Ru Wang

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Research Interests

My research interests lie within Human-Computer Interaction, Eye Tracking, Extended Reality, and Accessibility.
- I use eye tracking to understand human intent across different visual abilities and tasks.
- I design and build gaze-based systems to make visual information more accessible.
- I design and build AI-driven AR interventions to support mental well-being.

Education

University of Wisconsin-Madison — Madison, WI
PhD in Computer Science — *2021 - 2026 (Expected)*
Research Advisor: Prof. Yuhang Zhao

University of California San Diego — La Jolla, CA
MS in Computer Science — *2019 – 2021*
Research Advisors: Prof. Nadir Weibel, Prof. Xinyu Zhang

Shanghai Jiao Tong University — Shanghai, China
BS in Information Engineering — *2015 – 2019*

Publications

Conference Papers (* in submission)

[C7*] **Ru Wang**, Kexin Zhang, Yuqing Wang, Keri Brown, and Yuhang Zhao. *"Therapy Happens Outside of Therapy": Design Opportunities in Symptom Self-Management Technology for People with Obsessive-Compulsive Disorder*. In Submission to CHI '25.

[C6*] Songlin Xu, Dongyin Hu, **Ru Wang**, and Xinyu Zhang. *PeerEdu: Bootstrapping Online Learning Behaviors via Asynchronous Area of Interest Sharing from Peer Gaze*. In Submission to CHI '25.

[C5*] Hanxiu 'Hazel' Zhu, Avanthika Senthil Kumar, Sihang Zhao, **Ru Wang**, Xin Tong, and Yuhang Zhao. *"Link to Research Papers, Please?": Characterizing Collective Efforts in Content Sharing and Quality Control for ADHD-relevant Content on Video-sharing Platforms*. In Submission to CHI '25.

[C4] **Ru Wang**, Zach Potter, Yun Ho, Daniel Killough, Linxiu Zeng, Sanbrita Mondal, and Yuhang Zhao. 2024. *GazePrompt: Enhancing Low Vision People's Reading Experience with Gaze-Aware Augmentations*. In Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24).

[C3] **Ru Wang**, Linxiu Zeng, Xinyong Zhang, Sanbrita Mondal, and Yuhang Zhao. 2023. *Understanding How Low Vision People Read Using Eye Tracking*. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23).

[C2] Danilo Gasques, Janet G. Johnson, Tommy Sharkey, Yuanyuan Feng, **Ru Wang**, Zhuoqun Robin Xu, Enrique Zavala, Yifei Zhang, Wanze Xie, Xinming Zhang, Konrad Davis, Michael Yip, and Nadir Weibel. 2021. *ARTEMIS: A Collaborative Mixed-Reality System for Immersive Surgical Telementoring*. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21).

[C1] Zhuoran Song, **Ru Wang**, Dongyu Ru, Zhenghao Peng, Hongru Huang, Hai Zhao, Xiaoyao Liang, and Li Jiang. 2019. *Approximate Random Dropout for DNN training acceleration in GPGPU*. 2019 Design, Automation & Test in Europe Conference & Exhibition (DATE), Florence, Italy, 2019

Posters & ArXivs

[P2] **Ru Wang**, Nihan Zhou, Tam Nguyen, Sanbrita Mondal, Bilge Mutlu, and Yuhang Zhao. 2023. *Practices and Barriers of Cooking Training for Blind and Low Vision People*. In Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '23).

[P1] Matin Yarmand, **Ru Wang**, Haowei Li, and Nadir Weibel. *Evaluating Video Conferencing and Desktop Virtual Platforms for Supporting Remote Classroom Activities*. In Proceedings of the 17th International Conference on Computer-Supported Collaborative Learning-CSCL 2024

[A1] **Ru Wang**, Nihan Zhou, Tam Nguyen, Sanbrita Mondal, Bilge Mutlu, and Yuhang Zhao. *Characterizing Barriers and Technology Needs in the Kitchen for Blind and Low Vision People. arXiv*

Selected Research Projects

AI-Enabled In-Situ Support for Compulsion Prevention *Feb 2024 – Present*

Advisor: Prof. Yuhang Zhao.

