



# Einladung zum Oberseminar Dynamische Systeme und Kontrolltheorie

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### A Lyapunov Function Approach for Input-to-State Stability of Impulsive Switched Systems

joint work with Saeed Ahmed and Stephan Trenn (University of Groningen, The Netherlands)

Impulsive and switched systems are two important classes of hybrid dynamical systems. Impulsive systems combine continuous behavior (referred to by the “flow”) and abrupt state changes (jumps) and switched systems consist of a family of flows and a switching signal that determines which flow is active at any given time. Input-to-state stability (ISS) combines internal asymptotic stability of the system and robustness with respect to external perturbations and therefore is an essential characteristic of control systems.

In this talk, we propose a new technique to guarantee ISS of nonlinear control systems that exhibit both switching and impulsive dynamics. To this aim, we introduce time-varying ISS-Lyapunov functions along with mode-dependent dwell- and leave-time conditions. Moreover, we provide a technique to construct strictly decreasing ISS Lyapunov functions from non-decreasing ones.

Ort: Mathematik Ost, Seminarraum 01.003

Zeit: Freitag, 09.02.2024.2024 14:00

Zu diesem Vortrag laden wir Sie herzlich ein.

*gez. Sergey Dashkovskiy*