

THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Information Systems, Business Statistics and Operations Management

IS SEMINAR ANNOUNCEMENT



Reinforcement Learning for Sustainable Online Education

by

Mr. Chaofan ZHAI
University of Minnesota

DATE	3 November 2025 (Monday)
TIME	2:30 pm - 4:00 pm
VENUE	Hyflex Classroom (Room 2006), LSK Business Building

ABSTRACT

Online education offers unprecedented scalability and accessibility to learners worldwide, yet it continues to face challenges of low learning engagement and poor long-term knowledge retention. To address these issues, we introduce AI-Tutor, a reinforcement learning-based system designed to promote sustainable online education. Rather than optimizing solely for short-term learning gains, AI-Tutor balances the tension between learning engagement and learning progress, as well as the trade-off between knowledge expansion and knowledge consolidation over the long run—at the individual level—drawing inspiration from cognitive theories of memory and human learning.

Experiments on large-scale language learning data demonstrate that AI-Tutor consistently outperforms state-of-the-art baselines in engagement, knowledge retention, and overall learning outcomes. Analyses of learning trajectories further reveal how AI-Tutor personalizes its strategies for learners with diverse profiles, offering an adaptive and human-centered approach to online learning.

BIOGRAPHY

Chaofan Zhai is a Ph.D. Candidate in Information & Decision Sciences at the Carlson School of Management, University of Minnesota. He is a multiple award-winning doctoral student, recognized with honors including the WITS Best Dissertation Award, a Best Student Paper Nomination at the INFORMS Workshop on Data Science, the Teaching Award for Outstanding Ph.D. Student Instructor at the Carlson School, and several fellowships at both the school and department levels. He has also successfully secured multiple research grants from the Carlson School of Management and Google.

Chaofan's research focuses on AI-enabled decision-making from both algorithmic design and economic impact perspectives. His work uniquely integrates AI technical design methodologies with field experiment validation and real-world applications, bridging academic theory with industry practice.