

Ingenieurspraxis

GUI based Testbed/Demo for networked control systems

Networked control systems are feedback control loops communicating over communication networks. Their dynamics can be modeled in discrete time in a practical, digital setting.

The goal of this project to setup a graphical user interface (GUI) based testbed that emulates such applications, e.g., inverted pendulum, cruise control etc. The packets will be sent/received through a UDP socket. The real-time performance of the control application should be animated and illustrated nicely. For instance we should see a pendulum balancing on the monitor.

Example: <https://www.youtube.com/watch?v=qjhAAQexzLg>

Prerequisites

This work requires:

- Fundamentals of control theory (e.g. Regelungssysteme I in Bachelor EI)
- Fundamentals of communication systems (e.g. Kommunikationsnetze in Bachelor EI, Broadband Communication Networks in Master EI / MSCE)
- Experience in GUI programming preferably QT Gui with C++ (1st preference) or Python GUI (2nd preference)
- Experience in socket programming is an advantage but can be learned quite fast

Advisors

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