# Na (Lina) Li

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## Appointments

*Thomas D. Cabot Associate Professor of Electrical Engineering and Applied Mathematics* Jul. 2018 -
School of Engineering and Applied Sciences
Harvard University

*Assistant Professor of Electrical Engineering and Applied Mathematics* Jul. 2014 - Jun. 2018
School of Engineering and Applied Sciences
Harvard University

*Postdoc Associate* Jul. 2013 - Jun. 2014
Laboratory of Information and Decision Systems
Massachusetts Institute of Technology
*Supervisor: Munther Dahleh*

## Education

*Ph.D. in Control and Dynamical Systems* Sep. 2007 - Jun. 2013
California Institute of Technology
*Advisor: Prof. John Doyle, Co-adviser: Prof. Steven Low*

*B.S. in Mathematics and Applied Mathematics* Sep. 2003 - Jun. 2007
Zhejiang University, P.R.China

*Visiting Student in Mechanical and Aerospace Engineering* Jul. - Aug. 2006; Jan. - May. 2007
University of California, Los Angeles, Undergraduate research assistant
*Advisor: Prof. Jeff Shamma*

## Honors and Awards (selected)

02/2018: Harvard Physical Sciences and Engineering Accelerator Award

01/2018: Harvard Climate Change Solutions Fund Award

10/2016, AFOSR Young Investigator Program (YIP) Award

09/2016, One of the five invited speakers in the inaugural Resnick Institute Young Investigators Symposium, The Resnick Sustainability Institute at Caltech.

01/2016, NSF CAREER Award

03/2015, One of the 2 nominees of Harvard University for Packard Fellowships for Science and Engineering

11/2012, "Rising Stars in EECS: An academia workshop for women", MIT

12/2011, Best Student Paper Award Finalist in 50th IEEE Conference on Decision and Control,

12/2006, Chu KoChen Honors Scholarship (Highest Honor in Zhejiang University, only awarded to 12/20,000 undergraduates each academic year)

02/2006, Meritorious Winner in International Interdisciplinary Contest in Modeling(ICM), United States

## Student Honors

06/2017: Master student Meier Yannick (from ETH) won the Outstanding Master Thesis award, ETH Zurich for his thesis under my supervision

04/2016, Masoud Badiei received IBM PhD fellowship

04/2015, Ariana Minot received "Runner-up for 1st Place" award in the poster session of AWM (Association for Women in Mathematics) Research Symposium

**Teaching & Education**

2016-Present, American Control Conference (ACC) Technical Committee on Education

Fall 2015, 2016, 2017, Harvard SEAS ES/AM 158: Feedback Control Systems: Analysis and Design

Spring 2015, 2016, Harvard SEAS: ES 202/AM 232: Estimation and Control of Dynamical Systems

2017-present: Mentor in Harvard Graduate Women in Science and Engineering (HGWISE)

2014-present, Concentration Adviser for Undergraduates: 14 Applied Mathematics, 5 Electrical Engineering.

2016-2017: Freshman Adviser for 4 freshmen.

**Advising**

*PhD students who graduated*:

- Ariana Minot (May 2017), Thesis: *Distributed Optimization Methods for Monitoring and Operating Electric Power Systems*, Next stop: Research scientist in MIT Lincoln Lab
- Masoud Badiei (June 2018), Thesis: *Primal-Dual Methods for Stochastic Optimization on Riemannian Manifolds and Connected Graphs*

*Current PhD students*:

- Guannan Qu (08/2014-present)
- Yingying Li (08/2015-present)
- Xin Chen (08/2017-present)
- Aoxiao Zhong (08/2018-present)

*Postdoc Associates (incoming and current)*

- Sindri Magnusson (08/2018-,)
- Jorge Poveda (09/2018-12/2018,)

*Postdoc Associates (past)*

- Chinwendu Enyioha (07/2015-01/2018, co-supervised with Prof. Vahid Tarokh), Next stop, University of Central Florida, Tenure-track Assistant Professor
- Qinran Hu (09/2015-07/2018, Next stop, Southeast University, Associate Professor)
- Xuan Zhang (11/2015-10/2017, co-supervised with Prof. Ali Malkawi in Graduate School of Design), Next stop, Tsinghua-Berkeley Shenzhen Institute, Tenure-track Assistant professor
- Wei Wei (12/2014-03/2015), Next stop, Tsinghua University, Tenure-track Assistant Professor

