



## SYSTEMS, CONTROLS, AND ROBOTICS SEMINAR SERIES



### **Dr. Shankar Bhattacharyya**

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Wednesday, September 11, 2013  
4:00 p.m. / 100 Harrington Education Classroom Center

### **Linear Systems: A New Measurement-Based Approach to Analysis, Synthesis and Design**

#### **ABSTRACT**

In this talk we describe a new approach to the analysis, synthesis and design of linear systems. We show that the problem of designing one or more new elements in an otherwise unknown linear system can be solved by taking a small number of measurements and processing them strategically to extract the design variables directly without constructing a model of the system. This basic result is a generalization and extension of Thevenin's Theorem (1843) of classical circuit theory. It is applied to DC and AC circuits, Mechanical, Chemical and Civil Engineering and to Control Systems. The result is a new approach to design that is potentially an attractive alternative to the traditional model based approach of Engineering Design. Some fundamental research areas related to this idea will be discussed in the talk.

#### **BIO**

Prof. S.P. Bhattacharyya is internationally renowned for his fundamental contributions to Control Theory. These include the solution of the multivariable servomechanism problem, robust and unknown input observers, pole assignment algorithms, robust stability under parametric uncertainty, fragility of high order controllers and modern PID control. He has coauthored 8 books and over 250 papers in the Control field. His current research focus is on model-free approaches to Engineering Design, the topic of this lecture.

Dr. Bhattacharyya is the Robert M. Kennedy Professor of Electrical Engineering at Texas A&M University. He is an IEEE Fellow, an IFAC Fellow and an elected Foreign Member of the Academia Brasileira de Ciencias. He received his B.Tech degree from IIT Bombay in 1967, and Ph.D degree from Rice University in 1971 under the supervision of the late Prof. J.B. Pearson.

Refreshments will be served at 4:00 p.m.