

Dynamical Systems in the Wasserstein Space and Their L^2 Representation

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Several optimal control problems in the Euclidean space, like systems with uncertainty, control of flock dynamics, or control of multiagent systems, can be naturally formulated in the space of probability measures on the Euclidean space. This leads to the study of dynamics and viscosity solutions to the Hamilton-Jacobi-Bellman equation satisfied by the value functions of those control problems, both stated in the Wasserstein space of probability measures. Since this space can be also viewed as the set of the laws of random variables in a suitable L^2 space, in this talk we aim to study such control systems in the Wasserstein space and to investigate the relations between dynamical systems in Wasserstein space and their representations by dynamical systems in L^2 , both from the points of view of trajectories and of (first order) Hamilton-Jacobi-Bellman equations.

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