Summary of *Deep Blue*

Qishun Yu, CM 2043

The Deep Blue article describes the mechanism of the world-famous chess machine Deep Blue and the design concept behind the scene. This article was published in 2001, four years after Deep Blue defeated world champion Garry Kasparov, by Murray Campbell, Feng-hsiung Hsu, and A.Joseph Hoaner Jr.

The authors first compare Deep Blue with its predecessor, Deep Thought, and lists varies improvement including multiprocessing, evaluation hardware, search software, etc. the very impressive improvement is its brilliant use of different layers. Master and workers work synergistically for grand inspection and detail examination. On the other hand, experience built on previous chess machine program also contributes significantly on the strategies like quiescence search, iterative deepening, etc.

Alpha-beta search was well implemented as a way to avoid searching subtree of moves that you don’t want to explore, more specifically, MAX nodes and MIN nodes represent Deep Blue and opponent’s moves. Meanwhile, certain moves are eliminated for being not productive, and credit generation mechanism is used to identify certain move’s credit; depth depend credit assignment can benefit the positions close to the tree for quicker resolution.

The very last few paragraphs introduce The Opening Book composed by Grandmasters and The Extended Book. Deep Blue studied The Opening Book and played well of the openings introduced. The Extended Book guided and directed Deep Blue’s play while The Opening Book couldn’t contribute. Finally, the Endgame databases were used to guide and direct Deep Blue’s play when few pieces were on the board.

In summary, the success of Deep Blue was the result of both incredible algorithms built by programmer and experience by chess Grandmasters.