

The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics  
and Operations Management

Dept of Industrial Engineering & Decision Analytics

Joint Seminar Announcement



## Dynamic Batch Learning in High-Dimensional Sparse Linear Contextual Bandits

by

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**Date** : **16 July 2021 (Friday)**  
**Time** : **9:00 - 10:05 AM**  
**Zoom ID** : **924 9031 1025 (passcode 813461)**



### **Abstract:**

We study the problem of dynamic batch learning in high-dimensional sparse linear contextual bandits, where a decision maker can only adapt decisions at a batch level. In particular, the decision maker, only observing rewards at the end of each batch, dynamically decides how many individuals to include in the next batch (at the current batch's end) and what personalized action-selection scheme to adopt within the batch. Such batch constraints are ubiquitous in a variety of practical contexts, including personalized product offerings in marketing and medical treatment selection in clinical trials. We characterize the fundamental learning limit in this problem via a novel lower bound analysis and provide a simple, exploration-free algorithm that uses the LASSO estimator, which achieves the minimax optimal performance characterized by the lower bound (up to log factors). To our best knowledge, our work provides the first inroad into a rigorous understanding of dynamic batch learning with high-dimensional covariates.

### **Bio:**

Dr Zhengyuan Zhou is currently an Assistant Professor in New York University Stern School of Business, Department of Technology, Operations and Statistics. Before joining NYU Stern, Dr Zhou spent the year 2019-2020 as a Goldstine research fellow at IBM research. He received his BA in Mathematics and BS in Electrical Engineering and Computer Sciences, both from UC Berkeley. Subsequently, Dr Zhou has received a Master's in Computer Science, a Master's in Statistics, a Master's in Economics and a PhD in Electrical Engineering, all from Stanford University in 2019. His research interests lie at the intersection of machine learning, stochastic optimization and game theory and focus on leveraging tools from those fields to develop methodological frameworks to solve data-driven decision-making problems.

All interested are welcome!

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