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Ethics of Conversational User Interfaces

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ABSTRACT

Building on the prior workshops on conversational user interfaces (CUIs) [2, 40], we tackle the topic of ethics of CUIs at CHI 2022. Though commercial CUI developments continue to rapidly advance, our scholarly dialogue on ethics of CUIs is underwhelming. The CUI community has implicitly been concerned with ethics, yet making it central to the growing body of work thus far has not been adequately done. Since ethics is a far-reaching topic, perspectives from philosophy, design, and engineering domains are integral to our CUI research community. For instance, philosophical traditions, e.g., deontology or virtue ethics, can guide ethical concepts that are relevant for CUIs, e.g., autonomy or trust. The practice of design through approaches like value sensitive design can inform *how* CUIs should be developed. Ethics comes into play with technical contributions, e.g., privacy-preserving data sharing between conversational systems. By considering such multidisciplinary angles, we come to a special topic of interest that ties together philosophy, design, and engineering: conversational *disclosure*, e.g., sharing personal information, *transparency*, e.g., as how to transparently convey relevant information in a conversational manner, and *vulnerability* of diverse user groups that should be taken into consideration.

CCS CONCEPTS

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

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KEYWORDS

Ethics, conversational user interface, CUI, speech interface, voice user interface, intelligent personal assistants

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1 BACKGROUND

People's use of conversational user interfaces (CUIs), like Amazon Alexa or chatbots, is increasing along with research on CUIs in the field of HCI. Previous CUI research spans how to best design CUI interactions [4, 5, 9, 16, 17, 34, 44], such as tools and heuristics on voice-based interfaces [8, 36] and sociolinguistic considerations [9, 11, 27], as well as diverse ways to understand people's different preferences or perceptions regarding conversational interfaces [12, 30, 31, 42, 43, 57]. Yet, scholarly works on potential ethical issues or moral considerations on how to design, use, or propagate conversational systems are lacking. While ethical concepts, like trust, have been featured in CUI research [20, 26, 29, 50], we need to critically incorporate a broader standpoint on ethics in and of itself. This becomes especially pressing considering vulnerable populations that are marginalized by conversational systems such as older adults [48], people who stammer [7], or people who are yet to be born who may be affected by current CUI developments [32]. Furthermore, ethical concerns have been raised regarding biases that commercial CUIs can propagate, such as sexism [52, 54], e.g., when conversational assistants do not appropriately react to sexual harassment [59]. The vast array of research on CUIs hints at a deep interest in ethics, such as research on trust and gender bias.

In addition, initial summaries of ethical and societal implications have been provided for conversational AI [45] and large language models [1]. Going forward, a critical challenge is developing a more intentional engagement with ethics centrally in order to advance CUI research.

2 POSITION PAPER TOPICS

Ethics is robustly treated as a topic in other subfields of HCI, such as in human-robot interaction and philosophy of technology e.g., [19, 39, 56] among others. Similarly, CUI researchers can look into ethics from various angles. We welcome diverse contributions as position papers in exploring CUI ethics. We illustrate examples from disciplines that are non-exhaustive ways to address ethics, then move onto topics that papers can address (Fig. 1). In philosophy, traditions such as virtue ethics can be referred to in order to design future technologies [55]. Thus, the position papers can be on the pros and cons of different philosophical traditions, such as virtue ethics vs. rule-based deontology, when applied to CUI research, or discuss the ethical challenges of CUIs with a philosophical lens. The ethical review process or other applied ethics views can be critically assessed in light of how we ought to study CUIs [35]. Design practitioners can refer to many approaches, such as value sensitive design [18, 56], design justice [10], and digital design marginalization [48]. Position papers can demonstrate CUI designs that follow such approaches, or offer new ways to think about designing conversational systems. In engineering, CUIs, such as chatbots, can be useful in fostering collaborations, building open source communities, promoting diversity and inclusion in software engineering, and more [51, 58]. Although not exhaustive, the workshop aims for position papers to coalesce around the following three topics:

Disclosure: We invite position papers that discuss how conversational disclosure can be conveyed by and to CUIs. On the machine-side, disclosure stands for how a system discloses or shares

