CPU-based Application Transformation to CUDA

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LAP Lambert Academic Publishing Jul 2012, 2012. Taschenbuch. Book Condition: Neu. 230x151x10 mm. Neuware - Scientific computation requires a great amount of computing power especially in floating-point operation but a high-end multi-cores processor is currently limited in terms of floating point operation performance and parallelization. Recent technological advancement has made parallel computing technically and financially feasible using Compute Unified Device Architecture (CUDA) developed by NVIDIA. This research focuses on measuring the performance of CUDA and implementing CUDA for a scientific computation involving the process of porting the source code from CPU to GPU using direct integration technique. The ported source code is then optimized by managing the resources to achieve performance gain over CPU. It is found that CUDA is able to boost the performance of the system up to 69 times in Parboil Benchmark Suite. Successful attempt at porting Serpent encryption algorithm and Lattice Boltzmann Method provided up to 7 times throughput performance gain and up to 10 times execution time performance gain respectively over the CPU. Direct integration guideline for porting the source code is then produced based on the two implementations. 88 pp. Englisch.

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