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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

Dept of Industrial Engineering & Decision Analytics

JOINT SPECIAL COLLOQUIUM

Partially Observed Indefinite LQ Mean-Field Game and Optimal Control

By

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Shandong University

Abstract

We investigate a partially observed indefinite linear-quadratic mean field game with common noise, incorporating both state-average and control-average effects. It is noteworthy that the weighting matrices in the cost functional are allowed to be indefinite. By employing the backward separation approach, we derive the optimal decentralized strategies using the Hamiltonian approach and establish the well-posedness of the resulting Hamiltonian system by employing a relaxed compensator. The associated consistency condition and the feedback representation of decentralized strategies are also established, and we demonstrate that the set of decentralized strategies forms an ε-Nash equilibrium. We also investigate mean-field linear–quadratic optimal control problem in the indefinite case with partial information. We derive the optimal control from a Hamiltonian system without requiring a monotonicity condition. The feedback representation of optimal control is provided by the indefinite Riccati equations. The talk is based on the joint work with Dr. Tian Chen, Prof. Guangchen Wang, Prof. Zhen Wu and Mr. Weiye Wu.

Bio: Professor Tianyang Nie is a Professor and Vice Dean of the School of Mathematics at Shandong University. He has conducted research on stochastic analysis and control theory of forward-backward stochastic systems as well as their application in contract pricing problems in nonlinear markets. He was awarded a Chang Jiang Scholars Distinguished Professor in 2024 and has published more than 30 papers in journals including SIAM J. Control Optim., Math. Finance, Finance Stoch. and Math. Oper. Res..

Date : 12 November 2026 (Thursday)
Time : 3:00p.m.-4:00p.m.
Venue : Room 4579 (near lift 27/28)

All Are Welcome!