

## Dr. Nanpeng (Eric) Yu

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CONTACT INFORMATION	Associate Professor University of California, Riverside Department of Electrical and Computer Engineering Winston Chung Hall, Room 428 Riverside, CA 92521 USA	<i>Work:</i> +1-951-827-3688 <i>Fax:</i> +1-951-827-2425 <i>E-mail:</i> nyu@ece.ucr.edu <i>Lab-Web:</i> www.ece.ucr.edu/nyu/
RESEARCH INTERESTS	Machine learning and big data analytics; Smart cities; Energy, climate and water nexus; Optimization and control in smart grids; Electricity market design.	
CURRENT ACADEMIC APPOINTMENTS	<b>Associate Professor</b> , University of California, Riverside Department of Electrical and Computer Engineering Bourns College of Engineering <ul style="list-style-type: none"><li>Affiliations:<ul style="list-style-type: none"><li>Department of Computer Science (Cooperating Faculty)</li><li>Department of Statistics (Cooperating Faculty)</li><li>Center for Spatial Sciences</li><li>Center for Environmental Research and Technology</li></ul></li></ul>	July 2019 to present
PREVIOUS POSITIONS	<b>Assistant Professor</b> , University of California, Riverside Department of Electrical and Computer Engineering Bourns College of Engineering  <b>Project Manager, Demand Response Integration</b> , Southern California Edison, Rosemead, CA, (December 2013 to July 2014) <ul style="list-style-type: none"><li>Integrated over 1GW of demand response resource into CAISO market.</li></ul> <b>Senior Power System Planner</b> , Southern California Edison, Rosemead, CA, (January 2011 to November 2013) <ul style="list-style-type: none"><li>Technical lead<ul style="list-style-type: none"><li>Energy storage valuation and optimization.</li><li>Hydroelectric power plant control and optimization.</li><li>Renewable resource integration.</li><li>Electricity market bidding strategy development.</li></ul></li></ul> <b>Research Intern</b> , Midcontinent Independent System Operator, Inc., Carmel, IN, (December 2009 to February 2010) <ul style="list-style-type: none"><li>Grid congestion forecasting and credit risk analysis modeling for Financial Transmission Rights (FTRs).</li></ul>	July 2014 to June 2019
EDUCATION	<b>Iowa State University</b> , Ames, IA  Ph.D., Electrical and Computer Engineering, December 2010 <ul style="list-style-type: none"><li>Thesis: <i>Evaluation of wholesale electric power market rules and financial risk management by agent-based simulations</i></li><li>Advisors:<ul style="list-style-type: none"><li>Professor Chen-Ching Liu</li><li>Professor Leigh Tesfatsion</li></ul></li><li>Area of Study: Power Engineering</li><li>Minor: Statistics</li></ul> M.S., Economics, December 2012 <ul style="list-style-type: none"><li>Thesis: <i>Economic Valuation of Wind Curtailment Rights</i></li><li>Advisor: Professor Leigh Tesfatsion</li></ul>	

M.S., Electrical and Computer Engineering, December 2007

- Thesis: *Modeling of suppliers' learning behaviors in an electricity market environment*
- Advisor: Professor Chen-Ching Liu
- Area of Study: Power Engineering

**Tsinghua University**, Beijing, China

B.S., Electrical Engineering, June 2006

- Power Engineering Specialization

## PUBLICATIONS

### Peer-Reviewed Journals

32. F. Kabir, N. Yu, W. Yao, R. Yang, and Y. Zhang, "Joint estimation of behind-the-meter solar generation in a community," under review, 2020.
31. B. Foggo and N. Yu, "Analyzing data selection techniques with tools from the theory of information losses," under review, <https://arxiv.org/abs/1902.09602>, 2020.
30. Y. Gao, W. Wang, J. Shi, and N. Yu, "Batch-constrained reinforcement learning for dynamic distribution network reconfiguration," in Press, *IEEE Transactions on Smart Grid*, <https://arxiv.org/abs/2006.12749>, 2020.
29. J. Shi, W. Wei, Y. Gao, and N. Yu, "Optimal placement and intelligent smoke detection algorithm for wildfire-monitoring cameras," *IEEE Access*, vol. 8, no. 1, pp. 72326-72339, Dec. 2020.
28. P. Wang, Y. Gao, N. Yu, W. Ren, J. Lian, and D. Wu, "Distributed and communication-efficient solutions to linear equations with special sparse structure," under review, 2020.
27. W. Wang, N. Yu, Y. Gao, and J. Shi, "Safe off-policy reinforcement algorithm for Volt-VAR control problems," *IEEE Transactions on Smart Grid*, vol. 11, no. 4, pp. 3008-3018, 2020.
26. M. Ostadijafari, A. Dubey, and N. Yu, "Linearized price-responsive HVAC controller for optimal scheduling of smart building loads," *IEEE Transactions on Smart Grid*, vol. 11, no. 4, pp. 3131-3145, 2020.
25. X. Zhou, W. Yao, and N. Yu, "A Robust mixed effects segmented regression model for electric load forecasting," under review, 2019.
24. W. Wang and N. Yu, "Maximum marginal likelihood estimation of phase connections in power distribution systems," in Press, *IEEE Transactions on Power Systems*, 2020.
23. B. Foggo and N. Yu, "Improving supervised phase identification through the theory of information losses," *IEEE Transactions on Smart Grid*, vol. 11, pp. 2337-2346, 2020.
22. J. Shi, Y. Gao, W. Wang, N. Yu, and P. Ioannou, "Reinforcement Learning based Electric Vehicle Fleet Routing for Ride-Hailing Services," in press, *IEEE Transactions on Intelligent Transportation Systems*, pp. 1-13, 2019.
21. B. Foggo and N. Yu, "Information losses in neural classifiers from sampling," in press, *IEEE Transactions on Neural Networks and Learning Systems*, pp. 1-11, 2019.
20. W. Wang, A. Abdolrashidi, N. Yu, and D. Wong, "Frequency regulation service provision by data center," *Applied Energy*, vol. 251, pp. 1-17, 2019.
19. Y. Gao, B. Foggo, and N. Yu, "A physically inspired data-driven model for electricity theft detection with smart meter data," *IEEE Transactions on Industrial Informatics*, vol. 15, no. 9, pp. 5076-5088, 2019.

