

## Ziang “John” Zhang Ph. D.

4400 Vestal Pkwy East  
Binghamton, NY, 13902  
E-mail: [ziang.zhang@binghamton.edu](mailto:ziang.zhang@binghamton.edu)  
Phone: 607-777-2481

### Academic/Professional Appointments

09/2020 – Current: Associate Professor, Binghamton University, Binghamton, NY  
09/2014 – 08/2020: Assistant Professor, Binghamton University, Binghamton, NY  
08/2013 – 07/2014: Postdoc, ABB US Corporate Research Center, Raleigh, NC  
01/2013 – 08/2013: Research Intern, ABB US Corporate Research Center, Raleigh, NC  
09/2009 – 08/2013: Research Assistant, North Carolina State University, Raleigh, NC

### Professional Preparation

University & Location	Major	Degree & Year
Beijing Institute of Technology, Beijing, China	Electrical Engineering	B. S., 2007
Purdue University Northwest, Hammond, IN	Electrical Engineering	M. S., 2009
North Carolina State University, Raleigh, NC	Electrical Engineering	Ph.D., 2013

### Research Interests

Transient stability of power system, stability of inverter-based resource, storage system planning and operation, networked nonlinear system dynamics.

### Funded Projects

- (PI) Development of High IBR Penetration New York Power System Models for Operators, New York State Energy Research and Development Authority (NYSERDA), \$400,000, 2024-2026.
- (PI) GOALI: ASCENT: Online Stability Assessment, Flexibility, and Enhancement of IBR-dominated Power Systems, NSF, \$1.2M, 2023-2026.
- (Co-PI) Web-based, interactive decision support tool to navigate NY's energy system tradeoffs, Binghamton University Seed Grant, \$14,994, 2020-2021<sup>1</sup>.
- (PI) Asynchronous Distributed and Adaptive Parameter Tuning (ADAPT) for Hybrid PV Plants, Department of Energy, \$2.6M, 2021-2024.
- (PI) Stability Impact Analysis of the New York Power Grid with High Penetration of Inverter-Based Distributed Energy Resources, NYSERDA, \$400,000, 2021-2023.
- (Co-PI) Smart Cities Innovation Partnership Project: Advanced Water Meters in New York State, Empire State Development Corporation, \$200,000, 2020-2022.
- (Co-PI) Physical and Statistical Modeling for Resilience Design of Modern Power Grid Systems, Binghamton University Seed Grant, \$15,000, 2020-2021<sup>2</sup>.
- (Co-PI) PFI-TT: Next Generation High Energy Storage, Light Weight Capacitors, National Science Foundation, \$300,888, 2020-2023.

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<sup>1,2</sup> Served as supporting roles for our junior colleagues in these projects.

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- (Co-PI) Feasibility Study of an On-board XFC/Motor Drive System with Extended Lifetime Batteries for All-electric and Plug-in Hybrid Transit Buses, New York State Energy Research and Development Authority (NYSERDA), \$250,000, 2020-2021.
- (PI) Balancing Phases in Medium Voltage Systems, Switched Source LLC, \$77,172, 2019-2020.
- (PI) A Flexible Storage plus DER Solution for Warehouse Energy Management, New York State Energy Research and Development Authority (NYSERDA), \$1,000,000, 2019-2022.
- (PI) Development of Low-Cost Active Distributed Energy Resource Systems, New York State Energy Research and Development Authority (NYSERDA), \$379,665, 2017-2019.
- (Co-PI) Integrated Sustainable Power System Operation & Planning with Real-Time Population Estimates, Binghamton University Seed Grant, \$10,000, 2017-2018.
- (PI) An Active Grid-Friendly Distributed Energy System Testbed, Binghamton University Seed Grant, \$15,000, 2016-2017.

