Practical State Estimation With Event-Triggered Sliding Mode Observer

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PROBLEM DESCRIPTION

Continuous-time system with disturbance:

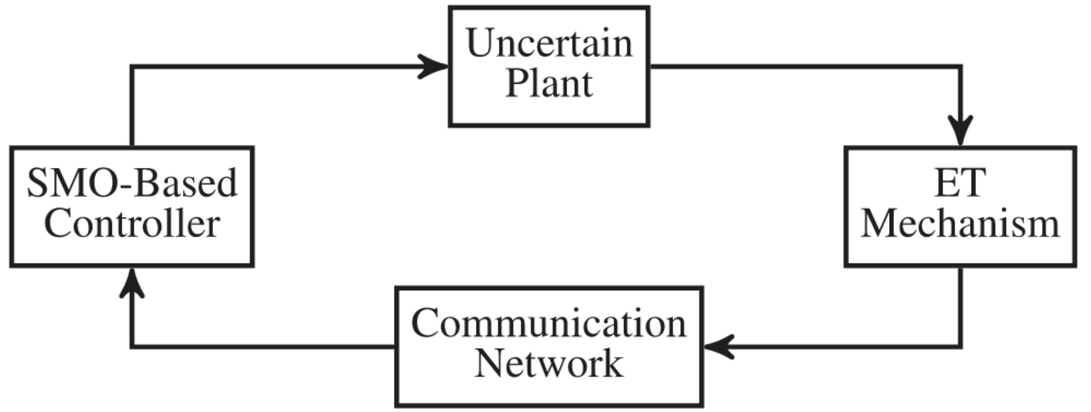
$$\dot{x} = Ax + B(u + d)$$
$$y = Cx$$

Assumption:

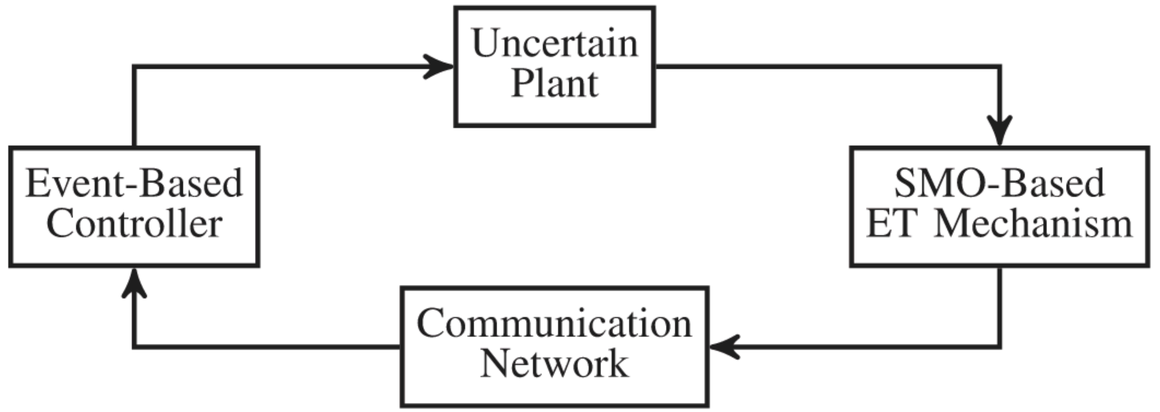
- $p > m$
- For some d_0 , $\|d(t)\| \leqslant d_0$ for all $t > 0$
- rank$(CB) = m$

Definition 1: Practical State Estimation

The observer $\dot{\hat{x}} = F(\hat{x}, y, u), \quad \hat{x}(0) \in \mathbb{R}^n$ is said to estimate the states practically if for any $\varepsilon > 0$, there exists a time $T \geq 0$ such that $\|x(t) - \hat{x}(t)\| \leqslant \varepsilon$ for all $t \geq T$.



(a) actuator side



(b) sensor side