

Global Optimization of Complex Systems

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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 black-box functions that are available only through computer programs. They may involve continuous and integer variables. I will present our algorithm called Probabilistic Branch and Bound (PBnB) for level set approximation, that can be applied to general mixed-integer problems, with noisy functions. I will discuss some new analyses on the finite-time behavior of quantile adaptive search, and the impact of dimension of the problem. I will mention several applications of complex systems that I have worked on.

Biosketch:

Dr. Zelda B. Zabinsky is a Professor in Industrial and Systems Engineering (ISE) 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 has published numerous journal articles. Her book, *Stochastic Adaptive Search in Global Optimization*, describes research on theory and practice of algorithms useful for solving problems with multi-modal 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 ISE at the University of Washington several times.