Miracle Machine in the Making: Soulful Speculation with Kabbalah

Brett A. Halperin
University of Washington, Human Centered Design & Engineering
Seattle, WA, USA
bhalp@uw.edu

Daniela K. Rosner
University of Washington, Human Centered Design & Engineering
Seattle, WA, USA
dkrosner@uw.edu

ABSTRACT

What does it mean to design for a miracle—an ineffable phenomenon that might just exist in the world, but might also transcend it? Focusing on an esoteric strand of Jewish mystical thought known as Kabbalah, we draw from speculative interview activities with 11 Jewish creative interlocutors to describe a process of designing a "miracle machine." Interweaving foundational Kabbalah literature with design inquiry, we find that lived experiences of miracles span life-saving events, effortful acts of love, and ineffable forms of knowledge. We also learn that people envision miracle machines as natural, cosmic, and sensory systems with transcendent capacities. These insights rework a normative focus on the human mind (cognition) and body (embodiment) by embracing the all-too-often overlooked soul as a design resource. We end with a reflection on what soulful speculation entails and the purview that it expands, reorienting our understanding of what machines are altogether.

CCS CONCEPTS

• **Human-centered computing → Interaction design theory, concepts and paradigms**.

KEYWORDS

Contemplation, Divinity, Faith, Judaism, Magic, Meditation, Mindfulness, More-than-Human, Mysticism, Non-Human, Religion, Science and Religion, Soul, Spirituality, Speculation, Speculative Design, Techno-Mysticism, Transcendence, Transcendent Experiences

ACM Reference Format:
Brett A. Halperin and Daniela K. Rosner. 2023. Miracle Machine in the Making: Soulful Speculation with Kabbalah. In *Designing Interactive Systems Conference (DIS '23), July 10–14, 2023, Pittsburgh, PA, USA.* ACM, New York, NY, USA, 17 pages. https://doi.org/10.1145/3563657.3595990

1 INTRODUCTION

> *"When it comes to political organizing and climate work, we need a miracle whether it's some sort of actual non-scientifically explained divine intervention in our situation or really effective community organizing."*
> — Danielle, Climate Activist

We live during a period of profound unrest. Whether due to global pandemics, the existential crises of a warming planet, or the heightened awareness of extreme social and political inequity, a strong current of unease has taken root in the field of design research. Many of us who feel the insurmountability of the current challenges—issues that are hardly solvable at the scale of individual intervention, and increasingly impossible through structural reform—are searching for additional responses, as one of our interlocutors observes above. Some call for organizing and collective action to rework existing institutional arrangements [41, 53, 121, 139]. Others call for shaping advocacy around public policy [8, 39, 44, 103]. Such efforts share ambitious hope for exceeding instrumental change. It is a hope for something beyond the easy-to-place solution; something more complex than an engineering innovation; something more ethereal than 'disruption' or resistance. Alongside day-to-day action, these efforts highlight a desire for intervention beyond human limitations—a mystical occurrence that might just transcend pain and suffering.

For design, the notion of mysticism might seem far afield. To be sure, mysticism has many definitions, some of which refer to the possibility of acquiring ineffable knowledge attributed to the divine [42]. Design, by contrast, tends to adhere to the terrestrial—those decisions made by people creating conditions for change in the earthly realm. To speak of mystical design then is to either redefine mysticism as human-made or to consider the work of a non-human designer. While scholars have begun to explore non-human [22, 34, 45, 50, 69, 101] and magical design possibilities [6, 96, 108, 117, 122, 123, 136], designing for mystical phenomena and transcendent experiences [25, 95] has been less fully imagined.

Our study builds on this loosely connected body of design scholarship that explores mystical connections to the unknown. Calling their projects speculative, critical, or reflective [33, 57, 71, 91], this range of work has reckoned with the impossibility of recovery or resolution, turning to religion or secular modes of spirituality (e.g., [95, 118, 145])—sometimes tracing connections between them. For example, AI scholar Mitchell Marcus provocates that computer scientists are in some ways like kabbalist mystics of today in terms of how they program machines with language, manipulating symbols to create information structures [94]. Looking to these connections between design and Kabbalah, we probe the possibility of supporting unconstrained speculation around visions for machinery.

Kabbalah refers to a set of texts, scholarly discipline, and school of Jewish mystical thought that likely hails from thirteenth century Spain [42]. Unlike exoteric Judaism examined in design research, which underscores shared rules, laws, and knowledge [67, 152], Kabbalah is an esoteric method of study that emphasizes secret or not commonly-held knowledge [21, 42, 59, 79, 125]. According to

DIS '23, July 10–14, 2023, Pittsburgh, PA, USA

ACM ISBN 978-1-4503-9893-0/23/07.
https://doi.org/10.1145/3563657.3595990

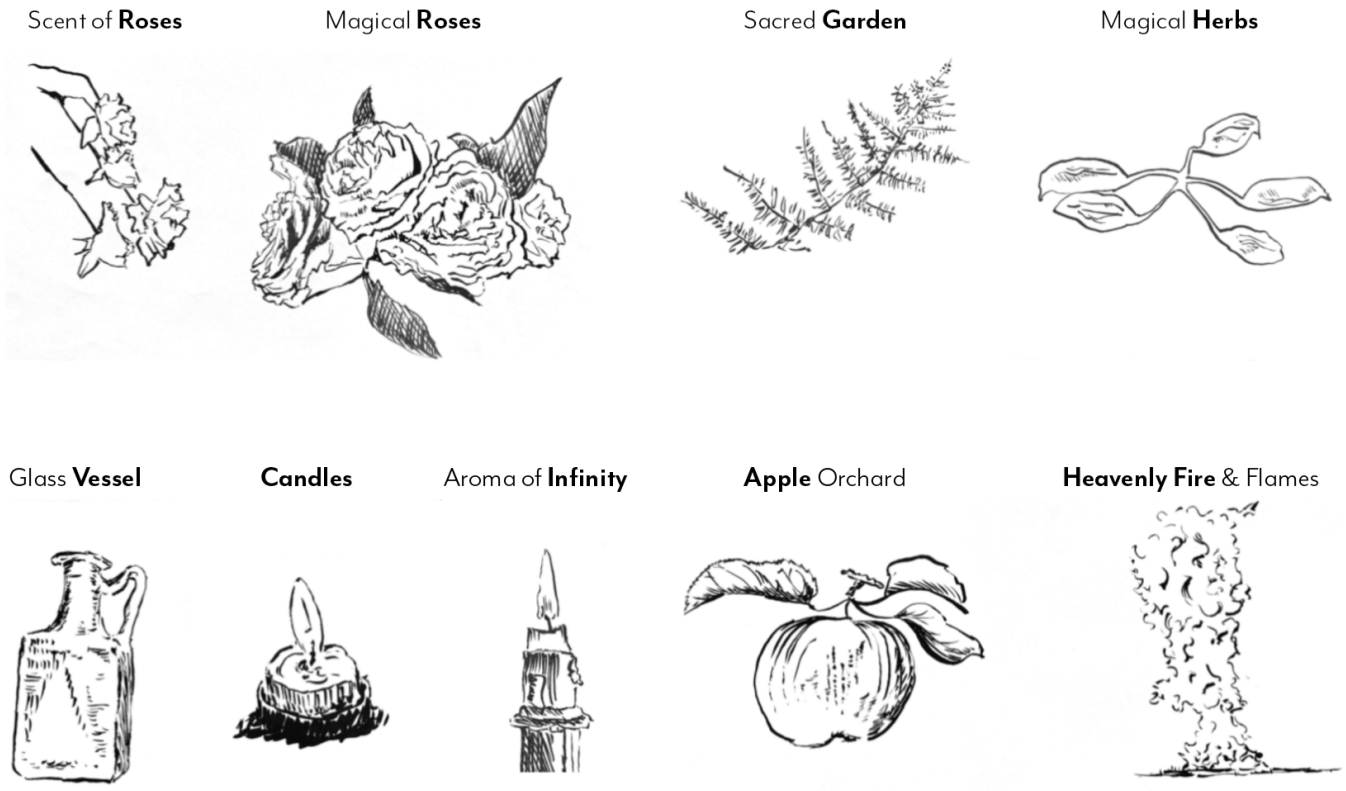

Figure 1: Hand-drawn illustrations of motifs in Kabbalah texts to inspire conceptual designs of miracle machinery.

Kabbalah texts where miracles are narrated by source text authors and debated among scholars, miracles are extraordinary and desired events that often go unexplained by nature or science [59, 61, 99]. They surface not only in the central text, the *Zohar* ("Book of Splendor" or "Radiance") [59, 61, 99], but also in conversations among Kabbalah scholars [20, 49] and practitioners, discerning miracles as rewards for "ethical virtue in the earthly realm" or expressions of a "particular view of divine providence" [49, p.273,286].

As two Jewish design scholars, we speculate with Kabbalah as a cultural form of more-than-human inquiry, introspection, and critique alongside fellow members of our Jewish communities. We therefore build upon decades of design scholarship that has benefited from studying speculation, as well as non-humans, non-users, and peripheral contexts (e.g., [13, 15, 120]) to ask: (1) *What experiences do people associate with miracles?*; and (2) *How do people envision a miracle machine inspired by Kabbalah?*

To address these questions, we draw from a speculative inquiry involving 11 Jewish interlocutors whose creative practices may create certain conditions or environments for miraculous experiences to transpire. Each session unfolded in three parts: an interview (questions about miracles and related Jewish mystical phenomena); Kabbalah readings (collaborative close readings and interpretation of source texts); and meditative sketching (a design activity involving illustration and analysis of a miracle machine). We devised these sessions to lay the groundwork for examining the role that design techniques may play in envisioning new technological formats for reflecting on and experiencing miracles.

Across this work, we make three contributions to design research literature. First, we broaden conversations on digital transcendence (e.g. [25, 28]) to present a form of technological development that helps designers reinterpret the conventional boundaries among users and interaction design contexts, use cases, and implicated non-humans. This process prompts designers to ask participants about the soul and to grasp forms of wonder, intuition, and awareness that exceed the physical (interpretable, experiential) world. Second, in the intimate interweaving of Jewish mystical thought and design, we identify techniques for deepening design inquiry methods for speculation. We show how incorporating modes of meditative sketching and mystical study in the design process open nuanced pathways for self-directed introspection that embraces and exceeds observed reality—a form of engagement that we deem participatory "soul work." Lastly, the resulting design proposals expand scopes of speculation by considering more sensory possibilities and peripheral users, as well as extended timelines of use by charting engagements with non-humans (other species, sacred objects, ancestors, decedents, and divinity). Through attentive encounters with beliefs surrounding the soul, our inquiry prompts design scholars to exercise care amid temporal ecologies that frame interaction as a wider set of design horizons in speculative activities.

2 BACKGROUND AND LITERATURE REVIEW

While a thorough review of prior work is beyond the scope of our article, below we cover key questions and themes that shaped our analysis across Jewish mysticism, technology for transcendence, and speculative design inquiry. One important aspect of this work involves recognition that terms such as mysticism, magic, and miracles are neither clear-cut nor stable, but tend to highlight common concepts such as connectedness, timelessness, and knowledge in relation to transcendence [29]. Mystical experiences—operationally defined as the deepest form of transcendence [28] and described as "peak-experience[s]" [25, 88, 97]—often exhibit a core set of features (e.g., sense of oneness or unity), whether viewed as religious or not [25, 107, 134]. Meanwhile, magic can be understood as either sorcery or natural phenomena [43]. Our focus is on how the latter "opens onto us the properties and qualities of hidden things, and the knowledge of the whole course of Nature" [Ibid]—secret workings that link the natural world to the divine [115, p.18]. As for miracles, in this paper, they refer to transcendent experiences, which may be perceived as mystical or magical across religions and cultures. To follow, we focus on miracles vis-à-vis Jewish mystical thought.

2.1 Kabbalah and Jewish Mystical Thought: A Brief Overview

Our work primarily engages excerpts from two Kabbalah source texts, *Sefer Ha Bahir* ("Book of Illumination" or "Brightness") and *Sefer Ha Zohar* ("Book of Radiance" or "Splendor")—two classical works of Kabbalah originally written primarily in Aramaic. First published as early as 1176, the *Bahir* expounds biblical verses with secret wisdom of divinity, creation, and Hebrew letters, unveiling the Ten *Sefirot* [divine attributes of God] that form the foundation of the kabbalistic belief system, the Tree of Life. Once the *Zohar* surfaced toward the end of the thirteenth century, it became the most influential text among the body of medieval Kabbalah literature [79] as a type of *midrash* (rabbinic interpretation of the Jewish Bible) that is also part medieval fiction. Among the many translations of these works, we draw mostly on Daniel Matt's acclaimed annotated and explained *Zohar* [99], as well as on a version of the *Bahir* that is attributed to Rabbi Nehunia ben haKana of the first century esoteric school (and translated into English by Aryeh Kaplan) [79].

