

# Jinshun Su

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[LinkedIn Profile](#) | [Google Scholar Profile](#) | [ResearchGate Profile](#)

## APPOINTMENT

### Postdoctoral Research Associate

Department of Civil & Environmental Engineering, The University of Virginia

*July 2025-Present*

Charlottesville, VA

## EDUCATION

### George Washington University, Washington, DC

*Aug. 2019-May 2025*

*Ph.D. in Electrical Engineering*

- *Advisor:* Prof. Payman Dehghanian
- *Dissertation:* Decision Making on Transportable Resilience Delivery for Short-Term Disaster Management in Power Distribution Systems

### George Washington University, Washington, DC

*Aug. 2017-May 2019*

*M.Sc. in Electrical Engineering*

- *Advisor:* Prof. Payman Dehghanian
- *Thesis:* On the Use of Wind Power and Pumped-Storage Hydro for Blackout Restoration and Resilience

### Xi'an University of Technology, Xi'an, China

*Aug. 2013-July 2017*

*B.Eng. in Electrical Engineering*

## SKILLS

- **Optimization & Modeling:** AMPL, GAMS, Gurobi, Pyomo, JuMP
- **Programming & Data Analysis:** Python, Julia, SQL, MATLAB, SAS
- **Simulation & Power Systems:** PowerWorld, PSCAD
- **Data Visualization & GIS:** Power BI, ArcGIS
- **Collaboration & Version Control:** Azure DevOps, Git

## RESEARCH INTEREST

**Theories:** Applications

- **Decision-dependent uncertainty:** Post-disaster assignment of mobile power sources
- **Chance-constrained programming:** Pre-positioning of mobile power sources
- **Second-order Stochastic dominance:** Mitigating wildfire risks
- **Tri-level optimization:** Defending against false data injection
- **Logistic regression:** Multi-dimensional fragility function for power line conductors in wildfires
- **Reinforcement learning:** Dispatching transportable wind turbines

## WORK EXPERIENCE

### Graduate Research Assistant

*Sep. 2019-Dec. 2024*

Department of Electrical & Computer Engineering, George Washington University

Washington, DC

- Developed a wildfire fragility model using logistic regression and Latin Hypercube Sampling to estimate power line failure under wildfire exposure, based on 20,000+ synthetic data samples
- Built a multi-agent deep reinforcement learning framework to optimize mobile wind turbine dispatch, improving grid resilience under uncertain outage and weather conditions
- Designed a risk-averse decision model combining public safety power shutoffs with mobile power deployment, reducing wildfire risk and outage impact using quasi-second-order stochastic dominance measure
- Constructed an optimization model for price-based unit commitment that incorporates decision-dependent uncertainty in the elastic portion of demand, addressing the uncertainty in customer willingness to pay based on the selling price set by power generation companies

**Power System Intern – Data Science Consultant***Exelon Corporation***Mar. 2024-Aug. 2024***Washington, DC*

- Built and validated a machine learning model to predict power outages across Exelon's service region, improving forecast accuracy using statistical metrics
- Created Power BI dashboards and ArcGIS maps to visualize outage trends and severity, enabling data-driven decisions in resource allocation and utility operations
- Developed a geospatial path tracing model to classify underground residential distribution circuits as looped or unlooped, supporting targeted maintenance planning across all service regions

**Visiting Researcher (supported by NSF)***Pacific Northwest National Laboratory (PNNL)***Aug. 2023-Dec. 2023***Richland, WA*

- Developed an innovative service restoration strategy for interdependent infrastructure systems—power distribution, communication, and transportation networks—under decision-dependent uncertainty in demand response. Incorporated AC optimal power flow analysis and applied Benders Decomposition to enhance computational efficiency of the optimization model

**Co-op Engineer***Sanmenxia Hydropower Plant***June 2016-July 2016***Sanmenxia, China*

- Conducted daily inspections and real-time monitoring of hydro-turbine generator units and transformers, recording key operational metrics including vibration, temperature, and oil pressure.
- Supported SCADA system monitoring in the central control room to ensure plant-wide power generation efficiency and compliance with grid dispatch protocols.

