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Consensus of heterogeneous first- and second-order multi-agent systems with directed communication topologies.

Summary: In this paper, we consider the consensus problem for heterogeneous multi-agent systems composed of some first-order and some second-order dynamic agents in directed communication graphs. Consensus protocols are proposed for the second- and first-order dynamic agents, respectively. Under certain assumptions on the control parameters, for fixed communication topologies, necessary and sufficient conditions for consensus are given, and the consensus values of all agents are established. For switching topologies, sufficient conditions are given for all agents to reach consensus. Finally, simulation examples are presented to demonstrate the effectiveness of the proposed methods.

Keywords: consensus; heterogeneous multi-agent systems; consensus value; directed topology
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