



Compact Explicit MPC Law with Guarantees of Feasibility for Reference Tracking

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Abstract: The present paper deals with the constrained model predictive control for linear time invariant systems. Even if these techniques reached a considerable maturity in the last decade, the feasibility problems remain a sensitive point at least for applications which involve tracking of challenging reference signals, most often in conjunction with restrictive physical limitations. The main goal here is the adaptation (enlargement) of the set of feasible trajectories. Two strategies are discussed: the tuning of the predictive control parameters and the reference governor schemes. Specifically on the former direction it will be shown that a compact piecewise affine "feedback control law" with guarantees of feasibility can be constructed. This compactness is given by mixing the explicit formulations of the predictive law and those of the reference adjustment mechanism.

Keywords: *Optimal control; predictive control; multiparametric optimization.*

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