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Education

The Hong Kong University of Science and Technology, Hong Kong
Ph.D. in Electronic and Computer Engineering, 08/2011-08/2015

- Dissertation Title: Scalable Sparse Optimization in Dense Cloud-RAN
- Advisor: Prof. Khaled B. Letaief

Tsinghua University, Beijing, China
B.E. in Electronic Engineering

- Dept. of Electronic Engineering, 07/2009-07/2011
- Dept. of Mathematical Sciences, 08/2007-07/2009
- Thesis Title: Numerical Algorithms for the Meijer's G-function and Its Applications in Wireless Networks
- Advisor: Prof. Wei Chen

Academic Positions

- **Assistant Professor**, School of Information Science and Technology, ShanghaiTech University, Shanghai, China, Sept. 2015-Present.
- **Visiting Researcher Scholar**, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, Host: Prof. Martin Wainwright, Oct. 2016-Present.

Academic Honors and Awards

- The 2016 Marconi Prize Paper Award in Wireless Communications (best paper in prior 3 years in the IEEE Transactions on Wireless Communications), jointly with Jun Zhang and Khaled B. Letaief.

Courses Taught

- Convex Optimization for Electrical Engineering, SI251, ShanghaiTech, Spring 2016.

Research Grants

- **Shanghai Sailing Program (No. 16YF1407700)**, PI/Project Manager, RMB$ 200,000, "Large-Scale Optimization for Dense Fog Computing Enabled Radio Access Networks", 2016-2019.
- **NSFC (No. 61601290)**, PI/Project Manager, RMB$ 220,000, "Mobile Edge Computing in Tactile Internet", 2017-2019.

Research Interests

My research focuses on massive data analytics, computation, and communication (***MC2***) aspects in network science, including:

- Computational big data analytics
- Mobile edge computing, caching and networking
- Dense wireless networking
- Sparse and low-rank modeling and optimization
- Convex and nonconvex optimization, Riemannian optimization

Publications

Book Chapters

1. **Y. Shi**, J. Zhang, K. B. Letaief, B. Bai and W. Chen, "Large-Scale Convex Optimization For C-RANs," in *Cloud Radio Access Networks: Principles, Technologies, and Applications*, Cambridge University Press, 2017.

Journal Articles

1. **Y. Shi**, J. Zhang, and K. B. Letaief, "Enhanced group sparse beamforming for dense green Cloud-RAN: A random matrix approach," submitted to *IEEE Trans. Signal Process.*, Oct. 2016.
2. **Y. Shi** and B. Mishra,"Topological interference management with user admission control via Riemannian optimization" submitted to *IEEE Trans. Signal Process.*, Jul. 2016.
3. **Y. Shi**, J. Zhang, and K. B. Letaief, "Low-rank matrix completion for topological interference management by Riemannian pursuit," *IEEE Trans. Wireless Commun.*, vol. 15, no. 7, Jul. 2016.
4. **Y. Shi**, J. Cheng, J. Zhang, B. Bai, W. Chen and K. B. Letaief, "Smoothed L_p-minimization for green Cloud-RAN with user admission control," *IEEE J. Select. Areas Commun.*, vol. 34, no. 4, Apr. 2016.
5. **Y. Shi**, J. Zhang, B. O'Donoghue, and K. B. Letaief, "Large-scale convex optimization for dense wireless cooperative networks," *IEEE Trans. Signal Process.*, vol. 63, no. 18, pp. 4729-4743, Sept. 2015.
6. **Y. Shi**, J. Zhang, and K. B. Letaief, "Robust group sparse beamforming for multicast green Cloud-RAN with imperfect CSI," *IEEE Trans. Signal Process.*, vol. 63, no. 17, pp. 4647-4659, Sept. 2015.
7. **Y. Shi**, J. Zhang, K. B. Letaief, B. Bai and W. Chen,"Large-scale convex optimization for ultra-dense Cloud-RAN," *IEEE Wireless Commun. Mag.*, vol. 22, no. 3, pp. 84-91, Jun. 2015.
8. **Y. Shi**, J. Zhang, and K. B. Letaief, "Optimal stochastic coordinated beamforming for wireless cooperative networks with CSI uncertainty," *IEEE Trans. Signal Process.*, vol. 63,, no. 4, pp. 960-973, Feb. 2015.
9. **Y. Shi**, J. Zhang, and K. B. Letaief, "Group sparse beamforming for green Cloud-RAN," *IEEE Trans. Wireless Commun.*, vol. 13, no. 5, pp. 2809-2823, May 2014. (**The 2016 Marconi Prize Paper Award**)

