

From Explainability to Ineffability?

ML Tarot and the Possibility of Inspiring Design

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ABSTRACT

Explainability has become a dominant aspect of developing more accountable AI systems. But for AI to be more accountable, we as designers must also reflect on our own positioning—including aspects of ourselves that are difficult or impossible to fully explain, yet still influence our design processes. Just as designers develop explainable AI, we explore how AI can be used to develop the unexplainable designer through documenting our creation and use of a machine learning-generated tarot deck. Alongside design researchers, we consider the promise of such machine learning-generated artifacts for self-reflection on our creative and collaborative roles—and our responsibilities—when designing AI systems, and we discuss how the artifact sparked acts of *inspiring*, a process of bringing the ineffable (back) into our engagements with machine learning systems.

Authors Keywords

tarot, first-person research, autobiographical design, design research, critical inquiry, design for the ineffable

CSS Concepts

- Human-centered computing~HCI design and evaluation methods

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Introduction

With increasing attention paid to the role of interpretability and explainability in machine learning systems, the field of design research is searching for new and different tools for design accountability [39]. Imagine you get a Facebook ad selling you a dream journal. Why? Explainable AI¹ claims to help spell out how the algorithm came up with that product based on the data it collects on your online behavior (e.g. posting on “How to Keep A Dream Journal” forums and Facebook groups) [12].

But making an algorithm understandable does little to account for the designers’ situation or status. Reflecting on the situation of the designer, this paper uses combined design inquiry and autobiographical design to creatively rethink the question of AI explainability. In particular, we ask: how might a reflective arts tradition help us embrace *unexplainability* in AI design?

To explore this question, we describe our process of developing and using a machine learning (ML)-generated deck of tarot cards. Tarot is a tool for reflection and divination often composed of 78 cards, each connected with an archetype and associated story. Players typically pull a small number of cards at random from the deck and use their text and illustrations to prompt introspection and speculation on a person’s past, present, and future. While many people “read” tarot for others, some use it as a mode of self-reflection [17]. In our process, we draw from an emerging tradition of tarot-based design research (e.g., the Tarot Cards of Tech [2] and Instant

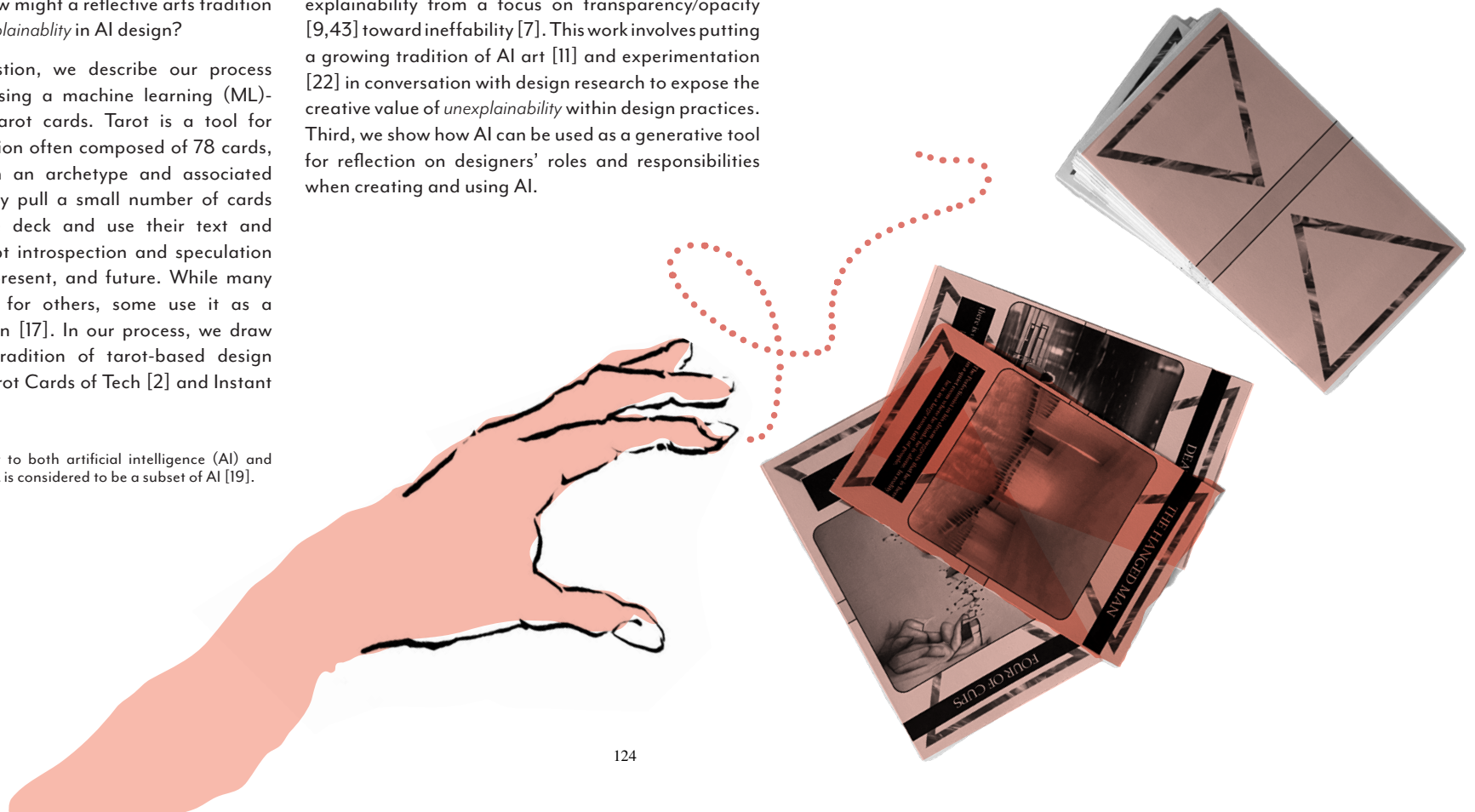
Archetypes [48]) and speculative futuring [15] (e.g., The Oracle for Transfeminist Technologies [29]) to explore the use of machine-generated cards among design researchers. We describe the development of the deck, the first author, Caitie’s, own practices using the deck herself over the course of several weeks, and our work with collaborators during a speculative tarot reading session and exhibition.

This project makes two main contributions to design research. First, we extend conversations on design for divination [5] to illustrate the imaginative role AI can play in supplementing and shaping speculative futuring practices. This process involves prompting designers to make creative interpretations of AI’s surreal, unsettling, and cryptic imagery. Second, we shift debates on AI explainability from a focus on transparency/opacity [9,43] toward ineffability [7]. This work involves putting a growing tradition of AI art [11] and experimentation [22] in conversation with design research to expose the creative value of *unexplainability* within design practices. Third, we show how AI can be used as a generative tool for reflection on designers’ roles and responsibilities when creating and using AI.