*Master students*

- Johannes Koehler (10/2016-12/2016), Master in University of Stuttgart, Germany, Thesis: *Distributed Economic Model Predictive Control under Inexact Minimization with Application to Power Systems.*
- Yannick Meier (12/2015-06/2016, Master in ETH), Thesis: *Parallel and Distributed Primal-Dual Interior Point Methods for Optimal Power Flow in Distribution Networks.*
- David Brown (09/2014-06/2015, Now as a researcher in Lincoln Lab), Thesis: Distributed Greedy Algorithm for Satellite Assignment Problem

*Undergraduate senior thesis advisor*

- Bahlakoana Mabetha (2017-2018), Proposed Topic: *A Smart Humidifier*
- Seif Abou Eleinen (2017-2018), Proposed Topic: *A Smart Arm Crutch*
- Austen Novis (2015-2016), Thesis: *Swim Power Meter*
- Tyler Barringer (2015-2016), Thesis: *Solar Photovoltaic Power: Short Term Volatility and its Future under Climate Change*

*Undergraduate pre-thesis advisor*

- Dylan Munro (2015)
- Salathiel Ntakirutimana (2015)

*Other Ph.D thesis committee*

- Reza Amizi, Brown University, 2018, Thesis: *Improving the Performance of Power Constrained Computing Clusters*
- Shuai Wang, Boston University, 2018, Thesis: *Paradigm and Paradox in Power Networks*
- Xin Zhan, Brown University, 2017, Thesis: *Energy-Efficiency Optimization Techniques for Computing Clusters: Exploiting the Heterogeneities*
- Ariana Minot, Harvard University 2017, Thesis: *Distributed Optimization Methods for Monitoring and Operating Electric Power Systems*, Next stop: Research scientist in MIT Lincoln Lab
- Ian Weiner, Harvard University, 2016, Thesis: *High-SNR Capacity of AWGN Channels with generic alphabet constraint.*
- Ioannis Gkioulekas, Harvard University, 2016, Thesis: *A Framework for Inverse Scattering.*
- Kevin Chen, Harvard University, 2016, Thesis: *Gradient Descent for Optimization Problems with sparse Solutions.*
- Elli Ntakou, Boston University, 2016, Thesis: *Distribution Power Markets: Detailed Modelding and Tractable algorithms.*

*Other graduate mentoring*
- Kathryn Heal (07/2015-05/2016, G2, co-advising with Prof. Vahid Tarokh, Harvard)
- Sindri Magnusson (07/2015-present, from KTH)
- Martin Anderasson (07/2015, from KTH)
- Xiaoqi Tan (11/2015-05/2016, from HKUST)

**Journal Publications**

- Yingying Li, Guannan Qu, Na Li, "Online Optimization with Predictions and Switching Costs: Fast Algorithms and Fundamental Limits", ArXiv, preprint.
- Guannan Qu and **Na Li**, "Accelerated Distributed Nesterov Gradient Descent", submitted to *IEEE Transactions on Automatic Control.*
- Rui Li, Shengwei Mei, Feng Liu, Wei Wei, and **Na Li**, "Matrix Completion Embedded PDIP Method for SDP Relaxation of Large-scale OPF Problems", submitted to *IEEE Transactions on Power Systems.*
- Sindri Magnusson, Guannan Qu, **Na Li**, Carlo Fischione, "Voltage Control Using Limited Communication", submitted to *IEEE Transactions on Control of Network Systems.*
- Bala Kameshwar Poolla, Saverio Bolognani, Na Li, Florian Drfler, "A Market Mechanism for Virtual Inertia", submitted to *IEEE Transactions on Control of Network Systems.*
- Johannes Khler, Matthias A. Muller, Na Li, and Frank Allgower, "Real-time economic dispatch in power systems with distributed economic model predictive control", summited to *IEEE Transactions on Power Systems.*
- Masoud Baidei and **Na Li**, "Distributed Primal-Dual Algorithms with Regularizers: Tradeoff between Efficiency and Constraints Violation", submitted to *IEEE Transactions on Automatic Control.*

1. Guannan Qu, David Brown, and **Na Li**, "Distributed Greedy Algorithm for Multi-Agent Task Assignment Problem with Submodular Utility Functions", conditionally accepted to *Automatica.*
2. Guannan Qu, **Na Li**, "On the Exponential Stability of Primal-Dual Gradient Dynamics", accepted to IEEE Control System Letters.
3. Sindri Magnusson, Chinwendu Enyioha, **Na Li**, Carlo Fischione, Vahid Tarokh, "Communication Complexity of Distributed Resource Allocation Optimization", Accepted to IEEE Journal of Selected Topics in Signal Processing, Special Issue on Signal and Information Processing for Critical Infrastructures.
4. Takeshi Hatanaka, Nikhil Chopra, Takayuki Ishizaki, and **Na Li**, "Passivity-Based Distributed Optimization with Communication Delays Using PI Consensus Algorithm", Accepted to *IEEE Transactions on Automatic Control.*
5. Guannan and **Na Li**, " Harnessing Smoothness to Accelerate Distributed Optimization", accepted to *IEEE Transactions on Control of Network Systems*, 2017.

