Control with a non First-In/First-Out delay

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This talks focuses on a specific class of time-varying delays, which violates the First-In/First-Out (FIFO) principle, i.e., the delay D is such that $\dot{D}(t) \geq 1$ for some time instants and can jump. This means that the delayed signal can be reordered. We present the control challenges that arise in this context, and draw some perspectives of control design. Namely, in the case of an input-delay, we propose sufficient conditions of asymptotic stabilization using a prediction-based controller. The stability analysis grounds on a Partial Differential Equation representation of the delay and an extension of Halanay inequality in a hybrid framework.