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ABSTRACT

The last decade has witnessed the expansion of design space to include the epistemologies and methodologies of more-than-human design (MTHD). Design researchers and practitioners have been increasingly studying, designing *for*, and designing *with* nonhumans. This panel will bring together HCI experts who work on MTHD with different nonhumans as their subjects. Panelists will engage the audience through discussion of their shared and diverging visions, perspectives, and experiences, and through suggestions for opportunities and challenges for the future of MTHD. The panel will provoke the audience into reflecting on how the emergence of MTHD signals a paradigm shift in HCI and human-centered design, what benefits this shift might bring and whether MTH should become the mainstream approach, as well as how to involve nonhumans in design and research.

CCS CONCEPTS

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

KEYWORDS

More-than-human, posthuman, human-centered design, design research methods

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1 INTRODUCTION

Recently, we are witnessing the expansion of design space from a narrow human-centered perspective to a more-than-human design (MTHD) orientation. Design researchers and practitioners have been increasingly interested in approaches, methodologies and practices to study, design for and design with non-human stakeholders, such as things, animals, or robots. While the work on MTHD has engaged with post-human prepositions from philosophy of science and critical studies, along with actor-network theory and new materialism, design has also developed its own ways of framing the scope and methods of more-than-human (MTH) approaches.

We see two main developments contributing to the flourishing of MTH within design. One stems from the pressing environmental crisis, which leads scientists to question the human dominancy over other species residing on earth [7, 14, 30]. Design, which gives crucial importance to sustainability, is searching for alternative design approaches to support the wellbeing of the entire planet without necessarily prioritizing one species over the others. MTH theories help to re-consider the basic unit of reference for humans in the "Anthropocene" and the basic tenets of interaction with both human and nonhuman agents on a planetary scale [5].

Another contributing aspect is that the notion of what a product is has dramatically changed in the past years from being "industrial artefacts" to "fluid assemblages" [18, 40]. This change has started

with the introduction of connectivity and is becoming prominent with the pervasive embedding of machine learning and artificial intelligence into everyday life. With new sensing and processing capabilities, products have become agents that can influence not only how other products respond, but also how humans relate to them and to each other [8]. This conceptual/ontological shift has been challenging the boundaries between humans and technologies. For instance, virtual reality, social robotics, digital assistants, and neuro-implants blur the traditional human-machine division, which raises the question as to where the human ends and where the machine begins. The shift has also highlighted the relational character of design demanding to position intelligence neither in the machine nor in the human, but in their relations [36, 41]. Lastly, it has required designers to expand the scope of their inquiry from a single archetypical user with an archetypical product to multiple products, services, and stakeholders with various roles and relations to each other, which in turns, questions the adequacy of human-centered design [11, 18, 20, 28].

These signal a potential paradigm shift in HCI [18] advancing on the third wave HCI [4]. Yet, the HCI and design discourse on MTHD is still developing. Current efforts in this field can be examined under three categories. The first line of work consists of *theories and concepts* that help us understand what it means to have a MTH approach in design. So far, the theoretical ground for MTHD has been established by introducing and discussing the design relevance of various post-humanistic theories and concepts to the field (see the seminal work of [11], [16], [18], [28], [42]), which refers to various theories including Actor-Network Theory [29], Object-oriented Ontology [25], New Materialism [5], Agential Realism [2], and post-Phenomenology [27]. These pioneering works paved the way for studying and discussing the values and principles underlying a MTH approach to design. Now, the challenge lies in initiating a dialogue among MTH designers and researchers to identify strategies for connecting MTHD theory to MTHD practice, as well as creating a vibrant MTH community within HCI.

The second line of work involves experimenting with the ways of designing for and with nonhumans from a *methodological* perspective. Previously, design researchers created new interactive technologies for animals [e.g., 17, 19, 26], involved living organisms (e.g., animals, insects, and plants) as research partners in their projects [13, 31, 32], and developed new research methods to integrate perspectives of objects into the design process such as thing ethnography [22], interview with things [6], object personas [9] and robotic techno-mimesis [12]. All these approaches require the "decentering of the human" and abandoning the familiar notions of agency and identity, as well as the boundary between an actor and its environment. Furthermore, since the term nonhuman entails various entities like things (e.g., smart products, connected appliances, robots, conversational agents), beings (e.g., animals, plants, fungi, microorganisms), and natural phenomena (e.g., rivers, mountains, rocks), the methodologies researchers use for studying and designing for/with nonhumans, and their experiences working in MTH contexts are quite different. From a methodological perspective, MTHD raises interesting questions regarding which proxies to use for "understanding" the perspectives of the "other" (and whether this might ever be possible) and how to include nonhumans in the design process without inadvertently extending humans' hegemony over them.

