Yingjie Bi

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Education

Cornell University **08/2014–05/2020**

Ph.D. in Electrical and Computer Engineering
Dissertation Title: Analysis of Convex Relaxations for Nonconvex Optimization
Advisor: Prof. Kevin Tang
Committee: Prof. Aaron B. Wagner and Prof. Madeleine Udell

Peking University **09/2010–07/2014**

Bachelors in Science
Major: Microelectronics
Rank 1/45

Research Interests

Optimization theory, networks and control theory.

Experiences

UC Berkeley **01/2020–present**

Postdoctoral Scholar, Department of IEOR
Mentor: Prof. Javad Lavaei

AT&T Labs **05/2017–08/2017**

Internship

- Proposed an algorithm based on dynamic programming to analyze the link costs in next-generation optical networks.
- Applied the method to a nationwide fiber network and studied the sensitivity analysis for the reach and cost of transponders.

City University of Hong Kong **05/2015–08/2015**

Research Assistant, Department of Computer Science
Mentor: Prof. Chee Wei Tan

- Studied network utility maximization over joint congestion control and routing for any given path cardinality constraint.
- Proposed a novel convex relaxation that allows performance estimation that is significantly better than previous results based on multipath routing relaxation.
- Proposed a distributed randomized algorithm based on the convex relaxation that can be interpreted as sparse multipath TCP/IP joint congestion control and routing algorithm.

Publications

[1] Y. Bi and J. Lavaei, "On the connectivity properties of feasible regions of optimal decentralized control problems," *preprint*.
[2] Y. Bi and J. Lavaei, "Identifying the connectivity of feasible regions for optimal decentralized control problems," in *Proc. IEEE CDC*, 2020, forthcoming.
[3] Y. Bi and A. Tang, "Duality gap estimation via a refined Shapley-Folkman lemma," *SIAM J. Optim.*, vol. 30, no. 2, pp. 1094–1118, 2020.
[4] Y. Bi and A. Tang, "On upper bounding Shannon capacity of graph through generalized conic programming," *Optim. Lett.*, vol. 13, no. 6, pp. 1313–1323, Sep. 2019.
[5] Y. Bi and A. Tang, "Uncertainty-aware optimization for network provisioning and routing," in *Proc. IEEE CISS*, Mar. 2019.
[6] N. Wu, Y. Bi, N. Michael, A. Tang, J. C. Doyle, and N. Matni, "A control-theoretic approach to in-network congestion management," *IEEE/ACM Trans. Netw.*, vol. 26, no. 6, pp. 2443–2456, Dec. 2018.

[7] Y. Bi and D. Lynch, "A dynamic-programming-based cost analysis of 100G, 200G, and 400G transmission rates," *preprint*.
[8] Y. Bi and A. Tang, "Cost of not arbitrarily splitting in routing," in *Proc. IEEE ICNP*, Oct. 2017.
[9] N. Wu, Y. Bi, N. Michael, A. Tang, J. Doyle, and N. Matni, "HFTraC: High-frequency traffic control," in *Proc. ACM SIGMETRICS*, Jun. 2017, pp. 43–44.
[10] Y. Bi, C. W. Tan, and A. Tang, "Network utility maximization with path cardinality constraints," in *Proc. IEEE INFOCOM*, Apr. 2016.
[11] B. Gao, Y. Bi *et al.*, "Ultra-low-energy three-dimensional oxide-based electronic synapses for implementation of robust high-accuracy neuromorphic computation systems," *ACS Nano*, vol. 8, no. 7, pp. 6998–7004, Jul. 2014.

Honors and Awards

- ECE Outstanding Thesis Research Award, Cornell University, 2020
- Hsien Wu and Daisy Yen Wu Scholarship, Cornell University, 2018
- Jacobs Fellow, Cornell University, 2014–2015, 2017–2018
- Peking University Fangzheng Scholarship, 2012–2013
- Outstanding Student in Peking University, 2011–2012
- National Scholarship of China, 2011–2012
- Peking University Alumni Association of Houston Scholarship, 2010–2011