Michael Malisoff (malisoff@[nospam]lsu.edu), Louisiana State University, Baton Rouge, LA, 70803-4918, *On Strict Lyapunov Functions for Discrete Time, Continuous Time, and Hybrid Time-Varying Systems* (103 Prescott Hall, Wednesday May 24th, 2:15-3:30).[1]

We review some recent results on the stability properties of a class of continuous time time-varying nonlinear systems. We assume that non-strict input-to-state stable (ISS) Lyapunov functions for our systems are given and posit a mild persistency of excitation condition on our given Lyapunov functions which guarantee the existence of strict ISS Lyapunov functions for our systems. Next, we provide simple direct constructions of explicit strict ISS Lyapunov functions for our systems by applying an integral smoothing method. We illustrate our constructions using a tracking problem for a rotating rigid body. We then illustrate how the results can be extended to discrete-time and hybrid time varying systems as well as systems with outputs. The material presented in this talk is based on the following papers:

[1] Malisoff, M., and F. Mazenc, "Further constructions of strict Lyapunov functions for time-varying systems," in *Proceedings of the American Control Conference (Portland, OR, 8-10 June 2005)*, Volume 3, pp. 1889-1894.

[2] Malisoff, M., and F. Mazenc, "Further remarks on strict input-to-state stable Lyapunov functions for time-varying systems," *Automatica*, Volume 41, Issue 11, November 2005, pp. 1973-1978.

[3] Malisoff, M., and F. Mazenc, "Constructions of strict Lyapunov functions for discrete time and hybrid time-varying systems," preprint.

Biographical Sketch. Michael Malisoff was born in the City of New York and received his B.S. degree summa cum laude in Economics and Mathematical Sciences from the State University of New York at Binghamton. He received the first place Student Best Paper Award plaque from the 38th IEEE Conference on Decision and Control in 1999. He earned his Ph.D. in Mathematics from Rutgers University in 2000 under the direction of Hector Sussmann and was a research associate at Washington University in Saint Louis. Since 2001, he has been an Assistant Professor and Associate Member of the Graduate Faculty in the Department of Mathematics at Louisiana State University in Baton Rouge. Together with Marcio de Queiroz and Peter Wolenski, he jointly organized the Louisiana Conference on Mathematical Control Theory (MCT'03) whose edited proceedings have been published in the Springer volume *Optimal Control, Stabilization, and Nonsmooth Analysis*. He has been the sole principal investigator on research grants from the Louisiana Board of Regents, the National Academy of Sciences, and the NSF including a 3-year NSF Mathematical Sciences Priority Area award. His has more than 30 technical publications in the areas of Lyapunov function theory, feedback stabilization, Hamilton-Jacobi equations, and optimal control.

[1] The [nospam] should be omitted when sending email. It was included here to avoid automatic "harvesting" by spam-list makers. This material is based upon work supported by the National Science Foundation under Grant No. 0424011. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.