Event-triggered control and observer design for infinite-dimensional systems

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We investigate event-triggered observer design for infinite-dimensional dynamical systems governed by partial differential equations.
We consider a class of linear systems for which a Luenberger-type observer is available and propose a dynamic event-triggering mechanism that determine when the control input should be updated.
Unlike approaches that rely on state-dependent triggering rules, our conditions are formulated using the observer state only, making them implementable in practice when full-state measurements are unavailable.
The dynamic rule incorporates an internal variable that provides additional flexibility in preventing event accumulation.
Under suitable assumptions, we prove exponential stability of the closed-loop system and we give sufficient conditions for the triggering times not to accumulate on finite-time horizon excluding Zeno behaviour.
Furthermore, the operator generating the system dynamics is not assumed to be skew-adjoint, which broadens the applicability of our approach to systems with quasi-dissipative or non-conservative behaviour.
Beyond the theoretical contribution, we mention how these results provide a natural and efficient tool for real-time state reconstruction and control of large-scale dynamical systems, in particular transportation networks.

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