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# CUI@CSCW: Collaborating through Conversational User Interfaces

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**ABSTRACT**

This virtual workshop seeks to bring together the burgeoning communities centred on the design, development, application, and study of so-called Conversational User Interfaces (CUIs). CUIs are used in myriad contexts, from online support chatbots through to entertainment devices in the home. In this workshop, we will examine the challenges involved in transforming CUIs into everyday computing devices capable of supporting collaborative activities across space and time. Additionally, this workshop seeks to establish a cohesive CUI community and research agenda within CSCW. We will examine the roles in which CSCW research can contribute insights into understanding how CUIs are or can be used in a variety of settings, from public to private, and how they can be brought into a potentially unlimited number of tasks. This proposed workshop will bring together researchers from academia and practitioners from industry to survey the state-of-the-art in terms of CUI design, use, and understanding, and will map new areas for work including addressing the technical, social, and ethical challenges that lay ahead. By bringing together existing researchers and new ideas in this space, we intend to foster a strong community and enable potential future collaborations.

**CCS CONCEPTS**

• **Human-centered computing** → **Natural language interfaces**; *Collaborative and social computing systems and tools*.

**KEYWORDS**

cuis; voice interfaces; vuix; cscw; collaboration; social interaction; accessibility; group work

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## BACKGROUND

This one-day workshop will examine the design and use of Conversational User Interfaces (CUIs) for collaboration. Research on CUIs has been reignited across disciplines by the recent surge in availability of commercially-available systems on smartphones as voice assistants [16], websites as chatbots [8], and as smart speakers in homes [15] and public spaces ranging from slums [18] to museums [2]. These systems are being used for a wide range of purposes and are enabling technology to become accessible to wider audiences including, but by no means not limited to, older adults [21], children [20], non-native speakers [23, 24], and the visually impaired [19].

Many CUI interactions tend to be designed with a dyadic task-oriented conversation in mind, even though popular voice-based CUIs such as Amazon Alexa and smartphone-based IPAs are often used in social or informal spaces, thereby becoming an active participant in collaborative multi-party tasks (e.g. [16]). CUIs also present new opportunities to support connecting people between spaces, either within or across homes. The nature of these interfaces as collaborators and how to best design for collaborative interactions with these devices remains a pressing challenge. The inclusion of CUIs to enable or support collaboration, either as facilitators or active participants, leads to a number of multi-disciplinary challenges that the CSCW community could be critical in shaping.

Additionally, approaches to designing CUIs remain relatively unexplored, despite the emergence of large third-party 'Skill' stores. While the development of CUIs naturally involves machine learning specialists, many other disciplines such as linguistics [11], psychology [4], sociophonetics [22], and conversation analysis [7] also informs their design and development. Understanding the roles of how non-machine learning specialists are involved in collaborative development processes remains a fundamental challenge in broadening access to programming and software development.

A significant amount of CUI research has explored single-party interactions [3], often noting significant differences in how machine and human dialogue partners are perceived [6], how this impacts on language production in human-machine dyads [5], and how the design of existing CUI systems such as intelligent personal assistants (IPAs) can lead to a gulf in expectation between perceived and actual performance [5, 6]. With devices such as IPAs often being deployed in social and public spaces (e.g. [15, 16, 18]), multi-party and mixed agent-user conversations, often involving voice, require further understanding to successfully support collaborative working.

Finally, CUIs can contribute to people's mental well-being via inviting therapeutic self-disclosure [13], increasing self-compassion [12], and via engaging in active listening [25]. Ongoing challenges exist in understanding patient safety, measuring health outcomes and providing standardised evaluation methods [10], which are beginning to be tackled in recent workshops [9]. Through greater involvement within CSCW, we believe research and development of CUIs can further develop in this space, and all the topics highlighted above.

### WORKSHOP AIMS

This workshop is intended for members of the CUI community with work in CSCW realm, and vice versa. Prior workshops have focused on broader ideas, such as grand challenges [1], theoretical and methodological perspectives [14], and voice-based interactions only [17], but here we want to specifically address issues cognisant to this overlap between the CUI and CSCW communities:

- Examine key ideas around the notion of how individuals or groups collaborate with or through CUIs (voice or text-based)
- Re-imagine CUIs as *everyday computing interfaces*
- Discuss the strategies for studying and designing CUIs within CSCW's understanding of group work and collaboration
- Explore parameters and issues needing to be considered in designing CUIs for multi-agent, multi-user conversations and tasks
- Understand the challenges in designing inclusive CUIs that accommodate and are sensitive to a wider range of personal, social, and cultural contexts, especially in multi-party interactions

Furthermore, there are specific and timely issues that we wish this workshop to raise, including:

- How can CUIs enhance or support an individual's personal health and wellbeing?
- How can CUIs support individuals who may be (self) isolating/shielding?
- How can the community address issues of biased or problematic AIs and enable CUIs to be used by the most diverse range of people, irrespective of age, ethnicity, or gender?
- How can we address existing CUI and VUI usability issues that limit accessibility to both general and underrepresented populations (older adults, users with vision/mobility impairments, etc.)?
- How can CUIs become a way for individuals with low literacy or access to technology to interact with digital media and the Internet?
- How can CUIs be created in a collaborative way by a diverse range of people, especially by non-machine learning experts?

