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# Einladung zum Vortrag

von Herrn Dr. Michael Schönlein (Universität Würzburg) zum Thema

# Ensemble reachability of parameter-dependent linear systems

am Dienstag, 20.11.2018, um 12:15 Uhr, in Raum (IM) SR 007

Abstract:

In this talk we consider parameter-dependent linear systems defined by a matrix pair $\big(A(\theta), B(\theta)\big)$ where the parameter $\theta$ is varying over a compact set in the plane. Ensemble reachability refers to the task of steering an entire family of initial states $x_0(\theta)$ in finite time arbitrarily close to a given family of desired terminal states $x^*(\theta)$ via a parameter-independent open-loop control input. In this case the pair $\big(A(\theta), B(\theta)\big)$ is called ensemble reachable. Using well-known characterizations of approximate controllability for systems in Banach spaces, ensemble reachability of $\big(A(\theta), B(\theta)\big)$ is equivalent to an infinite-dimensional extension of the Kalman rank condition. This condition, however, is not easy to check. This talk considers structural properties of ensemble reachable pairs and proves a decomposition theorem according to the spectra of the matrices $A(\theta)$. Based on this results together with results from complex approximation and functional analysis the talk presents necessary and sufficient conditions in terms of $\big(A(\theta), B(\theta)\big)$ for ensemble reachability for families of linear systems $\big(A(\theta), B(\theta)\big)$ defined on the Banach spaces of continuous functions and $L^q$-functions.