CONVITE À COMUNIDADE

A Coordenação do Programa de Pós-Graduação em Engenharia Elétrica UFSJ/CEFET-MG tem o prazer de convidar toda a comunidade para a sessão pública de apresentação e defesa da dissertação "STATE FEEDBACK CONTROL FOR LINEAR AND STATE POLYNOMIAL CONTINUOUS-TIME LPV SYSTEMS UNDER CONSTRAINTS".

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Abstract:

This work investigates new convex conditions to design robust and Linear Parameter Varying (LPV) gains for continuous time-varying systems subject to saturating actuator and energy bounded disturbances. The input-to-state stability conditions are used to design controllers ensuring the minimization of the L2-gain between the disturbance input and the controlled output. Furthermore, optimization procedures to maximize the estimate of the region of attraction, and the bound to the control signal as well, are formulated. By means of sum of squares (SOS) decomposition, this work is also concerned with the design of state-feedback controllers for LPV polynomial continuous-time systems. The vector field presents polynomial dependence on states. For both cases, the state-feedback gains designed depend on the filtered time-varying parameter. Additionally, when designing time-varying controllers for timevarying systems in real situations, the noise on the parameter measures may induce abrupt changes in the gain values and, consequently, in the control signal. Therefore, one may expect early damages on the actuator due to wear and fatigue. Hence, filtering the time-varying parameter and guaranteeing that the closed-loop filtered system is stable may produce state-feedback gains with smaller variance over time. The methods proposed consider the filtered parameter on the stabilization problems and, as an advantage over the existing literature, there is no need to know the bounds of the time-derivative of the parameter and such function does not need to be continuous. Convex conditions are also developed for the case when LPV polynomial continuous-time systems present input constraints. For all cases, the efficacy of the proposed methods is illustrated with numerical examples.

Key-words: Continuous time-varying systems. Saturating actuators. Inputto-state. Region of attraction. Sum of squares. Polynomial continuous-time systems.