Abstract

Genetic algorithms have been proven to be both an efficient and effective means of solving certain types of search and optimization problems. Genetic algorithms have been applied with positive results in many areas including scheduling problems, neural networking, face recognition and other NP-complete problems. The idea behind GA’s is to extract optimization strategies nature uses successfully - known as Darwinian Evolution - and transform them for application in mathematical optimization theory to find the global optimum in a defined phase space. Another popular way to improve genetic algorithms is to run them in parallel, some parallel genetic algorithms have performed very well compared to the standard non-parallel genetic algorithm. Parallel genetic algorithms focus their efforts at simulating multiple species and include not only the standard operations for crossover and mutation but also operations for migration between different populations.

Genetic algorithm (GA) which is a meta-heuristic algorithm has been successfully applied to solve the scheduling problem. The fitness evaluation is the most time consuming GA operation
for the CPU time, which affects the GA performance. This paper proposes and implements a synchronous master-slave parallelization where the fitness evaluated in parallel. The rest of paper organized as follow: genetic algorithm, parallel genetic algorithm, proposed algorithm, theoretical analysis, practical analysis, and conclusion.

References

1. Abtin Hassani ... Box 883. Västerås, Sweden han03007@student.mdh.se. Jonatan Treijs. Mälardalen's University. Box 883. Västerås, Sweden jts05002@student.mdh.se ... in parallel.

Index Terms
Keywords

Genetic Algorithm, Parallel Generic Algorithm, Dual Species, Genetic Algorithm, Search Algorithm, Path finding, GA, PGA, DSGA