

Master thesis

Data-driven nonlinear predictive control for robotic manipulators: A case study

The concept of (direct) data-driven control for linear and nonlinear systems provides a way to design controllers directly from input/output data. Recently, a data-driven nonlinear predictive control scheme was proposed. It is of interest to apply such a control technique to robotic manipulators and compare the results against existing model-based control methods.

The goals of this case study is to apply a data-based predictive control scheme in a realistic simulation environment, compare it to other existing control techniques and (potentially) apply it to a robotic manipulator in hardware.

Tasks

- Implement the controller in a realistic simulation environment.
- Extensively compare the developed control technique against other existing model-based control methods.
- Reduce computation times and work towards real-time hardware implementation.

Requirements

- Good command of English language.
- Attended RT I/II, Nonlinear Control and Robotics I/II.
- Excellent Matlab, C/C++ skills and preferably ROS and Python.
- Basic knowledge of model predictive control.

Contact

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