

# Bo Chen

POSTDOCTORAL RESEARCH ASSOCIATE

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## Research Interests

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

## Education

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### 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

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- [29] **Bo Chen**, Zhisheng Yan, Yinjie Zhang, Zhe Yang, Klara Nahrstedt, “LiFteR: Unleash Learned Codecs in Video Streaming with Loose Frame Referencing,” **USENIX NSDI**, 2024
- [28] **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
- [27] **Bo Chen**, Zhisheng Yan, Bo Han, Klara Nahrstedt, “NeRFHub: A Context-Aware NeRF Serving Framework for Mobile Immersive Applications,” **ACM MobiSys**, 2024
- [26] **Bo Chen**, Mingyuan Wu, Hongpeng Guo, Zhisheng Yan, Klara Nahrstedt, “Vesper: Learning to Manage Uncertainty in Video Streaming,” **ACM MMSys**, 2024
- [25] **(Best Student Paper Award) Bo Chen**, Zhisheng Yan, Klara Nahrstedt, “Context-aware Image Compression Optimization for Visual Analytics Offloading,” **ACM MMSys**, 2022
- [24] **(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
- [23] Rui-Xiao Zhang, Tianchi Huang, **Bo Chen**, Klara Nahrstedt, “NeRFFlow: Towards Adaptive Streaming for NeRF Videos,” **ACM MobiSys**, 2025
- [22] Nan Wu, **Bo Chen**, Ruizhi Cheng, Klara Nahrstedt, Bo Han, “NeVo: Advancing Volumetric Video Streaming with Neural Content Representation,” **ACM MobiCom**, 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] Jiayi 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, Yuhan 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,” AIChallengerIoT, 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

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- 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

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- 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

## Patents

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

## Research & Working Experience

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### University of Illinois at Urbana-Champaign (Postdoc)

ADVISOR: PROF. KLARA NAHRSTEDT

*Urbana, IL*

*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.)

ADVISOR: PROF. KLARA NAHRSTEDT

*Urbana, IL*

*Sep. 2016 - May. 2022*

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

### Facebook (Internship)

ADVISOR: LUKE WANG

*Menlo Park, CA*

*May. 2020 - Aug. 2020*

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

### AT&T Research Lab (Internship)

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

*Bedminster, NJ*

*May. 2019 - Aug. 2019*

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

## Teaching Experience

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- 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

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I helped the writing of the following proposals.

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

## Professional Involvement

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- 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	<b>Nan Wu, Ph.D.</b> , Paper Accepted in ACM MobiCom 2025: “Photo-realistic Volumetric Video Streaming with Neural-based Content Representation”	<i>GMU</i>
Paper	<b>Beitong Tian, PhD</b> , Paper Accepted in IEEE MIPR 2024: “GaugeTracker: AI-Powered Cost-Effective Analog Gauge Monitoring System”	<i>UIUC</i>
Paper	<b>Wei Luo, Master</b> , Paper Accepted in ICML 2023 Neural Compression Workshop: “Neural Image Compression with Quantization Rectifier”	<i>Princeton</i>
Paper	<b>Jiaxi Li, Master</b> , Paper Accepted in ACM NOSSDAV23: “Latency-aware 360-degree Video Analytics Framework for First Responders Situational Awareness”	<i>UIUC</i>
Submitted	<b>Lingzhi Zhao, PhD</b> , Submission to ACM SIGCOMM 2025: “Reliable Underwater Image Transmission Using Mobile Devices”	<i>UIUC</i>
Submitted	<b>Mingyuan Wu, PhD</b> , Submission to ACL 2025: “CACHE-OF-THOUGHT: Master-Apprentice Framework for Cost-Effective Vision Language Model Inference”	<i>UIUC</i>
Submitted	<b>Lingzhi Zhao, PhD</b> , Submission to ACM Multimedia 2025: “Effortless Underwater Communication with your SmartPhone”	<i>UIUC</i>
Submitted	<b>Cody Wang, Master</b> , Submission to IEEE WFIOT 2025: “Cost-Effective Tracking of Chemical Containers with Magnets”	<i>UIUC</i>
Submitted	<b>Ben Civjan, Master</b> , Submission to IEEE SMARTCOMP 2025: “Energy-efficient Frame Filtering at Edge”	<i>UIUC</i>
Submitted	<b>Jingwei Liao, Ph.D.</b> , Submission to ACM TOMM 2024: “Viewport Polyhedron-based 360-degree Image Compression”	<i>GMU</i>
In progress	<b>Ruizhi Cheng, PhD</b> , Project in Progress: “On-demand 4D Gaussian Splatting-based Video Streaming”	<i>GMU</i>
In progress	<b>Revan Ji, Master</b> , Project in Progress: “Training Acceleration for 3D Gaussian Splatting”	<i>UIUC</i>
In progress	<b>Jiaxi Li, PhD</b> , Project in Progress: “Energy-efficient Video Analytics via DVFS”	<i>UIUC</i>
Finished	<b>Wei Luo, Master</b> , Project Finished: “Discovering Vulnerable Sketches with Manufactured Network Traffic”	<i>Princeton</i>
Finished	<b>Revan Ji, Undergraduate</b> , Project Finished: “Efficient Neural Rendering of Human Face with A Mixture of Volume and Mesh”	<i>UIUC</i>
Finished	<b>Aditi Tiwari, Master</b> , Project Finished: “Action-based Search in 360-degree Videos”	<i>UIUC</i>
Finished	<b>Wei Luo, Undergraduate</b> , Senior Thesis: “Learning Feature Saliency Towards Better Compression”	<i>UIUC</i>