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Infinite dimensional optimal control differential systems with randomness and path-dependence

This talk is devoted to the stochastic optimal control problem of infinite-dimensional differential systems allowing for both path-dependence and measurable randomness. As opposed to the deterministic path-dependent cases studied by Bayraktar and Keller [J. Funct. Anal. 275 (2018), 2096–2161], the value function turns out to be a random field on the path space and it is characterized by a stochastic path-dependent Hamilton-Jacobi (SPHJ) equation. A notion of viscosity solution is proposed and the value function is proved to be the unique viscosity solution to the associated SPHJ equation.