

Universität Stuttgart Institut für Systemtheorie und Regelungstechnik Prof. Dr. Andrea lannelli

# **Open Thesis (MA)**

# Active Learning for the Identification of Partially Observable Linear System

ISt.

**Description:** 

**System identification** is a methodology for building

mathematical models of dynamic systems using measurements of the input and output signals of the system. A partially observable system is one whose entire state is not fully visible or measurable to an external sensor. Active **learning** is proposed to learn the system with desired data points, and aims to select the next operation points during the identification in order to improve the learning rate or reduce the uncertainty bound compared with random generalized operation points. The goal of this thesis is threefold. First, to develop active learning algorithm to identify a partially observable linear system with noise via system input and observable output data, while exploring ways to find rich informativity data. Second, to discuss the performance and properties of this algorithm, such as its applicability or guarantee of estimation. Finally, the method should be applied in simulation and compared to the conventional identification method.

### **Prerequisites:**

- Knowledge in *data-driven control*
- Programming skills, Matlab or Python

Supervisor: Bowen Song Room 2.236

#### Area:

Data-driven Control System Identification Machine Learning

#### **Properties:**

Type: MA

 $\begin{array}{l} 30\% \ \text{literature} \\ 35\% \ \text{theory} \\ 35\% \ \text{simulation} \end{array}$ 

## **Beginning:**

Any time

 $Further\ information\ on\ www.ist.uni-stuttgart.de/lehre/bama$ 

Aushang vom March 24, 2023