

# Bo Chen

POSTDOCTORAL RESEARCH ASSOCIATE

☎ +1 217-778-4329 | ✉ boc2@illinois.com

## Research Interests

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Networked systems. Multimedia systems. Machine learning systems. Mobile systems.

## Education

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### University of Illinois at Urbana-Champaign

POSTDOCTORAL RESEARCH ASSOCIATE IN COMPUTER SCIENCE

*Urbana, IL*

*Jul. 2022 - Present*

- Advisor: Prof. Klara Nahrstedt

### University of Illinois at Urbana-Champaign

PHD IN COMPUTER SCIENCE

*Urbana, IL*

*Sep. 2016 - May. 2022*

- Advisor: Prof. Klara Nahrstedt

### Shanghai Jiao Tong University

B.E. IN INFORMATION ENGINEERING

*Shanghai, China*

*Sep. 2012 - Jun. 2016*

- Advisor: Prof. Xinbing Wang

## Publications

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- [22] **Bo Chen**, Zhisheng Yan, Bo Han, Klara Nahrstedt, “NeRFHub: A Context-Aware NeRF Serving Framework for Mobile Immersive Applications,” **ACM MobiSys**, 2024
- [21] **Bo Chen**, Zhisheng Yan, Yinjie Zhang, Zhe Yang, Klara Nahrstedt, “LiFteR: Unleash Learned Codecs in Video Streaming with Loose Frame Referencing,” **USENIX NSDI**, 2024
- [20] **Bo Chen**, Mingyuan Wu, Hongpeng Guo, Zhisheng Yan, Klara Nahrstedt, “Vesper: Learning to Manage Uncertainty in Video Streaming,” **ACM MMSys**, 2024
- [19] (**Best Student Paper Award**) **Bo Chen**, Zhisheng Yan, Klara Nahrstedt, “Context-aware Image Compression Optimization for Visual Analytics Offloading,” **ACM MMSys**, 2022
- [18] (**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
- [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,” 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, 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 Elgamel, **Bo Chen**, Klara Nahrstedt, “Teleconsultant: Communication and analysis of wearable videos in Emergency Medical Environments”, **ACM Multimedia**, 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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- 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

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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

## Research & Working Experience

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### 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: “Augmented 360 Video for Situation Awareness in Firefighting”
- 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)

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

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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

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Sep. 2023 - Present	<b>Lingzhi Zhao, PhD</b> , Project in progress: “Ubiquitous Underwater Data Transmission”	UIUC
Sep. 2023 - Present	<b>Cody Wang, Master</b> , Project in progress: “Magnet-based asset tracking”	UIUC
Sep. 2023 - Present	<b>Wei Luo, Master</b> , Project in progress: “Discovering vulnerable sketches with manufactured network traffic”	Princeton University
Sep. 2023 - Present	<b>Nan Wu, Ph.D.</b> , Project in progress: “Photo-realistic volumetric video streaming with neural-based content representation”	George Mason University
Jun. 2023 - Dec. 2023	<b>Revan Ji, Undergraduate</b> , Project: “Efficient neural rendering of human face with a mixture of volume and mesh”	UIUC
Sep. 2022 - Dec. 2023	<b>Aditi Tiwari, Master</b> , Project: “Action-based search in 360-degree videos”	UIUC
Sep. 2022 - May. 2023	<b>Jiaxi Li, Master</b> , Paper accepted in NOSSDAV23: “Latency-aware 360-degree video analytics framework for first responders situational awareness”	UIUC
Oct. 2022 - May. 2023	<b>Jingwei Liao, Ph.D.</b> , Paper in submission: “Viewport polyhedron-based 360-degree image compression”	George Mason University
Sep. 2022 - May. 2023	<b>Wei Luo, Master</b> , Paper accepted in Neural Compression Workshop at ICML 2023: “Neural image compression with quantization rectifier”	Princeton University
Oct. 2021 - May. 2022	<b>Wei Luo, Undergraduate</b> , Senior Thesis: “Learning feature saliency towards better compression”	UIUC

## Professional Involvement

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2024	<b>NSF Workshop on Sustainable Computing for Sustainability</b> , Publication Chair
2024	<b>ACM MMSys</b> , TPC Member
2024	<b>ACM MM, IEEE ICCCN, ACM TOMM</b> , Reviewer
2023	<b>IEEE SECON</b> , Publication Chair
2023	<b>SEC, ImmerCom</b> , TPC Member
2023	<b>ACM MM, ACM MMSys, ACM TOMM</b> , Reviewer