Dr. Yu Zhang

Department of Electrical Engineering   ☎ 831-459-2921
Baskin School of Engineering, Room 243   ✉ zhangy@ucsc.edu
University of California, Santa Cruz, CA 95064   🌐 people.ucsc.edu/~yzhan419/

RESEARCH INTERESTS

- Smart grids: Energy management, grid monitoring and data analytics
- Cyber-physical IoT systems: Optimal resource allocation
- Optimization and control: Distributed, stochastic and online optimization
- Machine learning: High dimensional statistical inference and deep learning

POSITIONS

Assistant Professor   07/2017 – present
Department of Electrical Engineering
CITRIS and the Banatao Institute
Cyber-Physical Systems Research Center
Crown College
University of California, Santa Cruz

Postdoctoral Employee   05/2017 – 06/2017
Energy Analysis and Environmental Impacts Division
Lawrence Berkeley National Laboratory

Postdoctoral Scholar   01/2016 – 04/2017
Industrial Engineering & Operations Research Department
University of California, Berkeley

Postdoctoral Associate   08/2015 – 01/2016
Department of Electrical and Computer Engineering
University of Minnesota – Twin Cities

EDUCATION

University of Minnesota – Twin Cities (UMN)   08/2010 – 07/2015
Ph.D. in Electrical Engineering

Shanghai Jiao Tong University (SJTU)   09/2007 – 03/2010
M.S. in Electrical Engineering (With Highest Honors)

Wuhan University of Technology (WUT)   09/2002 – 07/2006
B.E. in Electrical Engineering (With Highest Honors)

PUBLICATIONS Google scholar citations 658, h-index 12, i10-index 12.

30. **Y. Zhang**, R. Madani, and J. Lavaei, "Conic Relaxations for Power System State Estimation with Line Measurements," *IEEE Trans. on Control of Network Systems*, vol. PP, no. 99, Mar. 2017 (accepted).

29. **Y. Zhang**, R. Madani, and J. Lavaei, "Power System State Estimation with Line Measurements," *Proc. of 55th IEEE Conf. on Decision and Control (CDC)*, Las Vegas, NV, Dec. 2016.

28. S. Hu, **Y. Zhang**, X. Wang, and G. Giannakis, "Weighted Sum-Rate Maximization for MIMO Downlink Systems Powered by Renewables," *IEEE Trans. on Wireless Communications*, vol. 15, no. 8, pp. 5615-5625, Aug. 2016.

27. X. Wang, **Y. Zhang**, G. Giannakis, and S. Hu, "Robust Smart-Grid Powered Cooperative Multipoint Systems," *IEEE Trans. on Wireless Communications*, vol. 14, no. 11, pp. 1348-1359, May 2016.

26. **Y. Zhang** and G. Giannakis, "Distributed Stochastic Market Clearing with High-Penetration Wind Power," *IEEE Trans. on Power Systems*, vol. 31, no. 2, pp. 895–906, Mar. 2016.

25. T. Chen, **Y. Zhang**, X. Wang, and G. Giannakis, "Robust Geographical Load Balancing for Sustainable Data Centers," *Proc. of Intl. Conf. on Acoustics, Speech, and Signal Process. (ICASSP)*, Shanghai, China, Mar. 2016.

24. T. Chen, **Y. Zhang**, X. Wang, and G. Giannakis, "Robust Workload and Energy Management for Sustainable Data Centers," *IEEE Journal on Selected Areas in Communications*, vol. 34, no. 3, pp. 651–664, Mar. 2016.

23. X. Wang, T. Chen, **Y. Zhang**, and G. Giannakis, "Optimal Dynamic Power Management for Green Coordinated Multipoint Systems," *Proc. of IEEE Global Commun. Conf. (Globecom)*, San Diego, CA, Dec. 2015.