18. K. Wang, H. Zhong, **N. Yu**, and Q. Xia, "Nonintrusive load monitoring based on sequence-to-sequence model and attention mechanism," *Proceedings of Chinese Society of Electrical Engineering*, vol. 39, no. 1, pp. 75-83, 2018.
17. F. Kabir, **N. Yu**, W. Yao, L. Wu, and J. Jiang, "Impact of aerosol on reservoir inflows: A case study for big creek hydroelectric system in California," *Hydrological Processes*, vol. 32, pp. 3365-3390, 2018.
16. Y. Liu, **N. Yu**, W. Wang, X. Guan, Z. Xu, B. Dong, and T. Liu, "Coordinating the operations of smart buildings in smart grids," *Applied Energy*, vol. 228, pp. 2510-2525, 2018.
15. L. Wu, Y. Gu, J. Jiang, H. Su, and **N. Yu**, "Impacts of aerosol on seasonal precipitation and snowpack in California based on convective-resolving WRF-Chem simulations," *Atmospheric Chemistry and Physics*, vol. 18, no. 8, pp. 5529-5547, 2018.
14. C. Peng, Y. Hou, **N. Yu**, and W. Wang, "Risk-limiting unit commitment in smart grid with intelligent periphery," *IEEE Transactions on Power Systems*, vol. 32, no. 6, pp. 4696-4707, 2017.
13. W. Wang and **N. Yu**, "Chordal conversion based convex iteration algorithm for three-phase optimal power flow," *IEEE Transactions on Power Systems*, vol. 33, no. 2, pp. 1603-1613, 2018.
12. L. Wu, H. Su, O. Kalashnikova, J. Jiang, C. Zhao, M. Garay, J. Campbell, and **N. Yu**, "WRF-chem simulation of aerosol seasonal variability in San Joaquin Valley," *Atmospheric Chemistry and Physics*, vol. 17, pp. 7291-7309, 2017.
11. W. Wang and **N. Yu**, "A model for commercial adoption of Photovoltaic systems," *Journal of Renewable and Sustainable Energy*, vol. 9, no. 2, pp. 1-15, 2017.
10. C. Peng, Y. Hou, **N. Yu**, J. Yan, and S. Lei, "Multi-period risk limiting dispatch with renewable integration," *IEEE Transactions on Industrial Informatics*, vol. 13, no. 4, pp. 1843-1854, 2017.
9. B. Foggo and **N. Yu**, "Improved battery storage valuation through degradation reduction," *IEEE Trans. Smart Grid*, vol. 9, no. 6, pp. 5721-5732, 2018.
8. **N. Yu** and B. Foggo, "Stochastic valuation of energy storage in wholesale power markets," *Energy Economics*, vol. 64, pp. 177-185, May, 2017.
7. M. Hong, X. Yu, **N. Yu**, and K. Loparo, "An energy scheduling algorithm supporting power quality management in commercial building microgrids," *IEEE Trans. Smart Grid [Special Issue on Distributed Energy Management]*, vol. 7, no. 2, pp. 1044-1056, 2016.
6. T. Wei, Q. Zhu, and **N. Yu**, "Proactive demand participation of smart buildings in smart grid," *IEEE Trans. Computers, [Selected Topics in Smart City Computing]*, vol. 65, pp. 1392-1406, 2015.
5. M.A. Bragin, P.B. Luh, J.H. Yan, **N. Yu**, G.A. Stern, "Convergence of surrogate Lagrangian relaxation method," *J. Optim. Theory Appl.*, vol. 164, pp. 173-201, 2015.
4. **N. Yu**, L. Tesfatsion, and C.C. Liu, "Financial bilateral contract negotiation in wholesale electricity markets using Nash bargaining theory," *IEEE Trans. Power Syst.*, vol. 27, pp. 251-267, 2012.
3. **N. Yu**, C.C. Liu, and J. Price "Evaluation of market rules using a multi-agent system method," *IEEE Trans. Power Syst.*, vol. 25, pp. 470-479, 2010.

2. Y. Liu, W. Wu, Y. Feng, B. Zhang, and N. Yu, "Black-start zone partitioning based on ordered binary decision diagram method," *Proceedings of the CSEE*, vol. 28, no. 10, pp. 26-31, 2008.
1. N. Yu, C.C. Liu, and L. Tesfatsion, "Modeling of suppliers learning behaviors in a market environment," *International Journal of Engineering Intelligent Systems*, vol.15, no. 2, pp. 115-121, 2007.

### Book Chapters

2. N. Yu and C.C. Liu, "Multi-agent system applications in power systems," Volume III: Advanced Techniques and Technologies: Facts and A.I. Part Two - Artificial Intelligence Techniques.
1. K. Wang, H. Zhong, N. Yu, and Q. Xia, "Nonintrusive load monitoring based on deep learning," In: Woon W., Aung Z., Catalina Feliu A., Madnick S. (eds) *Data Analytics for Renewable Energy Integration. Technologies, Systems and Society. DARE 2018. Lecture Notes in Computer Science*, vol 11325. Springer, Cham.

