

Ignacio Madrid (Institute of Industrial Science, The University of Tokyo): Long-time behaviour of a measure-valued branching process with state-dependent reinforcement

Abstract:

In this talk I will introduce a stochastic multi-type population model, where the individuals can adapt their strategy (i.e., the Markov kernel giving the probability to produce a certain number of different types) using the empirical distribution of their ancestral states through a reinforcement mechanism.

We are interested in the effect of reinforcement and selection on the long-time behaviour of the population process. I will discuss a variational description of the population growth rate based on a "many-to-one" change of measure, reducing population-level quantities to expectations under a single particle evolving under tilted dynamics. I will show that the population-level distribution of strategies concentrates around an optimal policy which we can characterize via a variational principle.