22. S. Chepuri, **Y. Zhang**, G. Leus, and G. Giannakis, "Big Data Sketching with Model Mismatch," *Proc. of Asilomar Conf. on Signals, Systems, and Computers (Asilomar)*, Pacific Grove, CA, Nov. 2015.

21. X. Wang, **Y. Zhang**, T. Chen, and G. Giannakis, "Dynamic Energy Management for Smart-Grid Powered Coordinated Multipoint Systems," *IEEE Journal on Selected Areas in Communications*, vol. 34, no. 5, pp. 6188–6199, Nov. 2015.

20. S. Hu, X. Wang, **Y. Zhang**, G. Giannakis, "Optimal Resource Allocation for Smart-Grid Powered MIMO Broadcast Channels," *Proc. of 7th Intl Conf. on Wireless Commun. and Signal Process. (WCSP)*, Nanjing, China, Oct. 2015.

19. **Y. Zhang**, X. Wang, G. Giannakis, and S. Hu, "Distributed Robust Resource Allocation for Renewable Powered Wireless Cellular Networks," *Proc. of 3rd Intl. BlackSea Conf. on Commun. and Netw. (BlackSeaCom)*, Constanta, Romania, May 2015.

18. **Y. Zhang**, S.-J. Kim, and G. Giannakis, "Short-Term Wind Power Forecasting using Nonnegative Sparse Coding," *Proc. of 49th Conf. on Info. Sci. and Syst. (CISS)*, Baltimore, MD, Mar. 2015.

17. V. Kekatos, **Y. Zhang**, and G. Giannakis, "Electricity Market Forecasting via Low-Rank Multi-Kernel Learning," *IEEE Journal of Selected Topics in Signal Processing*, vol. 8, no. 6, pp. 1182–1193, Dec. 2014.

16. **Y. Zhang** and G. Giannakis, "Distributed Market Clearing with Wind Generation and Large-Scale Dispatchable Loads," *Proc. of 53rd IEEE Conf. on Decision and Control (CDC)*, Los Angeles, CA, Dec. 2014.

15. G. Martinez, **Y. Zhang**, and G. Giannakis, "An Efficient Primal-Dual Approach to Chance-Constrained Economic Dispatch," *Proc. of North American Power Symp. (NAPS)*, Pullman, WA, Sep. 2014.

14. V. Kekatos, **Y. Zhang**, and G. Giannakis, "Kernel Selection for Power Market Inference via Block Successive Upper Bound Minimization," *Proc. of Intl. Conf. on Acoustics, Speech, and Signal Process. (ICASSP)*, Florence, Italy, May 2014.

13. **Y. Zhang** and G. Giannakis, "Efficient Decentralized Economic Dispatch for Microgrids with Wind Power Integration," *Proc. of 6th Annual IEEE Green Tech. (GreenTech)*, Corpus Christi, TX, Apr. 2014.

12. **Y. Zhang**, N. Gatsis, and G. Giannakis, "Disaggregated Bundle Methods for Distributed Market Clearing in Power Networks," *Proc. of 1st Global Conf. on Signal and Info. Processing (GlobalSIP)*, Austin, TX, Dec. 2013 (invited).

11. V. Kekatos, **Y. Zhang**, and G. Giannakis, "Low-Rank Kernel Learning for Electricity Market Inference," *Proc. of Asilomar Conf. on Signals, Systems, and Computers (Asilomar)*, Pacific Grove, CA, Nov. 2013.

10. **Y. Zhang**, N. Gatsis, and G. Giannakis, "Robust Energy Management for Microgrids With High-Penetration Renewables," *IEEE Trans. on Sustainable Energy*, vol. 4, no. 4, pp. 944–953, Oct. 2013.

9. **Y. Zhang** and G. Giannakis, "Robust Optimal Power Flow with Wind Integration using Conditional Value-at-Risk," *Proc. of 4th Intl. Conf. on Smart Grid Commun. (SGComm)*, Vancouver, Canada, Oct. 2013.