**PUBLICATIONS**

This list includes a total of **20** technical peer-reviewed papers including **8** journal articles (7 published & 1 under review) and **12** conference papers. The total number of citations according to Google Scholar is currently **163** (h-index: 7)

**Published Peer-Reviewed Journal Articles (J)**

- **[J7]** Jinshun Su, R. Zhang, P. Dehghanian, M. H. Kapourchali, S. Choi, and Z. Ding, "Renewable-Dominated Mobility-As-A-Service Framework for Resilience Delivery in Hydrogen-Accommodated Microgrids," *International Journal of Electrical Power and Energy Systems*, vol. 159, pp. 110047, 2024
- **[J6]** Jinshun Su, S. Mehrani, P. Dehghanian, and M. A. Lejeune, "Quasi Second-Order Stochastic Dominance Model for Balancing Wildfire Risks and Power Outages due to Proactive Public Safety De-Energizations," *IEEE Transactions on Power Systems*, vol. 39, no. 2, pp. 2528-2542, Mar. 2024
- **[J5]** Jinshun Su, D. Anokhin, P. Dehghanian, and M. A. Lejeune, "On the Use of Mobile Power Sources in Distribution Networks under Endogenous Uncertainty," *IEEE Transactions on Control of Network Systems*, vol. 10, no. 4, pp. 1937-1949, Dec. 2023
- **[J4]** Jinshun Su, P. Dehghanian, and M. A. Lejeune, "Price-based unit commitment with decision-dependent uncertainty in hourly demand," *IET Smart Grid*, vol. 5, no.1, pp.12-24, Feb. 2022
- **[J3]** R. Zhang, Jinshun Su, P. Dehghanian, M. Alhazmi, and X. Fan, "Deep Reinforcement Learning-Based Allocation of Mobile Wind Turbines for Enhancing Resilience in Power Distribution Systems," *IEEE Transactions on Sustainable Energy*, 2025 ([Early Access](#))
- **[J2]** M. Nazemi, P. Dehghanian, Y. Darestani, and Jinshun Su, "Parameterized Wildfire Fragility Functions for Overhead Power Line Conductors," *IEEE Transactions on Power Systems*, vol. 39, no. 2, pp. 2517-2527, Mar. 2024
- **[J1]** D. Anokhin, P. Dehghanian, M. A. Lejeune, and Jinshun Su, "Mobility-As-A-Service for Resilience Delivery in Power Distribution Systems," *Production and Operations Management*, vol. 30, no. 8, pp. 2492-2521, Aug. 2021

**Conference Proceedings (C)**

- **[C12]** Jinshun Su, and P. Dehghanian, "Post-Disaster Dispatch of Transportable Wind Turbines for Enhancing Resilience of Power Distribution Systems," *2024 IEEE Texas Power and Energy Conference (TPEC)*, Feb. 2024, College Station, Texas, USA

- [C11] **Jinshun Su**, R. Zhang, P. Dehghanian, and M. H. Kapourchali, “Pre-Disaster Allocation of Mobile Renewable-Powered Resilience-Delivery Sources in Power Distribution Networks,” *2023 North American Power Symposium (NAPS)*, Oct. 2023, Asheville, North Carolina, USA
- [C10] **Jinshun Su**, C. Xie, P. Dehghanian, and S. Mehrani, “Optimal Defense Strategy Against Load Redistribution Attacks under Attacker’s Resource Uncertainty: A Trilevel Optimization Approach,” *2023 IEEE PES Grid Edge Technologies Conference & Exposition*, Apr. 2023, San Diego, California, USA
- [C9] **Jinshun Su**, P. Dehghanian, B. Vergara, and M. H. Kapourchali, “An Energy Management System for Joint Operation of Small-Scale Wind Turbines and Electric Thermal Storage in Isolated Microgrids,” *2021 North American Power Symposium (NAPS)*, Nov. 2021, College Station, Texas, USA
- [C8] **Jinshun Su**, P. Dehghanian, M. Nazemi, and B. Wang, “Distributed Wind Power Resources for Enhanced Power Grid Resilience,” *2019 North American Power Symposium (NAPS)*, Oct. 2019, Wichita, Kansas, USA
- [C7] Y. Li, P. Dehghanian, X. Zhang, **Jinshun Su**, R. Zhang, “Exploring the Capabilities and Limitations of Recommender System Models in the Electric Power Sector,” *2025 IEEE Texas Power and Energy Conference (TPEC)*, Feb. 2025, College Station, Texas, USA
- [C6] B. Zargar, M. Ferdowsi, **Jinshun Su**, Y. Li, P. Dehghanian, and R. Hibberts-Caswell, “Linear Distribution System State Estimation with Synchrophasor Measurements and Voltage-Dependent Load Model,” *2025 IEEE Texas Power and Energy Conference (TPEC)*, Feb. 2025, College Station, Texas, USA
- [C5] H. Wang, **Jinshun Su**, and P. Dehghanian, “Operation and DC Protection of Hybrid DRU-MMC HVDC System for Offshore Wind Integration,” *2024 IEEE Industry Applications Society (IAS) Annual Meeting*, Oct. 2024, Phoenix, Arizona, USA
- [C4] R. Zhang, **Jinshun Su**, P. Dehghanian, and M. Alhazmi, “Deep Reinforcement Learning-Aided Pre-Positioning of Mobile Wind Turbines to Enhance Power Distribution System Resilience,” *2024 North American Power Symposium (NAPS)*, Oct. 2024, El Paso, Texas, USA
- [C3] C. Xie, **Jinshun Su**, and P. Dehghanian, “Optimal Energy Scheduling in Seaport Integrated Energy Systems,” *2023 IEEE PES GTD International Conference and Exposition (GTD)*, May 2023, Istanbul, Turkey
- [C2] R. Zhang, Y. Li, M. Hijazi, **Jinshun Su**, and P. Dehghanian, “Machine Learning-Aided Enhancement of Power Grid Resilience to Electromagnetic Pulse Strikes,” *2022 North American Power Symposium (NAPS)*, Oct. 2022, Salt Lake City, Utah, USA
- [C1] S. Wang, P. Dehghanian, M. Alhazmi, **Jinshun Su** and B. Shinde, “Resilience-Assured Protective Control of DC/AC Inverters Under Unbalanced and Fault Scenarios,” *2019 IEEE Power and Energy Society (PES) Conference on Innovative Smart Grid Technologies-North America (ISGT-NA)*, 18-21 Feb. 2019, Washington DC, USA

