Designing Posthuman Data: Mapping Relations Between Bodies, Land and Data

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ABSTRACT

The posthuman turn is an emerging trend in HCI which builds on situated, multi-agent, horizontal, and entangled theories of interactions between people and technologies and people and non-human others like animals, trash, and bacteria (to name a few). My work adds to recent trends in sustainable HCI (SHCI) which uses posthuman theories to understand and intervene in The Anthropocene Era and impacts of climate change. In my dissertation research, I explore posthuman framings of environmental sustainability HCI by asking how data mediates relations between bodies and land using cases and embodied orientations which push the posthuman agenda to intersect with social justice. Through explorations of situated bodies in place, I ask how data practices bring people into relationship with land in more or less sustainable ways. I use race and queerness as critical embodied orientations to land and water histories which interrogate climate changed futures in the Midwestern United States.

CCS CONCEPTS

• **HCI**; • **Deisgn**;

KEYWORDS

Posthumanism, Design, Climate Change, Body/Land Doubling

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1 CURRENT PHD STATUS

I am in my third year as a PhD candidate at Penn State University. The projected completion date for my dissertation will be end of Fall 2023. The opportunity to participate in DIS's doctoral consortium comes at a perfect time in my research development, as it will allow me to gain perspective and feedback from a broader audience during pivotal stages of my dissertation development. I am currently working on larger implications for my work as well as a final chapter for my dissertation which uses hand embroidered map making and auto-theory [19] to reflect on and materialize the experiences of a recent bike ethnography fieldwork trip I took to the Mississippi River exploring historic flooding and futures with climate change at the intersections of data, queer and racialized bodies and land use histories. I have never attended a doctoral consortium before, and I readily seek the guidance and community the DIS consortium would help me build.

In addition, as I am an interdisciplinary scholar, with a B.A. in English Literature and an MDes (Master of Design) in Interaction Design. As a member of the consortium, I can offer the perspective of interdisciplinary and emerging ways of working as I am engaged in topics like entanglement [20], more-than-human design [44], and social justice [16]. I am also a non-binary identifying person, so I can bring queer perspectives to the doctoral consortium. As HCI blossoms into a multi-epistemological and socially and culturally diverse field, I hope my presence validates and makes room for these emerging ways of working and represents the diverse identities entering the field of HCI today.

2 BACKGROUND AND MOTIVATION

I am a sustainable HCI [SHCI] researcher, who uses design/making and embodied experiences to understand climate change and sustainability. My work is inspired by a growing urgency to address climate change and acknowledgement of The Anthropocene Era, a name for the current geological epoch which suggests humans are the leading geologic force on earth [11]. To this end, my research engages with the current more-than-human turn in HCI [18, 20, 44]. However, I add to these works in critical ways, tackling what it means to be a posthuman subject and designer, and how ecological, post-anthropocentric sustainability research in HCI can intersect with social justice agendas. Guided by ecological posthuman theory which grapples with climate change and the Anthropocene, and postmodern, queer, and feminist theory that imagines bodies as de-naturalized and sites of multiplicity, my final chapters of my research seek to illustrate, map, trouble, and ground these relations through making, interdisciplinary dialogues, and first-person accounts. Through these explorations I reframe sustainability in HCI as a constant co-shaping of relations between people, nature, and data which enable critical readings and reimagining of environmental data, expanded definitions of sustainability in HCI, and a liberatory ecological posthuman subjectivity I enact and refer to as *body/land doubling*. *Body/land doubling* suggests land histories and body histories are entangled and can inform each other, and imagines a liberatory posthuman subject.

