

Hongxing Ye

CONTACT INFORMATION

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RESEARCH AREAS

power system, smart grid, stochastic optimization, control, renewable energy integration, electricity market, microgrid, cyber-physical security, parallel computing

EDUCATION

Illinois Institute of Technology, Chicago, Illinois, USA

Ph.D., Electrical Engineering, May, 2016 (expected)

- Dissertation: “Optimization and Market Clearing in Power Systems with Renewable Energies”
- GPA: 4.00/4.00

Xi'an Jiaotong University, Xi'an, Shaanxi, China

M.S., Systems Engineering (*Outstanding Graduates*), July, 2011

- Thesis: “A Method for Constructing Feasible Solutions to Power System Scheduling Problem Based on Analytical Necessary and Sufficient Conditions” (*Thesis Award*)

Xi'an Jiaotong University, Xi'an, Shaanxi, China

B.S., Information Engineering, July, 2007

INTERN EXPERIENCE

Argonne National Laboratory, Argonne, Illinois, USA

Research Intern

September, 2015 - December, 2015

- Worked on microgrid and power system collaboratively with the experts in Argonne

PROPOSAL EXPERIENCE

- Prepared **National Science Foundation** research proposal “EAGER: Renewables: Market Mechanism for Managing Uncertainties Caused by High Levels of Renewable Generation” based on my research, with Dr. Zuyi Li, funded, \$299,952, ECCS-1549937, Sept. 2015.
- Prepared **National Science Foundation** research proposal “Uncertainty Management in Electricity Markets with High-level Penetration of Renewables” based on my research, with Dr. Zuyi Li, \$345,683, pending, Nov. 2015.
- Participated in the preparation of **Department of Energy** research proposal “Robust optimization of dispatchable solar power: Coordination with natural gas infrastructure, demand response, and storage for flexible energy supply” based on my research, with Dr. Zuyi Li, \$900,168, pending, Jun. 2015.

PEER-REVIEWED PUBLICATIONS

- **Hongxing Ye**, Yinyin Ge, Mohammad Shahidehpour, and Zuyi Li, “Pricing Energy and Flexibility in Robust Security-Constrained Unit Commitment Model”, accepted, *2016 IEEE Power and Energy Society General Meeting* at Boston, MA.
- **Hongxing Ye**, and Zuyi Li, “Robust Security-Constrained Unit Commitment and Dispatch with Recourse Cost Requirement”, *IEEE Transactions on Power Systems*, in press (Early Access).
- **Hongxing Ye**, and Zuyi Li, “Necessary Conditions of Line Congestions in Uncertainty Accommodation”, *IEEE Transactions on Power Systems*, in press (Early Access).
- **Hongxing Ye**, Yinyin Ge, Xuan Liu, and Zuyi Li, “Transmission Line Rating Attack in Two-Settlement Electricity Markets”, *IEEE Transactions on Smart Grid*, in press (Early Access).
- **Hongxing Ye**, and Zuyi Li, “Robust Security-Constrained Unit Commitment with Recourse Cost Requirement”, *IEEE Power and Energy Society General Meeting*, Denver, CO, Jul. 2015.

- **Hongxing Ye**, and Zuyi Li, “Uncertainty Clearing Price in Real-time Market”, *IEEE Power and Energy Society General Meeting*, Washington, DC, Jul. 2014.
- **Hongxing Ye**, and Zuyi Li, “Robust Look-Ahead Economic Dispatch in Real-Time Market”, *Great Lakes Symposium on Smart Grid and The New Energy Economy*, Chicago, IL, Sept. 2013.
- Hongyu Wu, Qiaozhu Zhai, Xiaohong Guan, Feng Gao, and **Hongxing Ye**, “Security-Constrained Unit Commitment Based on a Realizable Energy Delivery Formulation”, *Mathematical Problems in Engineering*, Vol. 2012, Feb. 2012.
- Hongyu Wu, Xiaohong Guan, Qiaozhu Zhai, and **Hongxing Ye**, “A Systematic Method for Constructing Feasible Solution to SCUC Problem With Analytical Feasibility Conditions”, *IEEE Transactions on Power Systems*, Vol 27, No. 1, 526-534, Jan. 2012.
- **Hongxing Ye**, Qiaozhu Zhai, Yinyin Ge, and H. Wu, “A Revised Subgradient Method for Solving the Dual Problem of Hydrothermal Scheduling”, *IEEE PES Asia-Pacific Power and Energy Conference*, Wuhan, China, 2011.