### Peer-Reviewed Conference Proceedings

40. J. Shi, B. Foggo, X. Kong, Y. Cheng, N. Yu, and K. Yamashita, "Online Event Detection in Synchrophasor Data with Graph Signal Processing," under preparation, 2020.
39. B. Foggo and N. Yu, "On the maximum mutual information capacity of neural architectures," under review, <https://arxiv.org/abs/2006.06037>, 2020.
38. S. Shihab, P. Wei, J. Shi, and N. Yu, "Optimal eVTOL fleet dispatch with power grid compensation and battery degradation cost," *2020 AIAA AVIATION Forum and Exposition*, pp. 1-10, 2020.
37. W. Wang and N. Yu, "Parameter estimation in three-phase power distribution networks using smart meter data," to appear in *PMAPS*, pp. 1-5, 2020.
36. W. Wang and N. Yu, "Partial discharge detection with convolutional neural networks," to appear in *PMAPS*, pp. 1-5, 2020.
35. W. Wang, N. Yu, J. Shi, and N. Navarro, "Diversity factor prediction for distribution feeders with interpretable machine learning algorithms," *IEEE Power and Energy Society General Meeting*, pp. 1-5, 2020. **Received Best Paper Award.**
34. J. Shi, W. Wang, Y. Gao, and N. Yu, "Detection and segmentation of power line fires in videos," *IEEE ISGT North America*, pp. 1-5, 2020.
33. J. Shi, N. Yu, E. Keogh, H. Chen, and K. Yamashita, "Discovering and labeling power system events in synchrophasor data with matrix profile," *IEEE Sustainable Power and Energy Conference*, pp. 1-5, Beijing China, Nov. 2019.
32. F. Kabir, N. Yu, W. Yao, R. Yang, and Y. Zhang, "Estimation of behind-the-meter solar generation by integrating physical with statistical models," *IEEE SmartGridComm*, pp. 1-6, Beijing, China, Oct. 2019.
31. Y. Gao, J. Shi, W. Wang, and N. Yu, "Dynamic distribution network reconfiguration using reinforcement learning," *IEEE SmartGridComm*, pp. 1-7, Beijing, China, Oct. 2019.

30. W. Wang, N. Yu, J. Shi, Y. Gao, "Volt-VAR control in power distribution systems with deep reinforcement learning," *IEEE SmartGridComm*, pp. 1-7, Beijing, China, Oct. 2019.
29. M. Ostadijafari, A. Dubey, Y. Liu, J. Shi, and N. Yu, "Smart building energy management using nonlinear economic model predictive control," *IEEE Power and Energy Society General Meeting*, pp. 1-5, Atlanta, USA, Aug. 2019.
28. W. Wang and N. Yu, "A machine learning framework for algorithmic trading with virtual bids in electricity markets," *IEEE Power and Energy Society General Meeting*, pp. 1-5, Atlanta, USA, Aug. 2019. **Received Best Paper Award.**
27. F. Kabir, N. Yu, B. Sastry, and V. Kaushik, "Impacts of aerosols on hydropower generation: A case study for Big Creek hydroelectric system in California," *IEEE Power and Energy Society GTD Asia*, pp. 1-6, Bangkok, Thailand, Mar. 2019.
26. Z. Zhang, J. Shi, Y. Gao, and N. Yu, "Degradation-aware operation and optimal sizing of behind-the-meter battery systems for commercial customers," *IEEE Power and Energy Society GTD Asia*, pp. 1-6, Bangkok, Thailand, Mar. 2019. **Received Best Paper Award.**
25. J. Shi and N. Yu, "The impacts of climate change and socioeconomic development on electric load in California," *31st Australasian Joint Conference on Artificial Intelligence*, pp. 1-12, Wellington, New Zealand, Dec. 2018.
24. J. Shi, Y. Gao, and N. Yu, "Routing electric vehicle fleet for ride-sharing," *2nd IEEE Conference on Energy Internet and Energy System Integration*, pp. 1-6, Beijing, China, Oct. 2018.
23. Y. Gao, P. Wang, and N. Yu, "A decentralized distribution network reconfiguration algorithm," *8th China International Conference on Electricity Distribution*, pp. 1-5, Tianjin, China, Sept. 2018.
22. F. Kabir, B. Foggo, and N. Yu, "Data driven predictive maintenance of distribution transformers," *8th China International Conference on Electricity Distribution*, pp. 1-5, Tianjin, China, 2018.
21. P. Wang, Y. Gao, N. Yu, W. Ren, J. Lian, and D. Wu, "Communication-efficient distributed solutions to a system of linear equations with Laplacian sparse structure," *57th IEEE Conference on Decision and Control*, pp. 1-8, Miami, USA, Dec. 2018.
20. B. Foggo and N. Yu, "A comprehensive evaluation of supervised machine learning for phase identification problem," *20th International Conference on Machine Learning and Applications* pp. 1-9, Copenhagen, Denmark, 2018.
19. J. Yang, N. Yu, W. Yao, A. Wong, L. Juang, and R. Johnson, "Evaluate the effectiveness of conservation voltage reduction with robust regression," *Probabilistic Methods Applied to Power Systems*, pp. 1-6, Boise, USA, June 2018.
18. W. Wang and N. Yu, "AMI data driven phase identification in smart grid," *The Second International Conference on Green Communications, Computing and Technologies*, pp. 1-8, Rome, Italy, Sept. 2017. **Received Best Paper Award.**
17. J. Shi and N. Yu, "Spatio-temporal modeling of electric loads," *49th North American Power Symposium*, pp. 1-6, Morgantown, WV, Sept. 2017.
16. Z. Li, B. Dong, N. Gatsis, A. Taha, and N. Yu, "Modeling, simulation and control of smart and connected communities," *Building Simulation* pp. 1-10, San Francisco, CA, Aug. 2017.

