Jae (Jaewook) Lee

Curriculum Vitae
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RESEARCH INTERESTS

Human-Computer Interaction (HCI), Augmented Reality (AR), Human-AI Interaction, and Accessibility

EDUCATION

University of Washington — Seattle, WA
Ph.D. in Computer Science (HCI), Advised by Prof. Jon Froehlich — Aug. 2022 –Present

University of Illinois at Urbana-Champaign — Urbana, IL
B.S. in Computer Science, Minor in Psychology (GPA: 3.96/4.00) — Aug. 2018 –May 2022

PROFESSIONAL EXPERIENCE

University of Washington — Seattle, WA
Graduate Research Assistant, Advised by Prof. Jon Froehlich — Aug. 2022 - Present

- I design AI-powered AR solutions capable of comprehending us and our surroundings, providing personalized assistance during our everyday tasks. I also study how such a system can assist the blind or low vision (BLV) and deaf or hard of hearing (DHH) communities. I am re-imagining AR for all!

Meta — Redmond, WA
Research Scientist Intern, Advised by Tianyi Wang, Jacqui Fashimpaur, and Tanya Jonker — Jun. 2023 - Nov. 2023

- Designed continuous in-world gaze interaction for wearable AR devices, which involves analyzing user's temporal multimodal data using a large language model (LLM).

NASA — Virtual
AR/VR Intern — Jun. 2022 - Aug. 2022

- Contributed to the Mixed Reality Exploration Toolkit (MRET) open-source software. Designed a set of tools for virtual reality that enables scientists and researchers to easily author space-related experiences.

Microsoft Research — Virtual
Open Source Researcher, Advised by Dr. Eyal Ofek — May. 2021 - Aug. 2022

- Led an effort to design an open-source Unity toolkit to facilitate remote user studies for VR researchers. This modular and platform-agnostic toolkit allows researchers to observe participants across multiple remote locations, collect behavioral data, and replay data from multiple media sources. [C9]

Carnegie Mellon University - Human-Computer Interaction Institute — Virtual
REU Research Intern, Advised by Prof. David Lindlbauer — Jun. 2021 - Nov. 2021

- Studied which MR navigation visualizations (e.g., arrows, avatar) work best in scenarios consisting of different combinations of contexts (e.g., environment – outdoors vs. indoors). [C7]

University of California, Los Angeles — Virtual
Research Intern, Advised by Prof. Yang Zhang — Apr. 2021 - Sep. 2021

- Designed an on-body interaction method for VR, which enable users to use their hands as tools in a VR environment (e.g., a user can form scissors using their index and middle fingers). [**C6**]

University of Michigan
Research Intern, Advised by Prof. Anhong Guo

Virtual
Aug. 2020 - Sep. 2021

- Designed a layer-based tactile interaction method for smartphones to empower blind users to judge the accuracy of AI-generated captions. [**P1, C5**]

Carnegie Mellon University - Human-Computer Interaction Institute
REU Research Intern, Advised by Prof. Vincent Aleven

Virtual
Jun. 2020 - Nov. 2020

- Studied whether a mid-fidelity prototyping method (which we call Virtual Prototyping Method) can be an effective tool in remotely co-designing spatial displays. [**C2**]

University of Illinois at Urbana-Champaign
Undergraduate Research Assistant, Advised by Prof. Alex Kirlik and Prof. Brian P. Bailey

Urbana, IL
May. 2019 - May 2022

- Conducted a field study using Decipher, a tool that facilitates understanding a large feedback set. This work was done in collaboration with Dr. Joy Kim from Adobe Research. [**J1**]
- Studied how a data-driven conversational agent can best assist under-contributing members to contribute more in a group chat setting. [**C8, C10**]
- Researched whether a tool that visualizes data from multiple teamwork-related software (e.g., Google Drive, Slack, Github) can be effective in assisting the peer evaluation process. [**C4**]
- Researched whether touch is a good additional modality to resolving ambiguities (e.g., "What is this?" – 'this' is ambiguous) in voice assistant queries. [**C3**]
- Examined the effects of complacency on humans as they interact with autonomous agents in a human-agent team. This work was done in collaboration with the *Army Research Lab (ARL)*. [**C1**]

PEER-REVIEWED PUBLICATIONS (* DENOTES EQUAL CONTRIBUTION)

C. 13 **Jaewook Lee**, Jun Wang, Elizabeth Brown, Liam Chu, Sebastian S. Rodriguez, and Jon E. Froehlich. GazePointAR: A Context-Aware Multimodal Voice Assistant for Pronoun Disambiguation in Wearable Augmented Reality. To Appear at CHI 2024.

C. 12 Xia Su, Kaiming Cheng, Han Zhang, **Jaewook Lee**, Wyatt Olson, and Jon E. Froehlich. RASSAR: Room Accessibility and Safety Scanning in Augmented Reality. To Appear at CHI 2024.

