Thrown from Normative Ground: Exploring the Potential of Disorientation as a Critical Methodological Strategy in HCI

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ABSTRACT

We introduce the concept of disorientation as an emerging critical methodological strategy for design research in HCI. Disorientation is a phenomenological concept developed by queer feminist theorist Sarah Ahmed that acknowledges the spatio-embodied 'orientations' of societal and cultural norms and the queering potential of 'disorientations'. We use humanistic close reading to analyze three examples from queer, feminist, and more-than-human work in HCI. Our interpretation focuses on how HCI researchers utilize disorientation as a methodological strategy for questioning norms of technologies as well as generatively, toward alternatives. We discuss the tenets of disorientation and several tactics we saw emerge in practice for other practitioners to build upon. Finally, we reflect on implications for the field, as disorientation requires vulnerability and willingness to undergo change, acknowledges embodied knowledge that emerges before interpretation, and suggests the possibility of generative and alternative orientations stemming from those epistemological commitments.

CCS CONCEPTS

• **Human Centered Computing – HCI theory, concepts and models**;

KEYWORDS

Disorientation, Phenomenology, Design Methodologies, Queer Theory

1 INTRODUCTION

Critical scholarship in HCI has a long history of using material, phenomenological, and reflective techniques to make the ways technology orients and mediates human attention and human relationships to the world around them more tangible and visible. Critical traditions like early writing on critical design [14] and recent reflection on critical practices in design that utilize frictions [14, 40] notice

the ways that artifacts direct action and attention. Other scholars draw from theoretical frames from the humanities to *queer* designs to cultivate user agency and remain open to reinterpretation and mischief [31] or design for defamiliarization [4], encouraging designers to separate themselves from norms and habitual practices to see and design differently. These various tactics hold a latent sense that critical distance can draw attention to latent, normative directionality or inertia which orient people within the design of technologies. In the following paper, we complement prior critical practices that reflect on norms through gaining rhetorical distance, such as defamiliarization [4], queering [31], or frictions [40], by contributing disorientation as an emerging methodological strategy in HCI which leverages embodied experiences of strangeness, upheaval, vulnerability, and/or change to ground critical reflections on technology and seek alternative orientations for the design of technologies.

Disorientation is a concept that stems from contemporary and critical reimaginations of phenomenology and embodied experience. Phenomenology is a philosophical movement that studies human experience of phenomena such as, *"things as they appear in our experience, or the ways we experience things, thus the meanings things have in our experience"* [43]. It operates from an embodied and first-person perspective but can connect to larger-scale, historic, and social/cultural interpersonal experiences as well. Phenomenology has a rich tradition in HCI research for grounding embodied, ethnographic, and participatory research, to name a few applications [12, 15, 21, 46, 49]. Disorientation was coined by feminist, queer, and racial theorist Sara Ahmed, who developed the concept in her book *Queer Phenomenology*. The concept has been picked up and explored in the context of disability, love, and moral life by other philosophers [17, 18, 26, 27, 29]. For Ahmed, *"moments of disorientation are vital. They are bodily experiences that throw the world up, or throw the body from its ground"* [1:157] – in other words, what was grounding is now elsewhere, whatever normative embodied markers we were accustomed to are viscerally rearranged. This can come in the shape of a trauma, a natural disaster, or learning new information, for example.

For Ahmed, orientation, stemming from the phenomenological tradition, refers to the way a person senses, moves through, and attends to the world around them – and how familiar and comfortable those lines and directions of extension are. Her goal for the book is to draw attention to how *"orientations are organized rather than casual . . . they shape what becomes socially as well as bodily given"* [1:158]. She points this out through the colloquial way of using 'orientation' to discuss sexual orientation, drawing attention to how there are certain orientations that are *normal,* or *dominant.* For example, heteronormative orientations are often even colloquially

called 'straight' which implies a directionality or shape – begging the question of what shape or orientation, then, does queerness occupy? Ahmed suggests queerness deviates from that straight path. Disorientations, for Ahmed, while common and every day, on the one hand, can also be repurposed toward meaningfully a) showing what was normative before the disorientation and b) exploring the politics of what disorientations can do. She asks, what might be possible if we stay with such moments, suggesting, "we might achieve a different orientation toward them" [1:4]. In our work, which explores cases of disorientation as a methodological strategy for HCI, we note that achieving disorientation which leads to generative outcomes requires vulnerability – the willingness and bravery to go into an unfamiliar and oftentimes cognitively and emotionally confusing and troubling space and be changed and affected. We use the term vulnerability here, following the work of Berne Brown, to mean embracing, "uncertainty, risk, and emotional exposure" and grappling with situations being seen and present in situations without perfect control of outcomes [7].

While it is not currently referred to as such in these cases, we argue disorientation is an emerging critical methodological strategy being explored by design researchers in HCI in the past several years. We define a methodological strategy as a quality and opportunity that emerges in a given methodology that can be used toward certain critical, reflective results. This paper operates at the level of intermediary knowledge production [34] by identifying and theorizing this emerging methodological strategy and its value to the field. We achieve this by identifying three cases in HCI which we analyze using close reading. Close reading an interpretive technique taken from the humanities [3]. In our close reading, we demonstrate how authors of these cases use embodied experiences of disorientation to find critical reflections on directions and orientations of technology. While authors of these cases never claim that they use disorientation to produce design research knowledge, we explicate in this paper how disorientation can nonetheless be seen as a methodological strategy across the three cases. The researcher who leverages disorientation acknowledges their vulnerability to outside forces, being unsettled, and is often changed in doing so. The researcher undergoes an alchemical shift: by letting go of orientation and succumbing to an experience that throws them from normative ground, they find new insight beyond what they could have ever conceived alone and from their starting point. This opens new terrains of criticality steeped in the personal, the embodied, propelled by the potential and bravery of being willing to undergo and be changed.

In this paper we contribute 1) an introduction to the concept of disorientation as a methodological strategy supported by three exemplary readings of research cases that use this emerging way of working in HCI, 2) we then discuss tenets of disorientation and three tactics we see practitioners using to access disorientation, and finally 3) we demonstrate the way disorientation as a methodological strategy is both critical and generative and how it can be further taken up by the field. Disorientation happens in the felt spaces before one can articulate clear orientations, it softens, offers new ways forward, and it requires the researcher to be open-minded, vulnerable, and willing to be changed. These ways of knowing seem poignant in times marked by uncertainty and a desire to find new ways of being in the world that are more equitable and sustainable.

2 INTRODUCING AND DIFFERENTIATING DISORIENTATION

2.1 Differentiating Disorientation

Disorientation works closely with some existing strategies for developing critical distance from normative HCI/design outcomes or the familiar and invisible normative orientations which technology design is enmeshed within. Disorientation adds to the language for describing critical design methodologies, and in the following, we discuss three we find closest in sentiment: frictions [40], queering [31], and defamiliarization [4]. Not all of these are methodological strategies, as we are claiming disorientation is. For example, friction describes the intention of a designed artifact to offer critical tension to normative design outcomes, while queering encourages designing for playful appropriation, and defamiliarization suggests rhetorical comparisons can be useful for developing critical distance. However, none of these critical strategies have focused as much on the researcher's experience, which is a rather new way of working in HCI, nor the value of showing the process of having one's normative orientations disoriented and reflecting on the experience as a critical methodological strategy. In the following we reflect on these other major factors, then discuss disorientation in detail.

