State Estimation via Distributed Observers Under Adaptive Dynamic Event-Triggered Scheme

Jing Ping[*1]

[1]China University of Mining and Technology – Chine

Résumé

This paper proposes an adaptive dynamic event-triggered scheme (ADETS) for distributed state estimation of linear time-invariant (LTI) systems via a network of observers. Each observer only accesses partial output measurements and relies on information exchange through a communication topology to achieve full state estimation. To reduce communication overhead, an ADETS is proposed to realize discrete communication among observers instead of continuous information transmission. The scheme supports asynchronous one-to-one communication, guarantees asymptotic omniscience of all observers, and rigorously excludes Zeno behavior. Notably, it operates in a fully distributed manner without relying on any global network information, such as the Laplacian matrix or its eigenvalues. Illustrative examples on a four-observer network and a three-inertia system demonstrate the effectiveness of the method.

Mots-Clés: Distributed estimation, asymptotic omniscience, event triggered scheme

---

[*]Intervenant