



**CLEAN ENERGY
INSTITUTE**

UNIVERSITY of WASHINGTON

Interdisciplinary Seminar Series Lecture: The Ups and Downs of Umbrella Constraint Discovery in Electricity Generation

Recent work on umbrella constraint discovery (UCD) has shown great promise in streamlining the solution of security-constrained optimal power flow (SCOPF) problems. The solution of the UCD problem itself is not trivial, however. In this talk, we present a significant, yet simple, improvement to the decomposition approach used to solve UCD. This improvement exploits the inherent structure of the parent SCOPF problem. Moreover, given the promising results from UCD-SCOPF, we have moved on to apply UCD to the solution of the classic thermal unit commitment problem with the hope that it could identify strong branching and time decoupling opportunities. We prove that, unlike SCOPF, the unit commitment problem does not have a favorable structure for which UCD can be effective. From these experiences, we can draw conclusions on the desirable features of mathematical programs for which UCD can be most effective, and we make recommendations for other important electricity generation planning problems.

Thursday, February 6

4:00 – 5:00 PM

**Physics/Astronomy
Auditorium (PAA) A110**

**Reception will take place in PAA
at 3:30 PM prior to start of lecture**



François Bouffard

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François Bouffard received the B.Eng. (Hon.) and the Ph.D. degrees in electrical engineering from McGill University, Montreal, QC, Canada, in 2000 and 2006, respectively. In 2006, he took up a lectureship with the School of Electrical and Electronic Engineering at The University of Manchester, Manchester, U.K. In 2010, he joined McGill University as an Assistant Professor. He is a member of McGill's Trottier Institute for Sustainability in Engineering and Design as well as of GERAD, a Montreal-based research center focusing on operations research and decision analysis. His research interests are in the fields of power system economics, reliability, control and optimization. His current research looks at computational streamlining of large-scale power system optimization problems, analytical and statistical techniques for demand response modeling, control and valuation and the engineering of low-carbon power system operation and planning. Dr. Bouffard is a licensed engineer in the province of Quebec, Canada, and a member of the IEEE Power & Energy Society. He is an Editor of the IEEE Transactions on Power Systems and of the IEEE Power Engineering Letters, and chairs the System Economics Subcommittee of the IEEE Power & Energy Society.