

Open Thesis (SA,MA)

Robust Predictive Control under Communication Constraints

<p>Description:</p> <p>Recently, dedicated mediums for the communication between plant and controller are more and more abandoned in favor of shared, wireless networks. Network abstractions, that model the available communication resources of such networks (e.g. the token bucket model, see picture), and controllers scheduling the transmission of updated control values accordingly, are necessary to address the challenges arising from this development.</p> <p>An effective tool in this context is so-called <i>rollout control</i>: control values and their corresponding transmission times are determined over a look-ahead horizon so as to maximize control performance. Recently, rollout control was extended to accommodate bounded disturbances using RPI set-based tube MPC known from the MPC lecture.</p> <p>Since these RPI sets need to bound the error between real and nominal system during extended phases of open loop, they can grow quite large. A different tube design may help to address this issue and thereby reduce the conservatism of robust rollout control. A possible thesis project in this area could investigate such approaches theoretically and compare them with existing schemes.</p> <p>Prerequisites:</p> <ul style="list-style-type: none"> • Background and interest in systems and control, preferably lecture <i>MPC</i>, having fun with theoretical work 	<p>Supervisor:</p> <p>Stefan Wildhagen Room 2.238</p>
	<p>Area:</p> <p>Model Pred. Control Networked Control Systems</p>
	<p>Properties:</p> <p>Type: SA,MA</p> <p>30% literature 50% theory 20% simulation</p>
	<p>Beginning:</p> <p>Any time, please approach me via email.</p>

Weitere Informationen: www.ist.uni-stuttgart.de/lehre/bama

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