2.1.1 Frictions. In his paper *In Tension with Progression: Grasping the Frictional Tendencies of Speculative, Critical, and Other Alternative Designs* [40], Pierce lays out the terrain of design in HCI as containing two goals, the first being 'progressive' designs and the second being alternative designs that have frictional tendencies. Progressive designs move forward linearly in a way that assumes designs are "instrumental problem-solving and production-oriented activity" [40]. Alternative designs seek to ask questions, pose alternatives, or draw out critiques, in other words, they resist mainstream ideas of progression. He also makes the point that all designs are prefigurative, meaning, preliminary material actualizations of possible futures – this helps us understand how designs that resist hegemonic ideas of progression. The goal of this work is to explain how alternative designs function by resisting normative ideas of design in material and formal ways. Frictions suggest a kind of material 'slowing up' of ideologies that underpin design that might go unquestioned. While frictions have much in common with disorientation such as unearthing latent orientations of designed artifacts, the former, as introduced by Pierce, operates by creating artifacts or designs that act as tools to think critically through design and use. Disorientation, as a knowledge production strategy, on the other hand, relates to knowing something new through being disoriented via a first-person embodied experience. This way of working belongs to an emerging way of working in design research which relies on generating and reflecting critically on embodied experiences.

2.1.2 Queering in HCI. Disorientation as a concept originates through the 'queering' of phenomenology by Ahmed, and it holds similarities to concepts of *queering HCI* developed by Ann Light [31]. Light introduces the term queer as both an identity and a verb, but focuses on the potential of using *queering,* the verb, as a design provocation. Light discusses the queer theory of Judith Butler who argues gender is socially constructed and culturally

performed, so is therefore non-fixed, non-natural, and able to be performed differently [8]. Taking queer theory in hand, Light argues that to queer something, *"is to treat it obliquely, to cross it, to go in an adverse or opposite direction. Queering is problematizing structural and foundational relationships with critical intent, and it may involve mischief and clowning as much as serious critique"* [31:432]. Light suggests that there may be 'straight' orientations in HCI we could think obliquely about and uses examples of designs to showcase strategies for queering design like forgetting, cheating, obscuring, and eluding, that leave designs open-ended, and which offer multiple possible paths forward. She warns against technologies that fix us into the status quo and straight 'rigid', ways of being, and argues that to queer design is to trouble the status quo and leave space for alternatives to emerge. We see disorientation as a continuation of this strategy, based in phenomenological praxis. While Light draws from interface exemplars, disorientation works via first-person action and accounting of researchers seeking out disorientation, being open and vulnerable to change, and reflecting on their experiences to generatively look obliquely and challenge the status quo.

2.1.3 Defamiliarization. Defamiliarization, developed by Bell, Blythe, and Sengers [4], draws conceptually from literary theory where rhetorical strategies can help generate comparisons that draw attention to invisible norms. Bell et al. use the example of a C.S. Lewis story, where Lewis brings Merlin (of Arthurian legend) to the present day. Merlins' descriptions of the home from the perspective of a medieval sorcerer suddenly make the home strange and defamiliarized. They also use comparative ethnography to draw cultural comparisons that defamiliarize a Western home through historical and cross-cultural comparative views of homes from different cultures. Defamiliarization and disorientation share the quality of noticing what we have become accustomed to. Defamiliarization relies on rhetorical contrast and comparison to generate distance between what one normally experiences to be able to see it with fresh eyes. Disorientation attends specifically to accounts of pre-hermeneutic experiences that resist immediate understanding or sense and noticing what happens when we stay with a feeling of being askew and wait for a new and novel grounds to develop. HCI research that uses disorientation is thereby often processual, personal, and documented in a narrative way that traces moments of change, uncertainty, and discovery.

2.2 Introducing Disorientation: A Critical Concept Based in Phenomenology

Disorientation is a concept based in phenomenology, a philosophical school of thought, "concerned with how we perceive, experience, and act in the world around us" [12:21]. Its origins are attributed to Edmond Husserl, and further developed by Martin Heidegger, Merleau Ponty, and Jean-Paul Sartre [43], all of whom have made it into discussions about phenomenology or postphenomenology in HCI. Phenomenology has been taken up in various ways in HCI, in somatic design practice [20, 21], participatory design [15], and ethnographic and embodied approaches to design research [12, 13]. Phenomenological thinking has also been extended to understand technological mediation like postphenomenological theory which

examines how technologies mediate our perception of the world [41, 48].

2.2.1 Orientation. To understand the value of disorientation, one must first understand the idea of orientation in phenomenology. Importantly for this paper, phenomenologists also argue that the structure of how we experience often relates to a person's intentions, or as phenomenologist Edmund Husserl described as, "the directedness of experience toward things in the world" [43]. This is echoed by Merleau-Ponty, known for theorizing embodied knowledge, who suggests, "perception opens onto things . . . perception is oriented [35:54]. Meaning perception isn't idle and unfocused, it attends toward, attunes, and becomes accustomed to the stimulus of an outside. From a phenomenological perspective, therefore, knowing comes from embodiment and attention which is oriented toward experiencing the world in extension and response to those orientations.

Sara Ahmed, in her book *Queer Phenomenology,* is specifically interested in orientation because queer theory is concerned with sexual orientation. For Ahmed, sexual orientation is a conflation of identity with the directionality/spatiality of one's desires. More broadly, Ahmed uses the word orientation to orient herself to phenomenology in a critical way. To be oriented, "involves aligning body and space: we only know which way to turn once we know which way we are facing" [1:7]. New spaces are harder to navigate, but they can become familiar, which for Ahmed is *becoming oriented.* Building on the concept of orientation she discusses progression and direction as dependent on positionality: "**If space is orientated, then what appears depends on one's point of view**" [1:12]. This draws attention to the partiality and contingency of one's orientation on one's interests, desires, and attention.

One might ask where these positions come from. Orientations don't only live at the level of the individual, they can be societally and historically sedimented. Merleau-Ponty, "describes bodily horizons as 'sedimented histories'" [1] – meaning that not only are our orientations to the world individual, but they are also directed by larger histories of social and cultural forces. What point of view and limits or freedoms one experiences depend on how one's orientations (sexual) or body (race or gender) fit into the paths, patterns, and perspectives of larger historic sedimentations of orientations. Orientations like these can be so familiar, Ahmed argues, that they can become hard to even notice one has an orientation. However, to be oriented differently, or follow directional lines that go against normative orientations, can be difficult or considered deviant, for example, "the queer subject within straight culture . . . deviates and is made socially present as a deviant" [1:21]. Difficulty can arise when orientations don't extend bodies into space, "some spaces extend certain bodies and simply do not leave room for others" or, when certain orientations make it so, "some things become reachable, and others remain or even become out of reach" [1:14]. In other words, orientations to space, connected to larger social patterns and histories around bodies and norms make easier paths and more comfortable and accessible spaces for some than others. For an example of work that gets at the mechanics of orientation, we turn to the paper *Critical Race Theory for HCI* [38]. In this paper, the authors use first-person accounts of embodied experiences of being a Black person in the field of HCI to reflect on how spaces

don't extend as effortlessly for an African American woman in the United States as non-African American colleagues do.

2.2.2 Disorientation. Disorientation is a concept that asks about the experience of moments of change, shifting, slippage, jolts, transitions, or oblique orientations. The term was coined by Ahmed in *Queer Phenomenology* but has also been meaningfully developed by queer, critical phenomenologist Corrine Lajoie who discusses the non-linearity of sense-making and the disorientation of disability [26, 27, 29], and Ami Harbin who talks about the disorientation of bodily change and transition and how it can build empathy and greater moral awareness individuals [17, 18]. For the most part, we read from Ahmed, for whom disorientations hold potential for generative change and critique. She describes a disorientation as, "vital . . . bodily experiences that throw the world up or throw the body from its ground" [1:157]. The feeling of thrownness can persist or resolve, but what it does, fundamentally for Ahmed, is it allows one to note the stability they might have taken for granted and points out what we had become accustomed to.

