



學術報告

Data Analytics for Wind Energy Integration: Spatio-Temporal Wind Power Analysis and Stochastic Optimization



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Biography: Lei Yang received the B.S. and M.S. degrees from Southeast University, respectively, and the Ph.D. degree from the School of Electrical Computer and Energy Engineering at Arizona State University. He is currently an Assistant Professor in the Department of Computer Science and Engineering, University of Nevada, Reno. He was a postdoctoral scholar at Princeton University, Princeton, NJ, USA, and an Assistant Research Professor with the School of Electrical Computer and Energy Engineering at Arizona State University. He has received the Best Paper Award Runner-up of IEEE INFOCOM 2014.

With the increasing penetration of wind into bulk power systems, wind generation has posed a significant challenge to system operators due to the highly variable wind generation. In this talk, short-term forecast of wind farm generation is investigated by applying spatio-temporal analysis to extensive measurement data. To capture the wind ramp dynamics, SVM is employed, based on one key observation from the measurement data that wind ramps always occur with specific patterns. Then, the forecast by the SVM is integrated into each finite-state Markov chain. The distributional forecast can be utilized to study stochastic unit commitment and economic dispatch problems by using a Markovian approach. Numerical test results demonstrate the significant improved accuracy of the proposed forecast approach.