

## Séminaire

Le lundi 8 février 2021, 13h

\*Le séminaire se déroulera en anglais.\*

## Seminar

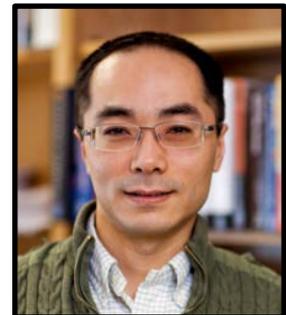
Monday, February 8, 2021, 1 p.m.

### Electricity-gas interdependency for enhancing energy sustainability and security

Lei Wu, Stevens Institute of Technology

**Abstract:** Electricity grid and natural gas network are two essential infrastructure systems in the U.S. energy sector, which have been traditionally operated and controlled rather independently. With a deeper penetration of renewable energy and other advanced smart grid technologies, these two energy systems have been coupled rather tightly. Given the critical role of combined-cycle gas turbines (CCGT) in today's power system operations as well as their tight dependence on the gas network, this talk will discuss several issues related to the secure and economic operation of interdependent natural gas-electricity systems for facilitating a deeper penetration of volatile renewable energy: (i) a hybrid CCGT model to accurately reflect their physical operation features and enhance their operation flexibilities in practice; (ii) a method to accurately identify and rank vulnerable components of interdependent natural gas-electricity systems; (iii) a co-optimization scheduling model of interdependent natural gas-electricity systems while considering heterogeneous uncertainties as well as physical limitations of electricity and gas networks.

**Bio:** Lei Wu is a Professor at Stevens Institute of Technology. His current research involves optimization and statistical analysis applied to electric power system operations and electricity markets, the public policy and technical issues associated with electricity transmission and distribution under market restructuring, the economic implications of integration of renewables, and the co-optimization of critical interdependent infrastructures. He is the recipient of the NSF CAREER Award in 2013, the IBM Smarter Planet Faculty Innovation Award in 2011, and the 2020 Jess H. Davis Memorial Award for Research Excellence at Stevens. He has a demonstrated track record in completing research and development projects funded by agencies such as the DOE and NSF, including \$5M+ funds from DOE, NSF, NYSERDA, and the industry on the design and development of community microgrids and distributed renewable resource integration and \$2M+ funds from DOE on augmenting operational flexibility of hydro resources.



TOP-SET est un programme de formation FONCER du CRSNG en puissance optoélectronique ayant pour but de façonner une cohorte de personnel hautement qualifié détenant des connaissances approfondies en systèmes optoélectroniques pour joindre les rangs d'équipes de recherche et développement.

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