[42]. While there are many branches of phenomenology, disorientation is one based in the body, and bodily experience, and thereby is often traced back to Merleau Ponty, the phenomenologist best known for theorizing bodily experience. In Merleau Ponty's accounts of phenomenology, attention orients experiences in the world, which we make sense of in embodied ways. We experience the world via a series of "levels" (set points, norms, things we are used to) which can get recalibrated when confronted with new information or experiences. One example Merleau Ponty gives to illustrate this in *The Phenomenology of Perception* is a case where mirrors are used to make a room appear tilted to a 45-degree angle. While it might be at first disorienting – the person looking slowly adjusts their perceptual levels to make sense of the room, and suddenly, it is readable as 'upright' again. However, importantly for this whole argument, new levels, or new orientations, are set **relationally*, in relation to the experiential past.*

Ahmed asks how these disorienting moments, where things are strange, or off-kilter, or momentarily unreadable – the moments when things don't yet make sense, or the body is no longer on familiar ground – can be operationalized in a critical and generative way. For Ahmed, disorientation allows, **"new lines to gather as expressions that we do not yet know how to read"**[1:171] – **in this way disorientation acknowledges the potential of a pre-hermeneutic (pre-textual and interpretivist) and embodied sense-making.** She asks how one might stay with experiences of disorientation, and how those experiences might become generative. She finally offers a call to asking readers to consider, "what we do with such moments of disorientation, as well as what such moments can do—whether they can offer us the hope of new directions, and whether new directions are reason enough for hope" [1:158]. In summary, while disorientations are inevitable, with intentionality, they might become generative.

As we will see, to acknowledge and emphasize disorientation as a methodological strategy is to conduct research that acknowledges vulnerability to outside forces and bravely acknowledges and opens oneself to uncertainty and turns it into a strength. Queer phenomenologist Lajoie argues bodily disorientations can open one

to, "ways of being in the world that are more attentive to interdependency, unpredictability, and change in human experience" [27:547]. Harbin suggests disorientations like natural disasters or bodily change can spur new moral action as difficult experiences bring forth new empathy for others [17]. Operationalizing disorientation embraces embodied experiences of strange, difficult, unexpected, or totally new experiences that broach novel ways of thinking, acting, and designing beyond what was initially understandable or imaginable. In our findings, it appears the HCI researchers find generative ways forward in disorientation by being vulnerable and open to being changed and disoriented, allowing them to sit with their disorientation and notice the new orientations and insights that emerge.

The important aspects of disorientation that we want to bring to light as we move into analysis are the following:

- Disorientation is grounded in embodied experience.
- Disorientation is *relational* and can only be felt in relation to normative orientations that are either 'thrown up' or exposed through a new oblique, foregrounded, or skewing of embodied experience. For some, this experience might be more innate or longer-term than others. There are many different time frames and timelines of disorientation.
- Disorientation *exists in time*, it happens through the experience of change, difference, or shifting relational orientations.
- Disorientation can be generative as well as critical, moving one into pre-hermeneutic critical spaces, beyond what we yet have the power to read or interpret – which slowly gain sense as we develop new ties and relations to ground the experiences.
- Disorientation requires the researcher to be vulnerable to being changed and to assume a radical and generative reorientation through the process they can't premeditate, brought on through the experience.

3 METHOD

The present work is a theoretical essay, leveraging humanistic approaches of interpretation and close reading as outlined in *Humanistic HCI* [3]. We curated a set of cases published in HCI as objects to think with. These works are drawn from feminist, queer, or other critical practices, with a focus on sense-making embodied accounts of strangeness, discomfort, breakdowns, and transitory states. Interestingly, these cases come from first-person methods, which are often used to explore phenomenological experiences or conduct more-than-human design research where the author recounts their personal life or experiences with non-speaking subjects like non-humans.

We chose the three cases that follow because they offer extreme/strong examples of the embodied experiences of disorientation that allowed us to analyze and present the concept. In addition, this line of thinking stems from and retheorizes prior work by the authors on bird watching [5], alongside other emerging practices in the field. Each case brings forth its own use of disorientation, by offering detailed accounts of using disorienting experiences as methodological strategies. These accounts become catalysts for generating critical perspectives on the design of technologies. The

cases selected do not individually reference the concept of disorientation, but our analysis shows how collectively, they exhibit a growing sensitivity in the field that points to disorientation as a methodological quality for researchers interested in operationalizing vulnerability and finding methods where they are changed and come to see the world and/or design opportunity space differently.

These strong/extreme cases emerged as we combed through research projects over time with disorientation in mind. As we became sensitive to the quality of disorientation, we saw it applied in other emerging research in HCI. For example, in Oogjes and Wakkary's work on more-than-human repertoires of weaving [39] or Ofer and Alistar's account of shifting from designing with kombucha as a material to designing to connect with it as a living organism [37]. We saw glimmers in other feminist and queer HCI work, for example, Balaam et al.'s work on somatic design for attuning somatic awareness of pelvic floor anatomy [44]. We think utilization of disorientation exists in many places in emerging research and we hope to see it taken up and noticed elsewhere and in creative ways.

We read our cases as texts to be interpreted. This analytical strategy is known as close reading in literary criticism, or *explication de texte,* where the analysts attend to individual words, the syntax, ways ideas unfold, as well as formal structures [3]. This strategy works well for these cases toward identifying disorientation as a methodological strategy because the expression of disorientation is related through narrative-heavy, temporal, personal, and affective transformations that are *undergone* by the authors which we can trace and read deeply. The approach has also been used in other feminist and queer projects in the HCI canon as well [6, 30]. Reading these cases as textual accounts, we paid close attention to the language and descriptions of the experiences of the authors and discussed how disorientation was utilized as a methodological strategy to generate critiques of normative orientations of technologies and imagine or enact alternatives. We unpack how disorientation is present in each case, and then take these findings into the discussion, where we distill the qualities of disorientation as a methodological strategy in ways that invite researchers to adopt it.

4 EXAMPLES OF DISORIENTATION AS METHODOLOGICAL STRATEGY

In the following, we offer three cases where researchers used the experience of disorientation to notice normative orientations, which they critique and suggest alternative orientations for moving forward. We start with an account of pregnancy [16], then queer breakup [24], and finally bird watching [5]. Ultimately, we watch the authors explore and admit their discomfort, lostness, 'thrownness', and ways they managed, tracked, and made sense of their embodied, sensed experiences. They then take these experiences as jumping-off points for critique and noticing the design of technologies and how they shape experience and directedness toward the world.

4.1 Critical Disorientation During Pregnancy

In *My Body, My Baby, and Everything Else: An Autoethnographic Illustrated Portfolio of Intra-Actions in Pregnancy and Childbirth,* Mafalda Gamboa lets the HCI community and readership into the intimate experience of the months leading up to childbirth [16]. She uses excerpts from therapeutic journaling from her third pregnancy, accompanied by annotated photographs to reflect on the intra-actions between her body and technology throughout her pregnancy. An intra-action is a term developed by posthuman theorist Karen Barad to express the ways embodied and technological agencies become entangled in knowledge production [2]. Gamboa explores intra-actions of her body and medical technology during pregnancy.

Although it might seem like a 'normal' experience to be pregnant, Gamboa joins other voices in the field who seek to de-normalize pregnancy in order to complicate pregnancy narratives in HCI [11] and destigmatize more taboo aspects of pregnancy like breastfeeding [19]. Without attending to and telling narratives of pregnancy that engage the full experience, these authors argue that we cannot design in ways that truly attend to and care for women during an experience that oscillates between affirming and wonderful, and complex and difficult. Gamboa frames her experience of pregnancy in a way that embraces how it is a disorienting experience, as we will show, and uses that embodied experience to reflect on the ways that technology intersects with and shapes that experience to offer novel and critical reflections on technological mediation in pregnancy.