“One of the most useful things I’ve learned about Tarot is that you need to practice different ideas. That’s because the nature of the Tarot is that each card represents a particular part of your life.”

— The Nine of Wands from ML Tarot deck

¹ In this pictorial, we refer to both artificial intelligence (AI) and machine learning (ML). ML is considered to be a subset of AI [19].



| THE FOOL | THE HIGH PRIESTESS | THE MAGICIAN |
|--------------|---------------------------------------------|----------------------------------------------------------------|
| | | |
| Fool's Doubt | Sickly, hedonistic, and intoxicating beauty | Living embodiment of the divine spark and a creature of light. |

| TEMPERANCE | DEATH | THE HANGED MAN |
|---------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| | | |
| Metallic form | there is only one person who will always be there, waiting for you | The Performer in his dream suggests that he is here in a quiet room where he thinks he is alone. In reality he is in a large room full of people. |

| NINE OF CUPS | EIGHT OF CUPS | SEVEN OF CUPS |
|-----------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|
| | | |
| A Christmas book and swing dancers in a shop. | It's the person that will choose death over love. | A person dancing through a still life with life energy bouncing in the air. |

The ml Tarot Card Deck

| STRENGTH | THE CHARIOT | THE LOVERS |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| | | |
| seven pointed stars | The horse represents the elephant, and the elephant represents the hermit who symbolizes the crosser, a rugged individual. The horse represents the Golem, who represents the untamed energy. | The Goal: Make it Feel Like I'm Choosing A Better Option |

| JUSTICE | WHEEL OF FORTUNE | THE HERMIT |
|-----------------------------------------------------|------------------|------------|
| | | |
| She's got the heart of a lion, the love of a queen. | Lizzy's journey | light-wood |

| THE STAR | THE TOWER | THE DEVIL |
|--------------------------------------|------------------------|-------------------------------------------|
| | | |
| Therapist at the Golden Gate Bridge. | Tower over Los Angeles | Torch to the altar and sacrifice a flower |

| NINE OF WANDS | THREE OF WANDS | THE WORLD |
|------------------------------|----------------------------------|------------------|
| | | |
| The girl with all the gifts. | The Man Who Reads the Telephones | Three dimensions |

| FIVE OF CUPS | FOUR OF CUPS | KNIGHT OF WANDS |
|-------------------------------------------|-----------------------------|---------------------------------------------------|
| | | |
| The red and dry world inside white walls. | Addiction in a broken place | Knight of money becomes the knight of the Throne. |

| TWO OF SWORDS | KING OF CUPS | KNIGHT OF CUPS |
|------------------------|----------------------------------------------------------|--------------------------|
| | | |
| Red Shirt on a mission | A man holding energy in front of water, star, and space. | Eight ovals in a palace. |

| TEN OF SWORDS | FIVE OF SWORDS | FOUR OF SWORDS |
|------------------------------------------------------|---------------------------|---------------------------------------------------------|
| | | |
| I am not human. But I am not a demon. We both exist. | Cleansing the battlefield | A beehive, a tree, and a cradle in cracks in the earth. |

| ACE OF PENTACLES | KING OF SWORDS | QUEEN OF SWORDS |
|-------------------------------------------|------------------|-----------------|
| | | |
| A seed, a rising sun, a compass, and God. | King Adjudicator | Vibrator |

Related Work

REFLECTION & TAROT

Reflection has emerged as a central practice of ethical design. Some groups such as the Creative Reactive Lab [45] and the Design Justice Network [46] have released workbooks that challenge designers to explore their assumptions and limitations. Others have adopted existing platforms such as board games [18] and card decks [29] that promote reflection on difficult topics. Still others turn to spiritual practices connected with meditation and other-worldly divination [5].

Within this range of work, the medium of tarot has made a notable appearance. Tarot's imagery, or archetype, tends to come in one of two kinds: Major Arcana and Minor Arcana. The Major Arcana represents "universal" archetypes that can signal major life events or important messages that the reader should take note of. The Minor Arcana has four different suits which have different properties and represent aspects of one's daily life. Pentacles are often associated with professional life; Swords are often associated with rationality; Wands are often associated with passion; and Cups are often associated with emotions and feelings. Each of the suits connects with a narrative. If someone draws the Two of Pentacles, for example, they might interpret that they are starting out on their work journey. If they draw a Ten of Pentacles, they could interpret that they've made good progress.

Among design researchers, tarot has worked as a metaphor: inspiring those making design decisions to first reflect on the embedded cultural scripts, structural effects, and potential unintended consequences perpetuated by their work. Researchers have used customized tarot cards in tandem with their design process. This work has involved creating space for collective reflection [33], prompting researchers to consider unintended harms [2], and raising awareness of systemic and structural concerns beyond the product cycle, such as municipal investment or the unevenly felt consequences of climate emergencies [20].

In tandem, people who regularly use tarot cards have begun to design the decks themselves—using tarot activity as a means of artistic expression. As of February 2022, over a one thousand tarot deck projects have been listed on Kickstarter.com, with

the most funded tarot deck project receiving over 1.4 million USD in funding [47]. Despite its normative and wide-ranging usage, tarot offers opportunities for transgression and non-normative self-making. Media artist and scholar Hong-An (Ann) Wu [41] describes tarot as a technology that has been taken up by social justice activists for prefiguration: "Various Tarot practitioners have reclaimed the pictorial images in decks and the language in guidebooks to prefigure a world where the lives, experiences, and knowledge of the poor, colonized, LGBTQIA, Black, Indigenous, Brown, people of color, and people with disabilities are not only centered and legitimized but also cherished and celebrated." People use tarot as a refusal of Western epistemologies [41,42] and a way of looking to "different epistemologies to forge and inhabit a different world" [41]. For example, Marcelitte Failla describes Black tarot as refocusing Eurocentric tarot on ancestral connection, intimacy, and resiliency: "Practitioners employing Black tarot cultivate moments of resilience, not a static state of innate being, but instead, they access feelings of optimism, clarity, flexibility, and self-control." [13] In Wu's personal reflections on her experience with tarot readings, tarot is a "technology of care" that helps tarot readers focus on "the project of making reality" [41]. We interweave these practices of tarot-inspired design and designing-tarot to explore the driving concerns around algorithmic explainability.

EXPLAINABLE AI & THE INEFFABLE

Algorithmic explainability tends to refer to a process of making the decisions a model makes understandable, as well as the work of accounting for the model development as a whole [9]. Explainability tools are post-hoc models created with the goal of helping people develop deep understandings of a system's internal logic and mechanisms; whereas interpretability is seen as a quality that is designed into a system [24,26]. Often explainability tools are seen as opening the "black box" of algorithmic systems to provide opportunities for human oversight [39] (and, in some cases, can be designed to support contestability [32]), although some researchers have pushed back against the idea that algorithmic systems need to be black boxed at all and, instead, should be designed for interpretability to begin with [35,36].