15. Y. Liu, **N. Yu**, J. Shi, B. Dong, W. Ren, and X. Guan, "Evaluation of frequency regulation provision by commercial building HVAC systems," *Proc. 12th Annual IEEE International Conference on Automation Science and Engineering*, pp. 1-6, Xi'an, China, Aug. 2017.
14. W. Wang and **N. Yu**, "Phase balancing in power distribution network with data center," *Greenmetrics*, pp. 1-6 Urbana-Champaign, IL, June. 2017.
13. Y. Gao, and **N. Yu**, "State estimation for unbalanced electric power distribution systems using AMI data," *The Eighth Conference on Innovative Smart Grid Technologies (ISGT)*, pp. 1-5, Arlington, VA, Apr. 2017.
12. W. Wang, **N. Yu**, B. Foggo, and J. Davis, "Phase identification in electric power distribution systems by clustering of smart meter data," *15th IEEE International Conference on Machine Learning and Applications (ICMLA)*, pp. 1-7, Anaheim, CA, Dec. 2016. (24.96% acceptance rate).
11. W. Wang and **N. Yu**, "LMP decomposition with three-phase DCOPF for distribution system," *2016 IEEE Innovative Smart Grid Technologies - Asia (ISGT Asia)*, pp. 1-8, Melbourne, Australia, Nov. 2016.
10. J. Shi, **N. Yu**, and W. Yao, "Energy efficient building HVAC control with real-time occupancy prediction," *International Conference on Sustainability in Energy and Buildings*, pp. 1-10, Turin, Italy, Sep. 2016.
9. X. Zhou, **N. Yu**, W. Yao and R. Johnson, "Forecast load impact from demand response resources," *IEEE Proceedings, Power and Energy Society General Meeting*, pp. 1-5, Boston, USA, 2016. **Nominated for Best Paper Award in Electric vehicles, energy storage, microgrids, and demand response operations and market economics.**
8. **N. Yu**, Q. Zhu, and T. Wei, "From passive demand response to proactive demand participation," *Proc. 11th Annual IEEE International Conference on Automation Science and Engineering*, pp. 1-7, Gothenburg, Sweden, Aug. 2015.
7. **N. Yu**, S. Shah, R. Johnson, R. Sherick, M. Hong and K. Loparo, "Big data analytics in power distribution systems," *Proc. IEEE PES Conference on Intelligent Smart Grid Technology*, pp. 1-5, Washington DC, Feb. 2015.
6. **N. Yu**, H. Sheng, and R. Johnson, "Economic valuation of wind curtailment rights," *Proc. Power and Energy Society General Meeting*, pp. 1-5, Vancouver, British Columbia, Canada, Jul. 2013. **Nominated for Best Paper Award in system operations and market economics.**
5. M.A. Bragin, P.B. Luh, J.H. Yan, **N. Yu**, and G.A. Stern, "Efficient surrogate optimization for payment cost co-optimization with transmission capacity constraints," *Proc. Power and Energy Society General Meeting*, pp. 1-5, Vancouver, British Columbia, Canada, Jul. 2013. **Nominated for Best Paper Award in system operations and market economics.**
4. M.A. Bragin, P.B. Luh, J.H. Yan, **N. Yu**, X. Han, and G.A. Stern, "An efficient surrogate subgradient method within Lagrangian relaxation for the payment cost minimization problem," *Proc. Power and Energy Society General Meeting*, pp. 1-5, San Diego, CA, Jul. 2012.
3. X. Han, P.B. Luh, M.A. Bragin, J.H. Yan, **N. Yu**, and G.A. Stern, "Solving payment cost co-optimization problems," *Proc. Power and Energy Society General Meeting*, pp. 1-5, San Diego, CA, Jul. 2012.

2. **N. Yu**, A. Somani, and L. Tesfatsion, "Financial risk management in restructured wholesale power markets: concepts and tools," *Proc. Power and Energy Society General Meeting*, Minneapolis, MN, pp.1-8, Jul. 2010.
1. **N. Yu** and C.C. Liu, "Multi-agent systems and electricity markets: state-of-the-art and the future," *Proc. Power and Energy Society General Meeting*, Pittsburgh, PA, Jul. 2008.

#### INVITED TALKS

58. Invited Seminar at Pacific Northwest National Laboratory, "Machine Learning and Big Data Analytics in Power Distribution Systems," Richland, WA, Nov. 2019.
57. Invited Seminar at Wuhan University, "Advances in Information Theoretic Machine Learning and Safe Reinforcement Learning," Wuhan, China, Oct. 2019.
56. Invited Seminar at Chongqing University, "Machine Learning and Big Data Analytics in Power Distribution Systems," Chongqing, China. Oct. 2019.
55. Invited Seminar at Tsinghua University, "Machine Learning and Big Data Analytics in Power Distribution Systems," Beijing, China, Oct. 2019.
54. 2019 IEEE SmartGridComm, "Estimation of Behind-the-Meter Solar Generation by Integrating Physical with Statistical Models," Beijing, China, Oct. 2019.
53. 2019 IEEE SmartGridComm, "Volt-VAR Control in Power Distribution Systems with Deep Reinforcement Learning," Beijing, China, Oct. 2019.
52. Tutorial at 2019 IEEE SmartGridComm, "Machine Learning and Big Data Analytics in Power Distribution Systems," Beijing, China, Oct. 2019.
51. Invited Seminar at Lawrence Livermore National Laboratory, "Machine Learning and Big Data Analytics in Smart Grid," Livermore, CA, Oct. 2019.
50. Invited Seminar at Stony Brook University, "Machine Learning and Big Data Analytics in Smart Grid" Stony Brook, New York, Aug. 2019
49. 2019 IEEE Power and Energy Society General Meeting, "Reinforcement Learning based Controls in Power Distribution Systems," Atlanta, Georgia, Aug. 2019.
48. 2019 IEEE Power and Energy Society General Meeting, "Optimization and Reinforcement Learning based Methods for Power Distribution Systems," Atlanta, Georgia, Aug. 2019.
47. 2019 IEEE Big Data Analytics Tutorial Series: Big Data & Analytics for Power Systems, "Machine Learning and Big Data Analytics in Power Distribution Systems," Webinar, March, 2019.
46. 2019 IEEE Power and Energy Society Grand International Conference and Exposition Asia, "Impacts of Aerosols on Hydropower Generation: A Case Study for Big Creek Hydroelectric System in California," Bangkok, Thailand, March, 2019.
45. 2019 IEEE Power and Energy Society Grand International Conference and Exposition Asia, "Degradation-aware operation and Optimal Sizing of Behind-the-Meter Battery Systems for Commercial Customers," Bangkok, Thailand, March, 2019.
44. Invited Seminar at The University of Hong Kong, "Big Data Analytics for Power Distribution Systems," Hong Kong, China, March, 2019.
43. 2018 31st Australasian Joint Conference on Artificial Intelligence, "The Impacts of Climate Change and Socioeconomic Development on Electric Load in California," Wellington, New Zealand, December, 2018.

