

# **Industrial Engineering Seminar Announcement**

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## **“Random Search for Global Optimization: Theory and Applications”**

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. Typically the objective function is a "black box" and may be nonconvex with many local optima, nondifferentiable, and possibly discontinuous. Both continuous and discrete variables may be included in the problem. An application in engineering design of composites structures for aircraft fuselage will be discussed, which falls into this category of global optimization problems.

While random search methods are relatively easy to implement, their performance is difficult to analyze. This talk will present theoretical results on a family of stochastic adaptive search methods, including pure adaptive search, hesitant adaptive search, adaptive search, and most recently backtracking adaptive search to gain understanding of the convergence of adaptive random search techniques. The theoretical analysis has also prompted specific algorithms, Improving Hit-and-Run and Hide-and-Seek, which have been applied to engineering design problems. Specifically, Improving Hit-and-Run has been successfully used to solve engineering structural design problems with composite materials, including the composite structures for a crown panel, keel, and window belt of aircraft fuselage.

**Tuesday, February 11, 2003  
12:30-1:20  
235 Mechanical Engineering Building**