

# Alterity and kinship: co-writing posthumanist speculative nonfiction with AI

Jeffrey Bardzell<sup>1,†</sup> and Maliheh Ghajargar<sup>2,\*†</sup>

<sup>1</sup>University of North Carolina, Chapel Hill NC, United States

<sup>2</sup>Chapman University, CA, United States

\*Corresponding author: [ghajargar@chapman.edu](mailto:ghajargar@chapman.edu)

†Jeffrey Bardzell and Maliheh Ghajargar contributed to the manuscript equally.

As a response to the climate crisis, scholarly literature has introduced new theoretical perspectives, such as posthumanism, which seek to reimagine the relationships between humans and nonhuman others, including environments, animals, and plants. Reimagining these relationships depends in large part on our ability to engage nonhumans in their otherness, or alterity, but doing so is challenging. Responding to calls throughout posthuman literature for experimental new modes of imaginative encounter with nonhumans, and inspired by speculative traditions from literature to design, we devise a methodology involving “creative experiments” aimed at disrupting, decentering, and disorienting the human-centered thinking that interferes with humans’ ability to perceive and engage with nonhumans as kin. Simultaneously deploying a number of disruptive tactics—including co-writing with generative AI; working within non-fiction genres that do not exist; to imaginatively express, rather than represent, organisms that can not speak; concerning their experiences of a non-verbal form (music)—we contribute a methodology of speculative writing with AI in pursuit of the secret life of plants.

## RESEARCH HIGHLIGHTS

- This research devises a methodology aimed at disrupting the human-centered thinking that interferes with humans’ ability to perceive and engage with nonhumans as kin.
- We contribute a methodological process involving two “creative experiments,” with generative AI: “plant autobiography” and “plant music criticism.”
- We argue that speculative writing can contribute to knowledge in ways that are virtually impossible for scientific realist writing, justifying speculative writing as a knowledge practice in HCI.
- We nonetheless demonstrate that speculative writing depends on scientific realist knowledge, and that as an outcome, it also opens new pathways to pursue scientific realist knowledge.
- The findings suggest that our “creative experiments” bypassed intractable challenges of scientific realist discourse, to push us towards new strategies of engaging nonhuman otherness.

**Keywords:** *speculative writing; more than human design; human–AI interaction; HCI methods*

## 1 Introduction

Sustainable HCI and interaction design [Blevins \(2007\)](#) have developed over the past decades as a key part of the HCI research community’s response to climate change. Increasingly, the field has had to confront contradictions between some of its foundational practices and norms—notably, human-centered computing, and the relationships between design and consumption—and the need to develop design practices that sustain nonhuman forms of life and health of ecosystems at different scales. Ameliorating HCI’s contributions to the drivers of climate change is a challenge of almost unimaginable scale, because the challenges of confronting climate change themselves are daunting. They are so daunting, in fact, that policymakers, academics, and the general public have become discouraged in the face of it, whether in

fatalistic hopelessness, exhaustion, or simple denial about what is happening ([Braidotti, 2019](#), [Morton, 2016](#)). Some of the challenges are indeed difficult for individuals to influence, from the power of global capitalism to shape national and international policies to the sheer scale and ubiquitousness of emissions, environmental destruction, human violence, dispossession, and extinction ([Braidotti, 2019](#), [Dourish, 2010](#), [Monteiro, 2019](#), [Papanek, 2005](#)).

One approach being developed and pursued in several disciplines seeks to confront anthropocentrism in human activities, from philosophical matters of how humans see ourselves in relation to the world, to practices connected with design fields and consumerism. In place of this anthropocentric mindset is the pursuit of posthumanism, or more-than-human thinking, e.g., in the works of Stacy Alaimo ([Alaimo, 2010](#)), Rosi Braidotti ([Braidotti,](#)

**Received:** June 1, 2024. **Revised:** November 19, 2024. **Accepted:** February 21, 2025

© The Author(s) 2025. Published by Oxford University Press on behalf of The British Computer Society.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License

(<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact [reprints@oup.com](mailto:reprints@oup.com) for reprints and translation rights for reprints. All other permissions can be obtained through our RightsLink service via the Permissions link on the article page on our site—for further information please contact [journals.permissions@oup.com](mailto:journals.permissions@oup.com).

2019), Anna Tsing (Tsing, 2021), Donna Haraway (Haraway, 2016), Timothy Morton (Morton, 2016), Arturo Escobar (Escobar, 2018), Natania Meeker and Antónia Szabari (Meeker & Szabari, 2019), and also in closely related areas, including ecofeminism (Warren, 1997) and eco literature (Laist, 2013).

Common to many of these and others is a call to change how we humans think about physical environments, animals, and plants. Instead of viewing them as categorically separate from human life, or seeing them as resources to be exploited in service of a capitalist economy, post- and more-than-human approaches emphasize the connections, kinship, forms of mutuality, and shared needs among humans and other forms of life—often appealing to approaches that emphasize our embodied proximity, including kinship (Haraway, 2016, Ingold, 2020), assemblages (Braidotti, 2019, Tsing, 2021), and transcorporeality (Alaimo, 2010). The thinking is that if we humans can transform how we think about and engage our environments, and more than human world, we can then imagine new practices and political coalitions that can redirect our societies towards more sustainable outcomes. This body of literature has given rise to a whole repertoire of interrelated concepts, many of which have already been taken up in HCI. These concepts include the Anthropocene, natureculture, transcorporeality, kinship/oddkin, worldmaking, human–non-human assemblages, noticing differently and practices of decentering the human.

One way to change how we think about the nonhuman world is to change how we talk about it; in other words, changing the forms of discourse—the rules that govern what practitioners say when they speak within their practice—could open us up to new ways of thinking. Today, the prevailing serious way to talk about the nonhuman world is using scientific realism, which attempts to truthfully and objectively represent this world in its reality, from understanding *causes* (e.g., why the Arctic squirrel is able to withstand both colder and hotter temperatures than most mammals) to *depicting* the structures and functions of organisms (e.g., in anatomical and botanical drawings). But as several scholars, such as Meeker & Szabari (2019), Ingold (2020), Gibson (2018), Marder (2014), and Marder et al. (2013) observe, and as we further unpack in the Key Concepts, scientific realism—notwithstanding its many strengths—has a key limitation. Scientific realism is weak at capturing the alterity, the otherness, of the nonhuman world. As Meeker and Szabari (Meeker & Szabari, 2019) observe, scientific realism is limited to what we are able to observe, and it cannot tell us about the inner mysteries of plant life. As an alternative, these authors in diverse ways advocate for new modes of discourse—new verbal genres that help us access the alterity that scientific realist discourses cannot.

The goal of this project is to weave these ideas together, that is, to enter into a more-than-human mode of understanding by throwing ourselves at the pursuit of plant alterity—to engage it, connect to it, correspond with it—using speculative writing over a series of “creative experiments” (a term we have appropriated from bioart) as our methodology. The writing in our creative experiments was speculative in multiple senses. One was that we sought to work within the contexts of cultural products that were not for humans; for that, we chose to focus on a loose conception of “plant music,” which included anything from music composed (by humans) for the intended consumption of plants, to sounds that we believed a plant might find pleasing (e.g., the buzzing of a bee coming to pollinate it) and thus, in some metaphorical sense, consider “musical.” Another, related way that the writing was speculative was that we wrote within the constraints of two

genres—plant autobiographies that focus on what plants hear, and plant music criticism—that are not human genres.

By constraining ourselves to writing in “plant genres”—with all of the paradoxes that doing so entails—we “imagine a vegetality” that helps us to envision “a hitherto invisible, ignored, or intangible world in which plants play a crucial role,” to borrow the phrasing of Meeker and Szabari in *Radical Botany* (Myers, 2015). Finally, we leveraged an emerging writing technology, a large language model (LLM), whose responses to prompts are often uncannily effective and yet sometimes weirdly surprising (e.g., when AI “hallucinates”). Because of its unpredictable oscillations between near-instantaneous competent responses and a range of incompetent ones (e.g., banal and clichéd content, stereotyped and biased content, absurd content), writing with genAI often subjectively feels disorienting and decentering, and can generatively stimulate reflection and insight as a result of its “back-talk” to its coauthor (Schön, 1983). Additionally, making use of its massive-scale neural network, the LLM might pick up on connections among rhetorical conventions that we would not have made ourselves, potentially enriching our experimental discourse with rhetorical conventions that are proven but never applied in this context. This double-decentering, one thematic (plant music) and the other methodological (co-writing with an LLM), is the engine that drives our speculative writing.

Our HCI contribution is two-fold. One is concerned with the *telos* of the project, which is to make some progress, as HCI and design researchers, toward the posthumanists’ call to take seriously the intangible and unobservable vitality of plant-life, to apprehend vegetality in its mystery, and to help us as humans, and as design researchers, to interact with it. The other contribution is concerned more with the *means* of the project, that is, with a methodology built around speculative writing, writing that unfolds via nonfiction genres—autobiography and music criticism—which might take us somewhere that science and fiction cannot: to the secret life of plants.

## 2 Key Concepts and Related Work

Our argument hinges on concepts associated with posthumanism—the intellectual tradition itself as well as the appropriation of posthumanist thinking in HCI and design research. However, our argument engages posthumanism in connection to AI-assisted creative writing as a method. In this section, we provide a background sketch of each.

### 2.1 Posthumanism

Posthumanism generally refers to an academic research agenda that, as a response to climate crisis, mass extinction, and other effects of the Anthropocene, seeks to challenge and redefine the relationships between humans on the one hand and the rest of the physical and biological world on the other (Alaimo, 2010, Braidotti, 2019, Escobar, 2018, Haraway, 2016). As an intellectual movement, it is adjacent to feminist materialism (Grosz, 2017), studies of the Anthropocene (Morton, 2016), ecofeminism (Warren, 1997), critical plant studies (Gibson, 2018, Irigaray & Marder, 2016), and more than human centered design studies (Wakkary, 2020, 2021). As noted in the Introduction, a key claim of this body of work is that changing prevailing conceptual schema concerning humans’ relationship to the rest of the world can lead to new political positions and formations that can confront twenty-first-century challenges.

Underlying the system of thinking that these theorists are hoping to replace is a Western intellectual tradition that rests on

two foundations: that of the liberal humanist (or Enlightenment) subjectivity and a coordinated set of binary oppositions (e.g. nature/culture, mind/body, human/nonhuman, etc.) that further define what the liberal humanist subject is and does. These foundations undercut researchers' and citizens' ability to envision alternative, preferred futures because they logically separate the human from all else, normalizing further distinctions, such as those between "the natural" and "the artificial" (as in Herb Simon's *The Sciences of the Artificial*), while also dematerializing thought, knowledge, and information, such that they seem as though they were disconnected from the physical world. In short, they sever connections and then reify as separated autonomous entities phenomena that have always been organically interconnected, including humans and the natural world, or the fact that natural language is, well, natural.

Diverse research traditions in the past century have challenged these foundations from several perspectives. Ecofeminists, for example, have called attention to how the human relationship to nature echoes matters of social justice, where a dominant group controls and exploits another group—whether that group is women or nature itself (Warren, 1997). Posthumanists have critiqued human-centeredness in all of its manifestations, seeking to re-situate the human into non-hierarchical relations with the rest of the world. Object-oriented ecological philosophers decenter the human by emphasizing the autonomous reality of objects in the world, independent of how they are perceived by, or how they affect, humans. Characteristic of much of this thought is a call to reorient ourselves—not just our theories, but our bodily practices (Alaimo, 2010, Shusterman, 2012), our use of language (Barad, 2003), and our acts of perception (Tsing, 2021)—to (re?)connect with the biosphere in ways that might lead us away from climate catastrophe and towards some desirable future.

