The Function of Magic and Magic as a Function: A Proposal for HCI

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Figure 1: Hinged aluminium door covering a digital screen, portraying an apotropaic lion, originally seen on an Etruscan sarcophagus and designed to avert evil in the afterlife. Adapted to a screen cover, the symbol protects digital content on the level of symbolic representation, and physically disrupts accessibility.

Abstract

The function of magic has historically been linked to dealing with uncertainty, offering emancipatory potential, and changing a reality outside of one's control by generating a new desired one. Objects have long assisted magic needs, becoming material intermediaries used to invoke, communicate, or interact with scales beyond the human. Tablets to curse those who had caused injustice, cups to avert evil, pendants to invite love and protection. The materiality of magic artefacts is an integral part of their function, constituting their affordances, their activation, and what makes them 'work' and fulfill purposes given to them. The field of HCI concerned with AI technologies has been interested in magic for years now, though predominantly as a useful metaphor, something to be aware of, to mimic aesthetically or to disenchant. In contrast, we argue for magic to be re-included in HCI considering its subversive and emancipatory potential, and its material cultures, particularly for AI interfaces and their similar role in mediating between human and scales beyond-human.

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CCS Concepts

• **Human-centered computing → Human computer interaction (HCI)**; HCI theory, concepts and models; Empirical studies in HCI.

Keywords

magic, resistance, function, affordances, AI interfaces

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1 Introduction

Magic and enchantment have been prevalent themes in the field of HCI, with magic terminology being adopted in interactive design [48], design fiction [5], and AI technologies [38]. Both the potential and the risk of magic analogies have been explored, from the possibility of becoming a useful metaphor [38], an inspiration to create meaningful interactions [48], prototyping objects with active re-imagination [3], or as a euphemism to describe seamless functionalities that are actually just 'untraceable'[18]. The similarities have been embraced by tech industries, and commercial platforms trying to justify AI's opaque qualities or just sell more subscriptions, as much as design studios and companies. With their influence, magic became a synonym for seamless interaction. One of the main consequences of this magic alliance has been termed by Campolo and Crawford as an "enchanted determinism," which shapes expectations over AI technologies avoiding questions of responsibility or regulation[9].

In order to expand the current reading of magic within HCI, in this late-breaking work we draw on usage and definitions of magic from historical, anthropological, and theoretical findings,[1] as well as a review of selected projects from art and design. Specifically, we introduce two understandings of magic to expand HCI definitions: (1) the *function of magic* traces the historical and anthropological role that magic has had in the history of humans, in particular its function – in societies all over the world – to deal with uncertainty, and to generate new realities; and (2) *magic as a function* which formalizes how objects have been material intermediaries of magic, by being designed to mediate between humans and scales beyond-human, and imbued with certain purposes to fulfill. We argue that this distinction offers HCI a more rigorous framework for engaging magic beyond its aesthetic or metaphorical appeal, particularly in relation to AI interfaces, which also serve as the material intermediary between humans and data, dealing with scales that are beyond-human, crossing many dimensions often unintelligible to humans [7, 26, 30].

[1]First author is a South-European, Mediterranean, female identifying design researcher with an artistic background. Her understanding of magic comes from both the direct experience of Mediterranean folk magic in her birth-place and the consequent exploration of it within her artistic practice, which now seeps through her academic work. Because of the specificity and at the same time broadness of what magic is and how it could be understood in different contexts, the historical and contemporary sources in this poster come primarily from Mediterranean ancient magic. We invite more situatedness in the reading of magic for further research.

Through our conceptual distinction between the *function of magic* and *magic as a function*, we aim to expand HCI's understanding of magic with the following contributions:

(1) A critical re-framing of *the function of magic* for HCI as a socio-material practice for negotiating uncertainty, redistributing agency, and resisting dominant computational paradigms.
(2) Including *magic as a function* as a lens to critically read and design AI interfaces as material mediators between humans and beyond-human scales.
(3) Identifying Materiality, Symbolic Representation and Physicality as underexplored design opportunities for HCI interaction design, particularly in relation to AI interfaces.

2 Background

In this section we outline the distinction between the *function of magic* and *magic as a function* to expand HCI's understanding of magic beyond metaphorical or aesthetic interests.

