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Summary: The stochastic neural networks can be considered as an expansion of cellular neural networks and Hopfield neural networks. In real world, the neural networks are prone to be instable due to time delay and external disturbance. In this paper, we consider the asymptotic stability for the stochastic neural networks with multiple time-varying delays. By employing a Lyapunov-Krasovskii function, a sufficient condition which guarantees the asymptotic stability of the state trajectory in the mean square is obtained. The criteria proposed can be verified readily by utilising the linear matrix inequality toolbox in Matlab, and no parameters to be tuned. In the end, two numerical examples are provided to demonstrate the effectiveness of the proposed method.

Keywords: asymptotic stability; stochastic neural networks; multiple time-varying; delays; linear matrix inequality
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