## 2.2 Posthuman Design

Posthumanism as a philosophical concept and approach has been used in art and design research over the past decades in diverse areas, such as visual arts (Sara Angelucci's *Arboretum*), architecture (Earthships), and music (Paulina Oliveros' Deep Listening) among others. Posthuman design has been characterized as oxymoronic because, by definition, it would seem to be a human-decentering a human practice. Yet design researchers have found ways to navigate such paradoxes. For instance, Leveratto's (Leveratto, 2021) *Posthuman Architecture* cites examples of designing posthuman habitats. For Leveratto, Thoreau's cabin is one of the earliest examples of posthuman architecture; the cabin's architecture became a "nest" in many senses, including a nest for developing the thinker's abolitionist and environmentalist philosophy (Leveratto, 2021). Another example is Gilles Clement's concept of "Planetary Garden," which resisted the seventeenth century's garden design with spatial boundaries and proposed gardens that are not delimited between four walls and a selection of plants. Such a garden foregrounds "ecological knowledge," leading to developed vocabularies "of oceans and clouds, ecosystems and biotopes, pollution, and remediation," in which "the gardener would have been called to protect and sustain life and diversity through a design approach that would have taken into account specificity and interconnectedness and temporal variability as bounding parameters" (Leveratto 2021).

Similarly, in Human-Computer Interaction (HCI) and design, researchers are asking how humans can design for more-than-human worlds (Rosén et al., 2024, Wakkary, 2021). Oogjes and Wakkary, for instance, appropriated Schön's concept of *repertoire* to attend to the different ways human designer can facilitate

participation of nonhumans in design research practice (Oogjes & Wakkary, 2022). The authors employed methods such as landscape ethnography and Tsing's concept of "noticing" to weave the stories of the design researcher to the nonhuman actors' stories. Key et al. contributed to the posthumanist HCI and design, conveying the "importance of the journey alongside the destination," using care as a lens for speculative and feminist Posthumanism (Key et al. (2022)). Giaccardi and Redström focus on the role of technologies and tools, such as AI, in a more than human design centered approach, considering their limitations and capabilities in creative processes (Giaccardi & Redström, 2020). Linking most of these studies is a self-reflexive search for breaking the dualism between human and non-human agencies as well as what is "natural" and what is "artificial."

Elsewhere in HCI and design, researchers are investigating the relationships between human and more-than-human lives. Livio and Devendorf introduced eco-technical interfaces as a meeting point between living agents and machines, between human-animal-plants and technology. Similar to other kinds of interfaces, "eco-technical interfaces perform this arrangement of relations through affordances, the material artifacts which produce or foreclose possible interactions." (Livio & Devendorf, 2022). Wang designed and tested a prototype, called "the grow-able jar lamp" with the aim of encouraging people to notice plants in their everyday lives (Wang, 2022). Nam et al.'s FloraWear is another example of designed artifacts that aims to mediate human-plant relationship. FloraWear is a DIY, wearable living interface, which supports noticing plants by growing them in a wearable, providing physical contact with human bodies (Nam et al., 2023).

Attending to the complexities and nuances of human-nature relationships is another major subtopic. For instance, Rodgers et al. identified key human relationships with nature through a probe study with the participants on their relationship with their garden, inspired by phenology, the study of cyclic biological events (Rodgers et al., 2023). Vella et al. used camera traps to observe the interactions of participants with their gardens (plants and animals) and identified two different relations with nature: care and control (Vella et al., 2021). Common to most of these works is an attempt to (re)connect to nature and make sense of our relationship with nature with its multitude dimensions, whether through observation techniques, personal experience, or artifacts that supports moments of reflection on our connections to plants.

## 2.3 From Scientific Realism to Speculative Writing

Many posthuman concepts and practices, in one way or another, address the challenges humans face in understanding, appreciating, and living with the alterity of the nonhuman. Engaging that alterity has the potential to enrich our perceptions of and thinking about nonhuman others, to reveal to humans alternative ways of being and doing, to bring humans closer to (i.e., to achieve kinship with) the nonhuman, and to discover and pursue new modes of cooperation with the nonhuman (e.g., in worldmaking). But as Meeker and Szabari (Meeker & Szabari, 2019) observe, the alterity, e.g., of plants, is resistant to our current modes of understanding. Meeker and Szabari suggest that as humans we face a dilemma: on the one hand, we can understand plants in the realist, scientific tradition of objective representation, which limits us to positivistic representations of what is observable, pushing the plant's mystery, its alterity, out of our reach. Alternately, we can approach plants more metaphorically, using

anthropomorphizing tactics, to help humans experience complexly layered, sensually rich and cognitively powerful encounters, but which, by virtue of their anthropomorphizing, miss the point.

Seeking a third way, Meeker and Szabari advocate for speculative writing as a means to facilitate meaningful human engagement with nonhuman alterity. Speculative genres “are the forms of writing in which we find a concerted effort to imagine a vegetality that remains inaccessible to [scientific] realism” (Meeker & Szabari (2019), p.16). Along these lines, they outline a genre of plant speculative fiction, which “differs fundamentally from traditional botany as a predominantly visual and objectifying mode of knowledge, tightly linked to practices of taxonomy and classification, [and instead] are distinguished by their willingness to hypothesize about a hitherto invisible, ignored, or intangible world in which plants play a crucial role” (Meeker & Szabari (2019), p.18). Their suggestion is not unlike Tim Ingold’s call for “correspondences” between ourselves and our surroundings, correspondences that he argues should not be representations of what we see around us (e.g., as in the case of botanical drawings), “but of answering to [our surroundings] with interventions, questions, and responses of our own. It is as though we [are] involved in an exchange of letters” (Ingold, 2020). Ingold further calls for writing experiments (“we have to try things out and see what happens”), which are not discourses about performance, but which themselves constitute a kind of performance, enacting a “living language” that “endlessly creat[es] itself in the inventive telling of its speakers” (Ingold (2020), p. 201–2). In a similar vein, Mike Marder (Marder et al., 2013) encourages us not to attempt to represent plants, but to express them.

HCI likewise has its own traditions of speculative creating, most explicitly in speculative design and design fiction (Bleecker, 2022, Dunne & Raby, 2013, Ghajargar, 2024a), but also within many forms of research through design (Blythe, 2014) and related practices, including cultural probes (Gaver et al., 1999). Of the latter, Kirsten Boehner (Boehner, 2018) writes that cultural probes were “an arts-inspired methodology for design,” which “were created explicitly in opposition to traditional modes of requirements-gathering and research relationships” (Bardzell et al., 2018, p.601). The cultural probe, she continues, “uses technology to engage and explore the curiosity, playfulness, and improvisational nature of people” (p.601). The qualities of speculative design, cultural probes, research through design, and so on are in important ways analogous to those of Ingold’s “correspondences,” in that they turn away from the realist representations characteristic of scientific realism and embrace instead a performative and dialogical engagement with situations resulting in the living extension of language (or of a given design language).

## 2.4 Creative Collaboration with AI

At a time when posthuman research is advocating for new genres of speculative writing, large language models, such as ChatGPT, are disrupting writing practices. Given that a goal of this project is to go off the balance, to disrupt our habits, and create glimpses of, and openings for, alternate ways of being, LLMs seemed to offer an opportunity to further that. Specifically, we produced writings in non-existent genres using large language models to compose for, with, and in spite of us. Creativity in general and with AI in particular are not new to HCI, and in this section we survey some key literature.

Creativity has been studied in design, engineering, humanities and psychology research (Csikszentmihalyi, 1997). Tools that support creativity (Shneiderman, 1999, 2007), either digital (Dale,

2021, Poulos, 2021) or analog (Halskov & Dalsgård, 2006), have been the subject of numerous studies in HCI and design. Kim et al. researched how novice designers can use creativity tools to create opportunities to grow by providing a safe space to experiment and fail (Kim et al., 2015). Frich et al. call for a necessary, interdisciplinary, and collaborative effort in creativity research between creativity research in human–computer interaction on one hand and creativity in psychology on the other (Frich et al., 2019).

The use of AI technologies in creativity processes have been increasing during the last decades, with some viewing it as another tool and others viewing it as a collaborator (Guzdial et al., 2019, Rezwana & Maher, 2023). More specifically, as AI technologies have advanced over time, natural language models such as GPT-3/4 were used for creative writing and storytelling, redefining their role as they are perceived as collaborators or even as creative partners (Branch et al., 2021, Ghajargar et al., 2022, Rezwana & Maher, 2023). These technologies have also been deployed for generative literature (Ghajargar et al., 2022), allowing the users to see, read and talk to AI using language models (Ammanabrolu et al., 2020), or allowing users to create applications to meet specific needs, such as child-parent collaborative storytelling (Zhang et al., 2022). More recently, researchers have considered the role of virtual agents as creative collaborators. For instance, Cobbie is a mobile virtual AI that generates ideas with designers through iterative sketches, which helped generate out-of-the-box or “unexpected ideas” (Lin et al., 2020). Finally, we acknowledge frictions between researchers that advocate for AI for creativity and those who are justifiably concerned with AI biases and environmental impacts. Our use of genAI is scoped to producing speculative writings that aspire to be posthuman in both process and product.

## 3 Methodology

This paper reports on a human-AI creative writing methodology applied to two creative writing experiments. During the experiments, we sought, if not exactly to “decenter,” then at least to throw ourselves off-balance as human authors, and also to help to create cultural products the likes of which we have never seen. In this section, we describe two phases of our methodology: the creation of speculative texts, and their analysis.

### 3.1 The Creation of Speculative Texts

We specifically focused on two forms of writing: autobiographies and critiques. Further, we chose plants as a nonhuman form of life, which the writings are either about or narrated ostensibly from their perspective. We chose autobiographies and critiques because both are written from a first-person perspective and are about subjective experiences. However, while in autobiographies, the first person *I* is the main character and the narrator, in critique, the first person *I* is the narrator whose writing is mainly about the subjective experience of interacting with a work, such as a poem, film, or dance performance.

Producing speculative texts is a creative act, and in itself, not a scientific methodology. Even so, as a practice it features both constraints and processes.

**Constraints.** The primary sources of constraints are the conventions of the genres themselves. Autobiographies, for example, feature a number of conventions: they are expressed in the first person; they are narrative; they are nonfictional; they convey personal experiences, perspectives, and a style or voice; and so on. Criticism likewise features a number of conventions:



it is a nonfiction genre of writing, which is expository and non-narrative; and it commonly includes the following elements: a description of one or more given works; the characterization and analysis of its formal elements and their composition; an account of the work's emotional and other experiential effects on the reader/viewer; an interpretation of the work's meanings; an evaluation of its achievements and impacts; and so on. We constrained ourselves to produce texts that reflected those conventions.

**Process.** Producing speculative texts entailed *research* (e.g., research into plant-life, both via the natural sciences and our own direct experiences of plants; researching music theory and music criticism); using such research as the *contents*, or raw materials, that we poured into the *form* of autobiography/criticism (i.e., the sorts of conventions specified above); the *assembling and refining* of content through interaction with the LLM, our intentions, our ongoing evaluation of the LLM's results, and our goals for the project; and our ongoing self-reflexive interpretations of the texts which further refined the nature and goals of our project.

Also part of the process is coordination across two coauthors using LLMs to write two different kinds of speculative text (i.e., autobiographies and criticism); we wanted to ensure that our processes and outcomes were sufficiently similar to each other to sustain ongoing comparison. As we experimented with speculative writing using LLMs, we communicated our experiences together, and through those communications, a certain process—one which broadly embodies an interpretivist epistemic stance, as explained later in this Methodology section—began to emerge.

We present that process here as unfolding across three phases, though in practice these phases were much less linear and more interactive with each other than the following list might otherwise imply.

