YIQIN ZHAO

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RESEARCH INTERESTS

My research interest lies in the board area of future mobile system design for mobile augmented reality (AR). My recent research has a strong focus on environment lighting estimation for mobile AR devices.

PROFESSIONAL EXPERIENCES

Worcester Polytechnic Institute, Worcester, MA, USA
Teaching Assistant — *Aug, 2024 - Present*
Research Assistant — *Aug, 2019 - May, 2024*
Adobe Research, San Jose, CA, USA
Research Scientist Intern — *May, 2024 - Aug, 2024*
Google AR&VR, Mountain View, CA, USA
Student Researcher Intern (Part-time) — *Aug. 2022 - May. 2023*
Student Researcher Intern (Full-time) — *May. 2022 - Aug. 2022*
Kuaishou Technology, Palo Alto, CA, USA
Research Intern — *Jan. 2022 - May. 2022*
Baidu, Haidian, Beijing, China
Software Engineer Intern — *July. 2018 - Sept. 2018*

EDUCATION

Worcester Polytechnic Institute, Worcester, MA, USA — *Aug. 2021 - Present*
Ph.D. in Computer Science — *Expected Graduation: May, 2025*
Advisor: Prof. Tian Guo
Worcester Polytechnic Institute, Worcester, MA, USA — *Aug. 2019 - June 2021*
M.S. in Computer Science
Thesis: *Rethink Lighting Estimation for 3D Vision-enabled Mobile Augmented Reality*
Advisor: Prof. Tian Guo
Tianjin Normal University, Tianjin, China — *Sept. 2015 - June 2019*
B.Eng. in Software Engineering
Advisor: Prof. Ziping Zhao

PUBLICATIONS

Conference, Journal, and Workshop Publications

[C1] **Yiqin Zhao**, Mallesham Dasari, Tian Guo. AlmondAR: Robust Generative Lighting Estimation for Mobile AR with Environmental Context Data 22nd ACM Conference on Embedded Networked Sensor Systems (SenSys'24). (In submission)

[C2] **Yiqin Zhao**, Rohit Pandey, Yinda Zhang, Ruofei Du, Feitong Tan, Chetan Ramaiah, Tian Guo, Sean Fanello. Portrait Expression Editing With Mobile Photo Sequence The 16th ACM SIGGRAPH Conference and Exhibition on Computer Graphics and Interactive Techniques in Asia (SigGraph Asia'23) Technical Communication.

[C3] **Yiqin Zhao**, Sheng Wei and Tian Guo. Privacy-preserving Reflection Rendering for Augmented Reality. ACM International Conference on Multimedia (MM'22).

[C4] **Yiqin Zhao**, and Tian Guo. Xihe: A 3D Vision-based Lighting Estimation Framework for Mobile Augmented Reality. The 19th annual international conference on mobile systems. (MobiSys'21) Artifacts Evaluated – Functional

[C5] **Yiqin Zhao**, and Tian Guo. PointAR: Efficient Lighting Estimation for Mobile Augmented Reality. The 16th European Conference On Computer Vision. (ECCV'20)

[C6] Ziping Zhao, Yu Zheng, Zixing Zhang, Haishuai Wang, **Yiqin Zhao**, Chao Li. Exploring spatio-temporal representations by integrating attention-based bidirectional-LSTM-RNNs and FCNs for speech emotion recognition. Conference of the International Speech Communication Association. (INTERSPEECH'18)

[J1] **Yiqin Zhao**, Sean Fanello, Tian Guo. Multi-Camera Lighting Estimation for Mobile Augmented Reality. GetMobile: Mobile Computing and Communications, Volume 27, Issue 2 (GetMobile'24). Invited paper

[J2] **Yiqin Zhao**, Chongyang Ma, Haibin Huang, Tian Guo. LitAR: Visually Coherent Lighting for Mobile Augmented Reality. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT'22).

