

Bo Chen

POSTDOCTORAL RESEARCH ASSOCIATE

✉ boc2@illinois.edu (backup email: bochen1993cs@gmail.com) | 🏠 <https://bochen.info/>

Research Interests

Networking, machine learning systems, immersive computing, virtual reality, mobile/edge computing.

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

- [31] **Bo Chen**, Zhisheng Yan, Yinjie Zhang, Zhe Yang, Klara Nahrstedt, “LiFteR: Unleash Learned Codecs in Video Streaming with Loose Frame Referencing,” **USENIX NSDI**, 2024
- [30] **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
- [29] **Bo Chen**, Zhisheng Yan, Bo Han, Klara Nahrstedt, “NeRFHub: A Context-Aware NeRF Serving Framework for Mobile Immersive Applications,” **ACM MobiSys**, 2024
- [28] **Bo Chen**, Mingyuan Wu, Hongpeng Guo, Zhisheng Yan, Klara Nahrstedt, “Vesper: Learning to Manage Uncertainty in Video Streaming,” **ACM MMSys**, 2024
- [27] **(Best Student Paper Award) Bo Chen**, Zhisheng Yan, Klara Nahrstedt, “Context-aware Image Compression Optimization for Visual Analytics Offloading,” **ACM MMSys**, 2022
- [26] **(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
- [25] Rui-Xiao Zhang, Tianchi Huang, **Bo Chen**, Klara Nahrstedt, “NeRFlow: Towards Adaptive Streaming for NeRF Videos,” **ACM MobiSys**, 2025
- [24] Nan Wu, **Bo Chen**, Ruizhi Cheng, Klara Nahrstedt, Bo Han, “NeVo: Advancing Volumetric Video Streaming with Neural Content Representation,” **ACM MobiCom**, 2025
- [23] Benjamin Civjan, **Bo Chen**, Rui-Xiao Zhang, Klara Nahrstedt, “EcoLens: Leveraging Multi-Objective Bayesian Optimization for Energy-Efficient Video Processing on Edge Devices,” **IEEE SmartComp**, 2025
- [22] Yaohui Wang, **Bo Chen**, Beitong Tian, Lingzhi Zhao, Robert Kaufman, Leah Espenhahn, John Dallesasse, Klara Nahrstedt, “EcoMAT: Energy-Efficient and Accurate Tracking of Chemical Containers with Magnets Toward Automated Laboratory Management,” **IEEE WFIoT**, 2025
- [21] Nan Wu, Weikai Lin, Ruizhi Cheng, **Bo Chen**, Yuhao Zhu, Klara Nahrstedt, Bo Han, “Advancing Immersive Content Delivery with Dynamic 3D Gaussian Splatting,” **HotMobile**, 2025
- [20] Jiaxi Li, Jingwei Liao, **Bo Chen**, Anh Nguyen, Aditi Tiwari, Qian Zhou, Zhisheng Yan, Klara Nahrstedt, “ST-360: Spatial-Temporal Filtering-Based Low-Latency 360-Degree Video Analytics Framework,” **ACM TOMM**, 2024

- [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, Yuhao 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,” AIChallengeIoT, 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, Niranjana 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

- Jun. 2025. **Intelligent Network Infrastructure for Extended Reality**. Invited talk at MobiSys’25 Rising Star Forum.
- May. 2025. **Intelligent Network Infrastructure for Extended Reality**. Invited talk at George Mason University.
- Apr. 2025. **Intelligent Network Infrastructure for Extended Reality**. Invited talk at Worcester Polytechnic Institute.
- Apr. 2025. **Intelligent Network Infrastructure for Extended Reality**. Invited talk at University of Hawai’i at Mānoa.
- Jan. 2025. **Intelligent Network Infrastructure for Extended Reality**. Invited talk at Syracuse University.

- Dec. 2024. **Advancing Immersive Computing with AI-System Co-design**. Invited talk at Shanghai Jiao Tong University.
- Nov. 2024. **Advancing Immersive Computing with AI-System Co-design**. Invited talk at the University of Michigan - Shanghai Jiao Tong University Joint Institute.
- Apr. 2024. **NeRFHub: A Context-Aware NeRF Serving Framework for Mobile Immersive Applications**. Invited talk at UIUC Sys-Net 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

- 2025 **Rising Star Best Presentation**, ACM MobiSys
- 2025 **MobiSys 2025 Rising Star**, ACM MobiSys
- 2022 **Best Student Paper Award**, ACM MMSys
- 2020 **Best Paper Award**, IEEE ISM
- 2019 **SIGMM Travel Grant**, ACM MMSys

Patents

- 2022 Shu Shi, Bo Han, Rittwik Jana, and **Bo Chen**. Transport Protocol For Latency Sensitive Applications. United States Patent 11252600.