The way Gamboa frames pregnancy offers an account of disorientation, and she uses her experience of pregnancy methodologically to reflect on the ways her body and technologies become entangled. The first way that Gamboa alludes to the disorientation of childbearing and childbirth is transitional: "They are immensely changing moments in the life of any parent. There are many new feelings and identities created in this process" [16:1]. Pregnancy is a break from life before pregnancy, and the body during pregnancy is in a constant state of flux, the grounds are never quite settled. This in and of itself could be read as a disorienting time in a person's life, one that unsettles the grounds of one's relation to one's body, as well as past and future self, desires, and goals. However, beyond this, Gamboa is vulnerable in explaining that her third pregnancy comes in the wake of a difficult experience during the birth of her second child. The traumatic second pregnancy necessarily comes through the third: "The traumatic dimension set the stage for an approach to a third pregnancy with mixed feelings of excitement and fear" [16:3]. Philosopher Ami Harbin suggests that disorientations are experiences of, "shock or surprise, unease, and discomfort" which can "change how we experience and act in the world" [17] – one might call Gamboa's prior pregnancy as also being disorienting, a disorientation that has changed how she approaches this pregnancy and becomes part of the fabric of how she manages her uncertainty and emerging experience of pregnancy in ways that help her track and process what is happening, and in turn offer insights to the HCI community.

In a brief overview of her findings, looking for moments of orientation and disorientation, we can see that there is tension between her own embodied experiences of pregnancy and the ways technologies become collaborators in making sense of her pregnancy – both helping her find footing and leading to moments of disorientation. For example, we were struck by the poetic language Gamboa used to describe her interactions and the parallels between her body and her pregnancy test. Gamboa had a hunch that she was

pregnant, she felt it. So, she took a paper pregnancy test and got a faint result that she wasn't sure she could trust. To get a more solid result, she took a digital pregnancy test, which came back as definitively positive. But after a few days, the digital screen where the result was displayed *died.* The record of the result was gone. Not knowing how to dispose of the test, and also curious about its insides, Gamboa cracked open the test. She writes, "It felt right to crack the test open the same way it had cracked me open" [16:4]. To be cracked open, to crack in return, shows a performative doubling between the test that had 'cracked' her – cracked her reality, cracked her open, made her vulnerable – and performing the same to the device, showing its insides, what it was made of, making it vulnerable. The crack is akin to disorientation, which can be a rupture, a break, an immediate new bodily orientation: pregnant.

Gamboa also ponders various orientations provided by technologies. She wonders if the digital test makes her disoriented from her own bodily intuition, and why the digital result somehow was more authoritative than her original bodily intuition. In another example of using technology to attempt to find orientations for herself, Gamboa reflects on how pregnancy apps, during her 3rd pregnancy, only told her things she already knew, and felt useless. She therefore resorted to using her phone to scroll back through old pictures, looking for photographs of herself at similar stages in past pregnancies, trying to remember how she felt during those times. In this exercise, she was using artifacts representing past levels or markers of her former experiences to orient her current experience – although she found scrolling through a huge collection of old photos didn't yield efficient or easy results.

The experience of pregnancy is a long-term transition, a shift, a break from one way of being embodied into another, and as such, represents a disoriented period – as a mother or mother-to-be undergoes an extensive period of bodily change. That shifting and change, combined with and informed by past pregnancies for Gamboa, intersects with an established medical-technical system. Due to trying to manage the impacts of a past traumatic pregnancy in the context of a new pregnancy, Gamboa took detailed notes of her experiences, including how her body was shaped and oriented through intra-actions with technologies. This experience of a particular period of her life, one marked by transition and transformation, but one which is also often guarded by taboos around mental health or body parts, is used to frame critiques as she uses her embodied experience to make technology strange alongside her journey through pregnancy. She draws attention to how the pregnant body is placed into far greater contact with techno-medical systems, and that is one aspect of this transitional period that cannot be ignored in this account. Ultimately, she calls for greater attention to care – that perhaps the intersections of birth and technology do not always give the care or tenderness that is required in disorienting moments of life-scale transition. This leaves us with the question, of natal technologies, "are they designed for what we want to be?" and leaves her open-ended account as a provocation for the HCI community to see the traces these intersections leave.

4.2 Sonic Disorientations of a Queer Breakup

In their recent paper *Sonic Technologies of a Queer Breakup* Kinnee et al. discuss the tensions that arise with using an Amazon Alexa during the period when Kinnee (they/he) was going through a polyamorous/queer breakup [24]. Kinnee adds to critiques of voice assistants and home IoT for reinforcing normative gender stereotypes [45] and nuclear family imaginaries of the home [9] by placing an Alexa in intimate spaces of queer life, queer homes, and queer relationships. They state, "Queering the Alexa device and enrolling it into a queer breakup fostered a subversive exploration of normative domestic tools for queer domestic use" [24:9]. To conduct this research, Kinnee conducted an autoethnographic exploration of sound data from Alexa collected during their breakup. They took note of glitches in how Alexa heard them, cringey misfires in Alexa's intended functionality, and shared their sense-making practices with constructing sound with data. These explorations disorient normative use and integration of audio data captured by Alexa by placing it in the context of queer intimate spaces and uniquely queer breakups and relationships.

As stated by Ahmed, in *Queer Phenomenology,* queer orientations go against heteronormative or straight relationships, therefore, to put an Alexa into a queer space of the home and intimate partnerships already begins to disorient its 'straight' use. Part of the 'disorientation' in this project is exploring how Alexa becomes part of sense-making and everyday life in queer domestic and relational life. The research is also centered around the disorienting phenomenon of a queer polyamorous breakup, which has inherently different qualities than a heteronormative breakup – as Kinnee broke up with one partner but maintained an ongoing relationship with another partner. The breakup is explored through the Alexa data via a record of memories, moments, and alerts, afforded via Alexa's functionality, in ways that upend time, and showcase comical and mundane misunderstandings and disconnects between Alexa and Kinnee. They wonder, "how glitches and oversights might lend themselves to alternative readings of voice assistants and queer life" [24:3]. And the queer breakup and queer use serve as embodied foundations for disorientation.

One of the ways Kinnee et al. explore disorientation is by asking how Alexa was not able to interpret or understand them. They combed through data logs for 'glitches' – times Alexa misheard them, misinterpreted their desires, or recorded blank statements. Glitch has been theorized by queer scholars as a way to explore the possibilities and anxiety of breakdown of normal operations of technologies [42]. Glitches can represent or cause disorientation. For example, at times, Kinnee discovered Alexa misheard them or couldn't hear them at all. Going through their audio data, Kinnee explored glitches like times when the transcripts of audio were blank or when audio couldn't be understood. They also found times when Alexa comically misheard or misinterpreted them, for example, interpreting their ex-partner's name as Michelle instead of Michael. This misunderstanding made Kinnee wonder if Alexa assumed they would have a female partner.

Another experience Kinnee recounts played with disorientations of temporality in a queer breakup. In this case, Kinnee plugged his Amazon Echo back in after taking some time off after their breakup. They had recently stopped taking PREP (Pre-Exposure Prophylaxis) that they had been taking during their time with their now ex-partner. That night, at 9 pm, they recount, "My Alexa device began sounding an alarm and blinking orange lights. '. . . # # # take my PrEP . . . # # # 'take my PrEP'" – they had formerly

programmed their Alexa to remind them to take this medication every night. They were immediately thrown from the grounds they had been in (post break up, not taking PrEP anymore) to the time when they had been in that relationship: "when this reminder first sounded . . . I was immediately reminded of my breakup—all of the associations with that time, that person, those places." However, they didn't cancel the reminder, which they started calling a "ghost reminder." It began to represent a daily moment of, "speculation of what could have been and of what was." While it was still a moment of disorientation, it softened – becoming reflective and generative. However, Kinnee also reflected on how this private information was suddenly very loudly out in the open, how Alexa was perhaps exposing information about medical history and partnerships that could be stigmatized.

