

Bo Chen

POSTDOCTORAL RESEARCH ASSOCIATE

☎ +1 217-778-4329 | ✉ boc2@illinois.com | 🏠 <https://bochen.info/>

Research Interests

Networked systems. Immersive computing systems. Machine learning systems. Mobile systems.

Education

University of Illinois at Urbana-Champaign

POSTDOCTORAL RESEARCH ASSOCIATE IN COMPUTER SCIENCE

- Advisor: Prof. Klara Nahrstedt

Urbana, IL

Jul. 2022 - Present

University of Illinois at Urbana-Champaign

PHD IN COMPUTER SCIENCE

- Advisor: Prof. Klara Nahrstedt

Urbana, IL

Sep. 2016 - May. 2022

Shanghai Jiao Tong University

B.E. IN INFORMATION ENGINEERING

- Advisor: Prof. Xinbing Wang

Shanghai, China

Sep. 2012 - Jun. 2016

Publications

- [25] **Bo Chen**, Hongpeng Guo, Mingyuan Wu, Zhe Yang, Zhisheng Yan, Klara Nahrstedt, “ImmerScope: Multi-view Video Aggregation at Edge towards Immersive Content Services,” **ACM SenSys**, 2024 (To appear)
- [24] **Bo Chen**, Zhisheng Yan, Bo Han, Klara Nahrstedt, “NeRFHub: A Context-Aware NeRF Serving Framework for Mobile Immersive Applications,” **ACM MobiSys**, 2024
- [23] **Bo Chen**, Zhisheng Yan, Yinjie Zhang, Zhe Yang, Klara Nahrstedt, “LiFteR: Unleash Learned Codecs in Video Streaming with Loose Frame Referencing,” **USENIX NSDI**, 2024
- [22] **Bo Chen**, Mingyuan Wu, Hongpeng Guo, Zhisheng Yan, Klara Nahrstedt, “Vesper: Learning to Manage Uncertainty in Video Streaming,” **ACM MMSys**, 2024
- [21] (**Best Student Paper Award**) **Bo Chen**, Zhisheng Yan, Klara Nahrstedt, “Context-aware Image Compression Optimization for Visual Analytics Offloading,” **ACM MMSys**, 2022
- [20] (**Best Paper Award**) Jounsup Park, Mingyuan Wu, Eric Lee, **Bo Chen**, Klara Nahrstedt, Michael Zink, and Ramesh Sitaraman, “SEAWARE: Semantic Aware View Prediction System for 360-degree Video Streaming,” **IEEE ISM**, 2020
- [19] Mingyuan Wu, Ruifan Ji, Haozhen Zheng, Jiayi Li, Beitong Tian, **Bo Chen**, Rui-Xiao Zhang, Jacob Chakareski, Michael Zink, Ramesh Sitaraman, Klara Nahrstedt, “Scene Graph Driven Hybrid Interactive VR Teleconferencing,” **ACM Multimedia (Demo)**, 2024
- [18] Beitong Tian, Mingyuan Wu, Ruixiao Zhang, Haozhen Zheng, **Bo Chen**, Yaohui Wang, Shiv Trivedi, Shanbo Zhang, Robert Bruce Kaufman, Leah Espenhahn, Gianni Pezzarossi, Mauro Sardela, John Dallesasse, Klara Nahrstedt, “GaugeTracker: AI-Powered Cost-Effective Analog Gauge Monitoring System,” **IEEE MIPR**, 2024
- [17] Hongpeng Guo, Haotian Gu, Xiaoyang Wang, **Bo Chen**, Eun Kyung Lee, Tamar Eilam, Deming Chen, Klara Nahrstedt, “FedCore: Accelerating Federated Learning with Distributed Coresets,” **IEEE ICC**, 2024
- [16] **Bo Chen**, Zhisheng Yan, Klara Nahrstedt, “Context-Aware Optimization for Bandwidth-Efficient Image Analytics Offloading,” **ACM TOMM**, 2023
- [15] Mingyuan Wu, Yuhang Lu, Shiv Trivedi, **Bo Chen**, Qian Zhou, Lingdong Wang, Simran Singh, Michael Zink, Ramesh Sitaraman, Jacob Chakareski, Klara Nahrstedt, “Interactive Scene Analysis for Teleconferencing,” **IEEE ISM**, 2023
- [14] Yinjie Zhang, Mingyuan Wu, Beitong Tian, Jiayi Li, **Bo Chen**, Qian Zhou, Klara Nahrstedt, “SAVG360: Saliency-aware Viewport-guidance-enabled 360-degree Video Streaming System,” **IEEE ISM**, 2023

