Nakano, Kazushi; **Sagara, Setsuo**

Optimal scanning measurement problem for a stochastic distributed- parameter system. (English) Zbl 0651.93078

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A maximum principle for a stochastic control problem $dx_t = f(t, x_t, u_t)dt + \sigma(t, x_t)dB_t$, $x(0) = x$, $J(u) = E_x[g(x_T)]$, with non-smooth drift is established by approximating this problem by differentiable problems. In this way Kushner's maximum principle is generalized and the adjoint process is characterized. The authors deal with the problem of determining the optimal measurement scheduling for a stochastic distributed-parameter system based on spatially continuous and discrete scanning observations. For the continuous scanning case the authors prove the existence of optimal solutions and establish the N- modal approximation problem. For the discrete case the authors introduce the concept of relaxed controls and present a practical method of constructing an approximate solution for the relaxed problem. Finally, the authors give a numerical example to compare two types of optimal measurement trajectory.

Reviewer: M.Kohlmann S.Sun

MSC:

93E20 Optimal stochastic control
93C20 Control/observation systems governed by partial differential equations
93E10 Estimation and detection in stochastic control theory
49J55 Existence of optimal solutions to problems involving randomness

Keywords:

.; maximum principle; stochastic control problem; non-smooth drift; adjoint process; optimal measurement scheduling; stochastic distributed- parameter system; continuous and discrete scanning observations; N-modal approximation; relaxed controls; approximate solution

Full Text: DOI

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