8. **Y. Zhang**, N. Gatsis, V. Kekatos, and G. Giannakis, "Risk-aware Management of Distributed Energy Resources," *Proc. of 18th Intl. Conf. on Digital Signal Process. (DSP)*, Santorini Island, Greece, Jul. 2013 (invited).

7. **Y. Zhang**, N. Gatsis, and G. Giannakis, "Risk-Constrained Energy Management with Multiple Wind Farms," *Proc. of 4th IEEE-PES on Innovative Smart Grid Tech. (ISGT)*, Washington, D.C., Feb. 2013.

6. **Y. Zhang**, E. Dall'Anese, and G. Giannakis, "Distributed Optimal Beamformers for Cognitive Radios Robust to Channel Uncertainties," *IEEE Trans. on Signal Processing*, vol. 60, no. 12, pp. 6495–6508, Dec. 2012.

5. **Y. Zhang**, N. Gatsis, and G. Giannakis, "Robust Distributed Energy Management for Microgrids with Renewables," *Proc. of 3rd Intl. Conf. on Smart Grid Commun. (SGComm)*, Tainan, Taiwan, Nov. 2012.

4. **Y. Zhang**, E. Dall'Anese, and G. Giannakis, "Distributed Robust Beamforming for MIMO Cognitive Networks," *Proc. of Intl. Conf. on Acoustics, Speech, and Signal Process. (ICASSP)*, Kyoto, Japan, Mar. 2012.

3. **Y. Zhang**, H.-W. Luo, and X.-L. Zhou, "A Relay Scheduling Algorithm in Dual-Hop Wireless Networks," *Journal of Shanghai Jiao Tong University*, vol. 45, no. 3, pp. 331–335, Mar. 2011.

2. **Y. Zhang**, H.-W. Luo, and W. Chen, "Efficient Relay Beamforming Design with SIC Detection for Dual-Hop MIMO Relay Networks," *IEEE Trans. on Vehicle Technology*, vol. 59, no. 8, pp. 4192–4197, Oct. 2010.

1. **Y. Zhang**, H.-W. Luo, C. Wang, and F. She, "A Utility Function Based Low Complexity User Scheduling Algorithm for Multi-user MIMO Systems," *Journal of Shanghai Jiao Tong University*, vol. 43, no. 7, pp. 1103–1107, Jul. 2009.

Technical Reports

R2. **Y. Zhang**, R. Madani, and J. Lavaei, "Conic Relaxations for Power System State Estimation with Line Measurements," Apr. 2017, [Online]. Available: `arxiv.org/abs/1704.00133`

R1. **Y. Zhang**, N. Gatsis, and G. Giannakis, "Robust Energy Management for Microgrids With High-Penetration Renewables," Jul. 2012, [Online]. Available: `arxiv.org/abs/1207.4831`

Thesis

T1. **Y. Zhang**, "Resource Management for Sustainable Power Grids and Wireless Networks: Distributed and Robust Designs," Ph.D. Thesis, ECE Department, University of Minnesota, Jul. 2015.
Committee: Prodromos Daoutidis, Sairaj Dhople, Georgios Giannakis, and Mostafa Kaveh (chair).

Posters

PO1. J. Miao, J. Chhabra, and **Y. Zhang**, "Medium-term Wind Power Forecasting via Recurrent Neural Networks," 1st conference on Machine Learning in Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, Jun. 6-8, 2018.

PO2. J. Miao, J. Chhabra, and **Y. Zhang**, "Medium-term Wind Power Forecasting via Recurrent Neural Networks," Data Science Workshop, The Data Science Institute and the University of California, Livermore, CA, Aug 7-8, 2018.

Patents

PA5. C. Xu, Y. Wu, **Y. Zhang**, H.-W. Luo, and H. Yu, "Eight-Antenna Channel Estimation Method for OFDM Demodulating End," CHN invention patent, pub. No.: CN 101667981 B (grant), 2012-10-31.