2.1 Posthuman turn and related sustainability agendas in HCI

In response to climate change and the Anthropocene, there has been a push in SHCI toward an emerging paradigm of more-than-human design, which seeks to respect the agency and limits of the objects we design and the materials we design with [12, 13, 32, 37],

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as well as greater pressure to assume more humble, horizontal, and entangled relations to non-human others like animals, plants, fungi, and ecologies [1, 7, 15, 29, 31]. This work is often based on critical posthuman and feminist new materialist theory, which moves away from Enlightenment era human/non-human and subject/object divisions toward human subjects who are ecologically, and technologically entangled and co-shaped [4, 9, 24, 41]. The importance in critiquing Humanism, according to feminist posthuman philosopher Rosi Braidotti is that it begins to denaturalize the concept of the human put forth in the Enlightenment, as the rational, individual 'man' (quite literally). Braidotti points out how the concept of the rational, European man, is built on hierarchies of power, man/woman, subject/object, where those who don't meet the criteria of the ideal Humanist subject were objectified and othered in colonial, patriarchal, racial, and heteronormative systems of oppression [9].

At its core, posthumanism challenges the human subject to be re-imagined and scholarship to shift to re-imagine it. One of the hardest parts of posthumanism is that, through its focus on post-anthropocentrism, it deeply questions the human subject and asks how we might reimagine that subjectivity to acknowledge non-human others. Braidotti, who is known for theorizing posthuman knowledge and subjectivity claims the posthuman subject must include, "include the relational dependence on multiple non-humans and the planetary dimension as a whole" [10:40]. And Richard Grusin, another posthuman theorist claims, "To turn toward the nonhuman is not only to confront the nonhuman but to lose the traditional way of the human, to move aside so that other nonhumans—animate and less animate—can make their way, turn toward movement themselves" [23]. Part of posthumanism is finding humility and finding oneself subject to and bound to the non-human others around them.

Sustainability research in HCI began to embrace this posthuman thinking in part due to a breakout paper by Light, Shklovski, and Powell, argued that we are in the midst of existential crisis on multiple fronts, including the imminent threat of Climate Change and mass extinction [28]. This paper calls for, "design to unseat humans from the center of the universe and support a more equitable gaze" [28:728]. This paper relied heavily on entanglement and posthuman theorists which catalyzed an already emerging push to bridge postanthropocentric movements in HCI with sustainability agendas (notably [14, 17, 39]). A wave of scholarship has followed, exploring concepts 'naturecultures' [30, 32, 39], designing for symbiotic encounters and collaborative survival between people and non-humans [29, 31], thinking along longer-term and material timelines and agencies [12, 13], noticing practices for noticing more-than-humans [5, 34], creating experiences which include or see from non-human perspectives [22, 38], and challenges to human-centeredness in agriculture [6, 31, 33]. Ultimately this research asks how we might care for and attend differently to non-human and ecological actors for collaborative survival in the face of climate change.

2.2 Work to Date

More-than-human design signals a meaningful turn in SHCI and design which has inspired much of my work, but my work specifically has stayed with the trouble (to quote the infamous Haraway) of what is required of one to shift orientations to non-humans and ecological actors. How must we change and what is at stake? And how do we practice and apply posthuman theory toward more sustainable futures through ourselves as designers and human subjects? For example, my CHI 2021 paper on autoethnographic and posthuman noticing explorations via bird watching practices [5] showcases the awkward, strange, uncomfortable nature of attending closer to birds, but then the final shift into a more decentered orientation to the birds in my neighborhood. In this work, I relied on the theoretical concept of abjection, developed by Bulgarian-French feminist psychoanalytic theorist, Julia Kristeva to explain a new model for subjectivity and relating to the environment that challenges the neat and painless subject/object relationship between humans and non-humans by proposing a subject/abject relationship, where the abject is something ejected from the self to constitute one's self-image, but which was at one point indistinguishable from the self. This work begins to ask how formulations of the self can shift and adjust to ecological encounters toward different orientations to more-than-human actors.

