Abstract

Computing of multiple tasks simultaneously on multiple processors is called Parallel Computing. The parallel program consists of multiple active processes simultaneously solving a given problem. Parallel computers can be roughly classified as Multi-Processor and Multi-Core. In both these classifications the hardware supports parallelism with computer node having
multiple processing elements in a single machine, either in single chip pack or on more than one distinct chip respectively. Parallel programming is the ability of program to run on this infrastructure which is still quite difficult and complex task to achieve. Out of many two different approaches used in parallel environment are MPI and OpenMP, each one of them having their own merits and demerits. Hybrid model combines both approaches in the pursuit of reducing the weaknesses in individual.

In proposed approach takes a pair of, Matrices produces another matrix by using Matrix-Vector Multiplication Algorithm. The resulting matrix agrees with the result of composition of the linear transformations represented by the two original matrices. This algorithm is implemented in MPI, OpenMP, and Hybrid mode. The algorithm is tested for number of nodes with different number of matrix size. The results indicates that the Hybrid approach out performs the MPI and OpenMP approach.

Reference

- OpenMP, The OpenMP ARB. http://www.OpenMP.org/.

Index Terms

Computer Science       Parallel Computing
Performance Analysis of Matrix-Vector Multiplication in Hybrid (MPI + OpenMP)

Key words

MPI          OpenMP          Hybrid (MPI+OpenMP)
Matrix-Vector Multiplication Algorithm