

IST Universität Stuttgart Institut für Systemtheorie und Regelungstechnik Prof. Dr.-Ing. Frank Aller

Open Thesis (BA)

Model Comparison for Rear-Steered Bicycles

Description:

Stabilizing a rear-steered bicycle around its upright position poses a significant challenge for human riders. While numerous control strategies have been proposed to address this, a wide variety of dynamic models are available in the literature, including models developed for the IST autonomous bicycle, that support offline controller design. This thesis focuses on reviewing and comparing these models, identifying their key differences, and analyzing how various parameters affect the system dynamics.

Prerequisites:

- Advanced mechanical modeling courses (e.g. Dynamik *mechanischer Systeme*) are beneficial
- Lectures: ERT, Technische Mechanik III



Supervisor:

J.Mair, **D.Tschemernjak** Room 2.243

Area:

Modeling System Dynamics Autonomous Vehicles

Properties:

Type: **BA**

30% literature 50% analytical work 20% evaluation

Beginning:

as soon as possible

Further information: www.ist.uni-stuttgart.de/teaching/bama

Notice from May 28, 2025