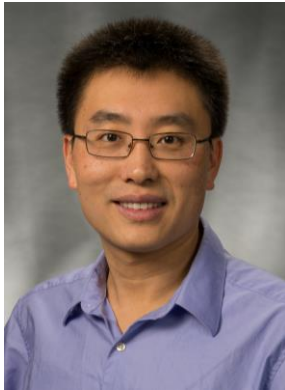


# Advanced Power System Operations with Uncertain Wind Power

Jianhui Wang  
Argonne National Laboratory

The increasing penetration of wind power into power systems has posed a significant challenge to power system operations. This talk will present various related research activities at Argonne National Laboratory. Advanced wind power forecasting techniques and their applications in electricity markets will be discussed first. Then a security-constrained unit commitment algorithm is proposed to capture the uncertainty and variability of wind power by scenario while maintaining the reliability of the system. A Bender decomposition based algorithm is used to solve the optimization problem. I will also discuss the application of chance-constrained programming in integrating large amounts of wind power into power system operations.



*Dr. Wang is an energy system engineer at Argonne National Laboratory. He is the chair of the IEEE Power & Energy Society (PES) Power System Operation Methods Subcommittee and co-chair of an IEEE task force on integrating wind and solar power into power system operations. He has authored/co-authored more than 100 journal and conference publications. He is an editor of the IEEE Transactions on Power Systems, IEEE Transactions on Smart Grid, Journal of Energy Engineering, IEEE PES Letters and Applied Energy. He is also the recipient of the IEEE Chicago Section 2012 Outstanding Young Engineer Award and an affiliate professor at Auburn University.*