PA4. **Y. Zhang**, H.-W. Luo, L. Chen, C. Xu, and W. Guan, "A Low Complexity User Selection Method in Multiuser MIMO Broadcasting Channels," CHN invention patent, pub. No.: CN 101499837 B (grant), 2012-09-05.

PA3. L. Chen, H.-W. Luo, F. She, **Y. Zhang**, and J. Zhang, "Method and Device of Space Division Multiple Address System Based on Codebook of Optimal Quantization Error," CHN invention patent. pub. No.: CN 101286756 B (grant), 2012-02-29.

PA2. C. Xu, Y. Wu, **Y. Zhang**, H.-W. Luo, and H. Yu, "Multi-User Multi-Antenna Two-Stage Limited Feedback Method," CHN invention patent. pub. No.: CN 101695008 A, (app.), 2010-04-14.

PA1. C. Xu, H.-W. Luo, L. Chen, **Y. Zhang**, and W. Guan, "Method for Rapidly Matching Codebook of MIMO System Subscriber Terminal," CHN invention patent. pub. No.: CN 101465684 A, (app.), 2009-06-24.

FUNDING EXPERIENCE

- PI for the Faculty Research Grant (FRG): "Smart Monitoring and Predictive Learning for Sustainable Microgrids," Committee on Research of UC Santa Cruz, May 2018.
- Co-PI for the NSF-SCC: "Improving Economics and Quality of Life in Rural Communities by Integrated Communications and Sensors," Feb. 2018. The proposal is under review (PI: Patrick Mantey).
- Co-PI for the 2018 CITRIS Seed Funding: "Data Analytics to Enable Sustainability for Power Systems," Jan. 2018. This proposal is under review (PI: Somayeh Sojoudi, co-PI: Javad Lavaei).
- Input for the NSF-CCSS proposal "Smart-Grid Powered Green Communications in Heterogeneous Networks," Jun. 2015. This proposal was funded under grant number ECCS-1508993 (PI: Xin Wang, co-PI: Georgios Giannakis).
- Input for the NSF-CCF proposal "From Communication to Power Networks: Adaptive Energy Management for Power Systems with Renewables," Sep. 2014. This proposal was funded under grant number CCF-1423316 (PI: Georgios Giannakis).

- Input for the NSF-CyberSEES proposal "Tenable Power Distribution Networks," Sep. 2014. This proposal was funded under grant number CCF-1442686 (PI: Georgios Giannakis, Co-PI: Sairaj Dhople).
- Input for the NSF-RIPS proposal "Distributed Power and Fuels in Rural Grids," Mar. 2014 (PI: Georgios Giannakis).
- Input for the NSF-EPAS proposal "Robust Energy Control for Microgrids with Renewables," Oct. 2012 (PI: Georgios Giannakis).
- Input for the NSF-CPS proposal "Inference and Management for the Power Grid: Distributed and Robust Designs," Mar. 2012 (PI: Georgios Giannakis).

MEDIA COVERAGE

- The New York Academy of Sciences: The Coming Revolution in Smart Electric Power.

HONORS & AWARDS

- IEEE Signal Processing Society (SPS) Travel Grant, 2014
- SIAM Student Travel Award, 2014
- PhD Student Travel Fellowship, Dept of ECE, UMN, 2014
- TCIPG Summer School Scholarship, 2013
- ECE Departmental Fellowship, UMN, 2010
- Shanghai Outstanding Graduate, 2010
- Merit Student of SJTU, 2009
- Huawei Scholarship, 2009
- Infineon Technologies Scholarship, 2009
- First-Class/Second-Class Academic Excellence Scholarship, SJTU, 2008/2007
- The Valedictorian at the WUT Commencement 2006
- Merit Student of Hubei Province, 2006
- Outstanding Graduate of WUT, 2005
- Pacemaker to Merit Student of WUT, Highest Honor (1‰), 2005
- Outstanding Merit Student of WUT, First-Class Scholarship, 2004
- Merit Student of WUT, Second-Class Scholarship, 2003