6. Xuan Zhang, Antonis Papachiristodoulou, **Na Li**, "Distributed Control for Achieving Optimal Steady State", *IEEE Transactions on Automatic Control*, 63(3), 864 871, 2017.
7. Sindri Magnusson, Chinwendu Enyioha, **Na Li**, Carlo Fischione, and Vahid Tarokh, "Convergence of Limited Communications Gradient Methods", *IEEE Transactions on Automatic Control*, 63(5), 1356 1371, 2018.
8. Chinwendu Enyioha, Sindri Magnusson, **Na Li**, Carlo Fischione, and Vahid Tarokh, "On the variability of Renewable energy and Online power allocation", *IEEE Transactions on Power Systems*, 33(1), 451 - 462 2018.
9. Xiaoqi Tan, Guannan Qu, Bo Sun, **Na Li**, Danny Tsang, "Optimal Scheduling of Battery Charging Station Serving Electric Vehicles Based on Battery Swapping", accepted to IEEE Transactions on Smart Grid, 2017.
10. Wei Wei, Jianhui Wang, **Na Li**, and Shengwei Mei, "Optimal Power Flow of Radial Networks and its Variations: A Sequential Convex Optimization Approach", *IEEE Transactions on Smart Grid*, 8(6), 2974 2987, 2017.
11. Wenbo Shi, **Na Li**, Chi-Cheng Chu, and Rajit Gadh, "Real-Time Energy Management in Microgrids", *IEEE Transactions on Smart Grid*, 8(1), Pages 228 - 238, 2017.
12. Wei Wei, **Na Li**, Jianhui Wang, Shengwei Mei, "Estimating the Probability of Infeasible Real-time Dispatch without Exact Distributions of Stochastic Wind Generations", *IEEE Transactions on Power Systems*, 31(6), Pages 5022 - 5032, 2016.
13. Ariana Minot, Yue Lu, **Na Li**, "A Distributed Newton Method for Power System State Estimation", *IEEE Transactions on Power Systems*, 31(5), Pages 3804 - 3815, 2016.
14. Qingqing Huang, Leilai Shao, **Na Li**, "Dynamic Detection of Transmission Line Outages Using Hidden Markov Models", *IEEE Transactions on Power Systems*, 31(3), Pages 2026 - 2033, 2016.
15. **Na Li**, Lijun Chen, Changhong Zhao, "Connecting Automatic General Control and Economic Dispatch from an Optimization View", *IEEE Transactions on Control of Network Systems*, 3(3), Pages 254 - 264, 2016.
16. Yunjian Xu, **Na Li**, Steven Low, "Demand Response with Capacity Constrained Supply Function Bidding", *IEEE Transactions on Power Systems*, 31(2), Pages 1377 - 1394, 2016.
17. Lijun Chen, **Na Li**, "On the Interaction between Load Balancing and Speed Scaling", *IEEE Journal on Selected Areas Communication (JSAC)- Series on Green Communications and Networking*, 33(12), Pages 2567-2578, 2015.
18. **Na Li**, Lijun Chen, Munther Dahleh, "Demand Response Using Linear Supply Function Bidding", *IEEE Transactions on Smart Grid*, 6(4), Pages 1827-1838, 2015.
19. Lingwen Gan, **Na Li**, Ufuk Topcu, Steven Low, "Exact Convex Relaxation for Optimal Power Flow in Radial Networks", *IEEE Transactions on Automatic Control*, 60(1), Pages 72-87, 2015.
20. **Na Li**, Jerry Cruz, Chenghao Chien, Somayeh Sojoudi, Ben Recht, David Stone, Marie Csete, Daniel Bahmiller, John Doyle, "Robust Efficiency and Actuator Saturation Explain Healthy Heart Rate Control and Variability", *Proceedings of National Academia Sciences*, 111(33), Pages E3476E3485, 2014.
21. Wenbo Shi, **Na Li**, Xiaorong Xie, Chi-Cheng Chu, and Rajit Gadh, "Optimal Residential Demand Response in Distribution Network", *IEEE Journal on Selected Areas in Communications*, 32(7), Pages 1-10, 2014.
22. Changhong Zhao, Ufuk Topcu, **Na Li**, Steven Low, "Design and Stability of Load-Side Primary Frequency Control in Power System", *IEEE Transactions on Automatic Control*, 59(5), Pages 1177-1189, 2014.
23. **Na Li**, Jason Marden, "Decoupling Coupled Constraints through Utility Design", *IEEE Transactions on Automatic Control*,59(8), Pages 2289-2294, 2014.
24. **Na Li**, Jason Marden, "Designing Games for Distributed Optimization", *the Journal of IEEE Selected Topics in Signal Processing*,7(2), Pages:230 - 242, 2013.

