SMU Lyle School of Engineering

Operations Research and Engineering Management
Seminar Series

Research Seminar

The ARPA-E Grid Optimization Competition

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Abstract
In recent years, the US Advanced Research Projects Agency-Energy (ARPA-E) has been organizing the "Grid Optimization Competition." To participate, teams from academia and industry submitted computer program implementations of specialized algorithms for solving large realistic Security-Constrained Optimal Power Flow (SCOPF) problems. The performance of the solvers was tested and ranked independently by the organizers, using large-scale real-life instances. The goal of SCOPF is the determination of the most cost-efficient operation of an electrical power grid in a such way that it can withstand contingencies in the form of outages of

any its components. Mathematically, this is an extremely large-scale two-stage nonlinear and nonconvex optimization problem. In this presentation, the approach of several teams will be described, including that of our own GO-SNIP team that placed second in the first challenge.

Biography

Andreas Wächter is a Professor in the Department of Industrial Engineering and Management Sciences at Northwestern University. His research interests include the design, analysis, implementation, and application of numerical algorithms for nonlinear continuous and mixed-integer optimization, scientific computing, power systems, and sustainability. He obtained his master's degree in Mathematics at the University of Cologne, Germany, and this Ph.D. in Chemical Engineering at Carnegie Mellon University. Before joining Northwestern University in 2011, he was a Research Staff Member in the Department of Mathematical Sciences at IBM Research in Yorktown Heights, NY. He is a recipient of the 2011 Wilkinson Prize for Numerical Software and the 2009 Informs Computing Society Prize for his work on the open-source optimization package Ipopt.