
Electrical & Computer Engineering
S E M I N A R
Louisiana State University

**Real-Time Digital Controller Design
for Networked Control Systems**

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Abstract—This presentation will focus on the real-time digital controller design for Networked Control System (NCS). NCSs are spatially distributed systems in which communications between sensors, actuators and controllers are realized through a shared digital communication network. Networked control can effectively reduce wiring, and achieve low installation cost, ease of maintenance, and flexibility in reconfiguration. Its advantages are further demonstrated with the ever increasing complexity of control system structures. For the real-time networked control system, a serious challenge is the inevitable and unpredictable delay and data loss due to shared communication channel, which may degrade the performance or even destabilize the system. So far, research efforts are mainly within single loop systems. For multiple interconnected systems over shared communication channels that work together in a distributed fashion towards common goals, the controller design methodologies to achieve satisfied performances under real-time conditions have not been fully explored. This research is to integrate control theory, mathematical modeling, embedded system, and cybernetics together to obtain a physical implementation for various applications involving cyber-physical system, power system, etc.

Bio—Yongpeng Zhang received his BS degree in Automatic Control from Xi'an University of Technology in 1994, MS degree in Automation from Tianjin University in 1999, and PhD degree in Electrical Engineering from University of Houston in 2003. After one year post-doctoral research, he was appointed as the Tenure-Track Assistant Professor in Engineering Technology Dept at Prairie View A&M University in 2004 Fall, where he received promotion as the Tenured Associate Professor from 2010 Fall. His research interests include control system, mechatronics, motor drive, power electronics, and real-time embedded system design. As the Principal Investigator for multiple grants sponsored by US Army Research Office, NSF, and industry (Emerson, 3M), his accumulated research funding has been 1 million US dollars.

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Where: Room 117 EE Building

Info: <http://www.ece.lsu.edu/seminar>

