杨恺

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教育经历

◆ **中国科学院大学(保送)**　　　　　　　　　　　　　　　　　　　　　　*中国上海*
　信息与通信工程 博士　　　　　　　　　　　　　　　　　　*2015 年 9 月 - 2020 年 6 月*
- 导师：[石远明](#)，[丁峣](#)
- 研究课题：边缘人工智能——通信，计算与学习
- 荣誉：中国科学院大学研究生国家奖学金，中国科学院大学优秀学生

◆ **大连理工大学**　　　　　　　　　　　　　　　　　　　　　　　　　　*中国辽宁大连*
　电子信息工程 学士　　　　　　　　　　　　　　　　　　*2011 年 9 月 - 2015 年 6 月*
- 导师：[郭艳卿](#)
- 专业排名：7/85
- 荣誉：国家励志奖学金；一等学习奖学金；大连市大学生数学竞赛理工类本科组一等奖。

访学经历

◆ **加州大学伯克利分校　访问学者**　　　　　　　　　　　　　　　　　*美国加州伯克利*
- 指导老师：[Martin J. Wainwright](#)　　　　　　　　　　　*2016 年 10 月 –2017 年 2 月*

◆ **多伦多大学　访问学者**　　　　　　　　　　　　　　　　　　　*加拿大安大略省多伦多*
- 指导老师：[郁炜](#)　　　　　　　　　　　　　　　　　　*2019 年 1 月 –2020 年 1 月*

实习经历

◆ **微众银行(webank) 人工智能算法实习生**　　　　　　　　　　　　　　　*中国深圳*
- 实习团队：AI 项目组 [FATE](#) 团队　　　　　　　　*2019 年 7 月 15 日–2019 年 9 月 14 日*
- 工作内容：高效联邦学习算法研究与设计
- 实习产出：专利申请两项，算法论文一篇

研究课题

◆ 移动边缘人工智能(Mobile Edge AI)：
- 联邦学习(Federated Learning)的快速数据聚合方案
- 基于边缘处理的移动设备端机器学习推断的超高可靠性通信服务方案设计
- 无线分式计算系统中的快速数据传输方案设计
- 超密集无线边缘网络的信道状态信息冗余压缩方案研究

科研成果

书籍章节

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.

期刊论文

1. Y. Shi, **K. Yang**, T. Jiang, J. Zhang, and K. B. Letaief, "[Communication-efficient edge AI: algorithms and systems](#)," *IEEE Commun. Surveys Tuts.*.
2. **K. Yang**, Y. Zhou, Z. Yang, and Y. Shi, "Communication-Efficient Edge AI Inference Over Wireless Networks," *ZTE Commun.*, 2020.
3. **K. Yang**, Y. Shi, Y. Zhou, Z. Yang, L. Fu, and W. Chen, "Federated machine learning for intelligent IoT via reconfigurable intelligent surface," *IEEE Netw.*, 2020.
4. **K. Yang**, Y. Shi, W. Yu, and Z. Ding, "Energy-efficient processing and robust wireless cooperative transmission for edge inference," *IEEE Internet Things J.*, 2020.
5. **K. Yang**, T. Jiang, Y. Shi, and Z. Ding, "Federated learning via over-the-air computation," *IEEE Trans. Wireless Commun.*, vol. 19, no. 3, pp. 2022-2035, Mar. 2020.
6. **K. Yang**, Y. Shi, and Z. Ding, "Data shuffling in wireless distributed computing via low-rank optimization," *IEEE*

Trans. Signal Process., vol. 67, no. 12, pp. 3087-3099, Jun. 2019.

7. **K. Yang**, Y. Shi, and Z. Ding, "Generalized low-rank optimization for topological cooperation in ultra-dense networks," *IEEE Trans. Wireless Commun.*, vol. 18, no. 5, pp. 2539-2552, May 2019.

8. J. Dong, **K. Yang**, and Y. Shi, "Ranking from crowdsourced pairwise comparisons via smoothed Riemannian optimization," *ACM Trans. Knowl. Discovery Data.*,vol. 14, no. 2, pp. 1-26, Feb. 2020.

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

会议论文

1. **K. Yang**, T. Fan, T. Chen, Y. Shi, and Q. Yang, "A Quasi-Newton Method Based Vertical Federated Learning Framework for Logistic Regression," *NeurIPS workshop on Federated Learning for Data Privacy and Confidentiality,* Dec. 2019.

2. **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.

3. 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.

4. **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.

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. **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 Communications Conf. (GLOBECOM)*, Washington, DC, Dec. 2016.

8. 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.

9. 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.

专业技术背景

◆ 应用数学与工程：无线通信理论，信号检测与估计，机器学习，深度学习，压缩感知

◆ 优化理论：凸优化与非凸优化，组合优化，鲁棒性优化，大规模优化，分布式优化，稀疏与低秩优化，黎曼优化

◆ 数学基础：矩阵分析，随机过程

◆ 编程语言：Matlab, Python，用作算法实现与系统仿真，熟悉 TensorFlow, Keras 等机器学习框架。