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 (expected)**
M.S. in Information and Communication Engineering *Advisor: Prof. Ying Cui*

Shanghai University **Sep. 2015 – Jul. 2019**
B.S. in Communication Engineering

Publications

- [**TWC'22**] **Lingzhi Zhao**, Ying Cui, and Sheng Yang, "An Optimization Framework for General Rate Splitting for General Multicast," *IEEE Trans. Wireless Commun.*, under review.
- [**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 **Jan. 2021 – Oct. 2022**

- Proposed a rate splitting scheme with joint decoding for general multicast in multi-carrier wireless systems
- Formulated weighted sum average rate maximization problem and proposed CCCP to obtain a KKT point in the slow fading scenario
- Formulated weighted sum ergodic rate maximization problem in the fast fading scenario; Proposed SSCA to obtain a KKT point and two low-complexity iterative algorithms to obtain a near-optimal solution

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 QoE over SOTAs in VoD and live streaming; 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 GOP and transmission adaptation at each transmission slot
- Considered FoV prediction error and revealed its impact on the performance of adaptive 360 video streaming
- Formulated utility maximization problems and proposed convex optimization and CCCP methods to solve the problems in the single-user and multi-user scenarios, respectively

Industrial Experience

DPVR Co., Ltd **Apr. 2018 – May 2019**

Software Engineer Intern @ Graphic Team *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 enjoying VR applications
- Developed an interactive application using C++ to display the real-time and history calorie consumption for VR users
- Fixed hundreds of bugs and finished tens of requirements to facilitate the development of the software

Teaching & Activities

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**

SHU Outstanding Scholarship **2016,2017,2018**

Technical Skills

Languages: Python, Matlab, C/C++, HTML/XML (ranked by proficiency)
Tools: LaTeX, VS Code, Git