UNIVERSITY of WASHINGTON

CENTER FOR RESEARCH AND EDUCATION ON ACCESSIBLE TECHNOLOGY AND EXPERIENCES

RESEARCH SPOTLIGHT: AI

Our Mission

To make technology accessible and to make the world accessible through technology

AI FOR COMMUNICATION

ASL Recognition

For the 70 million d/Deaf people worldwide whose primary language is signing, the written language (typically English) used for social media, news sites, and search engines is a barrier to comprehension and participation. This team is working to design ASL recognition datasets, with implications for issues of fairness, ethics, and responsible AI development.

Led by: Richard Ladner, CREATE Director for Education Emeritus, and Aashaka Desai, CREATE Ph.D. student

Real-time Captioning and Sound Awareness Support

With advances in wearable computing and machine learning, CREATE researchers have investigated opportunities for real-time captioning and sound awareness support for d/Deaf and hard-of-hearing people (DHH). This work spans three primary areas:

- AR Captioning - real-time captioning in augmented reality and wearables
- HomeSound - sound awareness support in the "smart home"
- SoundWatch - real-time identification of sounds through a smart watch app

Led by: Jon E. Froehlich and Leah Findlater, CREATE Associate Directors

AI FOR THE WORKFORCE AND CULTURAL PARTICIPATION

A11yBoard: Slide Design Tool

A11yBoard for Google Slides assists blind and low-vision users in creating visual slide content. The user's desktop canvas is mirrored on a mobile touchscreen device that provides feedback. Via touch, gesture, and speech, the user can move objects, manage color, position a textbox, and hear a description from the screen reader. Current research integrates machine learning and AI to improve the tool's functioning.

Led by: Jacob O. Wobbrock, CREATE Associate Director, and Zhuohao (Jerry) Zhang, CREATE Ph.D. student

Ga11y: Accessible Animated GIFs

The animated GIFs shared on social media sites, texting platforms, and websites often lack descriptions for blind or low-vision users. Ga11y creates an initial description of the GIF, then improves the description with crowdsourced human annotations. Ga11y uses computer vision and generative AI to improve meaning, context, and nuance when low-vision users encounter inaccessible animated GIFs.

Led by: Jacob O. Wobbrock, CREATE Associate Director, and Mingrui Ray Zhang, CREATE Ph.D. student

AI FOR HEALTH AND MOBILITY

CREATE Associate Director Jon E. Froehlich leads a suite of research projects that incorporate AI to design, build, and evaluate interactive technology that addresses social issues such as environmental sustainability, computer accessibility, and personalized health and wellness.

RASSAR: Room Accessibility and Safety Scan in Augmented Reality

Developed with CREATE Ph.D. student Xia Su, RASSAR is a prototype for identifying indoor accessibility and safety issues. The user scans a space with their smartphone. Then RASSAR uses LiDAR and camera data, machine learning, and augmented reality to construct a model of the scene to visualize potential problems.

ARTennis: AI-assisted Vision

Individuals with low vision (LV) can experience vision-related challenges when participating in sports, especially those with fast-moving objects. ARTennis is a prototype for a wearable augmented reality (AR) device that uses real-time computer vision (CV) to help LV users visualize moving tennis balls. As AR and CV technologies continue to improve, the team expects head-worn AR to broaden the inclusivity of sports such as tennis and basketball.

Project Sidewalk: Sidewalk Accessibility

Project Sidewalk seeks to transform how accessibility data about every sidewalk, street, and building façade in the United States are collected and visualized. The team is developing scalable data collection methods through crowdsourcing, computer vision, and online map imagery. Using the new data, the team then designs, develops, and evaluates a novel set of navigation and map tools for accessibility.

AI AND SOCIETY

Survey: How People with Disabilities Use Generative AI (GAI)

CREATE researchers are running a four-year survey to study how people with disabilities use GAI tools for accessibility purposes and other aspects of everyday life, as well as what concerns they may have about privacy and other issues.

Led by: Jennifer Mankoff, CREATE Director

Research Study Finds Bias in GAI

A CREATE study found that GAI tools used to rank job applicants exhibit bias against resumes that include implied markers of disability. Even when researchers customized a GPT to be non-ableist, the results still displayed bias.

Led by: Jennifer Mankoff, CREATE Director, and Kate Glazko, Ph.D. student

Continuing Research on Bias in GAI

CREATE is expanding its research on GAI tools and hiring bias. One planned future study will examine how GAI tools rank resumes that include markers of both disability and other categories of identity.

Want to know more?

You can learn more about **CREATE's Research Initiatives** by visiting our website:

Sign up for our **CREATE mailing lists** for info on news and events