Fixed-time projective synchronization of delayed memristive neural networks via aperiodically intermittent switching control

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Abstract

In this paper, the fixed-time projective synchronization issue for a class of delayed memristive neural networks is studied via aperiodically intermittent switching control. Firstly, according to the existing aperiodically intermittent switching strategy, a novel theorem for aperiodically intermittent switching fixed-time stability is proposed and proved through mathematical induction. Subsequently, an aperiodically intermittent switching controller is designed to reach fixed-time projective synchronization for drive-response systems. The power exponent is a function of error system state rather than one or two fixed constants. With the help of the extended differential inclusion framework, the inequality technique and the analysis method, some novel sufficient conditions are derived to ensure fixed-time projective synchronization for the considered systems. The settling time is closely related to the number of neurons and the maximum ratio of the rest width to the aperiodic time span, but independent of the initial value conditions. Furthermore, the fixed-time complete synchronization, fixed-time anti-synchronization and fixed-time stability obtained are special cases of the main theorem. Meanwhile, the conclusions of this paper improve some previous relevant works. Finally, a numerical example is given to verify the effectiveness and feasibility of the obtained results

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