42. Invited Seminar at Tianjin University, "Big Data Applications in Power Distribution Systems," Tianjin, China, October, 2018.
41. 2018 The 2nd IEEE Conference on Energy Internet and Energy System Integration, "Big Data Applications in Power Distribution Systems," Beijing, China, October, 2018.
40. The Annual DOE Transmission Reliability and Markets Program Review Meeting, "Economic and Engineering Aspects of Proactive Demand Participation: Centralized versus Bilateral Control Structure," Washington DC, June, 2018.
39. 2018 IEEE PES T&D Conference and Exposition, "Stochastic Valuation of Energy Storage Systems Considering Degradation," Denver, CO, April, 2018.
38. 2018 IEEE PES T&D Conference and Exposition, "Coordinating the Operations of DERs with Proactive Demand Participation at DSO Market," Denver, CO, April, 2018.
37. 2018 IEEE PES T&D Conference and Exposition, "Big Data Analytics in Electric Power Distribution Systems," Denver, CO, April, 2018.
36. Invited Seminar at National Renewable Energy Laboratory, "Big Data Analytics in Electric Power Distribution Systems," Denver, CO, April, 2018.
35. 2018 DOE GridEd Technology Transfer Workshop, "Short Course Development: Big Analytics for Electric Power Distribution Systems," Denver, CO, April, 2018.
34. 2018 DistribuTech, "Topology Identification in Power Distribution Systems with Big Data Analytics," San Antonio, TX, Jan, 2018.
33. Invited Seminar in Department of Electrical Engineering at Southern Methodist University, "Big Data Analytics in Electric Power Distribution Systems," Dallas, TX, Oct, 2017.
32. 2017 IEEE MetroCon, "Big Data Analytics for Electrical Utilities," Arlington, TX, Oct, 2017.
31. 2017 The Second International Conference on Green Communications, Computing and Technologies, Panel Session "Sensor-based Applications and Services in Digital Society," Rome, Italy, September, 2017.
30. Keynote Presentation, 2017 The Second International Conference on Green Communications, Computing and Technologies, "Big Data Analytics in Smart Grid," Rome, Italy, September, 2017.
29. 2017 IEEE PES General Meeting, Panel Session Presentation, "Big Data Analytics in Electric Power Distribution Systems," Chicago, IL, July, 2017.
28. Invited Seminar at North China Electric Power University, "Research Frontiers in Smart Grid - Big Data Analytics in Electric Power Distribution Systems," Beijing, China, June, 2017.
27. Invited Seminar in Department of Electrical Engineering at Tsinghua University, "Big Data Analytics in Electric Power Distribution Systems," Beijing, China, June, 2017.
26. Invited Seminar in School of the Electronic and Information Engineering at Xi'an Jiaotong University, "Big Data Analytics in Electric Power Distribution Systems," Xi'an, China, June, 2017.
25. The Annual DOE Transmission Reliability and Markets Program Review Meeting, "Economic and Engineering Aspects of Proactive Demand Participation: Centralized versus Bilateral Control Structure," Washington DC, June, 2017.



24. 2017 DOE GridEd Technology Transfer Workshop, "Predictive Analytics for Electric Power Distribution Systems," Dallas, April, 2017.
23. 2017 DistribuTech Transmission & Distribution Conference, "Distribution Network Phase Identification with Smart Meter Data," San Diego, Jan, 2017.
22. 2016 ISGT Asia, "LMP Decomposition with Three-Phase DCOPF for Distribution System," Melbourne, Australia, Dec, 2016.
21. Seminar Series on Systems, Control, Communication and Networks, USC, "Enabling Smart Energy Communities with Proactive Demand Participation and Distribution System Operator Market," USC, November, 2016.
20. 2016 International Conference on Sustainability in Energy and Buildings, "Energy efficient building HVAC control with real-time occupancy prediction," Turin, Italy, September, 2016.
19. 2016 IEEE PES General Meeting, "Forecast load impact from demand response resources," Boston, MA, July, 2016.
18. 2016 EPIC Summer Workshop on Distribution Automation, "Integrated distributed energy management systems," Westminster, CA, June, 2016.
17. Joint Mechanical and Aerospace Engineering/Center for Energy Seminar Series, UCSD, "Stochastic valuation of energy storage systems considering degradation," San Diego, CA, May, 2016.
16. 2016 IEEE PES T&D Conference & Exposition, Panel Session Presentation, Bulk Energy Storage Integration: Best Practices, "Stochastic valuation of energy storage systems," Dallas, TX, May, 2016.
15. Seminar in Statistic Department at Univeristy of California, Riverside, "Future curve modeling in electricity market and its application in stochastic valuation of energy storage," Riverside, CA, Feb. 2016.
14. Seminar in School of Electrical Engineering at Wuhan University, "Proactive demand participation of smart buildings in smart grid," Wuhan, China, Dec. 2015.
13. Distinguished Seminar Series in Huazhong University of Science and Technology, "From passive demand response to proactive demand participation," Wuhan, China, Dec. 2015.
12. Seminar in Department of Electrical Engineering at Tsinghua University, "Stochastic valuation of energy storage system in wholesale power market," Beijing, China, Dec. 2015.
11. Forum on Performance Analysis and Optimization for Internet of Things, Tsinghua University, "Proactive demand participation of smart buildings in smart grid," Beijing, China, Dec. 2015.
10. 2015 IEEE Conference on Decision and Control Workshop, Smart Cities: Service Models, Vulnerabilities, and Resilience, "Proactive demand participation of smart buildings in smart grid," Osaka, Japan, Dec. 2015.
9. 11th Annual IEEE International Conference on Automation Science and Engineering, "From passive demand response to proactive demand participation," Gothenburg, Sweden, Aug. 2015.
8. 2015 IEEE PES General Meeting, "From passive demand response to proactive demand participation," Denver, CO, Jul. 2015.

