

Necessary conditions for optimality in relaxed stochastic control problems

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Abstract :

In this paper, we are concerned with optimal control problems where the system is driven by a stochastic differential equation of the Ito type. We study the relaxed model for which an optimal solution exists. This is an extension of the initial control problem, where admissible controls are measure valued processes. Using Ekeland's variational principle and some stability properties of the corresponding state equation and adjoint processes, we establish necessary conditions for optimality satisfied by an optimal relaxed control. This is the first version of the stochastic maximum principle that covers relaxed controls.

Keywords :

- Stochastic Differential Equation,
- Optimal Control,
- Adjoint Process,
- Variational Principle,
- Maximum Principle,
- Relaxed Control

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