Delay-Dependent Robust Stability for Uncertain Discrete Stochastic Recurrent Neural Networks with Interval Time-Varying Delays

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Abstract

This paper considers the problem of global robust delay-dependent stabilityfor uncertain discrete stochastic recurrent neural networks with intervaltime-varying delays. The parameter uncertainties are assumed to be time-varyingnorm-bounded in the state equation. The activation functions are assumed to beglobally Lipschitz continuous. Based on an appropriate Lyapunov-Krasovskiifunctional, global robust delay-dependent stability criterion which is dependenton both the lower bound and upper bound of the interval time-varying delays isderived by introducing some slack matrix variables. A sufficient condition forthe discrete stochastic recurrent neural networks with interval time-varyingdelays is presented in terms of the linear matrix inequality (LMI). A Numericalexample is given to demonstrate the reduced conservatism of the proposed resultsin this paper.

Key words: Discrete stochastic recurrent neural networks; Interval time-varying delays; Linear matrix inequality; Robuststability; Uncertainty