

Global Asymptotic Synchronization of Fractional Order Multi-linked Memristive Neural Networks with Time-varying Delays via Discontinuous Control

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Abstract

In this paper, we address the global asymptotic synchronization (GAS) problem of the Master-Slave fractional order multi-linked memristive neural networks (FOMMNNs). Firstly, we propose the FOMMNNs which incorporate the fractional calculus into multi-linked memristive neural networks (MMNNs) for the first time. Then, by utilizing the fractional differential inclusions and set-valued mapping theories, the addressed FOMMNNs with discontinuous state switching at the right-hand side and time-varying delays are converted into the continuous FOMMNNs. Under the frameworks of fractional Caputo derivative and fractional Fillipov solution, by the way of building up appropriate Lyapunov functionals and utilizing some synchronous analysis technology, several sufficient criteria ensuring that the Master-Slave FOMMNNs can realize global asymptotic synchronization (GAS) under two different state-feedback controllers are obtained.

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