Department of Biostatistics and Medical Informatics Seminar

Yuhang Zhao, PhD

Assistant Professor of Computer Sciences
University of Wisconsin-Madison
https://www.yuhangz.com/

Friday, December 5, 2025
12:00-1:00 pm
Morgridge Hall Seminar Room 7560 or
Zoom:
https://uwmadison.zoom.us/j/99879638765?pwd=wbtqxoucEFIlPVCVc9SFbvKB1Av7Xk.1
Passcode: 343271

AI-assisted Vision: Context-Aware Systems to Empower People with Low Vision

Abstract: People with disabilities are marginalized by inaccessible social infrastructure and technology, facing various challenges in all aspects of their life. Conventional assistive technologies commonly provide generic solutions to a certain disability population and do not consider users' individual and context differences, leading to high abandonment rate. My research seeks to thoroughly understand the experiences and needs of people with disabilities and create intelligent assistive technologies that are adaptive to user contexts, such as their environments and intents, providing tailored, unobtrusive support. In this talk, I will focus on people with low vision, who have visual impairments but are not blind. I will discuss how I leverage state-of-the-art AI, augmented reality (AR), and eye-tracking technologies to design and develop context-aware systems to enhance low vision people's visual perceptions in activities of daily living. Specifically, I divide user context into external factors (e.g., surrounding environments) and internal factors (e.g., behaviors, intents). To capture external context, I create scene-aware systems that recognize essential visual contents around the users via egocentric scene interpretation and render suitable augmentations for low vision. For example, *CookAR* is a wearable AR system that distinguishes and augments the affordance of kitchen tools (e.g., knife blade vs. knife handle) to facilitate safe and efficient interactions. In terms of internal context, I leverage eye-tracking techniques to understand low vision people's unique gaze patterns and develop intent-aware systems to recognize their visual challenges and intents and provide adaptive assistance. One example is our *GazePrompt* system that generates gaze-aware augmentations to support reading tasks, such as highlighting the next line when a user is switching line, or verbally reading aloud a word when the user hesitates around that word. I will conclude my talk by highlighting future research directions towards AI-assisted vision for people with low vision.

Bio: Yuhang Zhao is an Assistant Professor at the Department of Computer Sciences at the University of Wisconsin-Madison. Her research interests lie in human-computer interaction (HCI), accessibility, augmented/virtual reality, and AI-powered systems. Zhao leads the madAbility Lab at UW-Madison to design and build intelligent interactive systems to enhance human abilities. She has frequently published at top-tier conferences and journals in the field of HCI and accessibility (e.g., CHI, UIST, ASSETS) and have received several U.S. and international patents. Her research has been funded by various agencies, including NSF, NIH, NIST, and corporate sponsors (e.g., Meta, Apple). Her work has received multiple best paper honorable mention awards and recognitions for contribution to diversity and inclusion and has been covered by various media outlets (e.g., TNW, New Scientist). Beyond paper publications, she disseminates her research outcomes via open-source toolkits and guidelines for broader impact. Zhao received her Ph.D. degree in Information Science at Cornell Tech, Cornell University and her B.A. and M.S. degree in Computer Science at Tsinghua University.

School of Medicine and Public Health
UNIVERSITY OF WISCONSIN–MADISON