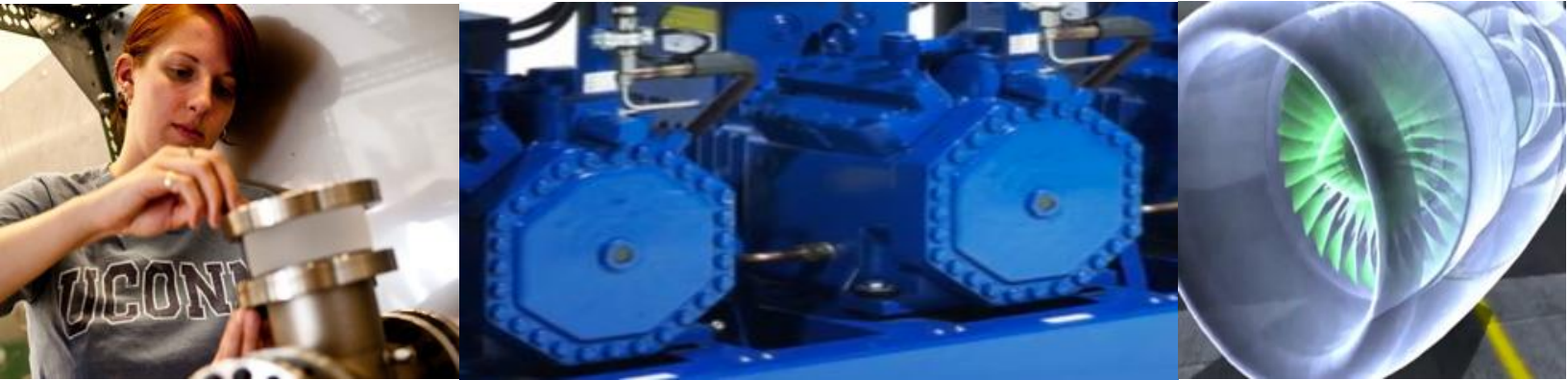# UTC Institute for Advanced Systems Engineering
Seminar Series

Dr. Daniel M. Liberzon
University of Illinois at Urbana-Champaign

AN INTRODUCTION TO SWITCHING ADAPTIVE CONTROL

July 21st & 22nd, 2014   1 – 2:30 p.m.   Storrs Campus, Ryan 204

Abstract: These two tutorial lectures will address the problem of controlling systems with large modeling uncertainty by means of switching adaptive control. The design methodology to be described employs a family of candidate controllers supervised by a high-level switching logic. Techniques for constructing such controller families and switching logics will be discussed. We will also draw comparisons with more conventional adaptive control which relies on continuous tuning, emphasizing how switching and logic can be used to overcome some of the limitations of traditional adaptive control. The ideas will be illustrated with specific examples. The first lecture will present the basic design concepts, and the second lecture will fill in some analysis details. Based on joint work with Joao Hespanha and A. Stephen Morse.

Speaker Bio: Daniel Liberzon was born in the former Soviet Union in 1973. He did his undergraduate studies in the Department of Mechanics and Mathematics at Moscow State University from 1989 to 1993. In 1993 he moved to the United States to pursue graduate studies in mathematics at Brandeis University, where he received the Ph.D. degree in 1998 (supervised by Prof. Roger W. Brockett of Harvard University). Following a postdoctoral position in the Department of Electrical Engineering at Yale University from 1998 to 2000 (with Prof. A. Stephen Morse), he joined the University of Illinois at Urbana-Champaign, where he is now a professor in the Electrical and Computer Engineering Department and the Coordinated Science Laboratory. His research interests include nonlinear control theory, switched and hybrid dynamical systems, control with limited information, and uncertain and stochastic systems. He is the author of the books "Switching in Systems and Control" (Birkhauser, 2003) and "Calculus of Variations and Optimal Control Theory: A Concise Introduction" (Princeton Univ. Press, 2012). His work has received several recognitions, including the 2002 IFAC Young Author Prize and the 2007 Donald P. Eckman Award. He delivered a plenary lecture at the 2008 American Control Conference. He has served as Associate Editor for the journals IEEE Transactions on Automatic Control and Mathematics of Control, Signals, and Systems. He is a Fellow of IEEE.