

Mean-field particle systems and applications to current large deviations.

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Dynamic rare events of additive observables in Markov processes can often be cast in terms of Feynman-Kac semigroups generated by a tilted version of the original generator. The McKean interpretation of those semigroups leads to a non-linear Markov process, which is numerically accessible by Monte Carlo sampling via particle filters, an ensemble of processes evolving in parallel and interacting in a mean-field fashion. I will discuss general rigorous convergence results for modified versions of such particle filters, which have recently been used in the theoretical physics literature under the name of ‘cloning algorithms’. In a second part I will also mention applications of this method to current large deviations in stochastic lattice gases.

This is joint work with Letizia Angeli, Adam Johansen and Andrea Pizzoferrato.