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ON THE MEAN SQUARE MINIMIZATION OF THE FINAL VALUE OF AN OUTPUT OF A LINEAR STOCHASTIC CONTROLLED SYSTEM*

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Abstract

In this work we deal with the problem of minimization of the mean square of the final value of an output of a controlled stochastic system having the state space representation described by a system of Itô differential equations. We assume that the system is controlled by piecewise constant controls which are non-anticipative with respect to the Brownian motion involved in the mathematical model of the controlled system. We provide explicit formulae of the optimal controls and we show that these are in a state feedback form. For the implementation of these optimal controls we need only the measured values of the states at discrete time instances. The gain matrices of the optimal control are computed based on the solution of a matrix backward differential equation with finite jumps of Riccati type. We also analyze the dependence of the value of the optimal performance with respect to the length of the sampling period.

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