Na (Lina) Li

Electrical Engineering
School of Engineering and Applied Sciences
Harvard University

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Research Interests

Distributed optimization and control; Game theory; Algorithm and mechanism design in smart grids; Dynamic modeling of physiology and system biology

Academic Experience

Assistant Professor of Electrical Engineering — Jul. 2014 -
School of Engineering and Applied Sciences
Harvard University

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

Education

Ph.D. in Control and Dynamical Systems — Sep. 2007 - Jun. 2013
California Institute of Technology (Caltech), Pasadena, CA
Advisor: Prof. John Doyle

B.S. in Mathematics and Applied Mathematics — Sep. 2003 - Jun. 2007
Zhejiang University (ZJU), Hangzhou, P.R.China

Visiting Student in Mechanical and Aerospace Engineering — Jul. - Aug. 2006; Jan. - May. 2007
University of California, Los Angeles, LA, CA — Undergraduate research assistant

Honors and Awards (selected)

Nominee to present a talk during "Graduation Day" at the ITA Workshop in San Diego, Feb. 2013

"Rising Stars in EECS: An academia workshop for women", MIT, Nov. 2012

Best Student Paper Award Finalist in 50th IEEE Conference on Decision and Control, Dec. 2012

Division Fellowship in California Institute of Technology, Sep. 2007

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

Journal Publications

1. Guannan Qu, **Na Li**, Munther Dahleh, "Real-time Decentralized and Robust Voltage Control in Distribution Networks", Submitted to *IEEE Transactions on Automatic Control*.
2. **Na Li**, Lijun Chen, Munther Dahleh, "Load Shedding in Power Networks Using Linear Supply Function Bidding ", Submitted to *IEEE Transactions on Smart Grids*.
3. Wenbo Shi, **Na Li**, Chi-Cheng Chu, Rajit Gahd "Real-Time Energy Management in Microgrids ", Submitted to *IEEE Transactions on Smart Grids*.
4. Yunjian Xu, **Na Li**, Steven Low "Demand Response with Capacity Constrained Supply Function Bidding ", Submitted to *IEEE Transactions on Smart Grids*.
5. Qingqing Huang, Leilai Shao, **Na Li**, "Dynamic Fault Diagnosis in Power Grids Using Hidden Markov Models", Submitted to *IEEE Transactions on Power Systems*.
6. **Na Li**, Lijun Chen, Changhong Zhao, "Connecting Automatic Generation Control with Economic Dispatch", Conditionally accepted to *IEEE Transactions on Control of Network Systems*, 2015.

7. 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.
8. **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, 2015.
9. 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.
10. 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.
11. **Na Li**, Jason Marden, "Decoupling Coupled Constraints through Utility Design", *IEEE Transactions on Automatic Control*,59(8), Pages 2289-2294, 2014.
12. **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

Proceedings of Refereed Conference

1. Qingqing Huang, Leilai Shao, **Na Li**, "Dynamic Fault Diagnosis in Power Grids Using Hidden Markov Models", Accepted to American Control Conference, 2015.
2. Ariana Minot, **Na Li**, "Distributed State Estimation", Accepted to American Control Conference, 2015.
3. **Na Li**, Changhong Zhao Lijun Chen, Steven Low, "Connecting Automatic Generation Control and Economic Dispatch from an Optimization View", American Control Conference, 2014.
4. **Na Li**, Guannan Qu, Munther Dahleh, "Real-time decentralized voltage control in distribution networks", Allerton, 2014.
5. Minghui Zhu, **Na Li**, "Stability constrained incentive mechanisms for distributed frequency control of power grid", IEEE Conference on Decision and Control, 2014.
6. Minghui Zhu, **Na Li**, Wenbo Shi, Rajit Gadh, "Distributed access control of volatile renewable energy resources", PESGM 2014.
7. Lingwen Gan, **Na Li**, Ufuk Topcu, Steven Low, "Optimal Power Flow in Distribution Networks", IEEE Conference on Decision and Control, 2013.
8. **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.
9. **Na Li**, Lijun Chen, Steven Low, "Demand Response in Radial Distribution Networks: Distributed Algorithm (Invitied Paper)", *Asilomar Conference on Signals, Systems and Computers*, 2012.
10. **Na Li**, Lijun Chen, Steven Low, "Exact Convex Relaxation for Radial Networks using Branch Flow Models", *IEEE International Conference on Smart Grid Communications*, 2012.
11. 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.
12. Lingwen Gan, **Na Li**, Ufuk Topcu, Steven Low, "Branch Flow Model for Radial Networks: Convex Relaxation", *Proceedings of the 51th IEEE Conference on Decision and Control*, 2012.

13. **Na Li**, Jason Marden, "Designing Games for Distributed Optimization with a Time-Varying Communication Graph" *Proceedings of the 51th IEEE Conference on Decision and Control*, 2012.
14. **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**
15. **Na Li**, Lijun Chen, Steven H. Low, "Optimal Demand Response based on Utility Maximization in Power Networks" *IEEE Power Engineering Society General Meeting*, 2011.
16. Lijun Chen, **Na Li**, Steven H. Low, "On the Interaction between Load Balancing and Speed Scaling", *Information Theory and Applications Workshop*, 2011.
17. 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.
18. **Na Li**, Jason Marden, "Designing Games to Handle Coupled Constraints", *Proceedings of the 49th IEEE Conference on Decision and Control*, 2010
19. **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

Workshop Presentations and Invited Talks

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

"Game Theory in Engineering Systems", EconCS seminar, Harvard University, 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

"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

"Distributed Energy Management in Power Networks", University of Michigan–Ann Arbor, Mar. 2013

"Distributed Energy Management in Power Networks", University of Wisconsin– Madison, Mar. 2013

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

"Distributed Energy Management in Power Networks", University of Illinois, Urbana-Champion, Mar. 2013

"Distributed Energy Management in Power Networks", Georgia Institute of Technology, Feb. 2013

"Distributed Energy Management in Power Networks", Carnegie Mellon University, Feb. 2013

"Designing Games for Distributed Optimization", ITA Workshop in San Diego, "Graduation Day", Feb. 2013

"Distributed Energy Management in Power Networks", University of California–San Diego, Jan. 2013

"Robust Efficiency and Actuator Saturation Explain Healthy Heart Rate Control and Variability", Rising Stars in EECS: an Academia Career Workshop for Women, MIT, Nov. 2012

"Designing Games for Distributed Optimization", University of Colorado, Boulder, Dec. 2011

"Designing Games for Distributed Optimization", Zhejiang University, Aug. 2011

"Designing Games for Distributed Optimization", The Hong Kong University of Science and Technology, Aug. 2011

"Designing Games for Distributed Optimization", 21th International Conference on Game Theory, Stony Brook University, Jul. 2011

"Dynamical Modeling of Heart Rate Variability", Southern California (Nonlinear) Control Workshop, UC-Riverside, May. 2011

"Designing Games to Handle Coupled Constraints", SISL/Yahoo! SISHOO Workshop, Hungtington Beach, Dec. 2010.

Professional Service

Conference-related duties

2012, 2014, Technical program committee for IEEE SmartGridComm;

2014, Technical program committee for ACM Workshop of GreenMetrics;

Invited Referee for Journals and Conferences

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;

Teaching

ES 202: Estimation and Control of Dynamical Systems

ES 158: Feedback Systems: Analysis and Design