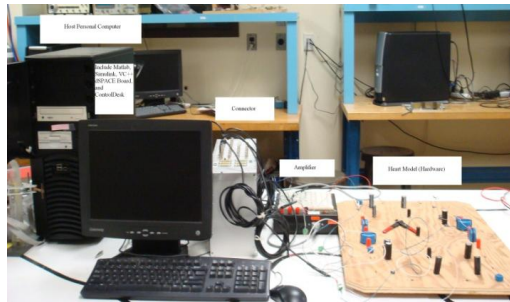


# Mechanical Engineering Colloquium

Fall 2010 Semester

1pm Wednesday November 3<sup>rd</sup>

Room 224 Mechanical Engineering Center



## Dr. Meng- Sang Chew

Mechanical Engineering – Lehigh University

### “Adaptive Control of a Model of an Artificial Heart - Theory and Experiment”

#### **Abstract:**

Applications of mathematical and physical analog models of total artificial heart (TAH) play a significant role in simulating human cardiovascular system. Instead of a hydraulic model, an inexpensive, compact and simple electrical circuit consisting of resistances, capacitances, inductances and diodes has been constructed, using parametric values that are transformed from hydraulic models.

Based on the electrical analog, heart rate control and pressure control to the adaptive control of the artificial heart model has been developed. The dSPACE hardware and Simulink provide the means for modeling the controller in software and then applying it to the actual hardware via a digital signal processing board. A comparison between the simulation results and dSPACE-based actual hardware results agree reasonably well.

**Dr. Meng-Sang Chew** specializes in the areas of Design of Advanced Mechanical Machinery and Systems. He received his BS, MS, MPH and PhD from Columbia University in New York City. Upon graduation he worked for GM Research Laboratories for over six years. He then was at Dominion University before joining the mechanical engineering faculty at Lehigh University in 1992. Currently a holder of four US patents and one European patent, he has published over eighty articles in various professional publications and technical journals.