ON THE NEAR-OPTIMALITY OF COMPOSITE OPTIMAL CONTROL FOR NONSTANDARD SINGULARLY PERTURBED SYSTEMS

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Abstract: In this paper, a new method based on a generalized algebraic Riccati equation arising in descriptor systems is presented to solve the composite optimal control problem of nonstandard singularly perturbed systems. It is shown that the composite optimal control can be obtained very simply by only revising the solution of the slow regulator problem. It is proven that the composite optimal control can achieve a performance which is $O(\varepsilon^2)$ close to the optimal performance. Although this result is well-known for the standard singularly perturbed systems, it is new in the nonstandard case.