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

Inventory Control Driven by Demand Delta: Optimality and Computation of Base Stocks

by

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Date: 23 May 2019 (Thursday)
Time: 10:30am - 11:30am
Venue: R501, Shirley Chan Building
The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

We study an infinite-horizon problem of inventory control when the demand depends on an unknown parameter. We begin with a prior distribution of the parameter and update this belief by observing demands over time. We develop a general dynamic programming theory involving infinite-dimensional functional equations, and show that the optimal policy is a base stock policy with the base stock dependent on the current belief. We develop a computational algorithm, prove that it converges, and apply it to two special cases. In one case, we use the symbolic toolbox in Matlab to obtain the base stock explicitly. In the other case of conjugate probabilities, we show that the infinite-dimensional problem reduces to a finite-dimensional one expressed in term of the vector of sufficient statistics. Moreover, our methodology can be extended to inventory problems including those with lost sales and with a fixed ordering cost.

Bio:

Prof. Suresh P. Sethi is Eugene McDermott Professor of Operations Management and Director of the Center for Intelligent Supply Networks at The University of Texas at Dallas. He has written 10 books and published over 400 research papers in the fields of manufacturing and operations management, finance and economics, marketing, and optimization theory. He teaches a course on optimal control theory/applications and organizes a seminar series on operations management topics. He initiated and developed the doctoral programs in operations management at both University of Texas at Dallas and University of Toronto. He serves on the editorial boards of several journals including *Production and Operations Management* and *SIAM Journal on Control and Optimization*. He was named a Fellow of The Royal Society of Canada in 1994. Two conferences were organized and two books edited in his honor in 2005-6. Other honors include: IEEE Fellow (2001), INFORMS Fellow (2003), AAAS Fellow (2003), POMS Fellow (2005), IITB Distinguished Alum (2008), SIAM Fellow (2009), POMS President (2012), INFORMS Fellows Selection Committee (2014-16), Alumni Achievement Award, Tepper School of Business, Carnegie Mellon University (2015).

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All are welcome!