The Hong Kong University of Science and Technology
Dept of Information Systems, Business Statistics and Operations Management

Frontiers in Operations Management Workshop

Capacity Optimization and Resource Allocation under Service Level Constraints
by
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Date : **3 December 2021 (Friday)**
Time : **4:00 - 4:30 PM**
Venue : **Room G012, LSK Business Building, HKUST**

Abstract: Service level requirement is an important measure of service quality in the real-life business. A big challenge for the companies is to appropriately harness the resources to meet their target service levels for customers. Companies gain competitive advantages by optimizing (1) the capacity level of pooled resources in anticipation of random demand of multiple customers and (2) the capacity allocation to fulfill customer demands after demand realization.

We present a general framework to study this two-stage resource allocation problem when customers require individual and possibly different service levels. Our modeling framework generalizes and unifies many existing models in the literature. We propose a simple randomized rationing policy for any fixed feasible capacity level. Our main result is the optimality of this Max-Weighted-Service policy for very general service-level constraints, including Type-I and Type-II constraints and beyond. The result follows from a semi-infinite linear programming formulation of the problem and its dual. We also prove the optimality of priority policies for a large class of problems when the set of feasible fulfilled demands is a polymatroid. Moreover, with a slight change in one step of the Max-Weighted-Service policy, it is also optimal when there is differentiated allocation cost from resources to demands. This is based on joint work with Jiashuo Jiang and Jiawei Zhang from NYU stern.

Bio: Dr Shixin Wang is an Assistant Professor in the Department of Decision Sciences and Managerial Economics at The Chinese University of Hong Kong (CUHK) Business School. Before joining CUHK, she obtained her doctoral degree in Operations Management from NYU Stern School of Business. Her research interests are robust optimization and online optimization with their applications in mechanism design, resource allocation, and process flexibility.

All interested are welcome!
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