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Robust static output feedback control for discrete time-delay systems. (English)

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Consider the discrete system $x_{k+1} = A_0x_k + A_1x_{k-d} + Bu_k + Fw_k$, $y_k = Cx_k$, $z_k = Dx_k + Ew_k$, where x_k , u_k , w_k , y_k and z_k are the state, control, disturbance, measured output and controlled output vectors, respectively. The delay d is unknown and the matrix coefficients A_0, A_1, \dots, E contain uncertainties represented by a convex bounded polytopic model. The control is chosen as $u_k = Ly_k$. Expressions for the gain matrix L are derived which ensure (i) robust stabilization and (ii) robust H_∞ performance of the closed-loop system $x_{k+1} = (A + BLC)x_k + A_1x_{k-d} + Fw_k$, $z_k = Dx_k + Ew_k$.

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MSC:

93B35 Sensitivity (robustness)

93B36 H^∞ -control

93B52 Feedback control

93C55 Discrete-time control/observation systems

Cited in 1 Document

Keywords:

robust control; discrete systems; static feedback; time-delay systems