The 36th Chinese Control Conference
Pre-conference Workshop 1

Speaker： **Andrew R. Teel,** University of California Santa Barbara

Title： Hybrid and stochastic hybrid systems

Biography: **Andrew R. Teel** received the A.B. degree in engineering sciences from Dartmouth College, Hanover, NH, in 1987, and the M.S. and Ph.D. degrees in electrical engineering from the University of California, Berkeley, in 1989 and 1992, respectively.

He then became a postdoctoral fellow at the Ecole des Mines de Paris, Fontainebleau, France. In 1992, he joined the faculty of the Electrical Engineering Department, University of Minnesota, where he was an Assistant Professor until 1997. Subsequently, he joined the faculty of the Electrical and Computer Engineering Department, University of California, Santa Barbara, where he is currently a Professor. His research interests are in nonlinear and hybrid dynamical systems, with a focus on stability analysis and control design.

Dr. Teel received the NSF Research Initiation and CAREER Awards, the 1998 IEEE Leon K. Kirchmayer Prize Paper Award, the 1998 George S. Axel by Outstanding Paper Award, and was the recipient of the first SIAM Control and Systems Theory Prize in 1998. He was the recipient of the 1999 Donald P. Eckman Award and the 2001 O. Hugo Schuck Best Paper Award, both given by the American Automatic Control Council, and also received the 2010 IEEE Control Systems Magazine Outstanding Paper Award. He is an Editor-in-Chief for Automatica, and a Fellow of IFAC.

Abstract: In this workshop, we will present the basics of modeling for hybrid dynamical systems, including also a modeling framework for stochastic hybrid systems. Several examples will be used to illustrate the modeling framework. After modeling, we turn our attention to stability properties that are natural for hybrid systems. In turn, Lyapunov function conditions for these stability properties will also be established and illustrated. These conditions include weak Lyapunov conditions based on the invariance principle, which can be shown to hold for hybrid systems. Converse Lyapunov theorems will also be reviewed to make the case that Lyapunov functions are natural for hybrid systems. The objective of the workshop is to provide researchers with a modeling framework and analysis tools that they can use for a wide variety of control problems.