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How Computer Chess Engines Works

It's amazing to believe that something as complex as the game of chess can be made into one big mathematical equation. Computers have no sense of a visual board but they can evaluate a large mathematical matrix of variables. Programmers have to give a numerical value to each of the following variables: material, control of squares, and king safty. A balance must be found between these three elements. For example, it's not uncommon for a pawn to be sacraficed in the opening in order to develope the pieces faster, thus, material can be out weighed by control of squares. Each of the variables must be evaluated for however many moves the program is allowed to think ahead to find the move that leads to the best possible numerical future. In other words, you're just playing a giant calculator that's looking at thousands of positions a second.

How can a human compete with a calculator?

Computers do not use artificial intelligence to play chess, they use what's called a brute force algorithm. It just looks at every possible move it can in the allocated time given. I feel proud when I see 6 moves ahead with fuzzy accuracy, but remember, you ignore moves that common sense tells us are pointless. The computer searches everything, no matter how ridiculous, and assigns it a point value several variations deep. When thinking of it this way, we skip thinking about thousands of pointless variations the computer looks through with simple logic. Don't let the position count the computer boasts scare you.

Computer vs Grandmaster

The computer is at a severe disadvantage in that it cannot see long term positions such as end game pawn structure or sometimes long term danger in king side sacrafices. Take for example Eduard Nemeth, a 2100 rated german who beat the 2700 rated computers with a ridiculous openings and knight sacrafice. He played a few that just put the computer into a closed position where the computer thought it was doing better positionally but had no productive moves to penetrate the position so it just kept using it's brute force algorithm and lost on time.

Deep Blue VS. Kasparov

Computer have prevailed as world champion, but considering IBM made a super computer that evaluated 200 million moves per second, it's a wonder Kasparov did so well. The world champion and many other super grandmasters today have a team of "analysts" which are probably aided by super computers. Probably the last "talent" was