

Bin Wang

📍 1 Cyclotron Road MS90R2024K, Berkeley, CA 94720 📩 wangbin@lbl.gov 📞 (510) 486-7250

Education

University of California, Los Angeles
Ph.D. in Mechanical Engineering

Sept 2012 – Sept 2016

- **Dissertation:** Develop and Implement Smart Energy Management System with the Integration of Electric Vehicles, Supporting Grid Services
- **Advisor:** Prof. Rajit Gadh

Jilin University, Changchun, China
Bachelor in Automotive Engineering

Sept 2008 – Jul 2012

Employment

Career Computational Research Scientist
Energy Analysis Division, LBNL

Jun 2022 – Present

Career-Track Computational Research Scientist
Energy Analysis Division, LBNL

Apr 2019 – May 2022

Postdoctoral Research Fellow
Energy Storage and Distributed Resources (ESDR) Division, LBNL
Computational Research Division (CRD), LBNL

Oct 2016 – Mar 2019

Graduate Student Researcher
Smart Grid Energy Research Center (SMERC)
Department of Mechanical and Aerospace Engineering, UCLA

Sept 2012 – Sept 2016

Research Grants (as P.I. or Co-P.I.)

- **HEVI-LOAD Commercialization Pathways**, PI, funded by BLF/SBFF, \$1.8M
- **HEVI-LOAD Augmentation for National-Scale Infrastructure Assessment**, PI, funded by US DOE, \$1.5M
- **Medium- and Heavy-Duty Electric Vehicle Infrastructure - Load Operation and Deployment**, PI, funded by CEC, \$1.55M
- **Low-Latency Digital-Twin Solutions to Address National Community Priorities Leveraging the FLEXLAB Testbed**, PI, funded by US DOE/LBNL LDRD fund, \$250K
- **H2 Infrastructure Planning for Medium- and Heavy-Duty Fuel Cell Electric Vehicle for the SCAG Territory**, co-PI, funded by SCAG, LBNL portion: \$150K
- **San Francisco and Bay Area Regional Medium- and Heavy-Duty Electrification Roadmap**, co-PI, funded by US DOE VTO, LBNL portion: \$250K
- **California's Deep Decarbonization Pathways: A Holistic Multi-Layer Assessment**, funded by University of California Office of the President (UCOP), LBNL portion \$390K
- **Artificial Intelligence Based Heavy-Duty Fleet Charging to Enable Distributed Energy Resource Integration**, funded by CEC, LBNL portion: \$300K
- **Non-Road Decarbonization Potential Analysis**, LBNL PI, funded by US DOE, \$200K
- **Electric Truck Research and Utilization Center (eTRUC)**, California's premier Research Hub for Electric Technologies in Truck Applications (RHETTA), funded by CEC, LBNL portion: \$320K

- **Early Career Development LDRD Award**, funded by US DOE/LBNL, \$225K/year (unburdened) over 2 years
- **Mitigating and Managing Extreme Wildfire Risk in California**, funded by UCOP, \$500K for 3 years
- **HPC4Mobility**, phase II, funded by US DOE, VTO, \$300K for 1 year
- **EV Flexibility Quantification**, funded by US DOE/GMLC, \$200K over 3 years

Honors and Awards

- **2025 IEEE PES Prize Paper Award**, 2025 IEEE Power and Energy Society General Meeting for the paper *A review of public safety power shutoffs (PSPS) for wildfire mitigation: Policies, practices, models and data sources*, shared with Can Huang, Qinran Hu, Linwei Sang, Donald D Lucas, Robin Wong, Wanshi Hong, Mengqi Yao, Vaibhav Donde
- **Best Paper Award**, 2025 Hawaii International Conference on System Sciences for the paper *Deepot: Parking Lot Identification Using Low-Resolution Satellite Imagery*, shared with Xianzhong Ding, Wanshi Hong, Zhiyu An, Wan Du
- **Best Paper Award**, 2024 IEEE Power and Energy Society General Meeting for the paper *Resilience Assessment for Distribution Systems during Hurricanes: A Learning-Based Framework*, shared with Soroush Vahedi, Junbo Zhao, Jin Dong, Jianming Lian
- **2023 R&D 100 Award** (The Oscars of Innovation), 2023
- **Distinguished Achievement Award**, US DOE Vehicle Technology Office, 2023
- **Early Career Development Award**, LBNL, May 2019
- **Commencement Student Speaker**, Finalist, UCLA Engineering School, Jun. 2017
- **Student Support Program Grant** from 2016 IEEE T&D conference, Mar. 2016
- **Student Travel Grant** from IEEE SmartGridComm'15 Symposium, Nov. 2015
- **Cum Laude Award** at College of Automotive Engineering, Jilin University, Jul. 2012
- **Jilin University Excellent Student Award**, 2010, 2011
- **Jilin University First-Class Scholarship**, 2009, 2010, 2011