### ORGANISERS

**Martin Porcheron** is a Lecturer in the Computational Foundry at Swansea University. His work examines the use of new technologies such as conversational interfaces in multi-party settings like pubs and the home. He has recently co-organised workshops at CHI '18-'20 and CSCW '16-'17 on topics including collocated interaction with technologies and conversational user interfaces. He is a member of the CUI conference series steering committee.

**Leigh Clark** is a Lecturer in Human-Computer Interaction at the Computational Foundry in Swansea University. His research examines the effects of voice and language design on speech

interface interactions and how linguistic theories can be implemented and redefined in this context. He is co-founder of the international Conversational User Interfaces (CUI) conference series.

**Matt Jones** is a Professor of Human Computer Interaction at Swansea University. His interests lie in the intersection of emerging technologies and emergent users (in places such as rural and urban informal settlements in India). This has involved exploring speech interfaces for information retrieval and creation. More at [undofuture.com](http://undofuture.com).

**Heloisa Candello** is an interaction designer and a research scientist at the IBM Research laboratory in Brazil. She is also a research scientist at ACM SIGCHI Volunteer Development Committee. She has experience in leading and conducting design research activities to understand people's contexts and motivations to use conversational technologies. She recently co-organized a related workshop at CSCW '17, CHI '18, and the prior workshop CUI@CHI '20. She is a member of the CUI conference steering committee.

**Benjamin R. Cowan** is an Assistant Professor at University College Dublin's School of Information & Communication Studies. His research lies at the juncture between psychology, HCI and computer science in investigating how theoretical perspectives in human communication can be applied to understand phenomena in speech based human-machine communication. He has published widely on user centered issues in conversational and speech interface interaction, is co-founder of the international Conversational User Interfaces (CUI) conference series and has been involved in a number of workshops on this topic at CHI and Mobile HCI.

**Christine Murad** is a graduate student at the Technologies for Aging Gracefully lab in the Department of Computer Science at the University of Toronto. Her research looks at the usability and design of conversational voice interfaces, and exploring the development of different tools and resources to aid in intuitive and user-friendly conversational voice interaction. She recently co-organized a related workshop at CHI '19 and CHI '20, and is also on the CUI conference steering committee.

**Jaisie Sin** is a graduate student at the Technologies for Aging Gracefully Lab and the Faculty of Information at the University of Toronto, in Toronto, Canada. Her research focuses on older adults' use of technology, in particular of speech-based interfaces, and inclusive design from the perspective of preventing digital marginalization. She recently co-organized a related workshop at CHI '20.

**Matthew P. Aylett** is Chief Scientific Officer and co-founder of CereProc, an Edinburgh-based technology company that creates advanced text-to-speech solutions. Dr Aylett, who holds a PhD in Speech and Language Technology from the University of Edinburgh, is recognised by both industry and academia as a world leader in speech technology research and development. His work at CereProc focuses on combining a passion for innovative and disruptive technology while creating individual, engaging and emotional voices that change how we interact with and experience technology.

**Minha Lee** is a PhD candidate in Human-Technology Interaction and Philosophy & Ethics groups of Eindhoven University of Technology. She is an incoming assistant professor at the department

of Industrial Design of the same university. She researches on morally relevant interactions with CUIs, particularly on promotion of well-being through positive moral emotions like compassion. Her recent work finds that our well-being can be promoted through conversations with digital entities, for example in becoming more self-compassionate via talking compassionately to a chatbot.

**Cosmin Munteanu** is an Assistant Professor at the Institute for Communication, Culture, Information, and Technology at the University of Toronto Mississauga, and Director of the Technologies for Ageing Gracefully lab. His research is focused on investigating information-rich media and intelligent technologies, such as speech interfaces, for several applications: mobile devices, mixed reality systems, and learning and assistive technologies for marginalized users. He has co-organized numerous workshops, panels, and courses on the topic of voice interaction at SIGCHI and industry conferences, and has been part of the steering committee for the Conversational User Interfaces (CUI) conference series since its inception.

**Joel E. Fischer** is an Associate Professor in HCI at the University of Nottingham, UK, and a member of the Mixed Reality Lab. His CUI research often applies a conversation analytic view to examine turn-by-turn interaction with VUIs, and how this becomes socially embedded in conversations in everyday life.

**Philip R. Doyle** is a PhD candidate in Human-Computer Interaction at University College Dublin, specialising in studying user perceptions of CUIs as dialogue partners. Adopting theory and methodological practices from cognitive psychology, Philip has published research at CHI, CUI, MobileHCI, IJHCI and is also a member of the current CUI steering committee. In addition to his main area of research, Philip also has a strong interest in ethics and transparency in CUI design.

