l^1-optimal Control for Multirate Systems Under Full State Feedback.

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Abstract: This paper considers the minimization of the ℓ^∞-induced norm of the closed loop in linear multirate systems when full state information is available for feedback. A state-space approach is taken and concepts of viability theory and controlled invariance are utilized. The essential idea is to construct a set such that the state may be confined to that set and that such a confinement guarantees that the output satisfies the desired output norm conditions. Once such a set is computed, it is shown that a memoryless nonlinear controller results, which achieves near-optimal performance. The construction involves the solution of several finite linear programs and generalizes to the multirate case earlier work on linear time-invariant (LTI) systems.

Keywords:

AMS Subject Classification: 93C;