BO CHEN

Email: boc2@illinois.edu Webpage: https://bochenuiuc.web.illinois.edu/

EDUCATION

University of Illinois at Urbana Champaign (UIUC), Urbana, USA   *Jul. 2022 - present*
Postdoc in System and Networking of Computer Science

University of Illinois at Urbana Champaign (UIUC), Urbana, USA   *Sept.2016 - May. 2022*
Ph.D. in System and Networking of Computer Science, **Research Assistant**

Shanghai Jiao Tong University (SJTU), Shanghai, China   *Sept.2012 - Jun.2016*
B.E. in Information Engineering, **GPA: 3.72/4.0 Rank: 8th/170**

RESEARCH EXPERIENCES

MONET Research Group, Urbana, USA   *Sep. 2022 - Present*
Onion Pruning towards Scalable and Efficient Vision
Advisor: Professor Klara Nahrstedt

- Designed a networking pruning approach that trains a neural network consistently adapting to various hardware scenarios without finetuning.
- Validated onion pruning on ResNet, VGG and Mobilenetv2, proving its effectiveness.

MONET Research Group, Urbana, USA   *Sep. 2021 - Sep. 2022*
LSVC: Learned Video Codec System for Live Streaming
Advisor: Professor Klara Nahrstedt

- Proposed LSVC, a learned video codec featured by a novel tree-based compression scheme, allowing parallelization in compression and improving encoding speed.
- Outperformed H.264 by achieving similar video quality while reducing the bandwidth consumption by 50% and reached a real-time streaming rate of 30 fps.

MONET Research Group, Urbana, USA   *May. 2021 - Sep. 2021*
Deep Contextualized Compressive Offloading for Images
Advisor: Professor Klara Nahrstedt

- Proposed DCCOI, a lightweight, context-aware, and bandwidth-efficient offloading framework for images based on a spatial-adaptive CNN-based encoder.
- Reduced the offloading size of JPEG by a factor of 9 and DeepCOD, the state-of-the-art compressive offloading approach, by 20% with similar accuracy and a small computation overhead.

MONET Research Group, Urbana, USA   *Feb. 2021 - May. 2021*
Context-aware Image Compression Optimization for Visual Analytics Offloading
Advisor: Professor Klara Nahrstedt

- Designed CICO, a Context-aware Image Compression Optimization framework that leverages low-level image features to understand the importance of different image regions for a visual analytics task with a learning-based method.
- Reduced the bandwidth consumption of existing compression methods by up to 40% under a comparable analytics accuracy and achieved up to a 2x speedup over state-of-the-art compression techniques.

MONET Research Group, Urbana, IL *Aug. 2020 - Feb. 2021*
EScALation: A Framework for Efficient and Scalable Spatiotemporal Action Localization
Advisor: Professor Klara Nahrstedt
- Optimized frame-level detections via a frame-sampling technique, based on the analysis of how the action detection performance is impacted by the sampling interval.
- Evaluated our framework on UCF-101-24 dataset and J-HMDB-21 dataset against the state-of-the-art approach to show savings of 72.2% of the time with only 6.1% loss of mean average precision.

MONET Research Group, Urbana, IL *Sep. 2019 - Aug. 2020*
Real-time Spatiotemporal Action Localization in 360 Videos
Advisor: Professor Klara Nahrstedt
- Exploited Single Shot Multibox Object Detector (SSD) with Feature Pyramid Networks (FPN) for detecting actions in 360 videos at the frame level.
- Demonstrated that our approach has the best accuracy and real-time performance on UCF-101-24 dataset and the J-HMDB-21 dataset than the state-of-the-art.

MONET Research Group, Urbana, USA *Jun. 2018 - Apr. 2019*
Event-driven Stitching for Tile-based Live 360 Video Streaming
Advisor: Professor Klara Nahrstedt
- Designed a tile actuator that optimizes tile-based stitching via offline profiling of data collected during stitching and online greedy search.
- Demonstrated that our system achieves high in-time delivery reliability of 89.4% and provides a better viewing experience than most of the other baseline systems.

