Dissipative control for nonlinear Markovian jump systems with mixed time-delays: the discrete-time case. (English) Zbl 1465.93165
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Summary: This article is concerned with the dissipative control problem for discrete-time nonlinear Markovian jump systems subject to both discrete and distributed time-delays. The purpose is to design a state feedback controller that is capable of guaranteeing the required closed-loop stability and dissipativity performances simultaneously. By resorting to Lyapunov functional methodology and completing square technique, sufficient conditions are established for the existence of the desired state feedback controller in terms of certain Hamilton-Jacobi inequalities (HJIs). Within the provided framework, the required controller parameters can be obtained by solving the corresponding HJIs. Finally, two numerical simulation examples are presented to demonstrate the correctness and effectiveness of the developed control paradigm.

MSC:
93D15 Stabilization of systems by feedback
93E15 Stochastic stability in control theory
93C10 Nonlinear systems in control theory
93C43 Delay control/observation systems
93C55 Discrete-time control/observation systems

Keywords:
dissipative control; Hamilton-Jacobi inequality; mixed time-delays; nonlinear Markovian jump systems

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