Conference Papers

1. K. Yang, **Y. Shi**, and Z. Ding, "Generalized matrix completion for cache-aided Fog-RAN via the Burer-Monteiro approach," submitted to *IEEE Int. Conf. Commun. (ICC)*, Paris, France, May 2017.

2. J. Dong, K. Yang, and **Y. Shi**, "Ranking from crowdsourced pairwise comparisons via smoothed matrix manifold optimization," submitted to *IEEE Int. Conf. Commun. (ICC)*, Paris, France, May 2017.

3. X. Liu, **Y. Shi**, J. Zhang, and K. B. Letaief, "Massive CSI acquisition in dense Cloud-RAN with spatial and temporal prior information," submitted to *IEEE Int. Conf. Commun. (ICC)*, Paris, France, May 2017.

4. **Y. Shi** and B. Mishra, "Sparse and low-rank decomposition for big data systems via smoothed Riemannian optimization," accepted to *9th NIPS workshop on optimization for machine learning (OPT2016)*, Barcelona, Spain, Dec. 2016.

5. Y. Su, **Y. Shi**, B. Bai, W. Chen, J. Zhang, K. B. Letaief, and S. Zhou, "Optimal stochastic power control with compressive CSI acquisition for Cloud-RAN," in *Proc. IEEE Global Conf. Signal and Inf. Process. (GlobalSIP)*, Washington, DC, Dec. 2016.

6. K. Yang, **Y. Shi**, J. Zhang, Z. Ding and K. B. Letaief, "A low-rank approach for interference management in dense wireless networks," in *Proc. IEEE Global Conf. Signal and Inf. Process.(GlobalSIP)*, Washington, DC, Dec. 2016.

7. K. Yang, **Y. Shi**, and Z. Ding, "Low-rank matrix completion for mobile edge caching in Fog-RAN via Riemannian optimization," in *Proc. IEEE Global Commun. Conf. (Globecom)*, Washington, DC, Dec. 2016.

8. **Y. Shi**, J. Zhang, and K. B. Letaief, "Statistical group sparse beamforming for green Cloud-RAN via large system analysis," in *Proc. IEEE Int. Symp. Inform. Theory (ISIT)*, Barcelona, Spain, Jul. 2016.

9. J. Cheng, **Y. Shi**, B. Bai, and W. Chen, "Computation offloading in Cloud-RAN based mobile cloud computing system," in *Proc. IEEE Int. Conf. Commun. (ICC)*, Kuala Lumpur, Malaysia, May 2016.

10. **Y. Shi**, J. Zhang, and K. B. Letaief, "Low-rank matrix completion via Riemannian pursuit for topological interference management," in *Proc. IEEE Int. Symp. Inform. Theory (ISIT)*, Hong Kong, Jun. 2015.

11. J. Cheng, **Y. Shi**, B. Bai, W. Chen, J. Zhang, and K. B. Letaief, "Group sparse beamforming for multicast green Cloud-RAN via parallel semidefinite programming," in *Proc. IEEE Int. Conf. Commun. (ICC)*, London, UK, Jun. 2015.

12. **Y. Shi**, J. Zhang, and K. B. Letaief, "Scalable coordinated beamforming for dense wireless cooperative networks," in *Proc. IEEE Global Commun. Conf. (Globecom)*, Austin, TX, Dec. 2014.

