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Deep Blue

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Abstract: Deep Blue is a chess machine or in simple language it is a chess engine made by the top programmers of IBM. The purpose of this research is to review the famous Deep Blue Chess engine which defeated Garry Kasparov, the famous World Chess Champion in a six – game match in 1997. Following are the main features of the Deep Blue:
A single chip chess engine.
A massively parallel system with multiple level of parallelism.
A strong emphasis on search extension.
Effective use of grandmaster's game database.
This research paper will describe a Deep Blue system and give all the interesting information about this chess engine along with all the other few important Chess engine.
Why deep blue only? – Deep blue is the first chess engine who defeated The World Chess Champion Garry Kasparov in 1997

I. INTRODUCTION

The Deep Blue was a chess-playing expert system developed by the IBM for an unique purpose. It was the first computer to win a Chess game, and the first to win a match, against a reigning world champion under regular time controls. The development of this machine began in 1985 at Carnegie Mellon university under the name "Chip Test". Then it moved to IBM, where it was first renamed "Deep Thought". It again renamed in 1989 as "Deep Blue". The first game between the Deep Blue and the world champion Garry Kasparov was played in 1996. It was a six-game match in which the Deep Blue lost 04-02. It was upgraded in 1997 and in a six-game re-match, it defeated Kasparov by winning two games and drawing three. Deep Blue's victory is considered a milestone in the history of artificial intelligence.



II. REALATED WORK

It is just a research o deep blue research paper which inform us about chess engine who defeated world champion Garry Kasparov in 1997 .deep blue is made by top programmers of IBM.

III. METHODOLOGY

IBM's Deep Blue made history in 1997 when it became the first machine to beat a reigning world chess champion. A research team led by IEEE (Institute of Electrical and Electronics Engineers) Senior Member Murray Campbell and Feng-hsiung Hsu developed the machine.

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Deep Blue, computer chess-playing system designed by IBM in the early 1990s. As the successor to Chip test and Deep Thought, earlier purpose-built chess computers, Deep Blue was designed to succeed where all others had failed. Deep Blue was a chess-playing expert system run on a unique purpose-built IBM supercomputer. It was the first computer to win a game, and the first to win a match, against a reigning world champion under regular time controls. Development began in 1985 at Carnegie Mellon University under the name Chip Test ..Deep Blue was a chess-playing expert system run on a unique purpose-built IBM supercomputer.

It was the first computer to win a game, and the first to win a match, against a reigning world champion under regular time controls. Kasparov won the first match, held in Philadelphia in 1996, by 4–2

In second match in 1997 The reason behind Garry Kasparov loss on Deep Blue is 100 million to 200 million chess moves per second. The team used a more advanced computer, more than doubled the number of chess chips, plus other enhancements. Deep Blue was a hybrid. It had general-purpose supercomputer processors combined with these chess accelerator chips. We had software that ran on the supercomputer to carry out part of a chess computation and then hand off the more complex parts of a move to the accelerator, which would then calculate [possible moves and outcomes]. The supercomputer would take those values and eventually decide what route to take.

1996 to 1997 in order to beat Kasparov did a couple of things. more or less doubled the speed of the system by creating a new generation of hardware. And then increased the chess knowledge of the system by adding features to the chess chip that enabled it to recognize different positions and made it more aware of chess concepts. Those chips could then search through a tree of possibilities to figure out the best move in a position. Part of the improvement between '96 and '97 is detected more patterns in a chess position and could put values on them and therefore evaluate chess positions more accurately. The 1997 version of Deep Blue searched between 100 million and 200 million positions per second, depending on the type of position. The system could search to a depth of between six and eight pairs of moves—one white, one black—to a maximum of 20 or even more pairs in some situations. Still, while were confident that the 1997 Deep Blue was much better than the 1996 version, in my mind the most probable outcome of the match was a draw. Even going into the final game of the match, was expecting a draw, and a likely rematch.

How has AI changed over the two decades since that match Of course, machines have improved in processing speed and memory and so on. People also started gathering—just as part of their business—a lot more data that provided fodder for the machine-learning algorithms of the day. Eventually we started realizing that combining all these things could produce some remarkable results. The IBM Watson system that played *Jeopardy!* used a machine-learning-based system that took a lot of data that existed in the world—things like Wikipedia and so on—and used that data to learn how to answer questions about the real world. Since then we have moved on to learn how to do certain kinds of perceptual tasks like speech recognition and machine vision. That has led to Watson performing more business-related tasks such as analysing radiology images and sharing that information with physicians.

IV. CONCLUSION

The problem in deep blue that dosen't mean that the code or algorithm of deep blue is wrong but it means that the difficulty level of the chess engine is way more powerful then the actual human brain and also deep blue is old and compare deep blue then other chess engine then stockfish have the latest AI program and algorithm and it is way more powerful then deep blue but the reason behind to write this research is the deep blue is the worlds first chess engine who defeated world champion Garry Kasparov in 1997 and garrry make a statement on this that is " the match I loose in 1997 is not the first match I loose against machine it was the first match I lost period. My lost is not the result of my bad play" and the most challenging and controversial statement "the match was also call that when machine challenge humanity". Deep blue who beat chess champion Garry Kasparov has once bragged he would never loose to machine. Kasparov and other chess master blamed the defeat on single man made by IBM machine.