- [13] Jiayi Li, Jingwei Liao, **Bo Chen**, Anh Nguyen, Aditi Tiwari, Qian Zhou, Zhisheng Yan, Klara Nahrstedt, “Latency-Aware 360-Degree Video Analytics Framework for First Responders Situational Awareness,” **ACM NOSSDAV**, 2023
- [12] Wei Luo, **Bo Chen**, “Neural Image Compression with Quantization Rectifier,” **ICML 2023 Workshop NCW**, 2023
- [11] Ahmed Ali-Eldin, Chirag Goel, Mayank Jha, **Bo Chen**, Klara Nahrstedt, Prashant Shenoy, “CAVE: Caching 360° Videos at the Edge,” **ACM NOSSDAV**, 2022
- [10] **Bo Chen**, Klara Nahrstedt, “EScALation: a framework for efficient and scalable spatio-temporal action localization,” **ACM MMSys**, 2021
- [9] **Bo Chen**, Zhisheng Yan, Hongpeng Guo, Zhe Yang, Ahmed Ali-Eldin, Prashant Shenoy, Klara Nahrstedt, “Deep Contextualized Compressive Offloading for Images,” AIChallengIoT, Workshop co-located with **ACM SenSys**, 2021
- [8] Ragini Gupta, **Bo Chen**, Shengzhong Liu, Tianshi Wang, Sandeep Singh Sandha, Abel Souza, Klara Nahrstedt, Tarek Abdelzaher, Mani Srivastava, Prashant Shenoy, Jeffrey Smith, Maggie Wigness, Niranjani Suri, “DARTS: Distributed IoT Architecture for Real-Time, Resilient, and AI-Compressed Workflows”, ApPLIED, Workshop co-located with **ACM PODC**, 2022
- [7] Qian Zhou, **Bo Chen**, Zhe Yang, Hongpeng Guo, Klara Nahrstedt, “360ViewPET: View Based Pose Estimation for Ultra-Sparse 360-Degree Cameras”, **IEEE ISM**, 2021
- [6] **Bo Chen**, Ahmed Ali-Eldin, Prashant Shenoy and Klara Nahrstedt, “Real-time Spatio-Temporal Action Localization in 360 Videos”, **IEEE ISM**, 2020
- [5] **Bo Chen**, Zhisheng Yan, Haiming Jin, Klara Nahrstedt, “Event-driven Stitching for Tile-based 360 Video Live Streaming”, **ACM MMSys**, 2019
- [4] **Bo Chen**, Klara Nahrstedt, “FIS: Facial Information Segmentation for Video Redaction”, **IEEE MIPR**, 2019
- [3] **Bo Chen**, Klara Nahrstedt, Carl Gunter, “ReSPonSe: Real-time, Secure, and Privacy-aware Video Redaction System”, **ACM MobiQuitous**, 2018
- [2] Tarek Elgamal, **Bo Chen**, Klara Nahrstedt, “Teleconsultant: Communication and analysis of wearable videos in Emergency Medical Environments”, **ACM Multimedia Demo**, 2017
- [1] Qianru Li, **Bo Chen**, Songjun Ma, Luoyi Fu, Xinbing Wang, “Contrastive Topic Discovery via Nonnegative Matrix Factorization”, **IEEE ICC**, 2016

Talks

- Apr. 2024. *NeRFHub: A Context-Aware NeRF Serving Framework for Mobile Immersive Applications*. Invited talk at UIUC SysNet Spring 2024 Retreat.
- Mar. 2024. *Advancing Immersive Computing Systems in Age of Machine Learning*. Invited talk at UT Dallas.
- Nov. 2023. *Context-aware Image Compression Optimization for Visual Analytics Offloading*. Guest lecture, Advanced Topics in IOT, UIUC.
- Feb. 2022. *Optimized Video Compression for Computation Offloading*. Invited talk at University of Chicago.

