Open Thesis (MA)

Data-based operator gain estimation via Gaussian Processes

Description:

There has been an increasing trend in identifying the impulse response of an unknown system via Gaussian Process Regression. From the impulse response of a system, we can also identify the operator gain for linear time-invariant single-input single-output systems. We therefore want to apply methods for identifying an impulse response via Gaussian Processes to receive a probabilistic estimate on the operator gain. This involves an extended literature review on impulse response identification via Gaussian Processes, as well as the development of some theoretical results on top for the resulting operator gain. Interesting challenges underlying this project are how prior knowledge on the system can be incorporated, how noise is handled and the availability of finite (possibly scarce) data points in time. The literature review and theoretical work shall be accompanied by extensive simulation examples.

Prerequisites:

- Strong background in systems and control
- Experience with Matlab
- Interest in optimization, mathematical problems, learning, simulations

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Room 2.235

Area:

Data-driven systems analysis

Properties:

Type: MA

30% literature
30% theory
40% simulation

Beginning: now

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

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