Despite variation in interpretations, scholars point to mysticism as a common denominator of Kabbalah. German-born Israeli philosopher and historian Gershom Scholem is credited with founding the modern academic study of Kabbalah as Jewish mystical thought [1, 7, 124–127, 132]. Centered on the *Zohar* [59], Scholem focused on philology and historicism, while refraining from ethnographic research on contemporary kabbalists or occultist Kabbalah in practice [74, 75]. In line with Scholem's academic study, we perform this work not as kabbalist mystics, but rather as scholars of the tradition. However, as design scholars, we are also interested in how kabbalists manipulate symbols and language to create information systems like computer programmers [94] in their mystical practices such as those of medieval Spanish kabbalists who, Schwartz argues, developed NLP in effect [114]. We further note that what people consider "authentic" Kabbalah is a source of debate since its esotericism can be exploited [73]. The international nonprofit Kabbalah Centre [14], for example, has their own translations that deviate from academic scholarship with much controversy surrounding it [54]. With that said, we recognize the knowledge of both Kabbalah scholars and practitioners. Thus, our study foregrounds the academic study, while also conversing with contemporary kabbalists (as other scholars have [99, 146]). Academic and practical studies may deviate in nature, but both tend to revolve around the *Zohar*.

The *Zohar* is commentary on the *Torah* (the Five Books of Moses), but also an experiment in fiction [99]. The mystical text follows an intricate literary structure of radical poetic mythology [21], interweaving homilies and parables of traveling companions unearthing mystical secrets. In the *Zohar*, God is presented not as static, but rather as in a dynamic process and cause-and-effect relationship with humanity. This means that human actions affect God's wholeness. Divine union of God's fragmented androgynous body can only occur if humans act virtuously to express the divine potential in them and thus in God [99]. Given this dynamic, every interaction in the text is "supernatural." However, the authors, namely Spanish rabbi and kabbalist Moses de León [42], reserve the word "miracle" itself for not the most spectacular events, but rather the more minor ones for which the divine interventions could be overlooked (e.g., the growth of a fruit tree in a cave to nourish a protagonist). Given this subtlety, renown medieval kabbalist Nahmanides posits the notion of "hidden miracles" that are both ubiquitous and hidden in our everyday environment [20, Nahmanides, Torat Adonai Temimah, 1: 147]. In analyzing literary devices and themes such as miracles, many contemporary Kabbalah scholars have conducted close-readings of the mystical thought and motifs in source texts. Below we draw from this form of close analysis connected to miracles, bringing age-old Kabbalah literature into our design process.

2.2 Transcendence, Mysticism, and Judaism in Design Research

Design scholars have increasingly studied techno-transcendence [25, 29, 100, 104] through inquiries that complicate normative notions of interaction between users and technologies, often involving non-humans in sacred experiences. In their landmark text on the subject, Blythe and Buie [25] present a fertile field of transcendent experience (TX) design to consider states of consciousness that operate beyond the limits of an individual identity, or what they call (in line with neuropsychology literature [109]) the transpersonal [25, p.22]. Designing for transcendent experiences—connecting with something transpersonal—then hinges on accounting for not only individuals, but also their sources of connection [104]. Scholars across cultural anthropology and psychology have found that people often associate transcendence with emotions like awe, wonder, gratitude, and appreciation [78, 109, 116, 128], which design scholars have explored in techno-spiritual design [24, 25, 29], as well as user experience design for mindfulness [47, 89] and awe [35, 36].

The relationship between mysticism and design reflects a longstanding dilemma in technology. Where computational practices tend to emphasize the new and realizable, mystical practices tend to underscore the age-old and the unknown [16, 67, 91, 105]. A small but significant body of scholarship has explored the occult in the landscape of digital design, outlining opportunities for supporting faith-based practices [151] and moments of caution and repair [3, 58]. In these connections, design researchers have alchemized

scientific and mystical ways of knowing. For example, Seymour and Van Kleek engage Japanese Shinto conceptions of the soul to inform the design of social robots, interrogating assumptions underpinning the design of voice assistants [129]. To date, these kinds of mystical inquiries have uncovered a range of implications for technology, including the entanglement of religious and technoscience practice [3, 152, 154]; support for moments of meditation and contemplation [76, 119, 133, 144, 145]; the importance of tending to intimate nuances of spiritual inquiry across cultures [57, 92, 110, 111, 155]; and the role that artifacts play in techno-spiritual experiences and practices [18, 23, 27–29, 70].

Adjacent design research on Judaism has drawn on theological traditions to challenge what scholars perceive to be the hegemony, amorality, and soullessness of mainstream technological development. Recent scholarship, for instance, has shown how Judaism and technology can enhance one another by positioning Judaic practices and concepts as exemplars for design innovation [67]. For example, in a study of American Jewish Orthodox families, Woodruff and colleagues show that a mixture of technology and religion in home automation can support the soulful Jewish tradition of refraining from technology use on the Sabbath [152]. Taking this insight to social justice, Hammer argues that Judaic orientations can resist Christian hegemony in systems design more broadly [67]. Putting this theory into practice, Klein and Dubin describe a socially-distanced robotic menorah that they designed amid the Covid-19 pandemic to help safely bring families together to celebrate Hanukkah, the Jewish holiday of miracles [82]. Our work draws from this focus on Judaic notions of miracles and experiments in design to explore how technology can serve not as a problem solving vehicle, but rather as a reflection of spiritual encounters—communal candle lighting, singing prayers, and celebrating miracles. While this set of projects exhibits a variety of ways technology might serve Jewish practices, they only begin to scratch the surface of what a computational system inflected with mysticism might do. We take inspiration from these theoretical, practical, and interstitial works to investigate the unknown mystical potential of Jewish miracle machinery.

2.3 Critical, Playful, and Magical Speculation

Many design scholars have engaged critical, playful, and even magical forms of speculation in the here and now, as well as in envisioning more just futures. Tan and colleagues, for instance, present critical-playful speculation as a method for enacting participants' creative imaginations on one hand, while eliciting critiques grounded in their social realities on the other [62]. Taking a similar approach to design inquiry, Fox and colleagues develop a fictional catalog of speculative artifacts that engage emotional, social, and political implications to consider possible design futures [52]. Additionally, Sum and colleagues evoke "dreaming" as a frame for envisioning futures of disability justice that transcend hegemonic thought [137]. Meanwhile, numerous scholars use similarly reflexive methods for critically rethinking time in relation to the future, calling for greater attention paid to: how temporal representations are culturally situated [83]; how deeper reflection on connections to time can actualize anti-oppressive futures[31, 32, 66]; and how spiritual transformations can occur over time with respect to love, friendship, and kinship [130]. To facilitate such vulnerable futuring, Howell and colleagues have called on design researchers to embrace uncertainties about the future by having humble respect for all that which is unknown [71]. Such speculation can inform design today.

Some scholars have also studied how magic can play a role in media arts and design [72, 96, 108, 117, 122, 123, 136]. As Pierson describes in tracing the development of computer-generated-imagery (CGI) back to early practices of magicians, visual effects in the cinematic arts are "designed to trick the eye and stimulate the imagination" while presented to audiences as magic; in her words: "artists, designers, and engineers [...] are revered as wizards and illusionists" in terms of how they elicit wonder [115, p.12]. Demonstrating this in design research, To and colleagues have maneuvered uncertainty and curiosity as speculative design resources [140]—for example, "Treehouse Dreams" presents a method for eliciting interview data by inviting participants to envision a fantasy tree house: a dream space that renders a "magic circle" [72] for "meaningmaking and open communication of thoughts and feelings" [142]. Similarly, Nam and Oldenburg create an immersive wonderland experience for people to find the magic in the mundane through stories [108]. Sharing this playful technique, Andersen and colleagues' magic machine workshops take an anti-solutionist approach to "inject the notions of the powerful and unknown" into subject matters that may otherwise be too banal or difficult for design briefs to address [4–6]. Magical speculation thus expands imaginative capacities.

While magic may seem to hinge on fantasy and fiction, Carey and colleagues show how a "fictional foundation" that is not merely speculative can also make it less burdensome for people to share personal stories of intense experiences that look toward just futures [33, 141]. Since telling personal stories of miracles can also be intimate, vulnerable, and even derided by skeptics, we take inspiration from these works to think about how speculation can not only be fantastical, but also reflexive and grounded in reality by providing a storytelling foundation for sharing desired futures and past experiences of miracles that may be discounted in other settings.

2.4 Non-Human and Peripheral Users

As an additional focus, we engage prior work on non-human and peripheral users seldom recognized in design processes [13, 15, 51, 120]. In techno-spiritual endeavors in particular, we learn that "users" may also be thought of as sacred imagery [153] and non-human cosmic entities such as divinity [17, 24, 57]. Non-human entities may be as immersive as a mosque or landscape [153]; as simple yet nourishing as an apple that grows from a tree [143]; as protective and vital as a home; or as mundane yet restorative as hand-cream [80]. All together, these non-humans demonstrate the power of inanimate artifacts to open pathways for reimagining not only who or what gets considered in design processes, but also the normative lifespan of use [55, 56, 156]. For example, Massimi and Charise develop thanatosensitive design to consider mortality and death in systems for memorializing ancestors [98]. Others have also explored technology to commemorate lost lives [135] and deceased relatives in techno-spiritual interactions [27]—sometimes even accounting for ghosts, spirits, and other unseen forces [30]. These works thus expand the definition and lifespan of the "user."

Engaging "traditionally ignored" users [51] further extends to feminist and anticolonial thought around more-than-human design. Scholars have cautioned against efforts to "humanize" or "see through the eyes of an other (human or non-human)" rather than meet them "where they are" with "nonrepresentational ways of knowing" [80] beyond colonial mentalities [138]. These works draw from Black and Indigenous ecological scholarship [112, 113, 149] to emphasize the importance of multi-species environmental design [22, 34, 45, 50, 69, 101]—sometimes describing pitfalls of oppressive subject-object divides that evoke domination over nature [138]. For example, Key and colleagues draw on the work of Watts, a Haudenosaunee and Anishinaabe scholar, [149] to warn against framing non-humans as subjects for extraction [80]. Similarly, Escobar calls for reorienting design away from colonial exploitation [26, 48]. These arguments reappear in work by Livio and Devendorf, who suggest subverting non-human instrumentalization to foster reciprocal relations at the "eco-technical interface" [90]. Our work builds on these proposals by probing the role that natural objects and other non-humans deemed sacred in Jewish mysticism might play in particular formulations of interaction and use.

3 METHODOLOGY

To facilitate reflection and speculation around miracles, we designed our study to include interviewing, close readings, and sketching prompts in the tradition of integrative mixed methods inquiry [9, 10]. We planned these activities with two aims: (1) to present interlocutors with Kabbalah concepts and motifs (e.g., Fig 1); and (2) to help design scholars imagine new relationships between technology and mystical consciousness. As we reflect on later (in 5.1), we find that the fusion of meditative music, sketching, and mystical study offers a unique opening for inquiry and introspection.

3.1 Study Design

We held remote, one-hour study sessions with 11 Jewish creative interlocutors (ages 26 to 75). To safely navigate the Covid-19 pandemic and reach broad locations, we conducted all interviews via Zoom with video cameras on (except for two sessions that were mostly audio only). With interlocutors' consent, Zoom recorded audio and video. Each interlocutor participated in a separate session. Ten sessions were one-on-one interviews, and one consisted of two interviewers (researchers) with one interviewee. All data were collected solely from these sessions aside from a few points of clarification in follow-up conversations with some interlocutors.

In preparation for interview study sessions, both authors performed close readings [9, 10] of Kabbalah texts [49, 99]. For us, this involved making annotations and writing memos, followed by discussion of our interpretations during weekly meetings. These discussions led to deepened analysis of central themes and curation of poems and stories (from [49, 99]) to incorporate in the study sessions. We paid close attention to literary motifs by tracking, curating, and illustrating them (Fig 1). Ahead of the interviews, we shared curated excerpts from the *Zohar* [99] with our interlocutors as an optional reading exercise to orient those less familiar with Kabbalah. We also aimed to introduce interlocutors to critical exegesis that could potentially deepen their speculations about miracle machinery during the study session.

Each study session broke into five main phases: (1) background questions; (2) mystical text interaction and discussion; (3) storytelling about miracles; (4) design activity; and (5) reflection. During phase one, we asked questions about their creative, social, and/or mystical practices. For phase two, we asked them to react to the kabbalistic belief system presented in the *Bahir* [79] for which we provided a brief overview and diagram. We also summarized how miracles appear in Kabbalah and asked them to reflect on poems or stories that stood out to them. In phase three, we prompted them to share specific times that they experienced miracles and any future miracles desired. During phase four, we used a design exercise to explore connections among our conversations on miracles, the Kabbalah excerpts, and speculative technology. We first asked our interlocutors to describe what they envision a "miracle machine" as. Then, we asked each interlocutor to draw a conceptual sketch of one vision for a miracle machine. To facilitate this, we shared our screen to display mystical motifs for prompting creative inspiration (e.g., Fig 1). To sensitize them to the motifs and design exercise, we played out loud Ovadia Hamama's rendition of the *Ana Bekoach*, often considered one of the most powerful prayers in Kabbalah [68]. We told them that they had until the end of the five-minute song to finish sketching. This time-constraint modeled that of a five-minute guided meditation, a short-form that can be just enough time to offer benefits such as mindfulness [40, 86]. We clarified that this embodied form of concept sketching was meant to be loose, lax, and intuitive rather than tight, rigid, and calculated. Once the song ended, we asked them to share their sketches and probed design rationale. We ended with a reflection on participating in the study.

