Lingzhi Zhao

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Research Interests

Media Streaming, Virtual Reality, Wireless Communication, Convex and Nonconvex Optimization

Education

University of Illinois Urbana-Champaign **Aug. 2022 – present**
Ph.D. in Computer Science
Advisor: Prof. Klara Nahrstedt

Shanghai Jiao Tong University **Sep. 2019 – Mar. 2022**
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, Sheng Yang, and Shlomo Shamai (Shitz),"An Optimization Framework for General Rate Splitting for General Multicast," *IEEE Trans. Wireless Commun.*, 2022.
- **[ICC'22] Lingzhi Zhao**, Ying Cui, Sheng Yang, Shlomo Shamai (Shitz), Yunbo Han, and Yunfei Zhang,"Rate Splitting for General Multicast," *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]
- **[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

Adaptive 360 Video Streaming **Jul. 2019 – Aug. 2020**

- Proposed an optimization-based cross-layer design for 360 video streaming to maximize video quality and reduce rebuffering time via bitrate adaptation at each GOP and transmission adaptation at each 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

Network Information Exposure for Video Streaming **Sep. 2020 – Sep. 2021**

- Proposed an adaptive bitrate algorithm using reinforcement learning for video on demand and live streaming, by utilizing network layer data, which has been deployed to Tencent Cloud for commercial purpose

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, which generalizes rate splitting for unicast and multicast
- Proposed CCCP, SSCA and two low-complexity iterative algorithms to obtain sub-optimal solutions of the weighted sum rate maximization problems in the slow fading and fast fading scenarios

Industrial Experience

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

Software Engineer Intern @ Graphic Team, mentor: Ziyi Xu *Shanghai, China*

- Designed and implemented a deep learning algorithm to predict users' calorie consumption by the traces of their headsets and controllers
- Developed a commercial application to display the dynamic and static calorie consumption for VR users

Teaching and Services

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., IEEE Trans. Commun., ACM MobiHoc, IEEE PIMRC

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: LaTeX, VS Code, Git