[J3] Ziping Zhao, Zhongtian Bao, **Yiqin Zhao**, Zixing Zhang, Nicholas Cummins, Zhao Ren, Björn W. Schuller. Exploring Deep Spectrum Representations via Attention-Based Recurrent and Convolutional Neural Networks for Speech Emotion Recognition. IEEE Access Journal'19

[W1] **Yiqin Zhao**, Ashkan Ganj, Tian Guo. Toward In-Context Environment Sensing for Mobile Augmented Reality The 2nd ACM Workshop on Mobile Immersive Computing, Networking, and Systems (ImmerCom'24).

[W2] Ashkan Ganj, **Yiqin Zhao**, Hang Su, Tian Guo. Mobile AR Depth Estimation: Challenges & Prospects The Twenty-fifth International Workshop on Mobile Computing Systems and Applications (HotMobile'24).

[W3] Ashkan Ganj, **Yiqin Zhao**, Federico Galbiati, Tian Guo. Toward Scalable and Controllable AR Experimentation. 1st ACM Workshop on Mobile Immersive Computing, Networking, and Systems (ImmerCom'23). Best paper runner-up

[W4] **Yiqin Zhao**, Sean Fanello, Tian Guo. Multi-Camera Lighting Estimation for Photorealistic Front-Facing Mobile Augmented Reality. The Twenty-fourth International Workshop on Mobile Computing Systems and Applications (HotMobile'23).

[W5] Ziping Zhao, **Yiqin Zhao**, Zhongtian Bao, Haishuai Wang, Zixing Zhang, Chao Li. Deep spectrum feature representations for speech emotion recognition. The 4th Workshop on Affective Social Multimedia Computing and first Multi-Modal Affective Computing of Large-Scale Multimedia, 2018. (ASMMC-MMAC'18)

Peer-reviewed Posters and Demos

[P1] **Yiqin Zhao**, and Tian Guo. FusedAR Adaptive Environment Lighting Reconstruction for Visually Coherent Mobile AR Rendering The IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR'22).

[P2] **Yiqin Zhao**, and Tian Guo. PointAR: Efficient Lighting Estimation for Mobile Augmented Reality. The 21st International Workshop on Mobile Computing Systems and Applications, 2020. (HotMobile'20)

[D1] **Yiqin Zhao**, and Tian Guo. ARFlow: A Framework for Simplifying AR Experimentation Workflow. The 25th International Workshop on Mobile Computing Systems and Applications. (HotMobile'24) **Code:** https://github.com/cake-lab/ARFlow

Patent Applications

- Google Classified Patent. Sean Fanello, **Yiqin Zhao**, Rohit Pandey, Yinda Zhang, Feitong Tan, Ruofei Du, and Chetan Ramaiah. Filing date November 16, 2023.
- Visually Coherent Lighting for Mobile Augmented Reality. **Yiqin Zhao**, and Tian Guo. US utility patent application number: 18/237,095, filing date August 23, 2023.

CONFERENCE PRESENTATIONS

The 16th ACM SIGGRAPH Conference and Exhibition on Computer Graphics and Interactive Techniques in Asia (SigGraph Asia'23)
Conference Presenter *Sydney, NSW, Australia. Dec 2023*
Topic: Portrait Expression Editing With Mobile Photo Sequence

The Twenty-fourth International Workshop on Mobile Computing Systems and Applications (HotMobile'23)
Conference Presenter *Orange County, CA, USA. Feb 2023*
Topic: Multi-Camera Lighting Estimation for Photorealistic Front-Facing Mobile Augmented Reality

The International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp'22)
Conference Presenter *Atlanta, GA, USA. Sept 2022*
Topic: LitAR: Visually Coherent Lighting for Mobile Augmented Reality

The 19th Annual International Conference on Mobile System (MobiSys'21)
Conference Presenter *Virtual. June 2021*
Topic: Xihe: A 3D Vision-based Lighting Estimation Framework for Mobile Augmented Reality.

