



Operations Research Seminar

Choosing Parameters in Sample-Path Optimization and Root Finding

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14:50-15:15 Refreshment outside GL-239
15:15-16:15 Seminar at GL-115

The Stochastic Root-Finding Problem (SRFP) is that of finding a zero of a vector-valued function known only through a stochastic simulation. The Simulation-Optimization Problem (SOP) is that of locating a real-valued function's minimum, again with only a stochastic simulation that generates function estimates. Owing to their flexibility, both of these problems have recently gained enormous expediency amongst researchers and practitioners in wide ranging fields. Sample-average approximation (SAA) methods—methods that generate an approximate deterministic problem using a “large enough” sample size and solve it to “adequate” tolerance—are currently amongst the most attractive methods of solving SRFPs and SOPs. In this talk, we answer the question of how to choose sample sizes and error tolerances within SAA algorithms. Specifically, we characterize a class of parameter sequences that are superior to others in a certain precisely defined sense. We also identify and recommend members of this class with a view toward providing more rigor and guidance to existing ad hoc ways of choosing algorithm parameters. We provide a numerical example illustrating the key results.

Raghu Pasupathy received his Bachelor's degree in the Indian Institute of Technology, Chennai, India in 1995, worked in the private industry between 1996 and 1999 performing vehicular-traffic simulation/optimization, and obtained a Ph.D. in Operations Research from Purdue University in 2005. He has been an assistant professor in the Industrial and Systems Engineering department at Virginia Tech since August 2005. His research interests are in general simulation methodology, with a focus on stochastic optimization and random vector generation. (The Office of Naval Research and the National Science Foundation have funded much of his ongoing research.) Raghu Pasupathy's publications appear in various journals including Operations Research, INFORMS Journal on Computing, and ACM TOMACS. He is the recipient of numerous awards including the 2008 INFORMS JFIG best paper prize, and multiple teaching awards in Virginia Tech and Purdue University. His current editorial appointments include associate editorship at ACM TOMACS and newsletter/communications editorship at I-Sim.