

# Participatory Design for Whom? Designing Conversational User Interfaces for Sensitive Settings and Vulnerable Populations

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# Participatory Design for Whom? Designing Conversational User Interfaces for Sensitive Settings and Vulnerable Populations

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## ABSTRACT

Conversational User Interfaces (CUIs) are becoming increasingly applied in a broad range of sensitive settings to address the needs and struggles of vulnerable or marginalized users. Sensitive settings include, for instance, CUIs mediating the communication difficulties of people with dementia or supporting refugees to cope with new cultural practices as a chatbot on a government website. While researchers are increasingly designing CUIs for such sensitive settings, methods and participatory design approaches to address vulnerable user groups' highly sensitive needs and struggles are sparse in research thus far. This workshop aims to explore how we can design CUIs for and in sensitive settings with vulnerable users in mind through the participatory design process. We aim to establish a working definition of vulnerability, sensitive settings, and how practice-oriented design of CUIs can be inclusive of diverse users.

## CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**; *HCI theory, concepts and models*.

## KEYWORDS

Ethics, conversational user interface, CUI, participatory design, sensitive settings, vulnerable populations

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## 1 BACKGROUND

Within various domains, researchers have been exploring the implications of technologies in sensitive settings to address the lived experiences and struggles of vulnerable users [7, 8, 14]. In this context, Conversational User Interfaces (CUIs) are becoming increasingly applied in a wide range of sensitive settings, such as supporting people to deal with mental health issues [4], assisting people with neurodevelopmental challenges [2], and empowering marginalized or disadvantaged communities in society by making CUIs accessible [12]. CUIs offer potential benefits for vulnerable populations by providing real-time, accessible, and tailored support in response to the lack of human resources or unclear information in existing support services, such as in clinical contexts [10], government administrations [3], or mental health workers [4]. For example, CUIs support people with cognitive disabilities in accessing online information or scheduling activities [15]. CUIs can also support people disadvantaged by social or cultural circumstances, such as immigrating between countries and facing challenges related to new cultural practices [3].

A similar technology that has been recently discussed to support the lack of human resources in sensitive contexts is Social-Assistive Robots (SAR). Especially when it comes to vulnerable people, such as people with dementia, SARs have the interactive potential to improve the psychological well-being of residents in terms of positive feelings and general mood and to decrease stress and depression levels [6]. SARs promote engagement in meaningful social activities, help externalize internal emotions and increase participation and social activities [5]. Participation in a conversation can also create a sense of belonging, with people with dementia being recognized for their basic needs and social contributions [6]. In the context of participatory design for and with vulnerable populations in sensitive settings, interactive artifacts such as CUIs or SARs may have a different impact on the individual lives and social ecosystems than what was initially intended. The individual appropriation and social integration of technical artifacts into everyday life thus seem to be crucial for appropriation and integration into routines, practices, and sustainable use [1, 13]. Therefore, there is a need for methods and participatory design approaches to allow vulnerable users to express their lived experiences, struggles, social contexts, and everyday needs during the development of interactive technologies, such as CUIs.

Participatory Action Research (PAR) emphasizes the process of jointly conducting research, action, and reflection with participants while explicitly recognizing the potential conflicts and negotiation of stakeholder positions, which is crucial for collective participation, inquiry, and empowerment [11]. The process of PAR ideally tends to be cyclical, whereby researchers and participants jointly develop the project goals, identify problematic issues or situations, devise context-specific methods of inquiry, conduct research, analyze or critically reflect on emerging outcomes, and undertake necessary actions. This cyclical process of research, action, and reflection allows researchers and participants to learn from each iteration of the inquiry while informing how to adapt their goals, methods, analytic interpretations, and actions [9]. PAR requires a deep commitment in interest, time, and resources on the part of both researchers and willing participants to build trusting relationships, ensuring there is sufficient capacity or training to enable participants to engage more fully as co-researchers, facilitating an open exchange of ideas and critique among all involved, and having the ability and desire to enact the changes or actions needed to transform the situation.