3.2 Recruitment

To reflect emergent insights from phase one, we recruited close contacts who we knew thought about miracles and were engaged in kabbalistic themes (e.g., *tikkun olam*, the modern Jewish notion of social justice and action derived from Kabbalah; light or lighting; art or design with spiritual orientations). Everyone identified as Jewish. Most participants also had a transcendent practice, meaning that their professions had relevancy to physical contexts that are common for transcendent experiences: architecture, art, music, and natural environments including outer space [25]. We purposely invited people varying in familiarity with Kabbalah and outside technology fields to explore alternative ideas of Kabbalah-inspired computational systems. All participants were based in a US city except for one located in *Tzfat*, the center of the Kabbalah movement.

3.3 Analyses

After the sessions, we closely read and analyzed the data, individually and as a pair. Each transcript was approximately 25 pages, totaling to about 275 pages, which we reviewed in full at least four times. In our first round of reading, we watched each recorded session and adjusted the audio transcript generated from Zoom to accurately reflect the discussion and activity. Then, we conducted additional rounds of shared analysis to draw out analytic interpretations, questions, and connections inspired by Adele Clarke's situated mapping techniques [38]. This work involved in depth engagement with individual stories, sharing and revising interpretations in memos, as well as identifying sensitizing concepts to

reflect on and revise in subsequent rounds of analysis. Furthermore, in the tradition of close reading [12], we analyzed individual responses for literary elements such as diction, figurative language, and metaphors entangled with their emotional responses and embodied encounters [11, 87] with miracles. This approach allowed us to examine their lived experiences as told through stories, while also reflect on our roles and relationships to the activities [77].

4 FINDINGS

Our intention was to learn about specific experiences with miracles and to explore what relationship they might have to technology. Across the stories of miracles and miracle machines that follow, our interlocutors speak to more-than-human interactions with other people, species, and cosmic entities. We find near-death moments intercepted by deer and divine presences; exceptional trials of childbirth; and healing through dialogue with God. These conversations with miracles and Kabbalah texts bring new readings of technology to the forefront. They also stress the significance of interpreting technology as part of expanded ecological connections, emphasizing the role that sensory encounters and non-humans play in reorienting people's minds, bodies, and souls to not only interactions with machinery, but also the universe writ large.

4.1 What Experiences Do People Associate With Miracles?

During the first part of our study sessions, our interlocutors reflected on their experiences of miracles, relaying moments of awe and relief. Rather than asking interlocutors to define miracles, we invited them to share stories about their specific experiences of them. Our goal was less to characterize miracles definitively or to delineate what they are or are not, and more to open up different orientations toward their existence, meaning, and potential. We expected all of our interlocutors to have already encountered miracles in some form based on how they described their practices and interests during our recruitment phase. In practice, however, some encounters took unexpected turns, including when one person initially resisted the premise. Despite varied responses, each person used their readings of the Kabbalah texts to explore what kind of phenomena a miracle might be. They interchangeably spoke of miracles as near-death events, effortful acts of love, and forms of knowledge beyond words. While interlocutors had different ideas and stories, they all elucidated the indispensable role that non-humans play in experiences of miracles, which we find hinge on mystical connections with deceased ancestors, forthcoming babies, God, biodiverse life forms, and nature.

4.1.1 Miracles as Life-Saving Events. Multiple interlocutors associated miracles with senses of divine intervention connected to overcoming near-death encounters of illness or pain. For example, Erin shared a story about a life-saving childhood moment that seemed divinely orchestrated. On a canoe trip with their dad and his brother, they inadvertently entered whitewater, stretches of river water that run dangerously fast. Their canoe filled up with water, pushing them perilously close to the river. At one point, Erin's leg got stuck in between the canoe and a rock, a painful experience that they believed would cause them to lose their leg:

> *It felt like it was going to squeeze my leg off and the weirdest thing—I saw this thing out of the corner of my eye, and it was this deer standing on the side of the river. And I think in turning my head, I pivoted my body and got free and kind of made my way to the riverbank and might have passed out. But when I woke up, the deer was still there. So it felt like [...] this miracle of sorts. [...] there's something in that particular moment that felt like some connection to the cosmos or God or something beyond the human realm that intervened and communicated and to me, in that moment, felt like it saved my life.*

The deer standing next to Erin, as they managed to maneuver safely to land, represented a particular presence. The miraculous act was not limited to the animal's concern for near death—it required the animal's role in witnessing Erin's threat and survival. While in excruciating pain, Erin described shifting their body to look at the deer, dislodging their leg, and making it to the riverbank. Describing that moment as a miracle, they drew a connection between the phenomenal recovery of life and divine intervention. With this soulful connection, Erin articulates the vital roles that a deer and divinity played in their near-death experience of a life-saving miracle.

This soulful connection to the cosmos, relating to phenomena beyond the human realm, undergirds a sense of awe that several interlocutors described in overcoming mortal threats. Further speaking to survival, Alana shared a story of her baby surviving a near-death experience in the womb. She described herself as being *"not of the age to really get anything that needed to be checked out by an ultrasound,"* but her spouse had uncanny insight. Her husband, a radiologist with a curious interest in utero-ultrasounds, told her that he had seen some bad cases at work and that she should do an ultrasound, just in case. When Alana received the ultrasound, her husband was very concerned. Ultimately, Alana delivered early to save her son's life. She reflected on the experience as follows: "*It's a miracle that [my son] is here because he would not have made it. One kidney was gone in utero and the other one was being insulted [...]. If his father was not interested in this type of work [...] I'd have a whole different story to tell [...]. This kid never would have been born.*" With this reflection, Alana conveys a rescue, which seemed beyond belief. In turn, she felt the unreal weight of this seemingly divine intervention, interpreting its unfolding as *"the biggest miracle"* of her life, as well as the source of her son's life.

For these interlocutors, a miracle did not signify a solitary, static, or isolated phenomenon, but rather an event activated by a form of mystical connection, presence, and timing. Betsy further spoke to this when she told a story about how her breast cancer was curiously caught just in time to be cured. These miracles involved stakes that were both particular and consequential. Whether surviving the loss of a leg, life, or child, they hinged on a cataclysmic possibility. Transcending fatality or loss seemed to be attributable to miraculous involvement of other life forms, loved ones, and divinity.

4.1.2 Miracles as Effortful Acts of Love. Some interlocutors shared stories of experiencing miracles through their own effortful acts of love: processes that took intention, time, and work to cultivate. With ongoing care, their benevolent giving could blossom into a

child, self-transformation, or relief and healing. Describing this care as a righteous phenomenon, Avraham explained: *"Once we reach a state of pure giving—a state loving that which is outside of ourselves—then we will be able to experience all of the boundless goodness."* But, he clarified, such *"goodness"* cannot and will not be received *"to serve ourselves."* Instead, it can only be received in *"a state of divine service, a state of giving and love."* Other interlocutors emphasized this effortful giving across stories of willful and arduous care work, leading to receipt of divine blessings. Consider Tamara, who joined the session with her newborn baby, sharing her *"unreal"* experience of giving birth to him and receiving the gift that is her son in return:

> *The birth of the child coming out is probably the closest thing to the word miracle I'd say because it's unreal. [...] I gave birth to both children unmedicated and him unassisted really, which allows you to feel every moment and everything [...]. It's just actually pulling him out and taking him into my arms that feels like an absolute like 'holy s—, a human being just emerged out of me.' [...] definitely a miracle.*

Tamara associates miracles with not just receiving her beloved baby, but also the act of giving birth itself: bringing him to life without the assistance of medicine or any technological *"beeps"* at home. In giving labor her full attention, she noticed an *"unreal"* sensibility coming from her choice to feel every moment of childbirth followed by her ongoing work to care for and sustain the miracle of life that she received. These laborious acts of love reflect how miracles can be born out of something or someone yet to be born who ultimately extends and indeed transforms the self in the process.

Rachel spoke in similar terms about a miraculous self-transformation from effortful acts of self-love with God's help. After repeated phone calls to a renown psychic in New York City, she finally convinced him to teach her how to perform tarot card readings. That persistence led her to transformational healing and thus her life changing:

> *What I had found in the tarot [...] part of that deck is composed of 22 cards [...] related to the 22 letters of the Hebrew alphabet, which the tarot says are the archetypes of the universe and so does Kabbalah [...]. That was really a miracle because when I started studying Kabbalah my whole life started opening up. [...] I was on antidepressants at the time. I remember that I was on medication for so long. That all lifted. Suddenly, I felt like I didn't need it. I was doing well without all this because, again, tapping into these three letter combinations and doing the prayers. I did the Dialing God[: Technology for the Soul] book [...]. When you transform yourself, miracles occur because you're transforming your nature.*

Rachel associates miracles with the soul work that she did to transform her conscious nature through *"dialing God,"* a daily process of kabbalistic prayer and meditation (e.g, the *Ana Bekoach*) [19]. By framing this process as "technology for the soul" in the book she engaged by sullied former Kabbalah Centre director Yehuda Berg, she links the cultivation of self-transformation and design. Upon materializing soulful connections with God, her life *"opened up"* with Kabbalah, shepherding a successful line of kabbalistic jewelry including her "*One Love*" necklace to spread the message: *"Love thy neighbor as thyself."* Through this story of miraculous change, she connected persistent giving of love to the receipt of divine blessings—what Betsy called "*unimaginably hard work*" contingent upon *"self-love"* in addition to selfless love; as Betsy, explained *"I had [my son], so I had to heal."* For these interlocutors implausible gifts emerge from a care ethic and labor of love that makes miracles.

4.1.3 Miracles as Ineffable Knowledge. While most interlocutors shared stories of miraculous experiences, two were reluctant to narrate any single event. Instead, they spoke to their reluctance, offering explanations that were logically similar, yet ideologically contrasting; they reflected the unexpected connections between their respective fields of deep study in Kabbalah and theoretical physics. As we learned, both fields involve contemplating the miraculous nature of the universe upon connections within and beyond the solar system, including with non-human life forms, celestial beings, and cosmic entities like the sun and stars.

Avraham, a mystical artist working with Kabbalah concepts in Tzfat, attested to why and how everything is a miracle that cannot be reduced to a single instance. In articulating why the universe is miraculous, he spoke to its composition:

> *Because right now we are on a big ball of dirt that is floating through space. There is the sun [...] that is blowing up every single moment. We are just the right distance, at just the right tilt, at just the right spin [...]. Space is so big [...]. Our hearts have been beating since the moment that we have been born. We can see stars. There are birds [...]. It is just glorious! Straight out glorious!*

In this explanation, Avraham associates miracles not only with the creation of the universe and Earth with its sun, stars, birds, and people, but also the moments of appreciation for glory that may otherwise be overlooked. When he stops to recognize that existence is miraculous, *"every second is a straight out 100% full blast miracle."*

Astrophysicist Bob, by contrast, relayed skepticism that anything at all could be a miracle. When asked to share a specific time that he experienced a miracle, he surprised us by saying, *"Well, there you're going to be out of luck, a little bit, because I don't believe in miracles [...]. There are things that happen that are not easy to explain."* Given our discussion of miracles in the study recruitment, we expected Bob to talk about miracles. Although he expressed disbelief in miracles at first, he did allude to the miraculous nature of the universe that in some ways was similar to Avraham's conception. Bob said:

> *It is remarkable that mathematics is the language of the universe. It's astonishing, right? [...] why would the universe care [...] that we can actually explain things [...] through equations? It's amazing actually, isn't it? [...] there is a kind of organizing principle [...]. If you want to call it God or something like that, fine [...]. This person-organizing principle exists [...]. It's amazing.*

For Bob, the capacity for certain principles to explain space and time, whether known or unknown, is neither trivial nor expected, but rather an *"astonishing"* form of knowledge. Since he was reluctant

to call this an outright miracle, however, we invited him to explore this concept further by recounting his family's survival through the Holocaust. He then conveyed a similar sense of awe in not only his own existence, but also that of his daughter: *"The fact that I exist, that [my daughter] exists, is the consequence of a series of chances. My father met [my] mom [...] in a displaced person camp in Austria in 1946. It's a miracle."* In essentially calculating his unlikely existence and the creation of the universe, he computed a miracle within his mathematical framework. Despite insisting on explanation and resisting belief in miracles, Bob ultimately embraced ineffability surrounding himself, his loved ones, and his deceased ancestors.

While Avraham and Bob began their reflections with opposite perspectives, they both found the miraculous in the cosmos and in existence. Where Avraham reiterated his stance that miracles are everything at every second, Bob began by expressing apprehension. Yet these contradictory understandings of miracles (everything versus nothing) allowed them to converge on the knowledge that the composition of the universe and creation of life is miraculous—or at the very least, *"remarkable," "astonishing,"* and *"amazing"* in Bob's words. Such sentiments associate miracles with unlikely events that defy the odds beyond belief, a process Tamara called *"the sublime"* and "*that feeling of smallness within something so much greater.*" Betsy also seemed to capture this observation, saying of miracles: *"They are awe-inspiring. It's everything. It's how I want to live [...] little miracle to big miracle to little miracle to big miracle."* Notwithstanding differences in interpretation, interlocutors associated miracles with an inexplicable and humbling sense of cosmic knowledge.

