

Stochastic Guaranteed Cost Control of Markovian Jumping Singular Systems

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The problem of stochastic finite-time guaranteed cost control is investigated for Markovian jumping singular systems with uncertain transition probabilities, parametric uncertainties, and time-varying norm-bounded disturbance. Firstly, the definitions of stochastic singular finite time stability, stochastic singular finite-time boundedness, and stochastic singular finite-time guaranteed cost control are presented. Then, sufficient conditions on stochastic singular finite time guaranteed cost control are obtained for the family of stochastic singular systems. Designed algorithms for the state feedback controller are provided to guarantee that the underlying stochastic singular system is stochastic singular finite-time guaranteed cost control in terms of restricted linear matrix equalities with a fixed parameter. Finally, numerical examples are given to show the validity of the proposed scheme.

Key Words: Guaranteed cost control, Markovian jumping singular systems, Stochastic singular systems, Linear matrix equalities, Feedback controller