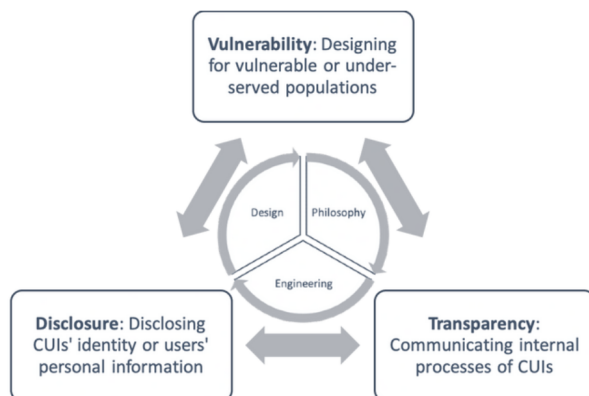


Figure 1: Position paper topics: Vulnerability, disclosure, and/or transparency from philosophical, engineering, and/or design perspectives.

information about itself, such as revealing its identity, built-in personality, or other aspects that are anthropomorphic. Disclosure also applies to human interactants, i.e., how much information they want to disclose to CUIs about themselves, often of personal information [33]. Thus, disclosing information can happen due to and during interactions with the system. Furthermore, systems of different embodiment and conversational modalities trigger disclosure from users at different levels [24]. When a conversational agent uses human-communication features, for example, empathy, users' disclosure of personal information increases over time and becomes more intimate [25]. At the same time, CUIs that do not disclose overly private data are perceived positively [23], suggesting that limits of information sharing, intimate or not, should be researched upon further.

Transparency: In tandem, transparency stands for conversational ways to show the internal processes of a technical system, e.g., decision-making by a machine. By providing transparency, the aim is to make CUIs' behaviour and intentions understandable to users, including how they collect user data. Ultimately, this should foster acceptance and decrease ethical concerns regarding the usage of CUIs. A recent survey paper identified several different types of transparency challenges in AI agents [53] that can be transferred to CUIs: trust and situation awareness, system behaviour explanations, breakdown recovery, as well as privacy and fairness of AI. A useful conversational tactic for tackling transparency issues is proactivity, i.e. communicating and explaining a CUI's decision processes when negotiating with the user. So a CUI can be assertive and take the lead when it is appropriate. For example, it has been shown that proactive dialogue strategies have an effect on the human-computer trust relationships depending on context [22] and user-specific information [21]. Furthermore, proactive explanations are able to foster and maintain trust as a response to system breakdowns [38]. We encourage position papers on positive and negative impacts of the development of transparent CUIs on their users.

Vulnerability: Lastly, we are interested in diversifying various user groups we consider, especially of vulnerable populations such as older adults. In order for CUIs to benefit vulnerable populations, CUIs must be designed in a way that is inclusive in order to foster such users' adoption of this technology, while not marginalizing these users who may stand to gain the most from CUIs [48]. For this, a stronger holistic understanding, for example through sociotechnical perspectives [47, 49], of vulnerable users' perceptions of and relationships with CUIs is essential, but this is still lacking [46]. In addition, vulnerability can refer to a person's passing state, such as a user who may feel vulnerable towards a chatbot that asks for care to increase self-compassion [28], which contrasts with long-term vulnerability. We thus invite position papers that discuss critically how CUIs address people's passing vulnerable moments, and how CUIs may benefit the vulnerable or under-served populations in a way that does not marginalize them or perpetuate social inequalities.

3 WORKSHOP AIMS

Our workshop on ethics is timely for CUI research in the field of HCI. It will be a critical and collaborative effort in looking back and forward, i.e., consolidating ethics related research of the past and

setting the agenda for future CUI research on ethics going forward. This builds on previous CUI workshops that explored theories and methods [6, 13], grand challenges and future design perspectives [2, 14, 37] and collaborative interactions [40]. To push ahead with a multidisciplinary perspective on ethics for CUI research, we aim to:

- **Look back:** Expand on discussions on ethics specifically on CUIs and put together existing, disparate views that implicitly relate to ethics in CUI research thus far.
- **Look forward:** Explore in what ways information disclosure between CUIs and humans should follow transparent communication methods, while being alert to vulnerable and under-served populations that may, e.g., over-disclose personal information or misunderstand CUIs' transparency cues.
- **Community building:** Enlarge our community by consulting philosophers, designers, and engineers to illuminate the next steps on CUI ethics research.