Kinnee et al. also explored disorientation through autoethnographic making explorations [5] by taking sound files from their Alexa data and remixing them in ways that disoriented the listener and let new information or interpretations shine through. In one case, Kinnee et al. took the short audio clips from their Alexa archive and turned them into loops of audio that the authors listened to on repeat. They noticed as they listened to the recordings, a few things became clear – the home, they note, "contains soundscapes of people's everyday lives" – while they listened on repeat, background noises started to take prominence, moving what is normally unheard in the background to the foreground. In this case, they started to hear "South of Seattle" in one of the clips. Kinnee remembered they had been listening to the local news report on a recent LGBTQ+ bar that burned down in south Seattle, possibly due to arson. They reflect on how "the moment of this recording was intensely defined by multitudes of mourning: their own queer breakup and the loss of space for the local LGBTQ+ community" (10). They then took that sound clip and remixed it with others, trying to build "something from the sound of queer heartbreak" (10). In this example, they took their finding about the multi-layered queer heartbreak and constructed with Amazon data to find alternative 'soundtracks' that reflected on the disorientation of queer relationality both personally and more globally.

Kinnee et al. work with disorientation in two distinct ways: one is much like Gamboa, placing technology into an embodied experience and orientation (queer breakup) that is oblique to the dominant straight orientation of heteronormativity. In addition, breakups are already times of transition, discomfort, and change. They use the timeframe of the breakup and the data collected during that time to notice generative disorienting instances when Alexa and Kinnee experienced disoriented glitches, misunderstandings, misalignments, and jolting temporalities (in the case of the alarm). However, they also remixed and listened differently to audio clips, building soundscapes for queer heartbreak and audio loops that took data and queered it in ways that allowed new information to come forward or new reflections to emerge.

4.3 Disorientation as a tool for shifting away from human-centered relations to non-human others

In our final example of disorientation, we look to the paper *Watching Myself Watching Birds: Abjection, Ecological Thinking, and*

Posthuman Design [5] where Biggs et al. trace the process of an autoethnographic birdwatching practice by the first author which disorients (or decenters) their relations to birds and ultimately results in new perceptual orientations that they claim were broadened, synesthetic, and more openly attuned to non-humans. The project was inspired by Biggs moving to Indiana and noticing there was a whole new group of avifauna in their local ecology which they wanted to become familiar with through testing 'noticing' as a method in design [33]. In this account, while there is much to focus on in this paper, we discuss the feeling of initial discomfort as birds began to take a new place in the first author's perceptual field, which the authors frame as abjection. We then discuss the ways they used making practices to hold onto and document pre-linguistic experiences with birds (as they were being disoriented) that they didn't know how to interpret or frame just yet. Finally, we discuss the different states of consciousness and perception they engaged or achieved in their research that were less 'forward facing' or fully conscious (like dreaming). In this, we show how disorientation was marked by discomfort and the ways the authors worked to capture the embodied feelings of disorientation before they could interpret them as well as how they playfully accessed new modes of being oriented in alternative/extended consciousnesses.

First, the authors discuss the discomfort of letting birds come forward and take up a larger place in their field of perception. Ahmed notes the foregrounding of things normally in the background is one method of disorientation as it represents a perceptual shift. The change that was taking place in this work was a shift in attention and practices of attention – and as birds became more and more part of the authors' awareness, Biggs reflected on an unexpected feeling of discomfort creeping into their interactions. The first author felt as though, "she had punctured a scrim and was now overwhelmed by the noise coming through" [5:10]. It was as if through attending to birds purposefully, a shift had taken place and suddenly bird songs were loud, and pervasive, making the first author wish, "I could go to back to a time when it did not permeate everything" [5:10]. The authors framed this discomfort as abjection, a term coined by Bulgarian-French feminist psychoanalyst Julia Kristeva [25]. Abjection is the visceral discomfort one feels when confronted with things that threaten the boundaries of one's discrete self-image. Borrowing from eco philosopher Timothy Morton's concept of 'ecological abjection' [36] the authors reflect that this discomfort might be due to the sudden shift of perception attention they generated a perceptual encounter which placed birds and themselves more equally in a larger ecological whole. They argue this discomfort, or abjection, was due to shifting human/non-humans from a subject/object division to a subject/abject relation: "effectively recognizing that non-humans are not separate from humans" [5:3]. Over the course of the paper, as this shift in consciousness or disorientation of human-centric attention settles, the first author discovers new ways to attend to the non-humans around her that are more diffuse, ecologically thick and weird, and synesthetic—disorienting direction and sensorial inputs.

Second, the authors explore several different ways of upsetting normative states of consciousness or human-centered habits of attending to open their field of experience and soften their grip on normative ways of attending. We see this as engaging disorientation

by staying with orientations that remain unresolved, fuzzy, vulnerable, or unintended. In one case, Biggs describes how imagining the perception of technology extends and alters her own listening practice. She reflects, *"I imagine how the microphone of my phone will be recording mostly the sound of wind and a few distant bird calls"* [5:9] – which drew attention to how her own human-listening attunements were more focused and ignored certain non-human sounds. Imagining the way technology heard sound inspired her to listen differently, with less of a 'filter' and in a more diffuse way. This began to disorient her, and she began to think of sound and listening with open-ended multi-directional intention as a way into ecological awareness and relationality.

In the paper, they also discuss using bird calls that penetrated into a dream as a starting point for new relationships with birds. The first author reflected on how hearing birds in her dreams was a "bridge between dream and reality . . . a place birds and I could meet in a pre-conscious mode" [5:17]. They had been reading research about the overlap between the expressive qualities of human language and bird song, which made her wonder if "in a dreamy half-memory, birds and humans could understand each other's sentiments in a pre-lingual expressive mode of communication" [5:17]. Dreams and perceptual imaginaries of technologies both shook up how the first author attended to and imagined connecting with birds and helped her find new ways of turning towards and oriented to birds in her neighborhood.

Finally, in this project, we notice that making became an important way of logging these 'pre-linguistic' or pre-hermeneutic interactions with birds. When one is *disoriented* or in the process of letting oneself hang in an uncomfortable space, when one is in the process of shifting, changing, or feeling off-kilter, it's hard to interpret that feeling or put it into words right away. When the authors were shifting the ways they relate to birds, for example, and subsequently shifting themselves, they were often at a loss for how to describe their experiences. There are many examples of the authors using making to mark their experiences throughout the paper, but one example stands out as exemplary. In this case, the first author experienced hearing the sounds of a sandhill crane migration without knowing exactly what they were hearing. The sound was powerful and affective—it was, "a sound so strange that I'd never heard anything like it before in my life and had no idea what it was" [5:14]. After the fact, the first author tried to figure out what they had heard, and through a series of internet sleuthing, figured out a flock of sandhill cranes had passed overhead earlier that day. Initially, they didn't know if it was even caused by birds at first. Biggs reflects, due to its strangeness, initially the sound was "held away from my mind by my mind" – they had been studying and focusing when they started hearing the sound and didn't pay attention until the sound was too far gone to react or record it. This experience made them later reflect on how they had two 'brains' a 'front brain' of focus, and a 'back brain' of attending to everything else. The first author wrote that they were enrapt in the experience of what they had heard and, "out of a kind of grief for not having reacted quickly enough in the moment, I reconstructed the sound" – the used sound found on the internet of individual sandhill cranes to create a flock and added effects to make it sound resonant and distant. Through making their sound and journaling, they cataloged an experience they could barely put words to well enough that they

could come back and theorize it. They also conducted making experiments several other times during their study to capture strange moments with birds and then used those making explorations to help them understand what they had experienced in context and conjunction with their larger theoretical project later.

