BOLUN XU

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POSITIONS

Columbia University *January 2020 - Present*
Assistant Professor
Earth and Environmental Engineering

Massachusetts Institute of Technology *July 2018 - December 2019*
Postdoctoral Associate
MIT Energy Initiative and Lab for Info. & Decision Systems

EDUCATION

University of Washington *September 2014 - June 2018*
PhD in Electrical Engineering

Swiss Federal Institute of Technology Zurich *September 2011 - January 2014*
MS in Electrical Engineering

Shanghai Jiaotong University *September 2007 - August 2011*
BS in Electrical and Computer Engineering (Dual degree with University of Michigan, Ann Arbor)

JOURNAL PUBLICATIONS

1. Ningkun Zheng, Joshua Jerzy Jaworski, and Bolun Xu. Arbitraging variable efficiency energy storage using analytical stochastic dynamic programming. *IEEE Transactions on Power Systems*, 2022
2. Bolun Xu. Dynamic valuation of battery lifetime. *IEEE Transactions on Power Systems*, 2021
3. Ian Mathews, Bolun Xu, Wei He, Vanessa Barreto, Tonio Buonassisi, and Ian Marius Peters. Technoeconomic model of second-life batteries for utility-scale solar considering calendar and cycle aging. *Applied Energy*, 269:115127, 2020
4. Yuxiao Liu, Bolun Xu, Audun Botterud, Ning Zhang, and Chongqing Kang. Bounding regression errors in data-driven power grid steady-state models. *IEEE Transactions on Power Systems*, 36(2):1023–1033, 2020
5. Bolun Xu, Yuanyuan Shi, Daniel S Kirschen, and Baosen Zhang. Optimal battery participation in frequency regulation markets. *IEEE Transactions on Power Systems*, 33(6):6715–6725, 2018
6. Bolun Xu, Jinye Zhao, Tongxin Zheng, Eugene Litvinov, and Daniel S Kirschen. Factoring the cycle aging cost of batteries participating in electricity markets. *IEEE Transactions on Power Systems*, 33(2):2248–2259, 2017
7. Yury Dvorkin, Ricardo Fernandez-Blanco, Yishen Wang, Bolun Xu, Daniel S Kirschen, Hrvoje Pandžić, Jean-Paul Watson, and Cesar A Silva-Monroy. Co-planning of investments in transmission and merchant energy storage. *IEEE Transactions on Power Systems*, 33(1):245–256, 2017
8. Yishen Wang, Yury Dvorkin, Ricardo Fernandez-Blanco, Bolun Xu, Ting Qiu, and Daniel S Kirschen. Look-ahead bidding strategy for energy storage. *IEEE Transactions on Sustainable Energy*, 8(3):1106–1117, 2017

9. Yuanyuan Shi, Bolun Xu, Di Wang, and Baosen Zhang. Using battery storage for peak shaving and frequency regulation: Joint optimization for superlinear gains. *IEEE Transactions on Power Systems*, 33(3):2882–2894, 2017

10. Bolun Xu, Yishen Wang, Yury Dvorkin, Ricardo Fernández-Blanco, Cesar A Silva-Monroy, Jean-Paul Watson, and Daniel S Kirschen. Scalable planning for energy storage in energy and reserve markets. *IEEE Transactions on Power systems*, 32(6):4515–4527, 2017

11. Bolun Xu, Alexandre Oudalov, Andreas Ulbig, Göran Andersson, and Daniel S Kirschen. Modeling of lithium-ion battery degradation for cell life assessment. *IEEE Transactions on Smart Grid*, 9(2):1131–1140, 2016

12. Ricardo Fernández-Blanco, Yury Dvorkin, Bolun Xu, Yishen Wang, and Daniel S Kirschen. Optimal energy storage siting and sizing: A wecc case study. *IEEE Transactions on Sustainable Energy*, 8(2):733–743, 2016

13. Ting Qiu, Bolun Xu, Yishen Wang, Yury Dvorkin, and Daniel S Kirschen. Stochastic multistage coplanning of transmission expansion and energy storage. *IEEE Transactions on Power Systems*, 32(1):643–651, 2016

CONFERENCE PAPERS

1. Wenting Ma and Bolun Xu. A data-driven nonlinear recharge controller for energy storage in frequency regulation. In *2021 IEEE Power & Energy Society General Meeting (PESGM)*, pages 1–5. IEEE, 2021

