Jiahui Guo

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Knoxville, TN 37909

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jiahuiguo

Education

University of Tennessee, Knoxville, TN, US
Doctor of Philosophy, Electrical Engineering and Computer Science — Expected 07/2016
- Cumulative GPA: 3.97/4.00
- Advisor: Dr. Yilu Liu (*NEA Member*)

University of Tennessee, Knoxville, TN, US
Master of Science, Electrical Engineering and Computer Science — 05/2014
Major in Power System, Minor in Computer Science
- Cumulative GPA: 4.00/4.00
- Advisor: Dr. Yilu Liu (*NEA Member*)

Tsinghua University, Beijing, China
Bachelor of Science, Electrical Engineering — 07/2011
- Cumulative GPA: 89.4/100
- Advisor: Dr. Chongqing Kang (*IET Fellow*)

Professional Experience

CURENT (NSF/DOE funded Engineering Research Center), Knoxville, TN
Research Assistant/Software developer — 08/2011–Present

- *Application development for Wide Area Measurement System in Smart Grid* — 08/2011–07/2014
  - Developed real-time power system disturbance alert tools serving over 40 electric companies
  - Built real-time pattern recognition applications handling power system measurement data collected from 200+ devices in 24 countries (6,000+ data points per second)
  - Designed SQL database for all devices, customers information, and server configurations
  - Led smart grid related data analytics and published 20+ top journals and conferences papers
- *Modal Analysis utilizing power system frequency* — 01/2013–07/2014
  - Prototyped an real-time single channel method for ambient frequency signal analysis
  - Implemented web application to visualize estimation results updated each 4 seconds
- *Solar Power Forecasting module for microgrid management system* — 09/2015–12/2015
  - Proposed an ensemble machine learning model for day-ahead forecasting
  - Improved the forecasting accuracy by 10% based on RMSE metric
- *Big data platform for sensor data in power system* — 07/2015–Present
  - Built a Hadoop based data platform to support batch and streaming processing
  - Processing yearly TB level data leveraging Spark in time series analysis and machine learning

Dominion Virginia Power, Richmond, VA
Research and Data Engineer Intern — 07/2014–-06/2015

- *Enterprise Big Data Historian*
  - Developed interactive data management and visualization software based on PI AFSDK
  - Collaborated with different departments for customized application features
  - Improved management and operation efficiency by 200%

University of Tennessee, Knoxville, TN
Graduate Teaching Assistant — 2012–2013

- COSC 100: Introduction to Computers and Computing — Spring 2012
- ECE 201: Circuits — Fall 2013

Lab of Electrical Economics and Information, Tsinghua University, Beijing, China
Research Assistant 10/2010–-07/2011

- *Load forecasting under demand response in smart grid*
  - Prototyped a new forecasting paradigm with demand response aiming at cutting electric bill
  - Achieved 5% forecast accuracy improvement
- *Optimization of Power Flow with Interior Point Optimizer*
  - Modeled a power system using object oriented design
  - Implemented interface with Interior Point OPTimizer to minimize network loss
  - Achieved 10% faster performance tested on IEEE standard cases

Schneider Electric, Beijing, China
Quality Intern 06/2010–-07/2010

- Worked on Incoming Quality Inspection (IQI), Quality Control (QC) and Quality Assurance (QA)
- Summarized supplier performance

Skills

Programming Languages: C, C/C++, C#, Java
Scripting Languages: Python, Matlab, R, JavaScript
Database: SQL, MongoDB
Big Data Ecosystems: Hadoop, Spark
Knowledge Base: Machine learning, Data mining, Statistics, Optimization

Honors & Awards

Min H. Kao Fellowship, University of Tennessee, Knoxville, TN	2011
Scholarship for Excellent Academic Performance, Tsinghua University, China	2010
Scholarship for Excellent Cadre, Tsinghua University, China	2010
Second Price, Electronic Technology Practice, Tsinghua University, China	2009
Scholarship for Excellent Academic Performance, Tsinghua University, China	2009
Award for Student Excellence, Inner Mongolia, China	2007

