

On Beyond LP: Optimization of Complex Systems

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Abstract: Many engineering applications would like to optimize the performance of their underlying complex system, and perform trade-off studies to better understand the impact of decisions. The decision makers may also wish to capture uncertainty in the system and consider multiple objectives. The complex systems are often modeled with functions that are available only through computer programs, or discrete-event simulations. They may involve continuous and integer variables. This talk uses three problems, optimal design of composite structures, supplier selection, and air traffic flow management, to illustrate the synergy between real-world problems, modeling, optimization theory and algorithms.

Bio: *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. She has published numerous journal articles, and 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*. She teaches courses in Operations Research and has received the annual teaching award in IE at the University of Washington several times.