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Michael Malisoff* (malisoff@lsu.edu), Department of Mathematics, 303 Lockett Hall,
Louisiana State University, Baton Rouge, LA 70803-4918. *Control and Robustness Analysis for
Curve Tracking with Unknown Control Gains.*

The adaptive control and parameter identification problem in robotic curve tracking involves designing a nonlinear controller that identifies the unknown model parameter and ensures that the robot moves parallel to, but a fixed positive distance from, the given curve. We show how this problem can be solved using a strict Lyapunov function. Our method makes it possible to prove robust tracking with respect to additive uncertainty on the control in terms of input-to-state stability, under a bound on the disturbance that maintains forward invariance of a class of invariant polygons. This work is joint with Fumin Zhang from Georgia Tech. (Received July 30, 2012)