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Weighted $H_{\infty}$ consensus design for stochastic multi-agent systems subject to external disturbances and ADT switching topologies. (English) Zbl 1437.93126 Nonlinear Dyn. 96, No. 2, 853-868 (2019).

Summary: This paper is devoted to weighted $H_{\infty}$ consensus design for continuous-time/discrete-time stochastic multi-agent systems with average dwell time (ADT) switching topologies and external disturbances via output feedback. By introducing a linear transformation, the closed-loop systems are changed into reduced-order systems and, at the same time, the issue of weighted $H_{\infty}$ consensus design is transformed into a weighted $H_{\infty}$ control problem. Then, Lyapunov conditions are established for the mean-square asymptotic stability and weighted $H_{\infty}$ disturbance attenuation of the reduced-order systems. Based on them, two sufficient conditions are derived for the existence of desired output-feedback control protocols through the feasible solution of a series of linear matrix inequalities. Finally, two numerical examples are given to illustrate the effectiveness of the proposed results.

MSC:
93D50 Consensus
93A16 Multi-agent systems

Keywords:
average Dwell time; stochastic disturbance; output-feedback control; consensus; multi-agent system

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References:

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