Woojin Ko

Personal Information

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Education

Aug '22 – Present — **Cornell Tech / Cornell University**
Ph.D in Computer Science - GPA: 3.74
Human Computer Interaction, Virtual / Augmented / Extended Reality, Applied AI / ML / CV, Mental Health / Accessibility

Aug '17 – May '21 — **University of California, Berkeley**
B.S. in Electrical Engineering and Computer Sciences - GPA: 3.71
EECS Honors Program: Breadth - Human Computer Interaction

Research Experience

Jun '23 – Present — **(WIP) ADHD / Autism + Social VR Accessibility Project Co-Lead, PhD Researcher**
Enhancing Ability Lab - Cornell Tech
Conducting user interviews to better understand the accessibility needs within social VR environments of people with ADHD / Autism who face frequent challenges with social interaction.

Feb '24 – Present — **(WIP) ADHD Video Accessibility Project Supporting Author, PhD Researcher**
Enhancing Ability Lab - Cornell Tech
Conducting user interviews to better understand the accessibility needs of people with ADHD and their experiences with watching videos on current video platforms.

Aug '22 – Jan '24 — **XRCare Project Co-Lead, PhD Researcher**
XR Collaboratory - Cornell Tech + MSK Cancer Center - Deborah Estrin, Harald Haraldsson
Leveraged XR to assist informal caregivers with at-home physical care along with remote expert clinicians.
Developed AR applications for wound care, drainage, and physical rehab, using various capabilities like photo capture and comparison, annotation tools, human pose tracking, and networked live streaming.

Jun '19 – Mar '21 — **Spacefind Project Co-Lead, Student Researcher**
XR Lab - College of Environmental Design - Luisa Caldas, Mohammad Keshavarzi
Devised integrated modules for processing 3D indoor scenes, calculating the optimal mutual interaction space, and recommending feasible furniture movements to expand the interaction boundaries.
Developed a Hololens application in Unity for multiple users to visualize the space layout projections in AR.
Designed a full-scale Hololens visualization experience with an intuitive UI, visual instructions for moving furniture, more aesthetic and user-friendly designs, and improved hologram stability.

Apr '19 – Jan '21 — **OpenARK Team Lead, Undergraduate Student Researcher**
FHL Vive Center for Enhanced Reality - Allen Yang, Shankar Sastry
Managed Berkeley's open-source AR SDK - maintaining industry-level performance and resolving issues relating to core assets such as hand tracking, 3D reconstruction, and SLAM.
Created installers and CMake scripts for building dependencies and running OpenARK on Windows/Linux.

Jan '21 – May '21 — **AR Video Query Project Co-Lead, Honors Research Thesis Author**
Jacobs Institute for Design Innovation - Bjoern Hartmann, James Smith
Conducted thesis to help build a system that enables users to query iPhone videos temporally and spatially.
Designed the spatial query interaction of painting points in a region, the temporal query interaction of scrubbing to specific time frames in multiple videos, and the results panel of visualizing query results.
Extended our system's utility for crowdsourcing social activism and optimizing CV training data collection.

Publications

2024 — **Exploring the Accessibility of Social Virtual Reality for People with ADHD and Autism: Preliminary Insights**
By Jazmin Collins, **Woojin Ko**, Tanisha Shende, Sharon Lin, Lucy Jiang, Andrea Stevenson Won, and Shiri Azenkot
2024 ASSETS
Collins, J., Ko, W., Shende, T., Lin, S., Jiang, L., Martinez, K., Won, A. S., Azenkot, S. (2024). Exploring the Accessibility of Social Virtual Reality for People with ADHD and Autism: Preliminary Insights [Poster Presentation]. 2024 ACM SIGACCESS Conference on Computers and Accessibility, St. John's, Newfoundland and Labrador, Canada, 2024.

