Voice-Activated AI for Stuttered Speech Convergence Symposium

Thank you for joining our virtual multidisciplinary stakeholder conference for the development of fair and accessible voice-activated AI technologies for people who stutter.

Making sure every voice is heard.

Agenda

9:00-9:30 Welcome and Overview

9:30-11:30 Session One: Voice-Activated AI and People Who Stutter

11:30-12:30 Lunch

12:30-2:30 Session 2: Voice-Activated AI in Hiring

2:30-3:00 Break

3:00-5:00 Session 3: Sociotechnical Challenges in Voice-Activated AI

5:00 - 5:30 General Discussion / Wrap-up

Welcome and Overview

9:00-9:30

Thank you for joining us! We are looking forward to hearing from a variety of perspectives and disciplines to help us develop fair and accessible voice-activated AI for people who stutter. Our project would not be possible without your participation. We will provide an overview of our project as well as introductions from each team member. We will also provide expectations related to the virtual environment of today's events.

Session One: Voice-Activated AI and People Who Stutter

9:30AM - 11:30AM

The development of speech recognition technologies do not consider the speech differences of people who stutter. Panelists in this session will discuss their personal challenges and experiences of using voice-activated AI. Opportunities for the improvement of these technologies will be covered as well as how voice-activated AI could be beneficial for people who stutter. An open discussion with all attendees will follow.

Moderator: Caryn Herring.

Caryn Herring, MS, CCC-SLP, is a person who stutters, an SLP, and a doctoral candidate at Michigan State University. Her research interests include the process of desensitization, exposure therapy, and the impact of voluntary stuttering. She is involved in stuttering support organizations as a co-host of StutterTalk and the Chairperson of Friends–The National Association of Young People Who Stutter.

Panelists

Jia Bin is a doctoral student at Michigan State University. Jia earned her undergraduate degree in English Language and Literature in China

and two master’s degrees in Secondary Education and Communicative Sciences and Disorders in the U.S. Jia's own journey of being a person who stutters, and an inter-cultural communicator motivate her to pursue a doctorate in CSD to help the people with communication challenges and bring people from various cultural backgrounds together.

Leigh Clark, PhD, is a Senior UX Researcher at Bold Insight UK, a research agency focused on user-centric approaches to improving product development. Leigh’s research focuses on interaction through speech and text-based interfaces and improving these interactions for people who stutter and other communication differences. He was previously a lecturer in Human-Computer Interaction at Swansea University and is a co-founder of the ACM Conversational User Interfaces (CUI) conference series.

Benji Schuessman is a person who stutters and a Junior at Duke University studying Computer Science and Physics. Benji has led a series of presentations to raise awareness on stuttering, was a featured speaker at the 2019 American Institute for Stuttering Gala, and published an opinion article in NBC News on Joe Biden’s stutter. He has also worked as a software engineer intern at Meta, and conducted machine learning research on accessible speech recognition systems for people who stutter.

Gareth Walkom is the founder of withVR, a company that produces virtual reality tools to customize speaking situations for people who stutter in the therapy setting. Gareth conducted extensive research and published on the use of virtual reality in speech therapy for people who stutter. He also speaks at international events to advocate for people who stutter and utilizes his voice to empower others to use theirs.

Iain Wilke is the founder of 50 Million Voices an organization that aims to bring acceptance of stuttering to the workplace. He is also an executive coach specializing in working with quiet leaders and a trustee of the UK's Business Disability Forum. Iain previously served for 21 years as an equity partner at global professional services firm EY. He frequently speaks about stuttering in the workplace, including on recent TEDx and Podcast talks both entitled 'The Gift of Stuttering'.

Session Two: Voice-Activated AI and Hiring

12:30PM - 2:30PM

Many employee selection tools have incorporated automated voice recognition in some way – from asynchronous video interviews, automated phone interview screens, interactive simulations. This panel will include a discussion on how these approaches create barriers and challenges for those with different speech patterns, how accommodations are currently considered, and ideas for greater inclusion in the future.

Moderator: Ann Marie Ryan, PhD

Dr. Ann Marie Ryan is a professor of organizational psychology whose research interests involve improving the quality and fairness of employee selection methods, and topics related to diversity and justice in the workplace.

Panelists

Renee Barr, PhD, is a Senior Research Scientist for Amazon Global Hiring Science, which conducts research on new technologies to ensure product development that will improve the lives of their customers. Renee's work focuses on making the hiring processes using AI speech recognition accurate, fair, and accessible in large volume hiring contexts.

Emily McElmurry is the Director of Vocational Services at Peckham, a non-profit vocational rehabilitation organization that provides job and training opportunities for people with disabilities. Emily leads a team of vocational rehabilitation specialists who work with adults with disabilities to find meaningful employment.

Brent Lyons is an Associate Professor of Organization Studies at the Schulich School of Business at York University and the York Research Chair in Stigmatization and Social Identity. His research involves the study of

stigma in organizations and how individuals with stigmatized social identities, such as disability, navigate their work and interpersonal relationships to reduce consequences of stigmatization.

Jone Papinchock, PhD, is a Director of Litigation Support and Principal Consultant with DCI Consulting. Jone has extensive experience as an Industrial and Organizational Psychologist and provides consulting and testifying expert witness services for lawsuits alleging disability discrimination.