TEACHING EXPERIENCE

- Lecturer, IEE293/EE183 Advanced Topics in EE, Winter 2018, UCSC
- Lecturer, EE290 Graduate Seminar, Academic year 2017–18, UCSC
- Lecturer, IEOR290 Control and Optim. for Power Syst., Spring 2017, 2016, UCB
- TA, EE8581 Detection and Estimation Theory, Spring 2015, UMN
- TA, EE3005 Fundamental of Electrical Engr., Fall 2010 & Spring 2011, UMN
- TA, ES320 Fundamental Circuits for Commun., Fall 2008, SJTU

TALKS

- CROSS Symposium, UC Santa Cruz, CA, 2017.
- Nicholas school of the Environment, Duke University, NC, 2017.
- ECE Department, Missouri University of Science and Technology, MO, 2017.
- Department of Engineering Technology, University of Houston, TX, 2017.
- ECE Department, New York University, NY, 2017.
- eCAL Seminar, UC Berkeley, CA, 2016.
- ECE Department, University of Louisville, KY, 2016.
- ECE Department, Southern Illinois University, IL, 2015.
- Foundations of Resilient CybEr-physical Systems (FORCES), UC Berkeley, CA, 2015.
- WindLogics Inc., Saint Paul, MN, 2013.
- Honeywell, Minneapolis, MN, 2012.

SERVICE
- Academic Reviewer:
  - *IEEE Transactions on Power Systems*
  - *IEEE Transactions on Smart Grid*
  - *IEEE Transactions on Sustainable Energy*
  - *IEEE Transactions on Automatic Control*
  - *IEEE Transactions on Control Systems Technology*
  - *IEEE Journal on Selected Areas in Communications*
  - *IEEE Transactions on Signal Processing*
  - *IEEE Transactions on Communications*
  - *IEEE Transactions on Wireless Communications*
  - *IEEE Transactions on Industrial Electronics*
  - *IEEE Transactions on Vehicular Technology*
  - *IEEE Transactions on Systems, Man, and Cybernetics: Systems*
  - *IEEE Signal Processing Letters*
  - *IEEE Wireless Communications Letters*
  - *IEEE Power Engineering Letters*
  - *IET Generation, Transmission & Distribution*
  - *International Journal of Electrical Power & Energy Systems*
  - *International Transactions on Electrical Energy Systems*
  - *International Journal of Sustainable Transportation*
  - *Transportmetrica A: Transport Science*
  - *ACM Trans. on Modeling and Performance Evaluation of Computing Systems*
  - *Annals of Operations Research*
  - *Wiley Complexity*
  - *IEEE Conference on Decision and Control*
  - *IEEE American Control Conference*
  - *IEEE Intl. Conference on Smart Grid Communications*
  - *IEEE Intl. Conference on Acoustics, Speech and Signal Proc.*
  - *IEEE Global Communications Conference*
  - *IEEE Intl. Wrksp on Computational Advances in Multi-Sensor Adaptive Proc.*
  - *IEEE Intl. Conference on Computing, Networking and Communications*

- Session Chair or Technical Program Committee:
  - *IEEE Global Conference on Signal and Information Processing* (2017)
  - *IEEE International Conference on Smart Grid Communications* (2017, 2016)
  - *IEEE Conference on Decision and Control* (2014)
  - *INFORMS Annual Meeting* (2017, 2016, 2015)

- Advisory Board Member:
  - *Swiss Innovation Valley* (2018)

MEMBERSHIP
- Institute of Electrical and Electronics Engineers (IEEE)
- Institute for Operations Research and the Management Sciences (INFORMS)
- The New York Academy of Sciences (NYAS)

CURRENT STUDENTS
- Janesh Chhabra (Junior in Computer Science), 10/2017 – present
- Jian Miao (Junior in Computer Engineering), 12/2017 – present