

NORTH CAROLINA STATE UNIVERSITY

**OPERATIONS RESEARCH PROGRAM
SEMINAR SERIES**

**April 1st, 2024
4:30PM-5:45PM**

In-Person: 4290 Fitts-Woolard Hall

[Zoom](#) details – bottom of page

Dr. Zelda Zabinsky

**Professor Emeritus,
Industrial & Systems Engineering at
University of Washington
zelda@uw.edu**

Title

Insights into Scalable Black-box Global Optimization

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. Today, optimization algorithms are addressing large-scale problems, with millions of variables that have complex interactions. Machine learning is creating models from huge data sets and large numbers of model parameters and hyper-parameters. How is this possible? A key issue is how to dynamically allocate computational effort efficiently in the search for the global optimum. This talk will provide some insights into how to adapt sampling distributions to achieve desirable performance in high dimensions. It will summarize finite-time analyses of adaptive random search methods to shed some light on important features of scalable algorithms. New results on the use of partitioning the domain to address heterogeneity of the response with the use of surrogate modeling, e.g., Gaussian processes, will be presented. The finite-time analyses provide an interpretation of the balance between exploration and exploitation while maintaining scalable algorithms.

Biography



Dr. Zelda Zabinsky

Zelda B. Zabinsky is an Emeritus Professor in Industrial & Systems Engineering at the University of Washington. She has held adjunct appointments in the departments of Mechanical Engineering, Electrical & Computer Engineering, and Civil & Environmental Engineering. She is fellow of both the Institute for Operations Research and the Management Sciences (INFORMS) and the Institute of Industrial and Systems Engineers (IISE). She has published numerous papers in theory and applications of global optimization. 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), NASA-Langley, Federal Aviation Administration (FAA), the Department of Homeland Security, and the Office of Naval Research (ONR) have funded her research, as well as local industries including Boeing Commercial Airplane Company, Microsoft, and the Port of Tacoma. Her research has been applied to engineering design, supply chain, healthcare, power systems with renewable resources, air traffic flow management, and communication scheduling. Professor Zabinsky is on the editorial board of the *Journal of Global Optimization*, and has been a board member of the Pacific Institute of Mathematical Sciences (PIMS) and the Women in Engineering (WIE) Initiative. She has received the annual teaching award in Industrial Engineering at the University of Washington several times.

Join via Zoom Meeting

Join Zoom Meeting

<https://ncsu.zoom.us/j/97198402775?pwd=dGN3ZDdlbm1obXNXMTEzUkJlcEILdz09>

Meeting ID: 971 9840 2775

Passcode: 557407