IBM overthought some of the machine move become anxious about it's abilities ,making errors ultimately led to his defeat .deep blue did not poses anything like artificial intelligence technique.

Deep Blue victory is consider the milestone in the history of Artificial intelligence

The algorithm of deep blue is 8x8 array of combinational logic acting at silicon chess board but the move generator generate single move at a time but it calculate all possible move and select most significant one move with the help of arbitration network

Deep blue is a weak AI then stockfish because 20 years ago itis not the weakest AI but in now days it is. It perform 2 to 3 million moves per mile second .but the latest stockfish engine is more powerful then deep blue.

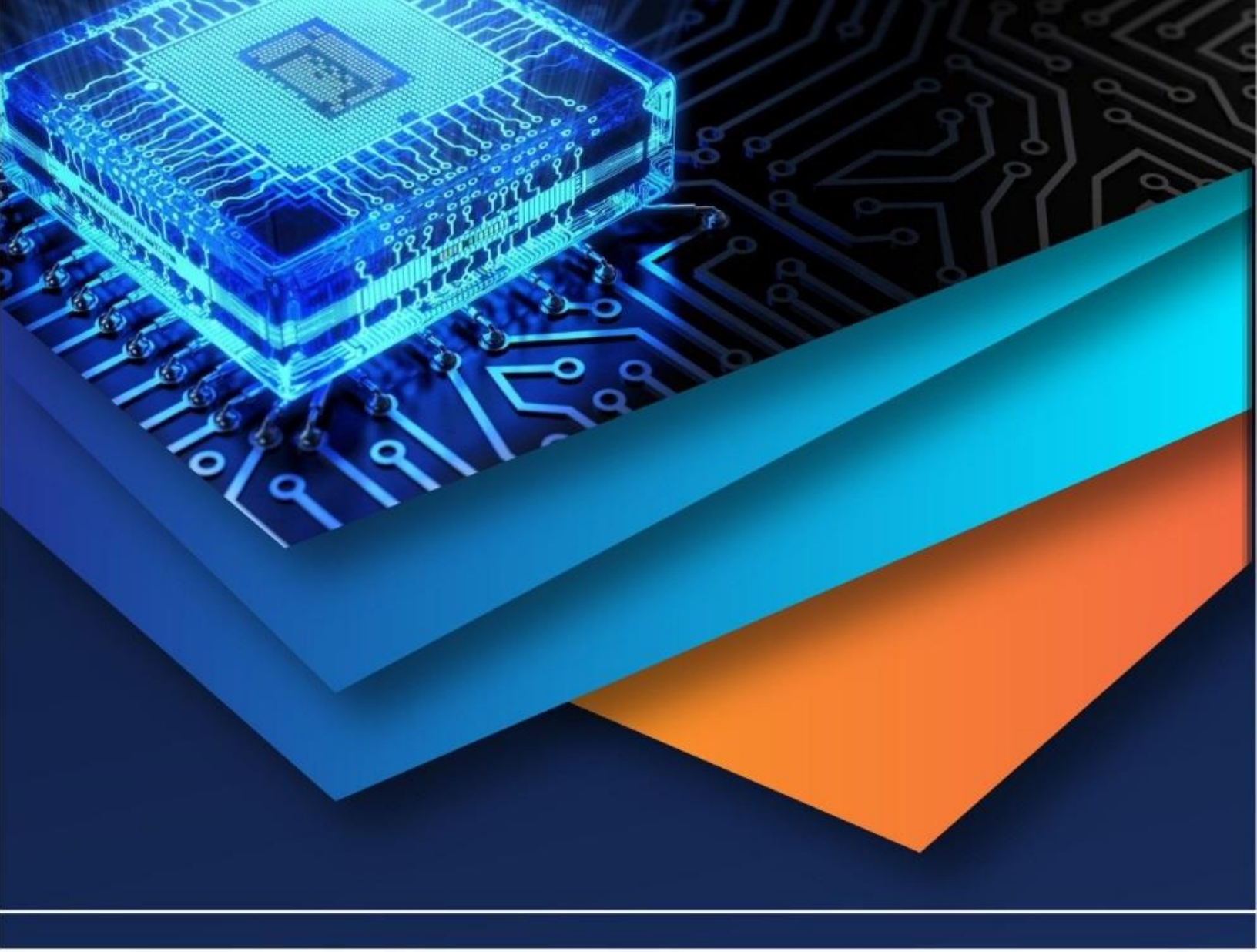
Deep Blue was a conservative algorithmic design even for its time. It got away with it by being monstrously faster than its opposition. Modern hardware and more than two decades of algorithmic improvements would while still slower be more than a match for it.

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AI was quite different in 1989 and early 1990. The dominant part in those days was what we now called good old-fashioned AI, or symbolic AI, which was based less on machine learning. Certainly machine learning was a serious field in those days but nothing like what it is today, where we have massive data sets and large computers and very advanced algorithms to churn through the data and come up with models that can do some amazing things. started with IBM, machine learning methods for game-playing programs were fairly primitive and not able to help us much in building Deep Blue. We worked on algorithms for efficient search and evaluation of the possible continuations, which we knew Deep Blue would need in order to compete.

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