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“On a Mean-Field Stochastic Target Problem”

Abstract: We consider the stochastic target problem of finding the collection of initial laws of a mean-field stochastic differential equation such that we can control its evolution to ensure that it reaches a prescribed set of terminal probability distributions, at a fixed time horizon. We establish a version of the geometric dynamic programming principle for the associated reachability sets and the corresponding value function which provides a characterization of the initial masses that can be almost-surely transported towards a given target, along the paths of a stochastic differential equation.