

Transportation Center Seminar Series presents.....

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Sequential Resource Allocation for Nonprofit Operations

Thursday, May 29, 2008

4:00 – 5:00 pm

Refreshments available at 3:30 pm

The Transportation Center

Chambers Hall

Lower Level Conference Center

600 Foster, Evanston

Abstract

Our work is on a sequential resource allocation problem motivated by distribution operations of a nonprofit organization. The alternate objectives that arise in nonprofit, as opposed to commercial, operations lead to new variations on traditional problems in operations research and inventory management. Specifically, we consider the problem of distributing a scarce resource to meet sequentially observed customer demand. In a commercial setting, the amount distributed to each customer is determined to maximize profit; however, this objective may lead to inequitable distributions among customers. Our work, in a nonprofit setting, solves the sequential resource allocation problem with an objective function aimed at equity and sustainability. We define service in terms of fill rate, the ratio of the distribution amount to demand, and develop an objective function to maximize the minimum fill rate among customers. Through a dynamic programming framework, we characterize the structure of the optimal allocation policy for a given sequence of customers. In addition, we address the problem of customer visitation sequence by identifying properties to consider in making sequencing decisions to optimize the objective. For both inventory distribution and customer sequencing decisions, we develop heuristic methods which yield near-optimal solutions.

Biography

Robert Lien is a PhD Candidate in the Department of Industrial Engineering at the Northwestern University McCormick School of Engineering. He holds a BS in Operations Research & Industrial Engineering from Cornell University, as well as a Master of Engineering in Applied Research from Cornell. He is a current Transportation Center Dissertation Year Fellow.