Altogether our interlocutors' stories illustrate how miracles offer a different way of approaching design compared with mainstream technology development. Seeking out alternative possibilities in acts of recovery, loving acts, and out-of-this-world knowledge, they show how devising change (material, social, epistemic) is only possible through mystical connections with humans and non-humans. Recall Alana, Bob, and Tamara's concerns for deceased souls, as well as Alana and Tamara's concerns for babies emerging in the world. These forms of care were not generic or incidental. They affirmed a deliberate ethic of love. Below we consider what this focus on effortful relationality brings to the design of miracle machinery.

4.2 How Do People Envision a Miracle Machine Inspired by Kabbalah?

In this second part of our study sessions, our interlocutors shifted from conversation to embodied speculative design activities. Some initially approached the prompt of a miracle machine in jest, referring to it variously as a *"parody"* (Rebecca) and *"play thing"* (Betsy). Or Erin saying *"miracles don't happen in machines,"* but also expressing desire to think beyond what they described as their *"dystopic, machines-are-going-to-do-anything-but-create-a-miracle mentality."* After studying the Kabbalah texts, however, interlocutors soon expressed more complex hopes and uncertainties about machinery.

As we see in the sketches that follow, this tenuous relationship between miracles and machines prompted interlocutors to refigure technology. Their initial feelings of skepticism and uncertainty transformed into hope, prompting considerations of what machines are today and speculating around what they may become. Below we review miracle machine concepts that take an array of formats and trajectories: natural (in some cases, supernatural) systems for fostering the sublime; tools for contemplating cosmic systems; and sensory systems for ascending the body. While some interlocutors conceived of machines that already exist in their environments, others invited more-than-human encounters with God, sacred Jewish objects, and other life forms in nature. We find that something like a tree can hold every mighty potential of a miracle (life, love, and knowledge), broadening our ideas of what machines are altogether.

4.2.1 (Super)Natural Systems. When faced with the kabbalistic belief system that is the Ten *Sefirot*—the Tree of Life—our interlocutors reflected on the divine attributes of God such as beauty, eternity, compassion, power, knowledge, and more. Taking this appreciation for the Tree of Life to the design of a miracle machine, several interlocutors envisioned similar phenomena in natural networks. Consider how Tamara, who previously described a miracle as an "*experience of the sublime*," presented her miracle machine:

> *It's literally a tree [...] all the way to the roots [...] grounding it [...] and sucking nutrients in from the Earth. [...] If you are the human being below the tree [...] you will experience the completely phenomenal and unexpected outcome of [sunlight] filtration. [...] that is why that grand tree represents the ultimate miracle machine [...]. The machine is [...] the components of the tree. [...] a super branch, and then the small branches begin to grow off of it [...]. It's like a mechanism for filtration [...]. Like the computer [...] it has a function it is doing for me. But it also has running functions I can't see that are keeping it alive [...]. So it's like the background and the foreground.*

Tamara is describing not only a tree inspired by the kabbalistic motif, but also an entire root structure. She tells us that roots are essential for giving people the experience of being under the tree, but that people do not experience the roots directly. Instead, what people experience—sunlight filtration—comes out through its sustenance of the tree canopy that people encounter from below. Calling this process a machine and comparing filtration to computing, she alludes to how technologies have a front-end and a back-end, but in a mystical sense. While the "*foreground*" refers to the observable aspects of the machine, the "*background*" refers to unobservable aspects that we know exist nonetheless. Tamara illuminates an underexamined technological capacity: the latent potential for spiritual connection in the background of computation. This machine—a tree in and of itself—thus refigures technology with kabbalistic roots. In the *Zohar*, the sheltering tree is a celebrated site of mystical study. When protagonists come across it, they stop to applaud the loveliness of its shade and beauty with prayers [49, p.164]. As the *Zohar* implies that this natural site is sanctified with mystical creativity [49], Tamara suggests that its sublime nature is technological.

Erin expressed a similar sensibility with their sketch, heightening natural networks to a supernatural level with extraordinary powers:

> *This little mushroom with the mycelial network and these little spores [...] have these powers of bioremediation [...]. They can help transform toxic chemicals into bioavailable, better organic*

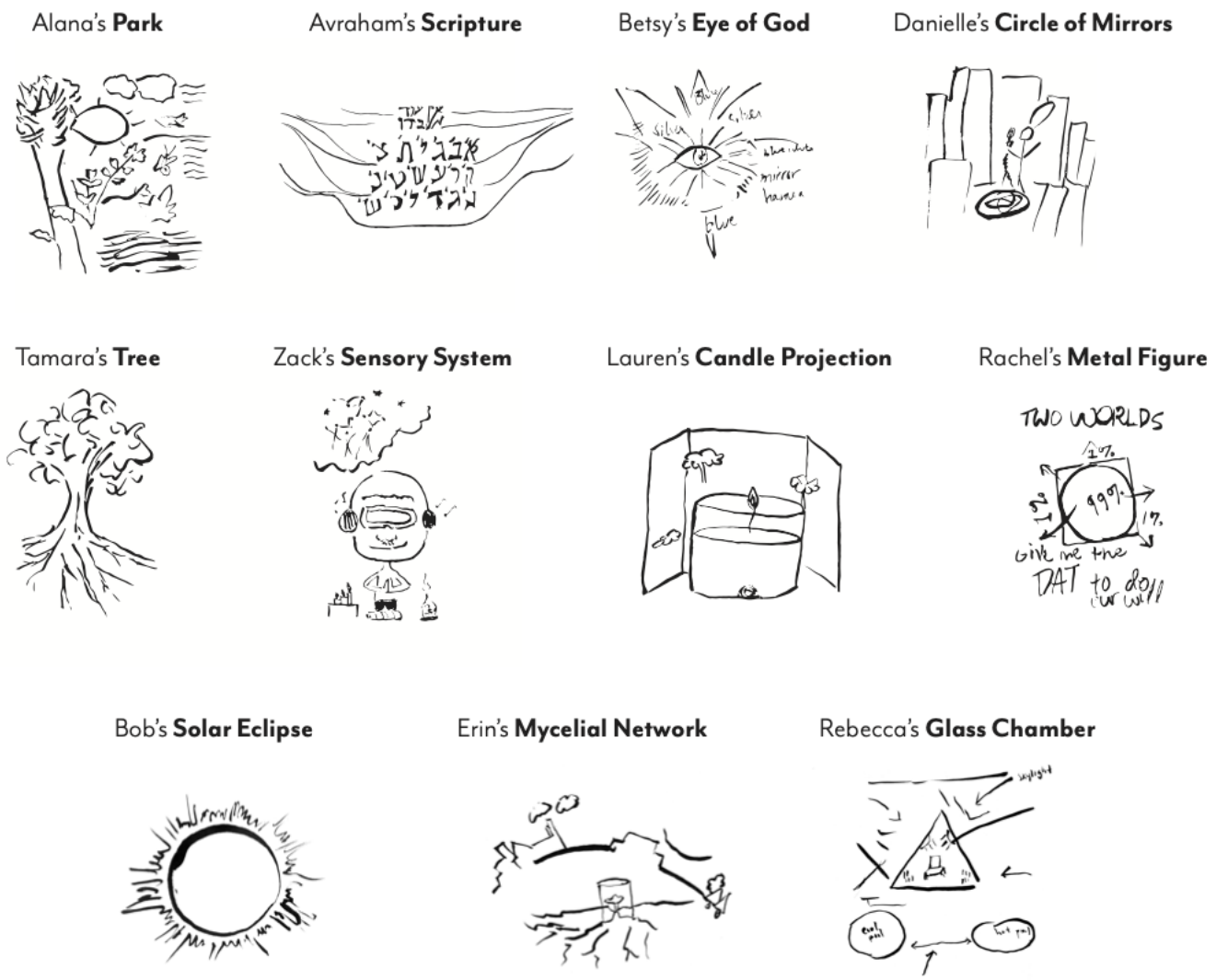

Figure 2: Gallery view of miracle machine sketches inspired by Kabbalah.

> *compounds that can decompose [...]. It kind of connects life and death [...] in a lot of biblical and also ancient stories [...]. So [the miracle machine is] this spore drive [...] that would connect the spores from the mushrooms, but also the mycelial network to engender new plant growth and renew our ecosystem [...]. The spores would help transform people's consciousnesses to be more compassionate and connected to the Earth.*

Inspired by *tikkun olam* ('repair of the world') and nature motifs, Erin is depicting a mycelial network of delicate white filaments within a fungus, entwining fungal roots, business supply chains, and wide forms of social and political life. Like Tamara's framework of branches and roots, Erin's mycelial network exhibits phenomenal capabilities related to the expanded connection, decomposition, and recomposition of life on Earth for eternity. Placing this insight into its biblical context, Erin draws attention to the forms of renewal and remediation that have long permeated religious stories. In this spiritual relation, Erin casts the fungal ecosystem as their miracle machine, using the technological metaphor as a means of expanding fungal capacities for care and planetary connection by disseminating compassion into businesses and government to repair the world. In the *Bahir* [79], *tikkun olam* appears in a story of creation, whereby primordial "vessels" (the Ten *Sefirot*) were able to receive God's light, but not interact, give, or hold it. The vessels were thus overwhelmed by the light and "shattered" (a concept known as the "Breaking of Vessels"), falling to a lower spiritual plane and becoming the source of evil [Ibid]. Rooted in this concept, Erin frames technology as a supernatural mechanism for repairing these "vessels" by reuniting human activity, divinity, and nature.

Where Erin and Tamara focused on a particular node in the network (tree and mushroom), Alana took in the whole. As a garden designer herself, Alana drew inspiration from the sacred garden motif to conceptualize the miracle machine as a soul-stirring site of natural beauty, describing a landscape both new and familiar for intimate connection with nature:

> *I have this tree that extends way beyond us into the sky and then the clouds as they move through and the world gets dark and then it gets light [...]. A gorgeous beautiful sky just sweeping across with all the colors of the world. To me that's just miracles. [...] this machine should have beauty to it that just fills up somebody that they cannot think anything but pure good thoughts [...] and fills our souls up.*

Alana is describing a sunny park that is full of biodiversity: a vibrant garden of flowers, butterflies, birds, and a *"majestic tree,"* mediating light from the multicolor sky. The park as a machine does not serve a physical or cognitive aim, but rather a soulful purpose. The beauty radiating from this ecosystem "*fills our souls up*" with ascendant feelings of relaxation and aesthetic joy. By focusing on the sensory power of connecting with nature, the machine stirs the soul.

Unlike Tamara and Erin, however, Alana shifted her vision when probed as to what makes her concept machine-like. Realizing that she already had a beautiful urban park near her home, she referred to her mobility scooter as the miracle machine that gives her access to the park and to feelings of deep appreciation for all the life forms:

> *This miracle machine [...] has gotten me to this gorgeous park. [...] I can drink in people, babies, just life, the world and it's not just the flowers. It's everything around it. [...] I can be part of the world again even though my legs are not doing it for me. [...] now how can that translate to bigger and beyond me?*

With this evolving idea of a miracle machine, Alana associated the site of natural beauty with her lived experience of muscular sclerosis and desire to connect with those around her. Being *"part of"* her surroundings involved a sense of soul nourishment that she sought to ascend onto the collective. Mediated by her scooter, she conveyed a technology-driven spiritual experience through immersion in nature and its stunning life forms. Near the end of our conversation, she observed: "*The drawing—it literally just flowed out of me [...]. It led to a really cool place: the introspection of it and, of course, the music.*" Her attention to the *Ana Bekoach* song and its facilitation of reflection highlights how the meditative sketching supported the formation of her miracle machine. Meanwhile, the machine itself recasts technology as a facilitator of sacred capacities built into natural environments like those that she activates as a garden designer. In the *Zohar*, earthly caves open up into the heavenly Garden of Eden while other gardens appear as mystical sites, where protagonists uncover secret knowledge. With this connection to Kabbalah, Alana's machine reflects a mobility scooter that operates like the cave: a way to access the heavenly experience of nature.

Calling natural elements like a tree the *"ultimate miracle machine"* and expressing the magnificence of its supported interactions, interlocutors like Tamara, Erin, and Alana invite a mystical interpretation of technology rooted in natural networks, ecosystems, and biodiverse landscapes that radiate life. These visions expand design scholarship focused on profound technological powers built into the existing environment (see [84] for analysis of "*natural sensors*" and [150] on mycelium artifacts). In materializing mystical concepts and connections among humans, nature, and God inspired by Kabbalah, their speculations prompted reflections on the potential for nature to embody miracle machinery.

