Control based on Data-intensive Sensing
A Switched Systems Approach

On-line switching of data-processing methods: Speed versus Accuracy

- Decision-making after every interval $T_1$ based on optimal control
  - Option 1
  - Option 2

- Switching criterion: Ellipsoidal separation of state space


Embedded systems control design: Resource utilization versus Control performance

- Embedded control platform
- Resource limitations

- Resource-aware sampling scheme
- Periodically time-varying control design


Dealing with data loss: Switched systems approach to $(m,k)$-firmness

- Embedded multi-purpose platform
- Processor sharing can cause insufficient resources
- Deadline to compute new input signals
- Verification: At least $m$ without deadline miss every $k$ computations

$(m,k)$-firmness leads to constrained switched linear system (cSLS)
- Bounds on infinite horizon quadratic cost (for LQR design)
- Improvement: Controller redesign for each mode in automaton