Alexa, Tell Me a Joke!: "Voice Interfaces are Truly Inclusive"

Jaisie Sin
TAGLab & Faculty of Information, University of Toronto, Canada
js.sin@mail.utoronto.ca

Cosmin Munteanu
TAGLab & Institute of Communication, Culture, Information and Technology, University of Toronto Mississauga, Mississauga, Canada
cosmin.munteanu@utoronto.ca

Jenny Waycott
School of Computing and Information Systems, The University of Melbourne
jwaycott@unimelb.edu.au

Robin N. Brewer
University of Michigan, United States
rnbrew@umich.edu

Sergio Sayago
Computer Science and Industrial Engineering Department Universitat de Lleida – Igualada Campus Igualada, Barcelona, Spain
sergio.sayago@udl.cat

Amanda Lazar
University of Maryland, United States
lazar@umd.edu

Astrid Weber
Google Research Mountain View, CA, United States
aweber@google.com

ABSTRACT

Speech and voice interaction is often hailed as a natural form of interaction and thus more inclusive for a larger portion of users. But, how accurate is this claim? In this panel, we challenge existing assumptions that voice and speech interaction is inclusive of diverse users. The goal of this panel is to bring together the broad HCI community to discuss the state of voice interaction for marginalized and vulnerable populations, how inclusive design is considered (or neglected) in current voice interaction design practice, and how to move forward when it comes to designing voice interaction for inclusion and diversity. In particular, we plan to center the discussion on older adults as a representative group of digitally-marginalized populations, especially given that voice interfaces are marketed towards this group, yet often fail to properly include this population in the design of such interfaces.

CCS CONCEPTS

• **Human-centered computing**; • **Natural language interfaces; HCI design and evaluation methods**;

KEYWORDS

voice user interfaces, inclusive design, digital marginalization, older adults

CHI '22 Extended Abstracts, April 29–May 05, 2022, New Orleans, LA, USA

ACM ISBN 978-1-4503-9156-6/22/04.
https://doi.org/10.1145/3491101.3516508

ACM Reference Format:
Jaisie Sin, Cosmin Munteanu, Jenny Waycott, Robin N. Brewer, Sergio Sayago, Amanda Lazar, and Astrid Weber. 2022. Alexa, Tell Me a Joke!: "Voice Interfaces are Truly Inclusive". In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '22 Extended Abstracts), April 29–May 05, 2022, New Orleans, LA, USA.* ACM, New York, NY, USA, 3 pages. https://doi.org/10.1145/3491101.3516508

1 INTRODUCTION AND MOTIVATION

Voice interaction has become a popular and commercially viable way of interacting with digital devices [6]. Voice assistants such as the Google Home and the Amazon Alexa allow users to use their voice to manage their lives through digital means (e.g., through calendar and reminder applications) and connect with essential services (e.g., shopping and ridesharing). Voice interaction has frequently been hailed as more "natural" and "easier-to-use" compared to "traditional" modalities such as GUIs (Graphical User Interfaces). As such, voice interaction is often seen as having much promise in making technology more accessible for certain user groups such as older adults and people living with disabilities.

However, preliminary evidence suggests that we do not yet fully know how to design voice interaction in a way that is inclusive of marginalized and vulnerable populations [9]. For starters, in the case of older adults, we do not yet fully understand their perceptions of and barriers to using voice assistants, how voice assistants should talk to them, and how anthropomorphism plays into their interactions [9]. However, most commercial voice assistants and chatbots, such as Apple's Siri and Amazon's Alexa, are geared towards young or middle-aged people. This design decision can result in older people and other user groups (e.g., people with disabilities) being overlooked in the design of commercial voice-based assistants, and thus foster their exclusion. When voice technology is not designed in a manner that is inclusive of marginalized and

vulnerable people such as older adults, for example by considering their information needs [1], these users face a greater risk of encountering offline social consequences that can push them further towards the margins of society [10].

Attention to the design of voice and speech systems that support diversity and inclusion has rapidly increased over recent years. For instance, open issues in the design of voice systems for older adults was a highlight in the ACM CUI 2019 [9], a conference dedicated to the research and design of voice and speech interaction. Moreover, in the current CHI 2022, matters of design for inclusion and vulnerability is a primary focus on the workshop on the Ethics of Conversational User Interfaces [5]. This panel will build on these community discussions through focused discussions on the design and study of voice user interfaces through the lens of inclusion and diversity, with older adults as an exemplar and starting point.

