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

Managing Navigation Channel Traffic and Anchorage Area Utilization of a Container Port

by

Mr Shuai JIA
PhD Student
Department of Logistics and Maritime Studies
The Hong Kong Polytechnic University

Date: 24 May 2018 (Thursday)
Time: 10:30am-11:30am
Venue: R501, Shirley Chan Building
The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

Navigation channels are fairways for vessels to travel in and out of the terminal basin of a container port. The capacity of a navigation channel is restricted by the number of traffic lanes and safety clearance of vessels, and the availability of a navigation channel is usually affected by tides. The limited capacity and availability of a navigation channel can lead to congestion in the terminal basin. When the navigation channels run out of capacity, the anchorage areas in the terminal basin can serve as a buffer. This paper aims to develop a mathematical model which simultaneously optimizes the navigation channel traffic and anchorage area utilization. We provide a mixed integer programming formulation of the problem, analyze its complexity, and propose a Lagrangian relaxation heuristic in which the relaxed problem is decomposable into two asymmetric assignment problems. Computational performance of the Lagrangian relaxation heuristic is tested on problem instances generated based on the operational data of a port in Shanghai. Computational results show that the proposed heuristic is able to achieve satisfactory performance within reasonable computation time.

Bio:

JIA Shuai is a PhD student at the Department of Logistics and Maritime Studies of The Hong Kong Polytechnic University. He obtained a master's degree from Shanghai Maritime University. Prior to commencing his PhD study, he worked for Shanghai International Port (Group) Co., Ltd. for three years as a software engineer. His research interests include port operations management, maritime logistics management, and integer programming. He is currently pursuing a PhD degree under the supervision of Prof. LI Chung-Lun and Dr. XU Zhou.

Please email to winnie.wy.tang@polyu.edu.hk for enquiries.

All are welcome!