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Multi-group consensus of neighbor-based multi-agent systems. (Chinese. English summary)

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Summary: Concerning multi-group consensus problems for second-order leader-following multi-agent systems, an appropriate control protocol was proposed by applying distribute control of neighborhood under linear and nonlinear dynamics respectively. Firstly, according to the designed control protocol and the knowledge of algebra and graph theory, group consensus problems for multi-agent systems can be transformed into the stability problems of error system. Then, using Lyapunov stability theory, sufficient conditions were obtained to ensure that linear and nonlinear second-order multi-agent systems can achieve group consensus. Finally, numerical simulation results show that the proposed control protocol can make multi-agent systems achieve multi-group consensus under certain conditions.

MSC:

93D50 Consensus
93A16 Multi-agent systems

Keywords:

multi-agent system; group consensus; time-delay; nonlinear system; Lyapunov-Razumikhin theorem