

The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics
and Operations Management

Seminar Announcement

Performance guarantees of the long chain design in resource allocation

Ms Xuan Wang
Stern School of Business
New York University

Date : 29 December 2015 (Tuesday)
Time : 11:00 - 12:15 pm
Venue : Room 3003, LSK Business Building



Abstract: We consider a class of resource allocation problems in which there are n types of capacitated resources and n demand types. The resources are flexible, where type j resource can be used to fulfill demand class j and $j+1$. This is known as the long chain design proposed by Jordan and Graves (1995), which has been an important concept in the design of sparse flexible processes. In this talk, we discuss the theoretical performance of the long chain in two different settings.

In the first setting, the demand arrives sequentially and reveals its type upon arrival, and the resource allocation decisions must be made in real time. We show that the long chain is very effective under the proposed proportional greedy online allocation policy. In particular, we show that the expected total number of lost sales only depends on the number of resource types n , and is independent of how large the market size is.

In the second setting, the resource allocation decisions are made after all the demand has realized. We obtain a distribution-free bound on the ratio of the expected sales of the long chain relative to that of full flexibility. In a special case with *i.i.d.* demand and uniform capacity, we are able to derive the bound in closed form. Our bound depends only on the mean and standard deviation of the random demand, but compares very well with the ratio that uses complete information of the demand distribution.

Bio: Xuan Wang is a fifth year doctoral candidate in the Operations Management group at Stern School of Business, New York University. Xuan's primary research interest lies in the field of supply chain management, optimization and business analytics. Prior to joining Stern, Xuan received her Bachelor's degree in industrial engineering and operations research from Tsinghua University in 2011. During her junior year, Xuan also spent one semester in the H. Milton Stewart School of Industrial & Systems Engineering at Georgia Institute of Technology as an exchange student.