STABILITY ANALYSIS OF NETWORKED SYSTEMS WITH PACKET DROPOUT AND TRANSMISSION DELAYS: DISCRETE-TIME CASE

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ABSTRACT

This paper analyzes the stability of networked control systems (NCSs) with data packet dropout and transmission delays induced by communication channels. Discrete-time NCSs with data packet dropout and transmission delays are modeled as linear systems with time-varying delays. Sufficient conditions for the stability of the NCSs are established in terms of linear matrix inequalities (LMIs) by using the Lyapunov function method. The case of NCSs with multiple-packet transmission is also studied. A numerical example is presented to illustrate our proposed approach.

KeyWords: Networked control systems, delay systems, data packet dropout, transmission delays, LMI.