C.11 Kaiming Cheng, Arka Bhattacharya, Michelle Lin, **Jaewook Lee**, Aroosh Kumar, Jeffery F. Tian, Tadayoshi Kohno, and Franziska Roesner. 2024. When the User Is Inside the User Interface: An Empirical Study of UI Security Properties in Augmented Reality. *To Appear at USINEX 2024*

D.4 **Jaewook Lee**, Devesh P. Sarda, Eujean Lee, Amy Lee, Jun Wang, Adrian Rodriguez, and Jon E. Froehlich. 2023. Towards Real-time Computer Vision and Augmented Reality to Support Low Vision Sports: A Demonstration of ARTennis. In Adjunct Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology (UIST '23 Adjunct). Association for Computing Machinery, New York, NY, USA, Article 81, 1–3. https://doi.org/10.1145/3586182.3615815

D.3 **Jaewook Lee**, Jun Wang, Elizabeth Brown, Liam Chu, Sebastian S. Rodriguez, and Jon E. Froehlich. 2023. Towards Designing a Context-Aware Multimodal Voice Assistant for Pronoun Disambiguation: A Demonstration of GazePointAR. In Adjunct Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology (UIST '23 Adjunct). Association for Computing Machinery, New York, NY, USA, Article 92, 1–3. https://doi.org/10.1145/3586182.3615819

D.2 Xia Su, Kaiming Cheng, Han Zhang, **Jaewook Lee**, Wyatt Olson, and Jon E. Froehlich. 2023. A Demonstration of RASSAR: Room Accessibility and Safety Scanning in Augmented Reality. In The 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '23). Association for Computing Machinery, New York, NY, USA, Article 90, 1–4. https://doi.org/10.1145/3597638.3614504

C.10 Hyo Jin Do, Ha-Kyung Kong, Pooja Tetali, **Jaewook Lee**, and Brian P. Bailey. 2023. To Err is AI: Imperfect Interventions and Repair in a Conversational Agent Facilitating Group Chat Discussions. Proc. ACM Hum.-Comput. Interact. 7, CSCW1, Article 99 (April 2023), 23 pages. https://doi.org/10.1145/3579532

J.1 Patrick Crain, **Jaewook Lee**, Yu-Chun Yen, Joy Kim, Alyssa Aiello, and Brian Bailey. 2023. Visualizing Topics and Opinions Helps Students Interpret Large Collections of Peer Feedback for Creative Projects. ACM Trans. Comput.-Hum. Interact. 30, 3, Article 49 (June 2023), 30 pages. https://doi.org/10.1145/3571817

W.1 Xia Su, Kaiming Cheng, Han Zhang, **Jaewook Lee**, Yueqian Zhang, and Jon E. Froehlich. 2022. Towards Semi-automatic Detection and Localization of Indoor Accessibility Issues using Mobile Depth Scanning and Computer Vision. ASSETS '22 - Future of Urban Accessibility Workshop. https://doi.org/10.48550/arXiv.2210.02533

C.9 **Jaewook Lee**, Raahul Natarrajan, Sebastian S. Rodriguez, Payod Panda, and Eyal Ofek. 2022. RemoteLab: A VR Remote Study Toolkit. In Proceedings of the 35th Annual ACM Symposium on User Interface Software and Technology (UIST '22). Association for Computing Machinery, New York, NY, USA, Article 51, 1–9. https://doi.org/10.1145/3526113.3545679

C.8 Hyo Jin Do, Ha-Kyung Kong, **Jaewook Lee**, and Brian P. Bailey. 2022. How Should the Agent Communicate to the Group? Communication Strategies of a Conversational Agent in Group Chat Discussions. Proc. ACM Hum.-Comput. Interact. 6, CSCW2, Article 387 (November 2022), 23 pages. https://doi.org/10.1145/3555112

C.7 **J. Lee**, F. Jin, Y. Kim and D. Lindlbauer, "User Preference for Navigation Instructions in Mixed Reality," 2022 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 2022, pp. 802-811, doi: https://doi.org/10.1109/VR51125.2022.00102

C.6 Siyou Pei, Alexander Chen, **Jaewook Lee**, and Yang Zhang. 2022. Hand Interfaces: Using Hands to Imitate Objects in AR/VR for Expressive Interactions. In CHI Conference on Human Factors in Computing Systems (CHI '22). Association for Computing Machinery, New York, NY, USA, Article 429, 1–16. https://doi.org/10.1145/3491102.3501898 [**Honorable Mention Award**]

C.5 **Jaewook Lee**, Jaylin Herskovitz, Yi-Hao Peng, and Anhong Guo. 2022. ImageExplorer: Multi-Layered Touch Exploration to Encourage Skepticism Towards Imperfect AI-Generated Image Captions. In CHI Conference on Human Factors in Computing Systems (CHI '22). Association for Computing Machinery, New York, NY, USA, Article 462, 1–15. https://doi.org/10.1145/3491102.3501966

C.4 Wenxuan Wendy Shi, Akshaya Jagannadharao, **Jaewook Lee**, and Brian P. Bailey. 2021. Challenges and Opportunities for Data-Centric Peer Evaluation Tools for Teamwork. Proc. ACM Hum.-Comput. Interact. 5, CSCW2, Article 432 (October 2021), 20 pages. https://doi.org/10.1145/3479576

