Joint Seminar

Systems Engineering Seminar
Department of Electrical and Computer Engineering and Computer Science
College of Engineering

Seminar Series
Department of Quantitative Analysis and Operations Management
College of Business

University of Cincinnati

"Pricing American-Style Derivatives via Monte Carlo Simulation"

Michael C. Fu

Department of Decision and Information Technologies, Robert H. Smith School of Business; Institute for Systems Research (joint appointment); Department of Electrical and Computer Engineering (affiliate faculty)

University of Maryland

Friday, March 14, 2003
12:30 p.m.
111 Lindner Hall

A number of Monte Carlo simulation-based approaches have been proposed within the past decade to address the problem of pricing American-style financial derivatives, which are contracts that allow early exercise. We have proposed an approach that parameterizes the early exercise curve and casts the valuation problem as an optimization problem of maximizing the expected payoff (under the martingale measure) with respect to the associated parameters, the optimization problem carried out using a gradient-based stochastic approximation algorithm. We focus on the stochastic gradient estimation problem, and report on numerical results for the algorithm in pricing a number of different types of options.

Michael C. Fu is a Professor in the Robert H. Smith School of Business, with a joint appointment in the Institute for Systems Research and an affiliate faculty position in the Department of Electrical and Computer Engineering, all at the University of Maryland. He received degrees in mathematics and EE/CS from MIT, and a Ph.D. in applied mathematics from Harvard University. His research interests include simulation and applied probability modeling, particularly with applications towards manufacturing systems and financial engineering. He teaches courses in applied probability, stochastic processes, simulation, computational finance, and supply chain/operations management. He is co-author (with J.Q. Hu) of the book, *Conditional Monte Carlo: Gradient Estimation and Optimization Applications*, which received the INFORMS College on Simulation Outstanding Publication Award in 1998. Other awards include the University of Maryland Institute for Systems Research 2002 Outstanding Systems Engineering Faculty Award, 1999 IIE Operations Research Division Award, a 1999 *Operations Research* Meritorious Service Award, and a 1998 *IIE Transactions* Best Paper Award. He is currently the Simulation Area Editor of *Operations Research*, and serves (or has recently served) on the editorial boards of *Management Science*, *INFORMS Journal on Computing*, *IIE Transactions*, and *Production and Operations Management*. He is also Guest co-Editor of an upcoming special issue on simulation optimization for the *ACM Transactions on Modeling and Computer Simulation*.