Open Thesis (MA)
Using Prior Knowledge in Data-Driven Control

Description:

Designing controllers based on data is an active research field. Most existing approaches assume that the underlying system is fully unknown and they only leverage measured data. However, in practical applications, the plant is rarely a black box. Instead, partial knowledge of parameter values, structure, or system properties is often available.

It will be the goal of this thesis to develop methods for merging prior knowledge and data in order to tackle system analysis and controller design problems. There are different options for addressing this objective and the concrete first steps can be decided at the beginning of the thesis. Possible analysis and control problems that can be studied are: dissipativity analysis, (robust) controller design, and model predictive control. The goal is to develop new methods which outperform classical model-based approaches as well as more recent data-driven methods. Beyond the above theoretical aspects, the developed methods should be applied in simulation and compared to existing methods.

Prerequisites:

- Solid background in control theory and mathematics
- Interest in theoretical problems
- Lectures: *KRT*; one of the following is beneficial: *Data-Driven Control / MPC / Robust Control*

Supervisor:

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Area:

Data-driven control
Control theory

Properties:

Type: **MA**

30% literature
50% theory
20% implementation

Beginning:

now

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

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