

学术报告会

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New developments in nonlinear control design and applications: a homogeneous perspective

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Abstract:

In the past, to design controllers for nonlinear systems, the intrinsic nonlinear structures are often ignored or destroyed by linearization or feedback linearization methods. However, these controllers, including PID controllers and even some nonlinear controllers based on feedback linearization, are no longer adequate to accommodate the increasing requirement for improved performances and enlarged operating regions of modern nonlinear control systems. This talk sketches recent progresses in developing genuine nonlinear approach for controller design based on homogeneous system theory. In addition, these talk shows that the new controllers can ensure enhanced performance, improved efficiency, and enlarged safe operating range for several practical systems found in the real world.

Biography:

Dr. Chunjiang Qian received his B.S. and M.S degrees in Control Theory from Fudan University in 1992 and 1994 respectively, and the Ph.D. degree in Electrical Engineering from Case Western Reserve University, 2001. Since August 2001, he has been with the Department of Electrical and Computer Engineering, University of Texas at San Antonio, where he is currently a Mary Lou Clarke Endowed Distinguished Professor and serving as the Department Chair. His current research interests include robust and adaptive control, nonlinear system theory, optimal control, network control system, power plant control, and biomedical applications. In those areas, so far he has published one monograph and more than 170 papers. Dr. Qian is a recipient of 2003 U.S. National Science Foundation (NSF) CAREER Award and one of the inaugural recipients of the University of Texas System Regents' Outstanding Teaching Award in 2009. He received the 3rd Best Paper Award in the ISA (International Society of Automation) Power Industry Division Symposium (2011) and the Best Poster Paper Award in the 3rd IFAC International Conference on Intelligent Control and Automation Science (2013). He currently serves as an Associate Editor for Automatica and a Subject Editor for International Journal of Robust and Nonlinear Control.