ABSTRACT:

The increasing interconnectedness of electric power systems provides both opportunities in improving economics and challenges to maintaining reliability. Recent advances in semidefinite optimization techniques provide promising avenues for addressing these opportunities and challenges. The ability to obtain a globally optimal solution to semidefinite optimization problems provides an advantage over existing techniques, which are only guaranteed to find local solutions.

This seminar discusses two applications of semidefinite optimization techniques to topics in electric power systems. The first application contributes to power system economics with a semidefinite relaxation of the optimal power flow problem that is capable of providing a globally optimal system dispatch. The second application contributes to power system reliability with a sufficient condition for power flow insolvability that yields a voltage stability margin to the power flow solvability boundary.

Biography of Daniel Molzahn

Daniel Molzahn received the B.S. and M.S. degrees in Electrical Engineering and the Masters of Public Affairs degree in 2008, 2010, and 2012, respectively, all from the University of Wisconsin-Madison, where he is currently a candidate for the Ph.D. degree in Electrical Engineering. His research interests are in application of optimization techniques and policy analysis to electric power systems.

The public is invited