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

**Index Terms**

Computer Science  
Algorithms

**Keywords**

Ant Colony System  
Parallel Computing  
Traveling Salesman Problem  
Shared Memory System