13. **Y. Shi**, J. Zhang, and K. B. Letaief, "CSI overhead reduction with stochastic beamforming for cloud radio access networks," in *Proc. IEEE Int. Conf. Commun. (ICC)*, Sydney, Australia, Jun. 2014.

14. **Y. Shi**, J. Zhang, and K. B. Letaief, "Group sparse beamforming for green cloud radio access networks," in *Proc. IEEE Global Commun. Conf. (Globecom)*, Atlanta, GA, Dec. 2013.

15. **Y. Shi**, J. Zhang, and K. B. Letaief, "Coordinated relay beamforming for amplify-and-forward two-hop interference networks," in *Proc. IEEE Global Commun. Conf. (Globecom)*, Anaheim, CA, Dec. 2012.

Talks and Presentations

Invited Seminars

1. "The power of sparse and low-rank optimization paradigms for network densification", Shanghai Jiao Tong University, Aug. 2016.
2. "The power of sparse optimization paradigms for dense Cloud-RAN", SIST Group Seminar of Communication and Information System, ShanghaiTech University, Jul. 2016.
3. "Scalable sparse optimization in dense wireless cooperative networks", School of Information Science and Technology, ShanghaiTech University, Jul. 2015.

Conference and Workshop Presentations

1. "Low-rank matrix completion for topological interference management via Riemannian pursuit", IEEE International Symposium on Information Theory (ISIT), Hong Kong, Jun. 2015.
2. "CSI overhead reduction with stochastic beamforming for cloud radio access networks", IEEE International Conference on Communications (ICC), Sydney, Australia, Jun. 2014.
3. "Coordinated relay beamforming for amplify-and-forward two-hop interference networks", IEEE Global Communications Conference (Globecom), Anaheim, California, USA, Dec. 2012.

Technical Backgrounds

Mathematics

Mathematical Analysis	Advanced Algebra and Geometry	Stochastic Processes
Complex Analysis	Advanced Probability Theory	Matrix Analysis
Functional Analysis	Advanced Mathematical Statistics	Random Matrix Theory

Optimization

Convex Optimization	Large-Scale Optimization	Riemannian Optimization
Convex Analysis	Integral Geometry	Differential Geometry

Applied Mathematics and Engineering

Information Theory	Machine Learning
Communication Theory	Estimation Theory

Research Supervision and Advising

- **Yukan Fang**, Master student at ShanghaiTech University

  Topic: Randomized sketching for wireless big data systems (Sept. 2016 - Present)

- **Gao Yin**, Master student at ShanghaiTech University

  Topic: Generalized matrix completion for wireless distributed computing systems (Sept. 2016 - Present)

- **Kai Yang**, Master student at ShanghaiTech University

  Topic: Sparse and low-rank optimization for mobile edge computing and networking (Sept. 2015 - Present)

Professional Activities

Technical Program Committee

- IEEE Vehicular Technology Conference (VTC), 2016-Spring.
- IEEE/CIC International Conference on Communications in China (ICCC) 2016.

Reviewing

- Journal Reviewing: *IEEE Journal on Selected Areas in Communications, IEEE Journal of Selected Topics in Signal Processing, IEEE Transaction on Wireless Communications, IEEE Transaction on Communications, IEEE Transactions on Mobile Computing, IEEE Transactions on Vehicular Technology, IEEE Communication Magazine, IEEE Wireless Communication Magazine, IEEE Communications Letters, IEEE Wireless Communications Letters.*
- Conference Reviewing: NIPS, ISIT, Globecom, ICC, VTC.

Membership

- Member of Institute of Electrical and Electronics Engineers (IEEE).

Computer Skills

Matlab, C, C++, Python, Mathematica.

Outside Interests

Cooking, hiking, running, cycling, and basketball.

Last updated: November 6, 2016