PAPERS UNDER REVIEW/PREPRINTS

- **Hongxing Ye**, Yinyin Ge, Mohammad Shahidehpour, and Zuyi Li, “Market Clearing for Uncertainty, Generation Reserve, and Transmission Reserve”, (available online, arXiv:1507.01540 [math.OC]), submitted to *IEEE Transactions on Power Systems* (2nd round review).
- **Hongxing Ye**, and Zuyi Li, “Pricing the Ramping Reserve and Capacity Reserve in Real Time Markets”, (available online, arXiv:1512.06050 [math.OC]), submitted to *IEEE Transactions on Power Systems* (2nd round review).
- **Hongxing Ye**, Jianhui Wang, and Zuyi Li, “MIP Reformulation for Max-min Problems in Two-stage Robust SCUC”, submitted to *IEEE Transactions on Power Systems* (2nd round review).
- **Hongxing Ye**, Jianhui Wang, and Zuyi Li, “Robust Integration of High-level Dispatchable Renewables in Power System Operation”, (available online, arXiv:1512.06036 [math.OC]), submitted to *IEEE Transactions on Sustainable Energy*.
- Miguel Paredes, Leonardo Martins, Secundino Soares, **Hongxing Ye** and Mohammad Shahidehpour, “Solving Unit Commitment by Benders Decomposition with Semidefinite Programming”, submitted to *IEEE Transactions on Power Systems* (2nd round review).
- Yinyin Ge, Alexander Flueck, and **Hongxing Ye**, “Three-phase Unbalanced Distribution System State Estimation based on Semidefinite Programming with PMU Augmentation and Partitioning”, submitted to *IEEE Transactions on Smart Grid*.
- Yinyin Ge, Alexander Flueck, and **Hongxing Ye**, “Distributed Semidefinite Programming with ADMM for Three-phase Unbalanced Distribution System State Estimation”, submitted to *IEEE Transactions on Smart Grid*.

OTHER PUBLICATIONS

- Chapter 2 “Electricity and Natural Gas System Operations” in the “White Paper: Long-term Electric and Natural Gas Infrastructure Requirements” for Eastern Interconnection States Planning Council, Mar. 2014.
- Chapter 1 “Electricity and Natural Gas Market Structures” in the “White Paper: Long-term Electric and Natural Gas Infrastructure Requirements” for Eastern Interconnection States Planning Council, Mar. 2014.

SOFTWARE COPYRIGHT

Hongxing Ye, Yinyin Ge, Wei Chai, and etc, Power System Analysis and Optimization Platform, No.2009SR049529, China, 2009 (The software has become the main demonstration platform in the lab now.)

PATENT

Hongxing Ye, and Yinyin Ge, A Real-Time Traffic Flow Monitoring Device, ZL201020246031.2, 2010, China

ACADEMIC
EXPERIENCE

Illinois Institute of Technology, Chicago, Illinois, USA

Research Assistant

August, 2011 - present

- Worked on robust optimization on power system and market operation with renewables, proposed a novel market mechanism, Jun. 2013 - Nov. 2015.
- Worked on the project of the nation's first **"Perfect Power" microgrid at IIT**, funded by Department of Energy, \$13.6 million, Aug. 2011 - Sept. 2014
 - ✓ Optimal reconfiguration of three-phase unbalanced distribution systems with distributed energy sources;
 - ✓ Optimal energy scheduling in smart building based on real-time electricity prices;
 - ✓ Visualization of the distribution system based on CIM5 files;
 - ✓ Generator and motor transient stability simulations using parallel library PETSC.
- Worked on the project "Stochastic Optimization and Coordination Control of Demand Response for Enhancing the Secure and Economic Operation of Power Systems" funded by National Science Foundation, Jun. 2013 - Sept. 2014