4.2.2 Cosmic Systems. Other interlocutors envisioned miracle machines that facilitated enlightening connections with God. For some, this vision sprouted from the Tree of Life and its divine attributes of balance, clarity, splendor, and unity. Avraham, for example, explained how the Tree of Life embodies opposites coming together. As a long time Kabbalah artist dedicated to working with the concepts, he described each side of the tree representing a polar opposite: the right side as divine provenance and the left side as free will. He then interpreted miracles as manifestations of these opposing sides coming together and balancing. Avraham thus drew his miracle machine as luminescent Hebrew letters and lines, explaining:

> *The [Ana Bekoach] was playing, so I drew the first three lines [...] because hopefully the miracle machine is helping us realize that everything is [God's] goodness. [...] the first line is connected to the right side of the tree of life, the left to the second side of the tree of life and the third line, the center of the tree of life [...]. Then on the top, I wrote Ein Ode Milvado that the Ana Bekoach can help us to realize: that there is nothing but God [...]. The machine is the contemplation [...]. Contemplating the tools like the Ana Bekoach and the Holy Names [of God] in the Zohar [...] work[s] on our inner transformation toward states of giving and love to ultimately realize that there is nothing but God [...]. The miracle machine, which is the Zohar in the Kabbalah, works, but [only] if we are using the machine for the right miracle.*

Avraham is recounting his machine as contemplation to facilitate the revelation that *"there is nothing but God."* Having created multiple artworks about the *Ana Bekoach* and listening to the song while sketching, he observes how the prayer inspired his conceptualization of a miracle machine as Hebrew letters containing *"spiritual light"* to help realize everything is God's goodness. Broadening the miraculous nature of his sketch to other kabbalistic tools, he then casts the *Zohar* as a miracle machine. He emphasizes how the intent behind interacting with the machine—desiring a miracle to transcend a selfish state of receiving and reach a selfless state of giving—is crucial for it to *"work."* Thus, Avraham's conceptualization extends beyond contemplative interaction. The machine can only enact miracles if the motivation for using it stems from pure desire to emit love (a central ideal in Kabbalah). This machine refigures how technology functions by not only hinging on divine interaction, but also divine will of the user to use it for greater good.

Resonating with Avraham's spiritual apparatus, Rachel envisioned a miracle machine as a contemplative tool for achieving clarity by connecting with God. Made of metal (in line with her jewelry designs), Rachel aimed to receive divine knowledge through the energetic Aramaic codes of hidden wisdom bestowed in Kabbalah. She described her sketch as follows:

> *There's a circle inside of a square, which is the shape of a kabbalistic wedding ring. The circle represents the 99%, the spiritual world. The square represents the physical world, which is the 1% and is the world of limitations. We need to know and have the clarity on how to live in both worlds at the same time and when to jump from one to another. So I thought the two worlds and just giving me the da'at to do God's will, I will know what to do at any given time. And if we have that, we have miracles. We have everything really [...]. You look at [this large sculpture] and you just understand the meaning.*

Rachel is describing a metallic figuration to unlock the miracle of God's will. She calls this the *"da'at to do God's will,"* where "*da'at*" refers to clarity: a Jewish mystical state of knowledge, where the Ten *Sefirot* [divine attributes] of the Tree of Life unite, representing the midpoint of the left and right sides of the human brain (see [46]). Using the metaphor of a circle inside a square, she depicts the expansive spiritual world as inside a smaller physical world of *"limitations."* She marks not only a need to exist across worlds, but also a desire to understand how to navigate them. The miracle comes from gaining this insight that fulfills the desire for an answer. From this knowledge, in Rachel's words, *"we have everything."* Rachel's miracle machine is therefore a meditative tool for connecting with divinity, a process she intends with her own design practice. While casting technology in a familiar form that is metal, the miracle machine pushes commonplace conceptualizations by facilitating interactions to receive divine knowledge.

Even as the envisioned miracle machines diverged in their representation, Rachel and Avraham shared a crucial recognition of the divine capacity for systems to reflect back our worlds and ourselves through contemplative interaction with God. With these benevolent visions of machinery, they approach technology design as a process of creating a mechanism to transmit and receive divine knowledge on spiritual journeys—a process with few parallels in current design practices, especially in mainstream technology development.

4.2.3 Sensory Systems. Multiple interlocutors envisioned miracle machines that drew inspiration from kabbalistic descriptions of sensory faculties. Engaging with excerpts from the *Zohar* about hidden light, astrophysicist Bob reflected on sensory limitations: *"In some sense there is light that is completely hidden [...]. Our eyes cannot see it [...] but instrumentation sees what our eyes cannot see."* From the same concepts, Rachel grasped that *"we're so limited by the five senses,"* and looked to Kabbalah texts as *"tools"* for exceeding sensorial limitations. This potential for sensual excess motivated several sketches. For instance, Rebecca gravitated toward an excerpt on roses because it seemed *"more sensual"* than others. Explaining that the rose scent facilitates a *"sweet intimate moment between two friends [...] taking a moment to pause and appreciate nature, but to also tie to some fundamental laws of the universe,"* Rebecca described her machine as an immersive "*architecture*" of technology:

> *The miracle machine is a chamber [...]. Prior to entering it, you record in present tense a personal miracle as if it has already happened and a collective miracle as if it already happened [...]. When you sit [inside], it loops 360 surround sound and deep acoustics and bass [...]. It's a whole thing to enter [...]. In front of the chamber there's a cold pool and a hot pool and you dip in between them and then you put on a satin robe to enter [...]. Inside [...] it smells really good. There's incense and a skylight [...]. The actual chamber itself is really wild stained glass [...]. When you exit, you eat the supernal bread.*

Rebecca's miracle machine involves non-linear conceptions of time through expanded aesthetic sensation. To document a present tense event as if it exists in the past involves a recognition of the past as shaping the present. In the *Zohar*, the protagonists similarly enter and exit divine dimensions like the chamber by activating the senses of smell in particular (e.g., inhalation of roses and enchanted apples facilitate magical entry and exit [49]). Further drawing inspiration from Judaism, she imagines the chamber made of stained glass in the formation of a Jewish ritual artifact, the Star of David, activating the sense of sound with a palpable experience of *"deep acoustics"* to physically revitalize oneself. Through the five senses, she creates an intimate channel between her bodily interiors and rich external sensations. The act of recording miracles blends with soulful sensations: touching the opposite water temperatures and soft satin robe; hearing the 360-surround-sound; witnessing the artfully sculpted glass; smelling the incense; tasting the heavenly bread. Inspired by Kabbalah, the miracle machine explores the role of design in sensory transcendence: moving within and between past and present realities through interactions with ritual objects that suggest divine contact in cosmic time.

Also drawing inspiration from zoharic roses while emphasizing "*the power in the lyrics*" of the *Ana Bekoach* music, Zack sketched a multisensory immersive holodeck for facilitating divine connection with God and nature:

> *I thought of it as an experience [...]. We have sensory deprivation tanks, but what if we had a [...] sensory experience tank? And so I was imagining [...] the scent of rose coming through air like essential oil vaporizer and the warmth of candles or natural fire burning and the smell of that fire. And the participant kneeling in meditation on a soft cushion of some kind, listening to [...] mystical music. [...] and then a VR experience [...]. An apple orchard is something that feels so special to me and when I saw that on the list [...] I thought that'd be the perfect virtual natural environment [...] especially for contemporary city living that's so disconnected from nature. [...] That would all together allow someone to relax and [move] into a place of safety—like their nervous system—to a point where that opening of that divine flow and*

> *a conversation and prayer might be a little more potent than it would otherwise.*

Zack is describing a physical-virtual engagement that culminates in an experience to calm the nervous system. He describes the machine activating the sense of smell, the feeling of warmth, the touch of softness, and the sound of music. For him, immersion in this sensorium facilitates a meditation that complements city living. To enrich these physical sensations, he further conceptualizes a virtual reality experience of an apple orchard. Like Rebecca's sketch, this machine reflects how the *Zohar* casts roses and apples as metaphysical openings and passageways to divinity (see [49]). Interpreting the machine as a means of dialogue and prayer, Zack locates a connection with God. Thus, Zack's miracle machine is a way of ascending bodily sensations to reach divine interaction.

For design research, these miracle machines complicate and subvert normative technology development. Where Erin and Tamara conceived of wondrous filtration systems (tree roots, mycelia), Avraham and Alana illustrated mystical constellations (lines of *Ana Bekoach*, a natural landscape). Meanwhile, Rebecca and Zack pondered multisensory immersions into divine spaces. Each miracle machine took users beyond present circumstances to open avenues for communing with other humans and non-humans, whether through contemplative prompts, extensions of the senses, or prompts for social and ecological connection. They envisioned technological mechanisms for accessing soulful experiences with clarity, appreciation, and deepened understanding of the cosmos. In broadening the purposes that people design for, the meanings assigned to tools, and the means by which a technology might exist in the world (if not beyond it), they introduced techniques that enrich how many of us, as design scholars, conceive of and create interactive machinery.

5 SOULFUL SPECULATION

We have so far probed the possibility of miracle machinery by informing technology development with Jewish mystical thought. Across study sessions and conversations, interlocutors drew from past experiences to describe miracles as multiple and variegated: sometimes momentous events; other times loving acts or remarkable knowledges. Faced with designing a machine around these encounters, they described scenarios with and without conventional notions of technology: ecological happenings, contemplative apparatuses, and sensory oases—sometimes all at once.

Looking toward interactive systems design, our study has set up a number of challenges for accommodating uncommon and otherworldly encounters. With our interlocutors, we learn the value of wonder and allowing design engagements to encompass not only ways of knowing and being, but also ways of doing that elevate secrecy, intuition, and witnessing of non-physical phenomena. What might it mean to create moments of hidden understanding with contemporary technologies like Internet of Things devices? How might designers extend acts of strange wonder with generative AI? This embrace of the non-physical and transpatial creates new links to transporting works such as Dinkins' *Conversations with Bina48* or Sweeney's *Deepfake Dad* (using AI to speak with ancestors), as well as holographic strands of thought in the philosophy of knowledge [102]. For design researchers, it places an emphasis on the inseparability of sensing and realization, where what we come to recognize and categorize as user input or output (sound, vision, heat, texture, etc.) registers an entangling of our feeling, thinking, and meditative selves. Practically, this might mean an imperative to consider: how present design materials (precious metals, lithium batteries) remember the past; how our data (oral histories, digital traces on social media) reflect wider forms of awareness and insight; and how asking design participants about the soul (conceptually, practically, technically, metaphorically) can inspirit technology.

While design scholars have long focused on concepts of experience (what we feel, see, and observe) and interpretation (what we analyze and think through), engagement with the soul remains less clear. Understood as spiritual and immaterial engagement, the soul has opened a range of opportunities for reflecting on the assumptions and possibilities underlying existing technology [30, 98, 129]. Our conversations with interlocutors open an additional layer. They introduce a kind of imaginative process to the design of machinery, a process we call soulful speculation. Soulful speculation describes an approach to envisioning future technological developments that exceed our empirical and interpretive tools. Where design speculations typically open questions about the future through the introduction of alternative material worlds, soulful speculations raise questions through the proposition of alternative immaterial worlds. As one of our interlocutors reminded, technology can feel like a soulless site where "*miracles do not happen*" (Erin). Through meditative and introspective encounters, we use this study to consider how technology might be or become a site where miracles can happen. We reflect on how speculative acts might allow designers to engage aspects of the self and environment that hold emotion, energy, and liveliness beyond our physical reality observations.

5.1 Participatory "Soul Work"

A first facet of soulful speculation concerns our subtle and provisional engagements with Kabbalah that helped infuse the design process with soulful techniques —what we deem participatory "soul work." Our study sessions elicited design ideas through acts of meditation, introspection, and contemplation. Rather than separate design research methods such as interviewing and sketching from reflective methods of close reading, our sessions blended the two. We asked interlocutors to intertwine conversations about Kabbalah with their own reflections, treating Jewish mystical thought as a complementary design resource. As a way of "tuning the soul" [131], we facilitated meditative sketching with prayer music, as well as introspection via reflective storytelling and contemplation prompted by the kabbalistic belief system and morals of stories in source texts. These connected forms of mystical song, imagery, and text invited us, as analysts, to turn our gaze to the inner rhythms, hopes, and recollections of our interlocutors.

Of particular note, we saw "soul work" generatively play out and concretely materialize in the meditative sketching excerise. We asked interlocutors to draw miracle machines while listening to a contemporary musical rendition of an age-old kabbalistic meditation and prayer. We devised this activity to potentially harness the transcendent power of the *Ana Bekoach* [68] through Ovadia Hamama's widely-revered and emotional composition of the sacredly encoded lyrics. This decision follows not only our recognition of how kabbalists manipulate language for mystical means

[94, 114], but also the role that cantillation, nusah, hymns, and other musical forms play in forming particular moods and experiences. The song builds on the linkages drawn among music, spiritual practices, and transcendent experience [25, 131]. Recall interlocutors like Avraham and Rachel who knew the alchemy of the *Ana Bekoach* letter combinations and aligned their sketching with Kabbalah practice. Or think back to Zack, who used the music's reverberations to support his sketching. Similarly, Alana described channeling the music as she sketched. Playing the meditative music during the sketching activity extended existing forms of Kabbalah tradition, complementing how the sketching acts flowed through the body.

While channeling the meditative flow of the music, people incorporated the Kabbalah morals and motifs into their sketches. This process recalls work by Wyche and colleagues to take seriously sacred imagery [153], as well as work by Key and colleagues to consider the powerful presence of inanimate objects [80]. But rather than live within an image or object, this exploration of kabbalistic beliefs and stories took a processual form. The miracle machine sketches evoked a kind of soul-searching, a recounting of ineffable memories that invited our interlocutors to critically reflect [32, 62], intimately imagine [52, 130], and daringly dream [137, 142] beyond "the traditional design brief as we know it" [6].

5.2 The Expansive Span of Speculation

A second dimension to soulful speculation is the span of speculation itself. Our engagement demonstrated a particularly expansive purview for speculating about time, technology, and use beyond normative design dimensions. To follow, we unpack how soulful speculation enlargens the scope of design considerations by accounting for more non-human peripheral users, expansive timelines of use, and multiple senses in technology-mediated experiences.