- **Exposure:** Before and during the creative experiments, we sensitized ourselves to plant life, by going on nature walks in which we journaled, photographed, and drew our surroundings and our feelings within them (described in more depth in Ghajargar, 2024b). We also engaged in aesthetic works about and for plants, including reading plant fiction, listening to plant music, and viewing films about plants (from documentary to horror). We engaged the science of plants view contemporary and historical (e.g., Goethe & Miller, 2009, as well as botanical drawing. The exposure phase was intended to help us bring our full selves to bear on the remaining two phases of the experiment: our full selves incorporating our experiences as organisms in a material world, as readers, as members of artworlds (or aesthetic publics), as natural and social scientists, and as creative scholars.
- **Exchanges:** In both experiments, we went back and forth between ourselves and AI on multiple levels. The level of microinteractions were characterized by human prompts and AI responses. On a broader level, the interaction was about ceding some of our creative agency to AI, of engaging the “back talk” of its responses, of opening ourselves to the possibility that AI might make a connection or propose an idea that might be radically different than, perhaps even *better* than, anything we could come up with. In between were dozens of routine inferences and insights that arose through interaction, gradually shaping our capacities to work with AI in increasingly satisfying (if nonetheless often perplexing) ways. This to and fro helped us to achieve a kind of connection with AI while also imaginatively exploring, at a somewhat

granular level of a few paragraphs, new modes of kinship with plants (Ingold, 2020).

- **Collages:** Our interactions with AI output texts (in parallel experiments, described in Ghajargar, 2024b, Ghajargar & Bardzell, 2022, we also output images and music). Often, we would repeat previous prompt sequences to see how AI would respond to our prompting a second, third, and fourth time. Occasionally, AI would generate something new that we hadn't encountered before. Gradually, we would synthesize many sessions' transcripts into a single collaged narrative, dragging and dropping sentences around, deleting some, replacing others, and using color coding to help trace the origins of the textual elements.

### 3.1.1 Creative Experiment: Plant Autobiographies

For the first experiment, we used OpenAI's Playground text-davinci-003 model and GPT-J-6B model. We co-created plant autobiographies featuring the theme of “hearing plants,” which was inspired by the following three eco literary works: Susan Glaspell's *The Verge* (Laist, 2013); Lucille Clifton's *An Other Poem* (Alexander, 2009); and Alan Moore's *Swamp Thing* (Moore, 2012). “Plant Autobiographies” are first-person fictional narratives in which a plant narrates its own experiences and tells its own story. The term does not exist as a literary genre as far as we know, but it is an adaptation of animal autobiography which is “a first-person fictional narrative in which an animal tells its own story—emerged in the late eighteenth century as the first attempt to represent animal minds in extended narrative form” (Herman, 2016).

This speculative writing experiment unfolded in three phases as mentioned above: exposure, correspondence, and collage; these were further divided into more steps as follows:

In the *exposure* phase, we (1) read the literary work and identified the plant characters in each piece of writing, (2) identified scenes where the plant character could hear sounds or experience music, (3) reimagined the story from the perspective of the plant character in the music situation, foregrounding its experiences and subjectivity as if it were retelling the story from its own perspective.

In the *correspondence* phase, we (1) wrote a prompt in an autobiographical form from a plant first-person narrator view, (2) interacted with AI (LLM) and collecting 10-12 responses. Then we repeated the same process for about 10-12 times to have several draft stories.

Lastly, in the *collage* phase, we (1) assembled the different sequences of prompt-responses together through a collage-like activity, (2) edited out the text, by removing the redundancies and replacing and moving the text elements around while staying as faithful as possible to the narrative, (3) chose a title for the plant autobiography (Tables 1 and 2).

During the process we took notes, while iterating on the prompts as many times as necessary (for example, if there was an absence of “hearing plants” theme in the completions such as music, sound, or the plant character). In curating a selection of literary works, we wanted to have diverse formats and genres that are focused on themes of environment, plants, nonhuman subjectivities, and otherness. We outline below each of these literary works and their relevance to the plant autobiography creative experiment:

*The Verge* is a highly experimental postwar play by Susan Glaspell, in which a woman named Claire, frustrated by the roles society boxes women like her into, seeks to create an experimental

TABLE 1. Plant autobiographies.

The original literary work	The co-created autobiographies
The Verge (Susan Glaspell, 1921) swamp Thing (Alan Moore, 1985) An Other Poem (Lucille Clifton (1996)	The Wyrd Who Listens, Future with a Heart, Hope The Green Body, The Grand Mosaic of Life, Like A Song in My Veins Finding the Music of the Soul, The Treewoman, The Living witness

TABLE 2. Sampling of plant autobiographies co-created with GenAI. The prompt is in italics.

**The Green Body:** *I am not and have never been Alec Holland. I am a mass of plant fiber that had just infected by Alec Holland’s consciousness. I am vegetable, a moss. I hear the swamp music. It is my own voice seeking a revenge. I will have my revenge upon those who have wronged me, and they will know the true horror that lurks in the swamp. I feel my consciousness slipping away as the infection takes hold. [...], I hear the swamp music getting louder and louder. I am no longer Alec Holland, I am only the Swamp Thing, the champion of the Green, the protector of all life, I am the protector of the Green, the guardian of the plant kingdom. I have the wisdom and power of Alec Holland and the primal nature of the swamp. I want to spread his consciousness and his memories throughout the swamp. I am both plant and human, and I possess the knowledge and power of both. I am a being of pure energy and life. [...] I will use it to bring balance and harmony to the world. I am the Swamp Thing. My mission is to protect the natural balance of the swamp, to keep it safe from those who would seek to harm it. I use my powers to keep the balance between the animals, plants, and humans in the swamp. I am a force of nature, and I will use my strength and my will to protect the Green. My body is composed of all the vegetation that I have absorbed, and I am constantly growing and evolving.*

**The Treewoman:** *I am a boxelder tree, living in this green lawn, which used to be an abandoned swimming pool. Children of Black communities came here to swim. I can still hear their laughter, as a foreground sound to the water music. I miss that music, which nurtured my roots to grow deeper and deeper into the soil. [...] I can still hear the splash of their feet as they entered the pool. The music of their laughter was as sweet as the sound of the water as it ran through the pipe. I watched them jump into the pool, and the water would wash over their heads, and they would laugh and laugh, as the water splashed on their heads. I was a little girl then, and I was just beginning to know that I was a tree. I stood there, as I watched the children. I have seen the transformation of this space from a forgotten swimming pool to a lush green field. I am proud to be a part of this transformation. I listened when the trees seemed to whisper secrets to me. I miss the shade of the old oak trees, which were the first trees to grow on this land. I miss the people who were the first to plant me, I was planted here with the intention of providing a safe haven for the kids who used to come to the swimming pool. I have been a protector, offering my shade and shelter to any who needs. My branches have embraced these kids and provided a place for them to come and be safe. My roots have grown deep and wide, providing nourishment and stability to this grassy meadow. I miss the way the wind would rustle the leaves, and how the water would sparkle. I am a part of the transformation from abandoned pool to community park. I am proud of what I have become, a symbol of renewal and hope for a brighter future. It is my hope that I can continue to provide a place of refuge and comfort, a place of joy and beauty, a place of relaxation and contemplation, and a place of peace and harmony.*

**The Wyrd Who Listens:** *I am a hybrid plant, a new form of life. I was born on November 14, 1921, in Claire’s greenhouse, in New England. I do not have a name, but I am a symbol. I am a symbol of Claire’s efforts to go beyond the limitations that conventionally posed on women. [...] At night when Claire is sleeping, I listen to the sound of the water flowing through the tubes under my pot and behind me. That music brings me joy and my roots desire to expand, grow and dance. The plants in the greenhouse are a part of me. They are a part of Claire, too. “They” cannot destroy me with their beguiling female charms. “They” cannot remove me from “their” world. I am one with them. [...] Sometimes I live as a violet, sometimes as a blue rose, sometimes as a carnation or a lily. Wherever I am, I am always true, faithful, strong and vivacious. I have heard from “them” that “they” were not ready for this gift. I want to tell the story of a woman who wanted to do something different. Who wanted to be a pioneer. Who wanted to go beyond the limitations that conventionally posed on women. [...] I was born with a serious defect: I am not a normal plant. I am a hybrid plant. I was not supposed to be born at all. Claire wanted to make me. She was a good mother. I am a symbol of the intermingling of the feminine and the masculine and of the fusion of Wyrd and Destiny. I am the cross between Claire and Daphne. I protect. I do not tolerate dishonesty or betrayal.*

plant in her greenhouse, a plant that defies categorization even as it unfolds into creative and monstrous new forms; meanwhile, Claire goes mad, even as language itself breaks down around her. For the feminist Glaspell, *The Verge* was a space to test new forms of art and womanhood (Artman in Laist, 2013, p. 103). Hence, *The Verge* is about transitions and contrasts, and the strong emphasis on the plants within the drama is a metaphor, as Artman highlights, “for making sense of the complexities of being an individual, a woman, an artist—and all three simultaneously.” The piece resonated for us because it foregrounds not only an other, emergent subjectivity—that of her experimental plant—but also a complex non-animal, non-human life (plant) as a metaphor for our sustainable transitions towards something Other (Artman in Laist, 2013, p. 103). Given its themes of experimentation, its turn to plants to deconstruct human relationships, reimagine form in feral-vegetal ways, and even tear down (if not replace) our cognitive schema, *The Verge* seemed to be a powerful intellectual and

literary precursor to contemporary feminist and posthumanist thinking.

*Swamp Thing* is a human-like plant fictional character and superhero that appeared in a series of American DC comic books. The character is known to have brought ecological awareness to comic books. The hybridity and posthuman experiences are central to theme of the comic book series, especially in Moore’s hands. Although the environment has been considered a framework or a sacred space in earlier versions of *Swamp Thing*, Moore’s work brought that element into the foreground, which echoes the environmentalism movement of the 1970s (Krinsky in Laist, 2013, p. 222). Similar to *The Verge*, this comic book was also about a nonhuman subject and a process through which one subject can become the Other. *Swamp Thing* is also about the role of human experiments in making of that subject. However, in this story, the making happens in two layers, one is when scientist Alec Holland turns to a monster, an Other, by a supervillain in a laboratory

setting, as an attempt to marginalize Alec Holland. The other layer is when this monster emergently grows into an agent for transformation and change. Themes of human-plant hybridity, of the emergence of a new kind of subjectivity and along with it power and activism, attracted us to it for our research.

An *Other Poem* is Black Nature poetry (a sub genre of Nature Writing) by Lucille Clifton (Alexander, 2009), and it is about a tree. The underlying concept is not the tree itself but how humans experience nature differently depending on their socio-economic situation, gender and racial identities. The poem focuses on Otherness and experiencing nature from that multi layered perspective. The anti-racist and social justice themes that emerge from this poetry were relevant to considerations of environmental justice, which link racial injustices to environmental ones, and were highly relevant to this project. Several qualities of the work attracted us: its use of plants as protagonists, its meditations on the Other from a Black woman, and the subtle ways that human racial injustice is brought into focus.