7. 2015 IEEE PES Conference on Intelligent Smart Grid Technology, "Big data analytics in power distribution system," Washington, D.C., Feb. 2015.
6. 2014 IEEE Conference on Decision and Control Workshop, Big Data Analytics for Societal Scale Cyber-Physical Systems "Big data analytics in power distribution systems," Los Angeles, CA, Dec. 2014.
5. Caltech Power Networks and the Smart Grid Research Seminar, "Integrating renewable energy in electricity market," Pasadena, CA, Mar. 2013.
4. 2013 IEEE PES General Meeting, "Economic valuation of wind curtailment rights," Vancouver, British Columbia, Canada, Jul. 2013.
3. 2010 IEEE PES General Meeting, "Financial risk management in restructured wholesale power markets: basic concepts and tools," Minneapolis, MN, July 2010.
2. 2008 IEEE PES General Meeting, "Multi-agent systems and electricity markets: state-of-the-art and the future," Pittsburgh, PA, Aug. 2008.
1. Power System Engineering Research Center Industry Advisor Board Meeting, "Evaluation of market rules using a multi-agent platform," Ames, IA, May 2008.

GRANTS

*Total: ~ \$11.9M, PI: ~ \$6.1M*

20. "Engagement for Grid-Ready Energy Analytics Training with Data (GREAT)"  
Sponsors: Department of Energy  
Site-PI: **Nanpeng Yu**, Co-PI: Weixin Yao  
Period: 05/15/2019 - 05/14/2024  
Amount: \$ 194,997
19. "Discovery of Signatures, Anomalies, and Precursors in Synchrophasor Data with Matrix Profile and Deep Recurrent Neural Networks"  
Sponsors: Department of Energy  
PI: **Nanpeng Yu**, Co-PIs: Eamonn Keogh, Chee-Wooi Ten  
Period: 10/01/2019 - 03/31/2021  
Amount: \$ 999,415
18. "Optimal Placement of Smart Meters to Improve Efficiency and Reliability of Power Distribution Systems"  
Sponsors: Riverside Public Utility  
PI: **Nanpeng Yu**  
Period: 09/23/2019 - 09/22/2020  
Amount: \$ 100,000
17. "Estimation of Behind-the-Meter Solar Generation from Smart Meter Data"  
Sponsors: National Renewable Energy Laboratory (NREL)  
PI: **Nanpeng Yu**  
Period: 03/22/2019 - 10/31/2019  
Amount: \$ 50,000
16. "Data-Driven State Forecasting in Power Transmission and Distribution Systems"  
Sponsors: Southern California Edison  
PI: **Nanpeng Yu**  
Period: 11/14/2018 - 11/13/2019  
Amount: \$ 25,000

15. "GAANN Fellowships in Electrical and Computer Engineering"  
Sponsors: Department of Education  
PI: Ertem Tuncel, Co-PIs: Amit Roy-Chowdhury, Matt Barth, **Nanpeng Yu**, Kostas Karydis  
Period: 10/01/2018 - 09/30/2021  
Amount: \$ 895,500
14. "Enabling Energy Efficient Data Centers in Smart Power Distribution Systems"  
Sponsors: California Energy Commission  
PI: **Nanpeng Yu**, Co-PIs: Daniel Wong, Hyeran Jecon  
Period: 03/31/2017 - 01/29/2021  
Amount: \$ 1,783,118
13. "Economical and Engineering Aspects of Proactive Demand Participation: Centralized versus Bilateral Control Structure"  
Sponsors: Department of Energy  
PI: **Nanpeng Yu**, Co-PIs: Chen-Ching Liu, Anamika Dubey  
Period: 10/01/2016 - 09/30/2019  
Amount: \$ 360,000
12. "Empowering Smart Energy Communities: Connecting Buildings, People, and Power Grids"  
Sponsors: National Science Foundation  
PI: **Nanpeng Yu**, PI/Co-PIs: Bing Dong, Ahmad Taha and Nikolaos Gatsis  
Period: 09/01/2016 - 08/31/2018  
Amount: \$ 260,000
11. "Integrated Distributed Energy Resources Management System (iDERMS)"  
Sponsors: California Energy Commission  
PI: **Nanpeng Yu**, Co-PI: Liang Min  
Period: 07/2016 - 07/2019  
Amount: \$1,119,437
10. "Leveraging Industry Research to Educate a Future Electric Grid Workforce"  
Sponsors: Department of Energy  
Site-PI: **Nanpeng Yu**  
Period: 04/2016 - 03/2019  
Amount: \$250,000
9. "Innovative Learning Technology Initiative"  
Sponsors: UCOP  
PI: **Nanpeng Yu**  
Period: 09/2015 - 09/2016  
Amount: \$68,769
8. "Chemehuevi Indian Tribe Microgrid"  
Sponsors: California Energy Commission  
PI: Alfredo Martinez-Morales, Co-PI: **Nanpeng Yu**  
Period: 07/2015 - 07/2018  
Amount: \$3,100,863
7. "Omnibus Travel Award"  
Sponsors: University of California, Riverside - Academic Senate  
PI: **Nanpeng Yu**  
Period: 07/2015 - 06/2016 & 07/2016 - 06/2017 & 07/2018 - 06/2019  
Amount: \$2,500

