

Electric Power and Power Electronics Institute

[SPECIAL SEMINAR]

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HIGH-DIMENSIONAL DATA ANALYTICS OF PMU MEASUREMENTS BY EXPLOITING LOW-DIMENSIONAL MODELS

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Abstract

The increasingly denser coverage of phasor measurement units (PMUs) enables dynamic visibility into power systems. The large amounts of data obtained by PMUs impose significant challenges to data management and information extraction. Interestingly, the spatial-temporal blocks of PMU data exhibit low-dimensional structures despite the high ambient dimensions. Such low-dimensionality can be exploited to enable and simplify multiple PMU data analysis tasks under the same framework.

In this talk, I will describe some examples of exploiting the low-dimensional structure for PMU data management. Specifically, I will talk about the recovery of missing PMU data, the detection of cyber data attacks, as well as our recent progress on PMU data privacy enhancement. Our proposed approaches have analytical performance guarantees and are evaluated on recorded PMU datasets.

Biography

Dr. Meng Wang is currently an assistant professor in the Department of Electrical, Computer, and Systems Engineering at Rensselaer Polytechnic Institute. She obtained her PhD degree in Electrical and Computer Engineering from Cornell University in August 2012. She was a postdoc research scholar at Duke University before she joined RPI in Spring 2013. She obtained her BS and MS degrees in Electrical Engineering from Tsinghua University in 2005 and 2007 respectively. Her current research focus is high-dimensional data analysis and its application in power system monitoring. Her boarder research interests include signal processing, optimization and networked systems.