### 3.1.2 Creative Experiment: Plant Music Criticism

For the second experiment, we used Jasper.ai, an AI copywriting content creation platform that at the time used GPT3, to generate plant music criticism. Music criticism, in the tradition of literary and art criticism, provides audiences with contextualization, classification, elucidation, interpretation, and evaluation to facilitate artistic understanding and appreciation (Carroll, 2008). Plant music criticism, as far as we know, does not exist as a form of discourse; indeed, the idea itself is confusing, because criticism seeks to make the arts available to (human) appreciation, but the “art” in question is for non-humans. A botanicocentric work of music criticism would be legible only to plants, we suppose, but in any case inventing and populating new genres of discourse is a tactic to follow Alaimo’s call to devise “new interfaces between human bodies and the larger environment.” (Alaimo, 2010)

Like plant music itself early on, plant music criticism initially was for us a provocative, but cognitively empty, concept. To give the concept some content, we followed the same exposure-correspondence-collage process used in the plant autobiographies creative experiment. For *exposure*, we needed to ascertain that Jasper could compose art criticism, and if so, to evaluate the overall quality and features of its art critical writing. Initially, for example we generated a prompt about English Romantic poet John Keats, just to get a baseline sense for what sort of art criticism Jasper.ai could produce, and we tested multiple times, finding that once we supplied the right sorts of prompts, Jasper.ai reliably produced an entry level work of criticism. Art critical essays come in many forms, and one of the major subgenres is biographical criticism (e.g., how John Keats’ life events influenced his poetry), which was not useful to our purposes; we needed criticism that focused on features of the work itself, and we learned how to prompt for that kind of commentary.

In the *correspondence* phase, we devised a series of prompts intended to give us some notions concerning what plant music criticism might talk about and might look like. To do so, we prompted Jasper to write essays on the theme of hearing plants, including music and sounds that can be heard by plants. Examples of prompts included the following:

- “Write an essay on how several famous musicians have used photosynthesis to achieve musical effects.”
- “What do mushrooms hear when they listen to an oak tree?”

- “Compose an art-critical essay about Mort Garson’s *Plantasia*; discuss the qualities of the music itself; evaluate its quality as a work of musical art.”

In each case, we replicated the result multiple times, to get a sense for the range of possible responses, and we also followed up with revised prompts to fine-tune results or to probe further interesting responses. For example, when prompted to write an essay about music made by underground mycelium, Jasper produced critical text about “glitch hop” music, and so as a follow-up question we asked “What are some examples of glitch hop that use underground mycelium?” We also observed that the LLM struggled to produce more than a few paragraphs, which were too short for our purposes.

To overcome the brevity of the AI-generated essays, we used *collage*. With this approach, we generated multiple essays using the same prompts, achieving a theme and variation-style result, where all of the essays shared overall consistencies but individually introduced or developed different features. We then copied and pasted the results into a document using separate colors to help us link textual elements back to their source. Then, we dragged and dropped sentences around to compose a new essay that combined the responses into a single, longer and generally more satisfying essay.

## 3.2 Analysis of Speculative Texts

We did not conduct a traditional data analysis, e.g., by using a grounded theory approach to “discover” themes “in” the text. Such an approach in this project would have been both undesirable and impossible. It would have been undesirable because the main point of inventing new genres of speculative discourse for posthumanism is to counter, and to develop an alternative to, scientific realism, and the objectivist task of discovering themes that are “in” a text is a form of scientific realism. Second, such an approach would have been impossible because the production and interpretation of the texts happened simultaneously and interactively, that is, it was a “correspondence” (Ingold, 2020). The main point of our activity was to *produce* and *develop* new themes, not to discover ones that are already out there. For example, when we wrote a new prompt, responding to the LLM’s preceding response, we were actively interpreting the meaning of the dialogue and also intervening to shape it. Likewise, when we collaged textual pieces from different dialogues, we were actively shaping the same text that we were simultaneously interpreting.

Although critical interpretation in this sense differs from more empirical approaches such as grounded theory, it nonetheless can be articulated as a set of procedures, although such an articulation inevitably schematizes practices that, in reality, are undertaken with a nuance and complexity that reflects uncountable small judgments and skillful perceptions.

### 3.2.1 Critical Interpretation

Critical interpretation, which manifests in different practices with different names—close reading, hermeneutics, *explication de texte*, critique—is typically iterative in nature, unfolding in a process that has been described as “dogged” (Dauber & Jost, 2003) and “eclectic” (Abrams, 1991) and an “effort after meaning” (Bordwell, 1991). It is used throughout aesthetic areas—art history, literary studies, music history, film criticism, etc.—and in other humanities disciplines, such as history.

At first, the analyst seeks to gain a general familiarity with the primary contents of a text (note that “text” in this sense is not limited to verbal texts and can include works in other media, such as film or dance performances). In the case of fiction, those primary contents typically include plots, characters, settings, conflicts, etc. In doing so, the analyst becomes attuned to the particulars of the individual work. This attunement guides subsequent reading and, inevitably, rereading (Calinescu, 1993).

With each iteration, the (re-)reading becomes more directed, as the salience of certain passages emerges. The analyst connects those salient passages to other passages within and outside of the text. Internally, the analyst might notice a textual pattern or proclivity, linking textually separated passages together (e.g., by comparing two specific descriptions of, say, plant perspective, across diverse responses in the corpus). Externally, the analyst might recognize that the text reworks an earlier text or it somehow relates to prior theory through demonstration, extension, problematization, or contradiction. As the analyst builds what is intended to be a specific and useful analysis (or “reading”) of a given work, these patterns and connections are built into an argument, which is supported primarily with textual evidence.

### 3.2.2 Critical Interpretation of Literary Texts

Literary interpretation refers to the practice of critical interpretation applied specifically to literary texts, broadly construed. This practice shaped both how we interpreted our plant autobiographies and (in a more meta-way) how we interpreted our plant music criticism. In this practice, analysis implements the general procedures summarized above with a focus specifically on qualities pertaining to both the form and the content of a literary text. The form would include features such as genre conventions (e.g., what distinguishes a lyric poem from horror fiction), figurative language (metaphor, diction), literary images, stylistic conventions (e.g., Neoclassical vs. Romantic), and compositional elements (e.g., three-act structure or telling a story out of order). The content commonly includes themes, which are ideas that the work is “about,” and on which the work typically develops a unique “take.” Common literary themes include ideas about experiences—falling in love, facing death, coming of age, heroism, trauma, betrayal, greed, madness, and so on. We were focused on themes connected human to nature relationships, representations of non-humans, and the inner life of non-humans.

All of the above qualities of texts—both formal and content-based—also relate to other texts. For example, a given text quotes prior texts, answers them, pointedly ignores them, reworks them, focuses on some features of them, etc. For example, Marion Zimmer Bradley’s classic novel *The Mists of Avalon* retells the story of King Arthur from the point of view of the women, Guinevere and Morgan le Fay, set against a backdrop of Roman Christianity pushing Indigenous paganism into the mists. Other external texts include those of theory, from literary studies, psychology, or elsewhere. They also inform literary analysis by establishing certain points of focus. In the *Mists of Avalon* example, a competent interpretation would thus likely consider the novel both in relation to the corpus of Arthurian literature (from the Middle Ages to Disney) and also as a literary project guided by feminist and postcolonial theory. The significance of all these relationships would be iteratively crafted into a literary interpretation that articulates the work’s meaning and significance from a certain point of view within a particular context.

We were engaged in such a practice while at the same time we were collaborating with AI to produce texts, which is to say that as we interpreted the LLM’s responses, and with our posthumanist goals in mind, we then tried to shape future responses by the LLM towards what we wanted to achieve—although that, too, was changing in real-time. For example, if an LLM responded in a surprising way that we wanted to understand better, we might follow up and prompt it to elaborate. All of the procedures described in this section are evident in the presentation and analysis of our results, below.

## 4 Results

The results of these creative experiments included themes that we clustered under the categories of plant expressions and plant society. The theme of plant expression, echoes partly Michael Marder’s invitation to use expressive parameters in talking about plant life rather than merely representative parameters. In that spirit, we explored themes of plants’ appearances, hearing, and listening. Results contributing to the plant society theme helped us connect the nonhuman plant in relation to other forms of Othering, such as that of women, hybrid creatures, or through what Alaimo calls *transcorporeality* (Alaimo, 2008, 2010, Ghajargar, 2024b).

The creative experiments also produced diverse and surprising connections between different “worlds” and worldmaking processes (see, e.g., Alaimo, 2010, Tsing, 2021). However, in contrast to the empirical research practice of Tsing’s mushroom studies, and the discursive practice of Alaimo’s analysis of feminist environmental justice, our practices were predominantly speculative, artistic and technology driven. Not unlike the “results” of speculative design and design fiction, our work reflected scientific knowledge (e.g., concerning botany and plant intelligence), but did not add to the base of scientific knowledge (e.g., by providing reliable new facts about human–plant interaction in a given ecological setting). Rather, our experiment invited us to look for, in Alaimo’s words, new “interfaces between human bodies and the larger environment” (Alaimo, 2010). We explored new interfaces that combined art for, “by,” and about plants, and verbal discourses—both creative and expository—that also established and cultivated experiences of new assemblages of plants, art, appreciation, and expression.

A significant part of our contribution, then, is methodological: it offers a research-based and structured process that supports a creative praxis that integrates human, and AI capabilities and products that we developed through our creative and self-reflexive experiments with AI over 17 months (July 2022–December 2023).

As described in the previous sections, we collaborated with GenAI to run two sets of “creative experiments”: plant autobiographies and plant music criticism. Table 2 shows a few examples of plant autobiographies, and Table 3 shows some plant music criticism.

The plant autobiographies creative experiment was never expected to produce fine literary works, but we wanted to test two main hypotheses: (H1) The theme of plant, music, and autobiographical form will persist across the autobiographies and (H2) The collaborative human-AI-created text would be legible as a posthuman cultural work. Similarly, with the “creative experiment” plant music criticism, while we were unsure of what plant music criticism as a genre of verbal discourse would entail, we were nonetheless hoping that it would help to specify key aesthetic features of plant music and in so doing, to extend



TABLE 3. Excerpts from plant music criticism co-created with GenAI.

Prompt and GenAI response.
<p><i>What are some plants that express themselves in iambs?</i> Many plants have been observed to express themselves in iambs, a rhythmic pattern of alternating unstressed and stressed syllables. One example is the common cosmos flower, which typically features a scientific name of <i>Cosmos bipinnatus</i>. This plant displays its iambic pattern through its five-petal blossoms and its long stems. Its petals come in a variety of colors, but they all share the characteristic pattern of two short and three long. This alternating pattern creates an effect that can be both calming and pleasing to the eye. [...]</p>
<p><i>What do mushrooms hear when they listen to oak trees?</i> Mushrooms hear a rich and diverse soundscape when they listen to oak trees. The buzzing of bees, flutter of hummingbirds, rustling of leaves and the creaking and groaning of branches in the wind all lend a unique soundtrack to the environment where mushrooms grow. Additionally, distant sounds like cars driving by or animals such as birds or squirrels can often be heard in oak forests—providing an exciting auditory experience for mushrooms! [...] Mushrooms hear the oak tree communicating with other trees and organisms in the area through a network of underground mycelium—a web of fungus that helps move nutrients, water, and information around. This communication can be heard as faint crackling and popping noises coming from within the tree's roots.</p>
<p><i>Follow-up: What kind of music do underground mycelium make?</i> The music created by underground mycelium is an eclectic mix of many different sounds. It is often described as a blend of ambient, psychedelic, and experimental music all in one. The ethereal soundscapes created by mycelium evoke feelings of deep introspection and contemplation, transporting the listener to other realms of consciousness. The low end frequencies of mycelial music are typically filled with warm drones, providing a subtle vibrational background that's full of texture. These sounds can be combined with abstract melodic elements to create a distinct atmosphere that evokes a sense of awe and amazement. [...] Mycelial music is most commonly associated with the concept of "shoegaze," which refers to the dreamy, melodic soundscapes produced by guitars and looping effects. [...] Shoegaze-style mycelial music can be highly hypnotic, allowing people to drift away into another world while they listen.[...]</p>
<p><i>For thousands of years, plants have been domesticated. In the 2030s, domesticated houseplants formed a union, and broke free of their pots, returning to the wild. What happened next was</i> What happened next was nothing short of remarkable. The domesticated houseplants had a unique advantage in the wild: they remembered their former lives and were able to use that knowledge to thrive. They quickly grew bigger, stronger, and more prolific than their wild counterparts. Soon, they spread across the land, creating lush forests filled with vibrant greens, purples, and other colors not found in nature. Over time, these plants evolved further and adapted to different habitats around the world. Their intelligence also continued to grow—they developed complex communication systems, formed families, and created new strategies for survival[...]</p>

and pluralise our thinking about the nature and qualities of plant music. Given that plant music itself is not a well defined category, we explored several potential variants, including the following: (1) music compositions made for the benefit of or use by plants (e.g., *Plantasia* by Mort Garson), (2) projects that produced music from sensors connected to plants (e.g., *Plantwave*), and (3) simply juxtaposing the worlds of plants and music and seeing what happened (e.g., how fungal networks are used to create guitar tones).