Publications

Peer-reviewed Journal Papers

- [1] S. Vahedi, J. Zhao, B. J. Pierre, **B. Wang** and J. Yusuf, “Probabilistic Resilience-Oriented Assessment Approach for Transmission Networks Under Wildfires,” *IEEE Transactions on Power Systems*, vol. 41, no. 1, pp. 283–295, Jan. 2026, doi: 10.1109/TPWRS.2025.3599431.
- [2] Soroush Vahedi, Junbo Zhao, Brian Pierre, Fangni Lei, Emmanouil Anagnostou, Kang He, Charles Jones, **Bin Wang**, “Wildfire and power grid nexus in a changing climate,” *Nat. Rev. Electr. Eng.*, vol. 2, no. 4, pp. 225–243, Apr. 2025, doi: 10.1038/s44287-025-00150-0.
- [3] O. Anderson, N. Yu, W. Hong, and **B. Wang**, “Impact of flexible and bidirectional charging in medium- and heavy-duty trucks on California’s decarbonization pathway,” *Appl. Energy*, vol. 377, p. 124450, Jan. 2025, doi: 10.1016/j.apenergy.2024.124450.
- [4] S. Mohammadi, V.-H. Bui, W. Su, and **B. Wang**, “Surrogate Modeling for Solving OPF: A Review,” *Sustainability*, vol. 16, no. 22, Art. no. 22, Jan. 2024, doi: 10.3390/su16229851.
- [5] V.-V. Thanh, W. Su, and **B. Wang**, “Optimal DC Microgrid Operation with Model Predictive Control-Based Voltage-Dependent Demand Response and Optimal Battery Dispatch,” *Energies*, vol. 15, no. 6, Art. no. 6, Jan. 2022, doi: 10.3390/en15062140.
- [6] H Zhang, M Tian, C Zhang, **B Wang**, D Wang, “A Systematic Solution to Quantify Economic Values of Vehicle Grid Integration,” *Energy*, 121006

- [7] Z Liang, C Huang, W Su, N Duan, V Donde, **B. Wang**, X Zhao, “Safe Reinforcement Learning-Based Resilient Proactive Scheduling for a Commercial Building Considering Correlated Demand Response,” *IEEE Open Access Journal of Power and Energy* 8, 85–96
- [8] Ali Hassan, Shahid Aziz Khan, Rongheng Li, Wencong Su, Xuan Zhou, Mengqi Wang, **Bin Wang**, “Second-Life Batteries: A Review on Power Grid Applications, Degradation Mechanisms, and Power Electronics Interface Architectures,” *Batteries*, vol. 9, no. 12, Art. no. 12, Dec. 2023, doi: 10.3390/batteries9120571.
- [9] Can Huang, Qinran Hu, Linwei Sang, Donald D Lucas, Robin Wong, **Bin Wang**, Wanshi Hong, Mengqi Yao, Vaibhav Donde, “A Review of Public Safety Power Shutoffs (PSPS) for Wildfire Mitigation: Policies, Practices, Models and Data Sources,” *Policy Regul. IEEE Trans. Energy Mark.*, vol. 1, no. 3, pp. 187–197, Sep. 2023, doi: 10.1109/TEMPR.2023.3287027.
- [10] W. Hong, A. Jenn, and **B. Wang**, “Electrified autonomous freight benefit analysis on fleet, infrastructure and grid leveraging Grid-Electrified Mobility (GEM) model,” *Appl. Energy*, vol. 335, p. 120760, Apr. 2023, doi: 10.1016/j.apenergy.2023.120760.
- [11] C. Zhang, **B. Wang**, H. Min, D. Wang, “Battery degradation minimization-oriented hybrid energy storage system for electric vehicles,” *Energies* 13 (1), 246.
- [12] H. Nazaripouya, **B. Wang**, and D. Black, “Electric Vehicles and Climate Change: Additional Contribution and Improved Economic Justification,” *IEEE Electrification Magazine*, vol. 7, no. 2, pp. 33–39, Jun. 2019.
- [13] Y. Xiong, **B. Wang**, C. Chu, and R. Gadh, “Vehicle grid integration for demand response with mixture user model and decentralized optimization,” *Applied Energy*, vol. 231, pp. 481–493, Dec. 2018.
- [14] **B. Wang**, Y. Wang, H. Nazaripouya, C. Qiu, C. C. Chu, and R. Gadh, “Predictive Scheduling Framework for Electric Vehicles With Uncertainties of User Behaviors,” *IEEE Internet Things J.*, vol. 4, no. 1, pp. 52–63, Feb. 2017.
- [15] D. Wang, J. Gao, P. Li, **B. Wang**, C. Zhang, and S. Saxena, “Modeling of plug-in electric vehicle travel patterns and charging load based on trip chain generation,” *J. Power Sources*, vol. 359, pp. 468–479, Aug. 2017.
- [16] Y. Wang, W. Shi, **B. Wang**, C.-C. Chu, and R. Gadh, “Optimal operation of stationary and mobile batteries in distribution grids,” *Appl. Energy*, vol. 190, pp. 1289–1301, Mar. 2017.
- [17] Y. Wang, **B. Wang**, C.-C. Chu, H. Pota, and R. Gadh, “Energy management for a commercial building microgrid with stationary and mobile battery storage,” *Energy Build.*, vol. 116, pp. 141–150, Mar. 2016.

