A Simulated Annealing Based Algorithm for the Hub Location Problem

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ABSTRACT

The location of hub facilities is fundamental to the design of a “ hub-and-spoke network ”, as it greatly affects the total transportation costs of system. Hub is a special type of facility, which is designed to act as switching point for internal flows of a network. The problem is to determine the optimal location for the hubs and the assignments of the nonhubs to hubs that minimizes the overall transportation cost. Due to its characteristics of NP-Complete, it is difficult to obtain optimal solution within an acceptable amount of time. In this study we consider both single and multiple allocation hub location problems. A hybrid heuristic algorithm based on the SAHUB, combining with simulated annealing(SA) and Tabu list, is developed. During the research, the parameters used in the heuristics that affect the solution quality and efficiency are analyzed and designed with a good parameter setting suggested. The SAHUBR algorithm presented in this study compares favorably with the computational results obtained from the literature. Experimental results indicate that SAHUBR is capable of obtaining good solutions in a very small amount of time.

Keywords : Hub locationproblem

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