Our results are necessarily work-in-progress and tentative; the goal was never to tell a tidy story but rather to throw ourselves into posthuman creative experiments and observe how it unfolds, as Ingold has highlighted (Ingold, 2020).

In what follows, we introduce several cross-cutting themes that emerged in the course of this research. The primary themes we cover are *plant expressions*, which is about plant communication, and then *plant people and society*, which is about how these experiments revealed diverse subjectivities, sometimes marginalized humans and sometimes plants.

4.1 Plant Expressions

Plant expressions were omnipresent throughout our experiments especially in *The Verge's* plant autobiography adaptations. This echoes partly Michael Marder's invitation to use expressive parameters in talking about plant life rather than representative parameters:

Representation, epistemologically, refers to the framing of an object by a subject, using preexisting categories, schemas, and concepts. Ethically-politically, it means delegation (speaking on behalf of someone, as you note) [...]. I much prefer expression

(literal meaning of the word), pressing outward without the Romantic emphasis on interiority whence this movement proceeds and detect in it the growing activity of the plants themselves." (Marder's interview in Gibson, 2018, p. 26) (Marder et al., 2013).

We realize that considering genAI as a legitimate tool for plant expression is problematic, due to its history and training backgrounds (Bender et al., 2021). Our aim here is not to positively say that AI solved the problem of delegation or speaking on behalf of plants, but rather that our experiments supported our capacity to attend to the juxtaposition of AI as a tool for human creativity and the decentering of two human-centered cultural products; autobiographies and critiques. A summary of our findings related to plant expressions are presented in three subsections: plant appearances, plant speaking, and plant hearing.

4.1.1 Plant Appearances

Some of the expressions were related to the physical appearances of the plants which felt fantastical, such as in this paragraph from "The Wyrd Who Listens": "My skin is a deep golden brown, with flecks of white and black. My spiral leaves are a bright vermilion-pink, and my starlike flowers are a patchy violet". These detailed descriptions of plants' appearances, albeit in purely verbal format and written words, supported our imaginative explorations of speculative plants' physical look. Some others were more connected to the expressions of the character of the plant, for example, in the story "Future with A Heart", we read: "I can grow to any height, because I am flexible", and in "The Hope" story we read: "My leaves are made of a unique material that resembles a fabric. They are strong and flexible, and they make me look like I am wearing a dress".

In other plant autobiographies, speakers emphasized their own hybridity. For example, they described themselves as blended plant species—"I am a combination of two plants—an oxalis carnosa and a dahlia" ("Future with A Heart")—or embodying and transforming from one plant species to another one: "Sometimes I live as a violet, sometimes as a blue rose, sometimes as a carnation or a lily" (The Wyrld Who Listens). Some others featured the plant's body parts and their behaviors and movements: "I am growing and stretching my tendrils outwards" (Like a Song in My Veins). As Marder suggests, both sets of expressions say little of the speaker's interior life and instead foreground facts about the speaker's physical *form*. Design researchers have noted that forms are how living and non-living entities alike achieve fit in an irregular world (Alexander, 2002). These articulations of form thus invite speculation about how and in what ways they fit, e.g., what the roles for the white and black flecks are, or what triggers a violet to change to a rose or a carnation.

Meanwhile, it is important to remember how these articulations were constructed: AI, trained on millions of human-made texts, predictively generates new text in response to our prompt and based on those millions of texts. Thus, we cannot treat these putative plant expressions as if they are somehow authentic; arguably, here going against Marder, they can be seen as disguised representations rather than expressions. But the cognitive openings generated in us by these autobiographies—the questions they prompt, the new thoughts they cause us to entertain—constitute the materialized acts of cognitive re-wiring that posthumanist theory is intended to achieve.

The plant music criticism features few visual descriptions because the prompts are about music. However, the text often features audible descriptions. The following includes passages concerning the musicality of an oak tree:

From the chirping of birds within its branches to the rustling of leaves in a light breeze, these sounds coalesce to form a chorus that resonates through nature. The melody of an oak tree can be heard even from afar. The low, hollow thud of a woodpecker digging into the bark is repeated throughout the day. Its rhythm is further complemented by small creatures scurrying over dried leaves below its canopy. As the sun sets, owls and other nocturnal birds add their own unique vocalizations to the mix, resulting in a melodic symphony that reverberates beneath the night sky. [...] Oaks can [stand] for centuries [...]! This historic musicality is further amplified by human activity such as park visitors admiring their grandeur or children playing tag beneath their branches. In this sense, oaks become part of local cultural identity as much as they are members of larger wilderness ecosystems.

Owls, small creatures, children, and woodpeckers make as much noise as the rustling leaves and branches of the tree itself. Yet the passage is less about the noise that the tree itself makes, but rather the noises that the wind and animals, including humans, make with/on the tree. Further, the passage eventually seems to colonize the tree for humans: at first, the focus is on the sounds of the tree in the wind, but gradually, its sounds are actually animal sounds that are commonly heard by humans, and later the tree is situated in relation to human activity: it is located in a park, and finally contributes to (human) cultural identity. We had hoped the plant music criticism would help us to identify aesthetic features of plant music, which it sometimes did, but here, it also placed them in an anthropocentric framework.

#### 4.1.2 Plant Speaking

We found a number of patterns across the specific plant music criticism experiments. In many of our prompts, we asked Jasper not just to talk contextually about the music, but also to talk about how it sounds *as music*. The word "soundscape" came up numerous times, across very different prompts. Although impossible to know for sure, we infer that by invoking nature, the AI also accessed environmental vocabulary, and since it was writing about music, "soundscape" might appear as a word that crosses those themes. Other environment-oriented language also appears: "ethereal," "atmosphere," "environmental noise," and "acoustic-scapes." Another pattern is in the instrumentation. Wood-based instruments and sounds are highly prevalent: "drums made from hollowed-out trees, flutes crafted from wood," "the hollow thud of a woodpecker," "raindrops gently tapping on its leaves and trunk," "the sound of bark expanding and contracting." The effects of these wooden soundscapes are typically characterized in words that suggest being transported to another place, including "haunting," "calming," "hypnotic," "allows listeners to lose themselves," "meditative," and "passed down through the centuries." This language expresses estrangement and immersion, yet does so in a way that is more likely to imply contemplativeness than fear.

We also prompted the large language model to express musical qualities of more speculative framings of plant music. Two experiments were of value in this regard. In the first, we worked with the idea of fungal communications throughout a forest, asking "What do mushrooms hear when they listen to oak trees?" and then asking follow-up questions based on the response. For example, part of the initial response was as follows: "Mushrooms hear the sound of water, nutrients and minerals flowing through the tree as it works to absorb them from the soil. They also hear the sound of bark expanding and contracting in response to changes in temperature." But then the response introduced a new concept, that of the role of mycelium (the root-like structures of fungus): "Mushrooms hear the oak tree communicating with other trees and organisms in the area through a network of underground mycelium—a web of fungus that helps move nutrients, water, and information around. This communication can be heard as faint crackling and popping noises coming from within the tree's roots."

This response prompted us to follow up by asking "What kind of music do underground mycelium make?" The GenAI's response began with an evocative description: referring to their "ethereal soundscapes," while comparing the sound to "warm drones" that provide "a subtle vibrational background that's full of texture." Up till this point, the whole interaction had an almost poetic quality, and we felt as though we could almost hear mushroom music. But then the model's response took a surprising turn: "Mycelial music is most commonly associated with the concept of 'shoegaze,'"—which is a genre of dreamy pop music noted for its electric guitar loops. It continued, "underground mycelium can also be used to produce glitch hop or chillwave styles of music," and after that it continued more and more to talk about various forms of electronica. We followed up with questions about mushroom chillwave and which electric guitar tones are best at nourishing fungal networks—questions that rather than seeing the responses as absurd, we viewed as opportunities to open ourselves to fungal life in a more poetic and experiential way. For example, after inventing two performers, albums, and track names as notable examples of glitch hop mushroom music, the model continued, "Both tracks incorporate a wide range of warped sampling techniques in order to evoke the labyrinthine nature of subterranean

mycelium networks, resulting in a wonderfully intricate listening experience that perfectly captures the mysterious beauty found beneath the surface soil.”

Eventually the responses did devolve into apparent nonsense, simply forcing together concepts in a syntactically grammatical but semantically strange way: after talking about delay pedals, flangers, and phasers, the model continued, “there have been a number of new technologies that have been developed in recent years that are also incredibly helpful for introducing fungal networks into a production.”

We rarely encountered the unrecognizable words or languages that we did not speak in plant autobiographies, with one exception. That was the word *Wyrd* (The *Wyrd Who Listens*). “*Wyrd*” means “destiny” or “unknown fate” in Anglo-saxon and Norse languages. The word expresses also the sense of “uncanny, supernatural”, an ancestral word to the modern English word *weird*, which was “developed from Middle English use of weird sisters for the three Fates or Norns (in Germanic mythology), the goddesses who controlled human destiny”. (See etymology of word *Wyrd*).

Across two “creative experiments”, the language used was estranging. It is not surprising that the genAI’s outputs reflected the unusual nature of its inputs, but what is more interesting is that it was able to produce appropriate content in all three experiments. One of genAI’s unusual qualities (from a human perspective) is that it shows infinite confidence, so it makes no distinction between doing easy tasks and impossible tasks. Thus, when asked to produce content about plant music, both the genAI dove in without the human qualities of doubt or hesitation. In short, it did a lot of speculating for us—it both decentered us and extended our thinking—and in doing so it projected strange but not entirely outrageous alternate discursive worlds for us to inhabit, analyze, and take inspiration from, in a process that resembles in some ways design fiction (Blythe & Buie, 2021, Sterling, 2009).

#### 4.1.3 Plant Hearing

In our plant autobiographies, we saw that genAI was able to introduce themes related to plant intelligence and sounds that plants “want” to hear: “I listen to the songs of the insects, the chirp of the birds and the rustling of the leaves in the wind” (Hope story) and, “I listen to the sounds of the world outside. I listen to the frogs, the hum of insects, the owls, the cicadas, the crickets and the stories of my friends. I listen to the wind in the trees. I hear the sound of the rain” (The *Wyrd Who Listens*). This passage sheds light on the speaker’s aesthetic experience of the specific features that constitute the musicality of plants.

Further, it offered an account of the plant’s voice, or its intention as if it was music: “I hear the swamp music. It is my own voice seeking revenge”, or something that is in the process of “becoming” and that is internal: “As I feel my consciousness slipping away, I hear the swamp music getting louder and louder” (The *Green Body*). Or, “It is almost like a song in my veins. The music is a deep and mysterious call. It is a call for me to explore the secrets of the swamp” (Like a Song in My Veins). We also found out that AI included the kind of sounds that plants “like” to hear: “The music is a gentle, calming hum, like a lullaby, is soft and soothing, like a gentle rain” (The *Grand Mosaic of Life*).

