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**Report on “A Bridging Model for Parallel Computation”**

This article is an argument that an efficient analogous bridge between software and hardware in required for parallel computation.

At the beginning of this article, author broadly describes the research status and process in parallel computation. Replacing sequential computer with parallel computer significantly decreases the cost of processing, memory and communication. General purpose parallel computation is using an analogous unifying bridging model for parallel computation. This model satisfy some stringent quantitative requirements as von Neumann model, however, some relevant issues also come out, such as logarithmic losses. Therefore, the paper introduces the bulk-synchronous parallel (BSP) mode and a bulk-synchronous parallel computer (BSPC) as an evidence to prove that they are more efficient bridging model for general-purpose parallel computation. BSP model efficiently provides the option to avoid the onerous burdens of managing memory, assigning communication and performing low-level synchronization.

Then the paper emphatically research and analyze BSP and BSPC with their three attributes as follow: 1. a number of components, each performing processing and/or memory functions; 2. a router that delivers messages point to point between pairs of components; 3. facilities for synchronizing all or a subset of the components at regular intervals of L time units where L is the periodicity parameter. The BSP model can be implemented for communication, computation or synchronization that does not violate von Neumann model spirit.

The author focuses his study on automatic memory management and concurrent memory accesses for BSPC. His automatic memory management analysis shows that if hashing is to be exploited, the periodicity L may be at least logarithmic can be achieved. From the concurrent memory accesses simulation, we observe that several global operations are superior to other simulations in implementation of hardware.

Additionally, the article also contains two BPS implementations in hardware, which are Packer Switching Network and Optical Crossbar. Since networks is favored method of communication in current parallel machines, the argument aim at packet switching. The author use the fact that two-phase randomized routing ca support heavier message densities to achieve optimal BSP simulation. Besides, BSP computer can be implemented optimally on a simple model of computation suggested by the possibilities of optical technology. In BSP model, each of components can transmit a message by directing a beam of light at a chosen component in each time step.

At last, authors get a conclusion that BSP model is a promising candidate as bridging model for conventional parallel computation. The BSP model defined in this article is suitable for computational and communication bandwidth, several important algorithm and a number of technologies.

**Reference**

[1] Leslie G. Valiant, “A Bridging Model for Parallel Computation”, *Special issue: Communications of the ACM* Volume 33 Issue 8, Aug. 1990, Pages 103-111, doi>10.1145/79173.79181