Abstract

Ant colony optimisation (ACO) could be a comparatively new random heuristic approach for determination optimisation issues. Furthermore, this paper extend these implementations with two local search methods and we compare two heuristics that guide the HACO algorithms. However, relatively few results on the runtime analysis of the ACO on the TSP are available. Moreover, we experiment with two different pheromone update strategies. In order to demonstrate this we present an ACO implementation for the travelling salesman problem it requires a larger number of ants and iterations which consume more time. The influence of the parameters controlling the relative importance of pheromone trail versus visibility is also analyzed, and their choice is shown to have an impact on the expected runtime. The main application of the ACO algorithm lies in the field of combinatorial optimization, and the traveling salesman problem (TSP) is the first benchmark problem to which the HACO algorithm has been applied.

References

- M. Dorigo and L. M. Gambardella, "Ant colony system: A cooperative learning
A Hybrid Ant Colony Optimization Algorithm using MapReduce for Arc Routing Problem


- J. He, X. Yao, and J. Li, &quot;A comparative study of three evolutionary algorithms incorporating different amount of domain knowledge for node covering problems,&quot; IEEE Trans. System.


A Hybrid Ant Colony Optimization Algorithm using MapReduce for Arc Routing Problem


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