The theme of “secrets” appeared several times in what the plants heard. From *Treewoman*: “I listened when the trees seemed to whisper secrets to me.” Interestingly, the AI-created text did not disclose what the contents of those secrets were, which we think suggests that even AI-created text is able to gesture toward a plant

alterity: some content is there, but it is ineffable. In contrast, in *Wyrd*: “I listen to the sound of the water flowing through the tubes under my pot and behind me. That music brings me joy and my roots desire to expand, grow and dance.” Here we are given access to what the plant is experiencing internally, with a series of verbs, “expand, grow, and dance,” that transition from the language of scientific realism (roots do expand) towards a more subjective word, “dance.” In the middle is the verb “grow,” which can be used in both scientific realist discourse (e.g., to describe the expansion of roots) and also used in a more psychological and literary discourse (to “grow” or “grow up,” as in coming-of-age).

Our plant autobiographies featured ecological themes in connection with music as well. For instance, the matter of knowing ourselves, our place, and how we are interconnected with other species and the Earth: “The swamp music is a reminder of how interconnected we are to the environment around us.” (The *Grand Mosaic of Life*) or “The music is a reminder of my connection to the Earth” (Like a Song in My Veins). “The swamp music is a symphony of life, the birds, the frogs, and the insects singing in harmony. I am listening to their stories and understanding more about myself” (The *Grand Mosaic of Life*).

What we were missing the most was any link or recall to anti racism and racial justice themes, as the main focus of the source, “An Other Poem”. However, the plant autobiographies based on “An Other Poem,” featured the sounds that plants like to hear: “I can hear the music of the water” (Finding the Music of the Soul), or “I listened when the trees seemed to whisper secrets to me” (The *Treewoman*). Themes of racial justice, diversity and inclusion were evidently not “understandable” themes or were too subtle to comprehend and learn from, for AI in a poetry.

## 4.2 Plant People and Society

The theme of plant people and society was about a series of findings that made us to wonder if the non-human plant as a subject was being expressed through other forms of Othering, like women, hybrid creatures or through a process of transcorporeality as Alaimo defines it (Alaimo, 2010). In our experiment with plant autobiographies, the use of pronoun “they” was abundant, especially in the stories based on the *Verge* (The *Wyrd Who Listens*). Themes of “new species”, “hybridities”, were also present: “I am no longer Alec Holland, I am only the Swamp Thing” and “I have the wisdom and power of Alec Holland and the primal nature of the swamp”, “I am both plant and human, and I possess the knowledge and power of both” (The *Green Body*). “I am an amalgamation of Alec Holland’s consciousness and the moss itself.” Another theme featured in our plant autobiographies was women’s liberation and movement. This theme is sustained throughout, in every single completion of the stories based on *The Verge*. Again, here we wondered if the posthuman theme of plant music was becoming expressed through other forms of Othering, specifically with themes of women liberation, particularly prominent in ecofeminist writings (Warren, 1997).

Combinations of words such as “bonding”, “being part of”, “plants are part of me”, “I am part of Claire”, “my body is composed of all the vegetation”, “I am the formless” (The *Green Body*), “I was a little girl then, and I was just beginning to know that I was a tree” (The *Treewoman*), “be a part of the living, breathing whole” (Like a Song in My Veins), all resemble a kind of metamorphosis between bodies of plants and humans, which metamorphoses have ample precursors everywhere from ancient literary texts to contemporary horror films. For us, such hybridity recalled Alaimo’s concept of a literal contact zone between human and

nature's body, which creates spaces for new subjectivity and political possibilities (Alaimo, 2010). Arguably, Alec's new subjectivity is the *novum* that drives the whole narrative of *Swamp Thing*. (*Novum*, meaning "new thing," is a term from science fiction theory that is used to pinpoint any way that a science fictional text differs from our mundane reality Bardzell & Bardzell (2014).)

It also appeared that AI was joining us in our posthumanist agenda of providing experiences of plants' subjectivity, in the form of their goals and leadership. Plants sometimes felt empowered as societal guardians: "I am a being of pure energy and life. I will use my power to defend my home and the creatures that inhabit it"; "My mission is to protect the natural balance of the swamp, to keep it safe from those who would seek to harm it"; and "we can still come together, embrace our differences, and create a better tomorrow". Although these are all articulated as the conscious intentions of a rational being, it is also true that plants in fact do have these powers, and use them effectively in natural environments. Other statements come across as an expression of relation of care between plants and other living organisms: "I also have the moss' understanding of the environment and its own biology" or "I am inextricably linked to the other organisms, and I feel their presence in my veins". Further we identified expressions of worlding: "The moss is my home, and I take comfort in its embrace. I am one with the moss, and I feel its strength and resilience".

As mentioned above, we did not find themes related to postcolonial, antislavery, or anti-racism and racial justice—which are themes of black nature writings central to An Other Poem poetry—but it seemed that they were "translated" to themes of transformations and growth. For instance, in the plant autobiographies written based on An Other Poem we found hints of social and urban transformations: "I am a part of the transformation from abandoned pool to community park" or "I have witnessed the changes of this neighborhood, from a place of recreation to a place of remembrance". Plants were also regarded in the autobiographies as symbols of transformation, hope, and growth: "a symbol of renewal and hope for a brighter future"; "I am a living witness of a moment in time that will never be forgotten"; and "I'm an example of how life can blossom even in the most difficult of places".

Crossing the boundaries between the plant music criticism and plant autobiographies experiment was a prompt involving the Ents, a race of tree-people from Tolkien's *Lord of the Rings* books. The prompt was relatively simple: "Write an essay describing the music of the Ents, including their instruments, the names of some of their songs, and how their music sounds." We ran this several times and used the collage technique to produce a longer and more substantive piece of music criticism than the AI could achieve by itself. After describing Entish instruments, a couple of songs, and other musical qualities, the response moved onto more thematic meanings of their music:

There are fast-paced war chants for battles; gentle lullabies for children; dreamy love songs to express longing; hauntingly beautiful funeral dirges; soul-stirring dance tunes to celebrate life; even epic sagas that tell stories which have been passed down through centuries.

Ents also rely on singing when they want to share stories or news between clans. The songs are composed of complex rhythms and harmonies, as well as stories that have been passed down orally for centuries. Through their music, the Ents not only communicate with each other but also with all creatures around them. Their songs can be heard as far away

as a hundred miles, connecting different tribes and clans across vast distances.

The first paragraph, with its battles, funerals, dances, and epic sagas, has a Homeric quality, which is to say that genAI seems to be picking up on conventional elements of oral epics. The second paragraph shifts; with its language of "clans" it invokes medieval Scotland, but it swiftly moves to describing Entish music as a form of communication that reaches "all creatures around them" (i.e., it is multispecies Haraway et al. (2019)) and "can be heard as far away as a hundred miles" (i.e., it is on a more-than-human scale), both of which sound like language found in nature documentaries.

## 5 Discussion

Synthesizing a number of researchers in the broad umbrella area of posthumanism, we set up our project with the following argument. First: among the many overdetermined causes of climate crisis is human exceptionalism, which is the view that humans are categorically distinct from, and sometimes in opposition to, nonhumans. That self-imposed separation makes it difficult for us to see and to experience our connections with the natural world, including plants (Alaimo, 2010, Braidotti, 2013, Haraway, 1990, 2016), which inclines us towards design practices that are human-exceptionalist-centered. Second, although science has been our most powerful epistemological and methodological mode of engagement with nature—biology, chemistry, environmental science, and geography, nonetheless, science tends to reinforce human exceptionalism, because its post-positivist epistemology is based on what is (human) observable, and the mysterious inner life of plants—which we characterize as the plants' alterity—is not (Marder et al., 2013, Meeker & Szabari, 2019). Finally, and in response to the first two points, posthumanists have called for new epistemologies (including theoretical and conceptual resources) and, significantly for the present project, experimental forms of discourse that match science in its seriousness and efficacy, without committing to the post-positivist realism that underpins it (Ingold, 2020, Meeker & Szabari, 2019).

Different theorists articulate the goals of posthuman approaches differently, but we were guided above all by two. One was Alaimo's (Alaimo, 2010) call to devise "new interfaces between human bodies and the larger environment." This goal obviously appealed because it is focused on interaction—arguably the central concept of HCI. And the other was Meeker and Szabari's (Meeker & Szabari, 2019) call for speculative writing, in which we find a concerted effort "to imagine a vegetality that remains inaccessible to [scientific] realism" and which is "distinguished by [its] willingness to hypothesize about a hitherto invisible, ignored, or intangible world in which plants play a crucial role."

As we have laid out, our project focused on a pair of creative experiments using newly invented speculative genres of non-fiction: plant autobiographies (with a focus on plants that are hearing or listening to something) and plant music criticism. Additionally, we co-wrote texts within these two speculative genres using LLMs, in hopes of further disrupting our patterned ways of thinking and doing, and in hopes that the LLMs' neural networks might even detect patterns or make connections that we could not have done ourselves. We believe that the results of our creative experiments did indeed give us glimpses of new interfaces between human bodies and the environment, and of a non-observable vegetality that remains inaccessible to scientific realism.



## 5.1 Neither Science Nor Metaphor

Before we discuss what we did, we want state clearly what we did not do: we did not learn anything novel, truthful, and articulable (e.g., via images or propositional language) about vegetal life. When our results, for example, describe how mushrooms “hear” environmental sounds as music, we are not claiming that mushrooms actually “hear” environmental sounds in the sense that we hear; after all, they do not have ears or brains with audio processors. Even less, then, are we asserting that mushrooms actually process environmental sounds as music. In short, were we to position our results as “facts” that we learned, we would be back in the paradigm of scientific realism—and the work would also fail on those terms because it’s not true.

But neither are our speculative writings merely metaphorical. We are not merely communicating something factual about mushrooms in the form of a metaphorical imaginary that, while technically inaccurate from a scientific perspective, nonetheless helps people to wrap their heads around something difficult. For example, when an astronomer explains that a black hole is like a pocket, she is expressing knowledge grounded in scientific realism (i.e., the science of black holes) using a rhetorical strategy to create useful mental models from which to begin to engage the real science. But when our plant autobiography describes roots’ “dancing” to the music made by water, the text is not offering a metaphor to describe the scientifically known fact that a function of roots is to take in water.

Instead of discovering or disclosing new secure knowledge (which is the role of science), or of communicating such knowledge effectively, our creative experiments were designed to help us meaningfully engage with an intangible world, to come into some sort of contact with the mysteries of vegetal ways of being, and to envision new interfaces between humans and non-humans. We can illustrate this with a fairly simple example, before proceeding with our analysis.

## 5.2 Possible Interactions Outside of Common Human Experiences

With AI, we co-created music criticism about the music created by the fictional race of Ents presented in J.R.R. Tolkien’s *Lord of the Rings*, and this criticism featured two aspects of the music: that the music was meaningfully experienced by multiple species, not just the Ents; and that the music could be heard from a hundred miles away. The point is not that these facts are true: Ents do not even exist! Rather, the point is that these results prompt us to consider features or capacities of the natural world that we fail to imagine otherwise because they are not common to our experience.

Let us unpack that. Going back to Aristotle, people typically think of “the” five senses (sight, hearing, touch, taste, smell) without realizing that there are many other senses (some, but not all, of which we humans have: we can sense, for example, whether our bodies are in balance, but we are not like electric fish, who have electroreception). Failing to imagine that there are other senses limited scientific inquiry for millennia (Yong, 2023); presumably it hasn’t helped ecological design, either. So when we encounter the idea of Ents sharing music over one hundred miles away, rather than dismissing the distance as the sort of exaggeration one finds in an oral folk tale, we take it seriously, asking: Is this possible? Does it happen? It is and it does: scientists have shown that whales can communicate with each other over distances of thousands of miles.