## Publications

1. Y. Chen, N. Zhou, and Z. Zhang, "Modified Eigen-Decomposition-based Interval Analysis (MEDIA) for Power System Dynamic State Estimation," in *IEEE Transactions on Power Systems*, 2023. doi: 10.1109/TPWRS.2023.3299463.
2. X. Huang, J. -Y. Gwak, L. Yu, Z. Zhang, and H. Cui, "Transient Stability Preventive Control via Tuning the Parameters of Virtual Synchronous Generators," *2023 IEEE Power & Energy Society General Meeting (PESGM)*, Orlando, FL, USA, 2023, doi: 10.1109/PESGM52003.2023.10253193.
3. Y. Che, C. Chang, and Z. Zhang, "Physical-Statistical Learning in Resilience Assessment for Power Generation Systems," *Physica A: Statistical Mechanics and its Applications* 615 (2023): 128584.
4. X. Huang, Z. Zhang, Y. Lin, and Y. Chen, "Arbitrage and Capacity Firming in Coordination with Day-Ahead Bidding of a Hybrid PV Plant," *2022 IEEE Power & Energy Society General Meeting (PESGM)*, 2022, pp. 1-5, doi: 10.1109/PESGM48719.2022.9917014.
5. Z. Ding, X. Huang, Z. Liu, and Z. Zhang, "A Two-Level Scheduling Algorithm for Battery Systems and Load Tap Changers Coordination in Distribution Networks," in *IEEE Transactions on Power Delivery*, vol. 37, no. 4, pp. 3027-3037, Aug. 2022, doi: 10.1109/TPWRD.2021.3121368.
6. R. Sioshansi *et al.*, "Energy-Storage Modeling: State-of-the-Art and Future Research Directions," in *IEEE Transactions on Power Systems*, vol. 37, no. 2, pp. 860-875, March 2022, doi: 10.1109/TPWRS.2021.3104768. (2023 IEEE PES Prize Paper Award)
7. Z. Liu and Z. Zhang, "Reinforcement Learning-based Parameter Tuning for Virtual Synchronous Machine on Grid Transient Stability Enhancement," *IECON 2020 The 46th Annual Conference of the IEEE Industrial Electronics Society*, 2020, pp. 4069-4075, doi: 10.1109/IECON43393.2020.9254428.

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8. Yiming Che, Changqing Cheng, Zhao Liu, and Ziang John Zhang. "Fast basin stability estimation for dynamic systems under large perturbations with sequential support vector machine." *Physica D: Nonlinear Phenomena* 405 (2020): 132381.
9. Y. Mao, E. Akyol and Z. Zhang, "A Novel Defense Strategy Against Zero-Dynamics Attacks in Multi-Agent Systems," *2019 IEEE 58th Conference on Decision and Control (CDC)*, 2019, pp. 3563-3568, doi: 10.1109/CDC40024.2019.9029736.
10. Z. Liu and Z. Zhang, "Probabilistic-Based Transient Stability Assessment of Power Systems with Virtual Synchronous Machines," *2019 IEEE 28th International Symposium on Industrial Electronics (ISIE)*, 2019, pp. 2117-2122, doi: 10.1109/ISIE.2019.8781299.
11. Z. Ding and Z. Zhang, "A Behind-the-Meter Battery Control Algorithm with the Consideration of Li-ion Battery Degradation," *2019 IEEE 28th International Symposium on Industrial Electronics (ISIE)*, 2019, pp. 1959-1964, doi: 10.1109/ISIE.2019.8781434.
12. Z. Ding, Z. Zhang and T. Zhao, "Online Operation of Battery Energy Storage System for Demand Charge Reduction Considering Degradation," *2019 IEEE Innovative Smart Grid Technologies - Asia (ISGT Asia)*, 2019, pp. 3702-3707, doi: 10.1109/ISGT-Asia.2019.8881757.
13. Mischen, Pamela A., George C. Homsy, Carl P. Lipo, Robert Holahan, Valerie Imbruce, Andreas Pape, Weixing Zhu, et al. "A foundation for measuring community sustainability." *Sustainability* 11, no. 7 (2019): 1903.
14. Y. Mao, E. Akyol and Z. Zhang, "Second-Order Consensus for Multi-Agent Systems by Time-Dependent Topology Switching," *2018 IEEE Conference on Decision and Control (CDC)*, 2018, pp. 6151-6156, doi: 10.1109/CDC.2018.8619351.
15. Z. Liu, Z. Zhang and Y. Lin, "Impact of Inverter-Interfaced Renewable Generation on Transient Stability at Varying Levels of Penetration," *IECON 2018 - 44th Annual Conference of the IEEE Industrial Electronics Society*, 2018, pp. 4027-4032, doi: 10.1109/IECON.2018.8591490.
16. Z. Ding, Z. Liu and Z. Zhang, "Dynamic Hosting Capacity Management and Demand Charge Reduction via a Hybrid Storage System," *IECON 2018 - 44th Annual Conference of the IEEE Industrial Electronics Society*, 2018, pp. 3827-3832, doi: 10.1109/IECON.2018.8591533.
17. Y. Mao and Z. Zhang, "Second-Order Consensus For Multi-Agent Systems By State-Dependent Topology Switching," *2018 Annual American Control Conference (ACC)*, 2018, pp. 3392-3397, doi: 10.23919/ACC.2018.8430934.
18. Z. Liu, X. He, Z. Ding and Z. Zhang, "A Basin Stability Based Metric for Ranking the Transient Stability of Generators," in *IEEE Transactions on Industrial Informatics*, vol. 15, no. 3, pp. 1450-1459, March 2019, doi: 10.1109/TII.2018.2846700.
19. Y. Mao and Z. Zhang, "Asymptotic Frequency Synchronization of Kuramoto Model by Step Force," in *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 50, no. 8, pp. 2768-2778, Aug. 2020, doi: 10.1109/TSMC.2018.2836863.

