An Integral Sliding Mode-Based Robust Consensus Control Protocol Design for Electro-Mechanical Systems

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Abstract

This paper proposes a consensus tracking control for a class of second-order multi-agent nonlinear systems and generalizes the concept of integral sliding mode for networked systems. This design relies upon an integral manifold which is defined as a function of the consensus error variables. The designed integral manifold helps in the establishment of sliding mode without reaching phase. Consequently, the robustness against uncertainties is guaranteed from the very start. The continuous control components, of the control laws, governs the dynamics of the nonlinear system in sliding mode and the discontinuous terms handle the disturbances. The stability analysis is given to show the sliding mode establishment and an example is considered to demonstrate the benefits of the proposed strategy.

Keywords

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