#### Preprint Articles (P)

- [P1] R. Zhang, P. Dehghanian, **Jinshun Su**, M. Alhazmi, and D. Celeita, “Enhancing Bulk Electric Grid Resilience against Electromagnetic Pulse (EMP) Events: A Frequency Control-based Mitigation Approach,” *IEEE Transactions on System, Man and Cybernetics*, 2025 (Under Review)

## TEACHING EXPERIENCE

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|--|---------------------------|
| • <b>Teaching Assistant</b> for <i>ECE 2115: Engineering Electronics</i> , <b>Instructor:</b> Prof. Shahrokh Ahmadi, George Washington University    | <b>Jan. 2025-May 2025</b> |
| • <b>Teaching Assistant</b> for <i>ECE 2210: Circuits, Signals, and Systems</i> , <b>Instructor:</b> Prof. Amir Aslani, George Washington University | <b>Jan. 2025-May 2025</b> |

## INVITED TALKS & CONFERENCE PRESENTATIONS

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- [T10] “Proactive and Reactive Strategies for Enhancing Power Distribution System Resilience Against Wildfires,” Department of Electrical and Computer Engineering, The University of Texas Rio Grande Valley, Edinburg, TX, Mar. 2025.
  - [T9] “Linear Distribution System State Estimation with Synchrophasor Measurements and Voltage-Dependent Load Model,” *2025 IEEE Texas Power and Energy Conference (TPEC)*, College Station, TX, Feb. 2025
  - [T8] “Enhancing Electrical Safety Measures in Wildfire Mitigation through Strategic Public Safety Power Shutoff Actions,” *2024 IEEE Industry Applications Society (IAS) Electrical Safety Workshop*, Tucson, AZ, Mar. 2024
  - [T7] “Post-Disaster Dispatch of Transportable Wind Turbines for Enhancing Resilience of Power Distribution Systems,” *2024 IEEE Texas Power and Energy Conference (TPEC)*, College Station, TX, Feb. 2024

- [T6] “Pre-Disaster Allocation of Mobile Renewable-Powered Resilience-Delivery Sources in Power Distribution Networks,” *2023 North American Power Symposium (NAPS)*, Asheville, NC, Oct. 2023
- [T5] “Transitions Toward Green Hydrogen and Implications for Electrical Safety,” *2023 IEEE Industry Applications Society (IAS) Electrical Safety Workshop*, Reno, NV, Mar. 2023
- [T4] “Electric Power Grid Resilience to Load Redistribution Cyber Attacks Under Attacker’s Behavioral Uncertainty,” *2022 INFORMS Conference on Security*, Arlington, VA, Aug. 2022
- [T3] “Navigating the IEEE Power and Energy Society (PES) & Industry Applications Society (IAS) Student Branch Chapter at the George Washington University,” *2022 IEEE PES General Meeting*, Denver, CO, July 2022
- [T2] “An Energy Management System for Joint Operation of Small-Scale Wind Turbines and Electric Thermal Storage in Isolated Microgrids,” *2021 North American Power Symposium (NAPS)*, College Station, TX, Nov. 2021
- [T1] “Distributed Wind Power Resources for Enhanced Power Grid Resilience,” *ECE Research Blitz, George Washington University*, Washington, DC, Nov. 2019