While that project was about subject orientations and the possibility of decentering the self in the relation to more-than-human and ecological actors, in other work, I use posthumanism to pry into the latent assumptions that underpin the design of technology and how it orients action toward more or less sustainable outcomes. In my 2021 CSCW paper *Alternatives to Agrilogistics: Designing for Ecological Thinking* I began to unravel the paradox of how agriculture is entangled in climate change. Current methods of intensified agriculture are a major contributor to climate change, but according to resilient agricultural advocates, these methods make agriculture more susceptible to the impacts of climate change. I borrow theory from Timothy Morton, who argues that *agrilogistics* – or the logics of agriculture – are the root cause of the human/non-human separation, and systematically refute his argument that agriculture must separate the human from the non-human through examples from ethnography with small farmers. I find that ultimately, while common applications of data for agricultural technologies are guided by principles of efficiency and scale (common ideologies that guide the design of technologies), guided by small farmers, we might see other ways to frame data in agriculture toward longer-term thinking about health, collaboration, and wellbeing for humans and non-humans alike.

In these two projects, which represent early work in my dissertation, I came to see posthumanism as a redirective tool. Whether it inspired me to re-imagine my own subject orientation to non-human others and redraw my attention more fully to my local ecology, or it helped me see alternative possibilities in how technologies might be designed for agriculture, based on ethnographies with small farmers, posthumanism helped me critically and performatively re-orient myself or design interventions away from whatever un-felt or un-reflected norms either myself or agricultural technology had been enmeshed in up until that point. I say performatively because, while theorists do the work of imagining posthuman theory, and philosophers like Braidotti pass down imperatives while it seems designers of technology grapple with implications, interventions, and enactments.

3 TROUBLING THE POSTHUMAN: NEW TERRAINS OF SUSTAINABILITY IN SHCI

While there is promise in posthumanism as a redirective practice, there are critiques about whether it can simultaneously be liberatory for humans. The Anthropocene has received meaningful critiques as well. Some have argued that as it stands, the posthuman turn doesn't attend to human difference and how human/nature binaries create human/human oppressions [26, 42], and that 'The Anthropocene' is often viewed at scales that erase colonial and racial histories, and often begins from an assumed lens of whiteness [40, 45]. While posthumans and feminist new materialist scholars offer abstract references to how nature/culture binaries scaffold oppressive social structures [3, 9], it does seem that in the emerging space of more-than-human SHCI research, there is a lack of attention to these critical or social complexities which queer ecofeminists and postcolonial feminists have argued are connected to human/nature binaries [21, 35]. According to Grusin, the nonhuman turn can feel like backsliding for liberatory projects that work against the objectification of people, like feminist, queer, and critical race scholars who fight against humans being turned into, "nonhuman object[s] or thing[s] that can be bought and sold, ordered to work and punished, incarcerated and even killed" [23]. However, in the final half of my research, I explore these tensions through interdisciplinary dialogue and auto-theoretical projects [19]which probe relations between people, nature, and data in ways the showcase intersections and tensions between social justice and ecological posthumanism.

First, I recently published a collaborative work where me and two collaborators held a cross disciplinary discourse using interdisciplinary map making which explored historic redlining's ties to present day sustainability in Indianapolis, Idiana [8]. The key question this work asked was how human/human problems intersect with human/non-human relations. Focusing on historic redlining, a US government run, racially discriminatory practice of assessing and mapping property values for federally subsidized home loan eligibility in the 1930s [25], my collaborators and I built maps using our disciplinary skills and lenses. One of my collaborators was an agricultural economics concerned with sustainable food systems. She built maps using census data about food access and food security amongst Black households in Indianapolis in comparison to historic redlining data using and R code. Trained as a designer, I constructed maps with paint, video, photography, and adobe illustrator and photoshop. I mapped histories redlining to environmental sustainability related to flooding, infrastructure, and pollution. Ultimately this exploration asked what definitions and data we use to understand sustainability, how they can influence each other and expose our blind spots or new ways of exploring sustainability and ask how historic data builds relations between bodies and land and underpins sustainable or less sustainable outcomes.

