

# Meng Wu

Web: <http://www.public.asu.edu/~mengwu1/>

Email: [mwu@asu.edu](mailto:mwu@asu.edu)

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## EDUCATION

- Texas A&M University**, College Station, TX 2013-2017  
*Doctor of Philosophy*, Electrical and Computer Engineering, GPA: 4.0/4.0
- **Advisor:** Professor Le Xie
  - **Research Focus:** Integrating Synchrophasor Data and Renewable Energy in Modern Power Systems.
- Cornell University**, Ithaca, NY 2010-2011  
*Master of Engineering*, Electrical and Computer Engineering
- **Master Project:** Distribution Network Reconfiguration for Loss Reduction: A Novel Solution Methodology using Particle Swarm Optimization.
- Tianjin University**, Tianjin, P.R. China 2006-2010  
*Bachelor of Engineering*, Electrical Engineering and Automation
- The University of Hong Kong**, Hong Kong, P.R. China 2008-2009  
*Undergraduate Exchange Study*, Electrical and Electronic Engineering

## RESEARCH EXPERIENCE

- Texas A&M University**, College Station, TX
- **Power Flow Solution Boundary in High-Dimensional Space** 2016-present
    - Working on numerical methods to explore high-dimensional power flow solution boundaries.
    - The current method is based on dynamic programming and computational meshing.
  - **Data-Driven Bad Data Detection for Synchrophasors** 2014-2016
    - Propose an online data-driven algorithm to identify low-quality PMU data.
    - The algorithm leverages spatio-temporal correlations among normal/fault-on/low-quality data.
    - The algorithm involves no knowledge on network parameters/topology.
    - The algorithm works properly under normal/fault-on operating conditions.
    - The computational speed is fast enough for real-time applications.
  - **Analysis of Wind Farm Sub-synchronous Oscillations** 2013-2014
    - Investigates the impact of wind farm spatial distribution and shunt compensation levels on triggering power system sub-synchronous oscillations.
    - Study the coupling relationship among wind turbines via quantitative analysis on system eigenvalue sensitivities with respect to system parameters and operating conditions.
  - **Direct Initialization for DFIG-based Wind Turbines** 2013-2014
    - Provide closed-form solution to the initialization of full-order DFIG-based wind generation model.
    - The approach supports lossy DFIG back-to-back converters and nonzero reactive power delivery through DFIG grid-side converter.
    - The non-iterative approach can calculate steady-state operating conditions of DFIG-based wind turbine models.
    - The approach can initialize DFIG-based wind turbine models for electro-magnetic simulations.

## INDUSTRY EXPERIENCE

**Business Architecture & Technology Department, ISO New England, Holyoke, MA**  
*Research Intern* May. 2016 - Aug. 2016

- **Automation and Verification of Synchrophasor-based Generator Model Validation**
  - Propose an initialization method for generator model validation process.
  - Design and develop software for batch generator model validation.
  - Study the verification criteria for generator model validation results.
  - The software works well for all the eligible generators in New England power grid.

**R&D Center, Beijing Sifang Automation Co. Ltd., Beijing, P.R. China**  
*Research Engineer* May. 2012 - Jun. 2013

- **Enhanced Power System State Estimation (Project Manager)**
  - Lead and monitor the overall R&D process of the project.
  - Design and develop a C++ library for bad data detection algorithm.
  - The software works well at both 1209-bus system of Northeast China Power Grid and 2048-bus system of South China Power Grid.
- **Power System Static Contingency Analysis (System Engineer)**
  - Design the overall structure of the software product.
  - Design and develop C++ software for power system static N-1 analysis.
  - The software works well at 1209-bus system of Northeast China Power Grid.
- **PMU-Based Online Generator Inertia Estimation (System Engineer)**
  - Provide the overall technical solutions to the project.
  - Prepare the funding proposal and technical bidding documents for the project.
  - The software works well at Jiangsu Province Power Grid.
- **Modeling of Generation Excitation Systems (R&D Engineer)**
  - Design and develop C++ libraries for generator excitation system models.
  - Simulation accuracies of the models are comparable with commercial transient stability software.
- **Generator Parameter Estimation Using PMU Data (R&D Engineer)**
  - Develop C++ software for online generator parameter estimation.
  - The software works well at North China Power Grid.

**Power System Department, China Electric Power Research Institute, Beijing, P.R. China**  
*Research Engineer* Jul. 2011 - May. 2012

- **Power System Corrective Voltage Control (R&D Engineer)**
  - Design and develop C++/Matlab study tools for power system static voltage stability assessment.
- **Power System Static Stability Analysis (R&D Engineer)**
  - Developed a novel power system static stability index.

