門檻接受法應用於多場站車輛路線問題之研究

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摘要

The Multi-Depot Vehicle Routing Problem (MDVRP) is an extent of the classical Vehicle Routing Problem. More complicated than VRP, MDVRP considers that the usage of multiple depots with fixed size of fleet, and the limitation of maximal duration for each route. In this paper, we propose a meta-heuristic procedure which is named as TA_MDVRP based on the combination of Threshold Accepting (TA) and traditional Neighborhood Search heuristics. In TA_MDVRP, eight initial solution construction methods and eight neighborhood search methods are designed. In order to generate the feasible solution, we also design two procedures which respectively focus on the constraints of fleet size and maximal duration to adjust the initial solutions to meet the feasibility. Additionally, a modified formula to generate the value of threshold series is proposed in the TA module. A bank of twenty-one MDVRP benchmark instances is adopted to identify the performance of TA_MDVRP. The average percentage of error to the best-known solutions is 0.98% among the twenty-one instances. Moreover, two best-found solutions obtained by TA_MDVRP are superior to the best-known solution. The results of numerical experiment imply that TA_MDVRP performs well in solving these benchmark instances.

關鍵字：Multi-depot Vehicle Routing Problem (MDVRP); Threshold Accepting (TA); Meta-Heuristic