

Spring 2015 Seminar Series

Presented by the ECE Division

TRACKING CONTROL FOR NEUROMUSCULAR ELECTRICAL STIMULATION

MONDAY JANUARY 26, 2015

1:00 PM – HEC 101

We discuss a new tracking controller for neuromuscular electrical stimulation, which is an emerging technology that artificially stimulates skeletal muscles to help restore functionality to human limbs. The novelty of our work is that we prove that the tracking error globally asymptotically and locally exponentially converges to zero for any positive input delay, coupled with our ability to satisfy a state constraint imposed by the physical system.

Also, our controller only requires sampled measurements of the states instead of continuous measurements, and allows perturbed sampling schedules.

DR. MICHAEL MALISOFF
Louisiana State University



Michael Malisoff received his PhD in 2000 from the Department of Mathematics at Rutgers University in New Brunswick, NJ. His doctoral research was in optimal control. He was a DARPA Research Associate at Washington University in Saint Louis as part of the Joint Force Air Component Commander Project. In 2001, he joined the faculty of the Department of Mathematics at Louisiana State University in Baton Rouge, where he is now the Roy Paul Daniels Professor #3 in the College of Science. His main research has been on controller design and analysis for nonlinear control systems with time delays and uncertainty and their applications in engineering. One of his projects is joint with the Georgia Tech Savannah Robotics team, and helped develop marine robotic methods to help understand the environmental impacts of hazards such as oil spills. His more than 100 publications include a monograph on

constructive Lyapunov methods in the Springer Communications and Control Engineering Series. His awards include the First Place Student Best Paper Award at the 1999 IEEE Conference on Decision and Control, two three-year National Science Foundation Mathematical Sciences Priority Area grants, and 9 Best Presentation awards in American Control Conference sessions. He is an associate editor for IEEE Transactions on Automatic Control and for SIAM Journal on Control and Optimization.

Hosted by: Dr. Zhihua Qu

