
Multilevel Monte Carlo for McKean-Vlasov SDEs

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Abstract

Stochastic Interacting Particle System (SIPS) and their limiting stochastic McKean-Vlasov equations offer a very rich and versatile modelling framework. On one hand interactions allow us to capture complex dependent structure, on the other provide a great challenge for Monte Carlo simulations. The non-linear dependence of the approximation bias on the statistical error makes classical variance reduction techniques fail in this setting. In this talk, we will devise a strategy that will allow us to overcome this difficulty. In particular, we will establish Multilevel Monte Carlo estimator for SIPS and demonstrate its computational superiority over standard Monte Carlo techniques.

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