Book Chapter

- [1] **B. Wang**, R. Yin, D. Black, and C. Chan, “Multistage and decentralized operations of electric vehicles within the California demand response markets,” in *Decision Making Applications in Modern Power Systems*. Academic Press, 2020, pp. 411–439.

Selected Conference Papers

- [1] X. Ding, W. Hong, Z. An, **B. Wang**, and W. Du, “Deepot: Parking Lot Identification Using Low-Resolution Satellite Imagery,” *2025 Hawaii International Conference on System Sciences*, 2025.
- [2] S. Vahedi, J. Zhao, J. Dong, **B. Wang**, and J. Lian, “Resilience Assessment for Distribution Systems during Hurricanes: A Learning-Based Framework,” in *2024 IEEE Power & Energy Society General Meeting (PESGM)*, Jul. 2024, pp. 1–5. doi: 10.1109/PESGM51994.2024.10688425.
- [3] SLT Talla, I Kemajou-Brown, C Chan, **B. Wang**, “A Binary Multi-Subsystems Transportation Networks Estimation using Mobiliti Data,” *2021 American Control Conference (ACC)*, 3749-3754
- [4] W. Hong, **B. Wang**, M. Yao, D. Callaway, L. Dale, and C. Huang, “Data-Driven Power System Optimal Decision Making Strategy under Wildfire Events,” *Hawaii International Conference on System Sciences*, Jan 2022.