**Book (Chapters)**

1. Lijun Chen, **Na Li**, Libin Jiang, Steven H. Low, "Optimal Demand Response: Problem Formulation and Deterministic Case", Chapter in Control and Optimization Theory for Electric Smart Grids, Aranya Chakarabortty and Marija Ilic (Eds.), Springer, 2012.

**Peer-Reviewed Conference Publications**

1. Guannan Qu, **Na Li**, "An Optimal and Distributed Feedback Voltage Control under Limited Reactive Power", Power Systems Computation Conference (PSCC), 2018.
2. Yingying Li, Guannan Qu, **Na Li**, "Using Predictions in Online Optimization with Switching Costs: A Fast Algorithm and A Fundamental Limit", American Control Conference (ACC), 2018.
3. Takashi Tanaka, **Na Li**, Kenko Uchida, "On the Relationship between the VCG Mechanism and Market Clearing", American Control Conference (ACC), 2018.
4. Tianyi Chen, **Na Li**, Georgios B. Giannakis, "Aggregating Flexibility of Heterogeneous Energy Resources in Distribution Networks", American Control Conference (ACC), 2018.
5. Guannan Qu, **Na Li**, "Accelerated Distributed Nesterov Gradient Descent for Convex and Smooth Functions", IEEE Conference on Decision and Control (CDC), 2017.
6. Johannes Koehler, Matthias A. Muller, **Na Li**, Frank Allgower, "Real Time Economic Dispatch for power networks: A Distributed Economic Model Predictive Control Approach", IEEE Conference on Decision and Control (CDC), 2017.
7. Takeshi Hatanaka, Xuan Zhang, Wenbo Shi, Minghui Zhu, **Na Li**, "Physics-Integrated Hierarchical/Distributed HVAC Optimization for Multiple Buildings with Robustness against Time Delays", IEEE Conference on Decision and Control (CDC), 2017.
8. Xuan Zhang, Bin Yan, Wenbo Shi, Ali Malkawi, (Samuel) Qing-Shan Jia, **Na Li**, "Community-level Geothermal Heat Pump System Management via an Aggregation-disaggregation Framework", IEEE Conference on Decision and Control (CDC), 2017.
9. Masoud Baidiei, **Na Li**, "Stochastic Primal-Dual Method on Riemannian Manifolds with Bounded Sectional Curvature", IEEE International Conference on Machine Learning and Applications (ICMLA), 2017.
10. Sindri Magnusson, Carlo Fischione, **Na Li**, "Voltage Control Using Limited Communication", IFAC 2017.
11. Yingying Li, **Na Li**, "Mechanism Design for Reliability in Demand Response with Uncertainty", Amercian Control Conference (ACC), 2017.
12. Xuan Zhang, Wenbo Shi, Qinran Hu, Bin Yan, Ali Malkawi, **Na Li**, "Distributed Temperature Control via Geothermal Heat Pump Systems in in Energy Efficient Buildings", Amercian Control Conference (ACC), 2017.
13. Yanhua Tian, **Na Li**, Josh Taylor, "Harmonic Reduction via Optimal Power Flow and the Frequency Coupling Matrix", IEEE Conference on Control Technology and Applications, 2017.
14. Takeshi Hatanaka, Xuan Zhang, Wenbo Shi, Minghui Zhu, **Na Li**, "An Integrated Design of Optimization and Physical Dynamics for Energy Efficient Buildings: A Passivity Approach", IEEE Conference on Control Technology and Applications (CCTA), 2017
15. Reza Azimi, Masoud Badiei, Xin Zhan, **Na Li**, Sherief Reda, "Fast decentralized power capping for server clusters", 23th IEEE Symposium on High Performance Computer Architecture (HPCA), 2017. (acceptance rate, 22%)
16. Guannan Qu, **Na Li**, "Harnessing Smoothness to Accelerate Distributed Optimization", Conference on Decision and Control (CDC), 2016.
17. Donya Ghavidel Dobakhshari, **Na Li**, Vijay Gupta, "An Incentive-Based Approach to Distributed Estimation with Strategic Sensors", Accepted to Conference on Decision and Control (CDC) 2016.