4 ETHICS OF CUIS

Importantly, we are motivated to discuss challenging questions that are required to design CUIs in an ethical manner or think about ethics for and of CUIs; we are open to diverse perspectives, from engineering practices to ethics of CUIs as philosophical discussions. The questions to address can include, but are not limited to, the following points:

- In what ways should we consider both ethical benefits and harms in the creation and use of CUIs? For example, what are the potential benefits that outweigh potential harms, and vice versa, when people disclose personal information to CUIs?
- How can we best design CUIs for under-served or vulnerable groups, and to what extent do we remain critical of the fact that inclusion of some can mean exclusion of others?
- How do we address conflicts of ethical nature, such as user privacy vs. ease of use, that become aggravated due to and through seamless interaction with increasingly connected systems that underlie CUIs?

Researchers and practitioners are invited to share their own experiences, perspectives, theories, methods, works in progress, among other ways of documenting their thoughts. To emphasize, we are open to disciplines other than philosophy, design, and engineering, as well as topics that are not necessarily on disclosure, transparency, and vulnerable or under-served populations. Ethics in a broad sense is considered; other disciplines and topics of relevance are also of interest.

5 PRE-WORKSHOP PLANS

Information about the workshop and the conversational interfaces community will be posted on a website dedicated to the workshop (at conversationaluserinterfaces.org/workshops/CHI2022/, which will be accessible when the workshop is accepted). This website will also provide the workshop call for participation, workshop aims, agenda and outcomes, workshop date, and organizers' short biographies and contact information.

We seek position papers that are 3 to 6 pages long (including references), submitted in the CHI Extended Abstract format (<https://chi2020.acm.org/authors/chi-proceedings-format/>), and describe work or discussion related to the position paper ethics topics outlined above. Admittance to the workshop will be based on the overall quality, novelty, and relevance of the submission, and the CUI community's goals of bringing together a set of presenters that can represent the diverse and multidisciplinary facets of philosophy, design, and engineering required for the design of CUIs. We will pay particular attention to under-served regions or universities, for our inclusive community will benefit from this, especially concerning ethics of CUIs. Papers should be submitted to m.lee@tue.nl by **February 24th, 2022**. At least one author of each accepted paper must attend the workshop.

Accepted papers will be posted to the workshop website ahead of workshop date and serve as the basis of presentations and discussion at the workshop. For examples of papers that are acceptable for the workshop, please see the websites for past CHI workshops in 2021 (<http://www.speech-interaction.org/CHI2021/>) and 2020 (<http://www.speech-interaction.org/CHI2020/>). All accepted workshop papers will also be invited to submit to the CUI '22 conference taking place in Glasgow, Scotland.

6 CALL FOR PARTICIPATION

In what ways can we advance our research on conversational user interfaces (CUIs) by including considerations on ethics? As CUIs, like Amazon Alexa or chatbots, become commonplace, discussions on how they can be designed in an ethical manner or how they change our views on the ethics of technology should be topics we engage with as a community. Authors are invited to submit position papers to the CHI 2022 workshop on the Ethics of CUIs. We aim for including diverse disciplines, including, but not limited to, philosophy, design, and engineering. Additionally, we welcome perspectives on three topics of conversational disclosure, transparency, and vulnerable or under-served populations, among other relevant topics. Papers can address how conversational systems and users disclose personally relevant information, how systems can be conversationally transparent about their limits and abilities, as well as how we must address diverse groups of users that are potentially vulnerable or under-served, e.g., due to socio-economic status or disability. Potential submissions can look at other areas that are related, such as morally relevant interactions with conversational partners, e.g., humans treating CUIs fairly when this is not necessary for CUIs. Submissions are expected to be between 3 to 6 pages including references, authors' work thus far, disciplinary background(s), as well as how they relate to the topics and goals of the workshop. We will select submissions based on quality; if accepted, papers will be featured on our website and at least one author must attend the workshop. Papers can be submitted to m.lee@tue.nl.