## HONORS & AWARDS

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| • 2025 GWU ECE Best Dissertation Award  | <b>2025</b> |
| • IEEE Industry Application Society (IAS) Electrical Safety through Design Student Education Initiative Award | <b>2024</b> |
| • NSF INTERN Award: Non-Academic Research Internships for Graduate Students                                   | <b>2023</b> |
| • IEEE Industry Application Society (IAS) Electrical Safety through Design Student Education Initiative Award | <b>2023</b> |

## FUNDED PROJECT EXPERIENCE

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| • Collaborated on the project entitled “ <i>Collaborative Research: NNA Research: Collaborative Research: Foundations for Improving Resilience in the Energy Sector against Wildfires on Alaskan Lands (FIREWALL)</i> ,” National Science Foundation (NSF), Navigating the New Arctic (NAA) Program, <b>PI</b> : Prof. Payman Dehghanian | <b>2022-2025</b> |
| • Collaborated on the project entitled “ <i>Mobility-As-A-Service for Resilience Delivery in Power Grids: Stochastic Programming Advancements under Decision-Dependent Uncertainties</i> ,” NSF, Energy, Power, Control, and Networks (EPCN) Program, <b>PI</b> : Prof. Payman Dehghanian  | <b>2021-2025</b> |
| • Collaborated on the project entitled “ <i>Collaborative Research: NNA Track 2: Foundations for Improving Resilience in the Energy Sector against Wildfires on Alaskan Lands (FIREWALL)</i> ,” NSF, NAA Program, <b>PI</b> : Prof. Payman Dehghanian  | <b>2020-2022</b> |
| • Collaborated on the project entitled “ <i>Effective Management of Endogenous Uncertainties in Large-Scale Power Grids</i> ,” Cross-Disciplinary Research Fund (CDRF), George Washington University, <b>PI</b> : Prof. Miguel Lejeune, <b>Co-PI</b> : Prof. Payman Dehghanian   | <b>2019-2020</b> |

## SERVICES & ACTIVITIES

### Referee Services

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|---|---------------------|
| • <b>Reviewer</b> for Journals: <i>IEEE Transactions on Smart Grid</i><br><i>IEEE Transactions on Power Systems</i><br><i>IEEE Transactions on Sustainable Energy</i><br><i>IEEE Transactions on Industry Applications</i><br><i>IEEE Transactions on Transportation Electrification</i><br><i>IEEE Power Engineering Letters</i><br><i>IEEE Internet of Things Journal</i><br><i>IEEE Access</i><br><i>IET Generation, Transmission &amp; Distribution</i><br><i>Scientific Reports</i><br><i>Reliability Engineering &amp; System Safety</i><br><i>Sustainable Energy, Grids and Networks</i><br><i>Journal of Modern Power System and Clear Energy</i> | <b>2019-Present</b> |
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- **Reviewer** for Conferences: *2025 IEEE PES General Meeting*  
*2025 IEEE Texas Power and Energy Conference*  
*2021 IEEE Green Technologies Conference* **2021-Present**

#### Conference Services

- **Session Chair** for *2022 INFORMS Conference on Security*, Arlington, VA **Aug. 2022**
- **Organizing Committee Member** for *FIREWALL workshop 2021*, Online **Sep. 2021**
- **Volunteer** for *2024 International Conference on Smart Grid Synchronized Measurements & Analytics*, Washington, DC **May 2024**
- **Volunteer** for *2019/2020/2022/2023/2024 IEEE PES Conference on Innovative Smart Grid Technologies-North America (ISGT-NA)*, Washington, DC **2019-2024**
- **Volunteer** for *2022 IEEE PES General Meeting*, Denver, CO **July 2022**

#### Student Organization Services

- **Chair (2022-2024)/Vice chair (2020-2022)/Secretary (2018-2020)** for IEEE Power and Energy Society (PES) & Industry Applications Society (IAS) Joint Student Branch at George Washington University **2018-2024**