5.2.1 More-than-Human Users. Regarding non-human peripheral users, soulful speculation broadened concerns around who is and is not a user. Much design literature makes a distinction between those *present* and *willful* in their technological engagement from those outside the frame of analysis or compelled into engagement [3, 15, 22, 34, 50, 69, 101]. Our interlocutors seemed to expand normative frames of analysis and speculation around non-human peripheral users by not only expressing concerns for other species and nature, but also cosmic entities like deceased souls and divinity. One of the main contributions of Kabbalah texts is their conceptualization of God as dependent upon human activity; how, in a cause-and-effect relationship, all human actions implicate God's ability to repair the world [42, 79, 99]. Applying this cultural belief to design means that God is a peripheral "user" in interactions such as those involved in Erin's mycelial network that conceives of politicians and business people acting with compassion that in turn renews our ecosystem. Our interest in soulful speculation thus builds upon prior design research on exoteric Judaism that has looked at how technology can support or exemplify Judaic practices in particular [67, 152]. However, our approach also broadens this analysis with esoteric teachings to consider how interaction designs may work to repair the world. For example, when Avraham called the *Zohar* the miracle machine, he said that it only works when interacted with to share love for greater good. This expansive outlook extends to interactions with biodiverse life forms and nature as exemplified by the ecological relations envisioned in the natural systems as miracle machines. Soulful speculation thus considers spiritual relations with nature and divinity at sites of technology development to include more non-human peripheral users within the frames of analysis.

5.2.2 Temporal Ecologies. What follows accounting for more non-human peripheral users are expanded timelines of use: a longer time-frame to speculate about with respect to the soul and non-humans. Consider how Ben associated miracles with his ancestors meeting, a connection that culminated in the birth of his daughter. In this reflection, he drew connections between terrestrial ancestral threads with the heavenly space beyond it. We see a similar interweaving of temporal registers in Avraham's ineffable knowledge of birds (a species that has existed long before humans) and Erin's connection with the mycelial landscape (as a site of future plant growth). These insights build on Black and Indigenous philosophies [60, 81, 93, 112] that call for deepened relational ethics, or what design scholars have examined as more-than-human ecologies that care for the planetary future [48, 80, 138]. As a particularly illustrious example, recall Tamara's idea of *"the ultimate miracle machine"* inspired by the Tree of Life: a tree exactly the way it is—where and how it exists today and has long existed—not extracted, tokenized, "rescued," or humanized [80], and barring anthropocentric abuse, will continue to live longer than many humans. In recognizing these temporal ecologies, soulful speculation looks at the past, present, and future to consider how, for example, extracting raw materials to power our computers with lithium batteries today may lead to future souls born into a planet devastated of natural resources.

Our work therefore points to another broadened axis of use: how human souls and non-humans might be physically absent but still (immaterially) present in technology. Timelines of technology use tend to concern the normative lifespan of humans, but not their souls that are culturally conceived of as immortal. With concern for how souls proceed and succeed human bodies, "miracle machines" like trees may be cared for to support the kinds of intergenerational interactions that Schofield and colleagues consider in speculating not only about the future but also the past in magical realist design [122]. We thus suggest that design scholars broaden temporal registers of use—concepts of use, users, and even the "human" and "more-than-human" that take into account how someone or something that existed centuries earlier or that will come to be might shape technological use today.

5.2.3 Multi-Sensory Interactions. Soulful speculation spans thinking about how more sensory faculties might support people in having transcendent experiences with technology. Recall how Zack and Rebecca sketched immersive alcoves for reaching sensational states of equanimity by activating four to five senses. These sketches exhibit how thinking beyond one or two senses (as more commonly done in design briefs) might help stir the soul with scents, light, sounds, temperatures, and tastes that orient users inward with immersive aesthetic joy. Speculating around what multiple senses might offer and how they might help the body ascend to an elevated human experience can thus help designers reimagine what technology is capable of supporting. This expands other spirited calls for making literary-inspired machines deeply expressive [63–65, 106, 148] but with the transcendent power of multisensory

user experiences [2, 37, 47, 85, 147]. These expansive sensorial concerns grounded in Kabbalah and personal stories of miracles—peak human experiences that cut across social geographies and cultures—augment the emerging subfield of design research on transcendent experiences [25, 27–29, 95]. Our inquiry suggests that technology may wield alternative capacities when it nurtures more senses that, as Zack speculates, help people reach states of relaxation and flow—or as Rebecca surmises, help rejuvenate. With a wider concern for soulful concepts, design researchers can probe the unknown and unseen more-than-human entanglements alongside the known and seen to configure how miracle machines might actually exist today.

6 CONCLUSION

Survival of near-death experiences. Child birth. The order of the universe. Such phenomena—what some might consider miracles—are not the typical sites of technology design. Many people believe in miracles or have experienced them, but few of us, as design scholars, take them seriously. They reflect a core but under-examined aspect of the human experience. By engaging Kabbalah, our study has extended an examination of mystical practices and how they get implicated in design. During our study sessions, Jewish mystical materials infused reflective pause into our conversations about machines and miraculous phenomena. In doing so, they worked to cultivate a technological premise that some interlocutors ultimately perceived as soulful. We attribute such shifts in perspective not to Kabbalah alone, but rather to how the engagements with mystical thought broaden concepts of more-than-human interaction and timelines of use. They honed in on the soul as an additional design resource that brings subtle immaterial inflections to engineering developments. When we recognize that a miracle machine is within arm's reach, we might just realize that miracles are up to all of us.

ACKNOWLEDGMENTS

We warmly thank our interlocutors for their soulful participation. We also extend great thanks to Gabrielle Benabdallah, Nathaniel Berman, Tyler Fox, Sourojit Ghosh, Helen Gibson, Nadya Peek, James Pierce, Jennifer Turns, Julie Vera, our anonymous reviewers, and the Tactile and Tactical Design Lab at University of Washington. This material is based upon work that is graciously supported by the National Science Foundation Graduate Research Fellowship Program under Grant No. DGE-2140004, as well as under NSF Grant No. 2222242. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

REFERENCES

[1] Theodor W Adorno and Gershom Scholem. 2021. *Correspondence, 1939-1969*. John Wiley & Sons.

[2] Yoko Akama, Ann Light, and Simon Bowen. 2017. Mindfulness and Technology: Traces of A Middle Way. In *Proceedings of the 2017 Conference on Designing Interactive Systems* (Edinburgh, United Kingdom) *(DIS '17)*. Association for Computing Machinery, New York, NY, USA, 345–355. https://doi.org/10.1145/3064663.3064752

[3] Morgan G Ames, Daniela K Rosner, and Ingrid Erickson. 2015. Worship, faith, and evangelism: Religion as an ideological lens for engineering worlds. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*. 69–81.

[4] Kristina Andersen. 2013. Making magic machines. In *10th European Academy of Design Conference*.

[5] K Andersen. 2013. Making Magic Machines in Proceedings of Crafting the Future. In *10th European Academy of Design Conference. Göteborg*.

[6] Kristina Andersen and Ron Wakkary. 2019. The magic machine workshops: making personal design knowledge. In *Proceedings of the 2019 CHI conference on human factors in computing systems*. 1–13.

[7] Hannah Arendt and Gershom Scholem. 2017. *The Correspondence of Hannah Arendt and Gershom Scholem*.

[8] Mariam Asad and Christopher A. Le Dantec. 2015. Illegitimate Civic Participation: Supporting Community Activists on the Ground. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (Vancouver, BC, Canada) *(CSCW '15)*. Association for Computing Machinery, New York, NY, USA, 1694–1703. https://doi.org/10.1145/2675133.2675156

[9] Jeffrey Bardzell. 2010. HCI and the Essay: Taking on 'Layers and Layers' of Meaning. In *CHI 2010 Workshop on Critical Dialogue*.

[10] Jeffrey Bardzell and Shaowen Bardzell. 2015. Humanistic hci. *Synthesis Lectures on Human-Centered Informatics* 8, 4 (2015), 1–185.

[11] Jeffrey Bardzell and Shaowen Bardzell. 2015. The user reconfigured: on subjectivities of information. In *Proceedings of The Fifth Decennial Aarhus Conference on Critical Alternatives*. 133–144.

[12] Jeffrey Bardzell and Shaowen Bardzell. 2016. Humanistic Hci. *Interactions* 23, 2 (2016), 20–29.

[13] Shaowen Bardzell. 2010. Feminist HCI: taking stock and outlining an agenda for design. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 1301–1310.

[14] Nicole Bauer. 2019. The Kabbalah Centre and Spirituality of the Self. *International Journal for the Study of New Religions* 10, 1 (2019).

[15] Eric PS Baumer, Jenna Burrell, Morgan G Ames, Jed R Brubaker, and Paul Dourish. 2015. On the importance and implications of studying technology non-use. *interactions* 22, 2 (2015), 52–56.

[16] Genevieve Bell. 2006. No more SMS from Jesus: Ubicomp, religion and techno-spiritual practices. In *International Conference on Ubiquitous Computing*. Springer, 141–158.

[17] Gabrielle Benabdallah. 2020. Sybil: A Divinatory Home Device. In *Companion Publication of the 2020 ACM Designing Interactive Systems Conference* (Eindhoven, Netherlands) *(DIS' 20 Companion)*. Association for Computing Machinery, New York, NY, USA, 275–279. https://doi.org/10.1145/3393914.3395857

[18] Gabrielle Benabdallah, Ashten Alexander, Sourojit Ghosh, Chariell Glogovac-Smith, Lacey Jacoby, Caitlin Lustig, Anh Nguyen, Anna Parkhurst, Kathryn Reyes, Neilly H Tan, et al. 2022. Slanted Speculations: Material Encounters with Algorithmic Bias. In *Designing Interactive Systems Conference*. 85–99.

[19] Yehuda Berg. 2013. *Dialing God: Daily Connection Book: Technology for the Soul*. Kabbalah Centre International.

[20] David Berger. 1983. Miracles and the Natural Order in Nahmanides. *Rabbi Moses Nahmanides (Ramban): Explorations in his religious and literary virtuosity* (1983), 107–128.

[21] Nathaniel Berman. 2018. *Divine and Demonic in the Poetic Mythology of the Zohar: The" other Side" of Kabbalah*. Brill.

[22] Purav Bhardwaj and Cletus V. Joseph. 2020. Plantimate: Personality Augmentation for Fostering Empathy Towards Plants. In *Companion Publication of the 2020 ACM Designing Interactive Systems Conference* (Eindhoven, Netherlands) *(DIS' 20 Companion)*. Association for Computing Machinery, New York, NY, USA, 563–567. https://doi.org/10.1145/3393914.3395901

[23] Ananya Bhattacharjee, Jiayu Pang, Angelina Liu, Alex Mariakakis, and Joseph Jay Williams. 2022. Design Implications for One-Way Text Messaging Services that Support Psychological Wellbeing. *ACM Transactions on Computer-Human Interaction* (2022).

[24] Mark Blythe and Elizabeth Buie. 2014. Chatbots of the gods: imaginary abstracts for techno-spirituality research. In *Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational*. 227–236.

[25] Mark Blythe, Elizabeth Buie, et al. 2021. Designs on Transcendence: Sketches of a TX machine. *Foundations and Trends® in Human–Computer Interaction* 15, 1 (2021), 1–131.

[26] Joe Bryan and Diego Melo. 2020. Arturo Escobar: Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds. *Journal of Latin American Geography* 19, 3 (2020), 353–357.

[27] Elizabeth Buie. 2016. Transcendhance: a game to facilitate techno-spiritual design. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. 1367–1374.

[28] Elizabeth Buie. 2019. Let Us Say What We Mean: Towards Operational Definitions for Techno-Spirituality Research. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*. 1–10.

[29] Elizabeth Anne Buie. 2018. *Exploring techno-spirituality: Design strategies for transcendent user experiences*. University of Northumbria at Newcastle (United Kingdom).

[30] Daragh Byrne, Dan Lockton, Meijie Hu, Miranda Luong, Anuprita Ranade, Karen Escarcha, Katherine Giesa, Yiwei Huang, Catherine Yochum, Gordon Robertson, Lisa (Yip Yan) Yeung, Matthew Cruz, Christi Danner, Elizabeth Wang, Malika Khurana, Zhenfang Chen, Alexander Heyison, and Yixiao Fu.

2022. Spooky Technology: The Ethereal and Otherworldly as a Resource for Design. In *Designing Interactive Systems Conference* (Virtual Event, Australia) *(DIS '22)*. Association for Computing Machinery, New York, NY, USA, 759–775. https://doi.org/10.1145/3532106.3533547

[31] Hillary Carey. 2020. Anti-Oppression Mindsets for Collaborative Design. (2020).

[32] Hillary Carey, Rachel Arredondo, Mihika Bansal, and Christopher Costes. 2022. Envisioning New Futuring Models: Past, Plurality, and Positionality. In *[] With Design: Reinventing Design Modes: Proceedings of the 9th Congress of the International Association of Societies of Design Research (IASDR 2021)*. Springer, 3618–3618.

[33] Hillary Carey, Alexandra To, Jessica Hammer, and Geoff Kaufman. 2020. Fictional, Interactive Narrative as a Foundation to Talk about Racism. In *Companion Publication of the 2020 ACM Designing Interactive Systems Conference*. 171–177.

