

School of Electronics, Electrical Engineering and Computer Science
Distinguished Scholar's Lecture

by

Professor Kumpati S. Narendra

Director of the Centre for Systems Science at Yale University

entitled

Adaptive Control Using Multiple Models
- A new approach -

Abstract

Adaptive control theory was first developed in the 1960s to deal with the control of linear time-invariant systems with unknown parameters. A large body of literature currently exists in this area. However, in numerous applications when the parameter errors are large, the adaptive methods result in large and oscillatory responses.

During the past twenty years, numerous approaches have been proposed to improve the speed, accuracy, and robustness of the response by using multiple models along with “switching” and “switching and tuning”. Both approaches involve numerous models and very little information provided by all the models is used in the generation of control laws.

The lecture will discuss a new approach in which all the models cooperate in the decision process. The advantages of the new approach make it particularly attractive for use in situations where the uncertainties are large and/or the parameters vary rapidly with time. The lecture will conclude with brief descriptions of several practical applications.

Location

Old Staff Common Room, Lanyon Building, Queen's University Belfast.

Time & Date

Friday 22 February 2013, at 5.00 pm. Tea/Coffee available from 4.30.

Everyone welcome!

Bio-sketch of the speaker

Kumpati S. Narendra is currently the Harold W. Cheel Professor of Electrical Engineering and the Director of the Centre for Systems Science at Yale University.

Education and Professional History:

Professor Narendra received the Ph.D. degree from Harvard University in 1959. From 1961 to 1965 he was an Assistant Professor at Harvard. In 1965, he joined the Department of Engineering and Applied Science at Yale, and was made Professor in 1968. From 1984 to 1987 he was the Chairman of the Electrical Engineering Department, and from 1995 to 1996 he was the Director of the Neuroengineering and Neuroscience Centre at Yale University. In 1995, his alma mater in India, the University of Madras (now Anna University) conferred on him an honorary Doctor of Science degree. In 2007 he received an honorary Doctor of Science degree from the National University of Ireland at Maynooth.

Research, Teaching, and Related Activities:

Professor Narendra is the author of over 250 technical articles in systems theory. He is the author of three books and the editor of four others in the areas of stability theory, adaptive control and learning automata. He has served on various national and international committees, and has been a consultant for over 15 industrial research laboratories (including Sikorsky Aircraft, General Motors, and AT&T) during the past 50 years. During this period, 47 doctoral students and over 35 postdoctoral and visiting fellows have done research under his guidance.

Honors and Awards:

Professor Narendra has received numerous honours for his work. They include the Franklin V. Taylor Memorial Award of the IEEE, Systems, Man, and Cybernetics Society (1972), the George S. Axelby Best Paper Award of the Control Systems Society (1987), the John R. Ragazzini Education Award of the American Automatic Control Council (AACC) (1990), The IEEE Neural Network Council Best Paper Award (1991), The Bode Prize of the IEEE Control Systems Society (1995), and the Richard E. Bellman Control Heritage Award of the AACC, "... for Pioneering Contributions to Stability theory, and Adaptive and Learning theory" in 2003. In 2007, he received a Walton Fellowship of the Science Foundation of Ireland, and in 2008 he was awarded the Neural Networks Pioneer Award of the International Computational Intelligence Society.

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