C.3 **Jaewook Lee**, Sebastian S. Rodriguez, Raahul Natarrajan, Jacqueline Chen, Harsh Deep, and Alex Kirlik. 2021. What's This? A Voice and Touch Multimodal Approach for Ambiguity Resolution in Voice Assistants. In Proceedings of the 2021 International Conference on Multimodal Interaction (ICMI '21). Association for Computing Machinery, New York, NY, USA, 512–520. https://doi.org/10.1145/3462244.3479902

D.1 **Jaewook Lee**, Yi-Hao Peng, Jaylin Herskovitz, and Anhong Guo. 2021. Image Explorer: Multi-Layered Touch Exploration to Make Images Accessible. In The 23rd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '21). Association for Computing Machinery, New York, NY, USA, Article 69, 1–4. https://doi.org/10.1145/3441852.3476548

C.2 JiWoong Jang*, **Jaewook Lee***, Vanessa Echeverria, LuEttaMae Lawrence, and Vincent Aleven. 2021. Explorations of Designing Spatial Classroom Analytics with Virtual Prototyping. In LAK21: 11th International Learning Analytics and Knowledge Conference (LAK21). Association for Computing Machinery, New York, NY, USA, 518–524. https://doi.org/10.1145/3448139.3448192

C.1 Sebastian S. Rodriguez, Jacqueline Chen*, Harsh Deep*, **Jaewook (Jae) Lee***, Derrik E. Asher, and Erin Zaroukian "Measuring complacency in humans interacting with autonomous agents in a multi-agent system", Proc. SPIE 11413, Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications II, 114130U (21 April 2020); https://doi.org/10.1117/12.2559474

Awards And Honors

• **NSF GRFP ($34,000 per year, 3 years)**	2022
• **Best Paper Honorable Mention Award** - CHI 2022	2022
• **Bridge to VR Scholarship** - IEEE VR Conference	2021
• **3rd Place, Voice Capabilities and AI Category** - Illinois Datathon 2021	2021
• **Runner-Up Masterpiece (2nd Place Overall)** - VandyHacks VI	2019
• **Best Oculus Hack** - Facebook @ HackIllinois 2019	2019
• **President's Volunteer Service Award** - 141 hours in one year	2016

Mentorship

• **Ben S. Kosa** *CSE Undergraduate Student at the University of Washington*	Aug. 2023 - Present
• **Ritesh Kanchi** *CSE Undergraduate Student at the University of Washington*	Aug. 2023 - Present
• **Minji Park** *CS Undergraduate Student at Sungkyunkwan University*	Aug. 2023 - Present
• **Dylan Bunarto** *CSE Undergraduate Student at the University of Washington*	Aug. 2023 - Present
• **Eujean Lee** *CSE Undergraduate Student at the University of Washington*	Jun. 2023 - Present
• **Andrew D. Tjahjadi** *CSE Undergraduate Student at the University of Washington*	Feb. 2023 - Present
• **Junpu Yu** *CSE Undergraduate Student at the University of Washington*	Feb. 2023 - Present
• **Jun Wang** *CSE Undergraduate Student at the University of Washington*	Nov. 2022 - Present
• **Davin Kyi** *CSE Undergraduate Student at the University of Washington*	Nov. 2022 - Present
• **Arvind Manivannan** *CSE Undergraduate Student at the University of Washington*	Oct. 2022 - Present

- **Amy S. Lee**   Jun. 2023 - Aug. 2023
  CogSci Undergraduate Student at the University of California, Davis
- **Jamil Islam**   Feb. 2023 - Jun. 2023
  CSE Undergraduate Student at the University of Washington
- **Devesh P. Sarda**   Jan. 2023 - Aug. 2023
  Next Position - CS Ph.D. at the University of Wisconsin-Madison
- **Elizabeth Brown**   Nov. 2022 - Apr. 2023
  Next Position - Data Scientist (Generative AI) at T-Mobile
- **Liam Chu**   Nov. 2022 - Apr. 2023
  Applied Mathematics Undergraduate Student at the University of Washington
- **Student Mentor** at ACM SIGCHI, UIUC Chapter   Sep. 2021 - May 2022
  Providing mentorship to undergraduate students who are interested in HCI

Paper Reviewing

- **ACM CHI**   2024
- **ACM TEI**   2024
- **ACM ICMI**   2023
- **ACM CHI Late-Breaking Work (LBW)**   2023
- **ACM CHI**   2023
- **ACM ICMI**   2022
- **ACM MobileHCI**   2022
- **ACM CHI Late-Breaking Work (LBW)**   2022
- **ACM ICMI**   2021

Invited Talks And Presentations

- **UW MHCI+D Program Guest Lecturer** - Future of Access Technology   2022
- **Undergraduate Research Seminar Panel Speaker** - Participating in Research as an Undergraduate   2020

Selected Press Coverage

- ARTennis attempts to help low vision players
- How University of Washington researchers are using augmented reality to improve accessibility
- Q&A: Researchers aim to improve accessibility with augmented reality
- Even if you can't see or don't know a foreign language... There will come a time where you only need XR
- Early Impact: Undergraduate Jaewook Lee Learns to Quickly Thrive Through Research