Dr. Nanpeng (Eric) Yu

CONTACT INFORMATION

Full Professor
University of California, Riverside
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RESEARCH INTERESTS

Physics-informed Machine learning; Optimization and Control in Smart Grids; Transportation Electrification; Electricity Market Design; Decarbonization for Critical Infrastructure Systems.

CURRENT ACADEMIC APPOINTMENTS

Full Professor, University of California, Riverside — July 2024 to present
Department of Electrical and Computer Engineering
Bourns College of Engineering
- Affiliations:
  - Department of Computer Science (Cooperating Faculty)

Vice Chair, University of California, Riverside — July 2023 to June 2025
- Department of Electrical and Computer Engineering

Graduate Advisor, University of California, Riverside — July 2022 to present
- Department of Electrical and Computer Engineering

Director, University of California, Riverside — December 2019 to present
- Center of Energy, Economics, and Environment

PREVIOUS POSITIONS

Associate Professor, University of California, Riverside — July 2019 to June 2024
Department of Electrical and Computer Engineering
Bourns College of Engineering
- Affiliations:
  - Department of Computer Science (Cooperating Faculty)

Assistant Professor, University of California, Riverside — July 2014 to June 2019
Department of Electrical and Computer Engineering
Bourns College of Engineering
- Affiliations:
  - Department of Statistics (Cooperating Faculty)
  - Center for Spatial Sciences
  - Center for Environmental Research and Technology

Project Manager, Demand Response Integration, Southern California Edison, Rosemead, CA, (December 2013 to July 2014)
- Integrated over 1GW of demand response resource into CAISO market.

Senior Power System Planner, Southern California Edison, Rosemead, CA, (January 2011 to November 2013)
- Technical lead
  - Energy storage valuation and optimization.
  - Hydroelectric power plant control and optimization.
  - Renewable resource integration.
  - Electricity market bidding strategy development.

Research Intern, Midcontinent Independent System Operator, Inc., Carmel, IN, (December 2009 to February 2010)
- Grid congestion forecasting and credit risk analysis modeling for Financial Transmission Rights (FTRs).

EDUCATION

Iowa State University, Ames, IA

Ph.D., Electrical and Computer Engineering, December 2010

- Thesis: *Evaluation of wholesale electric power market rules and financial risk management by agent-based simulations*
- Advisors:
  - Professor Chen-Ching Liu
  - Professor Leigh Tesfatsion
- Area of Study: Power Engineering
- Minor: Statistics

M.S., Economics, December 2012

- Thesis: *Economic Valuation of Wind Curtailment Rights*
- Advisor: Professor Leigh Tesfatsion

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

Students supervised marked by †; postdocs and project scientists supervised are underlined; students co-advised marked by #.

80. C. Zhang, X. Fu, Z. Li, **N. Yu**, Y. Zhang, H. Gu, "Unified Fourier graph-based spatiotemporal learning and corrected NWP for multi-site ultra-short term photovoltaic power forecasting," to appear in *IEEE Transactions on Smart Grid*, 2025.

79. M. Tang†, Z. Ye, I. Karamouzas, and **N. Yu**, "TERRAN: A Transformer-based electric vehicle routing agent for real-time adaptive navigation," to appear in *IEEE Transactions on Automation Science and Engineering*, 2025.

78. S. Zhang†, Y. Cheng†, and **N. Yu**, "Generating synthetic net load data with physics-informed diffusion model," to appear in *IEEE Transactions on Smart Grid*, 2025.

77. Y. Yang, Y. Zhou, Y. Liu, S. He, **N. Yu**, J. Fei, T. Liu, and X. Guan, "A cyber-physical security assessment model for distribution grid with high penetration of electric vehicle charging infrastructure," to appear in *IEEE Internet of Things Journal*, 2025.

76. J. Qin†, A. Liu, M. Bragin, and **N. Yu**, "AccSPS learning rate: accelerated convergence through decision-adjusted levels for stochastic Polyak stepsize," to appear in *IEEE Transactions on Automation Science and Engineering*, 2025.

75. Z. Zhao, Y. Yang, F. Wang, **N. Yu**, G. Huang, X. Chang, G. Li, "Short-term PV power forecasting method using a dynamic spatio-temporal attention graph convolutional network with error correction," *Solar Energy*, vol. 300, 2025.

74. **N. Yu**, et al., "Data-driven control, optimization, and decision-making in active distribution networks," to appear in *Applied Energy*, 2025.

73. J. Qin† and **N. Yu**, "Solve large-scale unit commitment problems by physics-informed graph learning," to appear in *IEEE Transactions on Power Systems*, 2025.

72. Y. Cheng†, K. Yamashita, J. Follum, and **N. Yu**, "Adversarial purification for data-driven power system classifiers with diffusion models," to appear in *IEEE Transactions on Power Systems*, 2025.

71. X. Wang, Y. Liu, **N. Yu**, P. Liu, T. Liu and X. Guan, "Physical intrusion attack detection in fieldbus network with passive fail-safe biasing," *IEEE Transactions on Automation Science and Engineering*, vol. 22, pp. 14008-14019, 2025.

70. K. Yamashita, **N. Yu**, E. Farantatos, and L. Zhu, "Graph learning-based power system health assessment algorithm," *IEEE Open Access Journal of Power and Energy*, vol. 12, pp. 181-193, 2025.

69. J. Qin†, R. Yang, and **N. Yu**, "Physics-informed graph neural networks for collaborative dynamics reconfiguration and voltage regulation in Unbalanced distribution systems," *IEEE Transactions on Industry Applications*, vol. 61, no. 2, pp. 2538-2548, 2025.

68. O. Anderson†, W. Hong, B. Wang, and **N. Yu**, "Impact of flexible and bidirectional charging in medium- and heavy-duty trucks on California's decarbonization pathway," *Applied Energy*, vol. 377, Part B, 2024.

67. O. Anderson†, M. Bragin, and **N. Yu**, "Optimizing deep decarbonization pathways in California with power system planning using surrogate level-based Lagrangian relaxation," *Applied Energy*, vol. 377, Part A, 2024.

66. O. Anderson†, **N. Yu**, C. Bracken, C. Burleyson, and A. Pusch, "Improved decarbonization planning through climate resiliency modeling", *IEEE Access*, vol. 12, pp. 128494 - 128508, 2024.

65. Z. Ye†, M. Bragin, R. Wei, and **N. Yu**, "Joint planning of dynamic wireless charging lanes and power delivery infrastructure for heavy-duty drayage trucks," *Applied Energy*, vol. 375, 2024.

64. Z. Ye†, **N. Yu**, and R. Wei, "Joint planning of charging stations and power systems for heavy-duty drayage trucks," *Transportation Research Part D*, vol. 134, 2024.

63. Y. Liu, C. Yang, **N. Yu**, J. Wang, J. Tian, Y. Zhou and T. Liu, "CFDI: Coordinated false data injection attack in active distribution network," *IET Generation, Transmission & Distribution*, vol. 18. pp. 2556-2569, 2024.

62. Z. Wang, Y. Liu, **N. Yu**, S. Zhang†, Y. Zhou, and T. Liu, "Data inference based on electricity prices: data leakage threats and assessment methods in power system," *IEEE Transactions on Power Systems*, vol. 40, no. 1, pp. 1049-1059, Jan. 2025.

61. J. Wang, J. Tian, **N. Yu**, Y. Liu, H. Zhang, Y. Zhou and T. Liu, "A dynamic and static combined state recovery method against FDI attacks in power grids," *IEEE Transactions on Smart Grid*, vol. 15, no. 6, pp. 6018-6030, Nov. 2024.