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20. Z. Liu and Z. Zhang, "Quantifying transient stability of generators by basin stability and Kuramoto-like models," *2017 North American Power Symposium (NAPS)*, 2017, pp. 1-6, doi: 10.1109/NAPS.2017.8107260.
21. Z. Ding and Z. Zhang, "Modeling and optimal operation of a combined heat and power system in microgrids," *2017 IEEE Power & Energy Society General Meeting*, 2017, pp. 1-5, doi: 10.1109/PESGM.2017.8274016. (IEEE PSG GM Best Paper Award)
22. Jian Zheng, Cencen Xu, Ziang Zhang and Xiaohua Li, "Electric load forecasting in smart grids using Long-Short-Term-Memory based Recurrent Neural Network," *2017 51st Annual Conference on Information Sciences and Systems (CISS)*, 2017, pp. 1-6, doi: 10.1109/CISS.2017.7926112.
23. Y. Mao and Z. Zhang, "Distributed frequency synchronization and phase-difference tracking for Kuramoto oscillators and its application to islanded microgrids," *2016 IEEE 55th Conference on Decision and Control (CDC)*, 2016, pp. 4364-4369, doi: 10.1109/CDC.2016.7798931.
24. S. Ahmed, D. Tremelling, H. Kim, Z. Zhang, N. Frank and R. McElveen, "Modeling, simulation and performance evaluation of cage rotor permanent magnet motor fed by variable speed drive," *2016 IEEE Energy Conversion Congress and Exposition (ECCE)*, 2016, pp. 1-6, doi: 10.1109/ECCE.2016.7855267.
25. Z. Liu and Z. Zhang, "Solar forecasting by K-Nearest Neighbors method with weather classification and physical model," *2016 North American Power Symposium (NAPS)*, 2016, pp. 1-6, doi: 10.1109/NAPS.2016.7747859.
26. Y. Mao, H. Zhang, and Z. Zhang, "Finite-Time Stabilization of Discrete-Time Switched Nonlinear Systems Without Stable Subsystems via Optimal Switching Signal Design," in *IEEE Transactions on Fuzzy Systems*, vol. 25, no. 1, pp. 172-180, Feb. 2017, doi: 10.1109/TFUZZ.2016.2554139.
27. Z. Zhang, N. Kang, and M. J. Mousavi, "Real-time transformer parameter estimation using terminal measurements," *2015 IEEE Power & Energy Society General Meeting*, 2015, pp. 1-5, doi: 10.1109/PESGM.2015.7285958.
28. L. Feng, B. McMillin, A. P. Santiago, and Z. Zhang, "Incremental Cost Consensus(ICC) and leaderless ICC implementations in FREEDM," *2015 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT)*, 2015, pp. 1-5, doi: 10.1109/ISGT.2015.7131876.
29. N. Rahbari-Asr, U. Ojha, Z. Zhang and M. -Y. Chow, "Incremental Welfare Consensus Algorithm for Cooperative Distributed Generation/Demand Response in Smart Grid," in *IEEE Transactions on Smart Grid*, vol. 5, no. 6, pp. 2836-2845, Nov. 2014, doi: 10.1109/TSG.2014.2346511.
30. G. Zhabelova, V. Vyatkin, Z. Zhang and M. -Y. Chow, "Agent-based distributed consensus algorithm for decentralized economic dispatch in Smart Grid," *IECON 2013 - 39th Annual Conference of the IEEE Industrial Electronics Society*, 2013, pp. 1968-1973, doi: 10.1109/IECON.2013.6699433.

