Kavita Ramanan, Brown University, USA

September 14 @ 4:30 pm - 5:30 pm UTC+0

Title: “Asymptotics of empirical measures of interacting particle systems on sparse graphs”

Abstract: We consider large systems of interacting particles in which the infinitesimal evolution of each particle depends on its own state as well as the (histories of) states of neighboring particles, as described by an underlying sparse (possibly random) interaction graph. Such systems model applications in a variety of fields, including statistical physics, neuroscience and engineering. Under broad conditions, we show that when the sequence of graphs converges in a suitable sense to a limit graph, the corresponding sequence of empirical measures also converges weakly to a deterministic limit. We also provide counterexamples to show when this convergence could fail. The proof techniques are quite different for the case of diffusive dynamics and pure jump process, and these results can be seen to complement classical mean-field limit theorems which hold when the underlying graphs are sufficiently dense.

This is based on various joint works with A. Ganguly, D. Lacker and R. Wu.