- Built a personalized compulsive **behavior recognition + segmentation** system using **YOLO** and **GPT-4o** in Python.
- **Collected and annotated dataset** of compulsive behaviors (e.g., hand washing, checking) for model fine-tuning.
- Designed in-situ **AR-based visual augmentation** on **HoloLens 2** for compulsive behavior prevention in Unity.
- Conducted interview with individuals with OCD (obsessive-compulsive disorder) and therapists to understand technology needs for OCD symptom self-management [**in submission to CHI '25**].

Understanding User Intent across Visual Abilities & Tasks via Eye Tracking *Jul 2021 – Present*

Advisor: Prof. Yuhang Zhao.

- Developed **accessible gaze calibration and reading interfaces** for people with low vision using React and Flask.
- Analyzed and compared the reading gaze patterns of sighted and low vision participants under different magnification modes [**published at CHI '23**].
- Developed a **reflective gaze data collection + annotation interface** for image viewing tasks using React.
- Analyzed, compared and categorized gaze behaviors of participants with diverse visual abilities under various image viewing tasks [**in preparation for ETRA '25**].

Intent-Aware Visual Augmentations to Empower People with Low Vision *Jul 2023 – Present*

Advisor: Prof. Yuhang Zhao.

- Built a Flask server with SocketIO that retrieve and analyze eye gaze data from **Tobii Pro Fusion** eye tracker, to enable bidirectional communication with the frontend.
- Developed real-time **gaze-based visual and audio augmentation** with React to support line switching and word recognition in reading for low vision users [**published at CHI '24, patent application filed**].

Industrial Experience

Tencent *Software Engineering Intern* Beijing, China

Worked on a spark-based real-time data stream processing system for ads. *Jun 2019 - Aug 2019*

- Developed an **online stream receiver** for the system to access data from multiple real-time message queues to enable a higher level of parallelism.
- Reduced batch interval from **1min** to **5s** without data consumption lag.

Clobotics *Research Intern* Shanghai, China

Worked on a beverage recognition & tracking IoT system in beverage coolers. *Dec 2018 – Jun 2019*

- Built a Python tool to automate **data annotation task creation**, **computer vision model updating**, and **deployment**.
- Developed an **Android** app to assist field workers to deploy, test, and maintain the device via Wi-Fi and Bluetooth.
- System deployed to over **10,000** beverage coolers, including partnerships with Coca-Cola.

Honors & Scholarships

Departmental Travel Scholarship, CS, UW-Madison	*2024*
Walsh Research Travel Award, McPherson Eye Research Institute, UW-Madison	*2023*
Summer Computer Sciences Fellowship, UW-Madison	*2022*
First-year CS Departmental Scholarship, UW-Madison	*2021*
Winner of Student Volunteer (SV) happi design contest, CHI 2021	*2021*
Overseas Research Scholarship (First Class), Shanghai Jiao Tong University	*2019*

Invited Talks

"Empowering low vision people using eye-tracking and AI" — Optica Vision & Color Summer Data Blast *Aug 2024*

Teaching Experience

CS 571: Building User Interfaces, UW-Madison *Teaching Assistant* *Spring 2022, Fall 2023*

CS 770: Human-Computer Interaction, UW-Madison *Teaching Assistant* *Spring 2024*

Service

Student Volunteer

CHI 2024, ASSETS 2022, CHI 2021

Peer Review

CHI 2025, CHI 2024, ISMAR 2024, CHI 2023, MobileHCI 2023, DIS 2023, UIST 2023, IMWUT 2023

Technical Skills

Programming Languages

Python, C/C++, C#, JavaScript, HTML/CSS, R, Java, LaTeX

Softwares & Tools

Git, React, Unity, PyTorch, CUDA, Adobe Illustrator, Adobe Premiere Pro, Arduino

Languages

Mandarin Chinese (native), English (fluent)