



Open Thesis (MA)

Data-driven adaptive control of time-varying systems

<p>Description:</p> <p>In a recent work, we developed a new control algorithm for the stabilization of discrete-time linear time-varying systems that does not require any knowledge of the plant's model. The controller is defined as a linear state-feedback law whose gain is adapted to the plant changes through a data-based event-triggering rule. That is, measured data are used to establish <i>how</i> and <i>when</i> an updated controller should be designed. The design of the controller merges recent results from data-driven control and classic robust control tools, whereas the analysis of the adaptive feedback interconnection is based on hybrid systems and Lyapunov theory. The student will first familiarize with the relevant literature, and then work on one or more extension that can be chosen during the project from the following (not exhaustive) list: richer policy class beyond linear state-feedback; nonlinear (first time-invariant and then possibly time-variant) plants; different objectives than stabilization (e.g. optimal operation). Apply directly at: andrea.iannelli@ist.uni-stuttgart.de</p> <p>Prerequisites:</p> <ul style="list-style-type: none">• <i>Nonlinear control</i>; possibly <i>Robust control</i> and/or <i>Linear Matrix Inequalities in Control</i>• Strong interest in learning new concepts and methods in control theory, and conducting theoretical work	<p>Supervisor: Prof. Dr. Andrea Iannelli Room 2.244</p> <p>Area: Nonlinear control Data-based control Adaptive control</p> <p>Properties:</p> <p>Type: MA</p> <p>25% literature 35% analytical work 20% implementation 20% simulation</p> <p>Beginning: anytime</p>
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Further information on www.ist.uni-stuttgart.de/lehre/bama

Aushang vom June 11, 2024