## TEACHING EXPERIENCE

**Texas A&M University, College Station, TX**  
*Graduate Teaching Fellow (ECEN-689 Data Science in Power Systems)* Fall 2015

- Involve in developing this brand-new course.
- Prepare part of the lecture notes.
- Teach part of the lectures.

*Teaching Assistant (ECEN-614 Power System State Estimation)* Fall 2014

- Design homework problems and solutions, exam problems and solutions.
- Teach tutorial sessions on power system basis and power flow analysis.

## MENTORING EXPERIENCE

- Texas A&M University**, College Station, TX  
*Graduate Advisor (ECEN-403 Senior Design Team Project)* 2015-2016
- Provide general and technical guidance to a senior design team of three students.
  - Monitor the project progress through weekly team meetings.
- China Electric Power Research Institute**, Beijing, China  
*Industry Advisor (Master Thesis of Beijing Jiaotong University)* 2011-2012
- Provide research guidance to the master thesis of a graduate student.
  - Supervise the internship progress of the graduate student at China EPRI.

## PUBLICATIONS

- [1] **Meng Wu**, and Le Xie. Calculating Steady-State Operating Conditions for DFIG-Based Wind Turbines. Submitted to *IEEE Transactions on Sustainable Energy*. Accepted, to appear.
- [2] **Meng Wu**, Weihong Huang, “Frankie” Qiang Zhang, Xiaochuan Luo, Slava Maslennikov, and Eugene Litvinov. Power Plant Model Verification at ISO New England. *2017 IEEE PES General Meeting*, Chicago, IL. Accepted, to appear.
- [3] **Meng Wu**, and Le Xie. Online Detection of False Data Injection Attacks to Synchrophasor Measurements: A Data-Driven Approach. *2017 50th Hawaii International Conference on System Sciences (HICSS)*. Accepted, to appear.
- [4] **Meng Wu**, and Le Xie. Online Detection of Low-Quality Synchrophasor Measurements: A Data-Driven Approach. *IEEE Transactions on Power Systems*. vol. 32, no. 4, pp. 2817-2827, July 2017.
- [5] **Meng Wu**, and Le Xie. Online Identification of Bad Synchrophasor Measurements via Spatio-Temporal Correlations. *2016 Power Systems Computation Conference (PSCC)*. Genoa, Italy. Jun. 2016.
- [6] **Meng Wu**, Le Xie, Lin Cheng, and Rongfu Sun. A Study on the Impact of Wind Farm Spatial Distribution on Power System Sub-synchronous Oscillations. *IEEE Transactions on Power Systems*. 31(3), pp. 2154-2162, May 2016.
- [7] **Meng Wu**, Rongfu Sun, Lin Cheng, and Le Xie. Parameter Sensitivity Analysis for Sub-Synchronous Control Interactions in Wind-Integrated Power Systems. *CIGRE Grid of the Future Symposium*. Houston, TX. Oct. 2014.
- [8] Shiyong Ma, Daowei Liu, **Meng Wu**, Hongfu Wang, Yifeng Dong, Yi Wang, and Zhiqiang Zhang. An Online Quantitative Evaluation Method of Power System Transient Stability Situation Based on WAMS and Generator Pair. *Power System Technology*. 37(5), pp. 1323-1328, May 2013 (in Chinese).
- [9] Daowei Liu, Xueshan Han, Ming Yang, **Meng Wu**, Hongfu Wang, and Yifeng Dong. Applied Criterion of Power System Static Stability Based on Comprehensive Parameters Sensitivity Technique. *Proceedings of the Chinese Society for Electrical Engineering*, vol. 32(7), pp. 91-100, Mar. 2012 (in Chinese).
- [10] **Meng Wu**, Yeting Wang, and Yingtao Wang. A Singular Value Sensitivity Approach for Corrective Voltage Control. Accepted to *2012 International Conference on Power Systems Technology*.

## PRESENTATIONS & INVITED TALKS

- **Meng Wu**, Yang Chen, Le Xie, and P.R. Kumar. PMU Streaming Data Dimensionality Reduction and Anomaly Detection. *2016 Workshop on Architecture and Economics of the Future Grid*, College Station, TX. Nov. 2016.
- **Meng Wu**, Online Bad Data Detection for Synchrophasor Measurements: A Data-driven Approach. *Guest Lecture for ECEN-614 (Fall 2016): Power System State Estimation*, Department of Electrical & Computer Engineering, Texas A&M University, College Station, TX. Oct. 2016.

