汽車路線貨運業轉運中心間多車種配送路線規劃之研究

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摘要

In order to fulfill the customer requirements, the fixed-route carriers build up the operational framework consisting of intra-network and extra-network to improve their efficiency of distribution. However, the route arrangement of the intra-network is very complicated, and related research is scarce. Therefore, the purpose of this study is to propose a model, named as the Interhub Heterogeneous Fleet Routing Problem (IHFRP), to deal with the route design of intra-network for the fixed route carriers. In addition, we proposed a threshold-based meta-heuristic procedure, TA_IHFRP, to be capable of solving the IHFRP. The proposed TA_IHFRP procedure is composed of two-stage strategies and three executive modules in solving the IHFRP. In the first stage, the Initial Solution Construction (ISC) module adopts modified insertion heuristics to generate a feasible initial solution under the objective of minimizing used vehicle numbers. Then, in the second stage, the Neighborhood Search (NS) module and Threshold Accepting (TA) module are utilized to improve the route cost of previous initial solution. The NS module includes three heuristics: 1-0 inter-route O-D pair exchange, 1-1 inter-route O-D pair exchange, and route reduction. Moreover, we design a Route Reconstruction sub-procedure in the NS and TA modules to improve the efficiency of execution.
In order to identify the feasibility of TA_IHFRP, we created a set of 36 IHFRP instances, coded the computer program of the proposed TA_IHFRP in Visual C# 2005 and conducted the computational tests on a Core(TM)2 Due PC. Experimental results indicated that the proposed TA_IHFRP is an efficient and effective method to solve the IHFRP. Furthermore, the IHFRP model also provides a considerable way to reduce the operational cost of the fixed-route carriers.

關鍵字：Fixed-route trucking Carrier, Intra-network, Heterogeneous Fleet, Vehicle Routing, Meta-heuristic Method