



Department of Data Science

香港城市大學
City University of Hong Kong

DS SEMINAR

Algorithmics of Stochastic Principal-Agency

Date: 1 April 2025 (Tuesday)

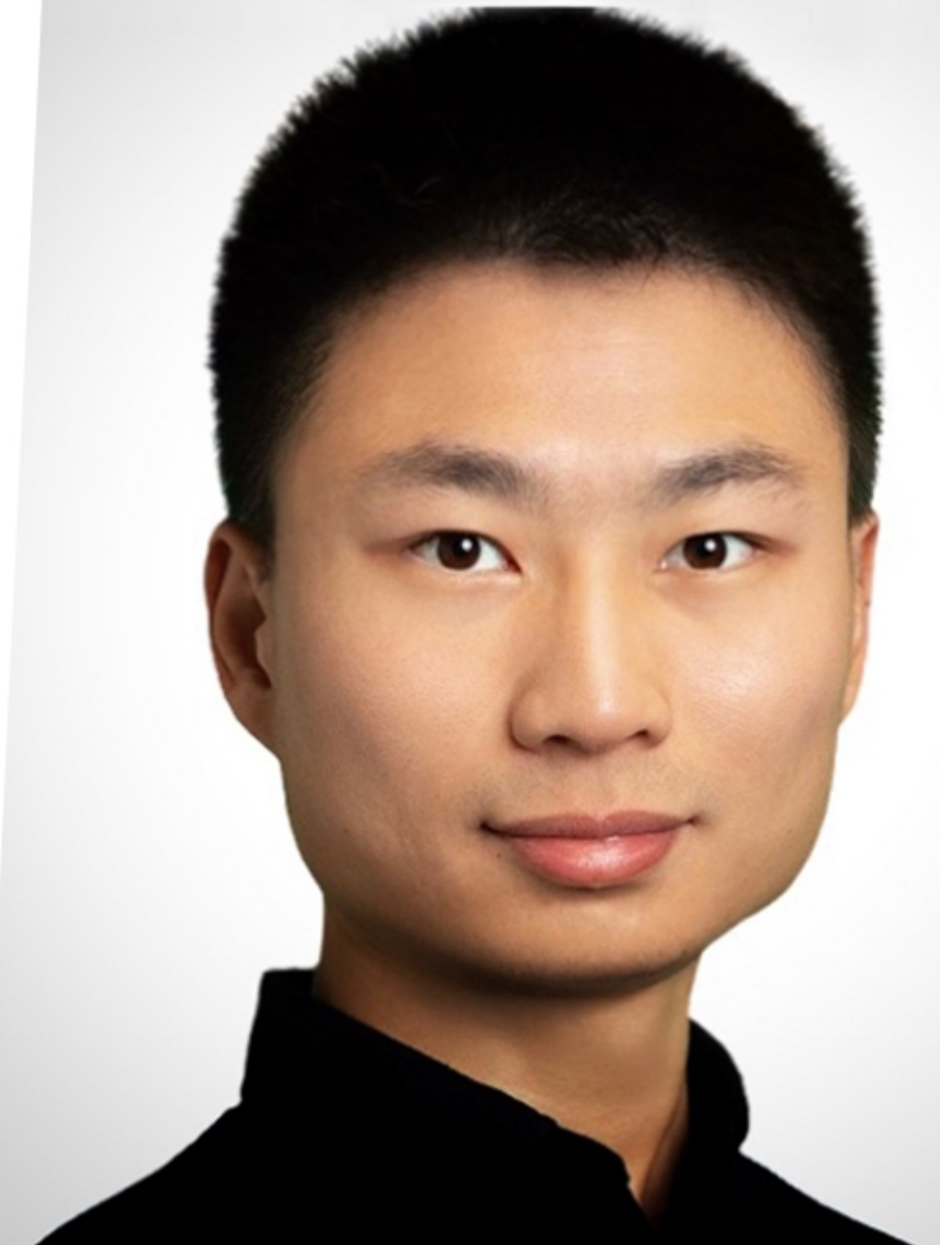
Time: 9:30am - 10:30am

Seminar Link: <https://cityu.zoom.us/j/85203867134>



ABSTRACT

How can we steer self-interested autonomous agents toward desirable equilibria in multi-agent systems? This question, long central to the field, has become ever more pressing due to the rise of today's intelligent agents and agentic technologies. We approach this challenge from a principal-agent perspective, focusing on stochastic environments where a coordinator (the principal) aims to align the actions of independent players (agents). In this talk, I will introduce a formulation of stochastic principal-agent problems and present our recent algorithmic results for computing the principal's optimal coordination policies. At the core of our approach lies a value-set iteration method, which enables efficient computing of optimal history-dependent policies. This reveals a surprising fact: such policies not only yield strictly higher utility than stationary policies but are also computationally more amenable, despite the representational challenges caused by the exponential growth of possible history trajectories. Our findings have direct implications for related fields, including stochastic/Markov games as well as multi-agent learning.



Prof. Jiarui GAN

GUEST SPEAKER'S PROFILE

Prof. Jiarui GAN is a Departmental Lecturer at the Computer Science Department, University of Oxford, working in the Artificial Intelligence & Machine Learning research theme. Before this, he was a postdoctoral researcher at Max Planck Institute for Software Systems, and he obtained his PhD from Oxford. Jiarui is broadly interested in algorithmic problems in game theory. His current focus is on sequential principal-agent interactions in stochastic environments. His recent work has been selected for an Outstanding Paper Honorable Mention at the AAI'22 conference.

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All are welcome