## 2 WORKSHOP AIMS

With this workshop, we aim to explore the ethical dimensions and boundaries of engaging vulnerable users in the design process of CUIs in sensitive settings. In particular, we will focus on identifying suitable participatory design practices for CUI development in sensitive settings. With this workshop, we aim to engage participants to collectively:

- create workable definitions of vulnerability, inclusion, and sensitive settings relevant to the design of CUIs;
- identify processes and challenges that can facilitate or inhibit meaningful design of CUIs for sensitive settings;
- establish best practices as part of a manifesto to inform future research, design, and development of CUIs by academia, industry, and public sector stakeholders.

As vulnerability is often present regardless of field or industry, we invite researchers and practitioners from all disciplines to participate in the workshop to ensure the interdisciplinary applicability of the workshop outcomes.

## 3 PRE-WORKSHOP PLANS

Position papers are *not required* for attending this workshop. However, we ask all participants to submit a statement of interest, including their name, affiliation, short biography, background, what they expect from the workshop, and what discussion topics they are interested in. In addition to a statement of interest, we do encourage participants to submit a position paper in which they briefly describe their work with CUIs and, if possible, how they think vulnerability may play a role in their particular research question or application (up to 2 pages, no preferred format). These examples may be used both for guiding the workshop and as scenarios against which to test any resulting definitions and procedures. Position papers must be submitted to [m.houben1@tue.nl](mailto:m.houben1@tue.nl), including "CUI23 Sensitive Settings workshop" in the email subject line.

All information for the workshop will be available on a website (<https://maartenhouben.be/cui23-workshop>), such as the call for participation, the workshop aims and structure, the background

of the organizers, and all practical information. Accepted position papers will also be posted on the workshop website after the notification deadline before the workshop. We aim to include participants with diverse backgrounds, spanning not just research but also industry. This diversity is also reflected in the organizing team, as one of the organizers is from industry. We will use a combination of internal messaging, reaching a large group of industry and public sector organizations that already deploy CUIs, as well as LinkedIn and Slack to tap into existing networks. Moreover, we strive to reach a diverse background in terms of disciplines - public sector, healthcare, customer service, etc. - as vulnerability and sensitive settings are not limited to a specific application domain. All the organizers have specific research experiences and expertise in various areas and will personally invite potentially interested participants working in these fields.

## 4 CALL FOR PARTICIPATION

As described in the section on Pre-Workshop Plans, position papers are welcome but not necessary for participation. However, we invite the participants to share their experiences and expertise in various topics concerning CUIs and vulnerability. As CUIs permeate all layers of society, it becomes ever more important to ensure no one is left out. Sensitive situations arise in many variants and contexts, and CUIs will always be used by vulnerable users regardless of the application domain. At the same time, CUIs provide opportunities to reach parts of society that would otherwise be left out - but only if we manage to identify these groups. However, it remains challenging to identify or assess such situations properly for researchers and industry. As a consequence, vulnerable users may be insufficiently involved in the design and development of a CUI. Access to vulnerable users may be difficult, yet categorizing groups of people without their explicit involvement or consent is undesirable on its own. Such issues raise multiple ethical questions, such as should "group membership" be made visible and editable to these users, and if so, in what shape or form? How can designers of CUIs prevent belittlement and ensure the explainability of decisions to users? Should "membership" be opt-in or opt-out? What aspects of sensitive situations warrant one feature over another, and how can we ensure we test the correct ones?

## 5 WORKSHOP STRUCTURE

We host a half-day workshop in a hybrid format, with participants attending in person and online. We will blend presentations with interactive sessions, stimulating engagement between the workshop participants and organizers. The workshop program will involve:

- (1) **Introduction to vulnerability.** We will provide a brief scoping of vulnerability in HCI research for the participants to work with. The participants are also invited to give a 5-minute pitch or presentation to introduce themselves, using their position paper or statement of interest, and to share their perspectives or experiences on vulnerability in HCI research.
- (2) **Participatory methods.** The workshop will address participatory design approaches in general and how such approaches are applicable in the context of CUI research and development - specifically with regard to sensitive situations.

