Kelly Avery Mack

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Education

2021–Present **University of Washington, Seattle, WA**.
Ph.D. in Computer Science; Graduate Certificate in Disability Studies
Advised by Dr. Jennifer Mankoff

2019–2021 **University of Washington, Seattle, WA**.
M.S. in Computer Science
Advised by Dr. Jennifer Mankoff

2014–2019 **University of Illinois at Urbana-Champaign, Urbana, IL**.
B.S. in Computer Science; Mathematics and Business minors
Research advised by Dr. Aditya Parameswaran and Dr. Karrie Karahalios

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Interests

Disability Representation and Accessibility in AI Technology.
As our world is increasingly created and mediated by AI technologies, it is critical to understand the accessibility of their outputs. My work investigates the accessibility and representation of disabled people in Generative Artificial Intelligence (GAI) model outputs through my work at the University of Washington and Google Research. I would be excited to continue this work by building inclusive datasets and better model evaluation procedures to improve the inclusivity of models.

Supporting Fluctuating Access Needs at Work.
The number of people who are neurodivergent or who have chronic or mental health conditions is rapidly increasing. These are people who may or may not identify as "disabled," but often have fluctuating access needs that arise in their jobs. I aim to better understand their needs in the work place and build technologies to help support them in achieving self-defined goals.

Creative Tool Accessibility.
It is important that the interfaces and outputs of creative tools are accessible to people with disabilities. Slideshows are ubiquitous and can carry a host of access issues for people with different disabilities. I aim to build tools that help fix existing issues and that aid authors in making accessible slides from the start. My current projects involve using optimization techniques and machine learning to make slideshow presentations more accessible to a wide variety of disabilities and creating tools to support better communication around accommodations.

Industry Impact

2023 **Google**.
My former team is working on sharing our findings with other relevant teams at Google.

2022 **Bitmoji**.
Conducted interviews with people with disabilities about disability representation in digital avatars which is being used by Bitmoji to make avatars more inclusive.

2020 **Microsoft Office Products**.
Redesigned the alt text authoring pane to better support authors in producing higher quality alt text, as defined by screen-reader users. **This new design was released in the alt text pane in Office Products that support images.**

2018 **Snap Inc**.
- Created the first disability-focused employee-resource-group at Snap Inc. through gaining grassroots support with other disabled employees and advocates and speaking to senior leadership.
- Presented to senior leadership, including the CEO, of Snap Inc. about the need to bolster accessibility efforts.
- Ran efforts to increase awareness of alt text for Bitmoji stickers, and hosted an event where 20+ employees wrote alt text for stickers.

Publications

- *An Autoethnographic Case Study of Generative Artificial Intelligence's Utility for Accessibility (ASSETS '23, Short Paper)*— K. S. Glazko, M. Yamagami, A. Desai, **K. A. Mack**, V. Potluri, X. Xu, J. Mankoff.

- *Maintaining the Accessibility Ecosystem: a Multi-Stakeholder Analysis of Accessibility in Higher Education (ASSETS '23, Short Paper)*— **K. A. Mack**, N. Sidik, A. Desai, E. McDonnell, Kunal Mehta, C. Zhang, J. Mankoff.

- *Mixed Abilities and Varied Experiences: a group autoethnography of a virtual summer internship (Communications of the ACM '23)*— **K. A. Mack**, M. Das, D. Jain, D. Bragg, J. Tang, A. Begel, E. Beneteau, J. Davis, A. Glasser, J. Park, V. Potluri.

- *Towards Inclusive Avatars: Disability Representation in Avatar Platforms (CHI '23)*— **K. A. Mack**, R. Hsu, A. Monroy-Hernández, B. Smith, F. Liu.

- *OPTIMISM: Enabling Collaborative Implementation of Domain (CHI '23)*— M. Hofmann, N. Auradkar, J. Birchfield, J. Cao, A. Hughes, G. Kim, S. Kurpad, K. Lum, **K. A. Mack**, A. Nilakantan, M. Seehorn, E. Warnock, J. Mankoff, S. Hudson.

- **(Honorable mention)** *Chronically Under-Addressed: Considerations for HCI Accessibility Practice with Chronically Ill People (ASSETS '22)*— ***K. A. Mack**, *E. McDonnell, L. Findlater, H. Evans.

