

# **Ningkun (Nik) Zheng**

## **EDUCATION**

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<b>Columbia University, New York, NY</b>	January 2021 – Present
• Ph.D. – Earth and Environmental Engineering	
<b>Johns Hopkins University, Baltimore, MD</b>	September 2018 – December 2019
• Master of Science - Environmental Health and Engineering	
<b>Zhejiang University, Hangzhou, China</b>	September 2014 – June 2018
• Bachelor of Science – Agriculture Resource and Environment	

Selected coursework: Energy Policy and Planning Models; Power Systems Analysis; Stochastic Models; Convex Optimization, Neural Network and Deep Learning; Data Mining; Risk and Decision Analysis; Applied Microeconomics for Policymaking; Environmental Health and Engineering Systems Design

## **INTERN & WORKING EXPERIENCE**

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<b>Energy Systems and Infrastructure Analysis Division, Argonne National Laboratory</b>	Lemont, IL
Ph.D. Research Aid	May 2022 - Aug 2022
Weather-Dependent Probabilistic Resources Adequacy Model	
• Proposed an optimization-based model framework for long-term resource adequacy analysis, which include weather information for generation unit outage rate assessment.	

<b>Carnegie Mellon Electricity Industry Center, Carnegie Mellon University</b>	Pittsburgh, PA
Research Assistant	May 2020 - December 2020
PI: Prof. Jay Apt	
Market Power Mitigation Considerations for Storage and Hybrid Resources	
• Developed the bi-level optimization model of energy storage in competitive electricity market in Pyomo	
• Wrote up mathematical formulation and linearization	
• Implemented new features in model, such as linearized relaxed unit commitment, hybrid resources type, two-settlement functionality	
Zonal Resource Adequacy Contribution of Storage and Hybrid Resources in MISO	
• Data processing, collect data from MISO and FERC data portal, mastered in NREL's PRAS model	

<b>Department of Environmental Health and Engineering, Johns Hopkins University</b>	Baltimore, MD
Research Assistant	September 2019 – May 2020
PI: Prof. Benjamin Hobbs	
Crediting Variable Renewable Energy and Energy Storage in Capacity Market: The Effects of Unit Commitment and Storage Operation	
• Developed the optimization model of capacity market in AIMMS	
• Used a market equilibrium model to quantify the resulting loss of efficiency due to capacity credit distortion, in combination with renewable tax subsidies and generation portfolio standards	
• Explore the impact of unit commitment constraint, storage installation and existing coal plant	

<b>Department of Environmental Health and Engineering, Johns Hopkins University</b>	Baltimore, MD
Teaching Assistant for Environmental Health and Engineering Systems	
Teaching Assistant for Risk and Decision Analysis	September 2019 – December 2019
• Graded homework and provided comments and suggestions to students during weekly office hours	

<b>Energy Administration of Ningbo</b>	Ningbo, China
Intern	June 2019 – September 2019
• Participated in the direct trading of Zhejiang electric power	

- Investigated city key energy-using enterprises to supervise the use of energy by enterprising and providing guidance in energy conservation
- Attended Zhejiang electricity market design and implementation seminar, mastered market design details, and assisted market design implementation.

## **Zhejiang Environmental Technology Protect Science Design and Research Institute** Hangzhou, China

Intern

August 2017 – September 2017

- Conducted analysis of polluted water sample from 10 enterprises and measured the COD, TN, TP and ammonia nitrogen content
- For the “863” Water Environment Special Project, made on-the-spot investigation on the terminal of rural domestic sewage treatment in Jingshan Town; learnt and sorted out the documents of pertaining project tendering and construction drawing; deepened the understanding of the relevant principles of domestic sewage treatment

## **PUBLICATIONS**

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1. N. Zheng, J. Jaworski, and B. Xu. "Arbitraging Variable Efficiency Energy Storage using Analytical Stochastic Dynamic Programming." IEEE Transactions on Power Systems, 2022.
2. N. Zheng and B. Xu, “Impact of Bidding and Dispatch Models over Energy Storage Utilization in Bulk Power Systems,” Proceedings of the Eleventh Bulk Power Systems Dynamics and Control Symposium, 2022.
3. Y Bian, N. Zheng, Y Zheng, B Xu, and Y shi. "Demand response model identification and behavior forecast with OptNet: a gradient-based approach." Proceedings of the Thirteenth ACM International Conference on Future Energy Systems. 2022.
4. N. Zheng, X. Qin, D. Wu, G. Murtaugh, and B. Xu. “Energy Storage State-of-Charge Market Model.” arXiv preprint. arXiv: 2207.07221. 2022. (IEEE Transactions on Power Systems reviewed, under revision)
5. L. Lavin, N. Zheng, and J. Apt, “Market power challenges and solutions for electric power storage resources,” Carnegie Mellon Electricity Industry Center Working Paper CEIC-21-02.
6. S. Wang, N. Zheng, C. D. Bothwell, Q. Xu, S. Kasina, and B. F. Hobbs, “Crediting variable renewable energy and energy storage in capacity markets: Effects of unit commitment and storage operation,” IEEE Transactions on Power Systems, 2021

## **AWARDS**

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La Von Duddleson Krumb Fellowship, 2021  
 Li Memorial Fellowship, 2021  
 Zhejiang Rural Credit Union International Exchange Scholarship, 2017  
 Scholarship for Outstanding Merits, 2017  
 Scholarship for Outstanding Students, 2017  
 Scholarship for Excellence in Special Major, 2017  
 Annual Excellent Student, 2014 - 2016

## **PROFESSIONAL ENGAGEMENT**

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Reviewer for IEEE Transactions on Power Systems, IEEE Transactions on Smart Grid, and IEEE Transactions on Sustainable Energy

## **SKILLS**

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Python, MATLAB, Julia, PowerWorld, AIMMS, R, SQL, Microsoft Excel (VBA & Solver), ArcGIS, AutoCAD, PS, AI, PR, AE

Languages

- Mandarin (native speaker), English (fluent), Spanish (rudimentary)

Personal Interests

- Landscape and Portrait Photography, Snowboarding, Cooking

