Professor Tamer Başar
University of Illinois

Bode Lecture: Games, Decisions, and Control:
Fifty Years Back, Fifty Years Forward

Friday, December 17
11:00 am – 12:00 noon
Atlantis Grand Ballroom D

Fifty years ago, when *control* was emerging as a scientific discipline fueled by developments in dynamic recursive decision making, dynamical systems, and stability theory, a separate discipline, *differential games*, was being born in response to the need to develop a framework and associated solution tools for strategic dynamic decision making in adversarial environments. The evolution of the two disciplines—control theory, and particularly optimal control, and the theory of differential games, as an outgrowth of game theory—initially followed somewhat different paths, but soon a healthy interaction between the two developed. Differential games, in both *zero-sum* and *nonzero-sum* settings, enabled the embedding of control into a broader picture and framework, and enriched the set of conceptual tools available to it. One of its essential ingredients—information structures (*who knows what and when*)—became a mainstay in control research, particularly in the context of large-scale systems. In the other direction, the rich set of mathematical tools developed for control, such as viscosity solutions, directly impacted progress in solvability of differential games. Such interactions between the two disciplines reached a climax when robustness became a prevailing issue in control, leading among others to a comprehensive treatment of $H^\Box$ control of both linear and nonlinear uncertain systems.

This Bode Lecture will dwell on the parallel developments in the two fields to the extent they have influenced each other over the past half century, talk about the present, and project into the future.

Tamer Başar is the Fredric G. and Elizabeth H. Nearing Professor of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign (UIUC). He received the B.S.E.E. from Robert College, Istanbul, in 1969, and M.S., M.Phil, and Ph.D. degrees from Yale University, during 1970-1972. After stints at Harvard University and Marmara Research Institute (Gebze, Turkey), he joined UIUC in 1981, where he has been since then with the ECE Department and the Coordinated Science Laboratory. He has authored or co-authored over 400 publications (including two books and several edited volumes) in the general areas of systems, control, dynamic games, information theory, communication systems and networks, and mathematical economics. He was elected Fellow of IEEE in 1983, and served Control Systems Society in various capacities, including: President (2000), Editor for Technical Notes and Correspondence for TAC (1992-1994), and General Chair (1992) and Program Chair (1989) of CDC. He is currently the Editor-in-Chief of *Automatica*; Editor of two Birkhäuser Series, in *Systems & Control and Dynamic Games*; and member of editorial and advisory boards of several international journals in control, wireless networks, and applied mathematics. Among some of the recent honors and awards he has received are: Tau Beta Pi Drucker Eminent Faculty Award of UIUC (2004), election to the National Academy of Engineering (2000), IEEE Millennium Medal (2000), Axelby Outstanding Paper Award (1995) and Distinguished Member Award (1993) of CSS, and Medal of Science of Turkey (1993). He will also receive the Quazza Medal of IFAC in 2005. His current research interests are in routing, pricing, and congestion control for communication networks; control over wired and wireless networks; mobile computing; and robust and risk-sensitive estimation and control.