60. A. Srivastava et al., "Distribution system behind-the-meter DERs: Estimation, uncertainty quantification, and control," *IEEE Transactions on Power Systems*, vol. 40, no. 1, pp. 1060-1077, Jan. 2025. DOI: 10.1109/TPWRS.2024.3404815.

59. M. Bragin, Z. Ye†, and **N. Yu**, "Toward efficient transportation electrification of heavy-duty trucks: joint scheduling of truck routing and charging," *Transportation Research Part C: Emerging Technologies*, 2024.

58. B. Foggo†, K. Yamashita, and **N. Yu**, "pmuBAGE: The benchmarking assortment of generated PMU data for power system events," *IEEE Transactions on Power Systems*, vol. 39, no. 2, pp. 3485-3496, Mar. 2024.

57. D. Cao[#], J. Zhao, W. Hu, **N. Yu**, J. Hu, Q. Huang, and Z. Chen, "Physics-informed graphical learning and Bayesian averaging for robust distribution state estimation," *IEEE Transactions on Power Systems*, vol. 39, no. 2, pp. 2879-2892, Mar. 2024.

56. M. Islam, Y. Liu, V. Vokkarane, and **N. Yu**, "Robust real-time load estimation using sparsely selected smart meters with high reporting rates," *Applied Energy*, vol. 352, 2023.

55. J. Qin[†], Y. Gao[†], M. Bragin, and **N. Yu**, "An optimization method-assisted ensemble deep reinforcement learning algorithm to solve unit commitment problems," *IEEE Access*, vol. 11, pp. 100125-100136, 2023.

54. Y. Cheng[†], B. Foggo[†], K. Yamashita, and **N. Yu**, "Missing value replacement for PMU data via deep learning model with magnitude trend decoupling," *IEEE Access*, vol. 11, pp. 27450-27461, 2023.

53. F. Kabir[†], Y. Gao[†], and **N. Yu**, "Reinforcement learning-based two-timescale Volt-VAR control with degradation-aware smart inverters in power distribution systems," *Applied Energy*, vol. 335, Apr. 2023.

52. J. Shi[†], Z. Ye[†], O. Gao, and **N. Yu**, "Lyapunov optimization in online battery energy storage system control for commercial buildings," *IEEE Transactions on Smart Grid*, vol. 14, no. 1, pp. 328-340, Jan. 2023.

51. **N. Yu**, W. Wang[†], R. Johnson, "Behind-the-meter resources: Data-driven modeling, monitoring, and control," *IEEE Electrification Magazine*, vol. 10, no. 4, pp. 20-28, 2022.

50. J. Shi[†], **N. Yu**, and O. Gao, "Bidding strategy for wireless charging roads with energy storage in real-time electricity market," *Applied Energy*, vol. 327, 2022.

49. Y. Gao[†], X. Wang, **N. Yu**, and B. Wong, "Harnessing deep reinforcement learning to discover time-dependent optimal fields for quantum control dynamics," *Physical Chemistry Chemical Physics*, vol. 24, no. 39, pp. 23939-24596, Oct. 2022.

48. K. Yamashita, B. Foggo[†], X. Kong[†], Y. Cheng[†], J. Shi[†], and **N. Yu**, "A dynamic behavior-based bulk power system event signature library with empirical clustering," *IEEE Access*, vol. 10, 2022.

47. Z. Ye[†], **N. Yu**, R. Wei, and C. Liu, "Decarbonizing regional multi-modal transportation system with shared electric charging hub," *Transportation Research, Part C: Emerging Technologies*, vol. 144, Nov. 2022.

46. D. Hu[#], Z. Ye[†], Y. Gao[†], Y. Peng, and **N. Yu**, "Multi-agent deep reinforcement learning for voltage control with coordinated active and reactive power optimization," *IEEE Transactions on Smart Grid*, vol. 13, no. 6, pp. 4873-4886, Nov. 2022.

45. M. Bragin, B. Yan, A. Kumar, **N. Yu**, and P. Zhang, "Efficient operations of micro-grids with meshed topology and under uncertainty through exact satisfaction of AC-PF, droop control and tap-changer constraints," *Energies*, 2022. DOI: 10.3390/en15103662.

44. Z. Ye[†], Y. Gao[†], and **N. Yu**, "Learning to operate an electric vehicle charging station considering vehicle-grid integration," *IEEE Transactions on Smart Grid*, vol. 13, no. 4, pp. 3038-3048, 2022.

43. Y. Cheng[†], **N. Yu**, B. Foggo[†], and K. Yamashita, "Online power system event detection via bidirectional generative adversarial networks," *IEEE Transactions on Power Systems*, vol. 37, no. 6, pp. 4807-4818, Nov. 2022.

42. A. Jahanshahi, D. Wong, and **N. Yu**, "PowerMorph: QoS-aware server power reshaping for data center regulation service," *ACM Transactions on Architecture and Code Optimization*, vol. 19, no. 3, pp. 1-27, Sep. 2022.

41. Y. Gao[†] and **N. Yu**, "Model-augmented safe reinforcement learning for Volt-VAR control in power distribution networks," *Applied Energy*, vol. 313, May 2022.

40. M. Ostadijafari[#], J. Bedoya, W. Wang[†], A. Dubey, C. Liu, and **N. Yu**, "Proactive demand-side participation: Centralized versus transactive demand-supply coordination," *Electric Power Systems Research*, vol. 206, 2022.

39. D. Cao[#], J. Zhao, W. Hu, **N. Yu**, F. Ding, Q. Huang, and Z. Chen, "Deep reinforcement learning enabled physical-model-free two-timescale voltage control method for active distribution systems," *IEEE Transactions on Smart Grid*, vol. 13, no. 1, pp. 149-165, Jan. 2022.

38. D. Cao[#], J. Zhao, W. Hu, F. Ding, **N. Yu**, Q. Huang, and Z. Chen, "Model-free voltage control of active distribution system with PVs using surrogate model-based deep reinforcement learning," *Applied Energy*, vol. 306, Jan. 2022.

37. 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," *Systems and Control Letters*, vol. 160, Feb. 2022.

36. W. Wang[†] and **N. Yu**, "Estimate three-phase distribution line parameters with physics-informed graphical learning method," *IEEE Transactions on Power Systems*, vol. 37, no. 5, pp. 3577-3591, Sep. 2022.

35. X. Kong[†], B. Foggo[†], K. Yamashita, and **N. Yu**, "Online voltage event detection using synchrophasor data with structured sparsity-inducing norms," *IEEE Transactions on Power Systems*, vol. 37, no. 5, pp. 3506-3515, Sep. 2022.

34. B. Foggo[†] and **N. Yu**, "Online PMU missing value replacement via event-participation decomposition," *IEEE Transactions on Power Systems*, vol. 37, no. 1, pp. 488-496, Jan. 2022.

33. Y. Li[†], **N. Yu**, and W. Wang[†], "Machine learning-driven virtual bidding with electricity market efficiency analysis," *IEEE Transactions on Power Systems*, vol. 37, no. 1, pp. 354-364, Jan. 2022.

32. J. Shi[†], B. Foggo[†], and **N. Yu**, "Power system event identification based on deep neural network with information loading," *IEEE Transactions on Power Systems*, vol. 36, no 6, pp. 5622-5632, Nov. 2021.

31. Y. Gao[†], W. Wang[†], and **N. Yu**, "Consensus multi-agent reinforcement learning for Volt-VAR control in power distribution networks," *IEEE Transactions on Smart Grid*, vol. 12, no. 4, pp. 3594-3604, 2021.

30. F. Kabir[†], **N. Yu**, W. Yao, R. Yang, and Y. Zhang, "Joint estimation of behind-the-meter solar generation in a community," *IEEE Transactions on Sustainable Energy*, vol. 12, no. 1, Jan. 2021, DOI: 10.1109/TSTE.2020.3016896.

