CONSENSUS OF CONTINUOUS-TIME MULTI-AGENT SYSTEMS UNDER NOISY MEASUREMENT

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Abstract- In this paper, we consider the consensus problem of first-order continuous-time multi-agent systems with fixed topology and time-varying topology in the presence of measurement noises. It is assumed that each agent can only obtain the information from its neighbors, and the information is corrupted by white noises. For the case of fixed topology, it is shown that consensus can be reached asymptotically in mean square provided the interaction topology has a spanning tree. For the case of time-varying topology, with the assumption that each interaction topology is balanced and strongly connected, consensus can be reached asymptotically in mean square as well. The convergence analysis is given by studying the reduced-order system with the help of stochastic Lyapunov analysis. Simulation results are presented to illustrated the theoretical results.

Index terms*:* Multi-agent systems, consensus, measurement noise, stochastic systems.