Grants & Awards

- 2022 **Best Student Paper Award**, ACM Multimedia Systems Conference
- 2020 **Best Paper Award**, IEEE International Symposium on Multimedia
- 2019 **SIGMM Travel Grant**, ACM Multimedia Systems

Research & Working Experience

University of Illinois at Urbana-Champaign (Postdoc)

ADVISOR: PROF. KLARA NAHRSTEDT

- Project: “miVirtualSeat: Semantics-aware Content Distribution for Immersive Meeting Environments”
- Project: “Augmented 360 Video for Situation Awareness in Firefighting”
- Project: “Clowder Open Source Customizable Research Data Management”

Urbana, IL

Jul. 2022 - Present

University of Illinois at Urbana-Champaign (Ph.D.)

ADVISOR: PROF. KLARA NAHRSTEDT

- Dissertation: “Learning-based Saliency-aware Compression Framework”

Urbana, IL

Sep. 2016 - May. 2022

Facebook (Internship)

ADVISOR: LUKE WANG

- Project: “A network device query system based on Elasticsearch”

Menlo Park, CA

May. 2020 - Aug. 2020

AT&T Research Lab (Internship)

CO-ADVISORS: DR. SHU SHI, PROF. BO HAN

- Project: “A novel transport protocol for latency-sensitive applications in LTE networks”

Bedminster, NJ

May. 2019 - Aug. 2019

Teaching Experience

2023	UIUC CS 537 Advanced Topics in IOT, Teaching Assistant	UIUC
2022	UIUC CS 537 Advanced Topics in IOT, Teaching Assistant	UIUC
2020	UIUC CS 438 Communication Networks, Teaching Assistant	UIUC

Mentoring

Sep. 2024 - Present	Lingzhi Zhao, PhD, Project in Progress: “Low-cost Underwater Conversation with Large Language Vision Models”	UIUC
Sep. 2024 - Present	Revan Ji, Master, Project in Progress: “Video Streaming with 3D Gaussian Splatting”	UIUC
May. 2024 - Present	Ben Civjan, Master, Project in Progress: “Energy-efficient Frame Filtering at Edge”	UIUC
May. 2024 - Present	Jiaxi Li, PhD, Project in Progress: “Energy-efficient Video Analytics”	UIUC
Sep. 2023 - Sep. 2024	Lingzhi Zhao, PhD, Paper in Submission: “Reliable Underwater Image Transmission Using Mobile Devices”	UIUC
Sep. 2023 - Jul. 2024	Cody Wang, Master, Paper in Submission: “Cost-Effective Tracking of Chemical Containers with Magnets”	UIUC
Sep. 2023 - Jul. 2024	Wei Luo, Master, Paper in Submission: “Discovering vulnerable sketches with manufactured network traffic”	Princeton University
Sep. 2023 - Sep. 2024	Nan Wu, Ph.D., Paper in Submission: “Photo-realistic volumetric video streaming with neural-based content representation”	George Mason University
Jun. 2023 - Dec. 2023	Revan Ji, Undergraduate, Project Finished: “Efficient neural rendering of human face with a mixture of volume and mesh”	UIUC
Sep. 2022 - Dec. 2023	Aditi Tiwari, Master, Project Finished: “Action-based search in 360-degree videos”	UIUC
Sep. 2022 - May. 2023	Jiaxi Li, Master, Paper Accepted in NOSSDAV23: “Latency-aware 360-degree video analytics framework for first responders situational awareness”	UIUC
Oct. 2022 - May. 2023	Jingwei Liao, Ph.D., Paper in Submission: “Viewport polyhedron-based 360-degree image compression”	George Mason University
Sep. 2022 - May. 2023	Wei Luo, Master, Paper Accepted in Neural Compression Workshop at ICML 2023: “Neural image compression with quantization rectifier”	Princeton University
Oct. 2021 - May. 2022	Wei Luo, Undergraduate, Senior Thesis: “Learning feature saliency towards better compression”	UIUC

Professional Involvement

2025 **ACM MMSys**, TPC Member
2025 **ACM TOMM**, **IEEE TMM**, Reviewer
2024 **NSF Workshop on Sustainable Computing for Sustainability**, Publication Chair
2024 **ACM MMSys**, TPC Member
2024 **ACM MM**, **IEEE ICCCN**, **ACM TOMM**, Reviewer
2023 **IEEE SECON**, Publication Chair
2023 **SEC**, **ImmerCom**, TPC Member
2023 **ACM MM**, **ACM MMSys**, **ACM TOMM**, Reviewer