Oberseminarvortrag

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Dienstag, den 4.4.2006 um 15 Uhr s.t. im S76 (NWII)

Approximate Dynamic Programming for Robust Model Predictive Control

Zusammenfassung:
We present a novel method to synthesize a robustly stable constrained feedback law, based on model predictive control (MPC) for polytopic systems with linear constraints. In contrast to previous approaches to robust MPC, our method does not require any prior knowledge of a locally stabilizing feedback law at the origin. Instead, a robust dynamic programming approach is used to generate automatically a robustly invariant set and a control Lyapunov function, along with the nonlinear constrained feedback law. While the exact method is prohibitively expensive in practice due to its combinatorial complexity, we use an approximation technique with bounded errors (both methods are publicly available in form of MATLAB Scripts). At the end of the talk we present a new concept for robust stability certificates, the ``uroborus", and sketch how it allows to generate robustly stable MPC laws.

This talk is based on joint work with Jakob Bjoernberg.

Lars Grüne