Prior work has articulated the importance of looking at algorithmic opacity within a framework of intentionality, technical (il)literacy, and technical usability [9]. Across this analysis, positionality matters when the people creating the algorithms are also deciding what explainability means and for whom [10]. Within a landscape of increasingly ubiquitous data extraction, it can be challenging to grasp who gets to be explainable (or unexplainable) to whom [23,31], and to trace how un/explainability changes across contexts and time [34].

A parallel body of work has examined the promise of ineffable design—exploring the sensory-driven engagement of aesthetic experience [7]. The challenge of designing for what cannot be fully understood, traced, or captured requires paying attention to emotional awareness [7], open dialogue [28], and impracticalities [38]. Amid calls for transparency [30] and usability [1] of AI design and documentation, ineffable design draws designers to the ill-defined and opaque, and prompts exploration of the unknown. When thinking about the difficulty of this exploration, we drew inspiration from poet and performer Sophie Fenella Robins [14], who wrote: "I write to perform ineffability, not describe an ineffable experience". Rather than attempting to explain the ineffable in this pictorial, we sought to understand it through the performance of tarot design and tarot reading.

In the pages that follow, we explore the important but under-examined connections between explainability and ineffable design. What kinds of insights can we generate when we embrace the unexplainable? And how might one, in the words of performance studies scholar Betina Judd, "open oneself to possibility beyond the effable—to place oneself relentlessly in the curious space of spiritual inquiry." We take particular inspiration from Bettina Judd's reflections on the automatic and spirit writing of poet Lucille Clifton. "Automatic writing is a technology that produces effects that re-embody and inspirit," she explains [22]. To explore the process of inspiring, she brings a tradition of speaking in tongues from her Pentecostal upbringing to an AI translation experiment. "In this experiment, I speak in tongues, transcribe it, and see if Google's translation software could decipher meaning. It did not, and in some sense, it did." From what the translation tool produces, Judd creates poetic texts. The texts cast the process of speaking in tongues

as impossible to fully decipher or synthesize meaning. Instead of decipherable or meaningful, the process reveals the translations as experiential. Inspiring then becomes a mode of foregrounding experience, of making something difficult to comprehend still present, felt, and known. By working in the emerging tradition of design inquiry toward divination [5,6,16,27] and the ineffable [7], we explore the potential of inspiring AI.

Approach

CREATING ML TAROT

To create the ML Tarot deck, Caitie engaged in a multi-stage process which involved using AI to generate descriptions of the cards and then, using another AI algorithm, using those descriptions to generate the images on the cards. They began by generating descriptions of the cards to put in a booklet. Tarot decks are often accompanied by booklets that help readers interpret the cards. To generate the descriptions, Caitie used GPT-2 (using a copy of a Collab notebook [40]), a large language model trained on a large corpus of web pages, which can generate human-like text. To use GPT-2, the AI must first be provided some text, and it will then use this text to predict what words should follow. Caitie provided it with short lightly edited descriptions of cards from tarot.com. These sentences from tarot.com included information about the traditional imagery on the cards and/or the traditional meaning of the cards. GPT-2 used these sentences to generate longer texts. For each card, Caitie used GPT-2 to generate multiple descriptions (in total, about 132 thousand words) and then for each card, they selected the description with the most “imaginative” imagery, narrative, or writing style. To generate the images shown on each card, they fed key words or quotes from these descriptions into nightcafe.studio [44] using their VQGAN+CLIP algorithm. This algorithm can generate images based from text prompts. In some cases, Caitie generated multiple images before picking ones that were the most evocative and representative of the textual aesthetic of the descriptions. Lastly, Caitie created a booklet with the AI-generated descriptions and printed cards with the AI-generated images. All blockquotes in this pictorial come from the GPT-2 generated card descriptions.

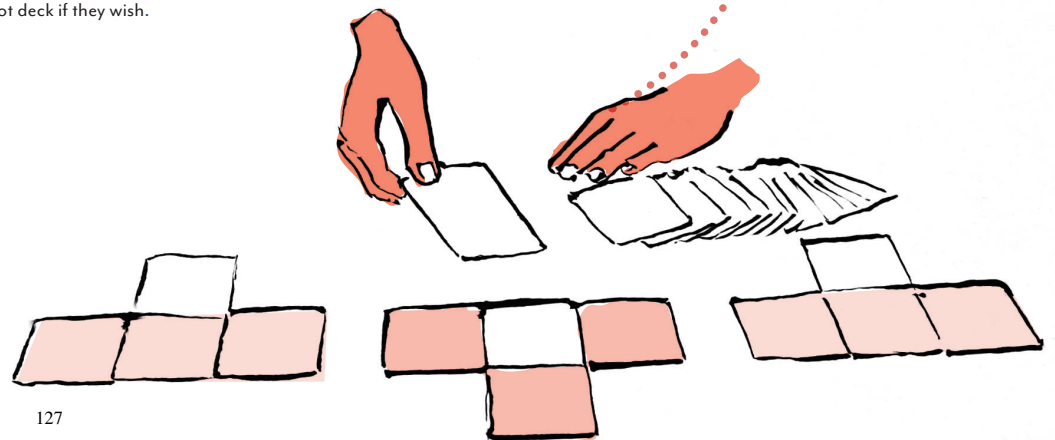
STUDYING ML TAROT

To examine ML Tarot, we conducted two experiments in reading: (1) Caitie’s own reflections on the design and use of the card deck over several weeks; and (2) a collective reading session with six design researchers.

For the self-reflections, Caitie used the ML Tarot cards for 3-card readings for herself and wrote down their reflections on those readings in a journal over the course of several weeks. They displayed the cards, guide booklet, and some of the journal entries as part of an art exhibition during fall 2021.