- **Meng Wu**, Hung-Ming Chow, Xinbo Geng, Sadegh Modarresi, Benjamin Wiseman, and Po-Chen Chen. Discussion Panel: Internship Experiences. *Electric Power and Power Electronics Institute (EPPEI) Weekly Seminar Series - Fall 2016*, Department of Electrical & Computer Engineering, Texas A&M University, College Station, TX. Oct. 2016.
- **Meng Wu**, and Le Xie. Online Bad Data Detection for Synchrophasor Measurements: A Data-driven Approach. *2016 IEEE PES General Meeting*, Boston, MA. Jul. 2016.
- **Meng Wu**, and Le Xie. Online Identification of Bad Synchrophasor Measurements via Spatio-Temporal Correlations. *2016 Power Systems Computation Conference (PSCC)*, Genoa, Italy. Jun. 2016.
- **Meng Wu**, and Le Xie. Online Bad Data Detection for Synchrophasor Systems via Spatio-temporal Correlations. *2016 International Synchrophasor Symposium*, Atlanta, GA. Mar. 2016.
- Tamara Becejac, Payman Dehghanian, Ahad Esmaeilian, Cheng Qian, **Meng Wu**, and Mladen Kezunovic. Management of Mission-Critical Systems through Certification, Commissioning, In-Service Maintenance, Remote Testing and Risk Assessment. *PSERC Industry Advisory Board meeting*. College Station, TX. Dec. 2015.
- **Meng Wu**, and Le Xie. Direct Initialization of Doubly-Fed Induction Generator Based Wind Turbines for Large System Transient Simulation. *2015 IEEE PES General Meeting*. Denver, CO. Jul. 2015.
- **Meng Wu**, Rongfu Sun, Lin Cheng, and Le Xie. Parameter Sensitivity Analysis for Sub-Synchronous Control Interactions in Wind-Integrated Power Systems. *CIGRE Grid of the Future Symposium*. Houston, TX. Oct. 2014.
- **Meng Wu**, and Le Xie. Sensitivity Analysis for Sub-Synchronous Oscillation in Wind-Integrated Power Systems. *2014 IEEE PES General Meeting*. National Harbor, MD. Jul. 2014.

## PROFESSIONAL SERVICES

- *Secretary*, IEEE Power & Energy Society (PES) Analytic Methods for Power Systems (AMPS) Committee Awards Work Group, 2017-present.
- *Receptionist*, 2016 Workshop on Architecture and Economics of the Future Grid, College Station, TX, Nov. 2016.
- *Reviewer*, 2016 IEEE Power & Energy Society (PES) General Meeting, 2015.
- *Reviewer*, IEEE Transactions on Energy Conversion, 2015-present.
- *Reviewer*, IEEE Transactions on Smart Grid, 2015-present.
- *Reviewer*, IEEE Transactions on Power Systems, 2017-present.
- *Reviewer*, 19th International Conference on Intelligent Systems Applications to Power (ISAP), 2017.
- *Group Secretary*, Research Group of Professor Le Xie, Department of Electrical & Computer Engineering, Texas A&M University, 2014-2016.
- *Student Ambassador*, China Affairs Office, The University of Hong Kong, 2008-2009.
- *Vice President*, Student Science and Technology Association, Tianjin University, 2007-2008.

## AWARDS, HONORS & CERTIFICATES

- *Best Project Poster Award*, Power System Engineering Research Center (PSERC) Industry Advisory Board (IAB) meeting, 2015.
- *Ebensberger Fellowship*, Department of Electrical and Computer Engineering, Texas A&M University, 2015.
- *Graduate Teaching Fellow*, College of Engineering, Texas A&M University, 2015.
- *Outstanding PhD Student Award*, Department of Electrical and Computer Engineering, Texas A&M University, 2015.
- *Certificate of Training for OPAL-RT Real-Time Simulation System*, Opal-RT Technologies, 2015.
- *One-Time Graduate Merit Scholarship*, Department of Electrical and Computer Engineering, Texas A&M University, 2013.

- *Best Undergraduate Thesis Award*, Tianjin University, 2010.
- *Outstanding Student Scholarship*, Tianjin University, 2008.
- *Silver Prize of Student Business Plan Competition*, Tianjin University, 2008.
- *China National Scholarship*, China Ministry of Education, 2007.