7 WORKSHOP STRUCTURE

We plan for a one-day, in-person/hybrid workshop. We will start with presentations before hearing from our invited speakers and transition to structured discussions. The hope is to exchange diverse perspectives on what ethics is and can be for CUI researchers in a

critical manner. We aim for approximately 20 participants, which has been the norm in the past CUI workshops.

Given the ongoing situation regarding the pandemic that is progressing differently around the world, we currently plan for an in-person/hybrid workshop. However, the organizing committee will convene to decide on the best course of action, i.e., online workshop, in due time. In the case of a hybrid workshop, the workshop will be simulcast on Zoom (or a similar platform) to enable remote participation. Online collaboration tools (e.g. Miro) will be used to facilitate discussions. Our tentative schedule is below.

- (1) **Introductions.** We start with short introductions from organizers and participants. We go over goals and the plan for the day.
- (2) **Presentations.** 5 minute presentations from accepted position papers.
- (3) **Invited speakers.** 20 minutes for each speaker: Cameron Lee Taylor and Marguerite Barry (bios below).
- (4) **Breakout Session 1: Disciplinary boundaries.** We divide organizers and participants into three different groups concerning aforementioned disciplines, i.e., philosophy, design, and engineering, based on mixing up people's backgrounds. Each group will outline assumptions people hold about each discipline, as well as opportunities to overcome assumptions in order to find common ground for multi-disciplinary research initiatives on CUI ethics. Each group will report back for a sharing moment with everyone.
- (5) **Breakout Session 2: Disclosure, transparency, and vulnerability.** The second session addresses our three topics of disclosure, transparency, and vulnerability. Participants and organizers will again be divided into three groups to discuss the topics separately. The group will explore future directions based on the topics while also considering overlapping facets on disclosure, transparency, and vulnerability. The groups then present what they have learned when we return for a sharing moment.
- (6) **Breakout Session 3: Putting together disciplines and topics in pairs.** Lastly, organizers and participants will be divided into pairs of two for a more intimate conversation on how we can integrate different disciplines and topics. How can each researcher consider ethics in a new light given the diverse topics and multidisciplinary nature of ethics?
- (7) **Closing.** Organizers end by synthesizing learning points from all previous sessions. We reflect together on how we can make ethics more tangible and accessible as we continue to think of a future direction for the CUI community. We think of specific steps for the CUI community to consider the breadth and depth of ethics, including how to plan for future CUI conference series and workshops by taking into account participants' views.

Note, even if we transition to an online workshop, our plan above will remain the same. The organizing committee has prior experience in hosting online, offline, and hybrid workshops.

8 INVITED SPEAKERS AND FRAMING

We have a speaker from the industry to frame ethics as a concern not just for academics, but for commercial sectors, in designing

and thinking about CUIs. For this reason, we will have as a speaker Cameron Lee Taylor.

Cameron Lee Taylor wrote a PhD at St John's College, University of Cambridge in Linguistics as a Gates Scholar. During his studies he founded the Inspire Dialogue Foundation with an aim to increase the level of trust and inclusion in society and organized the Dialogue with the Dalai Lama. He spent 2 years in Norway as a researcher at a Conversational AI software company serving businesses and government services in Scandinavia. He is currently a Senior User Researcher at Google focusing on Product Inclusion. Taylor will frame how academic and industry efforts can be bridged together in spearheading ethics for and about CUIs.

We aim to have an academic perspective on ethics. Hence, the second invited speaker is **Marguerite Barry**. She is an Assistant Professor at the School of Information & Communication Studies at University College Dublin. She has expertise in ethics of mHealth and eHealth applications, as well as in interactive design more broadly. Her background is in communication and media research, but she also focuses on creative approaches to supporting ethical design and development practices for digital technologies. For example, she has experience in using improvisational theatre techniques with AI developers to help navigate challenging conversations, or using stories to promote care and virtue ethics perspectives. Barry will introduce how we can explore these approaches for designing CUIs.

