計測自動制御学会中部支部主催
第１回 制御理論ワーキングセミナー

講師：Prof. Pramod P. Khargonekar（University of Florida）

題目：Stabilization and Output Regulation of Discrete-Time Switched Linear Systems

Abstract:

A switched system consists of a finite number of subsystems that are switched according to the time variation of the system's mode of operation. Such systems can be used to model complex hybrid systems, where continuous dynamics and discrete state transitions coexist and depend on each other, and arise in many different contexts such as nonlinear control, supervisory control, networked control, distributed networks, etc.

This talk consists of two parts. In the first part, we present a generalization of some of the most important system theoretic concepts to switched systems under constrained switching. We show that a stabilizing controller has to depend not only on the current state and mode pair but also to a certain number of past modes. This shows the limitation of the usual mode-dependent control approaches, and necessitates the need for path-dependent notions of detectability and stabilizability. We present new results on a generalization of the duality concept, path-dependent detectability and stabilizability concepts, and a separation principle for path-dependent dynamic output feedback stabilization.

The second part of the talk presents the extension of the stabilization results to output regulation problems such as the minimization of the peak output variance and the infinite-horizon linear quadratic Gaussian control. These two output regulation problems are connected via a receding-horizon control type problem, where the zero horizon length leads to the former and the limit as the horizon length approaches infinity yields the latter. We present exact linear matrix inequality based conditions for the output regulation performance problem. We will also discuss exact linear matrix inequality based synthesis conditions for suboptimal controllers. Finally, we discuss the computational complexity for optimizing the performance.

This talk is based on joint work with Dr. J.-W. Lee.

日時：6月11日（月）15：00～16：30

会場：名古屋大学　工学部　2号館　243講義室

参加費：無料

制御理論ワーキングセミナーを上記のように開催いたします．
関心をお持ちの方は、どなたでも自由に御参加ください．

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