Session "Topics in Combinatorial Optimization" invited by Paolo Toth

Solving Multi-Objective Hub Location Problems by Hybrid Algorithms[†]

Enrique Domínguez*
Department of Computer Science, University of Málaga, enriqued@lcc.uma.es

Miguel A. Domínguez
Department of Computer Science, University of Málaga,
miguel.angel.dominguez.rios@gmail.com

Francisco Chicano
Department of Computer Science, University of Málaga, chicano@lcc.uma.es

Ana B. Ruiz
Deparment of Applied Economics (Mathematics), University of Málaga, abruiz@uma.es

Abstract In many logistic, telecommunications and computer networks, direct routing of commodities between any origin and destination is not viable due to economic and technological constraints. In that cases, a network with centralized units, known as hub facilities, and a small number of links is commonly used to connect any origin-destination pair. The purpose of these hub facilities is to consolidate, sort and transship efficiently any commodity in the network. Hub location problems (HLPs) consider the design of these networks by locating a set of hub facilities, establishing an interhub subnet, and routing the commodities through the network while optimizing some objective(s) based on the cost or service. Hub location has evolved into a rich research area, where a huge number of papers have been published since the seminal work of O'Kelly [1]. Early works were focused on analogue facility location problems, considering some assumptions to simplify network design. Recent works [2] have studied more complex models that relax some of these assumptions and incorporate additional real-life features. In most HLPs considered in the literature, the input parameters are assumed to be known and deterministic. However, in practice, this assumption is unrealistic since there is a high uncertainty on relevant parameters, such as costs, demands or even distances. In this work, we will study the multi-objective hub location problems with uncertainty.

Keywords: *hub location, hybrid algorithms, combinatorial optimization*

References

[1] O'Kelly, M. E., *The location of interacting hub facilities*, Transportation Science **20 (2)** (1986), 92–106.

[2] Farahani, R. Z., Hekmatfar, M., Arabani, A. B., and E. Nikbakhsh, *Hub location problems: A review of models, classification, solution techniques, and applications*, Computers and Industrial Engineering **64(4)** (2013), 1096–1109.

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