18. Sindri Magnusson, Chinwendu Enyioha, **Na Li**, Carlo Fischione, "Practical Coding Schemes For Bandwidth Limited One-Way Communication Resource Allocation", Accepted to Conference on Decision and Control (CDC), 2016.
19. Masoud Badiei, **Na Li**,"Distributed Regularized Primal-Dual Method", Accepted to GlobalSIP, 2016.
20. Xuan Zhang, Wenbo Shi, Xiwang Li, Bin Yan, Ali Malkawi, **Na Li**, "Decentralized Temperature Control via HVAC Systems in Energy Efficient Buildings: An Approximate Solution Procedure", Accepted to GlobalSIP, 2016
21. Hongyao Ma, Valentin Robu, **Na Li**, David Parkes, "Incentivizing Reliability in Demand-Side Response", Accepted to *International Joint Conference on Artificial Intelligence IJCAI-16*, 2016.
22. Ariana Minot, Yue Lu, Na Li, "A Distributed Primal-Dual Interior Point Method for Optimal Power Flow", *Power Systems Computation Conference (PSCC)*, 2016.
23. Martin Andreasson and **Na Li**, "Dynamical Decentralized Voltage Control of Multi-Terminal HVDC Grids", European Control Conference, 2016.
24. Sindri Magnusson, Chinwendu Enyioha, Kathryn Heal, Na Li, Carlo Fischione, and Vahid Tarokh, "Convergence of Limited Communications Gradient Methods", *American Control Conference (ACC)*, 2016.
25. Masoud Badiei Khuzani, Xin Zhan, Reza Azimi, Sherief Reda and **Na Li**, "DiBA: Distributed Power Budget Allocation for Large-Scale Computing Clusters", *IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing(CCGrid)*, 2016. (acceptance rate, 20%)
26. Sindri Magnusson, Chinwendu Enyioha, Kathryn Heal, **Na Li**, Carlo Fischione, and Vahid Tarokh, "Distributed Resource Allocation Using One-Way Communication with Applications to Power Networks", *Conference on Information Sciences and Systems (CISS)*, 2016.
27. Hao Zhu, **Na Li**, "Asynchronous Local Voltage Control in Power Distribution Networks", *IEEE Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2016.
28. Guannan Qu, Dave Brown, **Na Li**, "Distributed Greedy Algorithm for Satellite Assignment Problem with Submodular Utility Function", *5th IFAC Workshop on Estimation and Control of Networked Systems (NecSys'15)*, 2015.
29. Masoud Badiei, **Na Li**, Adam Wierman, "Online Convex Optimization with Ramp Constraints", *Proceedings of 54th IEEE Conference on Decision and Control*, 2015.
30. Xuan Zhang, Antonis Papachristodoulou, **Na Li**, "Distributed Optimal Steady-state Control Using Reverse- and Forward- Engineering", *Proceedings of 54th IEEE Conference on Decision and Control*, 2015.
31. **Na Li**, "A Market Design for Electricity Distribution Networks", *Proceedings of 54th IEEE Conference on Decision and Control*, 2015.
32. Xuan Zhang, **Na Li**, Antonis Papachristodoulou, "Achieving Real-time Economic Dispatch in Power Networks via a Saddle Point Design Approach", *Power & Energy Society General Meeting*, 2015.
33. Qingqing Huang, Leilai Shao, **Na Li**, "Dynamic Fault Diagnosis in Power Grids Using Hidden Markov Models", *Proceedings of American Control Conference*, 2015.
34. Ariana Minot, **Na Li**, "Distributed State Estimation", *Proceedings of American Control Conference*, 2015.
35. **Na Li**, Changhong Zhao Lijun Chen, Steven Low, "Connecting Automatic Generation Control and Economic Dispatch from an Optimization View", *Proceedings of American Control Conference*, 2014.
36. **Na Li**, Guannan Qu, Munther Dahleh, "Real-time decentralized voltage control in distribution networks", *52nd Annual Allerton Conference on Communication, Control, and Computing*, 2014.
37. Minghui Zhu, **Na Li**, "Stability Constrained Incentive Mechanisms for Distributed Frequency Control of Power Grid", *Proceedings of 53rd IEEE Conference on Decision and Control*, 2014.
38. Minghui Zhu, **Na Li**, Wenbo Shi, Rajit Gadh, "Distributed Access Control of Volatile Renewable Energy Resources", *Power & Energy Society General Meeting* 2014.