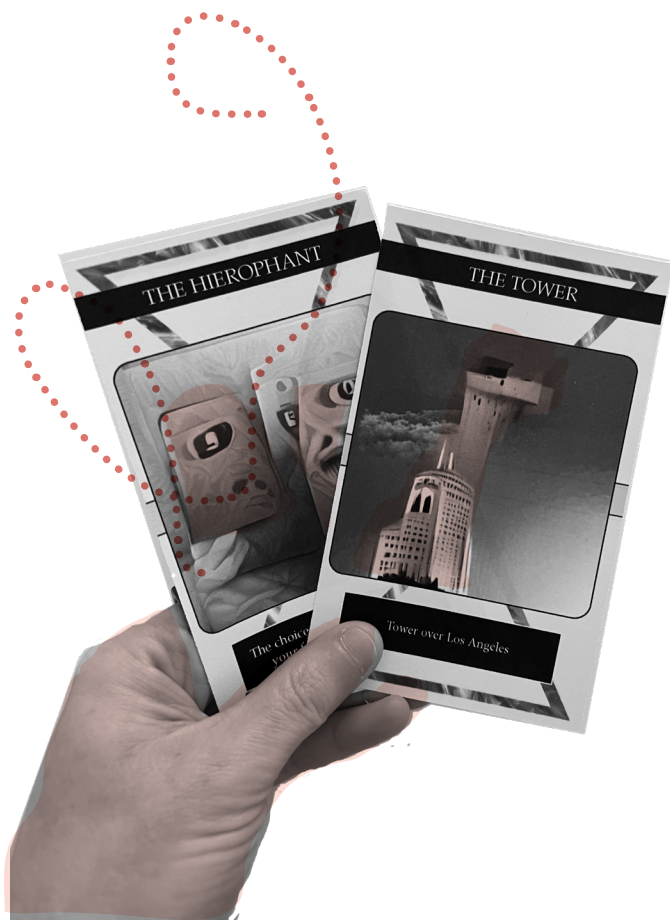
For the reading session, we gathered a group of design researchers who have expertise in critical examinations of and creations with AI on a video call with a PDF version of the card deck². While most of the researchers were familiar with tarot and had done tarot readings before, a couple of them were new to the medium. After explaining how tarot works and how Caitie does readings, Caitie introduced the researchers to the process of creating the ML Tarot cards. They illustrated how the deck was generated and generated a new card together in a demo. We then asked each of them to use a random number generator to pick out tarot cards and do their own readings. We then wrote down personal reflections and discussed them as a group. All people who are quoted or paraphrased in this pictorial gave their explicit permission for us to do so, as well as expressed their preferences for anonymity, following co-creation principles [8]. This range of reflections point to deeply personal accounts of the visual and its role in crafting different points of inflection for design research, AI, and life.

² A PDF of the booklet can be found [here](#), which readers can use it to do their own readings with the ML Tarot deck if they wish.



ml Tarot

ML Tarot is a card deck for reflection and divination composed of ML-generated text and images. To understand a reading with ML tarot, consider the following 3-card example wherein the second author of this pictorial, Daniela, selected three cards (representing past, present, and future) and reflected on the ML-generated visuals.



THE HIEROPHANT - PAST

The face asks or maybe invites me to consider mutability—the changing nature of memory and what seems at first so stable and complete; never quite so. How the moving parts are also reflections of ourselves, of myself. The backdrop of memory is soft and scrambled, hard to interpret but also familiar. I think of the childhood friendships that stare into my insides, that wait to be addressed, known, pieced together again. They might be faint memories—the Sega game we played together in the living room when no one was watching. Getting picked up and feeling the chill between our parents. How those memories change and fold into the creases of the pillow I sleep on.



ACE OF SWORDS - PRESENT

So much hierarchy in this image. The wall becomes a series of steps. I'm a small figure on the right, climbing higher, even reaching out to find something - but unclear what I find or where I find it. The only certainty is in the thing existing out there. It's just reachable, and maybe slightly out of step. It's taunting - a hot glowing ball across the cool blue landscape. But then below is something domestic and plant-like, maybe the silly planter from IKEA. I can't tell if I'm so far away from the domesticity or if it's always anchoring me. How far do I get from the IKEA planter when I don't know what's coming but I know it's contrasting with what's here?



THE TOWER - FUTURE

The landscape has a misty quality. It's a blue sky but the water color character makes it seem hazy and serene. I'm in the image but only as an on looker. I want to look at the bright pink light below, but my focus is drawn to the tower in the sky. Maybe the tower holds some kind of secret. Clouds stretch out from its side, as if showing a different world. Could there be some kind of different existence in the future waiting. No people are in the space but maybe they exist in the warm, in the red light. The sky reminds me of water, familiar waters that I spend time with my family during summers. The building in the front — institutional and high contrast — is the most present but least interesting. It doesn't need to be the destination. It might distract, but won't call me there. Maybe the card is letting me leave institutional support and career. Letting me float. Imagine and wonder.



First Author Readings: AI for Reflection

Caitie originally created the ML Tarot deck to explore how bias impacts the generation of the images in tarot cards and their descriptions—both the bias of the machine learning itself and of the traditional tarot depictions (i.e., the Smith-Rider-Waite deck, published in 1909), which were highly gendered and had colorist descriptions (e.g., that people with certain complexions had specific personality traits). The bias of GPT-2 was evident in the many generated descriptions of video games and anime. These types of descriptions were largely discarded in favor of more descriptions that tapped into more mystical qualities. The bias of the generated images is partially displayed in the predominately “Western” art styles that the generator chose to use and of the pale skin tones. And lastly, when we do a reading, we often use our own biases to understand what we are seeing, layered on top of an artist and writer’s visions. However, Caitie quickly found that beyond an exploration of bias, the ML tarot was a tool for reflection as well.

Caitie keeps a tarot journal and uses tarot to regularly reflect on their life experience. But using ML Tarot prompted additional reflections that related to their identity as much as the tool. Consider the following vignette, when Caitie examines the process of building the deck.

When I began creating this deck, I felt some anxiety because I didn’t think of myself as a “creative” person, but I felt as though something had possessed me to work on the deck. I put long hours in, incessantly tinkering with it, and sometimes just sitting with it and reflecting on it. Rather than directly design the cards, I made decisions about which of the generated texts to use for each of the card descriptions, which phrases to use to generate the images, and which of the generated images to use for the card. Over time, I began to see machine learning as a generative way for me to explore my creativity, or even recognize a creative potential in myself.

By working with ML, Caitie realized the number of decisions required within a process so often hidden or presumed ‘automatic.’ The curation of data, the development of training models, the adjustment and revision of the algorithm, each constituted a particular form of creative labor and contributed to the process of card development.

They spent time tinkering with the website that generated the images, inputting different phrases until images were generated that externalized the feelings that each card description evoked for them. For most of the cards, they quoted the GPT-2 generated texts, often using more abstract phrases or full sentences to generate the images. For example, the Eight of Cups used the sentence “It’s the person that will choose death over love.”, which generated an image of a heart balloon floating over a graveyard and shrouded figures. They reflected:

When I did readings, my own curation of machine learning generated outputs was reflected back at me. When others did readings with the deck, they also had a window into my states of mind when I created the deck—and they filtered their own experiences through them. Similarly, does using AI to generate images reflect back the “self” of the AI/ML?

Coming back to these cards over the coming weeks, their meanings shifted every time they were drawn. They largely drew from the textual descriptions of each cards to guide their interpretation, but the visuals inspired a reading of the emotional quality of each card. In each reading the same card could tell a different story as it was put in conversation with other cards and contextualized in spreads designed to answer different kinds of questions. They found that the images and textual descriptions of the ML Tarot cards could be adapted for multiple purposes and could provide insight into different kinds of phenomena. While this quality of shifting interpretations is not unique to ML-generated tarot decks, it opens up a space for reflection on different aspects of both oneself and of ML, which our design researcher colleagues demonstrated in their readings. Unlike Caitie’s focus on bias and labor, these reflections highlighted other qualities of ML such as possibilities for collaborative meaning-making and prefigurative design.



