

H_2 OPTIMAL FILTERING FOR DISCRETE-TIME LINEAR STOCHASTIC SYSTEMS WITH PERIODIC COEFFICIENTS AND MARKOVIAN JUMPING*

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Abstract

The purpose of the paper is to present a design procedure of the optimal filter for discrete-time stochastic linear system with periodic coefficients simultaneously affected by a non-homogeneous but periodic Markov chain and state multiplicative white noise perturbations. The optimal filter minimizes a performance index described by the Cesaro limit of the mean square of the deviations of the signal generated by the filter from the values of the signal which must be estimated. It is proved that the optimal filter with respect to the considered performance criterion has a Luenberger observer form which gain depends on the unique periodic solution of a discrete-time linear equation together with the stabilizing solution of a suitable discrete-time Riccati type

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