兩階段回溯式門檻接受法求解時窗限制回程取貨車輛路線問題之研究

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摘要

The vehicle routing problem with backhauls and time windows (VRPBTW), which simultaneously considers the operations of delivery and pickup, is a variant of the classical vehicle routing problem (VRP). Successful application of the VRPBTW to the real-world distribution will improve the performance of logistics. Due to the NP-hard complexity of VRPBTW, the most solution methods are heuristics and meta-heuristics. This paper aims to develop a two-phase backtracking threshold accepting (TBTA) meta-heuristic approach, which combines the threshold accepting (TA) meta-strategy and the traditional local search algorithms, to solve the VRPBTW. We adopted fifteen VRPBTW benchmark instances to test and analyze the performance of the proposed TBTA meta-heuristic. The average error percentages of TBTA are 3.52% for the objective of fleet size and 2.81% for the objective of traveling time. Moreover, the average value of CPU running time is merely 33.69 seconds. Computational results implied that the TBTA actually provides an efficient tool for VRPBTW applications.

關鍵字：Vehicle routing problem with backhauls and time windows (VRPBTW); Meta-heuristics; Two-phase backtracking threshold accepting (TBTA)