29. Y. Gao[†], W. Wang[†], J. Shi[†], and **N. Yu**, "Batch-constrained reinforcement learning for dynamic distribution network reconfiguration," *IEEE Transactions on Smart Grid*, vol. 11, no. 6, Nov. 2020. https://arxiv.org/abs/2006.12749.

28. 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.

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**, "Linearzied 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[#], Y. Gao[†], W. Yao, and **N. Yu**, "A Robust mixed effects segmented regression model for baseline electricity consumption forecasting," *Journal of Modern Power Systems and Clean Energy*, vol. 10, no. 1, Jan. 2022.

24. W. Wang[†] and **N. Yu**, "Maximum marginal likelihood estimation of phase connections in power distribution systems," *IEEE Transactions on Power Systems*, vol. 35, no. 5. pp. 3906-3917, Sep. 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, "Operating electric vehicle fleet for ride-hailing services with reinforcement learning," *IEEE Transactions on Intelligent Transportation Systems*, vol. 21, no. 11, pp. 4822-4834, Nov. 2020.

21. B. Foggo[†] and **N. Yu**, "Information losses in neural classifiers from sampling," *IEEE Transactions on Neural Networks and Learning Systems*, vol. 31n no. 10, pp. 4073-4083, 2020, doi: 10.1109/TNNLS.2019.2952029.

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**, "WFR-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. Theroy 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

3. M. Bragin, B. Yan, and **N. Yu**, "Operations of micro-grids with meshed topology under uncertainty," In: Peng Zhang and Yifan Zhou (eds) Microgrids: Theory and Practice, Wiley, 2023.

2. 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.

1. **N. Yu** and C.C. Liu, "Multi-agent system applications in power systems," In: M. Eremia, C. Liu, and A. Edris (eds) Volume III: Advanced Techniques and Technologies: Facts and A.I. Part Two - Artificial Intelligence Techniques, John Wiley & Sons, pp. 903-930, Oct. 2016.

Peer-Reviewed Conference Proceedings

73. J. Brown†, **N. Yu**, A. Rahman and K. Oikonomou, "Assessing power system and market volatility during heat waves using probabilistic AI forecasts: Insights from the WECC region," to appear in IEEE PES International Meeting, pp. 1-5, 2025.

72. L. Zhou†, Z. Ye, and **N. Yu**, "Carbon-aware charging strategies for electric vehicle battery swapping stations " *IEEE IECON*, pp. 1-7, 2025.

71. Y. Cheng†, **N. Yu**, and J. Follum, "Enhancing black-box adversarial attacks on power system event classifiers via transferability," *IEEE IECON*, pp. 1-7, 2025."

70. Z. Shao and **N. Yu**, "Carbon-aware optimal power flow with data-driven carbon emission tracing," *IEEE PES General Meeting*, pp. 1-5, 2025.

69. J. Chan†, **N. Yu**, and Y. Li†, "Empirical analysis of financial transmission right trading behavior," 11th International Conference on Power and Energy Systems Engineering, 2024.

68. Y. Cheng†,K. Yamashita, **N. Yu**, and Yang Liu "A hybrid query-efficient black-box adversarial attack on power system event classifier,", IEEE SmartGridComm, pp. 1-7, Sep. 2024.

67. K. Yamashita, **N. Yu**, E. Farantatos, and L. Zhu, "Predicting power system frequency health index with PMUs and graph attention networks," IEEE SmartGridComm, pp. 1-6, Sep. 2024.

66. O. Anderson†, **N. Yu**, K. Oikonomou, and D. Wu, "Selection of intermediate length representative periods for capacity expansion," *IEEE PES General Meeting*, pp. 1-5, 2024.

65. S. Zhang†, K. Yamashita, and **N. Yu**, "Learning power system dynamics with neural ordinary differential equations," *IEEE PES General Meeting*, pp. 1-5, 2024.

64. W. Wang†, Z. Ye†, **N. Yu**, and P. Chen, "Prediction of electric vehicle penetration and its impacts on distribution systems: a real-world case study in Maryland,"*IEEE SusTech*, 2024.

63. H. Li†, R. Wei, W. Wang†, and **N. Yu**, "Predicting COVID-19 transmission in Southern California with machine learning methods," *9th International Conference on Big Data Analytics*, 2024.

62. O. Anderson†, **N. Yu**, K. Oikonomou, P. Maloney, and D. Wu, "Representative period selection for robust capacity expansion planning in low-carbon grids," *IEEE PES T&D Conference and Exposition*, pp. 1-5, 2024.

61. W. Wang†, Y. Li†, and **N. Yu**, "Predict locational marginal greenhouse gas emission factors of electricity with a spatio-temporal graph convolution network," *IEEE Power and Energy Society Innovative Smart Grid Technologies (ISGT) Conference Europe*, pp. 1-6, 2023.

60. J. Qin† and **N. Yu**, "Reconfigure distribution network with physics-informed graph neural network," *IEEE Power and Energy Society Innovative Smart Grid Technologies (ISGT) Conference Europe*, pp. 1-6, 2023.

59. B. Foggo† and **N. Yu**, "On the maximum mutual information capacity of neural architectures," *International Conference on Machine Learning*, Workshop on Neural Compression: From Information Theory to Applications, https://arxiv.org/abs/2006.06037, 2023.

58. S. Zhang† and **N. Yu**, "Learning power system dynamics with nearly-Hamiltonian neural networks," *IEEE Power and Energy Society General Meeting*, pp. 1-5, Jul. 2023.

57. K. Yamashita, J. Qin†, **N. Yu**, E. Farantatos, and L. Zhu, "Predicting power system voltage health index with graph convolutional networks,"*IEEE Power and Energy Society General Meeting*, pp. 1-5, Jul. 2023.

56. W. Wang†, **N. Yu**, and Y. Zhao, "Fast graphical learning method for parameter estimation in large-scale distribution networks," *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, pp. 1-7, Singapore, Oct. 2022.

55. K. Yamashita and **N. Yu**, "Data-driven ice blockage estimation of water intake at Niagara hydropower station," *2022 IEEE Innovative Smart Grid Technologies - Asia (ISGT Asia)*, pp. 1-5, Singapore, Nov. 2022.

54. Y. Cheng†, K. Yamashita, and **N. Yu**, "Adversarial attacks on deep neural network-based power system event classification models," *2022 IEEE Innovative Smart Grid Technologies - Asia (ISGT Asia)*, pp. 1-5, Singapore, Nov. 2022.

53. Y. Gao† and **N. Yu**, "A reinforcement learning-based Volt-VAR control dataset and testing environment," *2022 IEEE Innovative Smart Grid Technologies - Asia (ISGT Asia)*, pp. 1-5, Singapore, Nov. 2022.

52. O. Anderson† and **N. Yu**, "Learning to Steal Electricity in Power Distribution Systems with Deep Reinforcement Learning," *International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, pp. 1-6, June, 2022.

51. X. Kong†, K. Yamashita, B. Foggo†, and **N. Yu**, "Dynamic parameter estimation with physics-based neural ordinary differential equations," *IEEE Power and Energy Society General Meeting*, pp. 1-5, Jul. 2022.

50. W. Wang†, **N. Yu**, F. Rahmatian, and S. Pandey, "Where to install distribution phasor measurement units to obtain accurate state estimation results?" *IEEE Power and Energy Society General Meeting*, pp. 1-5, Jul. 2022.

49. J. Shi†, K. Yamashita, and **N. Yu**, "Power system event identification with transfer learning using large-scale real-world synchrophasor data in the United States," *IEEE Power and Energy Society Innovative Smart Grid Technologies (ISGT) North America*, pp. 1-5 , Washington, DC, Feb. 2022.