Ultimately, disorientation was used in several ways, the authors *noticed* they were becoming disoriented from a human-centered orientation to the world when they started to feel overwhelmed and uncomfortable in their relationship to the birds. They used altered, blurry states of consciousness or outside exemplars like their recording device to help them imagine new softer, and more multi-directional ways of attending and listening, and they used making to materialize experiences they had before they could articulate or interpret those responses. Finally, making offered a method for tracing pre-hermeneutic, non-verbal, inter-species experiences which could be made sense of later.

5 DISCUSSION

To recap, so far we have defined and discussed disorientation within a tradition of phenomenology, differentiated it from other critical approaches in HCI, and given 3 examples of disorientation at work in HCI research. In the following we synthesize the definition and examples, showing how disorientation is being performed in HCI research more broadly, describing tactics of use for future practitioners to try, and describing the implications of this type of work on a shifting and changing field of knowledge production in HCI.

5.1 Disorientation at work in HCI – tenets and tactics

5.1.1 Tenets of Disorientation in HCI. In our introduction to disorientation in 2.2.2, we marked five key characteristics of disorientation as staked out by philosophers and theorists who are curious about the potential of the concept. For these theorists, disorientation is a visceral bodily experience of being 'thrown from familiar ground' via bodily change, holding non-normative orientations in larger social structures, or by deliberate attempts to unseat prior orientations. It is relational and can only be felt as one's normative orientations are disrupted through new, oblique, skewing, proximal shifts. These shifts can take more or less time, and be sudden or slow, but ultimately, they happen *in time* and must be experienced in time. The promise of disorientation (although they can be mundane, normal, non-productive, or even destructive) is to approach them as potential openings toward generative, critical, and new orientations – and disorientation can open up a special space of embodied experience and sense-making that precedes the ability to interpret or make sense. This generative, embodied space of disorientation is where the unique work of disorientation might be most potent.

We now move from our close reading of cases of disorientation toward ways that disorientation can be adopted by others. Disorientation can be characterized as a critical methodological strategy where the researcher purposefully strives towards experiences that will critically and relationally disorient themselves. This experience can make things that are 'normative' and invisible due to habit or everyday-ness, noticeable and visible. This practice requires the

researcher to become vulnerable to change, track this experience, and eventually reorient.

There are therefore several stages of this methodological strategy that can be adopted and adapted by researchers in HCI. The researcher, either through their critical positionality, or desire to orient otherwise, traces an experience that drives toward a critical question (examples from the cases being "How can I decenter myself in relation to birds?" "How does pregnancy shift how I think about the design of technologies that intersect with the body?" and, "How do voice assistants work in queer relational settings?"). The researcher takes note of said experience in a disciplined way, through note taking and journaling [5, 16], sketching and making [5, 16, 24], and exploratory data analysis [24]. In particular, they are observing their orientation being disrupted and tracing a path through the entangled, vulnerable experience of being affected, troubled, and ultimately transformed. In other words, the researcher takes special care to note the vulnerability, intra-action, strangeness, frictions, and discomforts of the disorienting experience. It is a process they are undergoing. Often, disorienting experiences only make sense afterward in their telling from the place of synthesis and reorientation. This is where critical insights are derived – via analyzing the experience one has undergone and using the record from regular documentation and sense-making along the way. Finally, as HCI researchers, each author used disorientation in generative ways, to draw attention to technological mediation and meaning making in the case of pregnancy, to queer voice assistants and remix their data into queer sounds of heartbreak, or to slowly imagine ways technology could be designed to hold different our attention to orient differently to non-human others.

Disorientation enables the researcher to find new relations to the world beyond what they can anticipate which allows them to see 'otherwise'. This is important for imagining worlds beyond the one we currently inhabit and finding new ways to frame and conceptualize equity and sustainability. Disorientation as a research strategy can thus be adopted by HCI researchers looking to either shift their orientation or use disorienting bodily experience to reflect on the design of technologies toward wide-ranging critical applications. It can also be used by HCI and design theorists who wish to engage with emerging research practices in HCI.

5.1.2 Tactics of Disorientation in HCI. The question remains how does a researcher archive, trace, and attend to moments of disorientation when it is unclear what one might be learning or where they might end up. In the essays above we saw three main tactics used by authors to access and operationalize disorientation: scenarios, making practices, and using or finding new/altered states of consciousness. We offer these as starting points for others who are interested in using disorientation as a critical methodological strategy and welcome HCI design researchers and practitioners to contribute to growing the repertoire as time goes on.

Scenario-Based Disorientations: Scenario-based disorientations refer to using scenarios of upheaval or disorientation and bodily change as the grounds for reflection on the normative orientations and designs of technology. For example, Gamboa used the liminal and transitional embodied space of her third pregnancy, scaffolded on a difficult second pregnancy, to reflect critically and in an open-ended way about the ways that medical-technical systems interact with the pregnant body and shape experiences of pregnancy. Kinnee used the scenario of a breakup, which is a dramatic and difficult life event, and Biggs scaffolded their experience of bird watching on having recently moved to a new part of the United States. Embodied experiences of change can serve as great premises for disorientation when one notices their potential to help see the normative orientations they were holding before or the normative orientations they are enmeshed within.

Making towards and through disorientation: In a way, all of the case studies used making practices to trace the critical spaces and their embodied critical lenses as they experienced disorientation. Gamboa used autoethnographic sketching over photographs that she took during the duration of her pregnancy. Kinnee et al. looped and remixed audio from his Amazon Alexa, collected during a breakup in order to reflect on the 'trippiness' of trying to queer Alexa's data, attending to its glitches, and also as a way to hear and attend to the audio files differently by looping them so that background noises began to stand out and new meanings emerged. Finally, Biggs et al. used making to capture experiences that Biggs didn't have words for yet, non-linguistic encounters between herself and birds, and affective moments that sent tingles down her but she didn't quite know what they meant yet. For designers, acknowledging how making can be used to capture the embodied experience of intuition, pre-linguistic understanding, and moments of strangeness that resist the categorization of normative orientations, offers powerful tools for working towards and through disorientations, and out into new generative grounds.

Altered States of Consciousness – Tapping into Disorientation: The question stands of how to enter disoriented states safely and productively. It is clear that disorientation requires a careful approach and should be done safely. In our last example, Biggs et al. discovered, haphazardly, the benefit of attending to altered states of consciousness like dreams. We also count their 'trying on' the imagined perception of technologies like microphones as a strategy for altering their norms of attending. HCI already, knowingly or not, has a range of work that supports shifts in consciousness like breathing practices [44] or somatic strategies like meditative walks [47]. Other avenues could be explored like trance music, distance running, or sensory deprivation, which anecdotally, are often used to shift mood or enhance religious experiences. Other states of disorientation like environmental shifts from forest fire smoke, or Covid-19 also present disorienting experiences. Noticing such a shift and starting a journaling or reflexive practice during such times to document them might be a way to capture these moments. There is more thinking to be done here – but finding new places and states to think from can be disorienting or soften the hold of normative orientations on our perceptual field.

5.2 Disorientations of HCI: The shifting grounds of the field itself

Using disorientation as a lens, while it does hold commonalities with other traditions of 'gaining critical distance' in the field that has come before such as defamiliarization, queering, or frictions, helps to theorize a nascent critical practice in HCI that uses highly-situated and personal first-person accounts. These emerging ways of working are vulnerable, and unlike strategies such as frictions,

which focuses on the impacts of artifacts and the trajectory of designerly work, or defamiliarization which focuses on rhetorically creating space through comparisons, disorientation requires the researcher to demonstrate their embodied process through which something shifted, became otherwise, or allowed them to see something new, and how that experience of disorientation, and all its discomfort or strangeness, should be the base of design considerations.

