

Master Thesis

Topic: Nonlinear system identification for motion of mobile robots

DESCRIPTION:

In this master thesis, a benchmark mobile robot is used to develop a nonlinear model for motion control and motion planning purposes (see link below for the robot we use for this purposes). The thesis consists of identifying a model based on gray-box schemes where the parameters of the model should be calculated from experimental data. For this purpose, the prototype models in the literature should be evaluated on experimental data. In the gray-box scheme it is aimed to consider the lateral and longitudinal dynamics of the mobile robot to be coupled.

In the second phase, the obtained model should be compared against the so-called nonlinear polynomial state-space (PNLSS) model. PNLSS model as a black-box model should provide a comparable identification quality without the physical interpretation.

The obtained model will be used for motion control and motion planning purposes.

The implementation of the method is intended to be in C++. However, all the identification tool-boxes can be prototyped in MATLAB.

REQUIREMENTS: Independent working style, some familiarity with C++, and MATLAB, interest in robotics.

ROBOT: rub.de/mas/forschung/forschungsgebiete

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Mechanik
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