Department of Mathematics Colloquium

Learning Mean Field Games

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Abstract: In this talk, we give a general introduction to mean-field games from a learning perspective, focusing on how large populations of interacting agents can make decisions and learn effective strategies over time. We consider discrete-time models with uncertainty and nonlinear dynamics, under discounted performance criteria.
We introduce a mean-field equilibrium (MFE) operator, whose fixed point represents the collective behavior of an infinite population, and show that it has a contraction property that makes the problem well-posed and tractable. Building on this, we propose a learning algorithm that approximates this equilibrium using random sampling, and we discuss its accuracy. Finally, we explain how the learned solution for the infinite-population model provides a good approximation to Nash equilibria in large but finite systems.

Date: Wednesday, April 29, 2026
Time: 15:40
Place: Mathematics Seminar Room, SA-141

Light refreshments will be served prior to the seminar.