- **(Honorable mention)** *Anticipate and Adjust: Cultivating Access in Human-Centered Methods (CHI '22)*— **K. A. Mack**, E. McDonnell, V. Potluri, M. Xu, J. Zabala, J. Bigham, J. Mankoff, C. Bennett.

- *Rapid Convergence: The Outcomes of Making PPE during a Healthcare Crisis (TOCHI '22)*— **K. A. Mack**, M. Hofmann, U. Lakshmi, J. Cao, N. Auradkar, R. Arriaga, S. Hudson, J. Mankoff.

- *"I'm Just Overwhelmed": Investigating Physical Therapy Access and Technology Interventions for People With Disabilities and/or Chronic Conditions (TACCESS '22)*— M. Yamagami, **K. A. Mack**, J. Mankoff, K. Steele.

- *Maptimizer: Using Optimization to Tailor Tactile Maps to Users Needs (CHI '22)*— M. Hofmann, **K. A. Mack**, J. Birchfield, J. Cao, A. Hughes, S. Kurpad, K. Lum, E. Warnock, A. Caspi, S. Hudson, J. Mankoff.

- *Making a Medical Maker's Playbook: An Ethnographic Study of Safety-Critical Collective Design by Makers in Response to COVID-19 (CSCW '22)*— M. Hofmann, U. Lakshmi, **K. A. Mack**, R. Arriaga, S. Hudson, J. Mankoff.

- **(Honorable mention)** *Designing Tools for High-Quality Alt Text Authoring (ASSETS '21)*— **K. A. Mack**, E. Cutrell, B. Lee, M. Morris.

- **(Honorable mention)** *Mixed Abilities and Varied Experiences: a group autoethnography of a virtual summer internship (ASSETS '21)*— **K. A. Mack**, M. Das, D. Jain, D. Bragg, J. Tang, A. Begel, E. Beneteau, J. Davis, A. Glasser, J. Park, V. Potluri.

- **(Honorable mention)** *What Do We Mean by "Accessibility Research"? A Literature Survey of Accessibility Papers in CHI and ASSETS from 1994 to 2019 (CHI '21)*— **K. A. Mack**, E. McDonnell, D. Jain, L. Wang, J. E. Froehlich, L. Findlater.

- **(Honorable mention)** *The Right to Help and the Right Help: Fostering and Regulating CollectiveAction in a Medical Making Reaction to COVID-19 (CHI '21)*— M. Hofmann, U. Lakshmi, **K. A. Mack**, R. Arriaga, S. Hudson, J. Mankoff.

- **(Honorable mention)** *Medical Maker Response to COVID-19: Distributed ManufacturingInfrastructure for Stopgap Protective Equipment (CHI '21)*— U. Lakshmi, M. Hofmann, **K. A. Mack**, S. Hudson, J. Mankoff, R. Arriaga.

- *Stitching Together the Experiences of Disabled Knitters (CHI '21)*— T. Gotfrid, **K. A. Mack**, K. Lum, E. Yang, J. Hodgins, S. Hudson, J. Mankoff.

- *Social App Accessibility for Deaf Signers (CSCW '20)*— **K. A. Mack**, D. Bragg, M. Ringel Morris, M. W. Bos, I. Albi, A. Monroy-Hernández.

- *Benchmarking Spreadsheet Systems (SIGMOD '20)*— S. Rahman, **K. A. Mack**, M. Bendre, R. Zhang, K. Karahalios, A. Parameswaran.

- *HomeSound: An Iterative Field Deployment of an In-Home Sound Awareness System for Deaf or Hard of Hearing Users (CHI '20)*— D. Jain, **K. A. Mack**, A. Amrous, M. Wright, S. Goodman, L. Findlater, and J. E. Froehlich.

- *Anti-Freeze for Large and Complex Spreadsheets: Asynchronous Formula Computation (SIGMOD '19)*— M. Bendre, T. Wattanawaroon, **K. A. Mack**, K. Chang, and A. Parameswaran.