[34] Michelle Chang, Chenyi Shen, Aditi Maheshwari, Andreea Danielescu, and Lining Yao. 2022. Patterns and Opportunities for the Design of Human-Plant Interaction. In *Designing Interactive Systems Conference*. 925–948.

[35] Alice Chirico, Pietro Cipresso, David B Yaden, Federica Biassoni, Giuseppe Riva, and Andrea Gaggioli. 2017. Effectiveness of immersive videos in inducing awe: an experimental study. *Scientific reports* 7, 1 (2017), 1–11.

[36] Alice Chirico, Francesco Ferrise, Lorenzo Cordella, and Andrea Gaggioli. 2018. Designing awe in virtual reality: An experimental study. *Frontiers in psychology* 8 (2018), 2351.

[37] Jean Ho Chu, Daniel Harley, Jamie Kwan, Melanie McBride, and Ali Mazalek. 2016. Sensing History: Contextualizing Artifacts with Sensory Interactions and Narrative Design.. In *Conference on Designing Interactive Systems*. 1294–1302.

[38] Adele E Clarke, Carrie Friese, and Rachel S Washburn. 2017. *Situational analysis: Grounded theory after the interpretive turn*. Sage Publications.

[39] Anna Claudia. 2019. *Bots as Storytellers: An Analysis of the Use of Facebook Messenger Chatbots by Non-Profit Organizations and Their Added Value for Advocacy Purposes*. Ph. D. Dissertation. Vrije Universiteit Brussel.

[40] Jennifer Cornelius. 2017. *Five minute meditation used to impact workplace meetings*. Ph. D. Dissertation. Pepperdine University.

[41] Sasha Costanza-Chock. 2020. *Design justice: Community-led practices to build the worlds we need*. The MIT Press.

[42] Joseph Dan. 2007. *Kabbalah: A very short introduction*. Vol. 162. Oxford University Press.

[43] Giambattista Della Porta. 1957. *Natural Magick*. Basic Books.

[44] Jill P Dimond, Michaelanne Dye, Daphne LaRose, and Amy S Bruckman. 2013. Hollaback! The role of storytelling online in a social movement organization. In *Proceedings of the 2013 conference on Computer supported cooperative work*. 477–490.

[45] Carl DiSalvo and Jonathan Lukens. 2011. Nonanthropocentrism and the nonhuman in design: possibilities for designing new forms of engagement with and through technology. *From social butterfly to engaged citizen: urban informatics, social media, ubiquitous computing, and mobile technology to support citizen engagement* 421 (2011).

[46] Gustav Dreifuss. 2005. The union of opposites in the Kabbalah. *Journal of Jungian Theory and Practice* 7, 1 (2005).

[47] Daniel A Epstein, Felicia Cordeiro, James Fogarty, Gary Hsieh, and Sean A Munson. 2016. Crumbs: lightweight daily food challenges to promote engagement and mindfulness. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. 5632–5644.

[48] Arturo Escobar. 2018. Designs for the Pluriverse. In *Designs for the Pluriverse*. Duke University Press.

[49] Eitan Fishbane. 2018. *The Art of Mystical Narrative: A Poetics of the Zohar*. Oxford University Press, USA.

[50] Laura Forlano. 2016. Decentering the human in the design of collaborative cities. *Design Issues* 32, 3 (2016), 42–54.

[51] Laura Forlano. 2017. Posthumanism and design. *She Ji: The Journal of Design, Economics, and Innovation* 3, 1 (2017), 16–29.

[52] Sarah Fox, Noura Howell, Richmond Wong, and Franchesca Spektor. 2019. Vivewell: speculating near-future menstrual tracking through current data practices. In *Proceedings of the 2019 on Designing Interactive Systems Conference*. 541–552.

[53] Sarah E Fox, Samantha Shorey, Franchesca Spektor, and Daniela K Rosner. 2020. Crafting everyday resistance through lightweight design. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference*. 101–113.

[54] Harry Freedman. 2019. *Kabbalah: secrecy, scandal and the soul*. Bloomsbury Publishing.

[55] Batya Friedman and Lisa P. Nathan. 2010. Multi-Lifespan Information System Design: A Research Initiative for the Hci Community. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Atlanta, Georgia, USA) *(CHI '10)*. Association for Computing Machinery, New York, NY, USA, 2243–2246. https://doi.org/10.1145/1753326.1753665

[56] Batya Friedman and Daisy Yoo. 2017. Pause: A Multi-Lifespan Design Mechanism. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (Denver, Colorado, USA) *(CHI '17)*. Association for Computing Machinery, New York, NY, USA, 460–464. https://doi.org/10.1145/3025453.3026031

[57] William Gaver, Mark Blythe, Andy Boucher, Nadine Jarvis, John Bowers, and Peter Wright. 2010. The prayer companion: openness and specificity, materiality and spirituality. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. 2055–2064.

[58] Elizabeth Gerber. 2007. *Devotion to an innovation process: The case of human centered design*. ProQuest.

[59] G Gershom. 1977. *Zohar The Book of Splendor: Basic: Readings from the Kabbalah*. Rider.

[60] Julia Gibson. In submission. Holographic Ethics for Intergenerational Justice: Planetary Politics Through the Prism. (In submission).

[61] David Goldstein, Yeruḥam Fishel Lachower, and Isaiah Tishby. 1989. *The wisdom of the Zohar: an anthology of texts*. Vol. 1. Oxford [England]: Published for the Littman Library by Oxford University Press.

[62] Neilly H. Tan, Brian Kinnee, Dana Langseth, Sean A. Munson, and Audrey Desjardins. 2022. Critical-Playful Speculations with Cameras in the Home. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–22.

[63] Brett A. Halperin. 2022. Airbrush Hyperfabric: Designing Interactive Storytelling Fabric Connected to Motion Graphics and Music. *Interactions* 29, 3 (apr 2022), 8–9. https://doi.org/10.1145/3529705

[64] Brett A Halperin, Gary Hsieh, Erin McElroy, James Pierce, and Daniela K Rosner. 2023. Probing a Community-Based Conversational Storytelling Agent to Document Digital Stories of Housing Insecurity. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (Hamburg, Germany) *(CHI '23)*. Association for Computing Machinery, New York, NY, USA. https://doi.org/10.1145/3544548.3581109

[65] Brett A. Halperin and Stephanie M. Lukin. 2023. Envisioning Narrative Intelligence: A Creative Visual Storytelling Anthology. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (Hamburg, Germany) *(CHI '23)*. Association for Computing Machinery, New York, NY, USA. https://doi.org/10.1145/3544548.3580744

[66] Brett A. Halperin and Erin McElroy. 2023. Temporal Tensions in Digital Story Mapping for Housing Justice: Rethinking Time and Technology in Community-Based Design. In *Designing Interactive Systems Conference* (Pittsburgh, Pennsylvania) *(DIS '23)*. Association for Computing Machinery, New York, NY, USA. https://doi.org/10.1145/3563657.3596088

[67] Jessica Hammer. 2020. Envisioning Jewish HCI. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–10.

[68] Yuval Harari. 2019. "Practical Kabbalah" and the Jewish Tradition of Magic. *Aries* 19, 1 (2019), 38–82.

[69] Fabian Hemmert, Andreas Bell, Miriam Glöß, Maximilian Klaiß, Katharina Kurm, Ina van der Linde, Kathrin Neumann, Gürkan Orak, Katlin Sommer, Thanh Ta Dui, Paulina Wagner, Becky Weier, and Michael Zalesak. 2020. Designing Human-God Interfaces. In *Proceedings of the Conference on Mensch Und Computer* (Magdeburg, Germany) *(MuC '20)*. Association for Computing Machinery, New York, NY, USA, 393–397. https://doi.org/10.1145/3404983.3409997

[70] Alexis Hiniker and Jacob O Wobbrock. 2022. Reclaiming attention: Christianity and HCI. *Interactions* 29, 4 (2022), 40–44.

[71] Noura Howell, Britta F. Schulte, Amy Twigger Holroyd, Rocío Fatás Arana, Sumita Sharma, and Grace Eden. 2021. Calling for a plurality of perspectives on design futuring: an un-manifesto. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–10.

[72] Johan Huizinga. 2014. *Homo ludens: A study of the play-element in culture*. Routledge.

[73] Boaz Huss. 2015. Kabbalah and the Politics of Inauthenticity: The Controversies over the Kabbalah Center. *Numen* 62, 2-3 (2015), 197–225.

[74] Boaz Huss. 2021. Academic Study of Kabbalah and Occultist Kabbalah. *Occult Roots of Religious Studies* (2021), 104.

[75] Boaz Huss and Joel A Linsider. 2005. Ask No Questions: Gershom Scholem and the Study of Contemporary Jewish Mysticism. *Modern Judaism* 25, 2 (2005), 141–158.

[76] Mahmoud Mohamed Hussien Ahmed, Chaklam Silpasuwanchai, Kavous Salehzadeh Niksirat, and Xiangshi Ren. 2017. Understanding the role of human senses in interactive meditation. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 4960–4965.

[77] John L Jackson Jr. 2013. *Thin Description: Ethnography and the African Hebrew Israelites of Jerusalem*. Harvard University Press.

[78] James W Jones. 2001. Transference AND Transcendence. In *Contemporary Psychoanalysis and Religion*. Yale University Press, 34–67.

[79] Aryeh Kaplan and Nehunia ben HaKana. 1989. *The Bahir*. Weiser Books.

[80] Cayla Key, Cally Gatehouse, and Nick Taylor. 2022. Feminist Care in the Anthropocene: Packing and Unpacking Tensions in Posthumanist HCI. In *Designing Interactive Systems Conference*. 677–692.

[81] Robin Kimmerer. 2013. *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed editions.

[82] Lauren Klein and Ryan Dubin. 2021. A Socially Distanced Robotic Menorah Set. In *Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction*. 653–654.

[83] Sandjar Kozubaev, Chris Elsden, Noura Howell, Marie Louise Juul Søndergaard, Nick Merrill, Britta Schulte, and Richmond Y Wong. 2020. Expanding modes of reflection in design futuring. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–15.

[84] Stacey Kuznetsov, William Odom, James Pierce, and Eric Paulos. 2011. Nurturing natural sensors. In *Proceedings of the 13th international conference on Ubiquitous computing*. 227–236.

[85] Mei-Kei Lai and Siu Wing Chung. 2021. TranScent in Stillness: Exploring the Feasibility of Using Incense Art with Virtual Reality for Meditation. In *10th International Conference on Digital and Interactive Arts*. 1–7.

[86] Amy G Lam. 2014. *Effects of five-minute mindfulness meditation on mental health care professionals*. The Chicago School of Professional Psychology.

[87] Amanda Lazar, Norman Makoto Su, Jeffrey Bardzell, and Shaowen Bardzell. 2019. Parting the Red Sea: sociotechnical systems and lived experiences of menopause. In *Proceedings of the 2019 CHI conference on human factors in computing systems*. 1–16.

[88] Jeff Levin and Lea Steele. 2005. The transcendent experience: conceptual, theoretical, and epidemiologic perspectives. *Explore* 1, 2 (2005), 89–101.

[89] Lika Haizhou Liu, Xi Lu, Richard Martinez, Dennis Wang, Fannie Liu, Andrés Monroy-Hernández, and Daniel A Epstein. 2022. Mindful Garden: Supporting Reflection on Biosignals in a Co-Located Augmented Reality Mindfulness Experience. In *Companion Publication of the 2022 Conference on Computer Supported Cooperative Work and Social Computing*. 201–204.

[90] Maya Livio and Laura Devendorf. 2022. The Eco-Technical Interface: Attuning to the Instrumental. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems* (New Orleans, LA, USA) *(CHI '22)*. Association for Computing Machinery, New York, NY, USA, Article 101, 12 pages. https://doi.org/10.1145/3491102.3501851

[91] Caitlin Lustig and Daniela Rosner. 2022. From Explainability to Ineffability? ML Tarot and the Possibility of Inspiriting Design. In *Designing Interactive Systems Conference*. 123–136.

[92] Caitlin (Caitie) Lustig and Hong-An (Ann) Wu. 2022. Tarot as a Technology of Care. *Interactions* 29, 4 (jun 2022), 24–29. https://doi.org/10.1145/3536392

[93] Lee Maracle. 2015. *Memory serves: oratories*. NeWest Press.

[94] Mitchell P Marcus. 1999. Computer science, the informational, and Jewish mysticism. *Technology in Society* 21, 4 (1999), 363–371.

[95] Robert B Markum and Kentaro Toyama. 2020. Digital Technology, Meditative and Contemplative Practices, and Transcendent Experiences. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–14.

[96] Joe Marshall, Steve Benford, and Tony Pridmore. 2010. Deception and Magic in Collaborative Interaction. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Atlanta, Georgia, USA) *(CHI '10)*. Association for Computing Machinery, New York, NY, USA, 567–576. https://doi.org/10.1145/1753326.1753410

[97] Abraham H Maslow. 1969. Various meanings of transcendence. *Journal of Transpersonal Psychology* 1, 1 (1969), 56–66.