While frictions, queering, and defamiliarization are productive strategies, disorientation can be considered a tool in the toolkit of critical design methodological strategies that seek to disrupt or notice normative patterns, and their impacts, and imagine otherwise. Disorientation fits well with the larger shifts toward more-than-human design in HCI because unlike social science traditions, where objectivity and reproducibility are tantamount to the methodological strategy, the method of disorientation highlights unique subjective experiences and an attitude of being willing to be affected and changed toward new attunements. The human, in disorientation, is in relation to the world around it, subject to its changes and fluctuations, decentered, and vulnerable to outside impacts. Disorientation works through the author's first-person action and accounting, through their phenomenological experience of seeking out and noticing differently, their willingness to be vulnerable and open to change, and their presence of mind to generatively look obliquely and challenge the status quo. In both Biggs et al. and Gamboa's exemplars, we note a willingness to be vulnerable (and the subsequent acknowledgment of it) seems to be the prerequisite for enabling disorientation to happen in the first place. The courage to be vulnerable, to be willing to be changed and thrown from the normal ground is what matters here.

Disorientation, unlike other methods that have come before, also picks up on and engages with moments of embodied intuition, a sense of curiosity or wonder *before* there is a solid framework or way to know exactly what is happening just yet. We refer to this as embodied and pre-hermeneutic, which means, knowledge that exists in the body before it can be interpreted or before it clearly signifies something. This openness of experience is part of the generative possibility of disorientation, it acknowledges grey zones of knowing before experiences are contextualized or made sense of. Making sense is a process, and in the process, multiple possibilities emerge. In the case of Biggs et al., they cannot find words for the experience of birds they are hearing, and this is where making helped them catalog and make sense of their experience. In the case of Kinnee, they listened to their alarm again and again, and the experience that was at first unpleasantly disorienting took on new orientations and meaning for them. For Gamboa, their journaling practice helped them track intra-actions of body and technology, putting together a larger narrative later on, perhaps as they reflected on their records. In other words, the journey is unclear as we undergo it. And showing this part of the process and looking specifically for new directions out of disorientation (grounded in a transition, a desire, or an identity) can drive generative shifts to occur.

One might ask what an HCI based on qualities and values of disorientation might look like. We offer the following to think with. First, disorientation changes orientations to time and acknowledges inconsistencies, rapid changes, loss, grief, and taboo

and sensitive subject matter. Time, in these stories, is not so linear, past traumas are woven into present experiences, grief wells up and passes, and rapid shifts upend stable realities. This might be an important lens to adopt as we grapple with climate change or other increased instabilities in society and technological systems. Second, following others who have put forward refusal as a strategy in past HCI research, disorientation makes us pause and ask, why? Why technology here? Why now? Why are we pointing in this 'direction' – perhaps it enables us to ask more questions of how there might be less, where we might hold back, or how we might orient otherwise. In this way, disorientation softens the grip of technology on an optimal progressive orientation, it softens it, blurs it, and perhaps might allow us to take steps back without feeling it as a threat, one's progression is dismantled through the act of concurrent timelines and disoriented praxis.

6 CONCLUSION

In this work, we introduce disorientation as an emerging critical methodological strategy for HCI. The concept is phenomenological, coined by Sarah Ahmed [1], and explored and developed by other critical phenomenologists as well [17, 18, 26–28]. Disorientation, from this phenomenological tradition, delineates experiences of being 'thrown' from normative ground – losing one's bearings, experiences which are felt through visceral embodied experiences that are often uncomfortable, strange, jarring, and at times traumatic. Disorientation joins other strategies in HCI and design research for creating distance, friction, and movement in the design of technologies that notice, attend to, and resist a status quo [4, 31, 40]. However, disorientation draws from the embodied first-person perspective and requires vulnerability, deep reflexive introspection, and commitment to the process of being otherwise on the part of the HCI researcher. We see disorientation as being closely tied to other emerging HCI methodologies such as first person [10, 22–24] and more-than-human approaches [32, 37, 39]. They all prioritize intimate accounts of one's experience and a willingness to be vulnerable to outside influence and change or highlight ways one is already oriented obliquely to 'normative' orientations. These meaningful and attended-to disorientations become the grounds from which this research extends. As we continue to evolve as a field, as technology becomes enmeshed in the shaping of our most intimate moments and draws us into certain collective (human and non-human alike) futures, disorientation might help us performatively break up the straight confines of normative technological orientations. Working through the soft and vulnerable experiences of laying out experiences of 'not quite knowing yet' or feeling untethered, insecure, and caught off guard. These are the generative moments that can be shaped into alternatives and offer hope for different readings of the world, and new significations, which soften phenomena that seemed rigid or finalized. It is in soft and indeterminate spaces that new growth can occur, and we can find things we didn't know we knew were possible, this is the value and hope of disorientation as a methodological strategy.

Ponty's phenomenology and disorientation, and to Catherine Weiczorek-Berkes for reading the draft and giving feedback.

