

## More-than-human design and AI

### In conversation with agents

Nicenboim, Iohanna; Giaccardi, Elisa; Søndergaard, Marie Louise Juul; Reddy, Anuradha Venugopal; Strengers, Yolande; Pierce, James; Redström, Johan

**DOI**

[10.1145/3393914.3395912](https://doi.org/10.1145/3393914.3395912)

**Publication date**

2020

**Document Version**

Final published version

**Published in**

DIS 2020 Companion - Companion Publication of the 2020 ACM Designing Interactive Systems Conference

**Citation (APA)**

Nicenboim, I., Giaccardi, E., Søndergaard, M. L. J., Reddy, A. V., Strengers, Y., Pierce, J., & Redström, J. (2020). More-than-human design and AI: In conversation with agents. In R. Wakkary, & K. Andersen (Eds.), *DIS 2020 Companion - Companion Publication of the 2020 ACM Designing Interactive Systems Conference* (pp. 397-400). (DIS 2020 Companion - Companion Publication of the 2020 ACM Designing Interactive Systems Conference). ACM. <https://doi.org/10.1145/3393914.3395912>

**Important note**

To cite this publication, please use the final published version (if applicable). Please check the document version above.

**Copyright**

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

**Takedown policy**

Please contact us and provide details if you believe this document breaches copyrights. We will remove access to the work immediately and investigate your claim.

---

# More-Than-Human Design and AI: In Conversation with Agents

**Iohanna Nicenboim**

Delft University of Technology, NL  
[i.nicenboim@tudelft.nl](mailto:i.nicenboim@tudelft.nl)

**Elisa Giaccardi**

Delft University of Technology, NL  
 Umeå Institute of Design, SE  
[e.giaccardi@tudelft.nl](mailto:e.giaccardi@tudelft.nl)

**Marie Louise Juul Søndergaard**

KTH Royal Institute of Technology,  
 Stockholm, SE  
[mljso@kth.se](mailto:mljso@kth.se)

**Anuradha Venugopal Reddy**

Malmö University, SE  
[anuradha.reddy@mau.se](mailto:anuradha.reddy@mau.se)

**Yolande Strengers**

Monash University,  
 Melbourne, AU  
[yolande.strengers@monash.edu](mailto:yolande.strengers@monash.edu)

**James Pierce**

California College of the Arts  
 San Francisco, USA  
[jpierce@cca.edu](mailto:jpierce@cca.edu)

**Johan Redström**

Umeå Institute of Design, SE  
[johan.redstrom@umu.se](mailto:johan.redstrom@umu.se)

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the Owner/Author.

*DIS '20 Companion*, July 6–10, 2020, Eindhoven, Netherlands

© 2020 Copyright is held by the owner/author(s).

ACM ISBN 978-1-4503-7987-8/20/07.

<https://doi.org/10.1145/3393914.3395912>

**Abstract**

This one-day workshop brings together HCI researchers, designers, and practitioners to explore how to study and design (with) AI agents from a more-than-human design perspective. We invite participants to experiment with thing ethnography and material speculations, as a starting point to map and possibly integrate emergent frameworks and methodologies for more-than-human design. By using conversational agents as a case, participants will discuss what a more-than-human approach can offer to the understanding and design of AI systems, and how this aligns with third-wave HCI concerns of networks, infrastructures, and ecologies.

**Author Keywords**

More-than-human design; co-performance; human-AI interaction; conversational agents; thing ethnography; material speculations

**CSS Concepts**

• **Human-centered computing** ~ HCI design and evaluation methods • Human-centered computing ~ Field studies

**Background and Motivation**

One of the unique challenges to HCI posed by Artificial Intelligence (AI) is interpreting complex models, such as deep neural networks. This has led governments,

researchers, and activists to advocate for more explainable AI and better accountability in decision-making processes. Unlike traditional software, faulty decisions and hidden biases in AI systems are harder to pinpoint because the “code path” may include millions of mathematical operations. For that reason, it is important to monitor how AI systems behave in different contexts, and how they respond to different people in different situations.

This challenge opens up a new research space for collaborations in HCI, at the productive overlap of data science, design, the social sciences, and philosophy. There has been growing attention over the last decades to issues of privacy, security, fairness, and explainability in the outcomes of AI systems [1]. But the wider contexts and complex networks of social relations in which the behavior of these systems is embedded remain underexamined [1, 13, 16]. As a result, there is also a lack of consideration for alternative discourses on AI ethics such as care, equity, welfare, or ecological networks [10], and for alternative alignments in design between humans and nonhumans [4, 6, 7].