48. B. Foggo† and **N. Yu**, "Analyzing data selection techniques with tools from the theory of information losses," *IEEE International Conference on Big Data*, pp. 1-10, Dec. 2021 (19.9% regular paper acceptance rate), https://arxiv.org/abs/1902.09602.

47. J. Qin†, **N. Yu**, and Y. Gao†, "Solving unit commitment problems with deep reinforcement learning," *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, pp. 1-6, Aachen, Germany, Oct. 2021.

46. Z. Ye†, R. Wei, and **N. Yu**, "Short-term forecasting for utilization rates of electric vehicle charging stations," 7th IEEE International Smart Cities Conference, pp. 1-7, Sep. 2021.

45. Y. Li† and **N. Yu**, "Learning to arbitrage congestion in electricity market with virtual bids," *IEEE Power and Energy Society Innovative Smart Grid Technologies (ISGT) Conference Europe*, Espoo, Finland, pp. 1-6, Oct. 2021

44. O. Anderson† and **N. Yu**, "Detect and identify topology change in power distribution systems using graph signal processing," *IEEE Power and Energy Society Innovative Smart Grid Technologies (ISGT) Conference Europe*, Espoo, Finland, pp. 1-6, Oct. 2021.

43. F. Kabir†, Y. Gao†, and **N. Yu**, "Reinforcement learning-based smart inverter control with polar action space in power distribution systems," *IEEE Conference on Control Technology and Applications*, pp. 1-9, Aug. 2021.

42. O. Anderson† and **N. Yu**, "Distribution system bad data detection using graph signal processing," *IEEE Power and Energy Society General Meeting*, pp. 1-5, Jul. 2021. **Received Best Paper Award**.

41. Y. Gao† and **N. Yu**, "Deep reinforcement learning in power distribution systems: overview, challenges, and opportunities," *The Twelfth Conference on Innovative Smart Grid Technologies (ISGT)*, pp. 1-5, Feb. 2021.

40. J. Zhang, S. Sadiqbatcha, Y. Gao†, M. Dea, **N. Yu**, and S. Tan, "HAT: Hotspot-Aware task-to-core control for lifetime and reliability improvement of multicore system with deep reinforcement learning," 2020 ACM/IEEE Workshop on Machine Learning for CAD (MLCAD), pp. 1-6, 2020.

39. J. Shi†, B. Foggo†, X. Kong†, Y. Cheng†, **N. Yu**, and K. Yamashita, "Online Event Detection in Synchrophasor Data with Graph Signal Processing," *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, pp. 1-6, Nov. 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," *International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, pp. 1-5, Liege, Benelux, Aug. 2020.

36. W. Wang† and **N. Yu**, "Partial discharge detection with convolutional neural networks," *International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, pp. 1-5, Liege, Benelux, Aug. 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, Montreal, Canada, 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 Innovative Smart Grid Technologies (ISGT) North America*, pp. 1-5, Washington, DC, Feb. 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. **Received Excellent Paper Award**.

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 International Conference on Smart Grid Communications (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 International Conference on Smart Grid Communications (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 International Conference on Smart Grid Communications (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," *International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, 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.

Patent

1. Phase Identification in Power Distribution Systems. Patent No.: US 11,740,274 B2. Date of Patent: Aug. 29, 2023.

INVITED TALKS

137. 2025 South Coast AQMD Clean Fuels Program Advisor Committee Meeting, "Data-Driven Planning Platforms for Charging Networks, Truck Fleets, and Power Systems: A Progress Report," September 2025.

136. 2025 IEEE Power and Energy Society General Meeting, "Assess System and Market Volatility During Heat Waves Using Probabilistic AI Forecasts: Insights from the WECC Region," July 2025.

135. 2025 IEEE Power and Energy Society General Meeting, "Educating & Training Next Generation Data Scientists for Power & Energy Industry," July 2025.

134. 2025 IEEE Power and Energy Society General Meeting, "Diffusion Models: Emerging Applications in Power Systems," July 2025.

133. 2025 Transportation Research Symposium, "Joint Planning of Charging Stations and Power Systems for Heavy-duty Drayage Trucks," May 2025.

132. 2025 Transportation Research Symposium, "Toward Efficient Transportation Electrification of Heavy-Duty Trucks: Joint Scheduling of Truck Routing and Charging," May 2025.

131. Invited Seminar, University of Birmingham, "Physics-informed Machine Learning for Power Systems," May 2025.

130. Invited Seminar, Imperial College, "Physics-informed Machine Learning for Power Systems," May 2025.

129. Keynote Talk at 2025 IEEE International Symposium on the Application of Artificial Intelligence in Electrical Engineering (AAIEE 2025), "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," April 2025.

128. North American Electric Reliability Corporation (NERC), Synchronized Measurement Working Group, "Applications of Machine Learning on Real-World PMU Data," April 2025.

127. 2025 IEEE PES Grid Edge Technologies Conference & Expo, "Data-Driven Modeling Monitoring and Control in Power Distribution Systems," January 2025.

126. 2025 IEEE PES Grid Edge Technologies Conference & Expo, "Applications of Machine Learning at the Grid Edge," January 2025.

125. University of California, Los Angeles, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," January 2025.

124. Shanghai University of Electric Power, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," December 2024.

123. Donghua University, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," December 2024.

122. Tongji University, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," December 2024.

121. Shanghai Jiaotong University, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," December 2024.

120. 2024 IEEE PES Live Online Webinar, "Physics-informed Machine Learning for Power Systems," October 2024.

119. 2024 IEEE International Conference on Smart Grid Communications, "A Hybrid Query-Efficient Black-Box Adversarial Attack on Power System Event Classifier," September 2024.

118. 2024 IEEE International Conference on Smart Grid Communications, "Predicting Power System Frequency Health Index with PMUs and Graph Attention Networks," September 2024.

117. 2024 China International Conference on Electricity Distribution (CICED), "Physics-informed Machine Learning for Power Distribution Systems," September 2024.

116. 2024 South Coast AQMD Clean Fuels Program Advisory Committee Meeting, "Accelerating Electrification of Medium- and Heavy-duty Trucks in Southern California with Data-Driven Planning," September 2024.

115. 2024 11th International Conference on Power and Energy Systems Engineering, "Empirical Analysis of Financial Transmission Right Trading Behavior," September 2024.

114. 2024 IEEE Power and Energy Society General Meeting, "How to Generate Realistic Synthetic PMU Dataset with Deep Generative Model?" July 2024.

113. 2024 IEEE Power and Energy Society General Meeting, "Solve Large-scale Unit Commitment Problems by Physics-informed Graph Learning," July 2024.

112. Tsinghua University, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," June 2024.

111. Beijing Jiaotong University, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," June 2024.

110. North China Electric Power University, Invited Seminar, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," June 2024.

109. Southeast University, Seminar in the Department of Electrical and Electronic Engineering, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," June 2024.

108. Xi'an Jiaotong University, Seminar in Systems Engineering Institute, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," June 2024.

107. South China University of Technology, Seminar in School of Electric Power "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," June 2024.

106. 2024 the 9th International Conference on Big Data Analytics, "Predicting COVID-19 Transmission in Southern California with Machine Learning Methods," March 2024.

105. 2023 IEEE PES Innovative Smart Grid Technologies Europe, "Predict Locational Marginal Greenhouse Gas Emission Factors of Electricity with Spatio-temporal Graph Convolutional Networks," October 2023.

104. 2023 IEEE PES Innovative Smart Grid Technologies Europe, "Reconfigure Distribution Network with Physics-informed Graph Neural Network," October 2023.

