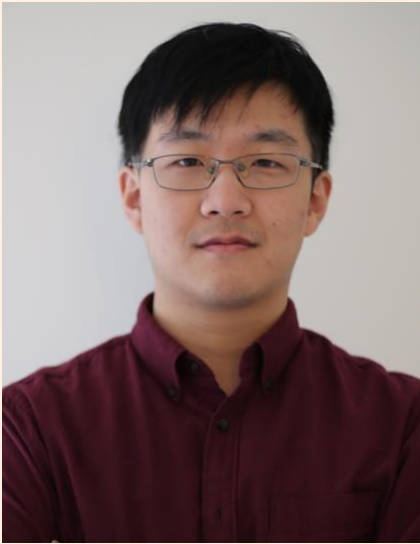# The Hong Kong University of Science and Technology
Dept of Information Systems, Business Statistics and Operations Management
Dept of Industrial Engineering & Decision Analytics
Joint Seminar Announcement

Bridging online and offline matching: Simulate-Optimize-Assign-Repeat (SOAR)
by
Prof Yilun Chen
The Chinese University of Hong Kong, Shenzhen

Date	:	**24 March 2023 (Friday)**
Time	:	**10:30 – 11:45 AM**
Venue	:	**Room 3005, LSK Business Building**

Abstract: We consider a feature-based dynamic matching problem faced by centralized platforms in a highly heterogeneous market. Specifically, a set of heterogeneous supply units, each characterized by i.i.d. supply feature vector, is available initially. In each period, a customer arrives with an i.i.d. demand weight vector describing her type, and requests to consume a supply unit. The platform seeks a dynamic matching policy that assigns supply units to customers to maximize the expected average matching utility. We propose and analyze a simple, simulation-based matching policy, dubbed Simulate-Optimize-Assign-Repeat (SOAR). We prove that SOAR enjoys a surprisingly universal (near) optimality guarantee. Indeed, it achieves the optimal regret scaling under various assumptions on the demand and supply distributions and for different matching utility functions. Our result is premised on a novel expansion representation of the expected matching utility under SOAR, which may be of wider applicability and independent interest. Extensive numerical simulations support the robustness of the performance of SOAR.

Bio: Prof Yilun Chen is an Assistant Professor in the School of Data Science at The Chinese University of Hong Kong, Shenzhen. He received his bachelor's degree in mathematics from Peking University in 2014 and a Ph.D. degree in Operations Research from Cornell University in 2021. Professor Chen's research interest lies in applied probability, with a focus on designing efficient, provably optimal and scalable sequential decision-making algorithms in various OR/OM contexts.

All interested are welcome!
Enquiries: Dept of ISOM