A critical question for the HCI community is how emergent more-than-human centered approaches can help address these challenges by surfacing the comprehensive relationships and networks in which AI systems are embedded [4]. For instance, it is not enough to simply observe how someone uses an Amazon Alexa voice assistant. In addition, we have to engage with multiple perspectives, ecologies, and infrastructures surrounding Alexa, including how the model was trained, how the artefact is contextually configured in use, and how it learns from that context.

This workshop aims to advance HCI research by exploring emergent frameworks, tactics, and methods to understand intelligent agents as part of broader and evolving socio-technical systems. By doing so, the workshop engages with particular aspects of third-wave HCI, such as artefact ecologies, multiplicity of perspectives, and infrastructuring [4,11].

### **More-than-Human Approaches in HCI**

In the last decades, HCI scholars have adopted more-than-human approaches in either design and/or research [3, 5, 8, 12, 20]. In parallel, novel ethnographic approaches have been proposed for studying algorithms as culture [17] or observing machine behavior in the same way we study human or animal behavior [15]. Relatively consolidated design approaches to access the unique perspectives, trajectories, and potential worldviews of intelligent things include thing ethnography [8,9]. This method considers intelligent things as experts of their worldview and includes them as active participants in the design process. These techniques are often used in the fuzzy front-end of the design process but can be also used to interrogate existing products in order to uncover hidden biases and speculate about future unintended consequences.

### **The Case of Conversational Agents**

Voice assistants represent a category of agents that pervasively mediate our everyday interactions with technology, and each other [14]. For the workshop, we position conversational agents as nonhuman things that ‘act as’ or are interpreted as ‘acting like’ humans. We will use the case as a provocation for investigating the impact of AI in everyday life, and surfacing the wider contexts and their complex networks of socio-technical

relations. Conversational agents are a particularly interesting case for how they are positioned within dominant narratives and stereotypes of interaction, and how they come to be contextually configured in use. For example, conversational agents are often personalized through female voices and associated with feminized types of labor [18, 19]. As a consequence, human users respond to these devices in stereotypically gendered ways including forms of gendered abuse or sexual innuendo [2].

### Themes, Methods, and Goals

In the workshop, we will invite participants to engage ethnographically and speculatively with conversational agents along three inter-dependent dimensions:

(1) How the agents present themselves to humans; (2) What relations and ecologies they create within the contexts in which humans use them; and (3) What infrastructures they need. Questions and topics of discussion include but are not limited to:

**(1) Agents: Human-likeness, self-representation, and personality.** What types of responses do conversational agents give to ethical issues, and how does that influence our expectations toward them? What types of questions are systematically avoided? How do they present themselves and how aware are they of biases?

**(2) Relations and ecologies: Contexts of use, human and non-human relations, and ecologies of interactions.** What kinds of relations and ecologies do conversational agents elicit through their interaction with humans, as well as with other non-human agents? How do these relations change with shifting contexts of use? What kinds of relations matter more to humans,

and why? In what instances does the authority/power of a conversational agent become visible, and problematic?

**(3) Infrastructures: Training data, security, privacy, and commercial interests.** What material and immaterial infrastructures, such as human labor, data, and planetary resources, can be disclosed by using decentered forms of ethnography? How does the disclosing of infrastructures challenge traditional divisions of design and use? How could that help us uncover biases and their origin? What would it take to design an unbiased agent?

By inviting conversational agents as participants of the workshop we will experiment with more-than-human ethnographic methods [8] and material speculations [21]. The expected outcomes of the workshop –a video, a series of questions for conversational agents to discuss ethical issues, and a publication– will serve to map and integrate emergent frameworks and methodologies for more-than-human design. Aligned with third-wave HCI, these frameworks will help surface wider contexts and complex socio-technical networks in which AI systems are embedded, and thus address some of the unique challenges posed by AI.