The final chapter of my dissertation continues to probe the intersections of land, body, and data by exploring historic flooding along the Mississippi River. In this exploration I ask about the historic data which builds up the statistical models of climate change, and how differential outcomes in those historic floods and natural disasters are unspoken parts of climate change data, which is so often offered up scientific and history-less. I performed a bike ethnography [2, 27] to explore my own queer embodied relationship to the land, as well as the racial histories of unequal treatment during natural disasters by tracing the path of a historic flood in 1927. This flood resulted in disparate outcomes for African Americans who were subject to being used as part of the infrastructure of containing flooding, forced to work to shore up levees and were subject to mistreatment by Red Cross camps according to historian Richard M. Mizelle Jr. [36]. I was interested in this site also for personal reasons, over the course of my studies, I have found wetlands (the Mississippi Delta was once a vast flood plain and wetland) and floods to be metaphors for queer and non-binary spaces, neither fully land or fully water, and as such, represent a queer ecological space of indeterminacy and instability.

From a posthuman perspective, the Mississippi River is a site which offers a larger scale of human/non-human interaction than much of what has been explored in SHCI research to date that asks what historic land use choices we are now entangled with, and how those choices impact water quality, quality of life, and climate change resilience. It has been shown that wetlands are critical in maintain water quality and managing floods [46], while at the same time, climate change intensified inland flooding from extreme precipitation is hypothesized to be one of the most destructive challenges we face in the U.S. in futures with climate change [43]. I ask about the traumas and terraforming these wetlands have undergone, as well as the potential of their indeterminacy, through the lens of my own bodily experience as a queer identifying person and my own traumas and embodied histories. In this way, I find *doubling* between my queer body, and the body of the land, and the history of racialized bodies. I will also theorize how data is connected to representations of the ways in which land and bodies experience doubling – and alternative, queered, other relations land and bodies might share toward more sustainable outcomes.

I am developing findings from my bike ethnography in two directions that refine methods and approaches from prior work. First, I am refining my first-person methods from my birdwatching project by writing collection of auto-theoretical [19] creative non-fiction vignettes based on my experiences of riding my bike ethnography. Auto-theory, based in techniques of creative non-fiction writing and performance art [19], is the use of one's own experiences and embodiment to perform and connect the personal to the global and theoretical. My autotheoretical work will allow me to tell a complex story of posthuman subjects and to theorize *body land doubling*. Second, I am refining my map making practice to bring together many kinds of data. As a part of my trip planning, I created booklets I took with me on my bike ethnography which had maps related to agriculture, economics, and historic flooding, and I sketched and drew into these maps every day. I plan to build maps that reflect my trip and the overlapping influences of histories, presents and futures in place, allowing us to think about the relationships between land, bodies, and re-imagine orientations to climate change data and liberatory courses of action.

4 GOALS & CONTRIBUTIONS

In my dissertation strive theorize the ways data, bodies and land build relations that are more or less sustainability, to trouble the definition of sustainability by drawing these relations closer to the body, and to respond to critiques of posthumanism by expanding the posthuman subject through narrative and interdisciplinary research that challenges how seeing one in relation to or part of land or non-humans can also be part of liberatory projects. This work contributes to HCI methodologically, expands sustainability research in HCI, and explores technological mediation and how it relates to sustainability. My research has implications for those looking to connect SHCI with social justice agendas as well as apply phenomenology and postphenomenology to critical projects.

5 CONCLUSION

In conclusion, I hope to present my interdisciplinary work that centers how data builds relations between bodies and weather, wetlands, and floods in certain geographies. This work is very much under development, and I would benefit from the feedback of the DIS doctoral consortium in how I frame the contributions to the field and build theory through my various projects. To have the feedback of mentors and peers would be invaluable at this time, perhaps leading to ways to include communities, insights into how others are thinking of environmental data and sustainability, critique, and feedback on some of my more experimental methods which utilize auto-theory, of methods, framings, and results so far. I hope to build intellectual community and exchange for years to come.

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