REFERENCES

[1] Sara Ahmed. 2006. Queer Phenomenology. Duke University Press.
[2] Karen Barad. 2007. *Meeting the Universe Halfway*. Duke University Press.
[3] Jeffrey Bardzell and Shaowen Bardzell. 2015. Humanistic hci. *Synthesis Lectures on Human-Centered Informatics* 8, 4: 1–185. https://doi.org/10.2200/s00664ed1v01y201508hci031
[4] Genevieve Bell, Mark Blythe, and Phoebe Sengers. 2005. Making by making strange: Defamiliarization and the design of domestic technologies. *ACM Transactions on Computer-Human Interaction* 12, 2: 149–173. https://doi.org/10.1145/1067860.1067862
[5] Heidi Biggs, Jeffrey Bardzell, and Shaowen; Bardzell. 2021. Watching Myself Watching Birds: Abjection, Ecological Thinking and Posthuman Design. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21)*.
[6] Heidi Biggs, Alexa Marcotte, and Shaowen Bardzell. 2023. TikTok as a Stage: Performing Rural# farmqueer Utopias on TikTok. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference*, 946–956.
[7] Brené Brown. 2015. Daring greatly: How the courage to be vulnerable transforms the way we live, love, parent, and lead. Penguin.
[8] Judith Butler. 2011. *Gender trouble: Feminism and the subversion of identity*. routledge.
[9] Audrey Desjardins, Jeremy E. Viny, Cayla Key, and Nouela Johnston. 2019. Alternative Avenues for IoT. *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*: 1–13. https://doi.org/10.1145/3290605.3300581
[10] Audrey Desjardins and Ron Wakkary. 2016. Living in a prototype: A reconfigured space. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*, 5274–5285. https://doi.org/10.1145/2858036.2858261
[11] Laura Devendorf, Kristina Andersen, and Aisling Kelliher. 2020. Making Design Memoirs: Understanding and Honoring Difficult Experiences. 1–12. https://doi.org/10.1145/3313831.3376345
[12] Paul Dourish. 2001. *Where the Action is: The Foundations of Embodied Interaction*. MIT Press. https://doi.org/10.1038/nchem.1037
[13] Paul Dourish. 2006. Implication for Design. *Proceedings of the 2006 Conference on Human Factors in Computing Systems*.
[14] Anthony Dunne. 1999. Hertzian Tales: Electronic products, aesthetic experience, and critical design. MIT Press.
[15] Christopher Frauenberger, Judith Good, and Wendy Keay-Bright. 2010. Phenomenology, a Framework for Participatory Design. In *Participatory Design Conference Proceeding (PDC '10)*, 299.
[16] Mafalda Gamboa. 2023. My Body, My Baby, and Everything Else: An Autoethnographic Illustrated Portfolio of Intra-Actions in Pregnancy and Childbirth. In *ACM International Conference Proceeding Series*. https://doi.org/10.1145/3569009.3572797
[17] Ami Harbin. 2012. Bodily disorientation and moral change. *Hypatia* 27, 2: 261–280. https://doi.org/10.1111/j.1527-2001.2011.01263.x
[18] Ami Harbin. 2016. *Disorientation and Moral Life*. Oxford University Press.
[19] Karey Helms. 2021. Entangled Reflections on Designing with Leaky Breastfeeding Bodies. *DIS 2021 - Proceedings of the 2021 ACM Designing Interactive Systems Conference: Nowhere and Everywhere*: 1998–2012. https://doi.org/10.1145/3461778.3462048
[20] Kristina Höök. 2010. Transferring qualities from horseback riding to design. *NordiCHI 2010: Extending Boundaries - Proceedings of the 6th Nordic Conference on Human-Computer Interaction*: 226–235. https://doi.org/10.1145/1868914.1868943
[21] Kristina Höök. 2018. *Designing with the Body: Somaesthetic Interaction Design*. MIT Press.
[22] Kristina Höök, Baptiste Caramiaux, Cumhur Erkut, Jodi Forlizzi, Nassrin Hajinejad, Michael Haller, Caroline Hummels, Katherine Isbister, Martin Jonsson, George Khut, Lian Loke, Danielle Lottridge, Patrizia Marti, Edward Melcer, Florian Müller, Marianne Petersen, Thecla Schiphorst, Elena Segura, Anna Ståhl, Dag Svanæs, Jakob Tholander, and Helena Tobiasson. 2018. Embracing First-Person Perspectives in Soma-Based Design. *Informatics* 5, 1: 8. https://doi.org/10.3390/informatics5010008
[23] Brian Kinnee, Audrey Desjardins, and Daniela Rosner. 2023. Autospeculation: Reflecting on the Intimate and Imaginative Capacities of Data Analysis. In *Proceedings of the 2023 CHI Conference on Human Factors in ComputingSystems (CHI '23)*. https://doi.org/10.1145/3544548.3580902
[24] Brian Kinnee, Daniela K Rosner, and Audrey Desjardins. 2022. Sonic Technologies of a Queer Breakup. In *Designing Interactive Systems Conference (DIS '22)*.
[25] Julia Kristeva. 1982. *Powers of Horror: An Essay on Abjection*. Columbia University Press.
[26] Corinne Lajoie. 2018. Sense and Normativity: Merleau-Ponty on Levels of Embodiment and the Disorientations of Love. 393–407.
[27] Corinne Lajoie. 2019. Being at Home: A Feminist Phenomenology of Disorientation in Illness. *Hypatia* 34, 3: 546–569. https://doi.org/10.1111/hypa.12476
[28] Corinne Lajoie. 2022. The Problems of Access: A Crip Rejoinder via the Phenomenology of Spatial Belonging. *Journal of the American Philosophical Association* 8, 2: 318–337. https://doi.org/10.1017/apa.2021.6
[29] Corinne Lajoie and Emily Douglas. 2020. A Crip Queer Dialogue on Sickness (Editors' Introduction). *Puncta* 3, 2: 1–14. https://doi.org/10.5399/pjcp.v3i2.1
[30] Amanda Lazar, Norman Makoto Su, Jefrey Bardzell, and Shaowen Bardzell. 2019. Parting the Red Sea: Sociotechnical systems and lived experiences of menopause. *Conference on Human Factors in Computing Systems - Proceedings*: 1–16. https://doi.org/10.1145/3290605.3300710
[31] Ann Light. 2011. HCI as heterodoxy: Technologies of identity and the queering of interaction with computers. *Interacting with Computers* 23, 5: 430–438. https://doi.org/10.1016/j.intcom.2011.02.002
[32] Szu Yu Cyn Liu, Jeffrey Bardzell, and Shaowen Bardzell. 2019. Decomposition as design: Co-creating (with) natureculture. *TEI 2019 - Proceedings of the 13th International Conference on Tangible, Embedded, and Embodied Interaction*: 605–614. https://doi.org/10.1145/3294109.3295653
[33] Szu Yu Liu, Jen Liu, Kristin Dew, Patrycja Zdziarska, Maya Livio, and Shaowen Bardzell. 2019. Exploring noticing as method in design research. *DIS 2019 Companion - Companion Publication of the 2019 ACM Designing Interactive Systems Conference*: 377–380. https://doi.org/10.1145/3301019.3319995
[34] Jonas Löwgren, Bill Gaver, and John Bowers. 2013. Annotated Portfolios and Other Forms of Intermediate-Level Knowledge. *Interactions*, January: 30–34.
[35] Maurice Merleau-Ponty. 2012. Phenomenology of Perception.
[36] Timothy Morton. 2016. *Dark ecology: For a logic of future coexistence*. Columbia University Press.
[37] Netta Ofer and Mirela Alistar. 2023. Felt Experiences with Kombucha Scoby: Exploring First-person Perspectives with Living Matter. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 1–18. https://doi.org/10.1145/3544548.3581276
[38] Ihudiya Finda Ogbonnaya-ogburu, Angela D R Smith, Alexandra To, and Kentaro Toyama. 2020. Critical Race Theory for HCI. 1–16.
[39] Doenja Oogjes and Ron Wakkary. 2022. Weaving Stories: Toward Repertoires for Designing Things. In *In CHI Conference on Human Factors in Computing Systems (CHI '22)*.
[40] James Pierce. 2021. In tension with progression: Grasping the frictional tendencies of speculative, critical, and other alternative designs. *Conference on Human Factors in Computing Systems - Proceedings*. https://doi.org/10.1145/3411764.3445406
[41] Robert Rosenberger and Peter-Paul Verbeek. 2015. A Field Guide to Postphenomenology. In *Postphenomenological Investigations: Essays on human-technology relations*. Lexington Books.
[42] Legacy Russell. 2020. *Glitch Feminism*. Verso, Brooklyn, NY.
[43] David Woodruff Smith. 2018. Phenomenology. *The Stanford Encyclopedia of Philosophy (Summer 2018 Edition)*. Retrieved February 8, 2023 from https://plato.stanford.edu/archives/sum2018/entries/phenomenology/
[44] Anna Ståhl, Martin Jonsson, Johanna Mercurio, Anna Karlsson, Kristina Höök, and Eva Carin Banka Johnson. 2016. The soma mat and breathing light. *Conference on Human Factors in Computing Systems - Proceedings* 07-12-May-: 305–308. https://doi.org/10.1145/2851581.2889464
[45] Yolande Strengers and Jenny Kennedy. 2021. *The smart wife: Why Siri, Alexa, and other smart home devices need a feminist reboot*. Mit Press.
[46] Dag Svanæs. 2013. Interaction design for and with the lived body: Some implications of Merleau-Ponty's phenomenology. *ACM Transactions on Computer-Human Interaction* 20, 1. https://doi.org/10.1145/2442106.2442114
[47] Vasiliki Tsaknaki, Madeline Balaam, Anna Ståhl, Pedro Sanches, Charles Windlin, Pavel Karpashevich, and Kristina Höök. 2019. Teaching Soma Design. 1237–1249. https://doi.org/10.1145/3322276.3322327
[48] Peter-Paul Verbeek. 2005. What things do: Philosophical reflections on technology, agency, and design. In *What things do: Philosophical reflections on technology, agency, and design*. The Pennsylvania State University Press. https://doi.org/10.1017/CBO9781107415324.004
[49] Terry Winograd, Fernando Flores, and Fernando F Flores. 1986. *Understanding computers and cognition: A new foundation for design*. Intellect Books.