



2013 Spring Physics Colloquium Series

John M. Davis, Ph.D.

Professor, Department of Mathematics
Baylor University

Stability and Control of Hybrid Systems

Hybrid systems are a class of dynamical systems which generalize differential equations on \mathbb{R} and finite difference equations on \mathbb{Z} . As such, they have attracted the attention of pure mathematicians aiming to explain why the continuous and discrete theories coalesce in certain places while diverging in others. Meanwhile, applied mathematicians and engineers are leveraging this new paradigm to give robust solutions to real-world problems that had eluded the standard theories.

In particular, we will explore questions about the stability and control of hybrid systems via Lyapunov theory and linear matrix inequalities involving appropriate Lyapunov operators. We use analytic, geometric, and Lie algebraic techniques to accomplish this. Along the way, we will see that the hybrid systems approach naturally reveals the interplay between discrete and continuous models. We conclude with examples of previously intractable modern adaptive control problems that are fairly straightforward to solve using this new approach.

Wednesday, March 27, 2013

4:00 p.m.

Room E.125, Baylor Sciences Building

Reception at 3:40 p.m. in BSB D.311

For more information contact:

Dr. Anzhong Wang 254- 710- 2276