Tube-MPC Based on Zonotopic Sets for Uncertain System Stabilisation

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Abstract: This paper is dedicated to the model predictive control (MPC) for constrained discrete time systems with additive uncertainties to track a reference system. The tracking MPC problem distributes a control law appropriate for regulating constrained uncertain system to a given target system. Though, when the target operating point changes, the feasibility of the controller may be lost and the controller misses to track the reference. In this paper, a novel MPC for tracking variation system references is introduced. The main issue consists in minimizing a cost that penalizes the error between the state of the original system and the reference system state. The polyhedral invariant set for tracking is considired an extended terminal constraint. The properties of the proposed controller have been tested in two examples. Simulation results show that the proposed tracking MPC successfully achieves robust tracking in terms of control performance.

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