

MATHEMATICS COLLOQUIUM

Linear convergence of fictitious play for non-potential mean-field games

A mean-field game (MFG) is a coupled system of a Hamilton-Jacobi-Bellman equation and a Fokker-Planck equation. It has broad applications in economics, social sciences, and more recently in generative models. However, the coupled structure poses significant challenges for solving MFGs. Fictitious play is an efficient algorithm that decouples and solves the system. Nevertheless, the convergence mechanism of this algorithm is not well understood, especially for non-potential MFGs. In this talk, we reformulate the algorithm as a combination of a best-reply mapping and a weighted average. We examine the stability of the best-reply mapping and, based on this stability, we establish the first convergence rate estimate for fictitious play in non-potential MFGs. This is a joint work with Jiajia Yu, Xiuyuan Cheng and Hongkai Zhao.

THURSDAY

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4:30 - 5:30PM
LECONTE COLLEGE
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