

QIAN ZHOU

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RESEARCH INTERESTS

My expertise is in *systems and networking*, with focus on *IoT and multimedia* systems and networking. For IoT, I aim at *enterprise-scale* contexts, and have solved multiple problems including scalable IoT service discovery, access control, routing, command execution, etc. For multimedia, I target *immersive 360° video* systems and networking, and have been working on various topics including 360° video streaming, viewing experience, viewport prediction, viewport recommendation, etc.

In the future, I will explore *next-generation, mixed-reality, immersive multimedia*, and their *content generation, distribution and viewing*. The work is *interdisciplinary*, spanning across multiple fields: *multimodality systems; networking; mixed-reality human-computer interaction*. Immersive computing is becoming significant because it targets immersive mixed-reality gatherings (tours, meetings, teaching, parties, etc.), which are emerging, urgent and crucial needs for an *in-pandemic and post-pandemic society*.

EMPLOYMENT

University of Illinois Urbana-Champaign

Postdoctoral Research Associate of Computer Science

As a Future Faculty Fellow, I am engaged in both research (on 360° video) and teaching.

August 2020 - Present

Advisor: Klara Nahrstedt

EDUCATION

Stony Brook University

Ph.D. in Computer Engineering

Thesis: Managing Enterprise-Scale Internet of Things: From Service Discovery, Access Control, to Command Execution

August 2015 - May 2020

Advisor: Fan Ye

Beihang University, China

B.E. in Astronautical Engineering

September 2008 - June 2012

TEACHING EXPERIENCES

Instructor of Computer Science, University of Illinois Urbana-Champaign

- CS 173 Discrete Structures (~200 undergraduates) Spring 2021, Fall 2021

Guest Lecturer of Computer Science, University of Illinois Urbana-Champaign

- CS 537 Advanced Topics in IoT Fall 2021
- CS 598 Advanced Multimedia Systems Fall 2020

Teaching Assistant of Electrical and Computer Engineering, Stony Brook University

- ESE 118 Digital Logic Design Fall 2015, Spring 2016, Fall 2016, Fall 2019
- ESE 333 Real-Time Operating Systems Spring 2017
- ESE 554 Computational Models for Computer Engineers Fall 2017, Fall 2018

PROFESSIONAL ACTIVITIES

Program Committee Member

- ACM International Conference on Multimedia (MM) 2023
- ACM International Conference on Multimedia (MM) 2022
- IEEE International Conference on Distributed Computing Systems (ICDCS) 2022
- IEEE International Conference on Networking, Architecture, and Storage (NAS) 2022
- IEEE International Conference on Edge Computing (EDGE) 2021

Publication Chair

- IEEE/ACM International Symposium on Quality of Service (IWQoS) 2023

Web and Social Media Chair

- IEEE International Conference on Sensing, Communication and Networking (SECON) 2023
- IEEE International Conference on Distributed Computing Systems (ICDCS) 2022

AWARDS

Best Paper Nominee, ACM/IEEE IoTDI 2019

Armstrong Memorial Research Foundation Award, 2018

PUBLICATIONS

Journals and Conferences

1. Jiayi Li, Jingwei Liao, Aditi Tiwari, Anh Nguyen, **Qian Zhou**, Zhisheng Yan, Klara Nahrstedt. Latency-Aware 360-Degree Video Analytics Framework for First Responders Situational Awareness. To appear in ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV) 2023.
2. **Qian Zhou**, Zhe Yang, Hongpeng Guo, Beitong Tian, and Klara Nahrstedt. 360BroadView: Viewer Management for Viewport Prediction in 360-Degree Video Live Broadcast. In ACM International Conference on Multimedia in Asia (MM Asia) 2022.
3. **Qian Zhou**, and Klara Nahrstedt. Ultra-Sparse 360-Degree Camera View Synthesis for Immersive Virtual Tourism. In IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR) 2022.
4. **Qian Zhou**, Bo Chen, Zhe Yang, Hongpeng Guo, and Klara Nahrstedt. 360ViewPET: View Based Pose Estimation for Ultra-Sparse 360-Degree Cameras. In IEEE International Symposium on Multimedia (ISM) 2021.
5. Zhe Yang, Klara Nahrstedt, Hongpeng Guo, and **Qian Zhou**. DeepRT: A Soft Real Time Scheduler for Computer Vision Applications on the Edge. In ACM/IEEE Symposium on Edge Computing (SEC) 2021.
6. Hongpeng Guo, Shuochao Yao, Zhe Yang, **Qian Zhou**, and Klara Nahrstedt. CrossRoI: Cross-camera Region of Interest Optimization for Efficient Real Time Video Analytics at Scale. In ACM Multimedia Systems Conference (MMSys) 2021.
7. **Qian Zhou**, Omkant Pandey, and Fan Ye. An Approach for Multi-Level Visibility Scoping of IoT Services in Enterprise Environments. In IEEE Transactions on Mobile Computing (TMC) 2020.