The third line of work is related to how MTHD is *practiced*, i.e., how to do design and research with nonhumans [24]. This includes developing novel ways of doing research and design engaging nonhumans as active participants [20, 43] and accounting for the multiplicity of agencies [8], temporalities [37], configurations [18, 31, 34, 40, 43], perspectives [3, 21, 22] and roles [28] that are at stake. Work in this area also includes defining new ways of practicing design as "nomadic" [41] and re-conceptualizing social practice theory to include nonhumans [28]. In the last years, MTHD has become part of several teaching programs [15, 23]. Scholars have also highlighted the politics and ethics of MTHD, with issues of participation [10], supporting values such as equality and justice, and including perspectives (humans and nonhumans) that have been traditionally ignored in design processes [1, 16]. Some of these issues were highlighted in various design fictions [11, 34, 35, 38, 39].

All these works demonstrate a proliferation of MTHD concepts, methods, and practices in HCI. To move forward, in this panel we will critically discuss the current state of MTHD research in HCI, identify differences and similarities between existing MTH perspectives and methods, assess the implications of MTHD approaches for HCI theory, research and practice, and discuss ways of advancing this nascent area further. In doing so, we will explore a series of questions grouped under MTHD concepts, MTHD methodologies and MTHD practices. The purpose of such a categorization is rather pragmatic, to have a more structured discussion during the limited time frame of a CHI panel. We consider that concepts, methodologies, and practices in MTHD are indeed interconnected and codependent.

MTHD concepts: This theme is focused on discussing the intellectual and historical path that led to the MTHD and the core concepts of MTH which are relevant for the design research and practice. The questions to be explored in the panel are: i) What are the central qualities of concepts and theories that underpin MTHD perspectives? and ii) What would be the strategies to link these theory and concepts to design practice?

MTHD methodologies: This theme is focused on discussing the methodologies and approaches for understanding, investigating, and imagining the world anew by going beyond the human perception and cognition. The main question to be discussed in this theme is what range of MTH methodologies might help decenter the human and integrate the perspectives of nonhumans in the design process in different contexts?

MTHD practices: This theme will discuss the politics and pedagogies of MTHD, highlighting how different tactics, such as defamiliarization, are used for unsettling assumptions, exposing human biases, and demonstrating that design problems are more uncertain, more nuanced, or more complex than originally assumed. We will unpack some of the struggles and opportunities that designers encounter when bringing MTHD concepts and methods into their practices, and how MTHD responds to rich and messy contexts. The main question to be discussed in this theme is what ethical, political and practical challenges and opportunities do designers, educators, practitioners and other stakeholders encounter with MTHD?

2 PANEL COMPOSITION

The three themes of the panel—concepts, methodologies, practices—will be discussed in a dialogue format by two panelists (six panelists in total). Each duo is composed of experts in that particular theme, while having different approaches and experiences towards MTH. Each dialogue will be moderated by one of the organizers.

2.1 Panel organizers/moderators

Aykut Coskun is an Assistant Professor of Design at Koç University Media and Visual Arts Department. He is also a design researcher at Koç University Arcelik Research Center for Creative Industries (KUAR). His current research focuses on investigating the role of design for promoting behavior change in various contexts including energy consumption, food waste, physical activity and so on. He leads IXD Research Group at KUAR and published at various design research venues including prestigious design journals and conferences.

NazlıCila is an Assistant Professor at Delft University of Technology, Department of Human-Centered Design, Connected Everyday Lab. Her research is focused on generating frameworks and methods that could help designers, computer scientists, and policy makers to envision and critically reflect on (new) interactions enabled by AI. She co-directs the TU Delft AI DeMoS Lab and published at premier HCI and design research venues.

Iohanna Nicenboim is a Microsoft-funded PhD candidate at Delft University of Technology, Netherlands. In her research, she investigates AI through more-than-human design. Using design provocations, she focuses on the everyday relations between humans and artificial agents, and how that perspective proposes a shift from explanations of AI to shared understandings. Before starting her PhD, Iohanna worked for several years as a speculative designer, creating design fictions to highlight the ethics of living with smart technologies in future everyday life. She is the author of several award-winning design fictions highlighting the ethics of living with smart technologies in future everyday life. She is a ThingsCon Fellow, and a recipient of the Internet of Things Awards for Design Fiction in 2015/6.

2.2 Panelists

2.2.1 MTH Concepts – Ron Wakkary and Christopher Frauenberger. **Ron Wakkary** is full professor at Simon Fraser University (Canada) and Eindhoven University of Technology (the Netherlands), and the founder of the Everyday Design Studio. His research investigates the changing nature of interaction design in response to everyday design practices in the home and new understandings of human-technology relations. He aims to reflectively create new interaction design exemplars, concepts, and emergent practices of design that help to shape both design and its relations to technologies. Among many other influential publications, he is the author of the recently published book *Things we could design: For more than human-centered worlds* (MIT Press).