The 16th European Conference On Computer Vision (ECCV'20)
Conference Presenter *Virtual. Aug 2020*
Topic: PointAR: Efficient Lighting Estimation for Mobile Augmented Reality

PROPOSAL WRITING

User-Driven Physical Data Privacy in Mobile Augmented Reality
PI: Dr. Tian Guo
Designed and wrote two out of three physical data privacy protection mechanisms.
Submitted to Google Research scholar program 2023. (not awarded)

Dual-Camera Lighting Estimation for Mobile AR
PI: Dr. Tian Guo
Designed and wrote two out of three tasks for dual-camera lighting estimation.
Submitted to Google Research scholar program 2022. (not awarded)

TEACHING AND STUDENT MENTORING

Teaching Assistant *Fall 2024*
Computer Science Department, WPI
Course: CS 539 Machine Learning (Graduate)

MQP Project Mentor *Fall 2024*
For Thinh Nguyen and Khang Luu, undergraduate students, Computer Science Department, WPI
Project: High-performance Mobile AR Device Data Capturing, Streaming, and Visualization

Graduate Research Project Mentor *Fall 2023*
For Ashkan Ganj, Ph.D. student, Computer Science Department, WPI
Project: Metric-accurate Depth Estimation with Mobile Camera Defocus Cues

AWARDS

- ImmerCom best paper runner-up award. *Oct 2023*
- Google conference scholarships. ($3000) *Oct 2023*
- ACM HotMobile 2023 student travel grant. ($1000) *Jan 2023*
- ACM HotMobile 2020 student travel grant. ($1000) *Jan 2020*
- Outstanding undergraduate thesis. *Sept 2019*
- China collegiate computing contest, 2017 national third prize, top 6%. *Oct. 2017*
- China collegiate computing contest, 2016 national third prize, top 10%. *Oct. 2016*
- 2018 - 2019 academic undergraduate first-grade scholarship, top 10%. *May 2019*
- Wang Kechang culture and technology innovation scholarship, top $\leq 1\%$. *Sept. 2018*
- 2017 - 2018 academic undergraduate year top grade scholarship, top 5%. *Sept. 2018*
- 2016 - 2017 academic undergraduate year second-grade scholarship, top 20%. *Sept. 2017*
- 2015 - 2016 academic undergraduate year first-grade scholarship, top 10%. *Sept. 2016*

STUDENT COMMUNITY LEADERSHIP EXPERIENCE

Founder of the TJNU iOS Club, Tianjin Normal University *2017 - 2018*
TJNU iOS Club is a college student association developed to democratize and support innovative mobile application development through the Apple device ecosystem. The iOS Club program is a cross-university program in mainland China supported by leading Chinese academic institutes and Apple Inc.

- Organized biweekly workshops on mobile application design and development on campus.
- Led educational programming student activities with Apple China at the local Apple Store.
- Led team to attend national iOS Club summer and winter camps held by Apple China.
- Developed the Tianjin Normal University iOS Club to be the largest and most influential student technology club in the department.

ACADEMIC SERVICES

- UbiComp 2022 student volunteer.
- Conference Reviewer: MM'24, NeruIPS'24, ICDCS'23, CAAI'23, MMSys'20
- Journal Reviewer: TMC'24, IJHCI'24,

RECENT COLLABORATORS

- **Ph.D. mentors**:
  Tian Guo (Worcester Polytechnic Institute), Mallesham Dasari (Northeastern University), Sheng Wei(Rutgers University)
- **Industry research internship mentors**:
  Yu Shen (Adobe), Stefano Petrangeli (Adobe), Sean Fanello (Google), Ruofei Du (Google), Haibin Huang (ByteDance), Chongyang Ma (ByteDance)

TECHNICAL SKILLS

- Proficient in deep learning research and data engineering, including Unix-like environment, deep learning model training, image/3D data processing, and graphics rendering engines.

- Proficient in system programming with Python, JavaScript, TypeScript, C#, and Swift.
- Familiar with modern GPU programming: Metal, WebGL, shader, and CUDA.
- Familiar with IoT device development and debugging: Android ADB, Xcode Instrument, Nvidia Jetson, and Raspberry Pi.