

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



**Managing Hybrid Manufacturing/Remanufacturing
Inventory Systems with Random Production Capacities**
by
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Date : **2 December 2022 (Friday)**
Time : **10:15 – 11:00 AM**
Venue : **Room G012, LSK Business Building, HKUST**



Abstract:

In this paper, we study hybrid manufacturing/remanufacturing inventory systems that produce a single product to satisfy random demands over a finite planning horizon. In each period, the firm receives random demand and random product returns. A serviceable product can be manufactured from raw materials or remanufactured from a returned product. Both operations face random capacities modeled as positively dependent random variables. The firm's objective is to minimize the expected total discounted cost over the planning horizon. We partially characterize the firm's optimal policy for the general model and completely characterize it for the models with deterministic manufacturing or remanufacturing capacity, by two increasing functions with slopes at most one. For the special case with unlimited manufacturing capacity, we further characterize the optimal policy and obtain additional insights. In particular, we connect this model with an auxiliary dual-sourcing inventory model and show that they have the same optimal policy under certain conditions. Finally, we conduct a numerical study to derive further insights into the effects of random capacities. Among others, we find that ignoring randomness of the manufacturing capacity often incurs significant cost to the firm while the cost of ignoring capacity correlation is negligible.

This is joint work with Suting Liu.

Bio:

Prof Xiting Gong is an Associate Professor in the Department of Decision Sciences and Managerial Economics at The Chinese University of Hong Kong (CUHK) Business School. Prior to joining CUHK, he was a postdoctoral research fellow at The University of Michigan, Ann Arbor. He received a bachelor's degree in Applied Mathematics and master's and PhD degrees in Management Science, all from Peking University. His research interests include operations management, stochastic inventory theory and applications, revenue management and pricing, and approximation and data-driven algorithms. He has published over ten research articles in top-tier academic journals in his field such as *Management Science*, *Operations Research*, and *Production and Operations Management*. His research has been funded by multiple ECS/GRF grants, CUHK direct allocation grants, and an industry grant. He is an associate editor for *Naval Research Logistics and Operations Research Letters*.

All interested are welcome!
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