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Vortragsankündigung

Seminar Regelungssysteme LV 0430L654

Freitag, 17. Juli 2015, 10:30 Uhr
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“Distributed and Event-Based State Estimation”

Networks offer great opportunities for the design of controllers for future engineering systems, since they allow for easy and flexible exchange of data between different units. Yet, communication must be managed in order to avoid overload of the network. To address this problem, we have developed methods for event-based state estimation for networked dynamic systems, where multiple sensor-actuator-agents exchange data with each other over a shared bus. Solving the joint estimation problem, while at the same time saving communication resources, each agent transmits its local data only when required to meet a certain estimation performance. Different methods implementing this idea are discussed in this talk, with specific focus on the choice of the event triggering mechanism.

The event-based algorithms are demonstrated in experiments on the Balancing Cube, a two-meter-tall dynamic sculpture that can balance autonomously on any one of its corners through the action of six rotating arms. The arms constitute the agents of the networked and distributed control system. When combined with standard state-feedback controllers on each agent, the event-based estimation algorithms enable stabilization of the cube with a reduced network load and adaptive communication rates.