



**The Center for Control, Dynamical Systems, and Computation
University of California at Santa Barbara
Winter 2008 Seminar Series
Presents**

Approximation of large-scale dynamical systems

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Friday, February 15, 2008 3:00-4:00pm Harold Frank Hall 1104

Abstract:

In many applications one is faced with the task of simulating or controlling complex dynamical systems. Such applications include for instance, weather prediction, VLSI chip design, electromagnetics, molecular dynamics, computational fluid dynamics, and in general problems described by sets of partial differential equations. In all these cases complexity manifests itself as the number of first order (ordinary) differential equations which arise. For the above examples, depending on the level of modeling detail required, complexity may range anywhere from a few thousand to a few million first order equations, and above. Simulating (controlling) systems of such complexity becomes a challenging problem, irrespective of the computational resources available.

In this talk we will first briefly describe some motivating examples; we will then define the problem in mathematical terms and sketch several methodologies for its solution. The talk will conclude with some recent results, case studies and open problems.

About the Speaker:

Thanos Antoulas was born in Athens, Greece, and studied at the ETH Zurich. He is a Professor at the Department of Electrical and Computer Engineering, Rice University. He also holds an appointment with the recently founded Jacobs University Bremen. He is an IEEE Fellow, and has traveled widely. His research interests focus on dynamical systems and computation, especially model reduction. He is the author of the recent book "Approximation of large-scale systems" published by SIAM, and is an Editor-in-Chief of Systems and Control Letters.