This panel aims to foster an interdisciplinary dialogue on the challenges to the inclusive design of voice interaction. By engaging the CHI community about inclusive practices for the design of speech-based systems, we aim to encourage interest in and discovery of further research opportunities in the practice and design of more inclusive speech interactions. To do this, in our panel discussions, we will reflect on the state of voice interaction for older adults (as a starting point for a greater discussion of inclusive design of voice interaction for marginalized and vulnerable populations), examine the topic of inclusive design of voice interaction, and discuss how to move forward in this design issue.

2 TOPICS

We will focus on three main areas of discussion: (1) The state of voice interaction for marginalized and vulnerable populations, (2) Practicing inclusive design of voice interaction; and (3) Moving forward in inclusive design of voice interaction. For each of these topics, we focus on older adults as an exemplar population and starting point. We expand on these themes below.

State of voice interaction for marginalized and vulnerable populations. Existing research (e.g., [9] for older adults) provides preliminary insights into the challenges and opportunities that currently exist in relation to voice interaction for marginalized and vulnerable populations. What are the important opportunities, challenges, and open issues when it comes to voice interaction design for marginalized and vulnerable populations, such as older adults? Are there discrepancies between what is lauded by marketing hype compared to what has been found in research (particularly for older adults, as hinted at by [11])? Is voice interaction exclusionary?

Practicing inclusive design of voice interaction. Most digital technologies are designed by and for a narrow subset of people, with inadequate consideration made for some user groups such as older adults [3, 4, 7], resulting in disastrous consequences to the lives of people who are vulnerable or marginalized [2, 8]. The CHI community can (and should) avoid making the same mistakes with voice interaction. In what ways are current approaches to designing voice interactions exclusive of user groups, for example on the basis of age? In what ways does voice interaction and its design marginalize people? Whose responsibility is it to make the systems that employ voice interaction inclusive?

Moving forward in inclusive design of voice interaction. It is important to continue exploring open issues and actively tackle issues of inclusion in relation to voice interaction. For this, we ask: Is voice interaction destined to follow the same path of algorithmic discrimination that other AI-based technologies have taken? How can we bridge knowledge gaps between speech interaction and design inclusive for older adults? What can the CHI community learn from inclusive design practices and, in turn, improve the inclusiveness of such technologies for older adults?

3 AUDIENCE AND PANEL FORMAT

3.1 Expected Audience

This panel is aimed at the entire CHI community. The proposed topics address voice interaction for marginalized and vulnerable populations (with older adults as an exemplar and starting point) through the lens of inclusive design, which is receiving growing academic interest in the speech community at CHI. For this, we expect a diverse audience with varying interests and points of view. The topics proposed for the panel do not require close knowledge of the inner workings of speech interaction or inclusive design. We expect that the panel will encourage contributions and discussions from audience members, regardless of whether or not they consider themselves to be "experts" on these topics or the user population in question.

Our panelists have backgrounds that complement each other. Everyone has significant work in the inclusive design, but in a diverse array of applications including voice interfaces, virtual reality, creative expression, and dementia. Our hope is for this diversity to provoke a vigorous and interesting debate on issues related to inclusive design, usability and usefulness, and adoption of voice interaction that will be engaging for the audience.

3.2 Panel Proceedings

The panel will open with a brief introduction and statements from each of the panelists. Then, the panel will debate each topic one at a time, with the questions raised in each topic helping guide the discussion. Some of the questions may be directed to specific panelists, with the aim of eliciting diverse (and occasionally, opposite) viewpoints, with the remaining panelists contributing follow-up comments. Throughout the discussions, we will use a Sli.do poll (we might use other platforms) for the audience to submit and vote for specific questions and comments they want addressed. When each of the panelists have had a turn to comment on a given discussion topic, these questions and comments will be used to further the discussion in a manner that allows the audience to interact with the panelists, before the panel moves onto the next discussion topic. Finally, the panel will close with brief concluding statements from the panelists.

4 PANELISTS

Jaisie Sin (Organizer & Panelist) is a PhD candidate at the Technologies for Ageing Gracefully Lab and the Faculty of Information at the University of Toronto. Her research focuses on the inclusive design of voice interfaces for underrepresented users like older adults through the lens of the potential offline consequences (digital

marginalization) of digital design. She holds a Master of Information (MI) from the University of Toronto and an Honours Bachelor of Science (HBSc) in Computer Science and Neuroscience from the University of Toronto.

Cosmin Munteanu (Organizer & Moderator) is an Associate Professor at the Institute for Communication, Culture, Information, and Technology at University of Toronto Mississauga. His research includes speech and natural language interaction for mobile devices, mixed reality systems, learning technologies for marginalized users, usable privacy and cyber-safety, assistive technologies for older adults, and ethics in human-computer interaction research.