[98] Michael Massimi and Andrea Charise. 2009. Dying, death, and mortality: towards thanatosensitivity in HCI. In *CHI'09 Extended Abstracts on Human Factors in Computing Systems*. 2459–2468.

[99] Daniel Matt. 2002. *Zohar: Annotated & Explained*. Skylight Paths Publishing.

[100] John McCarthy and Peter Wright. 2004. Technology as experience. *interactions* 11, 5 (2004), 42–43.

[101] Joshua McVeigh-Schultz, Jen Stein, Jeff Watson, and Scott Fisher. 2012. Extending the Lifelog to Non-Human Subjects: Ambient Storytelling for Human-Object Relationships. In *Proceedings of the 20th ACM International Conference on Multimedia* (Nara, Japan) *(MM '12)*. Association for Computing Machinery, New York, NY, USA, 1205–1208. https://doi.org/10.1145/2393347.2396419

[102] Manulani Aluli Meyer. 2013. Holographic epistemology: Native common sense. *China Media Research* 9, 2 (2013), 94–101.

[103] Lydia Michie, Madeline Balaam, John McCarthy, Timur Osadchiy, and Kellie Morrissey. 2018. From Her Story, to Our Story: Digital Storytelling as Public Engagement around Abortion Rights Advocacy in Ireland *(CHI '18)*. Association for Computing Machinery, New York, NY, USA, 1–15. https://doi.org/10.1145/3173574.3173931

[104] Julia Mossbridge. 2016. Designing transcendence technology. *Psychology's New Design Science and the Reflective Practitioner* (2016), 1–27.

[105] Michael J Muller, Ellen Christiansen, Bonnie Nardi, and Susan Dray. 2001. Spiritual life and information technology. *Commun. ACM* 44, 3 (2001), 82–82.

[106] Janet H Murray. 2017. *Hamlet on the Holodeck, updated edition: The Future of Narrative in Cyberspace*. MIT press.

[107] Caroline Myss and James Finley. 2009. *Transforming Trauma: A Seven-step Process for Spiritual Healing*. Sounds True.

[108] Hye Yeon Nam. 2008. Wonderland (2007). In *ACM SIGGRAPH 2008 art gallery*. 108–108.

[109] Andrew B Newberg and Eugene G d'Aquili. 2000. The neuropsychology of religious and spiritual experience. *Journal of consciousness studies* 7, 11-12 (2000), 251–266.

[110] Teresa K O'Leary, Dhaval Parmar, Stefan Olafsson, Michael Paasche-Orlow, Timothy Bickmore, and Andrea G Parker. 2022. Community Dynamics in Technospiritual Interventions: Lessons Learned from a Church-based mHealth Pilot. In *CHI Conference on Human Factors in Computing Systems*.

[111] Teresa K O'Leary, Elizabeth Stowell, Jessica A Hoffman, Michael Paasche-Orlow, Timothy Bickmore, and Andrea G Parker. 2021. Examining the Intersections of Race, Religion & Community Technologies: A Photovoice Study. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–19.

[112] Romy Opperman. 2020. *Race, Ecology, Freedom: Climate Justice and Environmental Racism*. Ph. D. Dissertation. Pennsylvania State University.

[113] Romy Opperman. 2022. Racism. *The Philosopher* (2022).

[114] Schwartz Oscar. 2019. Natural Language Processing Dates Back to Kabbalist Mystics. *IEEE Spectrum* (2019).

[115] Michele Pierson. 2002. *Special effects: Still in search of wonder*. Columbia University Press.

[116] Denise Quesnel, Ekaterina R Stepanova, Ivan A Aguilar, Patrick Pennefather, and Bernhard E Riecke. 2018. Creating AWE: artistic and scientific practices in research-based design for exploring a profound immersive installation. In *2018 IEEE Games, Entertainment, Media Conference (GEM)*. IEEE, 1–207.

[117] Majken Kirkegaard Rasmussen. 2013. Magical Realities in Interaction Design *(TEI '13)*. Association for Computing Machinery, New York, NY, USA, 125–128. https://doi.org/10.1145/2460625.2460644

[118] Joan Sol Roo, Renaud Gervais, Jeremy Frey, and Martin Hachet. 2017. Inner Garden: Connecting Inner States to a Mixed Reality Sandbox for Mindfulness. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (Denver, Colorado, USA) *(CHI '17)*. Association for Computing Machinery, New York, NY, USA, 1459–1470. https://doi.org/10.1145/3025453.3025743

[119] Joan Sol Roo, Renaud Gervais, Jeremy Frey, and Martin Hachet. 2017. Inner garden: Connecting inner states to a mixed reality sandbox for mindfulness. In *Proceedings of the 2017 CHI conference on human factors in computing systems*. 1459–1470.

[120] Christine Satchell and Paul Dourish. 2009. Beyond the user: use and non-use in HCI. In *Proceedings of the 21st annual conference of the Australian computer-human interaction special interest group: Design: Open 24/7*. 9–16.

[121] Jan Rippentrop Schnell. 2020. *Better living through anger: religious women negotiating virtuous anger through community organizing*. The University of Iowa.

[122] Tom Schofield, John Bowers, and Diego Trujillo Pisanty. 2020. Magical Realist Design. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference* (Eindhoven, Netherlands) *(DIS '20)*. Association for Computing Machinery, New York, NY, USA, 1873–1886. https://doi.org/10.1145/3357236.3395530

[123] Tom Schofield, Diego Trujillo Pisanty, Gabriella Arrigoni, Kim Reynolds, and Rachel Pattinson. 2019. Magical Realism and Augmented Reality: Designing Apps with Children in a Cultural Institution *(DIS '19)*. Association for Computing Machinery, New York, NY, USA, 737–749. https://doi.org/10.1145/3322276.3322293

[124] Gershom Scholem. 2003. *Walter Benjamin: The story of a friendship*. New York Review of Books.

[125] Gershom Gerhard Scholem. 1991. Origins of the Kabbalah. In *Origins of the Kabbalah*. Princeton University Press.

[126] Gershom Gerhard Scholem. 1995. *Major trends in Jewish mysticism*. Random House Digital, Inc.

[127] Gershom Gerhard Scholem. 1997. *On the mystical shape of the Godhead: basic concepts in the Kabbalah*. Mysticism and Kabbalah.

[128] Martin EP Seligman. 2011. Flourish: a new understanding of happiness and well-being–and how to achieve them. *Boston: Nicholas Brealey* (2011).

[129] William Seymour and Max Van Kleek. 2020. Does Siri have a soul? Exploring voice assistants through shinto design fictions. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–12.

[130] Sumita Sharma, Britta F. Schulte, Rocío Fatás, Noura Howell, Amy Twigger Holroyd, and Grace Eden. 2022. Design Futuring for Love, Friendship, and Kinships: Five Perspectives on Intimacy. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts*. 1–14.

[131] Chani Haran Smith. 2008. *Tuning the Soul: Music as a spiritual process in the teachings of Rabbi Nahman of Bratzlav*. University of London, University College London (United Kingdom).

[132] Steven B Smith. 1993. Gershom Scholem and Leo Strauss: Notes toward a German-Jewish Dialogue. *Modern Judaism* (1993), 209–229.

[133] Velvet Spors, Hanne Gesine Wagner, Martin Flintham, Pat Brundell, and David Murphy. 2021. Selling Glossy, Easy Futures: A Feminist Exploration of Commercial Mental-Health-Focused Self-Care Apps' Descriptions in the Google Play Store. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (Yokohama, Japan) *(CHI '21)*. Association for Computing Machinery, New York, NY, USA, Article 404, 17 pages. https://doi.org/10.1145/3411764.3445500

[134] Walter Terence Stace. 1960. Mysticism and philosophy. *Philosophy* 37, 140 (1960).

[135] Angelika Strohmayer, Janis Lena Meissner, Alexander Wilson, Sarah Charlton, and Laura McIntyre. 2020. "We Come Together as One...and Hope for Solidarity to Live on": On Designing Technologies for Activism and the Commemoration of Lost Lives. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference* (Eindhoven, Netherlands) *(DIS '20)*. Association for Computing Machinery, New York, NY, USA, 87–100. https://doi.org/10.1145/3357236.3395452

[136] Sharifa Sultana and Syed Ishtiaque Ahmed. 2019. Witchcraft and HCI: Morality, Modernity, and Postcolonial Computing in Rural Bangladesh. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, Scotland Uk) *(CHI '19)*. Association for Computing Machinery, New York, NY, USA, 1–15. https://doi.org/10.1145/3290605.3300586

[137] Cella M Sum, Rahaf Alharbi, Franchesca Spektor, Cynthia L Bennett, Christina N Harrington, Katta Spiel, and Rua Mae Williams. 2022. Dreaming Disability Justice in HCI. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts*. 1–5.

[138] Jordan Taylor. 2022. Decoloniality in computing: an interview with Dipto Das. *XRDS: Crossroads, The ACM Magazine for Students* 28, 4 (2022), 32–36.

[139] Jordan Taylor and Adinawa Adjagbodjou. 2022. DEI in computing: centering the margins. , 6–7 pages.

[140] Alexandra To, Safinah Ali, Geoff Kaufman, and Jessica Hammer. 2016. Integrating Curiosity and Uncertainty in Game Design. *Digra/fdg* (2016).

[141] Alexandra To, Hillary Carey, Riya Shrivastava, Jessica Hammer, and Geoff Kaufman. 2022. Interactive Fiction Provotypes for Coping with Interpersonal Racism. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–14.

[142] Alexandra To, Anny Fan, Catherine Kildunne, Eda Zhang, Geoff Kaufman, and Jessica Hammer. 2016. Treehouse Dreams: A Game-Based Method for Eliciting Interview Data from Children. In *Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts*. 307–314.

[143] Sherry Turkle. 2011. *Evocative objects: Things we think with*. MIT press.

[144] Jay Vidyarthi and Bernhard E Riecke. 2013. Mediated meditation: cultivating mindfulness with sonic cradle. In *CHI'13 Extended Abstracts on Human Factors in Computing Systems*. 2305–2314.

[145] Jay Vidyarthi and Bernhard E Riecke. 2014. Interactively mediating experiences of mindfulness meditation. *International Journal of Human-Computer Studies* 72, 8-9 (2014), 674–688.

[146] Birrell Thomas Walsh. 1999. *The practice of praying for others: Eight examples from late twentieth-century America*. California Institute of Integral Studies.

[147] Vanissa Wanick, Guilherme Xavier, and Erhan Ekmekcioglu. 2018. Virtual transcendence experiences: Exploring technical and design challenges in multisensory environments. In *Proceedings of the 10th International Workshop on Immersive Mixed and Virtual Environment Systems*. 7–12.

[148] Noah Wardrip-Fruin. 2009. *Expressive Processing: Digital fictions, computer games, and software studies*. MIT press.

[149] Vanessa Watts. 2013. Indigenous place-thought and agency amongst humans and non humans (First Woman and Sky Woman go on a European world tour!). *Decolonization: Indigeneity, Education & Society* 2, 1 (2013).

[150] Jennifer Weiler, Piyum Fernando, Nipuni Siyambalapitiya, and Stacey Kuznetsov. 2019. Mycelium artifacts: Exploring shapeable and accessible biofabrication. In *Companion Publication of the 2019 on Designing Interactive Systems Conference 2019 Companion*. 69–72.

[151] Mikael Wiberg, Alex Taylor, and Daniela Rosner (Eds.). 2022. *Interactions* 29, 4 (2022).

[152] Allison Woodruff, Sally Augustin, and Brooke Foucault. 2007. Sabbath Day Home Automation: "It's like Mixing Technology and Religion". In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (San Jose, California, USA) *(CHI '07)*. Association for Computing Machinery, New York, NY, USA, 527–536. https://doi.org/10.1145/1240624.1240710

[153] Susan P. Wyche, Kelly E. Caine, Benjamin K. Davison, Shwetak N. Patel, Michael Arteaga, and Rebecca E. Grinter. 2009. Sacred Imagery in Techno-Spiritual Design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Boston, MA, USA) *(CHI '09)*. Association for Computing Machinery, New York, NY, USA, 55–58. https://doi.org/10.1145/1518701.1518710

[154] Susan P. Wyche and Rebecca E. Grinter. 2009. Extraordinary Computing: Religion as a Lens for Reconsidering the Home. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Boston, MA, USA) *(CHI '09)*. Association for Computing Machinery, New York, NY, USA, 749–758. https://doi.org/10.1145/1518701.1518817

[155] Susan P. Wyche, Gillian R. Hayes, Lonnie D. Harvel, and Rebecca E. Grinter. 2006. Technology in Spiritual Formation: An Exploratory Study of Computer Mediated Religious Communications. In *Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work* (Banff, Alberta, Canada) *(CSCW '06)*. Association for Computing Machinery, New York, NY, USA, 199–208. https://doi.org/10.1145/1180875.1180908

[156] Daisy Yoo, Milli Lake, Trond Nilsen, Molly E. Utter, Robert Alsdorf, Theoneste Bizimana, Lisa P. Nathan, Mark Ring, Elizabeth J. Utter, Robert F. Utter, and Batya Friedman. 2013. Envisioning across Generations: A Multi-Lifespan Information System for International Justice in Rwanda. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Paris, France) *(CHI '13)*. Association for Computing Machinery, New York, NY, USA, 2527–2536. https://doi.org/10.1145/2470654.2481349