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Event-Triggered Control for an SIS Epidemic Model

In this talk, we will explore two control strategies, namely event-triggered feedback control and event-triggered impulse control, applied to an SIS epidemic model. In the event-triggered feedback control case, we construct a threshold to ensure the asymptotic stability of the disease-free equilibrium while maintaining the positivity of the proportion of infected individuals at all times. The control updates are triggered once the error between the proportion of infected individuals at the latest triggering time and the current proportion of infected individuals reaches that threshold. The update remains active and constant for a certain period of time before the next triggering instant is determined, and this control strategy operates continuously. The event-triggered impulse control case on the other hand, relies on a predefined threshold, aiming primarily at the convergence of the proportion of infected individuals toward the disease-free equilibrium. Control interventions are discrete and determined when the proportion of infected individuals reaches that threshold. Additionally, we analyze the effect of execution delays in both control strategies and demonstrate that in either control case, the controlled SIS system does not exhibit Zeno behavior.