The participants are asked to reflect on their own research approaches to discover potential cases or situations during which vulnerability can arise and to share this with the group to feed the discussion.

- (3) **Case studies.** Building on the input of the participants, the workshop dives into the context of vulnerable settings by focusing on multiple concrete cases. For example, one case can address the context of dementia, while another case can focus on immigration. With these cases, we aim to provoke reflection and thoughts on different dimensions of vulnerability that will be further discussed during an interactive session.
- (4) **Future research directions and challenges.** At the end of the workshop, we discuss how the insights from the different cases are translatable to other contexts, also based on the participants' own experiences. By doing this, we aim to define the different dimensions of vulnerability and sketch an overview of the scope and different meanings of sensitive settings. Moreover, we aim to bring together this definition and participatory design processes into a workable manifesto to be used as guidance for both research and industry in the creation of inclusive CUIs.

## 6 ACCESSIBILITY AND INCLUSION

The inclusion of vulnerable users is pivotal in our research practices. Therefore, we apply the same principles and standards in terms of accessibility and inclusion for this workshop. We aim to cater to the diverse and specific needs of the participants in terms of accessibility by actively reaching out to the workshop participants and asking them to communicate their specific needs or practical arrangements before the workshop. In line with our workshop goal, we highly welcome people who have lived experiences or faced challenges related to vulnerability. Furthermore, we will organize the workshop in a hybrid format to allow participants to join remotely. By doing so, we aim to invite researchers or practitioners from geographic regions who are disadvantaged in terms of financial resources or available travel budgets. Having expertise from different socio-cultural settings also allows for rich in-depth discussions that highlight different perspectives on vulnerability. Lastly, the organizers will ensure an open, respectful, and safe space for the participants to express their concerns and struggles related to vulnerability.

## 7 ORGANIZERS

**Maarten Houben** is an Assistant Professor at the Eindhoven University of Technology in the Department of Industrial Design. His PhD research focused on the beneficial effects of everyday sounds and soundscapes in technologies for dementia. Maarten adopts a design approach for introducing and evaluating novel technologies in everyday care environments by involving key stakeholders such as people with dementia, their relatives, and care practitioners.

**Nena van As** is a Conversational UX Researcher at Boost.ai, a company that offers a low-code platform to create conversational AI. She has a background in Human-Technology Interaction and gets to combine academia with industry in her current role at Boost.ai. As a result, she works with industry-specific questions - What do

we define as success for a bot? How do we measure and analyse this? - as well as more academic investigations into the effect of human likeness on trust in the face of conversational breakdown.

**Nitin Sawhney** is a Professor of Practice in the Department of Computer Science at Aalto University and leads the CRAI-CIS (CRITICAL AI and Crisis Interrogatives) research group. Working at the intersection of Human Computer Interaction (HCI), responsible AI, and participatory design research, he examines the critical role of technology, civic agency, and social justice in society and crisis contexts. Prof. Sawhney has previously conducted research in speech/audio interaction, wearable computing, distributed open source collaboration, civic/participatory media at the MIT Media Lab and The New School.

**David Unbehaun** is a Deputy Professor of Human-centered Information Systems in the Department of Informatics at the Technical University Claustahl and Research Group Leader at University of Siegen. He wrote his PhD about assistive technologies in the context of People with Dementia and their care-ecosystem. His research focus lies on the field of digital health care research, practice- and user-oriented assistance technology design in the intersection of Human Computer Interaction, Human Robotic Interaction, and participatory design research.

**Minha Lee** is an Assistant Professor at the Eindhoven University of Technology at the Department of Industrial Design, with a background in philosophy, digital arts, and HCI. Her research is about morally relevant interactions with technological agents like robots or chatbots. Her work explores how we can explore our moral self-identity through conversations with digital entities, e.g., via acting compassionately towards a chatbot. She has organized workshops at relevant conferences: CSCW '20-'21, IUI '21, HRI '2021, and Philosophy of Human-Technology Relations (PHTR) '20.

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