Analysis of Parallel Matrix Multiplication Algorithms

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ABSTRACT

Matrix multiplication is the fundamental operation in many numerical linear algebra applications. Its efficient implementation on parallel high performance computers, together with the implementation of other basic linear algebra operations, is an issue of primary importance for providing these systems with scientific software libraries. Consequently, considerable effort has been devoted to development of efficient practical parallel matrix multiplication algorithms. In this paper, we describe performance analysis of a simple parallel algorithm, Cannon's algorithm, systolic algorithm and hyper-systolic algorithm. Theoretical analysis indicates that the performance of the hyper-systolic algorithm outperforms the other algorithms.

Keywords Matrix Multiplication, Performance Analysis, Cannon's Algorithm, Systolic Algorithm, Hyper-systolic Algorithm