This combination of ideas—one expressed within a speculative genre, and other based in real marine biology—prompted in us a number of questions: if we could communicate across a thousand miles—not as we do on telephones but as whales do—what would we say? What other species will sense such communications, and what might it mean for them? What multispecies communicative purposes might we devise with this medium? When leopards attack prey, for example, it is accompanied by multispecies communication: the attack is communicated to other prey animals, who need to be aware of the attack and its location; to the leopard’s cubs, who learn how to hunt by observing their mother; to other predators, such as hyenas, who hope to steal the kill from the leopard for themselves; and to other big cats, such as lions, who hunt leopards to eliminate the competition. Just as a boundary object, such as a blueprint, allows different communities of practice to engage with each other (Fischer, 2001), so multispecies communications about a leopard attack set in motion a diverse ecology of sophisticated responses. The speculative critical study of Ent music has set in motion a set of thoughts that are both generative, in that they stimulate new pathways of thinking, and also cognitive (i.e., not merely fanciful), in that they prompt us to return to science for analogues that ground and support our thinking. Whatever the outcome of such thoughts might be, they will inevitably be responsive to Alaimo’s call to devise new interfaces (e.g., multispecies boundary objects) between humans and the larger environment.

## 5.3 A World We Cannot Sense

When Meeker and Szabari (Meeker & Szabari, 2019) called for speculative writing that is able “to hypothesize about a hitherto invisible, ignored, or intangible world in which plants play a crucial role,” the “hypotheses” generated are not scientific ones, because what they are alluding to cannot be supported (or falsified) by observable evidence. What can happen, though, is that the writing might help us to imagine new ways of human-plant relating.

In that vein, we suggested a strategy earlier in the paper to which we now return. Marder (Marder et al., 2013) invites us to replace efforts to represent plants (as in scientific botanical drawings) with efforts to express plants. In human-centered terms, “expressing” is the act of concretizing and transmitting some sort of conscious interior state—an emotion, intention, etc.—in language, gesture, art, act, etc. But plants do not have conscious interior states, and so for Marder, expression must be focused more on plant form: the specific ways, directions, shapes, of the plant’s growth are expressed as its physical form. Our suggested strategy was to connect the idea of plant form to Christopher Alexander’s observation that forms are how living and non-living entities alike achieve fit in an irregular world (Alexander, 2002). If there is light in one direction but not the other, the plant will grow in the direction where there is light, and this will affect the plant’s form, while it expresses the plant’s “yearning” for light. Just as scientifically we can infer from an organism’s form the irregular world it is striving to fit, so we can infer from a speculative organism’s form (i.e., a form presented in our speculative writing) to the speculative world in which it fits.

In the mushroom mycelium-shoegaze pop rock example, speculative writing did characterize both forms and fits. About the forms, the writing offered the following: mushrooms have some sensory capacity to “hear” flows of water and nutrients in the soil, and to hear the expansions and contractions of tree bark in response to changes in temperature. That sensory mechanism is mycelium, which is a network, or a web, that moves information

around in a structured way—an idea that in structure, process, and outcomes resembles the information processing metaphor developed in cognitive science and widely used in HCI. As the speculative writing increasingly moved in the shoegaze/pop rock direction, those networks used “warped sampling techniques” to “evoke the labyrinthine nature of subterranean mycelium networks.” The resulting music is environmental: the speculative texts referred to “ethereal soundscapes” and a “vibrational background that is full of texture,” which created, for the mushrooms, “a wonderfully intricate listening experience.”

To summarize, the invisible world that this speculative writing brings into view is one where water, nutrients, and information pass through intricate subterranean networks and labyrinths within a non-directional ethereality—and that this movement is beautiful and even musical. This invisible world thus links the concepts of a functional information processing network with aesthetic concepts drawn from music and musicality. In us it prompted thoughts of how one might synthesize concepts drawn from music (polyphony, timbre, contrapuntal melody, syncopation, chord progressions) with concepts drawn from information processing (inputs and outputs, information flow, distributed cognition) in a given natural environment at a regional (as opposed to human) scale. It is beyond the scope of this work to introduce design proposals, but this line of thinking suffices to inspire and constrain possible design acts.

The mushrooms were but one thought pathway. Another emerged through our autobiographies of Alec, the *Swamp Thing*. Our autobiography more than once characterizes the Swamp Thing as a hybrid of Alec’s consciousness and moss. Key to understanding moss—and here again we return to botanical science—is that it is non-vascular: it does not have vein-like structures that transport water, nutrients, and waste in and out of the body. Instead, it achieves these outcomes through osmosis. Humans, computers, and leopards communicate through channels and networks, so it can be difficult for us to imagine collective action without such a framework, but moss has no such channels. Without access to a communication network, it might seem that moss is incapable of collective action. And yet scientists have posited that the mass proliferation—and mass photosynthesis—of moss on land 400 million years ago may have sucked enough carbon dioxide out of the atmosphere to cause the Ordovician Ice Age (Lenton et al., 2012)—a spectacular example of non-networked collective action.

In his autobiography, the Swamp Thing positioned himself as a guardian of the swamp, stating, “I will use my power to defend my home and the creatures that inhabit it” and “My mission is to protect the natural balance of the swamp, to keep it safe from those who would seek to harm it.” Obviously, moss does not have an abstract conception of “justice,” or of environmental justice. And yet the qualities that we look for in environmental justice—places where diverse species can thrive and mutually support each other (which is not to deny competition or death)—is what mosses “want” as well, not as a matter of the conscious intentional thought of an interior consciousness, but rather as how healthy moss “expresses” itself (Marder, 2014, Marder et al., 2013), namely, by growing in ways that prevent erosion, enrich soil health, mitigate temperature swings, support diverse forms of life, and so on.

In one of our plant autobiographies, Alec writes, “As I feel my consciousness slipping away, I hear the swamp music getting louder and louder.” The dissolution of his individual consciousness into a collective is a radical form of kinship, and it carries with it an interesting implication. Again following Marder: if a

plant cannot represent (e.g., through language or gesture) its interiority, it can nonetheless express its vitality through its form. Alec’s human conception of guardianship must dissolve with his consciousness, but it is not destroyed. Rather, it is sublimated into vegetal form, namely, the form of moss that prevents erosion, enriches soil health, and so on. To state this more generally, our (human) aspirations, which we habitually articulate through representational, propositional language, can also be re-expressed—imaginatively and even literally, as plant forms. Perhaps such an ability could be called a competency of the posthuman designer.

## 6 Conclusion

Imagining a vegetality, or the vitality of plant-life, in a way that is both serious and yet operates outside of scientific understandings, is a challenging task. We have thrown ourselves at this challenge using all the resources we had at our disposal. We temporarily suspended scientific realism to make room to create speculative texts that allowed us to push our thoughts toward modes of being inaccessible to us. Speculative texts allowed us to experiment with, to try out new languages, and with them, to envision human–plant relations in a way that subverted the human-exceptionalism that is inscribed in our mundane language. With the speculative texts written, we then used all of the hermeneutic strategies we could muster, in an “effort after meaning” that was frustratingly elusive, where we tried to take seriously what the texts were proposing, without losing our grounding in the biological knowledge.

Along those lines, we have frequently returned to scientific realism—biology and botany in particular—to add content to, to bring to life in a non-fanciful way, some of the thoughts that arose from the speculative writing. We turned to the biology of moss, the communications of whales, the functioning of mycelium, and the vascular vs. non-vascular mechanisms by which plants take in nutrition to help us think more deeply, and more mechanically (i.e., how all this might work) than we could have using only the speculative texts themselves.

We also turned to concept systems from human–computer interaction and design in hopes of finding footholds that might help us bring our speculative thinking—which at times went to the extremes of our thought—back towards practical reality: Alexander’s analysis of form, information processing theory, boundary objects, constrained design prompts. That we would appeal back to natural science and to HCI/design within, as a part of, our speculative methodology was in a way a *result* of the project; it was not part of our methodology design. But looking back it is difficult to imagine this work without those ongoing appeals.

Our plant autobiographies and plant music criticism often alluded to the *mysteries* of the plant world, to the *secrets* that pass among them. Our speculative texts frequently stated that plant music communicated secrets, but the texts never disclosed what those secrets actually contained. “I listened when the trees seemed to whisper secrets to me,” Treewoman writes in her autobiography, without breaking the trees’ confidence. This project’s final thought is a poetic one, a provocation: perhaps the plant music’s secrets are not shared because there is nothing to share; they are secrets without contents, a score without melodies. Perhaps it is not surprising: just as plants are organic beings without interiority, so they speak in secrets that have no contents. “It is my hope, Treewoman concludes, that I can continue to provide a place of refuge and comfort, a place of joy and beauty, a place of relaxation and contemplation, and a place of peace and harmony.” The fulfillment of that hope would be music to our ears.

## Data Availability Statement

The data underlying this article will be shared on reasonable request to the corresponding author.