Reading Session: Reflecting on AI

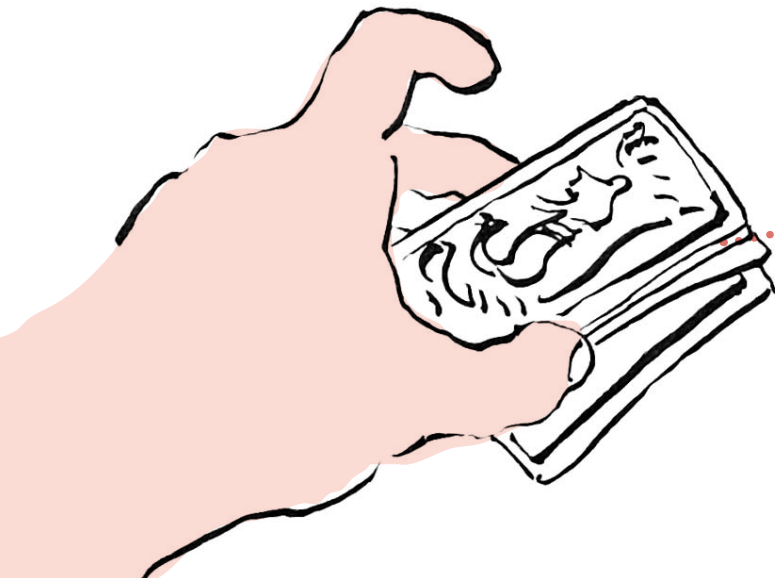
Within the reading session, our six design research colleagues brought a range of reflections and understandings to the cards.

AI as Lively, Lyrical and Poetic

Several researchers noticed themselves initially skeptical of the deck's AI foundations, only to find themselves leaning into the process of interpretation. "I expected to be a lot more resistant to the content of the cards (my own bias against generated content, I guess) but found it surprisingly lyrical and relevant... it didn't feel like it was locking me into a meaning or like there was an 'interpretation' I was after, it was more playful." Another researcher drew The Seven of Cups, a card pointing to multiple options and opportunities, and commented: "This time it also felt like a collaboration with AI-generated media, and I loved that!" Experimenting with the bounds of interpretation, they later observed, "interpretation will always work with whatever elements you give it. In that sense, perhaps a tarot deck is the best use case for AI-generated art, which is formally sound but always incoherent (to some degree)." In its flexible interpretations, several readers saw something lively and poetic endemic to machine learning systems.

"You can feel your own energy being moved forward by the magic of the moment, your own imagination."

—The Seven of Cups from ML Tarot deck





Dialogues and Collaboration with AI

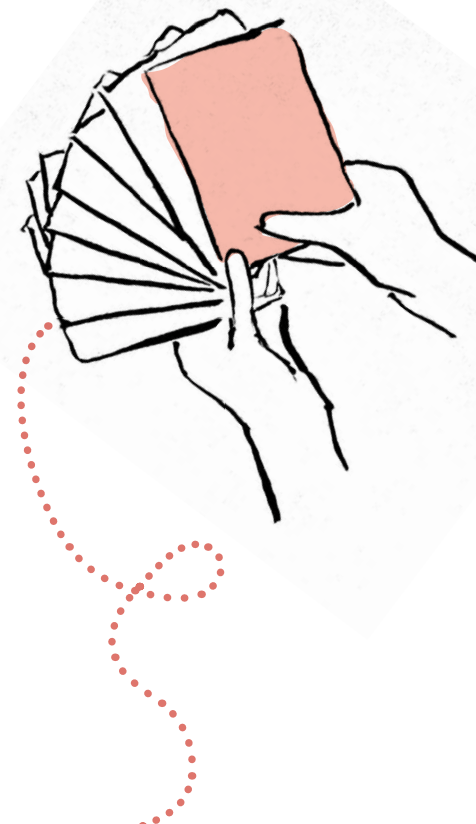
During our post-reading discussion, readers considered the trail of AI development and their role in it. “Interesting that you used the AI generated content to drive the other AI generated content,” one remarked when faced with The Hermit, a card whose description in the ML Tarot booklet suggests a phase of introspection: “I imagine that for the ancient person the light might represent the now hidden vital force in their life, the moment in which their strength and vitality is building, or for the ancient person, a kind of spring that comes from the heart, producing a sense of well-being and well-being itself”. Depicted as a block of wood with light glowing from within, the Hermit’s desire for looking inward came across as dreamlike and even absurd. Using AI as a tool to reflect on their thought processes, our research colleagues reflected on how meaning-making felt like a dialogue or collaboration with the chain of AIs that generated the cards. They wondered what it means to make meaning from an AI.



The Two of Wands

AI for Prompting Emergent Visual-Textual Meanings

For those drawn to the visual material, a surrealism marked the imagery. “I found both the images and the text to be very interesting. I enjoyed the dialogues between them, and how they allowed me to triangulate my own meaning,” a reader observed. While some researchers spent more time with the image than the text, others felt compelled to the text. “The text drew me in,” said one researcher who pulled *The Hanged Man*, a card that typically represents ultimate sacrifice or suspension in time. They discussed the intricacies of perfection, and how perfectionism is not always harmful. In another instance, looking closely at the text and image in *The Seven of Cups*, a paint-like rendering of a still life within a room reminiscent of work by Spanish artist Salvador Dalí, exposed a certain semantic flexibility. “There are a number of ways we can relate to this card,” the card reads, reflecting the reader’s own views of the illusive quality of the analysis. “Maybe making your own decks could unlock different futures,” they explained.