8. **Qian Zhou**, Mohammed Elbadry, Fan Ye, and Yuanyuan Yang. Towards Fine-Grained Access Control in Enterprise-Scale Internet-of-Things. In IEEE Transactions on Mobile Computing (TMC) 2020.
9. **Qian Zhou**, Omkant Pandey, and Fan Ye. Argus: Multi-Level Service Visibility Scoping for Internet-of-Things in Enterprise Environments. In IEEE International Parallel and Distributed Processing Symposium (IPDPS) 2020.
10. **Qian Zhou**, and Fan Ye. On Achieving Reliable and Efficient Precondition Execution Enforcement in Internet-of-Things. In IEEE International Conference on Communications (ICC) 2020.
11. **Qian Zhou**, and Fan Ye. APEX: Automatic Precondition Execution with Isolation and Atomicity in Internet-of-Things. In ACM/IEEE International Conference on Internet of Things Design and Implementation (IoTDI) 2019.
12. **Qian Zhou**, and Fan Ye. GraphiteRouting: Name-based Hierarchical Routing for Internet-of-Things in Enterprise Environments. In IEEE Global Communications Conference (GLOBECOM) 2019.
13. **Qian Zhou**, Mohammed Elbadry, Fan Ye, and Yuanyuan Yang. Heracles: Scalable, Fine-Grained Access Control for Internet-of-Things in Enterprise Environments. In IEEE International Conference on Computer Communications (INFOCOM) 2018.
14. Xintong Song, Yaodong Huang, **Qian Zhou**, Fan Ye, Yuanyuan Yang, and Xiaoming Li. Content Centric Peer Data Sharing in Pervasive Edge Computing Environments. In IEEE International Conference on Distributed Computing Systems (ICDCS) 2017.
15. **Qian Zhou**, Mohammed Elbadry, Fan Ye, and Yuanyuan Yang. Flexible, Fine Grained Access Control for Internet of Things. In ACM/IEEE International Conference on Internet of Things Design and Implementation (IoTDI) Workshop 2017.
16. Xintong Song, Yaodong Huang, **Qian Zhou**, Fan Ye, Yuanyuan Yang, and Xiaoming Li. Pervasive Edge Data Sharing in MANET. In IEEE International Conference on Computer Communications (INFOCOM) Workshop 2017.
17. **Qian Zhou**, Fan Ye, Xiaoge Wang, and Yuanyuan Yang. Automatic Construction of Garage Maps for Future Vehicle Navigation Service. In IEEE International Conference on Communications (ICC) 2016.

In Submission

1. **Qian Zhou**, Mingyuan Wu, Yinjie Zhang, Michael Zink, Ramesh Sitaraman and Klara Nahrstedt. 360TripleView: A Triple Viewing Mode for 360-Degree Video Driven by Convergence Degree of Viewing Preferences.
2. Lingzhi Zhao, **Qian Zhou**, Klara Nahrstedt. Hi360Live: A Hierarchical Framework for Adaptive 360 Video Live Broadcast.
3. Mingyuan Wu, Yuhan Lu, Shiv Trivedi, Bo Chen, **Qian Zhou**, Simran Singh, Michael Zink, Ramesh Sitaraman, Jacob Chakareski, Klara Nahrstedt. CATS: Context Aware Teleconferencing System.
4. Hongpeng Guo, Beitong Tian, Zhe Yang, Bo Chen, **Qian Zhou**, Shengzhong Liu, Klara Nahrstedt, Claudiu Danilov. DeepStream: Bandwidth Efficient Multi-Camera Video Streaming for Deep Learning Analytics.

Book Chapters

1. Ming Cai, **Qian Zhou**, Fan Ye, and Yuanyuan Yang. A Comparative Study of Software Programming Platforms for the Internet of Things. IET Book: Big Data-Enabled Internet of Things (Page 111 - 136).

REFERENCES

Prof. Fan Ye
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