บทความ Finite-time event-triggered approach for recurrent neural networks with leakage term and its application

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Adaptive fuzzy event-triggered cooperative control for fractional-order delayed multi-agent systems with unknown control direction

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Abstract

In this paper, the cooperative control of fractional-order multi-agent systems with time delay and unknown control direction is studied by combining frequency distributed model and event-triggered mechanism. The Nussbaum function is employed to address the unmeasured control direction. Then, through the event-triggered mechanism, a corresponding controller is designed, which can guarantee that all signals are bounded while saving resources. The proposed theme is convenient for analyzing the stability of fractional-order systems based on a transformation of frequency distributed model. In particular, in order to enhance the universality of the proposed scheme in the fractional-order system stability analysis, a generalized fractional-order generalized lemma with respect to the Nussbaum function is given. Finally, the availability of the proposed method is confirmed by a simulation example.

Introduction

In the past several decades, multi-agent systems (MASs) have been widely used in real life due to their autonomy, fault tolerance, scalability and collaboration capabilities, such as military [2], engineering [3], [12], [35], traffic [4], artificial intelligence [7], [18], and have gradually become a research hotspot. In addition, since most engineering problems and the evolution of biological systems show the characteristics of cooperative work, and many attractive issues such as synchronization, flock, formation, swarm, coordination are all related to collaboration, thereby studying the MASs's cooperative control is also an important direction. Many achievements have been made in relevant research, for example, Tran et al. explored the cooperative control of invariant formation in [27]; a distributed location coordination control problem was studied in [20]; Khan et al. considered the problem of unit load distribution of electric energy storage in [14]. It should be noted that, until now, most achievements on cooperative control of MASs have been limited to integer order systems, such as first-order systems [22], [24], second-order systems [10], [41], and higher-order systems [11], [33]. However, many phenomena

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Event-Triggered Controller on Practically Exponential Input-to-State Stabilization of Stochastic Reaction–Diffusion Cohen–Grossberg Neural Networks and Its Application to Image Encryption

V. Gokulakrishnan & R. Srinivasan

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Abstract

The stabilization problem for a class of stochastic reaction–diffusion delayed Cohen–Grossberg neural networks (SRDDCGNNs) with event-triggered controllers is addressed in this paper. Neumann boundary conditions, distributed and bounded external disturbances are introduced to solve such a problem. New sufficient criteria are derived using the 2-norm event generator and Lyapunov functional to ensure that the proposed controlled systems achieve practically exponential input-to-state stabilization in terms of the linear matrix inequality. Considering these criteria, the impact of an event-triggered controller on the practically exponential input-to-state stability is investigated. The Zeno phenomenon of the event-