KEXUE ZHANG, Queen's University

Hybrid Event-Triggered Stabilization of Time-Delay Systems

Event-triggered control strategies allow for updating the control inputs when an event, triggered by a certain event-triggering rule, occurs. The unpredictable sequence of event times is determined explicitly by the event-triggering rule. The event-triggering mechanism has the advantage of reducing the number of control input updates while still guaranteeing the underlying desired performance. Due to the advantages of event-triggered control in efficiency improvements and the significance of time-delay systems in modeling real-world phenomena, the study of event-triggered control strategies for time-delay systems is of great importance. There are two main challenges in this study. First, the control algorithms for delay-free systems cannot be applied to time-delay systems directly. Another challenge, which is also the main difficulty of this research, is to exclude Zeno behavior from the closed-loop control systems. In this talk, we will introduce an event-triggered control algorithm that is based on the Lyapunov-Razumikhin technique. However, Zeno behavior can be easily examined in a class of linear time-delay systems. Therefore, a hybrid event-triggered control and impulsive control mechanism will be proposed to rule out Zeno behavior. This is joint work with Bahman Gharesifard.