Hong Kong Consortium of Quantitative Finance









Centre for Quantitative Finance Faculty of Science

Hong Kong - Singapore joint Seminar Series in Financial Mathematics/Engineering

Linear quadratic mean field games and their asymptotic solvability

Professor Minyi Huang Carleton University, Canada

Abstract

We consider linear quadratic (LQ) mean field games (MFGs) and study their asymptotic solvability problems. Roughly, we attempt to answer these questions: When does a sequence of games, with increasing populations, have "well behaved" centralized solutions? And how to characterize a necessary and sufficient condition for such nice solution behaviors. We start with a model of homogeneous agents and develop a re-scaling technique for analysis. An important issue in MFGs is the performance of the obtained decentralized strategies in an N-player model, and one usually can obtain an $O(N^{-1/2})$ -Nash equilibrium. By our approach we can improve the estimate from $O(N^{-1/2})$ to the tightest bound O(1/N).

We will further generalize to a major player model and clarify the relation of different solutions existing in the literature. Finally, this asymptotic solvability formulation can be extended to mean field social optimization.

About the speaker

Minyi Huang received his Ph.D. from McGill University, Montreal, Canada, in 2003. He joined Carleton University, Ottawa, Canada, in 2007, where he is a Professor in the School of Mathematics and Statistics. His research interests include mean field games, mean field control, and applied probability.

Date

11 Feb 2022(Friday) (HK Time)

Time

10:00am – 11:00am (HK Time)

Zoom

https://cityu.zoom.us/j/97 232939340?pwd=VU9mN VVNZUNVZDc3NIIUTIdP N1hNUT09 Meeting ID: 972 3293 9340 Passcode: 151920