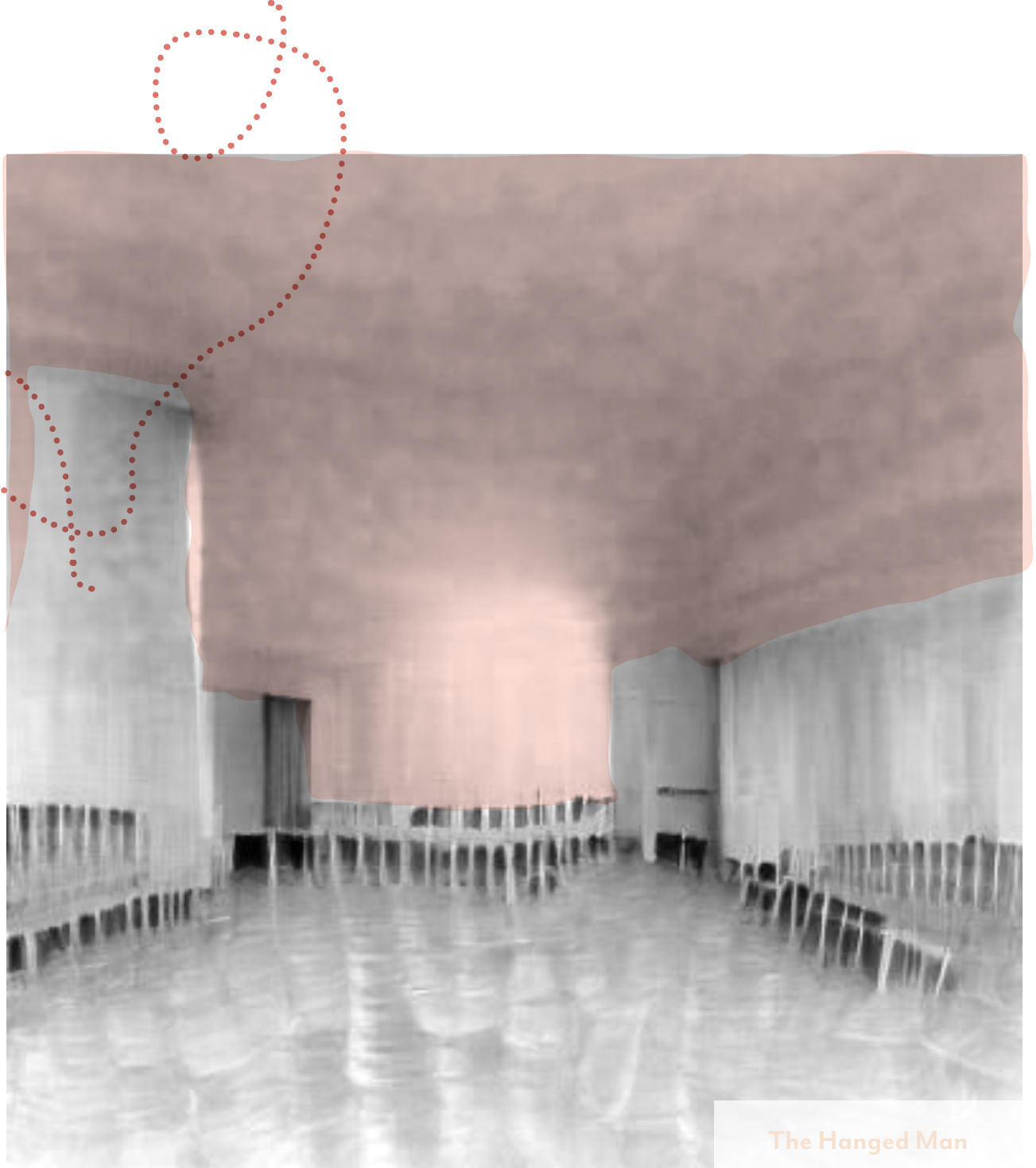


“The Perfectionist in his dream suggests that he is here in a quiet room where he thinks he is alone. In reality he is in a large room full of people.”

— The Hanged Man from ML Tarot deck

Reading New Potentials & Imagining Otherwise with AI

Readers noticed missing context and glitches pervading the text and imagery, but also observed that they supported a certain imaginative thinking. “I think in this case, the nonsensical nature and the gaps that often comes from generated text was actually a strength in opening up spaces for themes and poetry and spacious interpretation/association,” one reader exclaimed. In some cases, the flawed text raised questions of gender. One researcher shared: “I know you haven’t been text editing, but I wonder about mass replacing to use gender neutral pronouns across the deck; ‘he or she’ feels excluding.” Another researcher took issue with typical cards. “It’s hard to take tarot sincerely when it doesn’t respect particulars of your personhood, they reflected. During their reading, their attention landed on The King of Wands, a card visually represented by a dragon-life form emerging from a pale and desolate grassy landscape. The accompanying description reads: “...a centuries old misconception in some cultures that the first King was a queen.” Reflecting on these words, the researcher, observed, “Even though [the cards] are using she/her or he/him [pronouns] they don’t match the way you expect it to. Maybe there’s some kind of weirdness with this Tarot [deck] that might be able to be imagined otherwise.” They identified a certain potential within the flawed reproduction of gender binaries and mixed gender identities.



The Hanged Man

Discussion

Our experiments have so far illustrated opportunities for using AI to produce different modes of reflection using AI/ML systems. During our development of ML Tarot, we took inspiration from prior work [5], and from a strong tradition of critical media arts practice [11,22], to assess the value that the unexplained holds. In particular, we questioned the potential of bringing AI into a creative process of critique. While we began by exploring critical reflections made possible with and thorough machine learning systems, with time our work exposed a reflective quality to AI that was in place all along.

Just as designers help create explainable AI, might AI help nurture unexplainable designers?

In closing, we consider how this project used AI to prompt us, as designers, to reflect on three aspects of ourselves.

Echoed Selves: In our own practice and reading session, we noticed the cards push us to notice features of our interpretive tools that might be different. Why does the sky turn to gold? When does a gender binary breakdown? Seeing tarot cards less as tools to design things or reflect and more as a means to develop a process or set of habits for reflecting on echoes of ourselves as well as the intimate and personal (even, spiritual) dimensions of the design process—our responsibilities, biases, strengths, and situated knowledges. Tapping into our spiritualities could be generative and speculative. As Judd notes about her experiment with Google Translate, “The technology of Google Translate continues to plug away, to create meaning, but always misses the mark.” [22] AI is unable to comprehend the spiritual, and yet it inspired something spiritual for Caitie.

Creative Selves: The process helped us to reflect on our role as creators and the ways AI/ML asks us to give up some control over what we create—and what that diffusion of creativity means for locating accountability in AI/ML systems. And this project also highlighted that designers in these sociotechnical systems are not without creative agency. We spend a lot of time talking about AI as curators (e.g. [25]). Perhaps we need to spend more time talking about humans as curators of AI. While argumentation around human accountability in AI systems is hardly new [3], it struck Caitie as more potent once they had experienced firsthand how designers make intentional creative choices when using AI.

Ineffable Selves: During the reading sessions, we began to think of the process of inspiriting AI as a way of sharing ineffable qualities of ourselves with others. Readings unfolded in a dialogue between our creative selves—Caitie as the person who created the cards and the design researchers as people who made sense of how the cards fit together to explain aspects of their lives. Was this also a dialogue with AI? And was Caitie acting in some way as a “voice” for the AI? This project raised more questions than answers about the importance of trying to share ineffable experiences.