39. Lingwen Gan, **Na Li**, Ufuk Topcu, Steven Low, "Optimal Power Flow in Distribution Networks", *Proceedings of 52nd IEEE Conference on Decision and Control*, 2013.
40. **Na Li**, Lingwen Gan, Lijun Chen, Steven Low, "An Optimization-based Demand Response in Radial Distribution Networks", *IEEE Workshop on Smart Grid Communications: Design for Performance*, 2012.
41. **Na Li**, Lijun Chen, Steven Low, "Demand Response in Radial Distribution Networks: Distributed Algorithm (Invitied Paper)", *Asilomar Conference on Signals, Systems and Computers*, 2012.
42. **Na Li**, Lijun Chen, Steven Low, "Exact Convex Relaxation for Radial Networks Using Branch Flow Models", *IEEE International Conference on Smart Grid Communications*, 2012.
43. Rui Huang, Tiana Huang, Rajit Gadh and **Na Li**, "Solar Generation Prediction Using the ARMA Model in a Laboratory-level Micro-grid", *IEEE International Conference on Smart Grid Communications*, 2012.
44. Lingwen Gan, **Na Li**, Ufuk Topcu, Steven Low, "Branch Flow Model for Radial Networks: Convex Relaxation", *Proceedings of the 51st IEEE Conference on Decision and Control*, 2012.
45. **Na Li**, Jason Marden, "Designing Games for Distributed Optimization with a Time-Varying Communication Graph" *Proceedings of the 51st IEEE Conference on Decision and Control*, 2012.
46. **Na Li**, Jason Marden, " Designing Games for Distributed Optimization", *Proceedings of the 50th IEEE Conference on Decision and Control*, 2011. **Best Student Paper Award Finalist**
47. **Na Li**, Lijun Chen, Steven H. Low, "Optimal Demand Response based on Utility Maximization in Power Networks" *IEEE Power Engineering Society General Meeting*, 2011. **Cited by 383 times by Feb 2016.**
48. Lijun Chen, **Na Li**, Steven H. Low, "On the Interaction between Load Balancing and Speed Scaling", *Information Theory and Applications Workshop*, 2011.
49. Lijun Chen, **Na Li**, Steven H. Low and John C. Doyle, "Two Market Models for Demand Response in Power Networks", *IEEE International Conference on Smart Grid Communications*, 2010.
50. **Na Li**, Jason Marden, "Designing Games to Handle Coupled Constraints", *Proceedings of the 49th IEEE Conference on Decision and Control*, 2010.
51. **Na Li**, Jason Marden, Jeff S. Shamma, "Learning Approaches to the Witsenhausen Counterexample from a View of Potential Games", *Proceedings of the 48th IEEE Conference on Decision and Control*, 2009.

**Research Support**

PI, Harvard Physical Sciences and Engineering Accelerator Award: *Singularity: AI-Powered Distributed Energy Networks*, 02/01/2018-01/31/2019, $72,500.

PI, Harvard Climate Change Solutions Fund Award: *Identifying the challenges and technical pathways toward a reliable carbon-free energy system in the United States*, 01/15/2018-01/14/2020, $128,800.

PI, AFOSR Yong Investigator Program (YIP) Award: *Distributed Coordination in Multi-Agent Networked Systems: Algorithms and Fundamental Limits*, 12/15/2017-12/14/2020, $360,000.00.

PI, NSF Collaborative Research: *Towards Communication-Cognizant Voltage Regulation and Energy Management for Power Distribution Systems*, 08/01/1016-07/31/2019, $221,111.

PI, NSF CAREER: *Optimization, Control, and Incentive Design for Power Networks with High Levels of Distributed Energy Resources*, 02/01/2016-01/31/2021, $500,003.

PI(Subcontractor), ARPA-E NODES: *Real-time optimization and control of next-generation*, 08/01/2016-07/31/2019, $340,000 out of $3,900,000 (Leading PI: National Renewable Energy Laboratory)

PI, Guodian Nanjing Automation Co., Ltd: *Optimal Bidding Strategy and Assets Allocation Plan for Generation Companies*, 04/01/2016-03/31/2018, $342,000.

co-PI, NSF Eager: *Limited Communications Demand Control in the Power Grid*, 08/15/2015-07/31/2017, $225,000. (PI: Vahid Tarokh)

PI, Lincoln Laboratory, *Optimization of Distributed Space Systems*, 09/01/2014-08/31/2015, $102,811.