2.1 The Function of Magic

If the world was governed by forces you didn't understand, and everything had to have a sense in a mysterious bigger picture, what would you do? Ethnographer de Martino defines magic as "aiming to restore the conditions in which both the individual and the world could regain their presence in the chaos of uncertainty and mutually go on with their active and imaginative relationship" [12]. In other words, anthropologically speaking magic provided the necessary tools to cope with the unfathomability of a pre-established order, and offered remedies to reality. Magic constructs the cosmos as an interconnected realm, in which the lines between humans, the environment, and the beyond-human become blurrier. A multitude of agencies co-exist, and they can influence or be influenced by humans. Practicing magic is trying to control, affect, or re-direct these agents based on specific needs or desires.

From a historical perspective, magic is associated with the marginal and the undesirable [21, 50, 62]; the powerless resort to magic to regain presence and agency in the world. Magic and its users are persecuted and de-legitimized by established orders. In relation to imperialism, protestantism or market capitalism, magic appears as illicit power, an instrument to obtain what one wants without work, and is considered difficult to control [21, 61]. Relative to science, magic is associated with 'primitive' thinking and rude superstition, undermining the Enlightenment values around which Western societies were built. Empirical sciences – including those of engineering and later computing – contributed to making the world numerical, gaining a "fundamentally quantitative feel for nature, how it is and how it ought to be" [29]. Today, magic is "technically impossible" [8], what is left are traces of past ontologies. With a loss of magic's primary function as a means of cosmic orientation, we propose that HCI has primarily operated with such traces through metaphoric and aesthetic means without considering the deeper anthropological and historical, particularly those of resistance and cosmological (re-)orientation.

2.2 Magic as a Function

For practitioners, magic artefacts have had the function of mediating between humans and beyond-human, from votive offerings to asking for healing, to forecasting tools to know futures, to protective amulets or curse devices. Their ability would be to fulfill purposes given to them, to affect and influence, to elicit and provoke [22]. Historian Di Serio and colleagues use Gibson's concept of affordances to contextualize the function of magic objects in history, seeing affordances as dynamic forces shaping the relations between humans and their environment [15]. Similarly, we situate our understanding of magic as a function as a deeply material matter for which material elements are considered active participants. Material traces of magic practices are generally treated as of secondary importance compared to words, actions, and beliefs by their scholars [62]. But, viewed through affordances, one cannot think of magic as disentangled from its material cultures; it cannot function without its objects, places, bodies, and practices. Magic practices are not only communicated through material forms, they are realized in and through them [15] creating instruments of belief. A focus on the function of magic opens a window on how humans have used material media to "summon, shape, or sustain encounters with super-human agents" [15], becoming situated ritual technologies.

Modern AI interfaces in many ways resemble magic artefacts, in the way in which they mediate between a human, and a beyond-human scale, and shape and sustain encounters with agents belonging to that scale. We argue a study of magic objects might inform and inspire new design approaches to AI interfaces. To further elucidate the practical implications of such a study, we present a series of historical cases in which objects are made with magic as a function.[2]

To restrict our argument to areas of more immediate concern for design in the following, we focus on three aspects that are fundamental in the making of the magic function in magical artefacts, as observed by Mancini and colleagues [15]: (i) Materiality, (ii) Symbolic Representation, and (iii) Physicality (i.e., sensory-motor interaction). We use these as three heuristic dimensions to discuss the following examples of ancient magic objects, as they are also aspects of any artefact, and therefore readily applicable to qualities of most direct relevance to HCI. We argue that dissecting magic functions according to these dimensions therefore holds potential for HCI, particularly regarding alternative ways of designing AI interfaces, by understanding them as material-symbolic-physical mediators with scales beyond-human, and in addition to their purpose of being information channels.

2.2.1 Materiality. Curse tablets were devices for casting curses directed at someone or something, [62], usually inscribed on tablets of lead, a very heavy and inert metal (Figure 2, Left); its affordance of permanence would ensure that the curse would last throughout time, space, and planes of reality [51].

Amber could generally be used to protect the evil eye, a curse-like state provoked by malevolent gazes, as well as the throat from ailments if worn in the form of a necklace's pendant (Figure 2, Right) and could be even more powerful if depicting deities [11, 16]. Its glowing and liquid appearance made it a material that better served questions of love, beauty, and general protection from evil.



