaluation than the original problem's evaluation)