Research & Working Experience

University of Illinois at Urbana-Champaign (Postdoc)

Urbana, IL

ADVISOR: PROF. KLARA NAHRSTEDT

Jul. 2022 - Present

- Project: "miVirtualSeat: Semantics-aware Content Distribution for Immersive Meeting Environments"
- Project: "Scalable Specialization in Distributed Edge-Cloud Systems – The Extended Reality Case"
- Project: "Augmented 360 Video for Situation Awareness in Firefighting"
- Project: "Scalable Dissemination and Navigation of Video 360 Content for Personalized Viewing"
- Project: "Clowder Open Source Customizable Research Data Management"

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

Urbana, IL

ADVISOR: PROF. KLARA NAHRSTEDT

Sep. 2016 - May. 2022

- Dissertation: "Learning-based Saliency-aware Compression Framework"

Facebook (Internship)

Menlo Park, CA

ADVISOR: LUKE WANG

May. 2020 - Aug. 2020

- Project: "A network device query system based on Elasticsearch"

AT&T Research Lab (Internship)

Bedminster, NJ

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

May. 2019 - Aug. 2019

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

Teaching Experience

- 2024 **UIUC CS 537 Advanced Topics in IOT**, Teaching Assistant
- 2023 **UIUC CS 537 Advanced Topics in IOT**, Teaching Assistant
- 2022 **UIUC CS 537 Advanced Topics in IOT**, Teaching Assistant
- 2020 **UIUC CS 438 Communication Networks**, Teaching Assistant

Grant Writing Experience

I helped the writing of the following proposals.

- 2024 **Resilient, Bandwidth-efficient, and Low-latency Immersive Video Streaming**, Pls: Klara Nahrstedt and Bo Han
2024 **Video Analytics at Scale via Collaborative AI**, Pls: Klara Nahrstedt and Zhisheng Yan

Professional Involvement

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

Mentoring

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| Paper | Nan Wu, Ph.D. , Paper Accepted in ACM MobiCom 2025: “Photo-realistic Volumetric Video Streaming with Neural-based Content Representation” | <i>GMU</i> |
| Paper | Cody Wang, Master , Paper accepted in IEEE WFIOT 2025: “Cost-Effective Tracking of Chemical Containers with Magnets” | <i>UIUC</i> |
| Paper | Ben Civjan, Master , Paper accepted in IEEE SMARTCOMP 2025: “EcoLens: Leveraging Multi-Objective Bayesian Optimization for Energy-Efficient Video Processing on Edge Devices” | <i>UIUC</i> |
| Paper | Beitong Tian, PhD , Paper Accepted in IEEE MIPR 2024: “GaugeTracker: AI-Powered Cost-Effective Analog Gauge Monitoring System” | <i>UIUC</i> |
| Paper | Wei Luo, Master , Paper Accepted in ICML 2023 Neural Compression Workshop: “Neural Image Compression with Quantization Rectifier” | <i>Princeton</i> |
| Paper | Jiaxi Li, Master , Paper Accepted in ACM NOSSDAV23: “Latency-aware 360-degree Video Analytics Framework for First Responders Situational Awareness” | <i>UIUC</i> |
| Submitted | Lingzhi Zhao, PhD , Submission to ACM MobiCom 2025: “Reliable Underwater Image Transmission Using Mobile Devices” | <i>UIUC</i> |
| Submitted | Mingyuan Wu, PhD , Submission to ARR 2025: “CACHE-OF-THOUGHT: Master-Apprentice Framework for Cost-Effective Vision Language Model Inference” | <i>UIUC</i> |
| Submitted | Lingzhi Zhao, PhD , Submission to ACM Multimedia 2025: “Effortless Underwater Communication with your SmartPhone” | <i>UIUC</i> |
| Submitted | Jingwei Liao, Ph.D. , Submission to ACM TOMM: “Viewport Polyhedron-based 360-degree Image Compression” | <i>GMU</i> |