

Data Science Seminar

Hosted by the Department of Mathematics and Statistics

- Date: Tuesday, October 28, 2025
- Time: 12:15pm - 1:15pm
- Room: Whitney Hall 100E
- Speaker: Dr. Yufeng Liu (University of Michigan)
- Title: Low-Rank Online Dynamic Assortment with Dual Contextual Information.

Abstract

In e-commerce, delivering real-time personalized recommendations from vast catalogs poses a critical challenge for retail platforms. Maximizing revenue requires careful consideration of both individual customer characteristics and available item features to optimize assortments over time. In this talk, we consider the dynamic assortment problem with dual contexts - user and item features. In high-dimensional scenarios, the quadratic growth in dimensionality complicates computation and estimation. To tackle this challenge, we introduce a new low-rank dynamic assortment model to transform this problem into a manageable scale. We then propose an efficient algorithm that estimates the intrinsic subspaces and uses an upper-confidence-bound (UCB) approach to address the exploration-exploitation trade-off in online decision-making. Some theoretical properties, as well as simulations and an application to Expedia's hotel recommendation, will be discussed. This talk is based on joint work with Seong Jin Lee at UNC-Chapel Hill and Will Wei Sun at Purdue University.

Biography of the speaker: Dr. Yufeng Liu is currently the John D. MacArthur Professor of Statistics in the Department of Statistics at the University of Michigan. Dr. Liu conducts research at the intersection of statistics, machine learning, optimization, and data science. His current research interests include statistical machine learning, high-dimensional data analysis, personalized medicine, bioinformatics, and e-commerce. Dr. Liu has served on the editorial boards of several statistics journals, including as Area Editor for the Annals of Applied Statistics and as Associate Editor for the Journal of the American Statistical Association and the Journal of the Royal Statistical Society: Series B. He received the CAREER Award from the National Science Foundation in 2008, the Ruth and Phillip Hettleman Prize for Artistic and Scholarly Achievement at UNC in 2010, and the inaugural Leo Breiman Junior Award in 2017. Dr. Liu is an elected Fellow of the American Statistical Association and the Institute of Mathematical Statistics (IMS) and an Elected Member of the International Statistical Institute.

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