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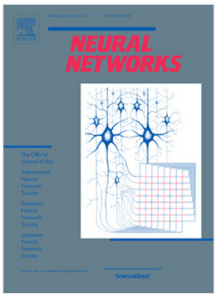

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Stability and synchronization of fractional-order memristive neural networks with multiple delays

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Abstract

The paper presents theoretical results on the global asymptotic stability and synchronization of a class of fractional-order memristor-based neural networks (FMNN) with multiple delays. First, the asymptotic stability of fractional-order (FO) linear systems with single or multiple delays is discussed. Delay-independent stability criteria for the two types of systems are established by using the maximum modulus principle and the spectral radii of matrices. Second, new testable algebraic criteria for ensuring the existence and global asymptotic stability of the system equilibrium point are obtained by employing the Kakutani's fixed point theorem of set-valued maps, the comparison theorem, and the stability criterion for FO linear systems with multiple delays. Third, the synchronization criterion for FMNN is presented based on the linear error feedback control. Finally, numerical examples are given demonstrating the effectiveness of the proposed results.

Key words: Fractional-order systems; Memristor-based neural networks; Stability; Synchronization; Multiple delays

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