**Jofish Kaye** is Principal Research Scientist at Mozilla in the Emerging Technologies team. He manages a team focusing on open voice products, tools, and technologies.

### PRE-WORKSHOP PLANS

We will use our website—<http://www.speech-interaction.org/CSCW2020/>—and networks within the CUI community (some workshop organisers are involved in the ACM in-cooperation CUI conference series) to promote the workshop, as well as the website. We will include our aims, agenda, outcomes, dates and biographies on our website. We will also post accepted position papers.

The call for positional papers will ask for 3–6 page papers in the ACM SIGCHI Extended Abstract template (i.e. this template), including references. Papers should describe how their work relates to the workshop topic or respond to one of the challenges highlighted above, or any other key topic that authors feel should be addressed by the community. We will especially prioritise papers that respond to pressing social topics, including remote working, isolation, and healthcare. We are ambitious for papers to be diverse in terms of topic, discipline, and approach, and workshop participation to be open and accessible to all people. We will accept 20 position papers for the workshop.

In addition to papers, we will invite the submission of one-page position statements for participants who wish to join the workshop without submitting a paper. In our past experiences we have found that this option is particularly attractive to industry-based researchers.

## **PARTICIPANTS**

Our workshop aims to bring together 30–50 world-leading researchers and industry representatives from a range of communities related to speech, dialogue, human-machine interaction, speech interface design, and voice UX to bring a multidisciplinary approach in solving these issues. Through engaging across these communities, we aim to highlight the relevance and broaden the reach of speech interface work at CSCW and within HCI in general to other research communities (e.g. speech technology, linguistics, dialogue research, cognitive sciences), whilst also building a collaborative, diverse and cross-disciplinary conversational interaction community that is strongly connected to CSCW. We had over 60 participants at the CUI 2019 conference in Dublin, Ireland, over 100 participants at our virtual CUI 2020 conference, and more than 30 participants at our recent CHI 2020 workshop [1]. We are thus confident that we will be able to attract similar levels of interest at CSCW.

## **WORKSHOP STRUCTURE**

Based on our experience of previously organising a virtual workshop, we propose the following structure. The maximum length of the workshop will be four hours to avoid fatigue and the likely impact home-working and timezones will have on people's availability to attend a longer workshop.

- (1) **Introductions:** Brief introductions from organisers and participants on workshop structure, goals, and interest in CUI research
- (2) A number of sessions in which there will be:
  - **Presentations:** *Very* short presentations from accepted submissions
  - **Breakout discussion:** A discussion in one or more groups (based on numbers/topics) on the topics raised in the sessions
  - **A short break:** Lengthy online workshops become tiring for everyone very quickly
- (3) **Group discussion:** There will be a regrouping towards the end of the workshop where sub-groups will feedback. We will allow time for a short discussion.
- (4) **Next steps:** The chairs will briefly lead a discussion on the next steps for the CUI and CSCW communities

As a large group of organisers, we will each work to facilitate discussions and events throughout, for example by keeping notes and chairing breakout discussions.

### **POST-WORKSHOP PLANS**

We expect the workshop will:

- Reconnect and foster the community of research and development of CUIs in CSCW
- Bring practitioners and researchers from across industry and academia together to examine CUIs in the CSCW context, as well as exploring the need for a CSCW focus within CUI research
- Identify specific challenges in line with CSCW's concerns of technologies that affect groups, organisations, communities, and networks
- Consider proposing joint publications or/and special issue of a journal

### **WORKSHOP WEBSITE**

We will host a website at <http://www.speech-interaction.org/CSCW2020/>, which will include a copy of the call for participation, our workshop aims and hopeful outcomes, agenda, biographies, and contact information. We will upload copies of the accepted papers before the workshop.

### **CALL FOR PARTICIPATION**

We invite researchers from academia and practitioners from industry working in conversational user interfaces to submit position papers to the virtual CUI@CSCW workshop. This workshop seeks to bring together the burgeoning communities centred on the design, development, application, and study of Conversational User Interfaces (CUIs). We will examine the challenges involved in transforming CUIs into everyday computing devices capable of supporting collaborative activities across space and time. Additionally, this workshop aims to establish a cohesive CUI community and research agenda within CSCW and examine the roles in which CSCW research can contribute insights into understanding how CUIs are or can be used in various settings. By bringing together existing researchers and new ideas in this space, we intend to foster a strong community and enable potential future collaborations.

Submissions should be between 3 to 6 pages in the ACM SIGCHI Extended Abstract template, including references. The submission should describe the authors' work related to the workshop challenges highlighted above, or any other key topic that authors feel should be addressed by the community. We will especially prioritise papers that respond to pressing social topics, including remote working, isolation, and healthcare. We are ambitious for papers to be diverse in terms of topic, discipline, and approach, and workshop participation to be open and accessible to all people. At least one author of each accepted paper must register for the conference and attend the workshop.

### **ACKNOWLEDGMENTS**

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