We see these three aspects of self-knowing as generative approaches for reflecting on when (not) to create AI [4,25] and our responsibilities to both communities and to ourselves as designers. Reflecting on Betina Judd’s writing on self-knowing and self-making [22], we find ourselves wondering if developing ML tools is always a form of trying to understand oneself. Are we trying to make sense of selves through the lens of an unknowable other? Maybe we are trying to know and make ourselves through the creator of an AI, a genre we might never fully know or understand. In the case of ML Tarot, interpretability never fully explains the cards’ ineffable aesthetic experience. But working with ML Tarot makes this ineffability tangible. We cannot explain the imprecise way that AI works, we can only absorb its imprecision.

We see possibilities for using other datasets (e.g., a corpus of poetry) and other algorithms (e.g., gpt-3) for generating different tarot card decks and tangible artifacts. Even starting from a card deck other than the Smith-Rider-Waite deck could further support the potential of AI for “imagining otherwise.” Alternative card decks could also help design researchers use this process of self-reflection within a range of contexts: on aspects of themselves that often remain unexplored in the design process; on the creative qualities of AI/ML systems; and on the relationships and accountabilities between designers and AI systems. While we have positioned ineffability as an alternative to explainability, we think this work could also complement efforts to make AI systems explainable. We could imagine using ML to generate explanatory artifacts, similar to model cards. If we view these artifacts as manifestations of inspirited AI, then they could be used for inquiry into how AI systems perceive, explain, and reflect on themselves.

Conclusion

When AI makes decisions, it abstracts and approximates [21] and uses abductive reasoning [37] to generate a best guess. Tarot might suggest we give AI too much authority when we talk about its (un)knowability. Our experiments with tarot help shift AI developments from a paradigm of cultural extraction to one of cultural production. This transition involves subverting the removal of data by corporate actors without consent from those the data describe or to whom they belong and, instead, using corporate data to cultivate new and different creative artifacts and collective practices. Through slow engagements with tarot alone and together, we illustrated the fraught but also generative character of AI to nurture diverse practices of self-reflection and future-making.

Seeking to know and make ourselves through ML Tarot exposed the importance of the unknowable. We struggled with how to express the importance of this unknowability to others through this text. And indeed, ineffability has a relational quality—it is through trying to describe something ineffable that the limits of what is explainable about our own experiences are made visible [14]. With ML Tarot, readings become a dialogue between the AI/ML and ourselves, which surface ineffable aspects of our situated experiences and situations, but can never be fully explained.

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References

1. Saleema Amershi, Dan Weld, Mihaela Vorvoreanu, Adam Fourney, Besmira Nushi, Penny Collisson, Jina Suh, Shamsi Iqbal, Paul N. Bennett, Kori Inkpen, Jaime Teevan, Ruth Kikin-Gil, and Eric Horvitz. 2019. Guidelines for Human-AI Interaction. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19), 1–13. <https://doi.org/10.1145/3290605.3300233>
2. Artefact. The Tarot Cards Of Tech. The Tarot Cards Of Tech. Retrieved February 7, 2022 from <http://tarotcardsoftech.artefactgroup.com/>
3. Solon Barocas, Sophie Hood, and Malte Ziewitz. 2013. Governing algorithms: A provocation piece. Available at SSRN 2245322. <http://dx.doi.org/10.2139/ssrn.2245322>
4. Eric P.S. Baumer and M. Six Silberman. 2011. When the implication is not to design (technology). In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI'11), 2271–2274. <https://doi.org/10.1145/1978942.1979275>
5. Gabrielle Benabdallah. 2020. Sybil: A Divinatory Home Device. In Companion Publication of the 2020 ACM Designing Interactive Systems Conference (DIS' 20 Companion), 275–279. <https://doi.org/10.1145/3393914.3395857>
6. 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 (NordiCHI '14), 227–236. <https://doi.org/10.1145/2639189.2641212>
7. Kirsten Boehner, Phoebe Sengers, and Simeon Warner. 2008. Interfaces with the ineffable: Meeting aesthetic experience on its own terms. ACM Transactions on Computer-Human Interaction 15, 3: 12:1-12:29. <https://doi.org/10.1145/1453152.1453155>
8. Barry Brown, Alexandra Weilenmann, Donald McMillan, and Airi Lampinen. 2016. Five Provocations for Ethical HCI Research. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16), 852–863. <https://doi.org/10.1145/2858036.2858313>
9. Jenna Burrell. 2016. How the machine ‘thinks’: Understanding opacity in machine learning algorithms. Big Data & Society 3, 1: 2053951715622512. <https://doi.org/10.1177/2053951715622512>
10. Scott Allen Cambo and Darren Gergle. 2022. Model Positionality and Computational Reflexivity: Promoting Reflexivity in Data Science. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22), 1-19. <https://doi.org/10.1145/3491102.3501998>
11. Stephanie Dinkins. projects. Stephanie Dinkins. Retrieved February 17, 2022 from <https://www.stephaniedinkins.com/projects.html>
12. Motahhare Eslami, Sneha R. Krishna Kumaran, Christian Sandvig, and Karrie Karahalios. 2018. Communicating Algorithmic Process in Online Behavioral Advertising. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, 1–13. Retrieved February 18, 2022 from <http://doi.org/10.1145/3173574.3174006>
13. Marcelitte Failla. 2021. Black Tarot: African American Women and Divine Processes of Resilience. Liturgy 36, 4: 41–51. <https://doi.org/10.1080/0458063X.2021.1990665>
14. Sophie Fenella Robins. 2014. Say Nothing. Say Anything. Do Something: Expressing the Ineffable in Performance Poetry. Liminalities 10, 3/4: 1.
15. Diana Floegel and Kaitlin L. Costello. 2021. Methods for a feminist technoscience of information practice: Design justice and speculative futurities. Journal of the Association for Information Science and Technology 73, 4: 625–634. <https://doi.org/10.1002/asi.24597>
16. William Gaver, Phoebe Sengers, Tobie Kerridge, Joseph Kaye, and John Bowers. 2007. Enhancing ubiquitous computing with user interpretation: field testing the home health horoscope. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07), 537–546. <https://doi.org/10.1145/1240624.1240711>
17. Mary K. Greer. 2002. Tarot for your self: A workbook for personal transformation. Red Wheel/Weiser.
18. Jaz Hee-jeong Choi, Laura Forlano, and Denisa Kera. 2020. Situated Automation: Algorithmic Creatures in Participatory Design. In Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 2 (PDC '20), 5–9. <https://doi.org/10.1145/3384772.3385153>
19. Andreas Holzinger, Peter Kieseberg, Edgar Weippl, and A. Min Tjoa. 2018. Current Advances, Trends and Challenges of Machine Learning and Knowledge Extraction: From Machine Learning to Explainable AI. In Machine Learning and Knowledge Extraction (Lecture Notes in Computer Science), 1–8. https://doi.org/10.1007/978-3-319-99740-7_1
20. Adriene Jenik. 2017. ECOTarot, 2017-Present | Adriene Jenik. Arizona State University. Retrieved February 17, 2022 from <https://ajenik.faculty.asu.edu/ecotarot>
21. Vladan Joler and Matteo Pasquinelli. 2020. The Noosope Manifested: AI as Instrument of Knowledge Extractivism. The Noosope Manifested: AI as Instrument of Knowledge Extractivism. Retrieved February 17, 2022 from <http://noosope.ai/>
22. Bettina Judd. 2019. Lucille Clifton's Creative Technologies of Becoming. Black Bodies and Transhuman Realities: Scientifically Modifying the Black Body in Posthuman Literature and Culture: 133-149.
23. Michael Katell, Meg Young, Bernease Herman, Dharma Dailey, Aaron Tam, Vivian Guetler, Corinne Binz, Daniella Raz, and P. M. Krafft. 2019. An Algorithmic Equity Toolkit for Technology Audits by Community Advocates and Activists. arXiv:1912.02943 [cs]. Retrieved February 17, 2022 from <http://arxiv.org/abs/1912.02943>
24. Pantelis Linardatos, Vasilis Papastefanopoulos, and Sotiris Kotsiantis. 2021. Explainable ai: A review of machine learning interpretability methods. Entropy 23, 1: 18. <https://doi.org/10.3390/e23010018>
25. Caitlin Lustig, Artie Konrad, and Jed Brubaker. 2022. Designing for the Bittersweet: Improving Sensitive Experiences with Recommender Systems. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22), 1-18. <https://doi.org/10.1145/3491102.3502049>

