Stabilization of a Class of Stochastic Nonlinear Time-Delay Systems*

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Abstract: In this paper, the stabilization problem is considered for a class of nonlinear continuous stochastic systems with state delays. The purpose of this problem is to design a state feedback controller such that the closed-loop system is exponentially stable (or exponentially ultimately bounded) in the mean square, for all admissible nonlinearities and time-delays. We first investigate the sufficient conditions for the nonlinear stochastic time-delay systems to be stable, and then derive the explicit expression of the desired controller gains. A numerical simulation example is provided to show the usefulness of the proposed design method.

Keywords: *Nonlinear systems; stochastic systems; time-delay; Lyapunov stability; algebraic matrix inequalities.*

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