THE UNIVERSITY OF CHICAGO

Departments of Computer Science, Mathematics, Statistics, and the Computation Institute

SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

STEFAN WILD

Laboratory for Advanced Numerical Simulations

Argonne National Laboratory

Beyond the Black Box in Simulation-Based Optimization

THURSDAY, January 9, 2014, at 4:30 PM

Eckhart 133, 5734 S. University Avenue

ABSTRACT

The advent of computational science has unveiled large classes of nonlinear optimization problems where derivatives of the objective and/or constraints are unavailable. Often, these problems are posed as black-box optimization problems, but rarely is this by necessity. In this talk, we report on our experience extracting additional structure on problems consisting of both black-box and algebraic or otherwise known components. We provide examples on nonlinear least squares/calibration problems and knowing derivatives of some nonlinear constraints or with respect to a subset of the decision variables. In each case, we use quadratic surrogates to model both the black-box and algebraic components to obtain new grey-box optimization methods.

Bio:

Stefan Wild is an Assistant Computational Mathematician in the Mathematics and Computer Science Division at Argonne National Laboratory and a Fellow in the Computation Institute at the University of Chicago. Prior to his current appointment, he was an Argonne Director's Postdoctoral Fellow and a DOE Computational Science Graduate Fellow at Cornell University. He obtained his Ph.D. in operations research from Cornell University and B.S. and M.S. degrees in applied mathematics from the University of Colorado-Boulder. His primary research focus is on algorithms and software for challenging numerical optimization problems.

Organizers:

Lek-Heng Lim, Department of Statistics, lekheng@galton.uchicago.edu,

Ridgway Scott, Departments of Computer Science and Mathematics, ridg@cs.uchicago.edu,

Jonathan Weare, Department of Statistics and The James Franck Institute, weare@uchicago.edu.

SSC Seminar URL: `http://www.stat.uchicago.edu/seminars/SSC_seminars.shtml`

If you wish to subscribe to our email list, please visit the following website:
`https://lists.uchicago.edu/web/arc/statseminars.`