Jenny Waycott (Panelist) is an Associate Professor in the Human-Computer Interaction research group in the School of Computing and Information Systems, The University of Melbourne. Her work broadly aims to understand how new technologies can be designed and used to foster social wellbeing in later life. She leads a program of research that examines how emerging technologies, such as virtual reality, social robots, and voice assistants, are used by caregivers and older adults to provide social and emotional enrichment in later life, especially for people living in aged care. Ultimately, this research aims to improve how we design and deploy technologies with older adults, especially in aged care, where a respectful and empathetic approach is critical to ensure new technologies provide benefit without causing harm.

Robin Brewer (Panelist) is an Assistant Professor in the School of Information at the University of Michigan. Her research lies at the intersection of accessibility and social computing where she studies how older adults and disabled people engage with technology, leveraging strengths of these communities to design for creativity, expression, and agency. Dr. Brewer holds a Ph.D. in Technology and Social Behavior from Northwestern University, M.S. in Human-Centered Computing from University of Maryland - Baltimore County, and B.S. in Computer Science from the University of Maryland - College Park.

Sergio Sayago (Panelist) is an Assistant Professor in Human-Computer Interaction at University of Lleida (Spain). His research focuses on older people, ageing, and digital technologies, from a qualitative (mostly ethnographic) perspective. His long-term research goals are to understand and improve ageing (and living) with existing digital technologies, and to bring insights developed from ethnographic studies to help in the design of technological tools that will be a good fit for people who use them.

Amanda Lazar (Panelist) is an assistant professor in the College of Information Studies at the University of Maryland, College Park. Her research lies at the intersection of Human-Computer Interaction (HCI) and Health Informatics. Much of her work addresses how technologies designed for health and wellbeing position and support individuals as they age, with a focus on dementia. Amanda's work on voice assistants (with PhD candidate Alisha Pradhan) involves working with older adults with and without voice assistant experience, and examines both current use and future possibilities.

Astrid Weber (Panelist) is a UX Research Manager at Google's headquarters in California. She leads the YouTube Rapid Research team which conducts research on all aspects of the user-facing parts of the platform. She holds a Master's degree in Communication Sciences and Design from the University of the Arts in Berlin and a Bachelor of Arts from the Art Institute of Chicago. Her research focuses on accessibility, speech interfaces and technology in the context of migration.

REFERENCES

[1] Simon Coghlan and Jenny Waycott. Swipe a Screen or Say the Word: Older Adults' Preferences for Information-seeking with Touchscreen and Voice-User Interfaces. 22.

[2] Virginia Eubanks. 2018. *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. St. Martin's Publishing Group.

[3] Peter Gregor, Alan F Newell, and Mary Zajicek. Designing for Dynamic Diversity - interfaces for older people. 6.

[4] Vicki L. Hanson. 2010. Influencing technology adoption by older adults. *Interacting with Computers* 22, 6: 502–509. https://doi.org/10.1016/j.intcom.2010.09.001

[5] Minha Lee, Jaisie Sin, Guy Laban, Matthias Kraus, Leigh Clark, Martin Porcheron, Benjamin R Cowan, Asbjørn Følstad, Cosmin Munteanu, and Heloisa Candello. Ethics of Conversational User Interfaces. 10.

[6] Michael McTear, Zoraida Callejas, and David Griol. 2016. *The Conversational Interface. Talking to Smart Devices*. Springer.

[7] Alan F. Newell. 2011. Design and the Digital Divide: Insights from 40 Years in Computer Support for Older and Disabled People. *Synthesis Lectures on Assistive, Rehabilitative, and Health-Preserving Technologies* 1, 1: 1–195. https://doi.org/10.2200/S00369ED1V01Y201106ARH001

[8] Safiya Umoja Noble. 2018. *Algorithms of oppression: How search engines reinforce racism*. nyu Press.

[9] Sergio Sayago, Barbara Barbosa Neves, and Benjamin R Cowan. 2019. Voice assistants and older people: some open issues. In *Proceedings of the 1st International Conference on Conversational User Interfaces - CUI '19*, 1–3. https://doi.org/10.1145/3342775.3342803

[10] Jaisie Sin, Rachel L. Franz, Cosmin Munteanu, and Barbara Barbosa Neves. 2021. Digital Design Marginalization: New Perspectives on Designing Inclusive Interfaces. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–11. https://doi.org/10.1145/3411764.3445180

[11] Jaisie Sin, Cosmin Munteanu, Numrita Ramanand, and Yi Rong Tan. 2021. VUI Influencers: How the Media Portrays Voice User Interfaces for Older Adults. In *CUI 2021 - 3rd Conference on Conversational User Interfaces*, 1–13. https://doi.org/10.1145/3469595.3469603