103. UAI, Asset Health Analytics Community Seminar, "Predictive Maintenance for Transformers in Power Distribution Systems," August 2023.

102. 2023 IEEE Power and Energy Society General Meeting, "Controlling Power Distribution Systems with Safe Reinforcement Learning," July 2023.

101. 2023 IEEE Power and Energy Society General Meeting, "Learning to Operate an Electric Vehicle Charging Station Considering Vehicle-grid Integration," July 2023.

100. 2023 IEEE Power and Energy Society General Meeting, "Consensus Multi-agent Reinforcement Learning for Decentralized Volt-VAR Control in Power Distribution Systems," July 2023.

99. 2023 IEEE Power and Energy Society General Meeting, "Toward Efficient Transportation Electrification of Heavy-duty Trucks," July 2023.

98. IEEE PES Grid Edge Technologies, "Accelerate Vehicle-Grid Integration with Advanced Optimization and Machine Learning Techniques," April, 2023.

97. University of Minnesota ECE Spring 2023 Colloquium, "Machine Learning for Power Systems with Physics-informed Methods," March, 2023.

96. 11th IEEE Innovative Smart Grid Technologies Asia, "Adversarial Attacks on Deep Neural Network-based Power System Event Classification Models," November, 2022.

95. 11th IEEE Innovative Smart Grid Technologies Asia, "A Reinforcement Learning-based Volt-VAR Control Dataset and Testing Environment," November, 2022.

94. 11th IEEE Innovative Smart Grid Technologies Asia, "Data-Driven Ice Blockage Estimation of Water Intake at Niagara Hydropower Station," November, 2022.

93. 2022 University of Houston Seminar, "Machine Learning Solutions for Monitoring U.S. Transmission Grid with Large-scale Real-world Phasor Measurement Unit (PMU) Data," October, 2022.

92. IEEE Power and Energy Society Big Data and Analytics Subcommittee Webinar, "Accelerating the Adoption of Machine Learning Technology for the Power Industry," September 2022.

91. University of Illinois Chicago, Seminar of the Electrical and Computer Engineering Department, "Machine Learning Solutions for Monitoring U.S. Transmission Grid with Large-scale Real-world Phasor Measurement Unit Data," August 2022.

90. 2022 IEEE Power and Energy Society General Meeting, Super Session, "Machine Learning for Power Systems: From Pure Data-Driven to Physics-Informed Methods," July 2022.

89. 2022 IEEE Power and Energy Society General Meeting, "A Reinforcement Learning-based Volt-VAR Control Dataset and Testing Environment," July 2022.

88. 2022 IEEE Power and Energy Society General Meeting, "Fast Graphical Learning Method for Parameter Estimation in Large-scale Distribution Networks," July 2022.

87. 2022 IEEE Power and Energy Society General Meeting, "Algorithmic Trading Strategy with Virtual Bids in Electricity Markets," July 2022.

86. 2022 IEEE Power and Energy Society General Meeting, "Development of Deep Learning and Data Mining Techniques Using Terabytes of PMU Data from the U.S.," July 2022.

85. The Fifth Workshop on Autonomous Energy Systems, "Machine Learning Solutions for Monitoring U.S. Transmission Grid with Large-scale Real-world PMU Data," National Renewable Energy Laboratory, Golden CO, July 2022.

84. Asia-Pacific Economic Cooperation (APEC) Workshop of Promoting Energy Efficient, Renewable and Resilient Data Centers, "Provision of Grid Services by Data Centers," June 2022.

83. Invited Talk, Pacific Northwest National Laboratory, "pmuBAGE: The Benchmarking Assortment of Generated PMU Events," May 2022

82. North American SynchroPhasor (NASPI) Initiative Work Group Virtual Meeting, "Discovery of Signatures, Anomalies and Precursors in Synchrophasor Data," April 2022.

81. Ezra's Round Table Systems Seminar Series at Cornell University, "Machine Learning for Smart Grid: From Pure Data-Driven to Physics-Informed Methods," Dec. 2021.

80. 2021 INFORMS Annual Meeting, "Big Data Analysis of Synchrophasor Data: Experience from the U.S.," , Anaheim, California, Oct. 2021.

79. Invited Seminar, Oak Ridge National Laboratory and Lawrence Livermore National Laboratory, "Extracting Useful Information from Terabytes of PMU Data with Machine Learning and Data Mining Techniques," Online, Sep. 2021.

78. 2021 Washington State University, Energy Systems Innovation Center Seminar Series, "Deep Reinforcement Learning-based control in Power Distribution Systems," Sep, 2021.

77. 2021 IEEE Power and Energy Society General Meeting, "Reinforcement Learning-based Smart Inverter Control with Polar Action Space in Power Distribution Systems," Jul. 2021.

76. 2021 IEEE Power and Energy Society General Meeting, "Deep Reinforcement Learning in Power Distribution Systems: Overview, Challenges, and Opportunities," July, 2021.

75. 2021 IEEE Power and Energy Society General Meeting, "Estimate Three-phase Distribution Line Parameters with Physics-Informed Graphical Learning Method," Jul. 2021.

74. 2021 IEEE Power and Energy Society General Meeting, "Interdisciplinary Education and Training: Making Connections Between Machine Learning and Power Systems," Jul. 2021.

73. 2021 IEEE Power and Energy Society General Meeting, "Curriculum Development: Machine Learning and Big Data Analytics in Smart Grid," Jul. 2021.

72. 2021 IEEE Power and Energy Society General Meeting, "Data-Driven Modeling and Control of Power Distribution Systems," Jul. 2021.

71. 2021 IEEE Power and Energy Society General Meeting, "Power System Event Identification based on Deep Neural Network with Information Loading," Jul. 2021.

70. The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA), "Power System Event Detection and Identification with PMU Data," May, 2021.

69. 2021 North American Synchrophasor Initiative (NASPI) Work Group Meeting, "Online Power System Event Detection and Identification with PMU Data," Apr. 2021.

68. 2021 Iowa State University, Electrical and Computer Engineering Department Seminar, "Deep Reinforcement Learning-based Control in Power Distribution Systems," Feb, 2021.

67. California Public Utility Commission, EPIC Policy + Innovation Forum, "Wildfire Mitigation with Advanced Machine Learning and Optimization Techniques," Feb. 2021.

66. 2021 Innovative Smart Grid Technologies North America, “Improve Distribution Grid Visibility with Machine Learning Algorithms,” Feb. 2021.

65. 2020 IEEE Sustainable Power & Energy Conference, “Deep Reinforcement Learning-based Control in Power Distribution Systems,” Nov. 2020.

64. 2020 INFORMS Annual meeting, “Deep Reinforcement Learning-based Control in Power Distribution Systems,” Oct. 2020.

63. The 16th International Conference on Probabilistic Methods Applied to Power Systems, “Partial Discharge Detection with Convolutional Neural Networks,” Aug. 2020.

62. 2020 IEEE Power and Energy Society General Meeting, “Physics-based Machine Learning Algorithms for Power Systems,” Virtual Meeting, Aug. 2020.

61. Invited Tutorial at 2020 IEEE Power and Energy Society General Meeting, “Machine Learning and Big Data Analytics in Smart Grid,” Virtual Meeting, Aug. 2020.

60. Invited Seminar at University of California, Santa Cruz, “Machine Learning and Big Data Analytics in Smart Grid,” Santa Cruz, California, Feb. 2020.

59. Invited Tutorial at DistribuTech, “Big Data Analytics and Machine Learning in Smart Grid,” San Antonio, Texas, Jan. 2020.

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, Mar. 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, Mar. 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, Mar. 2019.