- *Faster, higher, stronger: Redesigning spreadsheets for scale. (ICDE '19)*— M. Bendre T. Wattanawaroon, S. Rahman, **K. A. Mack**, Y. Liu, S. Zhu, Y. Lu et al.

- *Characterizing Scalability Issues in Spreadsheet Software using Online Forums (CHI EA '18)*— **K. A. Mack**, J. Lee, K. Chang, K. Karahalios, and A. Parameswaran.

* Both authors contributed equally to this work and are considered first author

Awards

- NCWIT Collegiate Award Finalist (2022)
- Dennis Lang Award in Disability Studies (2021)
- Google Lime Scholar (2020)
- NSF Graduate Research Fellowship Recipient (2019)
- ARCS Foundation Scholar (2019-2021)
- Wilma Bradley Endowed Fellowship in Computer Science & Engineering (2019)
- UIUC Bronze Table (2019)- top 3% of class
- Boeing Women in Engineering Scholarship (2018)
- NVIDIA John Nickolls Memorial Scholarship (2018)
- Snap Inc. Research Scholar (2018)
- CRA Outstanding Undergraduate Researcher Award Honorable Mention (2018)

Industry Experience

Jun '23 – **Google Research**.
Sep '23 *Research Intern*: People + AI Research; Advised by Cynthia Bennett and Shaun Kane

- Led a research project looking at how people with disabilities are represented in images generated by text-to-image AI models
- Developed a study protocol involving focus groups and surveys to allow disabled participants multiple ways to share their thoughts on current forms of representation and what disability representation ought to look like
- Presented the findings of this work across multiple teams and product areas including to directors and teams working on GAI

Jun '22 – **Snap Inc. Research**.
Sep '22 *Research Intern*: HCI Research Team; Advised by Fannie Liu, Brian Smith, and Andrés Monroy-Hernández

- Led a research project looking at how people with disabilities want to use and be represented in digital avatars
- Scoped our sample to include a variety of people with non-normative bodies and minds to ensure diverse representation (e.g., we included people who identify as neurodiverse, people who have chronic or mental health conditions, as well as people with sensory disabilities).
- Drafted and ran an interview protocol focused on understanding intersectional issues for disabled people of color and queer disabled people

Jun '20 – **Microsoft Research**.
Sep '20 *Research Intern*: Ability Team; Advised by Meredith Ringel Morris

- Created interface designs in React.js to encourage engagement with and quality of alternative text for images in PowerPoint
- Performed interviews with alternative text authors and screen reader users to verify the validity of designs and further improve them
- Compiled and presented a final set of alternative text design considerations to the PowerPoint team to allow for future implementation

May '19 –
Aug '19

Microsoft.
Software Engineering Intern: Interaction for Everyone Team

- Added additional functionality to Narrator, Microsoft's screen reader software, to improve the reading of math using C++ and interacting with the COM framework
- Won second place in the company-wide hackathon and first place in the M365 hackathon (project details under NDA)

Aug '18 –
Nov '18

Snap Inc. Research.
Research Intern: App Platform Team; Accessibility Evangelist

- Led an accessibility-themed research project looking at how deaf and hard of hearing users interact on social media
- Created an interview protocol and survey to answer our research questions
- Learned how to perform statistical analysis techniques on survey data to explore the results and performed open coding on qualitative interview responses
- Developed and delivered a presentation related to the importance of accessibility to team members, executives, and the CEO of Snap Inc.
- Instigated Snap Inc.'s first disability-focused employee resource group

May '18 –
Aug '18

Microsoft.
Software Engineering Intern: Platform Health Team

- Built a web application using the ASP.NET MVC framework to correlate user feedback with available data to help diagnose the root cause of issues on Windows devices
- Applied basic natural language processing techniques to link the text from user feedback to concrete scenarios we can further investigate
- Participated in a hackathon project with members of Microsoft Research to create a novel experience for Narrator screen reader users
- Created and delivered a presentation to my team explaining the importance and benefits of making all of our content and applications accessible

May '17 –
Aug '17

Meta (f.k.a. Facebook).
Software Engineering Intern: Accessibility Team

- Improved the quality of using the Facebook Android app for users with dyslexia and also the experience of newsfeed for those who use screen readers
- Updated an algorithm that determines the best alternate text for images to be read by screen readers

