

LINGZHI ZHAO

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Research Interests

Multimedia Communication, Convex and Nonconvex Optimization, Wireless Communication

Education

Shanghai Jiao Tong University

Sep. 2019 – Mar. 2022

M.S. in Information and Communication Engineering

Advisor: Prof. Ying Cui, GPA: 3.84/4.00

Shanghai University

Sep. 2015 – Jul. 2019

B.S. in Communication Engineering

Advisor: Prof. Mengyao Zhu, GPA: 3.39/4.00

Publications

- [TWC'22] **Lingzhi Zhao**, Ying Cui, Sheng Yang, and Shlomo Shamai (Shitz), "An Optimization Framework for General Rate Splitting for General Multicast," *IEEE Trans. Wireless Commun.*, under review.
- [ICC'22] **Lingzhi Zhao**, Ying Cui, Sheng Yang, Shlomo Shamai (Shitz), Yunbo Han, and Yunfei Zhang, "Rate Splitting for General Multicast," submit to *IEEE International Conference on Communications*, 2022.
- [TIP'21] **Lingzhi Zhao**, Ying Cui, Zhi Liu, Yunfei Zhang, and Sheng Yang, "Adaptive Streaming of 360 Videos with Perfect, Imperfect, and Unknown FoV Viewing Probabilities in Wireless Networks," *IEEE Trans. Image Process.*, 2021.[\[pdf\]](#)
- [TWC'21] Chengjun Guo, **Lingzhi Zhao**, Ying Cui, Zhi Liu and Derrick Wing Kwan, "Power-Efficient Wireless Streaming of Multi-Quality Tiled 360 VR Video in MIMO-OFDMA Systems," *IEEE Trans. Wireless Commun.*, 2021.[\[pdf\]](#)
- [ComEX'21] Wuyang Jiang, Chencheng Ye, **Lingzhi Zhao**, Ying Cui, and Zhi Liu, "Optimal Adaptive Streaming of A Scalable Multi-view Video via Rate Splitting and SIC," *IEICE Commun. Express*, 2021.[\[pdf\]](#)
- [GlobeCom'20] **Lingzhi Zhao**, Ying Cui, Chengjun Guo, and Zhi Liu, "Optimal Streaming of 360 VR Videos with Perfect, Imperfect and Unknown FoV Viewing Probabilities," *IEEE Global Communications Conference*, 2020.[\[pdf\]](#)

Research Experiences

Rate Splitting for General Multicast

Apr. 2021 – Oct. 2021

- Proposed a rate splitting scheme with joint decoding for general multicast in multi-carrier wireless networks
- Proposed concave convex procedure (CCCP) methods to obtain a Karush–Kuhn–Tucker (KKT) point of the weighted sum average rate maximization problem in the slow fading scenario
- Proposed stochastic successive convex approximation (SSCA) to obtain a KKT point and two low-complexity iterative algorithms to obtain a near-optimal solution of the weighted sum ergodic rate maximization problem in the fast fading scenario
- The proposed optimization framework generalized the existing ones for rate splitting for unicast and multicast

Network Information Exposure for Video Streaming

Sep. 2020 – Sep. 2021

- Proposed an adaptive bitrate algorithm using reinforcement learning for video on demand (VoD) and live streaming, respectively, by utilizing both application layer data and network layer data
- Achieved 5.8% and 20.5% gains on quality of experience (QoE) over state-of-arts in the scenarios of VoD and live streaming, respectively
- Deployed the algorithm docker container to Tencent Cloud for commercial purpose

Adaptive 360 Video Streaming

Jul. 2019 – Aug. 2020

- Proposed a two time-scale system to maximize the video perceptual quality while keeping rebuffering time small via encoding rate adaptation at each group of pictures (GOP) and transmission adaptation at each transmission slot
- Considered FoV prediction error and revealed its impact on the performance of adaptive 360 video streaming
- Proposed convex optimization methods and CCCP to solve the utility maximization problems in the single-user and multi-user scenarios, respectively

Industrial Experience

DPVR Co., Ltd

Apr. 2018 – May 2019

Software Engineer Intern @ Graphic Team, mentor: Ziyi Xu

Shanghai, China

- Proposed and implemented a deep learning-based method to predict users' calorie consumption by the traces of the headsets and controllers when they are playing virtual reality (VR) games
- Developed a commercial application to display the dynamic and static calorie consumption for VR users
- Fixed hundreds of bugs and finished tens of requirements to facilitate the development of the software

Teaching and Service

TA, EE372 : **Computing and Communication Theory**

Sep. 2021 – Jan. 2022

TA, ICE7301H, ICE7302H : **Convex Optimization**

Sep. 2020 – Jan. 2021

Reviewer for IEEE Trans. Wireless Commun.

2021

Reviewer for ACM MobiHoc

2021

Reviewer for IEEE PIMRC

2021

Awards

SJTU Outstanding Scholarship

2020,2021

SHU Outstanding Scholarship

2016,2017,2018

Technical Skills

Languages: Python, Matlab, C/C++, HTML/XML (ranked by proficiency)

Tools: L^AT_EX, VS Code, Git