



Power Systems Engineering Research Center

Robust Transmission Planning under Uncertain Generation Investment and Retirement

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2:00-3:00 p.m. Eastern Time (11:00-12:00 p.m. Pacific)

Description: We present a new robust optimization model for transmission planning. This model considers the addition of new renewable generation and the retirement of existing generation capacity as sources of uncertainty, anticipates for each transmission plan the worst scenario that would result in the highest investment and operational cost, and identifies the most robust transmission plan with the least costly worst case scenario. We demonstrate this approach with a case study on the WECC 240-bus test system. Using an efficient algorithm that we invented, we were able to consider an astronomical number (10^{49}) of scenarios, representing different possible combinations of what/when/where/how much new generators could emerge and existing ones could retire, and identify the optimal solution among three trillion possible transmission expansion plans. Results will be illustrated with novel quantification and visualization techniques.

Biography: Lizhi Wang is an Associate Professor in the Department of Industrial and Manufacturing Systems Engineering at Iowa State University. He received his Ph.D. in 2007 in Industrial Engineering from the University of Pittsburgh. Wang's research interests include bilevel optimization algorithm design, power systems modeling and analysis, transportation system resiliency assessment and enhancement, manufacturing supply chain design, and plant breeding.