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Applied Math and Numerical Analysis Seminar

Two-Scale Mean-Field Gradient Descent Ascent finds Mixed Nash Equilibria of Continuous Games

by

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Abstract :

Finding the mixed Nash equilibria (MNE) of a two-player zero sum continuous game is an important and challenging problem in machine learning. A canonical algorithm to finding the MNE is the (noisy) gradient descent ascent (GDA) method. In this talk, we will discuss the infinite particle limit of the GDA dynamics and its convergence properties. Specifically, we show that for each finite temperature (or regularization parameter), the two-scale Mean-Field GDA with a suitable finite scale ratio converges exponentially to the unique MNE without assuming the convexity or concavity of the interaction potential. We further study the simulated annealing of the Mean-Field GDA dynamics. We show that with a temperature schedule that decays logarithmically in time the annealed Mean-Field GDA converges to the MNE of the original unregularized objective.

Date :	May 18, 2023 (Thursday)
Time :	10:00am – 11:00am (Hong Kong SAR)
Zoom link:	https://cuhk.zoom.us/j/9792985952
Meeting ID:	9792985952
Passcode:	202266

All are Welcome