Industrial and Systems Engineering Seminar

Optimal Merchandise Testing with Limited Inventory

Wednesday, December 2

3:15 PM – Refreshments before the Seminar

3:30 PM – Graduate Seminar

Mechanical Engineering Room 4125 A & B

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The practice of "merchandise testing" refers to the deployment of fashion products to stores in limited quantities so that a retailer may learn about demand prior to the main selling season. We consider the optimal allocation of inventory to stores in a merchandise test, focusing on the tradeoff between the quantity of stores tested and the quality of observations, which can be impacted by demand censoring due to inventory stockouts. We find that the visibility into the timing of each sales transaction has a pivotal impact on the optimal allocation decisions. When such timing information is unobservable, the retailer may need to consolidate inventory in few stores to increase service levels during the test and thereby to minimize the negative impacts of demand censoring. When sales timing information is observable, the retailer is better off maximizing the number of sales during the test period without regard to stockouts in individual stores. Motivated by our analysis, we propose two heuristic allocation policies for the cases with and without sales timing information, respectively. A numerical study shows the heuristics to be near optimal for instances for which we can compare them to the optimal solution. On the other hand, ineffeicient inventory allocations can considerably reduce the value of the merchandise test.

BIO: Adam J. Mersereau is Sarah Graham Kenan Scholar and associate professor at the University of North Carolina's Kenan-Flagler Business School. He previously served on the faculty of The University of Chicago Graduate School of Business. Dr. Mersereau earned his PhD in operations research from the Massachusetts Institute of Technology. Dr. Mersereau's research addresses problems in retail operations, inventory control, revenue management, and supply chain management. He is particularly interested in dynamic optimization problems involving parameter uncertainty and learning. He has published in *Operations Research*, *Manufacturing and Service Operations Management*, *Management Science*, *IEEE Transactions on Automatic Control*, and *Production and Operations Management*. He and co-authors received the 2009 M&SOM Best Paper Award for the paper "Retail Inventory Management When Records Are Inaccurate." Dr. Mersereau teaches operations management, statistics, decision modeling, and analytics at UNC Kenan-Flagler. In 2011, he received the Weatherspoon Award for excellence in MBA teaching at Kenan-Flagler.