Distinguished SYE Seminar Series

Department of Systems Engineering
香港城市大學
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A semiglobal control framework for input delay tolerance of nonlinear systems

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Abstract

This seminar presents some recent advances in the study of actuator/input delay tolerance of nonlinear control systems by revealing its intrinsic connection with digital computer control or sampled-data feedback.

In the first part of this talk, we focus on the problem of semiglobal input delay tolerance (SGIDT) under smooth feedback. A semiglobal control framework is introduced for the analysis/synthesis of input delay tolerance of nonlinear systems under smooth feedback. Using the converse Lyapunov theorem on global asymptotic local exponential stability, together with Razumikhin theorem, we prove that: 1) GALES implies the SGIDT of nonlinear systems under smooth state feedback; 2) GALES and uniform observability imply the SGIDT of MIMO nonlinear systems under smooth output feedback.

About the Speaker

Wei Lin received the D.Sc. and M.S. degrees in Systems Science and Mathematics from Washington University, St. Louis, in 1993 and 1991. He also received the B.S. and M.S. degrees in Electrical Engineering from Dalian University of Technology (1983) and Huazhong University of Science and Technology (1986), respectively. During 1986 to 1989, he was a Lecturer in the Dept. of Mathematics at Fudan University, Shanghai, China. From 1994 to 1995, he was a Post-doctor and then Visiting Assistant Professor in Washington University. Since spring of 1996, he has been a Professor in the Dept. of Electrical, Computer, and Systems Engineering at Case Western Reserve University, Cleveland, Ohio. He has also held visiting positions at several universities in North America, Europe and Asia. Dr. Lin's research interests include nonlinear control, dynamic systems with time-delay, homogeneous systems theory, estimation and adaptive control, stochastic control and stochastic stability, under-actuated mechanical systems and robotics, power systems, renewable energy and smart grids. In these areas, he has published a number of papers in peer refereed journals and conferences. More details can be found at https://engineering.case.edu/research/labs/nonlinear-control-systems/about

Dr. Lin was a recipient of the U.S. NSF CAREER Award, the Warren E. Rupp Endowed Professor, the Robert Herbold Faculty Fellow Award, the JSPS Fellow and IEEE Fellow. He served as an Associate Editor of the IEEE Trans. on Automatic Control (1999-2002), an Associate Editor of Automatica (2003-2005), a Guest Editor of TAC Special Issue on "New Directions in Nonlinear Control" (2003), a Subject Editor of Int. J. of Robust and Nonlinear Control (2005-2010), an Associate Editor of Journal of Control Theory and Applications (2005-2008), Board of Governors of IEEE Control Systems Society (2003-2005), and Vice Program Chair of 2001 IEEE CDC (Short Papers)and 2002 IEEE CDC (Invited Papers). He has also been a Plenary Speakerin IFAC and IEEE conferences including the 7th IFAC Symposium on Nonlinear Control Systems, 2007.

Enquiry: 3442 8422 | All are welcome