

A Global Perspective on Optimization

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Abstract: Optimization is a fundamental tool that has been used for many purposes, from strategic policy planning to last-mile distribution to optimal control of dynamical systems. There are also many algorithms to solve optimization problems. Typically, optimization algorithms are specialized for categories of formulations, such as real-valued decision variables versus discrete (integer-valued) variables, or deterministic versus probabilistic, or dynamic versus static. This restricts the scope of applications, since many realistic problems require mixtures of categories, and need flexible algorithms. We must recognize that there is a synergy between the formulation of the optimization model and the choice of algorithm. This talk takes a global perspective on optimization, and discusses commonalities and unifying concepts between algorithms and formulations. Several examples are used to illustrate the synergy between real-world problems, modeling, optimization theory and algorithms.

Bio: Dr. Zelda B. Zabinsky is a Professor in the Department of 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 INFORMS Fellow and an IIE Fellow. Professor Zabinsky has published numerous papers in theory and applications of global optimization and a book, *Stochastic Adaptive Search in Global Optimization*. Her research has been funded by the National Science Foundation (NSF), NASA-Langley, Federal Aviation Administration (FAA), and the Office of Naval Research (ONR), as well as local industries including Boeing Commercial Airplane Company, Microsoft, and the Port of Tacoma. She has applications in engineering design, supply chain, healthcare, power systems with renewable resources, air traffic flow management, and communication scheduling of nano-satellites. Professor Zabinsky is currently on the editorial board of the Journal of Global Optimization, and has been a board member for the Pacific Institute of Mathematical Sciences (PIMS) and the Women in Engineering (WIE) Initiative. She teaches courses in Operations Research and has received the annual teaching award in Industrial Engineering at the University of Washington several times.