



## Bernard Sarchet Graduate Seminar Series



**Dr. Zelda Zabinsky,**  
Professor  
Industrial & Systems Engineering  
University of Washington, Seattle

### On Beyond LP: Optimization of Complex Systems

**Wednesday, November 18<sup>th</sup>**  
**12:00 - 12:50 pm (CST)**  
**in Room 260 Toomey\* & via WebEx**

**Abstract:** *Many engineers designing a complex system would like to optimize its performance, and perform trade-off studies to better understand the impact of decisions. The complex systems are often modeled with functions that are non-linear, non-convex, multimodal, discontinuous and available only through computer programs. They may involve continuous and integer variables. In this talk, I will summarize some theoretical results regarding performance of random search algorithms, and discuss a new meta-control methodology that adaptively guides an interacting-particle algorithm with a filtering technique. Numerical results will be presented demonstrating how the meta-control methodology dynamically heats and cools a temperature parameter based on observed behavior of the algorithm to achieve desired performance characteristics (e.g., quality of the final outcome, algorithm running time, etc.). An application in engineering design of composites structures for aircraft fuselage, such as the new 787 Boeing composite aircraft, will be mentioned.*

**Bio:** *Dr. Zelda B. Zabinsky is a Professor in Industrial and Systems Engineering at the University of Washington, with adjunct appointments in the departments of Electrical Engineering, Mechanical Engineering, and Civil and Environmental Engineering. She is an IIE Fellow, and active in INFORMS, serving as General Chair for the INFORMS Annual Meeting held in Seattle in 2007. Her book, Stochastic Adaptive Search in Global Optimization, describes research on theory and practice of algorithms useful for solving problems with multimodal objective functions in high dimension. The National Science Foundation (NSF), Department of Homeland Security, NASA-Langley, Federal Aviation Administration (FAA), Boeing Commercial Airplane Company, Microsoft and the Port of Tacoma have funded her research. Professor Zabinsky is currently on the editorial board of the Journal of Global Optimization, and a board member of the Pacific Institute of Mathematical Sciences (PIMS). She teaches courses in Operations Research and has received the annual teaching award in IE at the University of Washington several times.*

*\* No food or drink is allowed in this room.*