Ergodic optimization and prevalence

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Abstract:
Given a dynamical system and a potential function, we look for the maximizing measures, i.e., the invariant probability measures that maximize the integral of the potential. It is a general belief that if the dynamics is sufficiently hyperbolic then the ``majority'' of (sufficiently regular) potentials has a unique maximizing measure, which is supported on a periodic orbit. Indeed, Contreras (ArXiv 2013) obtained an important result in this direction, where ``majority'' is meant in a topological sense (open and dense set). I will talk about a result of this kind, obtained jointly with Yiwei Zhang (PUC-Chile), in which we use a probabilistic sense of ``majority'', namely the concept of prevalence as introduced by Hunt, Sauer, and Yorke. Our potentials have a very strong modulus of continuity (so forming a smaller space than Contreras'), which allows us to attack the problem using finite-dimensional approximations.