**Invited Talks and Presentations (Selected)**

"Limited Communication Gradient Methods for Distributed Resource Allocation Optimization", Workshop of *Interdisciplinary Approaches for Control of Largescale Complex Systems* in American Control Conference (ACC), June 2018.

"Limited Communication Gradient Methods for Distributed Resource Allocation Optimization", Workshop of *Mathematical and Computational Challenges in Real-Time Decision Making* in Simons Institute of Berkeley, May 2018.

"Distributed Coordination in Multi-Agent Network Systems: Algorithms, Fundamental Limits, and Applications", Iowa State University, April 2018.

"Distributed Coordination in Multi-Agent Network Systems: Algorithms, Fundamental Limits, and Applications",University of California, Berkeley, April 2018.

"Learning and Targeting the Right Customers for Residential Demand Response: A Case Study and A Multi-Armed Bandit Approach", Workshop of *Societal Networks* in Simons Institute of Berkeley, March 2018.

"Distributed Coordination in Multi-Agent Network Systems: Algorithms, Fundamental Limits, and Applications", UPenn, December 2017.

"Distributed Coordination in Multi-Agent Network Systems: Algorithms, Fundamental Limits, and Applications", University of California, Santa Barbara, November 2017.

"Voltage regulation using limited communication" Workshop on Electric Energy Systems and OR-Analytics, Georgia Tech, November 2017.

"A Sequential Convex Optimization Approach to Optimal Power Flow and Its Variations", INFORMS annual meeting, October 2017.

"Distributed Coordination in Multi-Agent Systems: Algorithms, Fundamental Limits, and Applications", Boston University, September 2017.

"Distributed Coordination in Multi-Agent Systems: Algorithms, Fundamental Limits, and Applications", Yale University, September 2017.

"Harness smoothness to accelerate distributed optimization", AFSOR D & C Annual Review, September 2017.

"Distributed Energy Management under Limited Communication", MIT September, 2017.

"Distributed Resource Allocation under Limited Communication", Rutgers, August 2017.

"Mechanism Design for Reliability in Demand Response with Uncertainty", Production and Operations Management Society (POMS) Annual Conference, May 2017.

"Parallelized Interior Point Method for Security Constrained Optimal Power Flow (SCOPF)", INFORMS Computing Society Conference, January, 2017.

"Voltage Regulation Using Limited Communication", INFORMS Computing Society Conference, January 2017.

"Parallelized Interior Point Method for Security Constrained Optimal Power Flow (SCOPF)", INFORMS Annual Meeting, Nov 2016.

"Market Design in Transforming Future Electric Distribution Networks", University of Maryland, College Park, October 2016.

"Distributed Energy Management with Limited Communication", Worcester Polytechnic Institute (WPI), October 2016.

"DistributedEnergyManagementin Power Networks", Harvard SEAS/HBS symposium on the Internet of Things, September, 2016.

"Market Design in Transforming Future Electric Distribution Networks", the inaugural Resnick Institute Young Investigators Symposium, The Resnick Sustainability Institute at Caltech, September 2016.

"Distributed Energy Management with Limited Communication", ETH Zurich, June 2016.

"Distributed Control for Achieving Optimal Steady State", DFG-JST-RCN-NSF, May 2016.

"A Market Mechanism for Electric Distribution Networks", Production and Operations Management Society (POMS) Annual Conference, May 2017.

"Distributed Energy Management with Limited Communication", North Carolina State University, Apr. 2016.

"Distriuted Energy Management with Limited Communication", University of Southern California, Mar. 2016.

"Connecting Distributed Control and Distributed Optimization in the Power Grid", Tsinghua University, Dec. 2015

"Connecting Distributed Control and Distributed Optimization in the Power Grid", Young Researchers Workshop on Distributed Energy Management Systems Toward International Collaborations between NSF, NRF and JST CREST projects, Osaka, Japan, Dec. 2015

"Distributed Energy Management with Limited Communication", Workshop on Power Systems and Markets, Penn State University, Nov. 2015

"Distributed Energy Management with Limited Communication", Computer Engineering Seminar Series, Brown University, Nov. 2015

"Demand Response Using Supply Function Bidding", Informs Annual Meeting, Nov. 2015

"A Market for Electricity Distribution Networks", Informs Annual Meeting, Nov. 2015

"Connecting Distributed Control and Distributed Optimization in the Power Grid", KAUST Conference on Human-Machine Networks and Intelligent Infrastructure, Oct. 2015

