

The Hong Kong Polytechnic University
Department of Logistics and Maritime Studies
Research Seminar

New Models and Solution Methods for Service Network Design: A Preliminary Study

by

Ms Shengnan SHU
PhD Student
Department of Logistics and Maritime Studies
The Hong Kong Polytechnic University

Date: 27 August 2019 (Tuesday)
Time: 10:00am - 11:00am
Venue: R401, Shirley Chan Building
The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

In this talk, we present our preliminary study on new models and solution methods for service network design. Our preliminary study focuses on how to optimize the design of service network design for transporting cargos of multiple commodities with the commodity holding cost taken into account. Unlike the models and methods known in the literature, which assume that the planning time horizon is discretized into a finite number of time units, we aim to tackle the problem on a continuous planning time horizon, so as to avoid any approximation errors caused by the discretization. In our study, we show that it is critical to take into account the commodity holding cost, as otherwise, there can be a significant loss in cost. To solve the problem, we develop a dynamic discretization discovery algorithm which iteratively refines a partial time-expanded network, where each partial time-expanded network can be used to derive a relaxation as well as a feasible solution of the problem. Due to the introduction of the commodity holding cost, we need to develop some new sophisticated techniques for deriving the relaxation and for refining the partial time-expanded networks. Our numerical experiments show that the newly proposed solution method is effective in solving even large sized instances of the problem, and can help the carriers to save about 4%, on average, of the total cost, compared with solutions obtained by other benchmark methods. Our preliminary study has also laid a solid foundation for the future study.

Bio:

Ms. Shu Shengnan received both her bachelor degree in Information Management and Information System, and her master degree in Management Science and Engineering from Huazhong University of Science and Technology. She is currently pursuing her PhD under the supervision of Professor Zhou XU in Hong Kong Polytechnic University.

Please email to anne-ly.wong@polyu.edu.hk for enquiries.

All are welcome!