Student Assistant-Model Predictive Control and Simulation for Autonomous Spacecraft

The iFR is currently developing on-board nonlinear model predictive control (NMPC) algorithms specifically designed to run on space-qualified hardware. For the development and verification, a simulation framework including embedded computers is needed. Furthermore, implementation and comparison to state-of-the-art algorithms are needed.

Main duties:
- Setup of a simulation environment for the verification
- Implementation of different NMPC controllers in well-known frameworks such as CasADi, ACADOS, or ForcesPro
- Development and Implementation of Toolchains for simulation model generation using the aforementioned tools
- Execution of evaluation of performance tests
- Extensions of the simulation environment including embedded computers

Required Skills
- Experience in Matlab/Simulink (C/C++ is a benefit)
- Experience (e.g. lectures) in nonlinear optimization and optimal control
- Experience in Model Predictive Control (from seminars or own work)

Interested students, please send a current CV, a motivation letter describing your experience, and your current transcript of record to the contact below.

Contact
Jan Oluçak M.Sc.
E-Mail: jan.olucak@ifr.uni-stuttgart.de
Tel.: 0711/685-67044