NORTH CAROLINA STATE UNIVERSITY

OPERATIONS RESEARCH PROGRAM
SEMINAR SERIES

February 19, 2024
4:30PM-5:45PM

In-Person: 4290 Fitts-Woolard Hall
Zoom details – bottom of page

Dr. Canan Ulu

Associate Professor,
McDonough School of Business at Georgetown University
canan.ulu@georgetown.edu

Title

Learning from Consideration Sets
Joint work with Bharadwaj Kadiyala and Dorothee Honhon

Abstract

Prior literature on consumer behavior suggests that consumers engage in a two-stage shopping behavior: in the first stage, they consider only a subset of the products offered for purchase (known as the consideration set) and in the second stage, they make a final purchase decision among the considered products based on their preferences. We model such purchase behavior using the Random Consideration Set (RCS) model (Manzini and Mariotti 2014). In this model, consumers consider each product independently with a given consideration probability. Motivated by environments in which consumers' consideration sets are observable (e.g., based on clickstream, home try-on programs, eye-tracking, and heatmap data sources), we consider how a decision maker should design product assortments to maximize profit while also learning about consumers' consideration probabilities over a finite time horizon. We show that the structure of the optimal assortment depends on two orders: the consumers' preference order and the product informativeness order, which we formalize using Blackwell sufficiency (Blackwell 1951). The optimal assortment has the well-known popular set characterization when the consumers' preference order and the product informativeness order are identical. Otherwise, the optimal assortment is popular within the set of products over which the two orders agree—a generalization of the popular set result. Based on our numerical experiments, we find that the decision maker's profit can increase by up to 2.62% by learning, and more than 50% of that benefit can be realized by learning from the consumers' consideration sets. The structural properties of the optimal assortment also reduce the search space for the optimal solution, leading to a reduction of up to 97.52% in the computational time compared to a complete enumeration benchmark.

Biography

Dr. Canan Ulu

Dr. Ulu is an associate professor at Georgetown University's McDonough School of Business. Previously, she was an assistant professor in McCombs School of Business at the University of Texas at Austin. She received her Ph.D. from Duke University and holds a B.S. and an M.S. degree in Industrial Engineering from Middle East Technical University, Ankara, Turkey. She teaches business analytics and decision modeling courses in Georgetown's graduate and undergraduate programs. Dr. Ulu is an associate editor for the decision analysis area at Operations Research and Manufacturing & Service Operations Management. Dr. Ulu studies Bayesian learning in sequential decision problems, multi-criteria decision-making problems and uses behavioral decision theory to improve decision analysis methods. Her work has been published in journals such as Operations Research, Management Science and Psychological Science among others.

Join via Zoom Meeting

Join Zoom Meeting
https://ncsu.zoom.us/j/97198402775?pwd=dGN3ZDdldm1obXNXMTEzUkJlcElLdz09

Meeting ID: 971 9840 2775
Passcode: 557407