Kai Yang

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School of Information Science and Technology
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Education

ShanghaiTech University, Shanghai, China & University of Chinese Academy of Sciences, Beijing, China
Ph.D. candidate in Communication and Information Systems, 09/2017-07/2020 (expected)

- Advisor: Prof. Yuanming Shi
- School of Information Science and Technology
- Research Topic: Generalized Sparse and Low-Rank Optimization for Dense Wireless Networks

Dalian University of Technology, Dalian, China
B.E. in Electronic Engineering, 09/2011–07/2015

- Advisor: Prof. Yanqing Guo
- School of Information and Communication Engineering 09/2013-07/2015
- Faculty of Electronic Information and Electrical Engineering 09/2011-07/2013

Honors and Awards

- National Scholarship for Graduate Students, 2017
- Student Merit Award, University of Chinese Academy of Science, 2017
- Student Merit Award, ShanghaiTech University, 2016

Experience

University of Toronto, Ontario, Canada
Visiting student, 01/2019-01/2020

- Host: Prof. Wei Yu

University of California, Berkeley, California, USA
Visiting student in BeSTEC program, 10/2016-02/2017

- Host: Prof. Martin J. Wainwright

Research Interests

My research interests include sparse and low-rank optimization, manifold optimization, machine learning, and their applications to dense wireless networks and distributed computing systems:

- convex and nonconvex optimization
- mobile edge artificial intelligence
- edge computing and caching
- intelligent IoT

Publications

Book Chapters

1. Y. Shi, **K. Yang**, and Y. Yang, "Generalized Low-Rank Optimization for Ultra-Dense Fog-RANs," in *Ultra Dense Networks: Principles and Technologies*, Cambridge University Press, 2019.

Journal Articles

1. **K. Yang**, T. Jiang, Y. Shi, and Z. Ding, Federated learning via over-the-air computation, submitted.

2. **K. Yang**, Y. Shi, and Z. Ding, "Data shuffling in wireless distributed computing via low-rank optimization," submitted to *IEEE Trans. Signal Process.*, under first round revision.

3. **K. Yang**, Y. Shi, and Z. Ding, "Generalized low-rank optimization for topological cooperation in ultra-dense networks," submitted to *IEEE Trans. Wireless Commun.*, under second round revision.

4. J. Dong, **K. Yang**, and Y. Shi, "Ranking from crowdsourced pairwise comparisons via smoothed Riemannian optimization," submitted to *Signal Process.*.

5. J. Dong, **K. Yang**, and Y. Shi, "Blind demixing for low-latency communication," in *IEEE Trans. Wireless Commun.*, vol. 18, no. 2, pp. 897-911, Feb. 2019.

Conference Papers

1. **K. Yang**, T. Jiang, Y. Shi, and Z. Ding, "Federated learning based on over-the-air computation," in *Proc. IEEE Int. Conf. Commun. (ICC)*, Shanghai, China, May 2019.

2. T. Jiang, **K. Yang**, and Y. Shi, "Pliable data shuffling for on-device distributed learning," in *Proc. IEEE Int. Conf. Acoust. Speech Signal Process. (ICASSP)*, Brighton, UK, May 2019.

3. **K. Yang**, Y. Shi, and Z. Ding, "Low-rank optimization for data shuffling in wireless distributed computing," in *Proc. IEEE Int. Conf. Acoust. Speech Signal Process. (ICASSP)*, Alberta, Canada, Apr. 2018.

4. J. Dong, **K. Yang**, and Y. Shi, "Blind demixing for low-latency communication," in *Proc. IEEE Wireless Commun. Networking Conf. (WCNC)*, Barcelona, Spain, Apr. 2018.

5. **K. Yang**, Y. Shi, and Z. Ding, "Generalized matrix completion for low complexity transceiver processing in cache-aided Fog-RAN via the Burer-Monteiro approach," in *Proc. IEEE Global Conf. Signal and Inf. Process. (GlobalSIP)*, Montreal, Canada, Nov. 2017.

6. J. Dong, **K. Yang**, and Y. Shi, "Ranking from crowdsourced pairwise comparisons via smoothed matrix manifold optimization," in *ICDM Workshops on Data-driven Discovery of Models (D3M)*, New Orleans, Louisiana, USA, Nov. 2017.

7. **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.

8. **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.

Technical Backgrounds

Mathematics

Matrix Analysis   Stochastic Processes

Optimization

Convex Optimization   Riemannian Optimization

Applied Mathematics and Engineering

Machine Learning   Deep Learning   Communication Theory   Detection and Estimation

Computer Skills

Matlab, Python.