State Key Lab in Xi'an Jiaotong University, Xi'an, Shaanxi, China

Research Assistant

September, 2008 - July, 2011

- Developed power generation scheduling algorithm with energy delivery constraints for research project supported by National Science Foundation of China
- Led a sub-project to develop a web-based software, titled "Power System Analysis and Optimization Platform", No.2009SR049529, China
 - ✓ Led the development team as project manager;
 - ✓ Worked as one of the major software developers;
 - ✓ Performed the final defense to National Science Foundation Committee of China.

TEACHING
EXPERIENCE

Guest Lecturer, Illinois Institute of Technology

2015

- ECE-564 Control and Operation of Electric Power Systems (graduate level)

Laboratory Instructor, Illinois Institute of Technology

2012

- ECE-319 Fundamentals of Power Engineering (undergraduate level)

Teaching Assistant, Illinois Institute of Technology

2012, 2013

- ECE-556 Power Market Economics and Security: Developed a new course module
- ECE-553 Power System Planning: Designed weekly assignments and the final exam
- ECE-557 Fault-Tolerant Power Systems: Graded weekly assignments
- ECE-319 Fundamentals of Power Engineering: Graded weekly assignments and held office hours

INVITED TALK

- "Pricing the Uncertainty and Flexibility in the Electricity Markets", Xi'an Jiaotong University, Xi'an, China, Apr 13, 2014
- "Uncertainty Management in Electricity Market with High-level Renewables", Argonne National Laboratory, Argonne, IL, Jan 6, 2016

PROFESSIONAL
SERVICE

Journal reviewer:

- IEEE Transactions on Power Systems (**Outstanding Reviewer for 2015**)
- IEEE Transactions on Sustainable Energy (**Outstanding Reviewer for 2015**)
- IEEE Transactions on Smart Grid
- IEEE Transactions on Power Delivery
- Electric Power Components and Systems

Conference reviewer:

- 2016 IEEE Power and Energy Society General Meeting

- 2015 IEEE Power and Energy Society General Meeting

Volunteer:

- The 4th Great Lake Symposium on Smart Grid and The New Energy Economy, Chicago
- The 3rd Great Lake Symposium on Smart Grid and The New Energy Economy, Chicago

HONORS AND
AWARDS

- Outstanding Reviewer for IEEE Transactions on Power Systems, 2015
- Outstanding Reviewer for IEEE Transactions on Sustainable Energy, 2015
- Xi'an Jiaotong University Graduate Student Thesis Award, 2011
- Xi'an Jiaotong University Outstanding Graduates, 2011
- Xi'an Jiaotong University Fellowships, 2008-2011
- Xi'an Jiaotong University "SiYuan" Fellowship, 2004
- Xi'an Jiaotong University Freshman Scholarship, 2003
- National High-school Mathematic Competition, China, 2nd Prize, 2002

PROFESSIONAL
MEMBERSHIP

- Institute of Electrical and Electronics Engineering (IEEE), Student Member
- IEEE Power & Energy Society, Member

COMPUTER SKILLS

- Power System Analysis Software: PSS/E, PowerWorld
- Optimization Solver and Software: Cplex, Gurobi, GAMS, AIMMS
- Computation Packages: Parallel computing library PETSC
- Languages: C, C++, C# for web interface, Matlab
- Database: MySQL, MS SQL Server
- Applications: L^AT_EX, spreadsheet, and presentation software
- Algorithms: Experience programming for Large-scale optimization problem
- Operating Systems: Unix/Linux, Windows.