

**MECHANICAL ENGINEERING DEPARTMENT
ME/ISyE 8773-8774**

**A Model Reference Adaptive Search Method for Global Optimization
(joint work with Jiaqiao Hu and Steven Marcus)**

by

Dr. Michael Fu

**Ralph J. Tyser Professor of Management Science
Department of Decision, Operations, & Information Technologies
Robert H. Smith School of Business
and Institute for Systems Research
University of Maryland
College Park, MD 20742-1815
www.rhsmith.umd.edu/faculty/mfu/fu.htm**

**Wednesday, April 23, 2008
3:15 p.m. — Refreshments before the seminar
3:30 p.m. — Graduate Seminar
Room 1130 ME**

ABSTRACT — Model Reference Adaptive Search (MRAS) is a randomized search method for solving global optimization problems. The method works with a parameterized probabilistic model on the solution space and generates at each iteration a group of candidate solutions. These candidate solutions are then used to update the parameters associated with the probabilistic model in such a way that the future search will be biased toward the region containing high quality solutions. The parameter updating procedure in MRAS is guided by a sequence of implicit probabilistic models called reference models. We describe a particular algorithm instantiation of the MRAS method, where the sequence of reference models can be viewed as the generalized probability distribution models for estimation of distribution algorithms (EDAs) with proportional selection scheme. In addition, we show that the model reference framework can also be used to describe the recently proposed cross-entropy (CE) method for optimization and study its properties. We prove global convergence of the proposed algorithm in both continuous and combinatorial domains, and carry out numerical studies to illustrate the performance of the algorithm.

BIO — **Michael C. Fu** is Ralph J. Tyser Professor of Management Science in the Robert H. Smith School of Business, with a joint appointment in the Institute for Systems Research and affiliate faculty appointment in the Department of Electrical and Computer Engineering, at the University of Maryland, College Park. 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 optimization and applied probability, with applications in supply chain management and financial engineering. He has published over 100 articles in refereed journals and conference proceedings, and four books. He currently serves as Stochastic Models and Simulation Department Editor for *Management Science*, and is a Fellow of INFORMS and IEEE.

Informal Faculty Luncheon: Wednesday, April 23, 2008, 12:00 noon. Meet in 1100 ME and walk to the Campus Club with other faculty. Prof. Michael Fu will be able to attend. Faculty Host is Prof. William Cooper