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31. Z. Zhang, N. Rahbari-Asr and M. -Y. Chow, "Asynchronous distributed cooperative energy management through gossip-based incremental cost consensus algorithm," *2013 North American Power Symposium (NAPS)*, 2013, pp. 1-6, doi: 10.1109/NAPS.2013.6666854.
32. Z. Zhang, Yuan Zhang, and M. -Y. Chow, "Distributed energy management under smart grid plug-and-play operations," *2013 IEEE Power & Energy Society General Meeting*, 2013, pp. 1-5, doi: 10.1109/PESMG.2013.6672509.
33. N. Rahbari Asr, Z. Zhang and M. -Y. Chow, "Consensus-based distributed energy management with real-time pricing," *2013 IEEE Power & Energy Society General Meeting*, 2013, pp. 1-5, doi: 10.1109/PESMG.2013.6672511.
34. Z. Zhang and M. -Y. Chow, "Convergence Analysis of the Incremental Cost Consensus Algorithm Under Different Communication Network Topologies in a Smart Grid," in *IEEE Transactions on Power Systems*, vol. 27, no. 4, pp. 1761-1768, Nov. 2012, doi: 10.1109/TPWRS.2012.2188912.
35. Ziang Zhang and Mo-Yuen Chow. "The influence of time delays on decentralized economic dispatch by using incremental cost consensus algorithm." In *Control and optimization methods for electric smart grids*, pp. 313-326. Springer, New York, NY, 2012.
36. Ziang Zhang and M. -Y. Chow, "The leader election criterion for decentralized economic dispatch using incremental cost consensus algorithm," *IECON 2011 - 37th Annual Conference of the IEEE Industrial Electronics Society*, 2011, pp. 2730-2735, doi: 10.1109/IECON.2011.6119743.
37. Ziang Zhang, Xichun Ying, and Mo-Yuen Chow, "Decentralizing the economic dispatch problem using a two-level incremental cost consensus algorithm in a smart grid environment," *2011 North American Power Symposium*, 2011, pp. 1-7, doi: 10.1109/NAPS.2011.6025103.
38. J. Mitra *et al.*, "Intelligent methods for smart microgrids," *2011 IEEE Power and Energy Society General Meeting*, 2011, pp. 1-8, doi: 10.1109/PES.2011.6039899.
39. Z. Zhang and M. -Y. Chow, "Incremental cost consensus algorithm in a smart grid environment," *2011 IEEE Power and Energy Society General Meeting*, 2011, pp. 1-6, doi: 10.1109/PES.2011.6039422.
40. B. McMillin, R. Akella, D. Ditch, G. Heydt, Z. Zhang, and M. -Y. Chow, "Architecture of a smart microgrid distributed operating system," *2011 IEEE/PES Power Systems Conference and Exposition*, 2011, pp. 1-5, doi: 10.1109/PSCE.2011.5772496.
41. D. Gray, Z. Zhang, C. Apostoiaia and C. Xu, "A neural network-based approach for the detection of faults in the brushless excitation of a synchronous motor," *2009 IEEE International Conference on Electro/Information Technology*, 2009, pp. 423-428, doi: 10.1109/EIT.2009.5189654.

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### Patent

**Ziang Zhang**, Ning Kang, Mirrasoul Mousavi, Transformer Parameter Estimation Using Terminal Measurements, ABB Schweiz AG, US20170030958A1, CN106605150A, EP3132514A1, WO2015160616A1.

### Conference/Workshop Activities

- **Organizing Committee Member**, IEEE Power & Energy Society (PES) Grid Edge Technologies Conference & Exposition, San Diego, CA, Jan 2025.
- **Organizing Committee Member**, IEEE 2024 Conference on Innovative Smart Grid Technologies (ISGT) 2024, Washington DC, Feb 2024.
- **Co-Chair**, Workshop on Lithium-Ion Battery Safety in Transportation Applications, Binghamton, NY, Oct 2023.
- **Organizing Committee Member**, 2023 IEEE PES Grid Edge Technologies Conference & Exposition, San Diego, CA, Jan 2023.
- **Chair**, Southern Tier Technology Symposium 2019, Binghamton, NY, Oct. 2019.
- **Organizing Committee Member**, NSF Workshop on Power Electronics-Enabled Operation of Power Systems, Chicago, IL, Oct. 2019.
- **Special Session Chair** on Battery Modeling and Control with Industrial Applications, in the 28th International Symposium on Industrial Electronics (ISIE), Vancouver, Canada, June 2019.
- **Special Session Chair** on Stability of Low-inertia Power Systems and Microgrids at the 44th Annual Conference of the IEEE Industrial Electronics Society (IECON). Washington DC, USA, Oct. 2018.
- **Panelist** on New York Battery and Energy Storage Technology (NY-BEST) Consortium Annual Technology Conference, Binghamton, NY, Sept. 2018.
- **Program Committee Member**, the First Northeast Regional Conference on Complex Systems, Binghamton, NY, Apr. 2018.
- **TPC Member** on IEEE SmartGridComm Symposium on Data Management, Grid Analytics, and Dynamic Pricing, 2016, 2015
- **Track Co-Chair** on Applications of Parallel and Distributed Computing, The 15th International Conference on Algorithms and Architectures for Parallel Processing, Zhangjiajie, China, 2015
- **Program Committee Member**, International Conference on Smart Grid Technologies, Coimbatore, India, 2015
- **Track Chair** on Power Systems, The 39th Annual Conference of the IEEE Industrial Electronics Society (IECON-2013), Vienna, Austria, 2013