Figure 2: *From top to bottom*: Terracotta kylix: eye-cup (drinking cup), Greek, Attic, ca. 530 B.C [57]; A Doric greek inscribed lead curse tablet circa 5th century B.C. [56]; Addorsed Females pendant, Etruscan, 600–550 B.C, Amber [58] ; Chihil Kilid (Forty Keys) Divination Bowl with Inscriptions, 1679 [55]

[2]We highlight a number of examples of magic objects, mostly ancient Mediterranean magic, because of the provenance of first author. We recognize that magic practices are still being performed today all over the world, so we invite future design research to go beyond ancient magic, and explore more situated, still performed magic, echoing design historian Carlton-Parada [10].

2.2.2 Symbolic Representation. In the case of the kylix eye-cups (Figure 2, Center), the depiction of the eyes wards off ill intentions one might receive at the dinner table while drinking, and therefore being unable to perceive physical or symbolic threats [42]. This magic representation is called 'apotropaic': designed to avert evil. Painting the eyes on a cup creates and connects to the symbolic understanding of the gaze, which in ancient magic is the carrier of ill intentions. Similarly, the representation of good also calls good [40]. In the case of Indian floor drawings, such as *alpona*, decorative shapes are meant to protect the house, dwelling, or village by magical representation [17].

2.2.3 Physicality. Again in the case of curse tablets, they would often be nailed, hammered, or folded. The "words of the curse gained physicality and permanence as they were inscribed" [51], hence the importance of Physicality in the efficacy of the ritual in both the physical actions required to produce the artefact and the ritual interaction. Persian incantation bowls would be engraved with invocations and amulets and used often as remedies against demons. In the specific case of the 'bowl of the forty keys', the bowl was filled with water and that water, imbued with the power of the inscription, would be used to bathe specific individuals in need of protection [35].

Magic as a function shows potential for direct relevance to the field of HCI, since it is observable through artefacts, their aesthetics, their affordances, and ways in which they are designed. The dimensions of Materiality, Symbolic Representation and Physicality in objects with magic functions become particularly relevant for AI interfaces, whose opacity, probabilistic operation, and scale increasingly position them as contemporary mediators of the unknowable.

3 Re-Orienting Magic in HCI

In the following section, we first problematize how HCI has considered magic until now and review four works from art and design as inspiration for re-orientation.

3.1 The Problem with HCI Magic

We contend that HCI design research has predominantly leveraged the *aesthetics* of magic. In this, it seems to be mostly inspired by depictions of magic in popular culture, fantasy genre, and illusionism – see for example design practices around *stage magic* in [38], or the fantasy infused *spellcasting* tropes used by programmers describing language model interactions [14]. This runs the risk of producing a flattened and homogenized reading of magic, reducing its cultural, historical, epistemic, and material richness. As a consequence, designs take shape without accounting for presenting opaque computational systems as magical. Although more-than-human, feminist design approaches have been widely explored in their potential to inform HCI design research, we argue that HCI is falling behind, except for a few notable examples [19, 52], in embracing magic not only as metaphor or aesthetic (e.g. [1, 5, 28]), but as a tool to negotiate with uncertainty, to redistribute agency, and reconfiguring human relationships with computational systems.