Publications

Journal

1. **J. Guo**, Y. Zhang, M. A. Young, M. J. Till, A. Dimitrovski, Y. Liu, and P. Willliging, "Design and Implementation of a Real-Time Off-Grid Operation Detection Tool from a Wide-Area Measurements Perspective", *IEEE Trans. Smart Grid*, vol.6, no.4, pp. 2080-2087, 2015.
2. Y. Liu, L. Zhan, Y. Zhang, P.N. Markham, D. Zhou, **J. Guo**, Y. Lei, G. Kou, W. Yao, J. Chai and Y. Liu, "Wide-area Measurement System Development at the Distribution Level: a FNET/GridEye Example", *IEEE Trans. Power Delivery*, In Press.
3. D. Zhou, **J. Guo**, Y. Zhang, J. Chai, H. Liu, X. Gui, and Y. Liu, "Distributed Data Analytics Platform for Wide-Area Synchrophasor Measurement Systems", *IEEE Trans. Smart Grid*, In Press.
4. S. You, **J. Guo**, Y. Liu and Y. Liu, "Oscillation Mode Identification Based on Wide-Area Ambient Measurements Using Multivariate Empirical Mode Decomposition", *Electric Power Systems Research*, vol.134, pp. 158–166, May 2016.
5. C. Huang, F. Li, T. Ding, **J. Guo**, and Y. Liu, "A Bounded Model of the Communication Delay for System Integrity Protection Schemes", *IEEE Trans. Power Delivery*, In Press.

Conference

1. P. Markham, Y. Zhang, **J. Guo**, Y. Liu, T. Bilke, and D. Bertagnolli, "Analysis of frequency extrema in the Eastern and Western Interconnections, 2010-2011", in *Proc. IEEE 2014 Power and Energy Society General Meeting*, July 2012.
2. D. He, **J. Guo**, and W. Lin, "The impact of trading wind power in both energy and regulation reserve market on system operation", in *Proc. North American Power Symposium (NAPS)*, 2012.
3. **J. Guo**, Y. Zhang, T. King, Y. Liu, B. David, F. Nuroglu, F. Bai, and X. Wang, "Worldwide Power System Oscillations Observed by Distribution Level Phasor Measurements", in *CIGRE/EPRI Grid of the Future Symposium*, 2013.
4. **J. Guo**, Y. Ye, Y. Zhang, Y. Lei, and Y. Liu, "Events Associated Power System Oscillations Observation Based on Distribution-level Phasor Measurements", in *Proc. 2014 IEEE PES Transmission and Distribution Conference and Exposition*, April 2014.
5. Y. Zhang, Y. Liu, L. Chen, **J. Guo**, and Y. Liu, "Visualization of distribution level voltage magnitude pattern trend in EI system using FNET data", in *Proc. 2014 IEEE PES Transmission and Distribution Conference and Exposition*, April 2014.
6. Y. Lei, G. Kou, **J. Guo**, Y. Liu, and R. Nuqui, "Eastern Interconnection model reduction based on phasor measurements", in *Proc. 2014 IEEE PES Transmission and Distribution Conference and Exposition*, April 2014.
7. Y. Lei, Y. Zhang, **J. Guo**, D. Zhou, J. Culliss, P. Irminger, and Y. Liu, "The impact of synchronized human activities on power system frequency", in *Proc. IEEE 2014 Power and Energy Society General Meeting*, July 2014.
8. **J. Guo**, Y. Zhang, M. A. Young, M. J. Till, A. Dimitrovski, Y. Liu, and P. Willliging, "Design and implementation of real-time off-grid detection tool based on FNET/ GridEye", in *Proc. IEEE 2014 Power and Energy Society General Meeting*, July 2014.
9. L. Wu, Y. Liu, D. Zhou, **J. Guo**, L. Zhan, Y. Liu, J. Gracia, M. Young, B. Ozpineci, and T. King, "A Time-synchronized Power Grid Monitoring System at the Distribution Level", in *Proc. 9th International Conference on Electrical and Electronics Engineering (ELECO)*, Nov 26-28, 2015.
10. **J. Guo**, H. Liu, D. Zhou, J. Chai, Y. Zhang, and Y. Liu, "Real-time Power System Electromechanical Mode Estimation Implementation and Visualization Utilizing Synchrophasor Data", in *Proc. 2016 IEEE PES Transmission and Distribution Conference and Exposition*, In Press.
11. H. Liu, **J. Guo**, W. Yu, T. Xia, R. Sun, M. Gardner, L. Zhu, and Y. Liu, "Design and Implementation of Enterprise-level Data Platform and Big Data Driven Applications", in *Proc. 2016 IEEE PES Transmission and Distribution Conference and Exposition*, In Press.
12. J. Chai, J. Zhao, W. Yao, **J. Guo**, and Y. Liu, "Application of Wide Area Power System Measurement for Digital Authentication", in *Proc. 2016 IEEE PES Transmission and Distribution Conference and Exposition*, In Press.
13. J. Chai, Y. Liu, **J. Guo**, L. Wu, D. Zhou, Y. Liu, T. King, M. A. Young and J. R. Gracia, "FNET/GridEye-based Wide-area Measurement Data Analytics", in *Proc. 2016 IEEE PES Power Systems Computation Conference (PSCC)*, In Press.
14. **J. Guo**, S. You, C. Huang, H. Liu, J. Chai, L. Wu, D. Zhou, Y. Liu and J. Glass, "An Ensemble Solar Power Forecasting Model Through Statistical Learning of Historical Weather Dataset", in *Proc. IEEE 2016 Power and Energy Society General Meeting*, In Press.
15. S. You, **J. Guo**, W. Yao, S. Wang, Y. Liu, and Y Liu, "Multi-Channel Inter-Area Oscillation Mode Identification Using Multivariate Empirical Mode Decomposition", in *Proc. IEEE 2016 Power*

