END OF PROJECT REPORT

INVESTIGATION ON THE DYNAMIC OF COMPUTATION OF SEMI AUTONOMOUS EVOLUTIONARY COMPUTATION FOR SYNTACTIC OPTIMIZATION OF A SET OF PROGRAMMING CODES

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ABSTRACT

Investigation on the Dynamics of Computation of Semi-Autonomous Evolutionary Computation for Syntactic Optimization of a Set of Programming Codes

In parallel programming, the challenges in optimizing the codes in general are more than that for serial programming. They have to be optimized for parallel execution while some parts still do have sequential execution due to data dependencies, which makes the optimization problem two folds, parallel and serial. This work focuses on the optimization of the parallelization of a sequential code. To begin with, in parallel computational machines, aside from the single-node performance, there exist two important factors affecting the performance of programs written for such machines. Firstly, the distribution of the data among the processors has an effect on the communication time. Secondly, the number of processors in use at each step of the parallel code (degree of parallelism) has an effect on the computation time and the communication time as well. The more data size being transferred per processor in one stage leads to the more communication time in that stage. The more processors utilized leads to the less computation time but the more communication time. In order to have a realistic characteristic of a parallel computing engine, a Rocks based computer cluster was built and used for the test. Genetic Algorithm as one of the Evolutionary Computation method improve the execution of parallel programming codes by optimizing the number of processors and the distribution of data. Since programming is not very exact and can be considered partially art then the Genetic Algorithm is not designed to be fully autonomous and programmers hand still have to be there, but with much reduced work.