### References

- [1] Saleema Amershi, Kori Inkpen, Jaime Teevan, et al. 2019. Guidelines for Human-AI Interaction. *Proc. CHI '19*, ACM Press, 1–13.
- [2] Sheryl Brahn and Antonella De Angeli. 2012. Gender Affordances of Conversational Agents. *Interacting with computers* 24, 3: 139–153.
- [3] Rachel Clarke, Sara Heitlinger, Marcus Foth, Carl DiSalvo, Ann Light, and Laura Forlano. 2018. More-than-human urban futures: speculative

- participatory design to avoid ecocidal smart cities. *Proc. PDC '18*, ACM Press, 1–4.
- [4] Paul Coulton and Joseph G. Lindley. 2019. More-Than Human Centred Design: Considering Other Things. *The Design Journal* 22, 4: 463–481.
- [5] Kristin N. Dew and Daniela K. Rosner. 2018. Lessons from the Woodshop: Cultivating Design with Living Materials. *Proc. CHI '18*, ACM Press, 1–12.
- [6] Elisa Giaccardi. 2020. Casting things as partners in design: Towards a more-than- human design practice. In H. Wiltse, ed., *Relating to Things: Design, Technology and the Artificial*. Bloomsbury.
- [7] Elisa Giaccardi and Johan Redström. (accepted/in press). Technology and more-than-human design. *Design Issues* 36, 4.
- [8] Elisa Giaccardi, Chris Speed, Nazli Cila, and Melissa L. Caldwell. 2016. Things As Co-ethnographers: Implications of a Thing Perspective for Design and Anthropology. In R.C. Smith, K.T. Vangkilde, M.G. Kjaersgaard, T. Otto, J. Halse, and T. Binder, eds., *Design Anthropological Futures*. Bloomsbury Academic.
- [9] Giaccardi, E. (2020) Thing ethnography. In Author: van Boeijen, A., Daalhuizen, J. and J. Zijlstra (Eds.) *Delft Design Guide* (revised edition). Amsterdam, NL: BIS Publishers.
- [10] Thilo Hagendorff. 2019. The Ethics of AI Ethics: An Evaluation of Guidelines. *arXiv:1903.03425v2*
- [11] Tom Jenkins. 2018. Third-Wave HCI Perspectives on the Internet of Things. In M. Filimowicz and V. Tzankova, eds., *New Directions in Third Wave Human-Computer Interaction: Volume 1 - Technologies*. Springer International Publishing, Cham, 145–161.
- [12] Lenneke Kuijer and Elisa Giaccardi. 2018. Co-performance: Conceptualizing the Role of Artificial Agency in the Design of Everyday Life. *Proc. CHI '18*, ACM, 125:1–125:13.
- [13] Daria Loi, Christine T. Wolf, Jeanette L. Blomberg, Raphael Arar, and Margot Brereton. 2019. Co-designing AI Futures: Integrating AI Ethics, Social Computing, and Design. *DIS '19 Companion*, ACM, 381–384.
- [14] Martin Porcheron, Joel E. Fischer, Stuart Reeves, and Sarah Sharples. 2018. Voice Interfaces in Everyday Life. *Proc. CHI '18*, ACM, 640:1–640:12.
- [15] Iyad Rahwan, Manuel Cebrian, Nick Obradovich, et al. 2019. Machine behaviour. *Nature* 568, 7753: 477–486.
- [16] Johan Redström and Heather Wiltse. 2018. *Changing Things: The Future of Objects in a Digital World*. Bloomsbury Visual Arts.
- [17] Nick Seaver. 2017. Algorithms as culture: Some tactics for the ethnography of algorithmic systems. *Big Data & Society* 4, 2: 2053951717738104.
- [18] Marie Louise Juul Søndergaard and Lone Koefoed Hansen. 2018. Intimate Futures: Staying with the Trouble of Digital Personal Assistants through Design Fiction. *Proc. DIS '18*, ACM, 869–880.
- [19] Yolande Strengers and Larissa Nicholls. 2018. Aesthetic pleasures and gendered tech-work in the 21st-century smart home. *Media International Australia* 166, 1: 70–80.
- [20] Ron Wakkary, Doenja Oogjes, Henry W. J. Lin, and Sabrina Hauser. 2018. Philosophers Living with the Tilting Bowl. *Proc. CHI '18*, ACM, 94:1–94:12.
- [21] Ron Wakkary, William Odom, Sabrina Hauser, Garnet Hertz, and Henry Lin. 2015. Material speculation: actual artifacts for critical inquiry. In *Proc. CA '15*. Aarhus University Press, Aarhus N, 97–108.