6. "Proactive Demand Participation of Smart Buildings in Smart Grid"  
Sponsors: University of California, Riverside - Collaborative Seed Grant Program  
PI: Qi Zhu, Co-PI: **Nanpeng Yu**  
Period: 06/2015 - 12/2015  
Amount: \$10,000
5. "Distribution System Optimization with Demand Response"  
Sponsors: Southern California Edison  
PI: **Nanpeng Yu**, Co-PI: Qi Zhu  
Period: 10/2014 - 06/2015  
Amount: \$10,000
4. "Bringing Energy Efficiency Solutions to California's Water Sector with the Use of Customized Energy Management Systems and Supervisory Control and Data Acquisition System"  
Sponsors: California Energy Commission  
PI: Sadrul Ula, Co-PI: **Nanpeng Yu**, Matthew Barth, Alfredo Martinez-Morales, Qi Zhu  
Period: 07/2015 - 03/2019  
Amount: \$3,017,035
3. "Aerosol Impacts on the Hydrology and Hydropower Generation in California"  
Sponsors: California Energy Commission  
PI: **Nanpeng Yu**, Co-PI: Jonathan Jiang and Longtao Wu  
Period: 07/2015 - 07/2018  
Amount: \$400,000
2. "Applications of Big Data Analytics in Power Distribution Systems"  
Sponsors: Southern California Edison  
PI: **Nanpeng Yu**  
Period: 10/2014 - 01/2018  
Amount: \$70,000
1. "Development of Energy Storage Valuation and Optimization Tool"  
Sponsors: Southern California Edison  
PI: **Nanpeng Yu**  
Period: 08/2014 - 08/2015  
Amount: \$50,000

HONORS AND  
AWARDS

- Excellent Paper Award, IEEE Sustainable Power & Energy Conference, 2019.
- Best Paper Award, IEEE Power and Energy Society General Meeting, 2019.
- Best Paper Award, IEEE Power and Energy Society Grand International Conference & Exposition Asia, 2019.
- Regents Faculty Development Award, University of California, 2018.
- Best Paper Award, the Second International Conference on Green Communications, Computing and Technologies, 2017.
- Regents Faculty Fellowship, University of California, 2017.
- Best Paper Award Finalist, IEEE Power and Energy Society General Meeting, 2016.
- Omnibus Travel Award, Academic Senate, 2015-2017.
- Best Paper Award Finalist (2 papers), IEEE Power and Energy Society General Meeting, 2013.

Third Prize Presenter, IEEE Power and Energy Society General Meeting Poster Contest, 2009  
Best Paper Award Finalist, Intelligent System Application to Power System Conference, 2007  
First-class Scholarship for Excellent Academic Performance, Tsinghua University, 2003-2004

STUDENT  
ADVISING

**Ph.D. Students**

11. Brandon Foggo (UCR ECE, Summer 2015 - Fall 2019). Graduated. Dissertation Title: Information Losses in Neural Classifiers with Applications to Training Data Selection Strategies and Cyber Physical Systems.
10. Wei Wang (UCR ECE, Spring 2015 - Winter 2020). Graduated. Dissertation Title: Advanced Optimization and Data-Driven Control in Smart Grid.
9. Yuanqi Gao (UCR ECE, Summer 2016 - Present)
8. Wenyu Wang (UCR ECE, Summer 2015 - Present)
7. Jie Shi (UCR ECE, Fall 2015- Present)
6. Farzana Kabir (UCR ECE, Fall 2016 - Present)
5. Yinglun Li (UCR ECE, Spring 2019 - Present)
4. Xianghao Kong (UCR ECE, Fall 2019 - Present)
3. Yuanbin Cheng (UCR CS, Fall 2019 - Present)
2. Osten Anderson (UCR ECE, Fall 2019 - Present)
1. Zuzhao Ye (UCR ECE, Summer 2020 - Present)

**M.S. Students**

6. Zhenhai Zhang (UCR ECE, Fall 2017 - Summer 2018). Graduated.
5. Zive Petrovski (UCR ECE, Fall 2015 - Summer 2018). Graduated.
4. Sampath Raman (UCR ECE, Fall 2017- Summer 2019). Graduated
3. Pritesh Shah (UCR ECE, Spring 2018 - Summer 2019). Graduated
2. Raul Avellaneda (UCR ECE, Fall 2017 - Present)
1. Benjamin Clark (UCR ECE, Spring 2018 - Present)

**Postdoc, Visiting Scholars and Students**

Brandon Foggo (Postdoc, Sep. 2019 - Present)

Koji Yamashita (Visiting Ph.D. Student, Michigan Tech, 2019)

Isha Sharma (Postdoc, 2018)

Yang Liu (Visiting Ph.D. Student, Xian Jiaotong University, 2016)

Wen Ding (Visiting Assistant Researcher, Wuhan University, 2015)

Chaoyi Peng (Visiting Ph.D. Student, Hong Kong University, 2014)

### **Graduate Degree Committee**

- Ph.D. Committees Members
  - Abbas Mazloumi, (UCR, Computer Science and Engineering, Role: Member)
  - Bo Dong, (UCR, Electrical and Computer Engineering, Role: Member)
  - Wei Song, (UCR, Computer Science and Engineering, Role: Member)
  - Lin Jiang, (UCR, Computer Science and Engineering, Role: Member)
  - Hisham Alhulayyil, (UCR, Computer Science and Engineering, Role: Member)
  - Umar Farooq, (UCR, Computer Science and Engineering, Role: Member)
  - Xukan Ran, (UCR, Computer Science and Engineering, Role: Member)
  - Sri Shaila, (UCR, Computer Science and Engineering, Role: Member)
  - Tianshu Wei, (UCR, Electrical and Computer Engineering, Role: Member)
  - Changfu Li, (UCSD, Mechanical and Aerospace Engineering, Role: Outside Member)
  - Dang Tu Nguyen, (UCR, Computer Science and Engineering, Role: Member)
  - Chun-Yu Chuang, (UCR, Computer Science and Engineering, Role: Member)
  - Jinhan Wang, (UCR, Computer Science and Engineering, Role: Member)
  - Junqiao Qiu, (UCR, Computer Science and Engineering, Role: Member)
  - Jeffrey Bell, (UCR, Material Science and Engineering, Role: Member)
  - Peng Wang, (UCR, Electrical and Computer Engineering, Role: Member)
  - Zhou Liang, (UCR, Computer Science and Engineering, Role: Member)
  - Zhongjie Wang, (UCR, Computer Science and Engineering, Role: Member)
  - Mohammad Jahanian, (UCR, Computer Science and Engineering, Role: Member)
  - Brandon Foggo, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Yuanqi Gao, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Wenyu Wang, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Jie Shi, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Wei Wang, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Xiaoyang Zhou, (UCR, Statistics, Role: Member)
  - Ali Mohammadkhan, (UCR, Computer Science and Engineering, Role: Member)
  - Fei Ye, (UCR, Electrical and Computer Engineering, Role: Member)
- M.S. Committees Members
  - Zhenhai Zhang, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Siyu Deng, (UCR, Electrical and Computer Engineering, Role: Member)
  - Yun Xue, (UCR, Electrical and Computer Engineering, Role: Member)

