Junhua Liu

Homepage: www.junhualiu0.github.io

Email: Junhualiu@link.cuhk.edu.cn

Github: JunhuaLiu0 Twitter: Junh_Liu

Education

- **The Chinese University of Hong Kong, Shenzhen** — Shenzhen, China
  Bachelor of Data Science and Big Data Technology, **with Full Tuition Scholarship** — *Aug. 2020 – May. 2024*
- **Summer School:** The Chinese University of Hong Kong @ 2022; University of California, Berkeley @ 2023.

Research Interest

- **Multimedia System, HCI, Mobile Computing, Internet of Things, Edge Computing, Virtual Reality**

Selected Publications & Pre-prints

***: Co-first authors are listed in alphabetical order, †: Mentored Interns**

[1] **Junhua Liu**, Ruizhi Cheng, Bo Han, Mallesham Dasari, Fangxin Wang. Semon: Neural-enhanced 3D Video Conferencing. **Submitted to USENIX NSDI, 2024**. The state-of-the-art 3D conferencing system on quality, latency, and loss resistance.
[2] Zhicheng Liang*, **Junhua Liu***, Mallesham Dasari, Fangxin Wang. Fumos: Neural Compression and Progressive Refinement for Continuous Point Cloud Video Streaming. **Submitted to IEEE VR, 2024**. [PDF, Code, Website].
[3] **Junhua Liu**, Yuanyuan Wang, Fangxin Wang, Mallesham Dasari. Video Streaming Innovations with Implicit Neural Codecs. **Submitted to IEEE Network, 2024**. A new subdirection for video streaming. [Invited Talk at Sensetime]

---

[4] Kaiyuan Hu, Haowen Yang, Yili Jin, **Junhua Liu**, Yongting Chen, Miao Zhang, Fangxin Wang. Understanding User Behavior in Volumetric Video Watching: Dataset, Analysis and Prediction. **ACM MM, 2023**. [Website, Dataset, PDF].
[5] Yili Jin*, **Junhua Liu***, Kaiyuan Hu, Fangxin Wang. A Networking Perspective of Volumetric Video Service: Architecture, Opportunities and Case Study. **Submitted to IEEE Network, 2023. (Under minor revision).**
[6] **Junhua Liu**, Yuanyuan Wang, Mallesham Dasari, Yan Wang, Yufeng Wang, Shuguang Cui, Fangxin Wang. Mobile Volumetric Video Streaming System through Implicit Neural Representation. **ACM SIGCOMM EMS, 2023**.[PDF, Oral Talk]. Extended Version is **submitted to ACM Mobicom, 2024**. [Full-version PDF].
[7] Yili Jin, Kaiyuan Hu, **Junhua Liu**, Fangxin Wang, Xue Liu. From Capture to Display: A Survey on Volumetric Video. **ACM Computing Surveys (JCR Q1), 2023.** Preprint at **Arxiv:2309.05658**. [PDF]
[8] Kaiyuan Hu, Yili Jin, Haowen Yang, **Junhua Liu**, Fangxin Wang. FSVVD: A Dataset of Full Scene Volumetric Video. **ACM Multimedia Systems, 2023**. [Website, Dataset , PDF]
[9] **Junhua Liu**, Boxiang Zhu, Fangxin Wang, Yili Jin, Wenyi Zhang, Zihan Xu, Shuguang Cui. CaV3: Cache-assisted Viewport Adaptive Volumetric Video Streaming. **IEEE VR, 2023**. The Only Undergraduate Oral Presentation.[Oral, PDF]. Extended version is submitted to **Transactions on Mobile Computing (TMC)** , 2024. (Under Revision).
[10] Yili Jin*, **Junhua Liu***, Fangxin Wang, Shuguang Cui. Where Are You Looking? A Large-Scale Dataset of Head and Gaze Behavior for 360-Degree Videos and a Pilot Study. **ACM MM, 2022**. [Website, Dataset, Oral Talk, PDF]
[11] Yili Jin, **Junhua Liu**, Fangxin Wang. Ebublio: Edge Assisted Multi-user 360-Degree Video Streaming. **IEEE VRW, 2022**; **IEEE Internet of Things Journal (JCR Q1), 2023**. [Poster, Website, PDF, Code]

---

[12] Zeyu Wang, Chengan He, Zhe Yan, Yingke Wang, Jiashun Wang, **Junhua Liu**, Anzhi Shen, Mengying Zeng, Holly Rushmeier, Huazhe Xu, Borou Yu, Chenchen Lu, Eugene Wang. Chang-E: A High-Quality Motion Capture Dataset of Chinese Classical Dunhuang Dance. **Submitted to EG, 2024.** Part of Link, project with **Harvard, CMU, Stanford.** [PDF, Video].
[13] Kaiyuan Hu, Yongting Chen, Kaiying Han, **Junhua Liu**, Yili Jin, Boyan Li, Fangxin Wang. Hulk: Human-Centered Live Volumetric Video Streaming System. **Submitted to IEEE VR, 2024**. Preprint at **Arxiv:2309.05658** [PDF]
[14] Zihan Xu, Wenyi Zhang, **Junhua Liu**, Yili Jin, Fangxin Wang, Lian Zhao, Shuguang Cui. Viewport-Aware Adaptive Volumetric Video Streaming. **Submitted to INFOCOM, 2023**. [PDF]
[15] Biaolin Wen, **Junhua Liu**, Tianshu Yu, Bowen Zhang. Generative Adversarial Training for RL-based Automatic Agent.
[16] **Junhua Liu**, et al. Versatile Volumetric Video Procedural Generator. **Submitted to ACM MMSys, 2024**. [PDF]
[17] **Junhua Liu**, et al. Lumos: Edge-Assisted Online 3D Video Analytics using IoT cameras. **Manuscript for Mobicom24**.

Research Experience

- **Carnegie Mellon University** — Pittsburgh, USA
  Visiting Intern advised by Prof. Mallesham Dasari and Prof. Anthony Rowe — *May. 2023 - Aug. 2023*
- **Future Network of Intelligence Institute** — Shenzhen, China
  Research Assistant advised by Prof. Fangxin Wang and Prof. Shuguang Cui — *Dec. 2021 - Now*
- **SenseTime Research** — Shanghai, China
  Research Intern advised by Prof. Yan Wang and Yuanyuan Wang — *Aug. 2022 - Now*
- **Harvard University** — Online
  Research Assistant lead by Prof. Eugene Wang. Work with Prof. Huazhe Xu and Prof. Zeyu Wang — *Mar. 2022 - Jun. 2022*
- **Shenzhen Institute of Artificial Intelligence and Robotics** — Shenzhen, China
  Involved dialogue system project lead by Prof. Yan Song and robotics project lead by Prof. Huihuan Qian — *Jan. 2022 - Feb. 2022*

Research Service

- **Teaching Assistant:** DDA2001: Introduction to Data Science; STA2002: Statistics, 2021 Fall @ CUHK-Shenzhen
- **Reviewer**: IEEE VR 23-24, ACM MM 23, ICASSP 23-24, CHI 23-24, UbiComp/ISWC 23, CSCW 23.