

# 巨集啟發式解法於多場站多車種車輛路線問題之研究

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## 摘要

The Multi-Depot and Heterogeneous Fleet Vehicle Routing Problem (MDHVRP) is an extent of the classical Vehicle Routing Problem. In this paper, we develop a Threshold Accepting (TA) meta-heuristic, named as TA\_MDHVRP, to solve the MDHVRP. TA\_MDHVRP is based on the combination of Threshold Accepting (TA) and traditional Neighborhood Search heuristics. There are three modules: initial solution construction (ISC), local search (LS), and threshold accepting (TA) in the TA\_MDHVRP framework. In ISC module, a two-stage approach that first assigns customers to the nearest depot and then utilizes the Farthest-start Nearest Neighbor (FNN) method to arrange routes of each depot. Moreover, two kinds of vehicle, the biggest truck and the smallest truck, are optionally selected to construct routes while executing FNN. Five exchange heuristics: 2-opt, Or-opt, Node Insert (Inter-route and Inter-depot), Node Exchange (Inter-route and Inter-depot), and Vehicle Exchange, are proposed in LS Module. Finally, a geometric descent TA mechanism is adopted in the TA module. Due to the lack of MDHVRP instances, we transfer the MDVRP benchmark instances to a bank of twenty-five MDHVRP test instances, which is used to identify the performance of TA\_MDHVRP. The results of numerical experiments imply that Threshold Accepting meta-heuristic can be a potential procedure to solve the complicated MDHVRP.

**關鍵字** : Multi-Depot and Heterogeneous Fleet Vehicle Routing Problem (MDHVRP); Threshold Accepting (TA); Farthest-start Nearest Neighbor (FNN)