end

2023 According to Statista, ChatGPT's largest users were men at 65.68% versus 34.32% women.

HAIL team members at the 2024 VISIONS Vendor Fair in Ann Arbor, MI.

LABZ

VISIONS of Accessibility
Human-AI Lab (HAIL), University of Michigan

The University of Michigan's Human-AI Lab (HAIL),[a] led by Professor Anhong Guo, designs, develops, studies, and deploys human-AI interactive systems, with the goal of enhancing accessibility in both the real and digital world. Formative qualitative studies seeking to understand the challenges disabled people face informs user-centered design work that iteratively designs and evaluates novel technical systems with disabled users, coming together as public deployment projects that aim to bring these solutions to the real world. HAIL's work is deeply community oriented. By highlighting the unique needs of people with disabilities, the research undertaken at HAIL fosters discussion and development of technologies that can best support an often-ignored group.

On June 5th, members of HAIL participated in the Ann Arbor District Library's 2024 VISIONS Vendor Fair.[b] VISIONS showcases the latest products and services for the blind, visually impaired, and physically disabled; it draws community members from around southeast Michigan to learn about technologies such as Braille devices, electronic readers, and magnifiers; local transportation and guide dog services; and other community organizations. For HAIL, participating in VISIONS presented an excellent opportunity to engage with two critical aspects of their lab's mission: encouraging community engagement and presenting technical solutions to real-world accessibility barriers.

At their vendor booth, student members of HAIL engaged in meaningful conversations with members of the community, gaining insights from disabled individuals with a wide variety of lived experiences about the technologies they use and that would be most valuable to them, and making connections with local disability advocacy groups. These discussions, in addition to providing valuable context for HAIL's current and future work, allowed HAIL to recruit members of the blind and low vision (BLV) community to be part of the design and evaluation process for ongoing assistive technology projects, keeping community input at the forefront of their research agenda.

In addition to engaging with attendees, HAIL used their participation at VISIONS to engage with another key aspect of their research philosophy: bringing technical solutions to public awareness and deployment. Two members of HAIL, Professor Guo and Ph.D. student Jaylin Herskovitz, gave a talk featuring several of the lab's technically oriented projects, including two with active deployments: VizLens—an iOS app that assists visually impaired people in accessing everyday appliances. ImageExplorer—an iOS app that helps improve (BLV) individuals' understanding of the content of images. The presentation not only publicized these applications, but also aimed to share an overview of the assistive technology research process with the general public.

VizLens, originally a project from Professor Guo's own Ph.D., began as a

Assistive technology research should be driven by the lived experiences of people with disabilities.

a https://humanailab.com

b https://aadl.org/visions

51% of students contacted by Pearson for its end-of-semester study, claimed generative AI helped them get better grades during the spring 2024 semester.

crowd-AI system, allowing users to repeatedly capture the inaccessible physical interface and their interactions with it, such as finger positioning, and then uses a combination of optical character recognition (OCR) technology and remote crowdworkers to produce real-time feedback to help users navigate their appliance use. Since its initial iteration, VizLens has been updated with more advanced computer vision algorithms to be completely automated.

ImageExplorer aims to address the challenge of BLV users relying on incomplete or incorrect alternative text for images. ImageExplorer is a touch-based multi-layered image exploration system that enables users to explore the spatial layout and information hierarchies in an image. In ImageExplorer, a user captures a photo and is presented with a high-level summary of the image, as well as elements available to be explored. Then, by moving around the image with their finger, the user can further get details about specific parts of the image, developing a more robust understanding of the image's content as well as a heightened spatial awareness of how the components interact.

Assistive technology research should be driven by the lived experiences of people with disabilities. By engaging with local communities and showcasing their research process and outcomes, HAIL aims to make strides towards a more inclusive and accessible world.

Biographies

Ellie Seehorn is a fourth-year undergraduate at Grinnell College majoring in computer science and sociology, with a concentration in statistics. Her research interests are in human-computer interaction, accessibility, and assistive technologies. She has conducted research in these areas at University of Washington, Carnegie Mellon University, and now, University of Michigan.

Jaylin Herskovitz is a fifth year Ph.D. student at the University of Michigan. She is a part of the Human AI (HAIL) Lab in the Computer Science and Engineering Department advised by Anhong Guo. Jaylin's research focuses on creating AI-based tools for accessibility. Specifically, the goal of her research is to help people create customized AI and sensing technologies to suit their unique needs.

The Journey of LLMs in Education

The evolution of large language models (LLMs) in education has been driven by significant advancements in artificial intelligence (AI) and natural language processing (NLP). In the 1960s, early LLMs relied on rule-based and expert systems using predefined rules to simulate tutoring and deliver educational content, exemplified by tools like PLATO.

In the 1990s and 2000s, statistical methods and machine learning led to the development of advanced models, creating adaptive learning platforms and virtual tutors that adjusted difficulty based on student performance. These innovations allowed for a more personalized educational experience, with systems dynamically tailoring content to individual needs and learning paces. This period saw the emergence of tools that provided real-time feedback and tracked student progress over time.

The 2010s marked a major leap with the introduction of word embeddings, deep learning, and increased model parameters, leading to impressive language generation and versatile educational applications, including personalized learning tools, automated content generation, and intelligent tutoring systems. For example, MATHia was an intelligent tutoring system designed for mathematics education that employed early adaptive learning algorithms. It provided personalized feedback and instruction by adjusting the difficulty of problems based on students' performance.

Today, modern language learning apps further this trend by customizing lessons according to user progress, errors, and learning styles. Additionally, AI writing assistants now play a crucial role in enhancing written content across various applications by providing users with features such as grammar and style corrections, contextual suggestions, and assistance in expanding and refining ideas. Looking ahead, the future of LLMs in education promises even greater innovations, including more emotionally aware AI systems, multimodal learning experiences integrating text, speech, and visuals, and continuous, personalized learning support.

—*Zhongxuan He (ZH)*