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; Co-adviser: Prof. Steven Low

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
Advisor: Prof. Jeff Shamma

Honors and Awards (selected)

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

Division Fellowship in California Institute of Technology, Sep. 2007

Outstanding undergraduate thesis award and outstanding graduate students, Zhejiang University, Jun. 2007

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

Journal Publications and Book Chapters

1. **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 ", Accepted to *Proceedings of National Academia Sciences*, 2014.
2. Lingwen Gan, **Na Li**, Ufuk Topcu, Steven Low, "Exact convex relaxation for optimal power flow in radial networks", Accepted to *IEEE Transactions on Automatic Control*, 2014.
3. **Na Li**, Lijun Chen, Munther Dahleh, "Load Shedding in Power Networks Using Linear Supply Function Bidding ", Submitted to *IEEE Transactions on Smart Grids*, 2014.
4. 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
5. 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

6. **Na Li**, Jason Marden, "Decoupling Coupled Constraints through Utility Design", *IEEE Transactions on Automatic Control*,59(8), Pages 2289-2294, 2014.
7. **Na Li**, Jason Marden,"Designing Games for Distributed Optimization", *the Journal of IEEE Selected Topics in Signal Processing*,7(2), Pages:230 - 242, 2013.
8. 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. **Na Li**, Changhong Zhao Lijun Chen, Steven Low, "Connecting Automatic Generation Control and Economic Dispatch from an Optimization View", American Control Conference, 2014.
2. **Na Li**, Munther Dahleh, "Real-time decentralized voltage control in distribution networks", submitted to Allerton, 2014.
3. Minghui Zhu, **Na Li**, "Stability constrained incentive mechanisms for distributed frequency control of power grid", IEEE Conference on Decision and Control 2014
4. Minghui Zhu, **Na Li**, Wenbo Shi, Rajit Gadh, "Distributed access control of volatile renewable energy resources", PESGM 2014,
5. Lingwen Gan, **Na Li**, " Ufuk Topcu, Steven Low, Optimal Power Flow in Distribution Networks", IEEE Conference on Decision and Control, 2013
6. **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.
7. **Na Li**, Lijun Chen, Steven Low, "Exact Convex Relaxation for Radial Networks using Branch Flow Models", *IEEE International Conference on Smart Grid Communications*, 2012.
8. 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.
9. 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.
10. **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.
11. **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**
12. **Na Li**, Lijun Chen, Steven H. Low, "Optimal Demand Response based on Utility Maximization in Power Networks" *IEEE Power Engineering Society General Meeting*, 2011.
13. Lijun Chen, **Na Li**, Steven H. Low, "On the Interaction between Load Balancing and Speed Scaling", *Information Theory and Applications Workshop*, 2011.
14. 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.
15. **Na Li**, Jason Marden, "Designing Games to Handle Coupled Constraints", *Proceedings of the 49th IEEE Conference on Decision and Control*, 2010
16. **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

Professional Service

Conference-related duties

2012, 2013, 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 Smart Grid; IEEE Transactions on Power Systems; IEEE Transactions on Systems, Man, and Cybernetics; IEEE Signal Processing Magazine; IEEE SmarGridComm Conference; IEEE Conference on Decision and Control; American Control Conference;

Teaching Experience

Teaching Assistant for "CDS 212 – Feedback Control Theory", Caltech, Fall 2011

Teaching Assistant for "ACM 104 / AM125a / CDS 201 – Applied Operator Theory", Caltech, Fall 2010

Teaching Assistant for "CS/EE 147 – Network Performanc Analysis", Caltech, Spring 2010

Teaching Assistant for "CDS 140 – Introduction to Dynamics", Caltech, Fall 2008