Output-based Event-triggered Control of Networked Systems Subject to Bilateral Packet Dropouts

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May 21, 2021

Abstract

In this paper, an output-based event-triggered control problem of discrete-time networked control systems (NCSs) subject to bilateral data packet dropouts is investigated. In view of the stochastic sequences of packet dropouts in measurement channels (from sensors to controller) and control channels (from controller to actuators), the NCS is converted into a closed-loop stochastic parameter system. In the aid of a Lyapunov functional based on stochastic variables, sufficient conditions on co-design of event-triggering strategy and exponentially mean-square stability of NCSs are derived. Furthermore, an improved iterative algorithm is given to obtain the dynamic output feedback control law and event-triggering parameters from the nonconvex inequalities. Finally, a numerical example and the corresponding simulation results are given to show the validity and applicability of the developed techniques.

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