Research Review:
Deep Blue by the IBM Watson Team

The publicly acclaimed Project "Deep Blue by the IBM Watson Team" or "Deep Blue II" astounded the world when it defeated the leading grandmaster in chess in May of 1997. There were multiple projects by IBM that finally lead to their success that started with: ChipTest, Deep Thought, Deep Thought II, Deep Blue I, and the awarded Deep Blue II. Deep Blue II was massively parallel system, and it chips had a symbiosis of a hardware search ("… *encoded in silicon on the chess chip*") and a software search (source code written in "C"). There was 480 single-chip chess search engines, and 500 processors available for computation. To simply describe the massively parallel system, "*The master searches the top levels of the chess game tree, and then distributes "leaf" positions to the workers for further examination*".

On the software side Feature Values, a clever Evaluation Function, Chess move Repositories and others were the foundation of Deep Blue's software. Additionally, many methods that were used in the Udacity Isolation project were used and undoubtedly a lot more. Common methods that were used are Quiescence Search, Iterative Deepening, Transposition Tables, and NegaScout. It was said that these methods formed a sound basis for designing a Chess-playing system. Along with Chess board functions such as generation of checking, check evasion moves, generation of certain kinds of attacking moves, king safety, pawn structure, rook on the 7th, blockade, restraint, color complex, and much more. All these methods helped the Evaluation Function, and in quote the "… *evaluation function is essentially a sum of feature values.*" Moreover, the evaluation function had two parts a "Fast Evaluation" and a "Slow Evaluation." "*This is a standard technique to skip computing an expensive full evaluation when an approximation is good enough.*" Lastly, there was a broad selection of possible repertoires to utilize, "… *the choice would be made on the basis of the match situation and the previous experience playing with the same color*." However, the endgame databases section of the repertoires helped very little with the 1997 match against Kasparov, "… *only game 4 approached an endgame that required access to the databases* …" In Summary, all these techniques paved the way for an ingenious Chess-playing system that was undefeated and beat the world champion in 1997.

The Results of Deep Blue and its predecessors were as follows. ChipTest and Deep Thought were at Carnegie University in the 1980s. Deep Thought was the first Project to win a match against a Grandmaster in a tournament in 1988. Next, Deep Blue I lost to Kasparov in 1996 with a 4-2 score. Also, there were two matches played before and in preparation of the 1997 match which was called "Deep Blue Jr." It was played against the two Grandmasters Larry Christiansen and Michael Rohde, and was won by Deep Blue Jr. with a score of 1.5-0.5. Finally, Deep Blue II which would average 100 million chess positions per second, won against Garry Kasparov in May 1997 with a score of 3.5-2.5. "*For this victory, the Deep Blue team was awarded the Fredkin prize for defeating the human world champion in a regulation match*." In conclusion, Deep Blue II stands as a pinnacle for its time who beat the human world champion Garry Kasparov who was *"… a chess player known for his complex attacking style …*"