Motivation
- nonlinear modeling of a parallel very flexible robot
- nonlinear actuator control of an underactuated robot based on the drivers position and velocity
- nonlinear curvature control based on strain gauge signals

State of Current Work
System Modeling
- equations of motion of the multibody system
  \[ M(q) \ddot{q} + k(q, \dot{q}, t) = g(q, \dot{q}, t) + B(q) \cdot u + \epsilon C(q) \cdot \lambda \]
- \( \lambda \): reaction forces due to the constraints
- \( C(q,t) \): loop closing constraints

System Control
off-line control
- define trajectory as a servo constraint for the system
- finding the solution by model inversion based on the stability of internal dynamics and two point boundary values with the MATLAB solver bvp5c
- result of off-line control is desired trajectory for online tracking

References

www.simtech.uni-stuttgart.de