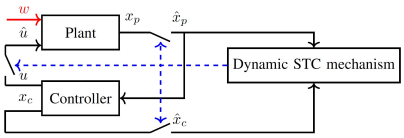
Universität Stuttgart
Institut für Systemtheorie und Regelungstechnik
Prof. Dr.–Ing. Frank Allgöwer

Open Thesis (MA)

Numerical integration for self-triggered control

Description:



When communication networks are involved in the feedback-loop, besides achieving guarantees for stability and performance, saving communication resources is an important goal of feedback control. Self-triggered control (STC) is a powerful approach to reduce the usage of communication resources whilst still guaranteeing a certain level of performance. In STC, the controller determines at each sampling instant based on sampled state information when the next sample should be taken, thus lowering the effort for monitoring the plant state. In this thesis, we want to leverage numerical integration techniques to develop new STC mechanisms. For that, explicit bounds on the error between real solutions and numerical approximations of solutions for the considered system need to be derived. Then, the goal of the thesis is to use the numerical approximations and error bounds to develop STC mechanisms with stability guarantees.

Prerequisites:

- Strong background in control theory
- Interest in theoretical problems
- Lectures: *Konzepte der Regelungstechnik*, *Nonlinear Control*

Supervisor:

Michael Hertneck
Room 3.240

Area:

Networked Control Systems

Properties:

Type: MA

Beginning:

at any time

Weitere Informationen: www.ist.uni-stuttgart.de/lehre/bama

Aushang vom 6. September 2023