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Michael Malisoff*, Department of Mathematics, 303 Lockett Hall, Louisiana State University, Baton Rouge, LA 70803-4918. *Stability and Robustness Analysis for Switched Systems with Time-Varying Delays.*

Switched systems in continuous time have discrete switching events that use a switching signal that indicates which continuous time subsystem operates at each instant. They are encountered in many applications, including communication networks. In addition, delays are frequently present in models describing engineering processes. The delays can be time-varying and discontinuous, especially for control over a network, where congestion and failures in links of the network can lead to sudden changes in the routing, causing the return trip time to change abruptly. This talk will discuss a new technique for the stability and robustness analysis of nonlinear switched time-varying systems in continuous time with uncertainties and time-varying delays. The delays are allowed to be discontinuous (but are required to be piecewise continuous) and arbitrarily long with known upper bounds. The technique uses an adaptation of Halanay's inequality and a trajectory based technique, and can be used to design switched controllers to stabilize linear time-varying systems with time-varying delays. This talk is based on the speaker's 2018 joint paper with Frederic Mazenc and Hitay Ozbay in SIAM Journal on Control and Optimization. (Received April 05, 2019)