THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF APPLIED MATHEMATICS
應 用 數 學 系

## Department of Applied Mathematics Seminar

# Professor Zhiping CHEN

Xi'an Jiaotong University

**Topic**

AC Reinforcement Learning Algorithms for Mean Field Games in Continuous Time, State and Action Spaces

**Date| Time**

9 June 2025 (Monday) | 10:30 – 11:30 (HK Time)

**Venue**

Y301

**Abstract:**

We investigate mean field games in continuous time, state and action spaces with an infinite number of agents, where each agent aims to maximize its expected cumulative reward. Using the technique of randomized policies, we show policy evaluation and policy gradient are equivalent to the martingale conditions of a process by focusing on a representative agent. Then combined with fictitious game, we propose online and offline actor-critic (AC) algorithms for solving continuous mean field games that update the value function and policy alternatively under the given population state distribution. We demonstrate through numerical experiments the practicality of proposed algorithms.

**ALL ARE WELCOME**