and Energy Society General Meeting, In Press.

16. H. Liu, L. Zhu, Z. Pan, **J. Guo**, J. Chai, W. Yu, and Y. Liu, "Comparison of MIMO System Identification Methods for Electromechanical Oscillation Damping Estimation", in *Proc. IEEE 2016 Power and Energy Society General Meeting*, In Press.
17. L. Wu, Y. Liu, D. Zhou, **J. Guo**, Y. Liu, "Observation of Inertial Frequency Response of Main Power Grids Worldwide Using FNET/GridEye", in *Proc. IEEE 2016 Power and Energy Society General Meeting*, In Press.

Book Chapter

1. Y. Liu, Y. Liu, Y. Zhang, **J. Guo**, D. Zhou, "Wide Area Monitoring Through Synchrophasor Measurement", *Handbook of Smart Grid Development*, *Wiley*, 2015, In Press.

Review Services

IEEE Transactions on Smart Grid	Since 2013
IEEE Transactions on Power Systems	Since 2014
IEEE Transactions on Power Delivery	Since 2015
Elsevier Electric Power Systems Research	Since 2015
International Journal of Emerging Electric Power Systems	Since 2016
IEEE PES General Meeting	2014, 2015 & 2016
IEEE International Conference on Smart Grid Communications	2015
IEEE Global Communications Conference, Exhibition & Industry Forum	2015
IEEE PES Power Africa Conference	2015
IEEE Electric Utility DRPT International Conference	2015
IEEE PES Transmission & Distribution Conference & Exposition	2016
IEEE Power and Energy Conference at Illinois (PECI)	2016

Certificates

Machine Learning, Coursera	10/2012
Analyzing PI System Data, OSIsoft	10/2014
Building PI Assets and Analytics with PI AF, OSIsoft	10/2014
The Analytics Edge, edx	05/2015

Professional Affiliations

IEEE Power & Energy Society Member	Since 2014
IEEE Student Member	Since 2014

Public Services

Undergraduate Mentor 01/2014–06/2014
University of Tennessee, Knoxville, TN
- Mentored a student to build a website to manage 200+ devices information

Publication Committee 07/2013–06/2014
Student Leadership Council, CURENT, Knoxville, TN
- Published monthly newsletter to all CURENT faculties and students

Vice President 07/2009–06/2010
Student Association of Science and Technology of EE Dept., Tsinghua University
- Organized technology competitions involving 100+ students

Voluntary Teaching Team Leader 07/2008
Guanping Elementary School, Yunnan Province, China
- Teached basic science and language classes for 3 weeks