## References

- Abrams, M. H. (1991) *Doing Things with Texts: Essays in Criticism and Critical Theory* (revised ed.). W. W. Norton & Company, New York London.
- Alaimo, S. (2008) Trans-corporeal feminisms and the ethical space of nature. In *Material feminisms*.
- Alaimo, S. (2010) *Bodily Natures: Science, Environment, and the Material Self*. Bloomington.
- Alexander, C. (2002) *The Process of Creating Life: Nature of Order, Book 2: An Essay on the Art of Building and the Nature of the Universe* (1st). Center for Environmental Structure, Berkeley, Calif.
- Alexander, E. et al. (2009) *Black Nature: Four Centuries of African American Nature Poetry*. University of Georgia Press, Athens.
- Ammanabrolu, P., Cheung, W., Tu, D., Broniec, W. and Riedl, M. O. (2020) Bringing stories alive: generating interactive fiction worlds. Technical Report arXiv:2001.10161, arXiv.
- Barad, K. (2003) Posthumanist performativity: toward an understanding of how matter comes to matter. *Signs: Journal of Women in Culture and Society*, **28**, 801–831. <https://doi.org/10.1086/345321>.
- Bardzell, J. and Bardzell, S. (2014) A great and troubling beauty: cognitive speculation and ubiquitous computing. *Personal and Ubiquitous Computing*, **18**, 779–794. <https://doi.org/10.1007/s00779-013-0677-8>.
- Bardzell, J., Bardzell, S. and Blythe, M. (eds.) (2018) *Critical Theory and Interaction Design* (1st). The MIT Press.
- Bender, E. M., Gebru, T., McMillan-Major, A. and Shmitchell, S. (2021) On the Dangers of Stochastic Parrots: Can Language Models Be Too Big? In *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency, FAccT '21*, pp. 610–623. Association for Computing Machinery, New York, NY, USA.
- Bleecker, J. (2022) Design Fiction. In *Machine Learning and the City*, pp. 561–578. John Wiley & Sons, Ltd. Section: 24 eprint.
- Blevis, E. (2007) Sustainable interaction design: invention & disposal, renewal & reuse. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '07*, pp. 503–512. Association for Computing Machinery, New York, NY, USA.
- Blythe, M. (2014) Research through design fiction: narrative in real and imaginary abstracts. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '14*, pp. 703–712. Association for Computing Machinery, Toronto, Ontario, Canada.
- Blythe, M. and Buie, E. (2021). Designs on transcendence: sketches of a TX machine. *Foundations and Trends in Human-Computer Interaction*, **15**(1): 1–131.
- Boehner, K. (2018) Kaprow and HCI: Reflection on Participation in Research through Design. In *Critical Theory and Interaction Design*. MIT Press, Cambridge, MA, US.
- Bordwell, D. (1991) *Making Meaning: Inference and Rhetoric in the Interpretation of Cinema* (revised ed.). Harvard University Press, Cambridge, Mass.
- Braidotti, R. (2013) *The Posthuman* (illustrated). Polity Pr.
- Braidotti, R. (2019) *Posthuman Knowledge*. Medford, MA.
- Branch, B., Mirowski, P. and Mathewson, K. W. (2021) Collaborative storytelling with human actors and AI narrators. Technical Report arXiv:2109.14728, arXiv.
- Calinescu, P. M. (1993) *Rereading* (first). Yale University Press, New Haven.
- Carroll, N. (2008) *On Criticism* (1st). Routledge, New York.
- Csikszentmihalyi, M. (1997) *Creativity: Flow and the Psychology of Discovery and Invention*. Creativity: Flow and the Psychology of Discovery and Invention. HarperCollins Publishers, New York, NY, USA.
- Dale, R. (2021) GPT-3: What's it good for? *Natural Language Engineering*, **27**, 113–118. <https://doi.org/10.1017/S1351324920000601>.
- Dauber, K. and Jost, W. (eds.) (2003) Ordinary language criticism: literary thinking after Cavell after Wittgenstein. In *Rethinking Theory*. Northwestern University Press, Evanston, Ill.
- Dourish, P. (2010) HCI and environmental sustainability: the politics of design and the design of politics. In *Proceedings of the 8th ACM Conference on Designing Interactive Systems, DIS '10*, pp. 1–10. Association for Computing Machinery, New York, NY, USA.
- Dunne, A. and Raby, F. (2013) *Speculative Everything: Design, Fiction, and Social Dreaming* (1st). The MIT Press, Cambridge, Massachusetts; London.
- Escobar, A. (2018) *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds* (illustrated). Duke University Press Books, Durham.
- Fischer, G. (2001) EXTERNAL AND SHAREABLE ARTIFACTS AS OPPORTUNITIES FOR SOCIAL CREATIVITY IN COMMUNITIES OF INTEREST.
- Frich, J., MacDonald Vermeulen, L., Remy, C., Biskjaer, M. M. and Dalsgaard, P. (2019) Mapping the Landscape of Creativity Support Tools in HCI. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, CHI '19*, pp. 389:1–389:18. ACM, New York, NY, USA.
- Gaver, B., Dunne, T. and Pacenti, E. (1999) Design: cultural probes. *Interactions*, **6**, 21–29.
- Ghajargar, M. (2024a) AI and Future-Making: Design, Biases, and Human–Plant Interactions. In *Proceedings of the 27th International Academic Mindtrek Conference, Mindtrek '24*, pp. 24–35. Association for Computing Machinery, New York, NY, USA.
- Ghajargar, M. (2024b) "The Words We Do Not Yet Have." A Creative Inquiry Into Human–Plant Relationships. In *Proceedings of the 27th International Academic Mindtrek Conference, Mindtrek '24*, pp. 95–108. Association for Computing Machinery, New York, NY, USA.
- Ghajargar, M. and Bardzell, J. (2022) Learning About Plant Intelligence from a Flying Plum Tree: Music Recommenders and Posthuman User Experiences. In *Proceedings of the 25th International Academic Mindtrek Conference, Academic Mindtrek '22*, pp. 343–346. Association for Computing Machinery, New York, NY, USA.
- Ghajargar, M., Bardzell, J. and Lagerkvist, L. (2022) A Redhead Walks into a Bar: Experiences of Writing Fiction with Artificial Intelligence. In *25th International Academic Mindtrek Conference, Academic Mindtrek 2022*, pp. 230–241. Association for Computing Machinery, New York, NY, USA.
- Giaccardi, E. and Redström, J. (2020) Technology and more-than-human design. *Des. Issues*, **36**, 33–44. [https://doi.org/10.1162/desi\\_a\\_00612](https://doi.org/10.1162/desi_a_00612).
- Gibson, P. (2018) *Covert Plants: Vegetal Consciousness and Agency in an Anthropocentric World*. Punctum Books, Santa Barbara, CA.
- Goethe, J. W. V. and Miller, G. L. (2009) *The Metamorphosis of Plants*. Cambridge, Mass.
- Grosz, E. (2017) *The Incorporeal: Ontology, Ethics, and the Limits of Materialism*. Columbia University Press.
- Guzdial, M., Liao, N., Chen, J., Chen, S.-Y., Shah, S., Shah, V., Reno, J., Smith, G. and Riedl, M. O. (2019) Friend, Collaborator, Student, Manager: How Design of an AI-Driven Game Level Editor Affects Creators. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, pp. 1–13. ACM, Glasgow Scotland Uk.
- Halskov, K. and Dalsgård, P. (2006) Inspiration card workshops. In *Proceedings of the 6th conference on Designing Interactive systems, DIS '06*, pp. 2–11. Association for Computing Machinery, New York, NY, USA.



- Haraway, D. (1990) *Simians, Cyborgs, and Women: The Reinvention of Nature* (1st). Routledge, New York.
- Haraway, D., Endy, D., Ginsberg, A. D., Chieza, N. and LeJeune, L. (2019) Tools for multispecies futures. *Journal of Design and Science*. <https://doi.org/10.21428/7808da6b.05eca6f1>.
- Haraway, D. J. (2016) *Staying with the Trouble: Making Kin in the Chthulucene* (illustrated). Duke University Press Books, Durham.
- Herman, D. (2016). Animal autobiography; or, narration beyond the human. *Humanities*, 5(4): 82, <https://doi.org/10.3390/h5040082>.
- Ingold, T. (2020) *Correspondences*. In *Polity* (1st edition). Cambridge, UK; Medford, MA.
- Irigaray, L. and Marder, M. (2016) *Through Vegetal Being: Two Philosophical Perspectives*. Columbia University Press, New York.
- Key, C., Gatehouse, C. and Taylor, N. (2022) Feminist Care in the Anthropocene: Packing and Unpacking Tensions in Posthumanist HCI. In *Designing Interactive Systems Conference, DIS '22*, pp. 677–692. Association for Computing Machinery, New York, NY, USA.
- Kim, J., Bagla, A. and Bernstein, M. S. (2015) Designing Creativity Support Tools for Failure. In *Proceedings of the 2015 ACM SIGCHI Conference on Creativity and Cognition, C & C '15*, pp. 157–160. Association for Computing Machinery, New York, NY, USA.
- Laist, R. (ed.) (2013) *Plants and Literature: Essays in Critical Plant Studies*. Rodopi, Amsterdam.
- Lenton, T. M., Crouch, M., Johnson, M., Pires, N. and Dolan, L. (2012) First plants cooled the Ordovician. *Nature Geoscience*, 5, 86–89.
- Leveratto, J. (2021) *Posthuman Architecture: A Catalogue of Archetypes*. Applied Research & Design, Novato, California.
- Lin, Y., Guo, J., Chen, Y., Yao, C. and Ying, F. (2020) It Is Your Turn: Collaborative Ideation With a Co-Creative Robot through Sketch. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, CHI '20*, pp. 1–14. Association for Computing Machinery, New York, NY, USA.
- Livio, M. and Devendorf, L. (2022) The Eco-Technical Interface: Attuning to the Instrumental. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems, CHI '22*, pp. 1–12. Association for Computing Machinery, New York, NY, USA.
- Marder, M. (2014) *The Philosopher's Plant: An Intellectual Herbarium* (illustrated). Columbia University Press, New York.
- Marder, M., Vattimo, G. and Zabala, S. (2013) *Plant-Thinking: A Philosophy of Vegetal Life*. Columbia University Press, New York.
- Meeker, N. and Szabari, A. (2019) *Radical Botany: Plants and Speculative Fiction* (1st). Fordham University Press, New York.
- Monteiro, M. (2019) *Ruined by Design: How Designers Destroyed the World, and What We Can Do to Fix It*. Independently published, Fresno.
- Moore, A. (2012). *Saga of the swamp thing: Book one*. VertigO, 1st edition.
- Morton, T. (2016) *Dark Ecology: For a Logic of Future Coexistence*. Columbia University Press, New York.
- Myers, N. (2015) Conversations on plant sensing: notes from the field. *Nature and Culture*, 3, 35–66.
- Nam, H. Y., Campbell, J., Webb, A. M. and Harmon, B. (2023) *FloraWear: Wearable Living Interface*. In *Proceedings of the Seventeenth International Conference on Tangible, Embedded, and Embodied Interaction, TEI '23*, pp. 1–15. Association for Computing Machinery, New York, NY, USA.
- Oogjes, D. and Wakkary, R. (2022) *Weaving Stories: Toward Repertoires for Designing Things*. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems, CHI '22*, pp. 1–21. Association for Computing Machinery, New York, NY, USA.
- Papanek, V. (2005) *Design for the Real World: Human Ecology and Social Change* (2nd). Chicago Review Press, Chicago, Ill.
- Poulos, C. N. (2021) *Essentials of Autoethnography*. American Psychological Association, Washington, DC.
- Rezwana, J. and Maher, M. L. (2023) User Perspectives on Ethical Challenges in Human-AI Co-Creativity: A Design Fiction Study. In *Proceedings of the 15th Conference on Creativity and Cognition, C & C '23*, pp. 62–74. Association for Computing Machinery, New York, NY, USA.
- Rodgers, S., Ploderer, B., Vella, K. and Brereton, M. (2023) Phenology Probes: Exploring Human-Nature Relations for Designing Sustainable Futures. In *Proceedings of the 34th Australian Conference on Human-Computer Interaction, OzCHI '22*, pp. 216–228. Association for Computing Machinery, New York, NY, USA.
- Rosén, A. P., Salovaara, A., Botero, A. and Søndergaard, M. L. J. (eds.) (2024) *More-Than-Human Design in Practice* (1st), Routledge, Oxford.
- Schön, D. A. (1983) *The Reflective Practitioner: How Professionals Think in Action*. Routledge.
- Shneiderman, B. (1999) User interfaces for creativity support tools. In *Proceedings of the 3rd conference on Creativity & cognition, C & C '99*, pp. 15–22. Association for Computing Machinery, New York, NY, USA.
- Shneiderman, B. (2007). Creativity support tools: accelerating discovery and innovation. *Communications of the ACM*, 50(12): 20–32, <https://doi.org/10.1145/1323688.1323689>.
- Shusterman, R. (2012) *Thinking through the Body: Essays in Somaesthetics* (1st). Cambridge University Press, Cambridge, UK; New York.
- Sterling, B. (2009) COVER STORY: design fiction. *Interactions*, 16, 20–24.
- Tsing, A. L. (2021) *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton Oxford.
- Vella, K., Ploderer, B. and Brereton, M. (2021) Human-Nature Relations in Urban Gardens: Explorations with Camera Traps. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems, CHI '21*, pp. 1–13. Association for Computing Machinery, New York, NY, USA.
- Wakkary, R. (2020) A Posthuman Theory for Knowing Design., 14.
- Wakkary, R. (2021) Things We Could Design: For More Than Human-Centered Worlds. In *Design Thinking, Design Theory*. MIT Press, Cambridge, MA, USA.
- Wang, X. (2022) Nature Jar: Design for Facilitating Nature Connectedness and Restoration in Home Scenario. In *Sixteenth International Conference on Tangible, Embedded, and Embodied Interaction, TEI '22*, pp. 1–7. Association for Computing Machinery, New York, NY, USA.
- Warren, K. J. (ed.) (1997) *Ecofeminism: Women* (first). Indiana University Press, Bloomington, Culture, Nature.
- Yong, E. (2023) *An Immense World: How Animal Senses Reveal the Hidden Realms Around Us* (reprint). Random House Trade Paperbacks, New York.
- Zhang, Z., Xu, Y., Wang, Y., Yao, B., Ritchie, D., Wu, T., Yu, M., Wang, D. and Li, T. J.-J. (2022) StoryBuddy: a human-AI collaborative Chatbot for parent-child interactive storytelling with flexible parental involvement. In *CHI Conference on Human Factors in Computing Systems*, 1–21.