44. Invited Seminar at The University of Hong Kong, “Big Data Analytics for Power Distribution Systems," Hong Kong, China, Mar. 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, Dec. 2018.

42. Invited Seminar at Tianjin University, “Big Data Applications in Power Distribution Systems," Tianjin, China, Oct. 2018.

41. 2018 The 2nd IEEE Conference on Energy Internet and Energy System Integration, “Big Data Applications in Power Distribution Systems," Beijing, China, Oct. 2018.

40. The Annual DOE Transmission Reliability and Markets Program Review Meeting, “Economical and Engineering Aspects of Proactive Demand Participation: Centralized versus Bilateral Control Structure," Washington DC, Jun. 2018.

39. 2018 IEEE PES T&D Conference and Exposition, “Stochastic Valuation of Energy Storage Systems Considering Degradation," Denver, CO, Apr. 2018.

38. 2018 IEEE PES T&D Conference and Exposition, “Coordinating the Operations of DERs with Proactive Demand Participation at DSO Market," Denver, CO, Apr. 2018.

37. 2018 IEEE PES T&D Conference and Exposition, “Big Data Analytics in Electric Power Distribution Systems," Denver, CO, Apr. 2018.

36. Invited Seminar at National Renewable Energy Laboratory, “Big Data Analytics in Electric Power Distribution Systems," Denver, CO, Apr. 2018.

35. 2018 DOE GridEd Technology Transfer Workshop, “Short Course Development: Big Analytics for Electric Power Distribution Systems," Denver, CO, Apr. 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, Sep. 2017.

30. Keynote Presentation, 2017 The Second International Conference on Green Communications, Computing and Technologies, “Big Data Analytics in Smart Grid," Rome, Italy, Sep. 2017.

29. 2017 IEEE PES General Meeting, Panel Session Presentation, “Big Data Analytics in Electric Power Distribution Systems," Chicago, IL, Jul. 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, Jun. 2017.

27. Invited Seminar in Department of Electrical Engineering at Tsinghua University, “Big Data Analytics in Electric Power Distribution Systems," Beijing, China, Jun. 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, Jun. 2017.

25. The Annual DOE Transmission Reliability and Markets Program Review Meeting, “Economical and Engineering Aspects of Proactive Demand Participation: Centralized versus Bilateral Control Structure," Washington DC, Jun. 2017.

24. 2017 DOE GridEd Technology Transfer Workshop, “Predictive Analytics for Electric Power Distribution Systems," Dallas, Apr. 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, Nov. 2016.

20. 2016 International Conference on Sustainability in Energy and Buildings, “Energy efficient building HVAC control with real-time occupancy prediction," Turin, Italy, Sep. 2016.

19. 2016 IEEE PES General Meeting, “Forecast load impact from demand response resources," Boston, MA, Jul. 2016.

18. 2016 EPIC Summer Workshop on Distribution Automation, “Integrated distributed energy management systems," Westminster, CA, Jun. 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, Jul. 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: $\sim$ \$18 Million, PI: $\sim$ \$10 Million

42. “Evaluating Optimization Algorithms for Large-scale Electricity Market Simulations”
Sponsors: Hitachi America
PI: **Nanpeng Yu**
Period: 12/12/2025 - 03/31/2026
Amount: \$50,000. My portion: \$50,000.
41. “Accelerate the Solution of Large-Scale Unit Commitment Problems by Physics-informed Graph Learning”
Sponsors: GE Vernova
PI: **Nanpeng Yu**
Period: 07/21/2025 - 07/20/2026
Amount: \$90,000. My portion: \$90,000.
40. “Driving Efficiency: AI-based Joint Optimization of Routes and Charging for Heavy-duty Electric Truck Fleets”
Sponsors: SoCal OASIS
PI: **Nanpeng Yu**
Period: 02/01/2025 - 06/30/2026
Amount: \$25,000. My portion: \$23,000.

39. "Data-Driven National-Scale Charging Infrastructure Assessment"
Sponsors: Lawrence Berkeley National Laboratory
PI: **Nanpeng Yu**
Period: 11/01/2024 - 10/31/2025
Amount: $35,000

38. "A Stress-Event-Informed Capacity Planning Framework for Optimized Reliability"
Sponsors: Department of Energy
PI: Konstantinos Oikonomou, Co-PI: **Nanpeng Yu**
Period: 10/15/2024 - 09/30/2027
Amount: $1,500,000. My portion $210,000.

37. "Enhance Data Quality, Event Detection, and Situational Awareness with Machine Learning Algorithms Using Synchrophasor and AMI Data"
Sponsors: Department of Energy
PI: **Nanpeng Yu**
Period: 10/30/2024 - 10/30/2027
Amount: $1,000,000. My portion $360,000.

36. "Community Oriented Interoperable Control Framework for Aggregating and Integrating DERs and other Grid-Edge Devices"
Sponsors: Department of Energy
UCR PI: **Nanpeng Yu**
Period: 10/01/2024 - 09/30/2029
Amount: UCR portion $918,476. My portion $918,476.

35. "DESC: Type I: Minimizing Carbon Footprint by Co-designing Data Centers with Sustainable Power Grids"
Sponsors: National Science Foundation
PI: Daniel Wong, Co-PI: **Nanpeng Yu**
Period: 09/30/2023 - 09/30/2026
Amount: UCR Portion $600,000. My portion $300,000.

34. "Expedite Integration of EV in Distribution Systems - American-Made Digitizing Utilities Prize Phase 1, Phase 2 and Grand Prize Winner"
Sponsors: Department of Energy
PI: **Nanpeng Yu**
Period: 03/30/2023 - 10/01/2026
Amount: $300,000

33. "Assessing Transmission System Health Index with PMU Measurements and Machine Learning Algorithms - Phase II"
Sponsors: Electric Power Research Institute
PI: **Nanpeng Yu**
Period: 01/01/2023 - 12/31/2023
Amount: $75,000

32. "Strategic Planning for the Electrification of Heavy-Duty Drayage Trucks"
Sponsors: UC Institute of Transportation Studies (UC ITS)
PI: Ran Wei, Co-PI: **Nanpeng Yu**
Period: 09/19/2022 - 09/18/2023
Amount: $80,000

31. "Integrated Planning for the Electrification of Heavy-Duty Drayage Trucks"
Sponsors: University of California, Riverside, Opportunities to Advance Sustainability,

Innovation, and Social Inclusion (OASIS)
PI: Ran Wei, Co-PI: **Nanpeng Yu**
Period: 09/1/2022 - 06/30/2023
Amount: $25,000

30. "Assessing Transmission System Health Index with PMU Measurements and Machine Learning Algorithms - Phase I"
Sponsors: Electric Power Research Institute
PI: **Nanpeng Yu**
Period: 06/07/2022 - 12/31/2022
Amount: $70,000

29. "California's Deep Decarbonization Pathways: A Holistic Multi-Layer Assessment"
Sponsors: University of California Office of the President, LFRP 2022 Collaborative Research and Training Awards
PI: Rajit Gadh, Co-PI: **Nanpeng Yu**
Period: 03/01/2022 - 02/28/2025
Amount: UCR Portion $650,000

28. "Harnessing Machine Learning Approaches to Efficiently Control Quantum Computers"
Sponsors: University of California, Riverside
PI: **Nanpeng Yu**, Co-PI: Bryan Wong
Period: 01/01/2022 - 12/31/2022
Amount: $25,000

27. "Hierarchical Machine Learning Approaches for Situation Awareness in Distribution Systems"
Sponsors: NuGrid Power Corp and Commonwealth Edison Company of Chicago
PI: **Nanpeng Yu**
Period: 08/01/2021 - 12/31/2021
Amount: UCR Portion $70,000