2. Bolun Xu, Magnus Korpås, and Audun Botterud. Operational valuation of energy storage under multi-stage price uncertainties. In *2020 59th IEEE Conference on Decision and Control (CDC)*, pages 55–60. IEEE, 2020

3. Bolun Xu, Magnus Korpås, Audun Botterud, and Francis OSullivan. A lagrangian policy for optimal energy storage control. In *2020 American Control Conference (ACC)*, pages 224–230. IEEE, 2020

4. Yishen Wang, Yury Dvorkin, Ricardo Fernández-Blanco, Bolun Xu, and Daniel S Kirschen. Impact of local transmission congestion on energy storage arbitrage opportunities. In *2017 IEEE Power & Energy Society General Meeting*, pages 1–5. IEEE, 2017

5. Bolun Xu, Yuanyuan Shi, Daniel S Kirschen, and Baosen Zhang. Optimal regulation response of batteries under cycle aging mechanisms. In *2017 IEEE 56th Annual Conference on Decision and Control (CDC)*, pages 751–756. IEEE, 2017

6. Yuanyuan Shi, Bolun Xu, Yushi Tan, and Baosen Zhang. A convex cycle-based degradation model for battery energy storage planning and operation. In *2018 Annual American Control Conference (ACC)*, pages 4590–4596. IEEE, 2018

7. Yuanyuan Shi, Bolun Xu, Baosen Zhang, and Di Wang. Leveraging energy storage to optimize data center electricity cost in emerging power markets. In *Proceedings of the Seventh International Conference on Future Energy Systems*, pages 1–13, 2016

8. Bolun Xu, Yury Dvorkin, Daniel S Kirschen, Cesar A Silva-Monroy, and Jean-Paul Watson. A comparison of policies on the participation of storage in us frequency regulation markets. In *2016 IEEE Power and Energy Society General Meeting (PESGM)*, pages 1–5. IEEE, 2016

9. Bolun Xu, Alexandre Oudalov, Jan Poland, Andreas Ulbig, and Göran Andersson. Bess control strategies for participating in grid frequency regulation. *IFAC Proceedings Volumes*, 47(3):4024–4029, 2014

10. Bolun Xu, Andreas Ulbig, and Göran Andersson. Impacts of dynamic line rating on power dispatch performance and grid integration of renewable energy sources. In *IEEE PES ISGT Europe 2013*, pages 1–5. IEEE, 2013

INVITED TALKS

1. Temple University, March 2022.
2. EPRI ISO/RTO Energy Storage Market Modeling Technical WG, December 2021.
3. John Hopkins University Energy Seminar, Online, December 2020.
4. Stanford Smart Grid Seminar, Online, November 2020.
5. MIT Energy Initiative Electric Power Systems Center Fall Workshop, Cambridge, Massachusetts, November 2018.
6. Seminar for the Next Generation of Researchers in Power Systems, Banff International Research Station, Canada, May 2018.
7. Future Information Technology International Forum for Young Scholars, Shanghai Jiaotong University, China, May 2018.

AWARDS

Scientific Achievement Award, U Washington Clean Energy Institute, 2018
Clean Energy Institute Graduate Fellowship, 2015
Grainger Foundation Fellowship, 2014
Best Poster Award, IEEE 4th European ISGT Conference at Copenhagen, 2013
Dean's List, University of Michigan, 2010
Excellence Student Scholarship, Shanghai Jiaotong University, 2008

GRANTS

Columbia Data Science Institute Seed Grant, 2022-2023.

INDUSTRY EXPERIENCE

Doosan Gridtech, WA USA *June 2017 - September 2017*
Power System Research Engineer Intern

ISO New England, MA USA *June 2016 - August 2016*
Research Intern Business Architecture & Technology Group

China Electric Power Research Institute, Beijing China *February 2014 - August 2014*
Research Intern in Distributed Energy Resource Group

ABB Corporate Research Center, Baden Switzerland *February 2012 - August 2012*
Research Intern in Utility Solutions Group

PROFESSIONAL ENGAGEMENTS

Reviewer for IEEE Transactions on Power Systems, IEEE Transactions on Smart Grid, IEEE Transactions on Sustainable Energy, IEEE IAS, Applied Energy, IET Generation, Transmission & Distribution, PES General Meeting, CDC, IFAC