Service

Oct '19 –
Present

Department Service.
Facilitator

- Fall 2019-present: served as a Graduate Student Coordinator who supports all other graduate student volunteers and organizes a quarterly lunch with the department head
- Fall 2020-present: served as a mentor for first year students, teaching them about the department and helping them acclimate to graduate school
- Spring 2022: hosted an event at student visit days to support prospective students who qualify for LEAP Fellows
- Spring 2020-2022: hosted a gender inclusion event at student visit days
- Fall 2020-2021: served as a peer-application mentor for applying students. This involved providing feedback on statements and meeting with students weekly about their application goals
- Winter-Fall 2020: served on G5PAC, the graduate student service committee. Contributed to the development of a teaching certification from our department

Dec '21 – **ASSETS Organizing Committee**.
Oct '22 *Virtual Experience Co-Chair*

- Responsible for planning and executing the virtual experience for the conference, which included hosting social events, running networking events, and maintaining a conference Discord server
- Led paper video accessibility for the event, which involved coordinated a team of 15 student volunteers to review the submissions, identify issues, and work with authors to remediate the concerns

Oct '21 – **Student Disability Commission**.
Jun '21 *Community Outreach Intern*

- Created and hosted monthly town halls to connect with the disabled community on campus and discuss current accessibility issues
- Created and deployed survey tools to understand the accessibility affordances and drawbacks of hybrid learning; analyzed the data from this survey which will be used to inform administrators and educate the student body

Aug '17 – **Girls Who Code**.
May '22 *Facilitator*

- Organize and run weekly chapter meetings for up to 30 girls from grades 6 through 12 by creating lesson plans and helping girls one-on-one with activities that teach them how to code
- Created and taught a workshop that educated members about what accessibility is, how to think about inclusive design, and how to design artifacts so they are accessible for people with a wide range of abilities
- Developed a series of lectures to teach members about web accessibility including how to properly nest content, CSS guidelines, how to properly create links, and more

Jan '21 – **UW Changemakers in Computing**.
July '21 *Facilitator*

- Developed curriculum to teach high schoolers basic Python programming, AI, and tech ethics
- Mentored a group of 5 students closely throughout a summer curriculum and final project
- Taught students lectures on Python basics and ran office hours to help unblock students on assignments
- Organized and hosted the program's final Hackathon

Invited Talks

Oct '23 **Disability, Technology, and Society**, *University of Toledo*, AI and Disability.

Oct '22 **Inclusive Design**, *University of Washington*, Accessible Research.

Oct '22 **Husky Adapt**, *University of Washington*, AI and Disability.

May '22 **Inclusive Design**, *University of Washington*, Accessible Research.

Mar '22 **Disability, Technology, and Society**, *University of Toledo*, AI and Disability.

Feb '22 **Intro to Programming I- Accessibility Guest Lecture**, *University of Washington*.

Oct '21 **Introduction to Disabilities**, *University of Washington*, How to Practice Accessibility in Daily Life.

April '21 **Human Computer Interaction Folk Have Found Disability Studies: Playing Together Well! (Panel)**, *Society for Disability Studies 2021 Conference*, Engaging with Technology and Disability Studies.

April '21 **Future of Access Technologies (Professional Masters Class)**, *University of Washington*, Accessible Design.

Feb '21 **Intro to Programming I- Accessibility Guest Lecture**, *University of Washington*.

Teaching

Sp'21 - Au'23	**CREATE Accessibility Seminar**, *Lead Facilitator*.
Sp'23	**First Year PhD Introduction Course**, *Teaching Assistant*.
Wi'23	**Professional Masters Program Accessibility Course**, *Teaching Assistant*.
Au'20 - Sp'21	**DUB HCI Seminar Facilitator**, *Lead Facilitator*.

References

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Computer Science
Princeton University
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Reviewing

- CHI: 2024, 2023, 2022*, 2020
- UIST: 2023, 2022
- CSCW: 2022
- CHI PLAY: 2020

* Recognized for Outstanding Reviews

Skills

Programming	C++, C#, HTML/CSS, Java, Javascript, Python, R
Tools	Android Studio, Google App Scripts, VS Code
Languages	Conversational American Sign Language