MONET Research Group, Urbana, IL *Jun. 2017 - Dec. 2017*
ReSPonSe: Real-time, Secure, and Privacy-aware Video Redaction System
Advisor: Professor Klara Nahrstedt
- Designed and implemented a video redaction system, ReSPonSe, to protect private information in personal videos according to permissions of people-in-video via two stages, Encapsulation and Decapsulation.
- Evaluated our system on online free videos and videos recorded on campus, which shows ReSPonSe efficiently and accurately protects private information in videos.

MONET Research Group, Urbana, IL *Jan. 2017 - May. 2017*
Teleconsultant: Communication and Analysis of Wearable Videos in Emergency Medical Environments
Advisor: Professor Klara Nahrstedt
- Designed and implemented an end-to-end video streaming system based on Hololens for Emergency Medical Services (EMS) scenarios between paramedics in the incident area and doctors in the hospital.
- Enabled the doctor to view the video streamed from the incident area of the patient, which is stabilized and marked with droop detection results, and the doctor can provide advice to the paramedics.

WORK EXPERIENCES

Facebook, Menlo Park, CA *May. 2020 - Aug. 2020*
Student Intern
Host: Luke Wang
- Participated in the development of a network device query system.

AT&T Research Lab, Bedminster, NJ   *May. 2019 - Jul. 2019*
Student Intern
Host: Shu Shi

- Conducted research on a novel transport protocol for latency-sensitive applications in LTE networks.

PUBLICATION

- [**Best Student Paper**] **Bo Chen**, Zhisheng Yan, Klara Nahrstedt, "Context-aware Image Compression Optimization for Visual Analytics Offloading," **ACM Multimedia Systems Conference**, 2022
- Ahmed Ali-Eldin, Chirag Goel, Mayank Jha, **Bo Chen**, Klara Nahrstedt, Prashant Shenoy, "CAVE: Caching 360 Videos at the Edge," **ACM NOSSDAV**, 2022
- **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'21
- **Bo Chen**, Klara Nahrstedt, "EScALation: A Framework for Efficient and Scalable Spatio-temporal Action Localization," **ACM Multimedia Systems Conference**, 2021
- Qian Zhou, **Bo Chen**, Zhe Yang, Hongpeng Guo, Klara Nahrstedt, "360ViewPET: View Based Pose EsTimation for Ultra-Sparse 360-Degree Cameras," **IEEE ISM**, 2021
- **Bo Chen**, Ahmed Ali-Eldin, Prashant Shenoy and Klara Nahrstedt, "Real-time Spatio-Temporal Action Localization in 360 Videos", **IEEE International Symposium on Multimedia (ISM)**, 2020
- 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
- **Bo Chen**, Zhisheng Yan, Haiming Jin, Klara Nahrstedt, "Event-driven Stitching for Tile-based 360 Video Live Streaming", **ACM Multimedia Systems Conference**, 2019
- **Bo Chen**, Klara Nahrstedt, "FIS: Facial Information Segmentation for Video Redaction", **IEEE MIPR**, 2019
- **Bo Chen**, Klara Nahrstedt, Carl Gunter, "ReSPonSe: Real-time, Secure, and Privacy-aware Video Redaction System", **ACM MobiQuitous**, 2018
- Tarek Elgamal, **Bo Chen**, Klara Nahrstedt, "Teleconsultant: Communication and analysis of wearable videos in Emergency Medical Environments", **ACM Multimedia**, 2017
- Qianru Li, **Bo Chen**, Songjun Ma, Luoyi Fu, Xinbing Wang, "Contrastive Topic Discovery via Non-negative Matrix Factorization", **IEEE ICC**, 2016.

COMPUTER SKILLS

Computer Languages	C/C++, Python
Tools	PyTorch, Docker, Kafka, GStreamer, OpenCV