26. "California Flexible Load Research and Deployment Hub"
Sponsors: California Energy Commission
PI: Mary Ann Piette, Co-PI: **Nanpeng Yu**
Period: 08/01/2021 - 07/31/2025
Amount: UCR Portion $98,000

25. "Machine Learning for Hi-fidelity Modeling of Distribution Systems and DERs"
Sponsors: NYSERDA
PI: Yue Zhao, Co-PI: **Nanpeng Yu**
Period: 01/01/2021 - 06/30/2022
Amount: Total $200,000. UCR Portion $100,000

24. "Analyze the Impact of Ice on Hydro Power Resources with Machine Learning"
Sponsors: American Public Power Association
PI: **Nanpeng Yu**
Period: 11/01/2020 - 10/31/2022
Amount: $87,500

23. "GAANN Fellowships in Electrical and Computer Engineering"
Sponsors: Office of Postsecondary Education Agency
PI: Ertem Tuncel, Co-PIs: Amit Roy-Chowdhury, Matt Barth, **Nanpeng Yu**, Kostas Karydis
Period: 10/01/2020 - 09/30/2021
Amount: $300,485

22. “Validating the Capability of Second-life Batteries to Cost-Effectively Integrated Solar Power for Small/Medium-sized Commercial Building Applications”
Sponsors: California Energy Commission
PI: Chris Mi, Co-PI: **Nanpeng Yu**
Period: 07/15/2020 - 08/31/2023
Amount: Total $2,837,672. UCR Portion $256,547

21. “Charging Hub for Electrified Mobility”
Sponsors: UC Institute of Transportation Studies (UC ITS)
PI: Ran Wei, Co-PI: **Nanpeng Yu**
Period: 09/28/2020 - 09/27/2021
Amount: $74,688

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 - 06/2025
    Amount: $8,000

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

American-Made Digitizing Utilities Prize. Phase 1 Winner, Phase 2 Winner and Grand Prize Winner, 2023. Department of Energy, Office of Electricity.

Best Paper Award, IEEE Power and Energy Society Technical Committee Prize Paper Award, 2022. Power System Operations, Planning & Economics Committee.

Best Paper Award, IEEE Power and Energy Society General Meeting, 2021.

Best Paper Award, IEEE Power and Energy Society General Meeting, 2020.

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.

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

1. 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.
2. Wei Wang (UCR ECE, Spring 2015 - Winter 2020). Graduated. Dissertation Title: Advanced Optimization and Data-Driven Control in Smart Grid.
3. Yuanqi Gao (UCR ECE, Summer 2016 - Summer 2020). Graduated. Dissertation Title: Data-Driven Monitoring and Control of Smart Grid.
4. Jie Shi (UCR ECE, Fall 2015- Winter 2021). Graduated. Dissertation Title: Intelligent Control and Data-Driven Algorithms for Critical Infrastructure Systems.
5. Wenyu Wang (UCR ECE, Summer 2015 - Spring 2021). Graduated. Dissertation Title: Estimation of the Topology, Parameters, and Distributed Energy Resources in Power Distribution Systems.
6. Farzana Kabir (UCR ECE, Fall 2016 - Spring 2022). Graduated. Dissertation Title: Data Driven Integration of Renewable Energy in Smart Grid.
7. Yinglun Li (UCR ECE, Spring 2019 - Winter 2024). Graduated. Dissertation Title: Data-driven Modeling and Algorithmic Trading in Electricity Market.
8. Zuzhao Ye (UCR ECE, Summer 2020 - Spring 2024). Graduated. Dissertation Title: Data-Driven Strategic Planning and Intelligent Operation of Electric Vehicle Charging Infrastructure.
9. Osten Anderson (UCR ECE, Fall 2019 - Summer 2024). Graduated. Dissertation Title: Decarbonizing the Electric Grid: Computational Advances in Power System Planning and Scenario Analysis.
10. Yuanbin Cheng (UCR CS, Fall 2019 - Spring 2025). Graduated. Dissertation Title: Anomaly Detection, Missing Value Replacement, Adversarial Attack, and Defense Strategies for Streaming Sensor Data in Power Systems.
11. Jingtao Qin (UCR ECE, Winter 2021 - Summer 2025). Graduated. Dissertation Title: Bridging Learning and Optimization: Advanced Algorithms for Combinatorial Optimization in Power Systems and Machine Learning.
12. Maojie Tang (UCR CSE, Fall 2023 - Present). Research Topic: Machine Learning-based Solutions for Joint Electric Vehicle Routing and Charging Optimization.
13. Fengbin An (UCR ECE, Spring 2025 - Present). Research Topic: Machine learning-based Power System Planning and Load Forecasting.
14. Lu Sun (UCR ECE, Fall 2025 - Present). Research Topic: Machine Learning for Power System Dynamics Analysis
15. Zifan Li (UCR ECE, Fall 2025 - Present). Research Topic: Data-Driven Transportation Electrification Planning

M.S. Students

1. Zive Petrovski (UCR ECE, Fall 2015 - Summer 2018). Graduated. Project Option.
2. Zhenhai Zhang (UCR ECE, Fall 2017 - Summer 2018). Graduated. Thesis Option. Thesis Title: Degradation-aware Valuation and Sizing of Behind-the-Meter Battery Energy Storage Systems for Commercial Customers.
3. Sampath Raman (UCR ECE, Fall 2017- Summer 2019). Graduated. Project Option.
4. Pritesh Shah (UCR ECE, Spring 2018 - Summer 2019). Graduated. Project Option.
5. Xianghao Kong (UCR CS, Fall 2019 - Spring 2022). Graduated. Thesis Option. Thesis Title: Physics-informed Machine Learning Models for Power Transmission Systems.
6. Shaorong Zhang (UCR ECE, Fall 2022 - Spring 2024). Thesis Option. Thesis Title: Physics-informed Machine Learning with Applications to Power Systems
7. Lingdong Zhou (UCR CS, Summer 2024 - Spring 2025). Project Option.
8. Joseph Brown (UCR ECE, Summer 2023 - Summer 2025). Thesis Title: Impacts of Climate Change on Power Systems.
9. Raul Avellaneda (UCR ECE, Fall 2017 - Present)
10. Benjamin Clark (UCR ECE, Spring 2018 - Present)

Project Scientist, Postdoc, Visiting Scholars and Students

Zhentong Shao (Postdoc, September 2024 - Present)

Zuzhao Ye (Postdoc, April 2024 - Present)

Mikhail Bragin (Project Scientist, Sep. 2022 - Present)

Wenyu Wang (Postdoc, May 2021 - October 2023)

Koji Yamashita (Postdoc, Mar. 2021 - Present, Visiting Ph.D. Student Michigan Tech, 2019-2020)

Yuanqi Gao (Postdoc, Sep. 2020 - Feb. 2022)

Brandon Foggo (Postdoc, Sep. 2019 - Mar. 2022)

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)

ACADEMIC SERVICE

Graduate Degree Committee

- Ph.D. Committees Members
  - Subed Lamichhane, (UCR, Electrical and Computer Engineering, Role: Member)
  - Jincong Lu, (UCR, Computer Science and Engineering, Role: Member)
  - Shaorong Zhang, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Ke Huang, (UCR, Statistics, Role: Member)
  - Jinhui Yang, (UCR, Statistics, Role: Member)
  - Yibo Liu, (UCR, Electrical and Computer Engineering, Role: Member)
  - Jingtao Qin, (UCR, Electrical and Computer Engineering, Role: Chair)