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### **Organizing/Technical Committees, Editorial**

- Associate Editor: IEEE Access, 2019 – 2022.
- R&D Advisory Group Member: National Offshore Wind R&D Consortium, 2020 – present.
- Member: IEEE P2800-2 Test and Verification of BPS-connected Inverter-Based Resources working group, 2021 – present.
- Member: IEEE Power & Energy Society Task Force on Decision Support Tools for Energy Storage Investment and Operations, 2016 – 2019.
- Member: IEEE Industrial Electronics Society Task Force on Smart Grid, 2015 – present.
- Member: Collective Dynamics of Complex Systems Research Group at Binghamton University, 2015 – present.

### **Teaching and Mentoring**

#### **Teaching (BU)**

- EECE 361, Control Systems I, 2020 - 2022
- EECE 212, Linear Algebra and Engineering Programming, 2017 - present
  - Flipped classroom since 2018.
- EECE 480B, Linear Algebra and Engineering Programming, 2016, then become EECE 212
- EECE 506, Mathematical Methods in Electrical Engineering, 2014, 2015
- EECE 512, Renewable Energy & Distribution Systems, 2015 - present
  - Flipped classroom and online since 2019.

#### **Continuing Education (BU)**

- Mini-Course: Introduction to Battery Systems
- Mini-Course: Battery Management System Design
- Faculty Member: New Energy New York (NENY) Battery Academy

#### **Student Supervision (BU)**

- Nine Ph.D. students since the Fall of 2015

#### **Teaching Assistant (NCSU)**

- ECE 756 Advanced Mechatronics
- ECE 456/556 Agent-Based Mechatronics System

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### Services

- Review panelist: National Science Foundation, 2020, 2021, 2023
- Review panelist: Department of Energy, 2019, 2021, 2023
- Review panelist: National Offshore Wind R&D Consortium
- Grant reviewer: Netherlands Organisation for Scientific Research (NWO)
- Podcast host: Podcast of the North America Chinese Power Professional Association (NACPPA), 2023 – present
- Section Chair: IEEE Binghamton Section, 2022 – present
- Chapter Chair, Power and Energy Society Chapter at IEEE Binghamton Section, 2019 - 2021

### **Campus Committee Service Activities**

- Steering committee member, Smart Energy Transdisciplinary Areas of Excellence (TAE), Binghamton University, 2017- present
- Research advisory committee member, Thomas J. Watson College of Engineering and Applied Science, 2021 – present, 2023 (chair)
- Commencement committee member, Thomas J. Watson College of Engineering and Applied Science, 2015, 2016, 2019, 2020, 2021
- Faculty search committee members, Department of Electrical and Computer Engineering, 2015, 2016, 2017, 2023 (chair), 2024 (chair)
- Thesis / Dissertation Committees Served on (not as principal advisor)
  - Yuting Chen, Ph.D. Dissertation, Principal advisor: Ning Zhou
  - Bahman Khaki, Ph.D. Dissertation, Principal advisor: Pritam Das
  - Yanbing, Mao, Ph.D. Dissertation, Principal advisor: Emrah Akyol
  - Robert J Thompson, Ph.D. Dissertation, Principal advisor: Edward Li
  - Mahboobeh Hejazibakhsh, Ph.D. Dissertation, Principal advisor: Hiroki Sayama (SSIE)

### **Technical Paper Reviewer**

- IEEE PES Conferences
- IEEE PES and IES Journals