Session 3: Sociotechnical Challenges in Voice-Activated AI

Time: 3:00PM-5:00PM

Voice-activated artificial intelligence (*voice AI*) is becoming increasingly pervasive in mediating our interactions with people, organizations, and smart devices in our physical and virtual environments in myriad application contexts. However, assumptions about human ability embedded into these systems across AI lifecycle stages—from planning, design, training, and development to evaluation, deployment, and use—threaten to further exclude people who stutter or have other speech differences from technological innovations, and even actively discriminate against them. In this session, we will discuss the limitations of current state-of-the-art voice AI systems in terms of their accessibility and fairness for people with atypical speech, their causes and consequences, and ideas for greater inclusion and fairness in the future.

Moderator: Nihar R. Mahapatra, PhD

Dr. Nihar R. Mahapatra is an Associate Professor of Electrical and Computer Engineering at Michigan State University. His current research is centered around AI fairness and accessibility, natural language processing,

AI and the future of work, bio- and cheminformatics, smart species identification, use-inspired AI, and embedded cyber-physical systems.

Panelists

Danielle Bragg is a Senior Researcher at Microsoft Research. Her work focuses on developing computational systems that expand access to information, in particular for people with disabilities (sign language users and low-vision readers). Her work is interdisciplinary, combining human-computer interaction, applied machine learning, and accessibility. She holds a PhD in Computer Science from the University of Washington, and a BA in Applied Mathematics from Harvard University.

Asmelash Teka Hadgu is the co-founder and CTO of Lesan and a fellow at the Distributed AI Research Institute (DAIR). At Lesan, he has built state-of-the-art machine translation systems to and from Amharic, Tigrinya and English. Prior to Lesan, Asmelash did his PhD at the Leibniz University Hannover where his research focused on applied machine learning for applications in scholarly communication, crisis communication and natural language processing in low resource settings. Currently, as part of the Lesan-DAIR partnership, he is working on language technologies such as Automatic Speech Recognition for Ge’ez based languages such as Tigrinya and Amharic.

Colin Lea is a Research Scientist at Apple working on machine learning for accessibility. Much of his recent focus has been on the development of new technologies centered on the needs of individuals with speech or motor-speech disabilities. He led the development of Sound Actions for Switch Control, an iOS15 feature that enables you to use nonverbal sounds like "pop" or "click" to interact with an iPhone or iPad and has contributed to various efforts towards improving speech recognition for people who stutter, including Siri Pause Time.

Brian MacWhinney is Teresa Heinz Professor of Psychology, Computational Linguistics, and Modern Languages at Carnegie Mellon University. His Unified Competition Model analyzes first and second language learning as aspects of a single basic system. In 1984, he and Catherine Snow co-founded the CHILDES (Child Language Data Exchange System) Project for the computational study of child language transcript data. This system has extended to 13 additional research areas, including L2 learning and code-switching from dozens of languages in the form of the TalkBank Project. MacWhinney's recent work includes studies of online learning of second language vocabulary and grammar, neural network modeling of lexical development, fMRI studies of children with focal brain lesions, and ERP studies of between-language competition. He is also exploring the role of grammatical constructions in the marking of perspective shifting and the construction of mental models in scientific reasoning. Recent edited books include The Handbook of Language Emergence (Wiley) and Competing Motivations in Grammar and Usage (Oxford).

Kathleen Preddy is a natural language processing (NLP) Scientist with HireVue, architecting NLP for the HireVue Hiring Assistant and building AI that improves the ease and equitability of the hiring process for everyone. Her areas of expertise include dialogue systems, question answering, text similarity, text classification, and semantic representations. She has several years of industry experience in NLP and holds her M.S. in Computational Linguistics from the University of Washington.

Nan Bernstein Ratner is a Professor of Hearing and Speech Sciences/Cognitive Science and Cognitive Neuroscience at The University of Maryland, College Park. She has worked for many years in the field of fluency disorders, as well as computer-assisted speech/language sample analysis. With Brian MacWhinney, she co-founded FluencyBank, which has been used by the majority of recent work in ASR algorithms to detect/ignore

stuttering in spoken samples. She is currently investigating, with Brian MacWhinney, the interactions between phonological skill and fluency breakdown in children.

Irina-Elena Veliche is an ML software engineer at Meta, in the Speech Recognition team. She has worked on ASR for various projects and products over the years: on products like Ray-Ban stories, Oculus, Portal and video captioning. She has worked on language expansion and lately leads the Fairness and Inclusion work on Speech. Her upcoming paper at ICASSP this year focuses on improving fairness and robustness of models in a privacy preserving way.

Shaomei Wu is the founder and CEO of AImpower.org, a tech nonprofit that researches and co-creates empowering technologies for and with marginalized communities. Previously, she was a staff research scientist at Facebook AI & Instagram, leading various "tech for good" initiatives from Accessibility, AI for Inclusion, to Racial Equity. She works at the intersection of HCI, AI, accessibility, and computational social sciences. She is a covert stutterer but has been working on stuttering openly.

General Discussion/Wrap-up

Description: The purpose of our symposium is to learn from our stakeholders on how to improve voice-activated AI for people who stutter. We will be sending a short survey via Qualtrics for your thoughts on today's discussions. In addition, we will meet as a team and review what we learned and the next steps to make sure that every voice is heard.

NSF Acknowledgement of Support and Disclaimer:

This material is based upon work supported by the National Science Foundation under Award No. 2235916.

Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.