### **UC, Riverside**

- EE 114, Probability, Random Variables, and Random Processes in Electrical Engineering. Spring 2020.
- EE 155, EE 155(V), Power System Analysis. Fall 2014, Fall 2015, Summer 2016, Fall 2016, Fall 2017, Spring 2018, Fall 2018.
- EE 260, Introduction to Power Distribution System. Spring 2015, Spring 2017, Winter 2020.
- EE 218, Power System Steady State and Market Analysis. Fall, 2015, Summer 2016, Winter 2017, Summer 2018, Summer 2019.
- EE 249, Power System Dynamics. Spring 2016, Spring 2018.
- EE 260, Big Data Analytics in Smart Grid. Spring 2019.

PROFESSIONAL  
SERVICE

**Conference Organizing**

- Workshop Chair, 2020 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids.
- Technical Program Committee Member, 2019 IEEE Power and Energy Society General Meeting
- Technical Review Committee Member, 2017 Innovative Smart Grid Technologies (ISGT Asia)
- Technical Program Committee Member, 2017 Intelligent System Applications to Power Systems (ISAP)
- Technical Program Committee Member, 2017 The Second International Conference on Green Communications, Computing and Technologies (GREEN)
- Session Co-Chair, 2019 IEEE PES General Meeting, Big Data Analytics for Power System Economics, Reliability, and Security.
- Session Chair, 2019 IEEE PES GTD Asia 2019, Energy Storage Systems.
- Session Co-Chair, 2018 The 2nd IEEE Conference on Energy Internet and Energy System Integration, Data-Driven Method and Its Applications in Power Systems
- Session Co-Chair, 2018 IEEE PES General Meeting, Super Session, Data Science and Data Quality as Applied to Power System
- Session Chair, 2018 IEEE PES General Meeting, Topology and Parameter Identification in Electric Power Distribution Systems
- Session Chair, 2018 IEEE PES General Meeting, Big Data Analytics Focused on End-Use Customers in Power Distribution Systems
- Session Chair, 2018 IEEE PES T&D Conference and Exposition, Planning, Deployment and Operation of Energy Storage Projects
- Session Chair, 2018 IEEE PES T&D Conference and Exposition, Are Electric Utilities Ready for the Era of Big Data?
- Session Co-Chair, 2017 IEEE PES General Meeting, Big Data in Power Systems: Transmission, Distribution, and Data Analytic Applications
- Session Co-Chair, 2016 IEEE ISGT Asia, Transmission and Distribution Networks Track
- Session Co-Chair, 2016 IEEE PES T&D Conference and Exposition, Bulk Energy Storage Integration: Best Practices
- Session Co-Chair, 2015 IEEE PES General Meeting, Power System Economics Forum
- Session Chair, 2014 IEEE PES General Meeting, DC Applications and Electric Vehicles

**Campus Service**

- Committee on International Education, 2018 - Present.
- Search Committee Member, Business Analytics in Finance Cluster, 2018.
- Search Committee Member, Director of Infrastructure and Energy Management, 2017
- Search Committee Member and AACO, Spatial Analysis Cluster, 2016
- CE-CERT Academic Committee Member, 2015 - Present
- BCOE Ad-hoc Committee on Research and Share Equipment and Technology, 2015

### Referee Service

- Associate editor: IEEE Transactions on Smart Grid, IEEE Transactions on Sustainable Energy, International Transactions on Electrical Energy Systems.
- Journal referee: IEEE Transactions on Power Systems, IEEE Transactions on Smart Grid, European Transactions on Electric Power, IET Generation, Transmission & Distribution, The Energy Journal, Building Simulations, Applied Energy, IEEE Transactions on Industrial Informatics, IEEE Transactions on Sustainable Energy.
- Conference referee: North America Power Symposium, IEEE Conference on Decision and Control, IEEE Power and Energy Society General Meeting, ISGT Asia.
- Proposal Reviewer: National Science Foundation Proposal Review Panel Member, 2017.

### Outreach Activities

- Committee Member, IEEE PES Scholarship Plus, Region 6
- Review Panel Co-Chair, undergraduate student design projects of the GridEd (the Center for Grid Engineering Education).

### PROFESSIONAL MEMBERSHIPS

**Institute for Electrical and Electronics Engineers (IEEE)**, Senior Member, 2016–present, Member 2010–2015

- IEEE PES Distribution System Operation and Planning Subcommittee, Co-chair (2019–present)
- IEEE PES Distribution System Operation and Planning Subcommittee, Secretary (2018–2019)
- IEEE PES Working Group on Data-Driven Modeling, Monitoring, and Control in Power Distribution Networks, Founding Chair (2019–present)
- IEEE PES Task Force on Big Data Applications on Power Distribution Systems, Founding Co-Chair (2016–2019)
- IEEE Big Data Analytics Subcommittee, Member (2016–present)
- IEEE Power and Energy Society, Senior Member (2016–present)
- IEEE Power and Energy Society, Member (2010–2015)
- IEEE Energy Storage Economics Working Group, Secretary (09/2014–2016)
- IEEE Demand Response Working Group, Member (09/2014–present)
- IEEE Smart Cities Community, Member (05/2017–present)
- IEEE Smart Grid Community, Member (05/2017–present)
- IEEE Big Data Community, Member (05/2017–present)