Solving Single-objective and Multi-objective Traveling Salesman Problem by Tabu Search

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ABSTRACT

The traveling salesman problem (TSP) has been a well studied problem for decades. TSP with more than objectives has also attracted attention recently for its reflecting actual condition better than single objective TSP. Due to its combinatorial characteristic, the solution efficiency gets worse as the problem size increases. In this research, we use Tabu Search, a meta-heuristic, to solve both the single and multiple objective TSP. One of the most powerful property of Tabu search is its using flexible memory to get rid of being trapped by local optimum when searching for the global optimum. First, some methods suggested from literature are adopted to construct the initial tour for TSP. Tabu search is then used to improve the tour(solution) until optimum (or near optimum) is obtained. For the multiple objective TSP, the augmented max-min operator is used to generate the non-inferior solution. Additionly, an interactive approach is used to reflect decision maker''s preference. Since the parameters setting of Tabu search would greatly affect the solution accuracy and the solving efficiency as well. A full factorial design is performed in this research to find the best parameter setting to solve the TSP accurately and efficiently.

Keywords : Traveling Salesman Problem ; Tabu Search ; Heuristic ; Multi-Objective Programming

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