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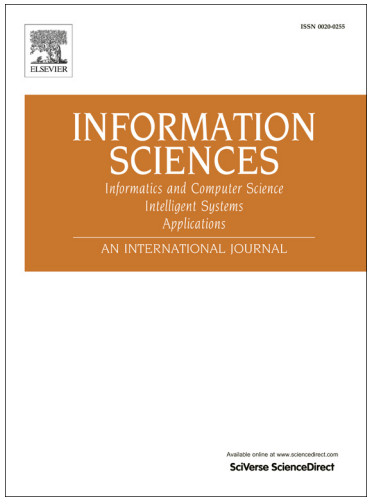

Network-based leader-following consensus of nonlinear multi-agent systems via distributed impulsive control

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Network-based leader-following consensus of nonlinear multi-agent systems via distributed impulsive control ☆

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Abstract

This paper investigates the problem of network-based leader-following consensus of nonlinear multi-agent systems via distributed impulsive control. First, by taking network-induced delays into account, a nonlinear system with delayed impulses is formulated. Then, a general consensus criterion is derived and several special cases of network-induced delays and network topologies are discussed. Moreover, sufficient conditions on the design of the sampling period, pinned nodes and the coupling strength are provided. The effects of the coupling strength and pinning strategy are further explored for multi-agent systems with an undirected communication graph. Finally, two examples are given to verify the theoretical results.

Key words: Leader-following consensus; Impulsive control; Network induced delays; Multi-agent systems

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