Christopher Frauenberger is full professor for HCI at University of Salzburg (Austria). He investigates and designs interactive digital technology in a wide range of contexts with groups who are often marginalized in mainstream innovation landscapes, e.g., autistic children. His research builds on new philosophical perspectives to conceptualize our increasingly entangled relationships with technology, unearthing the ethical, moral, epistemological, and ontological implications for designing technological futures.

2.2.2 MTH Methodologies – Clara Mancini and Marc Hassenzahl. **Clara Mancini** is professor of Animal-Computer Interaction (ACI) and founding head of the ACI Lab at the Open University (UK), and co-founder of the ACI International Conference. She has led or supervised a range of ACI projects, including ubiquitous and ambient interfaces for mobility assistance and medical detection dogs, interactive enrichment for captive elephants, and wearable animal biotelemetry. Clara is interested in the design, methodological and ethical challenges and opportunities presented by more-than-human-centred interaction design and is committed to demonstrating its potential to contribute to animal and human wellbeing, multispecies social inclusion, interspecies cooperation and environmental restoration.

Marc Hassenzahl is professor of Ubiquitous Design/Experience and Interaction at the University of Siegen (Germany). As a Doctor of Psychology, he combines his empirical background with a passion for interaction design. The focus is on the theory and practice of creating joyful, meaningful, and transformative experiences. He is the author of the book *Experience Design. Technology for all the right reasons* (Morgan Claypool) and other influential articles at the interface between psychology, design research, interaction, and industrial design.

2.2.3 MTH Practices – Elisa Giaccardi and Laura Forlano. **Elisa Giaccardi** is Chair and Professor of Post-Industrial Design at Delft University of Technology. Her research interests reflect a persistent concern with design as a shared process of cultivation and management of opportunity spaces, and the transformative role technology can play. After pioneering work in metadesign, networked and open design processes, her current research engages with how digital things 'participate' in design and use in ways that previous industrially produced objects could not, experimenting with novel design approaches that look at computational artefacts as co-performers of practice, and thus as potential co-ethnographers and co-designers in the design process. Her work has contributed significantly to the development of post-industrial and post-humanist approaches in the field of design through more than one hundred peer-reviewed conference and journal papers and book chapters. Elisa is director of the MSc program Design for Interaction at the Faculty of Industrial Design Engineering, Associate Editor for Springer HCI, and Coordinator of the international DCODE Network (www.dcode-network.eu).

Laura Forlano, a Fulbright award-winning and National Science Foundation funded scholar, is a writer, social scientist and design researcher. She is an Associate Professor of Design at the Institute of Design and Affiliated Faculty in the College of Architecture at Illinois Institute of Technology where she is Director of the Critical Futures Lab. Forlano's research is focused on the aesthetics and politics at the intersection between design and emerging technologies. She is an editor of three books: *Bauhaus Futures* (MIT Press 2019), *digitalSTS* (Princeton University Press 2019) and *From Social Butterfly to Engaged Citizen* (MIT Press 2011). She received her Ph.D. in communications from Columbia University.

3 PANEL FORMAT AND AUDIENCE ENGAGEMENT

Due to COVID-19 restrictions, we plan the panel to be fully virtual. The organizers will provide a brief overview of the rationale behind the panel, its aim and structure, and introduce the panelists (5 mins). Each theme will be moderated by one of the organizers and discussed as a dialogue between two experts in around 15 minutes. To ground the discussions, the panelists will be encouraged to share a few slides (possibly as a Zoom background) about their projects when they respond to questions. We will start introducing each theme with a poll to canvas the opinions of the audience about a debatable statement related to that theme (e.g., Is MTH a niche field in HCI or can it be mainstream?) and the panelists will be asked to reflect on the poll results. During the panelists' talks, the audience is invited to use the chat feature of Zoom for questions and comments. Moderators will simultaneously organize these questions to be discussed with the entire panel in the last 10 minutes. Furthermore, we intend to utilize the conference's hashtag to invite questions and support broader audience participation via Twitter. To ensure wider dissemination of the insights discussed during the session and building a community of researchers interested in MTHD, we first will create a Slack channel to encourage the audience and panel members to continue discussing the future of more-than human design after the panel. Second, after the session we aim to write a short position paper to be submitted as an ACM magazine piece (e.g., Communications, Interactions), which summarizes the insights from the dialogues and propose an alternative HCI agenda that would include MTH perspectives.

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