



## DO&IT Seminar Series

**Speaker:** Zelda Zabinsky, Professor, Industrial Engineering  
University of Washington, Seattle WA

**Date:** Friday, October 17, 2008

**Time:** 11-12 noon

**Location:** VMH 1206

**Title:** **Stochastic Adaptive Search for Global Optimization: Theory and Applications**

**Abstract:** Random search methods, including simulated annealing and genetic algorithms, are popular search methods for solving global optimization problems with no known structure to the function. While random search methods are relatively easy to implement, their performance is difficult to analyze. Theoretical results on a family of stochastic adaptive search methods, including pure adaptive search, hesitant adaptive search and annealing adaptive search are presented to gain understanding of the convergence of stochastic adaptive search methods. The theoretical analysis has also prompted development of specific algorithms that have been applied to engineering design problems. This optimization approach was used in the preliminary design of the new 787 Boeing composite airplane.

**Bio:** Dr. Zelda B. Zabinsky is a Professor in Industrial Engineering at the University of Washington. She has published numerous papers in the areas of global optimization, algorithm complexity, and optimal design of composite structures. Her book, *Stochastic Adaptive Search in Global Optimization*, 2003, describes research on theory and practice of algorithms useful for solving problems with multimodal objective functions in high dimension. The National Science Foundation (NSF), NASA-Langley, FAA, and the Boeing Commercial Airplane Company have funded her research, as well as local industries including Microsoft, Genie, Solectron and the Port of Tacoma. She has participated in developing software currently in use at Boeing to aid engineers in optimizing the design of fuselage panels made of advanced composite materials. She has also performed research on optimization of air traffic flow management, supply chain, and disaster management, where the objective function is not only multimodal, but incorporates probabilistic effects as well. Other application areas include transportation, forestry, health care, structural optimization and manufacturing. Professor Zabinsky is currently on the editorial board of the *Journal of Global Optimization*. She teaches courses in Operations Research and has received the annual teaching award in Industrial Engineering at the University of Washington several times.