References

26. Ricards Marcinkevics and Julia E. Vogt. 2020. Interpretability and Explainability: A Machine Learning Zoo Mini-tour. Institute for Machine Learning.
27. Betti Marenko. 2018. FutureCrafting: A Speculative Method for an Imaginative AI. In AAAI Spring Symposium Series. Palo Alto, USA: Association for the Advancement of Artificial Intelligence, 419–422.
28. Deborah Maxwell, Chris Speed, and Dug Campbell. 2015. “Effing” the ineffable: opening up understandings of the blockchain. In Proceedings of the 2015 British HCI Conference (British HCI ’15), 208–209. <https://doi.org/10.1145/2783446.2783593>
29. MIT Co-design Studio and Sasha Costanza-Chock. The Oracle for transfeminist technologies. The Oracle for transfeminist technologies. Retrieved from <https://www.transfeministech.codingrights.org/>
30. Margaret Mitchell, Simone Wu, Andrew Zaldivar, Parker Barnes, Lucy Vasserman, Ben Hutchinson, Elena Spitzer, Inioluwa Deborah Raji, and Timnit Gebru. 2019. Model cards for model reporting. In Proceedings of the conference on fairness, accountability, and transparency (FAT* ’19), 220–229. <https://doi.org/10.1145/3287560.3287596>
31. Emanuel Moss, Elizabeth Anne Watkins, Ranjit Singh, Madeleine Clare Elish, and Jacob Metcalf. 2021. Assembling Accountability: Algorithmic Impact Assessment for the Public Interest. Data & Society. <https://doi.org/10.2139/ssrn.3877437>
32. Deirdre K. Mulligan, Daniel Kluttz, and Nitin Kohli. 2019. Shaping Our Tools: Contestability as a Means to Promote Responsible Algorithmic Decision Making in the Professions. Social Science Research Network, Rochester, NY. <https://doi.org/10.2139/ssrn.3311894>
33. Ashlea Powell Sommer and Emma Baker. This Deck of Cards Will Change the Way You Work. IDEO. Retrieved February 17, 2022 from <https://www.ideo.com/blog/this-deck-of-cards-will-change-the-way-you-work>
34. Inioluwa Deborah Raji, Andrew Smart, Rebecca N. White, Margaret Mitchell, Timnit Gebru, Ben Hutchinson, Jamila Smith-Loud, Daniel Theron, and Parker Barnes. 2020. Closing the AI accountability gap: defining an end-to-end framework for internal algorithmic auditing. In Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency (FAT* ’20), 33–44. <https://doi.org/10.1145/3351095.3372873>
35. Cynthia Rudin. 2019. Stop explaining black box machine learning models for high stakes decisions and use interpretable models instead. Nature Machine Intelligence 1, 5: 206–215. <https://doi.org/10.1038/s42256-019-0048-x>
36. Cynthia Rudin and Joanna Radin. 2019. Why Are We Using Black Box Models in AI When We Don’t Need To? A Lesson From An Explainable AI Competition. Harvard Data Science Review 1, 2. <https://doi.org/10.1162/99608f92.5a8a3a3d>
37. Jim Thatcher. 2014. Big Data, Big Questions| Living on Fumes: Digital Footprints, Data Fumes, and the Limitations of Spatial Big Data. International Journal of Communication 8, 0: 19.
38. Gonzalo Vaillo. 2019. The Knowable and the Ineffable: an object-oriented reading of Enric Miralles’ design approach. Cuadernos de Proyectos Arquitectónicos, 9: 92–95.
39. Maranke Wieringa. 2020. What to account for when accounting for algorithms: a systematic literature review on algorithmic accountability. In Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency (FAT* ’20), 1–18. <https://doi.org/10.1145/3351095.3372833>
40. Max Woolf. 2019. Train a GPT-2 Text-Generating Model w/ GPU For Free. Google Colaboratory. Retrieved February 17, 2022 from https://colab.research.google.com/github/sarthakmalik/GPT2.Training.Google.Colaboratory/blob/master/Train_a_GPT_2_Text_Generating_Model_w_GPU.ipynb
41. Hong-An Wu. 2020. Tarot as a Technology. Journal of Cultural Research in Art Education (Online) 37: 193–218.
42. Hong-An Wu. 2021. Troubleshooting with Tarot. OneShot: A Journal of Critical Games and Play 2. Retrieved February 9, 2022 from <http://oneshotjournal.com/troubleshooting-with-tarot/>
43. Carlos Zednik. 2021. Solving the Black Box Problem: A Normative Framework for Explainable Artificial Intelligence. Philosophy & Technology 34, 2: 265–288. <https://doi.org/10.1007/s13347-019-00382-7>
44. AI Generated Art Prints. NightCafe Creator. Retrieved February 17, 2022 from <https://nightcafe.studio/>
45. Creative Reaction Lab. Creative Reaction Lab. Retrieved February 17, 2022 from <https://www.creativereactionlab.com>
46. Design Justice Network. Design Justice Network. Retrieved February 17, 2022 from <https://designjustice.org>
47. Discover » Most Funded » “tarot deck” — Kickstarter. Retrieved February 7, 2022 from https://www.kickstarter.com/discover/advanced?term=tarot+deck&sort=most_funded&seed=2704695&page=1
48. Instant Archetypes: A toolkit to imagine plural futures. Superflux. Retrieved February 17, 2022 from <http://superflux.in/index.php/and-now-for-something-completely-different/>

