Covariance Control for Bilinear Stochastic Systems via Sliding Mode Control Concept

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Abstract

Based on the concept of sliding mode control, we study the problem of steady state covariance assignment for bilinear stochastic systems. We find that the invariance property of sliding mode control ensures nullity of the matched bilinear term in the system on the sliding mode. By suitably using Ito calculus, the controller u(t) can be designed to force the feedback gain matrix G to achieve the goal of steady state covariance assignment. We also compare our method with other approaches via simulations.