"Distributed Control and Decision Making Over Networks", Institute for Mathematics and its Applications (IMA), University of Minnesota in Minneapolis, Sep. 2015

"Distributed Mechanism in Electricity Distribution Networks", Panel session in IEEE Power and Energy Society General Meeting, Jul. 2015

"Fully-Decentralized and Robust Voltage Control in Distribution Networks", SIAM Conference on Control and Its Application, France, Jul. 2015

"Distributed Optimal Steady-state Control Using Reverse- and Forward- Engineering", Los Alamos National Lab, May. 2015

"Distributed Optimal Steady-state Control Using Reverse- and Forward- Engineering", Rensselaer Polytechnic Institute, May. 2015

"Robust Efficiency and Actuator Saturation Explain Heart Rate Control and Variability", MIT CIR seminar, Apr. 2015

"Real-time Decentralized and Robust Voltage Control in Distribution Networks", ITA Workshop in San Diego, Feb. 2015

"Distributed Algorithm and Mechanism in Smart Grid", Harvard University Center for Environment(HUCE) Graduate Consortium seminar, Oct. 2014

"Distributed Optimization and Control in Smart Grid", Workshop on Urban Research, Harvard-MIT-University of Madrid, Oct. 2014

"Distributed Energy Management in Power Networks", New England ISO, Mar. 2014

"Connecting AGC and Economic Dispatch from an Optimization Point of View", NSF Workshop: Role of Distributed Coordination in Resilient & Fine-Grain Control of Power Grids, Feb. 2014

"Distributed Energy Management in Power Networks", Cornell University, Mar. 2013

"Robust Efficiency and Actuator Saturation Explain Healthy Heart Rate Control and Variability",University of California–San Diego, Mar. 2013

**Professional Service**

***Committee-related duties***

2019- , Associate Editor of IEEE Control System Letters.

2016-Present, Associate Editor of the Conference Editorial Board (CEB) of the IEEE Control Systems Society (CSS).

2016-Present, American Automatic Control Council (AACC) Technical Committees on Education.

2015-Present, IEEE Technical Committee on Cybernetics for Cyber-Physical Systems (CPS).

2017, 2016, 2015 Session Chairs in American Control Conference and IEEE Conference on Decision and Control.

2016, Technical Program Committee on the 2017 International Conference on Cyber-Physical Systems (ICCPS).

2016, Guest editor for a Special Issue of IET Generation Transmission & Distribution titled with "Distributed & autonomous dispatch and control for active distribution network/microgrids– potential scheme to realize plug & play of DER".

2016, Organize Invited Session in IEEE American Control Conference.

2016, 2015, 2014 Technical program committee for ACM Workshop of GreenMetrics.

2016 Technical program committee for GlobalSIP.

2015, Organize Invited Session in IEEE Conference on Decision and Control.

2018, 2014, 2012 Technical program committee for IEEE SmartGridComm.

2018, 2017, 2016, Serve on NSF review panels

***Invited Referee for Journals and Conferences***

Proceedings of the National Academy of Sciences (PNAS); Automatica; IEEE Transactions on Automatic Control; IEEE Transactions on Control of Network Systems; IEEE Transactions on Smart Grid; IEEE Transactions on Power Systems; IEEE Transactions on Systems, Man, and Cybernetics; IEEE Transactions on Signal Processing; IEEE Signal Processing Magazine; IEEE Journal of Selected Topics in Signal Processing; IEEE Transactions on Industrial Informatics; IEEE Transactions on Mobile Computing; IEEE System Journal; ACM Transactions on Internet Technology; IEEE SmarGridComm Conference; IEEE Conference on Decision and Control; American Control Conference; European Control Conference; Power Systems Computation Conference; SIAM conference on Control and Its Applications; Conference on Neural Information Processing Systems (NIPS);

**Institute Service at Harvard**

Committee member in graduate student admission since 2014.
Committee member in the Committee of High Degree(CHD) since 2014.
Committee for PhD student qualification exams and defenses, on average 5 per year since 2014.
Committee member for the junior faculty search in EE for 2014, 2015, 2016.
Advisor on the committee of the junior faculty search in bio-mechanic control, 2018. Committee member for the junior faculty search in system biology in FAS for 2016, 2017.
Concentration adviser for undergraduates in Electrical Engineering and Applied Mathematics since 2014.
Freshman Adviser for 4 freshmen in 2016-2017.
EE seminars organizer July 2014- December 2016.
Initiate a joint group (ISS) with other faculties in EE information and systems and organize activities and seminars since 2014.