9 POST-WORKSHOP PLANS

The expected workshop outcomes include:

- Inviting participants to ethics-related initiatives within the CUI community.
- A special issue of the ACM interactions magazine for highlighting what ethics can be concerning CUI research.
- Propose a special issue at relevant journals, e.g., International Journal of Human-Computer Interaction.
- Invite a selection of papers for a fast-track review process for our upcoming CUI 2022 conference.

10 ORGANIZERS

We organize the workshop by combining established, leading researchers of the CUI community, with up-and-coming junior researchers. The number of organizers is purposefully expansive, for we are looking to integrate various perspectives in academia and industry, from various regions (the U.K., Canada, the Netherlands, Brazil, Germany, among others). This is done to think broadly about ethics with participants for moving CUI research forward.

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.

Jaisie Sin is a graduate student at the Technologies for Aging Gracefully Lab and the Faculty of Information at the University of

Toronto. Her research focuses on the inclusive design of conversational interfaces for underrepresented users like older adults. She has been a co-organizer of the CUI conference series and related workshops at CHI '19-'21, IUI '20-'21, and CSCW '20.

Guy Laban is a Marie Skłodowska-Curie Research Fellow and a PhD candidate at the school of Psychology and Neuroscience of the University of Glasgow. Guy is interested with the neuropsychological mechanisms that underlay human-robot interactions, and the affect of these interactions. Guy's research is aimed at exploring how people disclose their emotions and needs to social robots, and how these, in turn, can reduce stress and burden.

Matthias Kraus is a Research Assistant at the Dialogue Systems Group at Ulm University in Germany. His research interests include the development of situation- and user-based proactive interaction strategies in multimodal dialogue systems. Furthermore, his work is centered around the computational modeling and the measurement of trust in assistance technologies.

Leigh Clark is a Lecturer in the Computational Foundry at Swansea University. His research examines the effects of voice and language design on speech interface interactions, how to understand interactions for people with diverse speech patterns like stammering, and how linguistic theories can be implemented and redefined in speech-based HCI. He is co-founder of the CUI conference series.

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-'21 and CSCW '16, '17 and '20 on topics including collocated interaction (e.g., [15]) with technologies and conversational user interfaces (e.g., [3, 41]). He is a founding member of the CUI conference steering committee.

Benjamin Cowan is an Associate 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 is the co-founder of the International Conference on Conversation User Interfaces (CUI) conference series and has run a number of workshops at CHI and Mobile HCI on designing speech and language technologies.

Asbjørn Følstad is a Senior Research Scientist at SINTEF, an independent Norwegian institute for technology research. His field of research is Human-Computer Interaction, coming from a background of psychology, and his current main research interest is chatbot user research and interaction design. He has led and contributed to a number of chatbot research and innovation projects within application areas such as youth mental health, education, public sector service provision, and customer service, and is currently researching the ethical and societal implications for public sector chatbots in the European ETAPAS project. He has been involved in the organization of several workshop arrangements and series, including the CONVERSATIONS international workshops on chatbot research and design.

Cosmin Munteanu is an Assistant Professor at the Institute for Communication, Culture, Information, and Technology, University of Toronto at Mississauga, and Associate Director of the

Technologies for Ageing Gracefully lab. His area of expertise is at the intersection of Human-Computer Interaction, Automatic Speech Recognition, Natural Language Processing, Mobile Computing, and Assistive Technologies. He has extensively studied the human factors of using imperfect speech recognition systems, and has designed and evaluated systems that improve humans' access to and interaction with information-rich media and technologies through natural language. Cosmin has organized speech interaction workshops and panels at SIGCHI conferences such as CHI, MobileHCI, and IUI for almost a decade, and has frequently delivered courses on designing voice interactions at these venues.

Heloisa Candello is research scientist at the IBM Research laboratory in Brazil. She has experience in leading and conducting design research activities to understand people's contexts and motivations to use conversation technologies. She recently co-organized related workshop at CHI '18-'21 and CSCW '16, '17, and '20. and previously published her research on UX with conversational systems at various HCI conferences. She was also a full paper co-chair for CUI'20.

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