- [5] Charles Jones, Donald Lucas, Allison Bagley, Judson Boomhower, Duncan Callaway, Leila V Carvalho, Larry Dale, Kris Daum, Meredith Fowlie, Jacob Gellman, Wanshi Hong, Can Huang, Andrew Plantinga, Callum Fraser Thompson, Anna Trugman, Daisuke Seto, Kevin Varga, **Bin Wang**, Robin Wong, Mengqi Yao, “An Overview of Mitigating and Managing Extreme Wildfire Risk in California,” presented at the *102nd American Meteorological Society Annual Meeting, AMS*, Jan. 2022.
- [6] YW Chung, M Mathew, C Rodgers, **B Wang**, B Khaki, C Chu, R Gadh, “The Framework of Invariant Electric Vehicle Charging Network for Anomaly Detection,” *2020 IEEE Transportation Electrification Conference & Expo (ITEC)*, 631-636
- [7] **B. Wang**, D. Wang, C. Chan, R. Yin, and D. Black, “Predictive Management of Electric Vehicles in a Community Micogrid,” *2020 IEEE Transportation Electrification Conference & Expo (ITEC)*, 773-778.
- [8] R. Yin, **B. Wang**, D. Black, “Characteristics of Electric Vehicle Charging Sessions and its Benefits in Managing Peak Demands of a Commercial Parking Garage,” *2019 IEEE International Conference on Smart Grid*, accepted.
- [9] C. Zhang, F. Tong, S. Saxena, **B. Wang**, “Quantifying the Impact of Fuel Cell Electric Vehicles on the Power Grid,” *2019 IEEE International Conference on Smart Grid*, accepted.
- [10] **B. Wang**, C. Chan, D. Somasi, J. Macfarlane, and E. Rask, “Data-Driven Energy Use Estimation in Large Scale Transportation Networks,” in *Proceedings of the 2Nd ACM/EIGSCC Symposium on Smart Cities and Communities*, New York, NY, USA, 2019, pp. 9:1–9:6.
- [11] C. Chan, **B. Wang**, J. Bachan, and J. Macfarlane, “Mobiliti: Scalable Transportation Simulation Using High-Performance Parallel Computing,” *21st IEEE International Conference on Intelligent Transportation Systems*, 2018.
- [12] Y. Xiong, **B. Wang**, C. Chu, and R. Gadh, “Electric Vehicle Driver Clustering using Statistical Model and Machine Learning,” *2018 IEEE PES General Meeting*.
- [13] **B. Wang**, J. Bachan, and C. Chan, “ExaGridPF: A Parallel Power Flow Solver for Transmission and Unbalanced Distribution Systems,” *Innovative Smart Grid Technologies Conference (ISGT), 2018 IEEE Power Energy Society*, 2018.
- [14] **B. Wang**, R. Huang, Y. Wang, H. Nayapouiya, C. Qiu, P. Chu, R. Gadh, “Predictive scheduling for Electric Vehicles considering uncertainty of load and user behaviors,” in *2016 IEEE/PES Transmission and Distribution Conference and Exposition (T D)*, 2016, pp. 1–5.
- [15] Y. Xiong, **B. Wang**, C. Chu, and R. Gadh, “Distributed Optimal Vehicle Grid Integration Strategy with User Behavior Prediction,” *2017 IEEE PES General Meeting*, July. 2017.
- [16] **B. Wang**, Y. Wang, C. Qiu, C. C. Chu, and R. Gadh, “Event-based electric vehicle scheduling considering random user behaviors,” in *2015 IEEE International Conference on Smart Grid Communications (SmartGridComm)*, 2015, pp. 313–318.
- [17] **B. Wang**, B. Hu, C. Qiu, P. Chu, and R. Gadh, “EV charging algorithm implementation with user price preference,” in *Innovative Smart Grid Technologies Conference (ISGT), 2015 IEEE Power Energy Society*, 2015, pp. 1–5.

Technical Reports

- [1] Wood, Eric; Borlaug, Brennan; McKenna, Killian; Keen, Jeremy; Liu, Bo; Sun, Jiayun; Narang, Dave; Kiboma, Lawrynn; **Wang, Bin**; Hong, Wanshi; Giraldez, Julieta; Moran, Chuck; Everett, Margot; Horner, Trina; Hodges, Troy; Crisostomo, Noel; Walsh, Patrick “Multi-State Transportation Electrification Impact Study: Preparing the Grid for Light-, Medium-, and Heavy-Duty Electric Vehicles,” Washington, D.C.: U.S. Department of Energy (DOE), NREL/TP-5400-88795, Mar. 2024. doi: 10.2172/2329422.
- [2] D. Black, R. Yin, **B. Wang**, “Smart Charging of Electric Vehicles and Driver Engagement for Demand Management and Participation in Electricity Markets,” LBNL, Apr. 2018

[3] D. Black, R. Yin, **B. Wang**, "Fleet PEV Utilization and Charging Load Data Report," LBNL, Feb. 2017

Software

- **B. Wang**, C. Zhang, F. Cong, D. Black, "HEVI-LOAD: Medium and Heavy-Duty Electric Vehicle Infrastructure - Load Operations and Deployment"