  - Po-Yao Niu, (UCR, Statistics, Role: Member)
  - Suyeon Kang, (UCR, Statistics, Role: Member)
  - Zuzhao Ye, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Abhishek Aich, (UCR, Electrical and Computer Engineering, Role: Member)
  - Osten Anderson, (UCR, Electrical and Computer Engineering, Role: Chair)
  - Yuanbin Cheng, (UCR, Computer Science and Engineering, Role: Chair)
  - Jiacheng Xue, (UCR, Statistics, Role: Member)
  - Mohsen Karimi, (UCR, Electrical and Computer Engineering, Role: Member)
  - Hengyue Liu, (UCR, Electrical and Computer Engineering, Role: Member)
  - Ali Jahanshahi, (UCR, Computer Science and Engineering, Role: Member)
  - Yinglun Li, (UCR, Electrical and Computer Engineering, Role: Chair)
  - 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
  - Yizhi Zhou, (UCR, Electrical and Computer Engineering, Role: Member)
  - Chetan Reddy Mudireddy, (UCR, Electrical and Computer Engineering, Role: Member)
  - Taanya Gupta, (UCR, Electrical and Computer Engineering, Role: Member)
  - Xianghao Kong, (UCR, Computer Science and Engineering, Role: Chair)
  - Mark Heisler, (UCR, Electrical and Computer Engineering, Role: Chair of M.S. project)
  - 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)

TEACHING

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, Spring 2020, Spring 2021, Spring 2022.
- EE 253, Introduction to Power Distribution System. Spring 2015, Spring 2017, Winter 2020, Winter 2023.
- EE 218, Power System Steady State and Market Analysis. Fall, 2015, Summer 2016, Winter 2017, Summer 2018, Summer 2019, Summer 2022.
- EE 249, Power System Dynamics. Spring 2016, Spring 2018, Winter 2022.
- EE 260, Big Data Analytics in Smart Grid. Spring 2019.
- EE 227/CS 258, Introduction to Reinforcement Learning, Winter 2021, Spring 2022, Spring 2023.

PROFESSIONAL SERVICE

Conference Organizing

- Panel Session Co-Chair, 2024 IEEE PES General Meeting, ML/AI for electricity market and grid operations under extreme weather
- Panel Session Co-Chair, 2023 IEEE PES General Meeting, Learning for Power Distribution System Optimization, Control and Protection
- Panel Session Co-Chair, 2023 IEEE PES General Meeting, Synchrophasor Data Analytics
- Technical Program Committee Member, 2022 IEEE Power and Energy Society General Meeting
- Panel Session Chair, 2022 IEEE PES General Meeting, Learning to Predict, Trade and Operate in Electricity Market
- Panel Session Co-chair, 2022 IEEE PES General Meeting, Data-Driven State and Parameter Estimation in Power Distribution Systems
- Panel Session Chair, 2022 IEEE PES General Meeting, Synchrophasor Data Analytics for Power System Monitoring, Operation and Planning
- Panel Session Chair, 2022 IEEE PES General Meeting, Testbed and Dataset for Machine learning Applications in Power Systems
- Panel Session Co-chair, 2022 IEEE PES General Meeting, Non-traditional career opportunities in power engineering: How can recent graduates prepare for those jobs?
- Technical Program Committee Member, 2022 IEEE Power and Energy Society Transmission and Distribution Conference & Exposition
- Technical Program Committee Member, 2022 IEEE Power and Energy Society Innovative Smart Grid Technologies North America (ISGT NA)
- Program Committee Member, The 1st ACM International Workshop on Big Data and Machine Learning for Smart Buildings and Cities (ACM BALANCES)
- Technical Program Committee Member, 2021 IEEE Power and Energy Society General Meeting
- Panel Session Co-Chair, 2021 IEEE PES General Meeting, Distribution Systems Operation in the Age of Big Data
- Panel Session Chair, 2021 IEEE PES General Meeting, Reinforcement Learning in Power Distribution System: Theory, Algorithms and Applications

- Panel Session Chair, 2021 IEEE PES General Meeting, Big Data Analysis of Synchrophasor Data: Experience from the U.S. Industry Track.
- Panel Session Chair, 2021 IEEE PES General Meeting, Big Data Analysis of Synchrophasor Data: Experience from the U.S. Academic Track.
- Symposium Chair for grid analytics and computation, 2021 IEEE International Conference on Communications, Control and Computing Technologies for Smart Grid.
- Panel Session Chair, 2020 IEEE PES General Meeting, Learning to Monitor, Model, and Control Power Distribution Systems.
- Technical Program Committee Member, 2020 IEEE Power and Energy Society General Meeting
- 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)
- Panel Session Co-Chair, 2019 IEEE PES General Meeting, Big Data Analytics for Power System Economics, Reliability, and Security.
- Panel Session Chair, 2019 IEEE PES GTD Asia 2019, Energy Storage Systems.
- Panel Session Co-Chair, 2018 The 2nd IEEE Conference on Energy Internet and Energy System Integration, Data-Driven Method and Its Applications in Power Systems
- Panel Session Co-Chair, 2018 IEEE PES General Meeting, Super Session, Data Science and Data Quality as Applied to Power System
- Panel session Chair, 2018 IEEE PES General Meeting, Topology and Parameter Identification in Electric Power Distribution Systems
- Panel Session Chair, 2018 IEEE PES General Meeting, Big Data Analytics Focused on End-Use Customers in Power Distribution Systems
- Panel Session Chair, 2018 IEEE PES T&D Conference and Exposition, Planning, Deployment and Operation of Energy Storage Projects
- Panel Session Chair, 2018 IEEE PES T&D Conference and Exposition, Are Electric Utilities Ready for the Era of Big Data?
- Panel Session Co-Chair, 2017 IEEE PES General Meeting, Big Data in Power Systems: Transmission, Distribution, and Data Analytic Applications
- Panel Session Co-Chair, 2016 IEEE ISGT Asia, Transmission and Distribution Networks Track
- Panel 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
- Paper Session Chair, 2014 IEEE PES General Meeting, DC Applications and Electric Vehicles

Campus Service

- Vice-Chair of Graduate Affairs in the Department of Electrical and Computer Engineering, Jul. 2023 - Present
- Graduate Advisor for the Department of Electrical and Computer Engineering, Jun. 2022 - Jun. 2023
- Member of Graduate Council, Sept. 2021 - present
- Search Committee Member, Vice Provost for International Affairs (VPIA), Aug. 2021 - Mar. 2022
- Search Committee Member, Vice Provost for Administrative Resolution (VPAR), Jun. 2021 - Sep. 2021
- Vice Chair of Executive Committee of Bourns College of Engineering, Nov. 2021 - present
- Executive Committee of Bourns College of Engineering, Sept. 2021 - present
- Member of Special Review Committee, 2020 - present
- Member of Committee on International Education, 2018 - 2021
- Advisor for Graduate Preparation Program in the Department of Electrical and Computer Engineering (advised >30 undergraduate students), 2018 - 2020
- 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 (Jan. 2018 to July 2024), IEEE Transactions on Sustainable Energy (Jan. 2020 to Dec. 2022), IEEE Power Engineering Letters (Jan. 2018 to present), IEEE Open Access Journal of Power and Energy (Jan. 2025 to Present), International Transactions on Electrical Energy Systems (Jan. 2017 - Dec. 2020).
- 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, Chair (Jul. 2022–present)
- IEEE PES Distribution System Operation and Planning Subcommittee, Co-chair (Jul. 2019–Jul. 2022)
- IEEE PES Distribution System Operation and Planning Subcommittee, Secretary (Jul. 2018–Jul. 2019)
- IEEE PES Working Group on Data-Driven Modeling, Monitoring, and Control in Power Distribution Networks, Founding Chair (2019–present)
- IEEE Foothill Section Power and Energy Chapter Chair (April 2021–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)

INFORMS, Member 2019–present