2024 | **Opportunities and Challenges for Augmented Reality in Family Caregiving: Qualitative Video Elicitation Study**
By Liam Albright, **Woojin Ko**, Meyhaa Buvanesh, Harald Haraldsson, Fernanda Polubriaginof, Gilad J. Kuperman, Michelle Levy, Madeline R. Sterling, Nicola Dell, and Deborah Estrin
2024 JMIR Formative Research 8, no. 1
Albright, L., Ko, W., Buvanesh, M., Haraldsson, H., Polubriaginof, F., Kuperman, G. J., ... & Estrin, D. (2024). Opportunities and Challenges for Augmented Reality in Family Caregiving: Qualitative Video Elicitation Study. JMIR Formative Research, 8(1), e56916

2020 | **Spacefind: Optimization and Manipulation of Contextual Mutual Spaces for Multi-User Virtual and Augmented Reality Interaction**
By Mohammad Keshavarzi, Allen Yang, **Woojin Ko**, Luisa Caldas
2020 IEEE Conference on Virtual Reality and 3D User Interfaces (Atlanta)
M. Keshavarzi, A. Y. Yang, W. Ko and L. Caldas, "Optimization and Manipulation of Contextual Mutual Spaces for Multi-User Virtual and Augmented Reality Interaction," 2020 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Atlanta, GA, USA, 2020, pp. 353-362, doi: 10.1109/VR46266.2020.00055.

Presentations

2023 | **XR Care Demo**
By **Woojin Ko**, Liam Albright, Harald Haraldsson, Deborah Estrin
2023 Cornell Tech Open Studio

2019 | **OpenARK Tutorial — Tackling AR Challenges via an Open-Source SDK**
By Joseph Menke, **Woojin Ko**, Allen Yang
2019 International Symposium on Mixed and Augmented Reality (Beijing)
Joseph Menke, Woojin Ko, and Allen Y Yang. 2019. Tutorial: OpenARK — Tackling Augmented Reality Challenges via an Open-Source SDK. 2019 IEEE International Symposium on Mixed and Augmented Reality (ISMAR). Beijing, China.

Relevant Experience

Aug '19 — Dec '19 | **Electrical Muscle Stimulation VR - Capstone Project Tech Lead**
CS294-137 Virtual Reality and Immersive Computing
Devised an electrical muscle stimulation haptic feedback system to immerse users further in VR.
Constructed a three-part system - hacking EMS device circuits, building an Arduino Unity-EMS bridge, and designing Oculus VR experiences (drums, tennis, shooting range) with the appropriate muscle stimulation

Jan '20 — May '21 | **Software Division Lead, Neurofit AR Project Manager**
Neurotech @ Berkeley
Directed the software division and overseeing EEG data projects including a self-care/health educational tool, music creation module, and human visual system reconstruction.
Led collaboration with Neurofit startup to utilize ARKit gaze detection for occulometric data to diagnose neurological conditions such as Alzheimer's and traumatic brain injury.

Feb '19 — Jan '21 | **AR for VIPs Team Lead, Officer**
Extended Reality @ Berkeley
Developed a Hololens app providing audio assistance for visually impaired users to navigate surroundings.
Mapped voice commands and hand gestures to our assistive audio functions for reading text aloud from street signs and sonifying nearby surroundings with attached audio beacons

Aug '20 — Dec '20 | **Piano Palette AR Technical Lead**
Jacobs Institute Innovation Catalysts Spark Grant Winner
Designed a real-time piano AR visualization experience to elicit deeper connections with classical music.

Professional Experience

Aug '21 — Dec '21 | **Technical Exhibit Designer Intern**
National Museum of Math
Designed and redesigned several exhibits aiming to make math more fun and interactive for kids.
Created a digital harmonograph drawing tool as a web application for the 2021 MoMath Gala.

May '20 — Aug '20 | **Software Development Engineer Intern**
Amazon, Inc.
Designed and implemented a Java backend API for calculating the cancellation date for Purchase Orders.
Created a UI displaying the successful results of API calls on many POs covering complex policies and cases.
Established the groundwork for significant improvements to internal tool predictions and vendor UX clarity.

Service

Jun '24	**Volunteer Chair**	*XR Access Symposium 2024*
Jan '24	**Co-President**	*PhDs at Cornell Tech (PACT)*
Oct '23	**Student Volunteer**	*ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2023)*
May '23	**Organizer**	*Cornell Graduate Student Union*
May '23	**PhD Mentor**	*Cornell REU*
Jun '23	**Student Volunteer**	*XR Access Symposium 2023*
May '21	**Volunteer**	*Berkeley Mutual Aid*
Oct '20	**Hackathon Mentor**	*Berkeley Hack Month*
Oct '19	**Hackathon Mentor**	*CalHacks*
Dec '19	**Academic Intern**	*(CS61B) Data Structures, (CS61A) Interpretation of Computer Programs*

Other Interests and Activities

Tottenham fan, pickup soccer, pickup basketball, writing, travel, food, photography, skateboarding, books, movies, concerts