

1112-93-588

Michael Malisoff* (malisoff@lsu.edu), Department of Mathematics, Louisiana State University, 303 Lockett Hall, Baton Rouge, LA 70803-4918. *Robustness of Adaptive Control under Time Delays for Three-Dimensional Curve Tracking.*

We study the robustness of a class of controllers that ensure three-dimensional curve tracking by a free moving particle. The free particle tracks a closest point on a curve. By constructing a strict Lyapunov function and a set of robustly forwardly invariant sets, we show input-to-state stability under predictable safety and tolerance bounds that ensure robustness under control uncertainty, input delays, and a set of polygonal state constraints. Our work ensures adaptive tracking and parameter identification when there are unknown control gains. This understanding can ensure that performance objectives are met, when the control laws are applied in real life systems. This is joint work with Fumin Zhang, and is based on our 2015 article in SIAM Journal on Control and Optimization. (Received August 11, 2015)