Abstract

Although Ant Colony Systems (ACS) have gained much attention in last two decades but slow execution and convergence speed are still two challenges for these meta-heuristic algorithms. Many parallel implementations have been proposed for faster execution. However, most of available implementations use coarse-grained synchronization mechanisms that are not efficient and scalable. In this work, we have taken a fine-grained (ant-level) approach that is more efficient and scalable. We have used traveling salesman problem as a test case and have presented a parallel fine-grained implementation for shared-memory multi-core systems. Our experimental results show that our proposed parallel implementation can achieve considerably higher speedup values on modern multicore processors.

References

  - P. Delisle, M. Krajecki, M. Gravel, and C. Gagné, “Parallel implementation of an ant colony optimization metaheuristic with OpenMP,” in Proceedings of the 3rd European Workshop on OpenMP (EWOMP’01), Barcelona, Spain, 2001.

Index Terms

Computer Science

Keywords

Ant Colony System, Parallel Computing, Traveling Salesman Problem, Shared Memory System