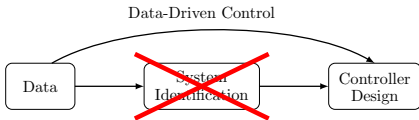


Open Thesis (MA)

Stochastic Data-Driven MPC

<p>Description:</p>  <p>Model predictive control (MPC) is a powerful modern control technique which relies on repeatedly solving an open-loop optimal control problem. The implementation of MPC requires an accurate prediction model, which is often not available or demands significant effort and expert knowledge. In recent years, data-driven MPC approaches have received increasing attention, which use only measured data to control unknown systems, without identifying a model. A key issue in data-driven MPC is the treatment of noise in the available data. While different stability results have been developed in case of bounded noise, the worst-case nature of these results leads to potentially conservative and hence impractical results. The goal of this thesis is to develop an MPC approach using data affected by stochastic noise. Inspired by existing results on data-driven MPC and model-based stochastic MPC, a stochastic data-driven MPC scheme should be developed and theoretical properties (stability, chance constraint satisfaction, etc.) should be analyzed. Finally, the method should be applied in simulation and compared to existing methods.</p> <p>Prerequisites:</p> <ul style="list-style-type: none"> • Strong background in control theory and mathematics • Interest in theoretical problems • Background in probability theory (ideal) • Lectures: <i>Konzepte der Regelungstechnik</i> (required), <i>model predictive control & data-driven control</i> (ideal) 	<p>Supervisor:</p> <p>Julian Berberich Henning Schlüter Room 2.236, 3.234</p> <hr/> <p>Area:</p> <p>MPC Data-Driven Control Stochastics</p> <hr/> <p>Properties:</p> <p>Type: MA</p> <p>20% literature 60% theory 20% simulation</p> <hr/> <p>Beginning:</p> <p>now</p>
--	---

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

Aushang vom 27. Oktober 2021