OpenCL Parallel Blocked Approach for Solving All Pairs Shortest Path Problem on GPU

Abstract

All-Pairs Shortest Path Problem (APSP) finds a large number of practical applications in real world. This paper presents a blocked parallel approach for APSP using an open standard framework OpenCL, which provides development environment for utilizing heterogeneous computing elements of computer system and to take advantage of massive parallel capabilities of multi-core processors such as graphics processing unit (GPU) and CPU. This blocked parallel approach exploits the local shared memory of GPU, thereby enhancing the overall performance. The proposed solution is for directed and dense graphs with no negative cycles and is based on blocked Floyd Warshall (FW) and Kleene’s algorithm. Like Floyd Warshall this approach is also in-place and therefore requires no extra memory.

References

Index Terms

Computer Science

Algorithms

Keywords

OpenCL Graphics processing Unit All Pairs Shortest Path Floyd Warshall