Professional Services

- **Invited Special Issue Editor**, Frontiers in Energy Research Journal, "Resilience of Interdependent and Critical Infrastructures", March 2021
- **Technical Session Chair**, 2020 IEEE Transportation Electrification Conference
- **Panel Session Chair**, 2019 IEEE PES General Meeting, title: Ensuring Quality of Service of DER application with Data-driven methods
- **Technical Program Committee**, IEEE International Conference on Smart Grid Communications, 2017-2019
- **Workgroup chair**, IEEE PES, intelligent grid and emerging technologies (iGET) committee, title: data-driven DER operations and economics
- **Workshop co-chair**, 2019 IEEE International Conference on Smart Grid Communications, workshop: Convergence of vehicular networks and smart grids
- **Panel Session Chair**, 2018 IEEE T&D Conference, Denver, Panel title: Future reliable and cost-effective integration of distributed energy resources: technologies, pilot projects and challenges
- **Technical Program Committee**, 2017 IEEE Green Energy and Smart Systems Conference
- **Invited Reviewer** for IEEE Transaction on Smart Grid, IEEE Internet of Things Journal, IEEE Transaction on Industrial Informatics, IEEE Transaction on Transportation Electrification, IEEE Transaction on Vehicular Technology, Applied Energy, IEEE Transactions on Circuits and Systems for Video Technology, and others

Invited Talks

- **Smart Grid Seminar**, UCLA, "HEVI-LOAD Key Analysis Capability Development", Nov. 2025
- **Smart Grid Seminar**, Stanford Bits & Watts Initiative, "HEVI-LOAD: Medium and Heavy-Duty Electric Vehicle Charging Infrastructure Load Operation and Deployment", March 2024
- **Transportation Study Seminar**, UC Davis, "HEVI-LOAD: National Truck Electrification Analysis", Nov. 2024
- **DOE VTO Annual Merit Review**, "Multi-State TEIS", June 2024, joint presentation with Eric Wood
- **DOE VTO Annual Merit Review**, "HEVI-LOAD Augmentation for National-Scale Infrastructure Assessment", June 2023
- **ASME Webinar Series**, "Charging the Future: How to Prepare Electric Vehicles for Mass Adoption", Sept. 2021
- **Electricity Subsector Coordinating Council**, National Lab Round Table, "Data-Driven Power System Optimal Decision-Making Strategy under Wildfire Events", Sept. 2021
- **DOE OE Wildfire Mitigation Webinar**, "Data-Driven Wildfire Risk Model and Optimal Grid De-Energization Strategies", Apr. 2021
- **Integrated Energy Policy Report (IEPR)** organized by California Energy Commission, "Medium-and Heavy-Duty Electric Vehicle Infrastructure Projections (HEVI-Pro)", Aug., 2020
- **Clemson University International Center for Automotive Research (CU-ICAR)**, "Towards an intelligent and sustainable transportation system via electrification, big data and HPC technologies", Oct., 2019
- **2019 ACM/EIGSCC Symposium on Smart Cities and Communities**, "Data-driven energy use estimation in large-scale transportation networks", Sept. 2019
- **2018 IEEE Intelligent Transportation System Conferences**, "Large scale traffic assignment for fuel optimizations", Hawaii, Nov. 2018

- **2016 IEEE/PES Transmission and Distribution Conference**, "Predictive scheduling for Electric Vehicles considering uncertainty of load and user behaviors", Dallas, May 2016
- **2015 PES Innovative Smart Grid Technologies Conference (ISGT)**, "EV charging algorithm implementation with user price preference", D.C., Feb. 2015
- **2015 IEEE International Conference on Smart Grid Communications (SmartGridComm)**, "Event-based electric vehicle scheduling considering random user behaviors", Miami, Nov. 2015

Teaching Experiences

Teaching Assistant

Spring 2016

Computer Aided Design and Draft (MECH&AE 94), instructed by Prof. Rajit Gadh

Teaching Assistant

Fall 2015

Computer Aided Design and Draft (MECH&AE 94), instructed by Dr. Giacomo Po

Advising Services

- **Ruihe Wang**, Ph.D. student, Dartmouth College, 2025-present
- **Wanshi Hong**, research scientist, LBNL, 2020-present
- **Xianzhong Ding**, postdoctoral researcher, LBNL, 2022-2025
- **Zhili Zhang**, intern at LBNL, 2023
- **Sihong He**, intern at LBNL, 2023
- **Zhiyu An**, intern at LBNL, 2023
- **Yanning Li**, intern at LBNL, 2023
- **Cong Zhang**, postdoctoral researcher, LBNL, 2019
- **Brendan Anderson**, summer intern at SMERC, UCLA, 2014
- **Jonathan Burns**, summer intern at SMERC, UCLA, 2013

Membership

Senior Member, IEEE