Large-Scale Optimization in Energy Applications

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LECTURE ABSTRACT

Optimization models and algorithms have been applied to a wide range of applications in energy and power systems. During the recent years of grid modernization, optimization models get larger and more complex. Security constrained optimal power flow (SCOPF) and security constrained unit commitment (SCUC) are two well-known optimization problems in power systems and they are typically large-scale problems. This talk will cover some recent developments in solving these two problems. I will briefly discuss the Grid Optimization Competition which is an ongoing prized competition for solving SCOPF. The emphasis of this talk will be on solving security constrained unit commitment problem. HIPPO project is funded by ARPA-E and aims to speed up the solution times for solving the SCUC in the RTO's day-ahead market. I will share some insights on solving SCUC problem and introduce several algorithmic approaches including a HPC based concurrent optimizer.

SPEAKER BIOSKETCH

Dr. Feng Pan joined Pacific Northwest National Laboratory in 2014 and is a computational scientist in the Optimization and Control Group in the Energy and Environmental Directorate. His current focus is on applying operations research techniques to solve energy and national security applications. He is leading two major projects, High Performance Power grid Optimization Project (HIPPO) and the ARPA-E Grid Optimization (GO) Competition. He has worked with National Security Directorate on several projects where developed mathematical optimization and network models in critical infrastructure and cyber security applications. Before joining PNNL, he worked at Los Alamos National Laboratory in 2003-2014 as a Scientist and Project Leader on research projects in stochastic and network optimization and on various applications in smart grid and national security.