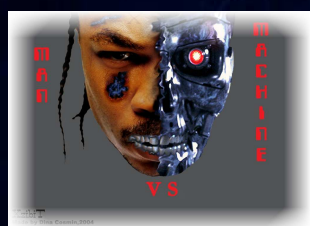


# INTELLECTUAL EQUALS

## DEEP BLUE

Deep Blue was a chess-playing computer developed by IBM. On May 11, 1997, the machine won a six-game match by two wins to one with three draws against world champion Garry Kasparov. Kasparov accused IBM of cheating and demanded a rematch, but IBM refused and dismantled Deep Blue. The project was started as "ChipTest" at Carnegie Mellon University by Feng-hsiung Hsu, followed by its successor, Deep Thought. After their graduation from Carnegie Mellon, Hsu, Thomas Anantharaman, and Murray Campbell from the Deep Thought team were hired by IBM Research to continue their quest to build a chess machine that could defeat the world champion. The system derived its playing strength mainly out of brute force computing power. It was a massively parallel, RS/6000 SP Thin P2SC-based system with 30-nodes, with each node containing a 120 MHz P2SC microprocessor for a total of 30, enhanced with 480 special purpose VLSI chess chips. Its chess playing program was written in C and ran under the AIX operating system. It was capable of evaluating 200 million positions per second. Deep Blue's evaluation function was initially written in a generalized form, with many to-be-determined parameters (e.g. how important is a safe king position compared to a space advantage in the center, etc.). The optimal values for these parameters were then determined by the system itself, by analyzing thousands of master games. The evaluation function had been split into 8,000 parts, many of them designed for special positions. In the opening book there were over 4,000 positions and 700,000 grandmaster games. The endgame database contained many six piece endgames and five or fewer piece positions.



### SO WHO HAS MORE PROCESSING POWER ?

By estimation, the brain has about 100 million MIPS (Million Instructions per second) worth of processing power while recent super-computers only has a few million MIPS worth in processor speed. That said, the brain is still the winner in the race. Because of the cost, enthusiasm and efforts still required, computer technology has still some length to go before it will match the human brain's processing power.

### SO WHO IS THE SUPERIOR ?

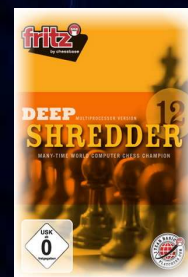
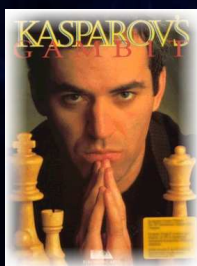
The brain is still the overall winner in many fields when it comes to numbers. However, because of its other commitments, the brain is less efficient when a person tries to use it for one specific function. The brain is as we can put it, a general purpose processor when compared to the computer. It therefore loses out when it comes to efficiency and performance. We have given the estimate for total human performance at 100 million MIPS, but the level of efficiency for which this can be applied to any task may only be a small fraction of the total. (This fraction depends on the adaptability of the brain to the task.)

## FUTURE OF ARTIFICIAL INTELLIGENCE

What is the future of artificial intelligence? Can machines ever be as thoughtful, self-aware and intelligent as human beings? The answer to both these questions is inter-related.

Artificial intelligence in the future will churn out machines and computers, which are much more sophisticated than the ones that we have today. For example, the speech recognition systems that we see today, will become more sophisticated and it is expected that they will reach the human performance levels in the future. It is also believed that they will be able to communicate with human beings, using both text and voice, in unstructured English in the coming few years. However, will artificial intelligence be able to create machines that are self-aware and even more intelligent than human beings - is a question that nobody has an answer to. Also, even if this is possible, how much time it is going to take, cannot be predicted at present.

It is expected that in the future such machines will be developed having basic common sense, similar to human beings, although pertaining to specific areas only. It is also expected that the human mind functions, such as learning by experience, learning by rehearsal, cognition and perception will also be performed by future intelligent machines. In fact, research and experiments are being conducted to recreate the human brain. CCortex, a project by Artificial Development Inc., California, and Swiss government's IBM sponsored Blue Brain Project, are two main ventures, whose goal is to simulate the human brain. Whether this brain will have human consciousness incorporated in it - there is still no answer for that. Besides you still need a human to program a machine. It is expected that the robots in the far future, will take on everybody's work. Whether it is office work or the work at home, robots will accomplish it even more faster and efficiently than human beings. So if somebody's falling ill, they can obtain a robot nurse who will give periodic medicines to them. How much care, concern and empathy the robot nurse will have towards the patient is anybody's guess!



ACCORDING TO EXPERTS, THIS GENERATION WILL LIVE TO KNOW INTUITIVE, "FEELING" COMPUTERS. WHEN THAT DAY COMES, WE'LL LOSE OUR LAST CLAIM OF SUPERIORITY

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