Chess by Ira Pohl Former US Senior Rapid Play Champion April 2016

The example in the videos does not give the objectively best line. This is embarrassing as I am a former US national Master – mostly because in my early years I was an ardent amateur chess enthusiast.

Best is R x f6 g x f6

Bh6+ Qg7

Qf6 Kg8

Qg7 mate

Chess programs at this point exceed human play by a significant amount. They have now defeated any number of world champion caliber players at odds that indicate a superiority of 400+ Elo points. (Elo points is a statistical measure of strength of play based on games played, much like a batting average.)

Human world champion play (Magnus Carlsen 2851) vs. Computers

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| **1** | [**Komodo 9.42 64-bit 4CPU**](http://www.computerchess.org.uk/ccrl/4040/cgi/engine_details.cgi?print=Details&each_game=1&eng=Komodo%209.42%2064-bit%204CPU#Komodo_9_42_64-bit_4CPU) | **3358** |  |  |  |  |  |  |  |
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| **2** | [**Stockfish 7 64-bit 4CPU**](http://www.computerchess.org.uk/ccrl/4040/cgi/engine_details.cgi?print=Details&each_game=1&eng=Stockfish%207%2064-bit%204CPU#Stockfish_7_64-bit_4CPU) | **3340** |  |  |  |  |  |  |
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These programs started to reach master standard in the 1980’s and World Championship caliber in the 1990’s. The key inflection point was the reigning world Champion Kasparov losing in 1997 to IBM Deep Blue. They are programmed using techniques like plausible move generation and alpha-beta evaluation. They have very refined numerical means of evaluating a position. They evaluate material, much the way a beginner is taught, eg. a knight is 3 pawns, and rook is 5 pawns; but they also can add value for controlling key squares and king safety. Current programs are computationally intensive and generally investigate all legal moves in the early part of the move tree.

Later we will talk about Monte Carlo evaluations as used in our Hex program. It would be an interesting experiment to see if the techniques using Monte Carlo and deep learning would work in chess – with the same results as was the case for the 2016 program AlphaGo program (Google project) beating the current human world champion.