



**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Seminar Series

Linear Quadratic Mean Field Stackelberg Games: Open-loop and Feedback Solutions

By

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Abstract

This paper investigates open-loop and feedback solutions of linear quadratic mean field games with a leader and a large number of followers. The leader first gives its strategy and then all the followers cooperate to optimize the social cost as the sum of their costs. By variational analysis with mean field approximations, we obtain a set of (strict) open-loop controls of players in terms of solutions to mean field FBSDEs, which is further shown to be an asymptotic Stackelberg equilibrium. By applying the matrix maximum principle, a set of decentralized feedback strategies is constructed for all the players. For open-loop and feedback solutions, the corresponding optimal costs of all players are explicitly given by virtue of the solutions to two Riccati equations, respectively. The performances under two solutions are compared by the numerical simulation.



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Date: 27 October 2022 (Thursday)

Time: 20:00-20:45 (Hong Kong Standard Time GMT +8)

Venue: Online Talk via Zoom (Meeting ID: 926 3306 0572)

Speaker: Prof. Bingchang Wang, Shandong University

Host: Dr. James Huang, The Hong Kong Polytechnic University

Click to join:

<https://polyu.zoom.us/j/92633060572?pwd=cmFUWGtsQU5UQ0RVYWxocU53TnVvZz09>

***** ALL ARE WELCOME *****

For enrolment, please send your name and email to wai-yan.moon@polyu.edu.hk on or before 26 October 2022