



A Successive Approximation Algorithm to Optimal Feedback Control of Time-varying LPV State-delayed Systems

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Abstract: In this paper problem of finite-time optimal state feedback control for a class of time-varying linear parameter-varying (LPV) systems with a known delay in the state vector under quadratic cost functional is investigated via a successive approximation algorithm. The method of successive approximation algorithm results an iterative scheme, which successively improves any initial control law ultimately converging to the optimal state feedback control. On the other hand, by manipulating linear matrix inequalities imposed by Generalized-Hamiltonian-Jacobi-Bellman method and the polynomially parameter-dependent quadratic (PPDQ) functions, sufficient conditions with high precision are given to guarantee asymptotic stability of the time-varying LPV state-delayed systems independent of the time delay.

Keywords: *Linear parameter-varying systems; time-delay; successive approximation algorithm; optimal control.*

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