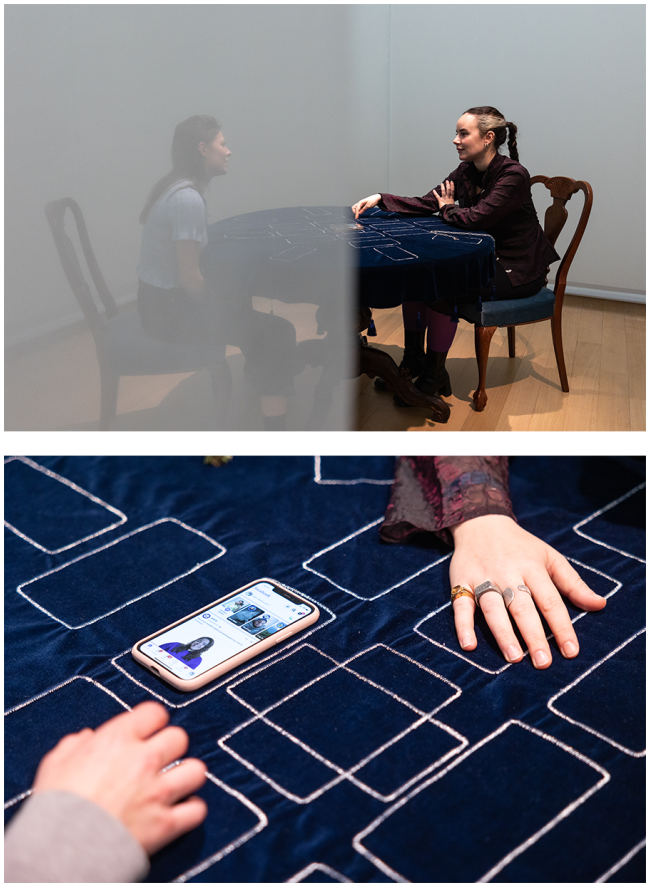


Figure 3: A shot of the performance showing the environment in which a reading takes place. A blue velvet tablecloth is embroidered with possible positions the phone might be placed in, to be read differently in accordance to a specific Tarot spread. Photo: Maarten Nauw

3.2 Objects with Magic Functions from the Arts and Design

In this section, and reading across the historical examples shown above, we look at four examples from the arts and design world that relate to the technological beyond-human sphere expressing *magic as a function* (by engaging with Materiality, Symbolic representation, Physicality) and the *function of magic* to resist and re-order reality. We approach these works as a preliminary and limited annotated portfolio [24], selecting projects that engage technological systems through magical functions rather than magical aesthetics alone. The selection and the annotations of the works were developed mostly by first author, leveraging the sensibilities [23] grown through her artistic practice, expertise in magical epistemologies, personal interest in archaeology, provenance and ultimately the beliefs circulating in that environment. Each of the works selected foregrounds one or more of the dimensions identified in Section 2.2 such as Materiality, Symbolic Representation, and Physicality, while also positioning magic as a mechanism for resistance, reconfiguration, or altered agency in relation to AI and computational systems.

In conversation with the other authors, the following examples were observed.

3.2.1 Digital Esoterism. First author's project 'Digital Esoterism' (Figure 3) explores how divination tools might be refashioned in order to reclaim a sense of agency towards targeted predictions in social media platforms. The performance consists of one-on-one readings with the artist, in which the smartphone of the querent is 'read' using the methodology of a Tarot reading. Before the performance, participants must walk through an "Accept All" sign that gives access to the exhibition space where the reading will take place. The performance embodies the importance of Physicality in the production of the magic function, which in this case transforms a common object such as the smartphone into a divination interface not by redesigning it, but by redesigning the actions around it.

3.2.2 Hexing Twitter. The 'Tithonus Extension' (Figure 4) explicitly reclaims the subversive potential of magic [21] to contest the hegemony of Surveillance Capitalism [63] and the structures of control behind the workings of social media platforms, specifically Twitter, impeding the use of the platform, the more one scrolls. Symbolically, it uses the curse of Tithonus, as narrated by Homer. Technically, by using the language of JavaScript, it 'decays' the content of tweets, images, GIFs and video, which appear more and more illegible and corrupted, the further one scrolls.

The project is an emblematic example of Materiality and Symbolic Representation embodied in a technological object such as the Twitter feed and infinite scroll. By materially corrupting the JavaScript code, the content of Twitter visually decays and its purpose that "by decaying Twitter, the meaning of Twitter can change" [19] is fulfilled.

3.2.3 Screen Guardian. First author's unpublished prototype 'Screen Guardian' (Figure 1) is an aluminium door depicting a lion as the protector of a computer screen. In Etruria (first author birth place), lions were portrayed on sarcophagi as protectors of tombs [36]. The door enacts an 'apotropaic' (see Section 2.2.2) protection from, e.g., harmful web content in its material heft, by Symbolic representation and through physically impeding the screen to be fully visible.

3.2.4 Autonomous Trap 001. Bridle's 'Autonomous Trap 001'[6] imagined the story of an autonomous vehicle stuck inside concentric salt circles, one made of a full line and one of a dotted line, which in road marking language respectively mean "do not cross" and "free to come in". With this simple stratagem, the author manages to trap the autonomous car in the middle of the circle, tricked by the machine learning vision system believing it is surrounded by no-entry points. (Figure 5)

The material choice for the circles is salt, widely used in magic practices, especially in the Mediterranean [47], for its protective qualities. Bridle describes this project falling "under the category of resistance" in the face of "crucial social issues such as the atomization and changing nature of labor, the shift of power to corporate elites and Silicon Valley, and the quasi-religious faith in computation as the only framework for the production of truth — and hence ethics and social justice."[41]

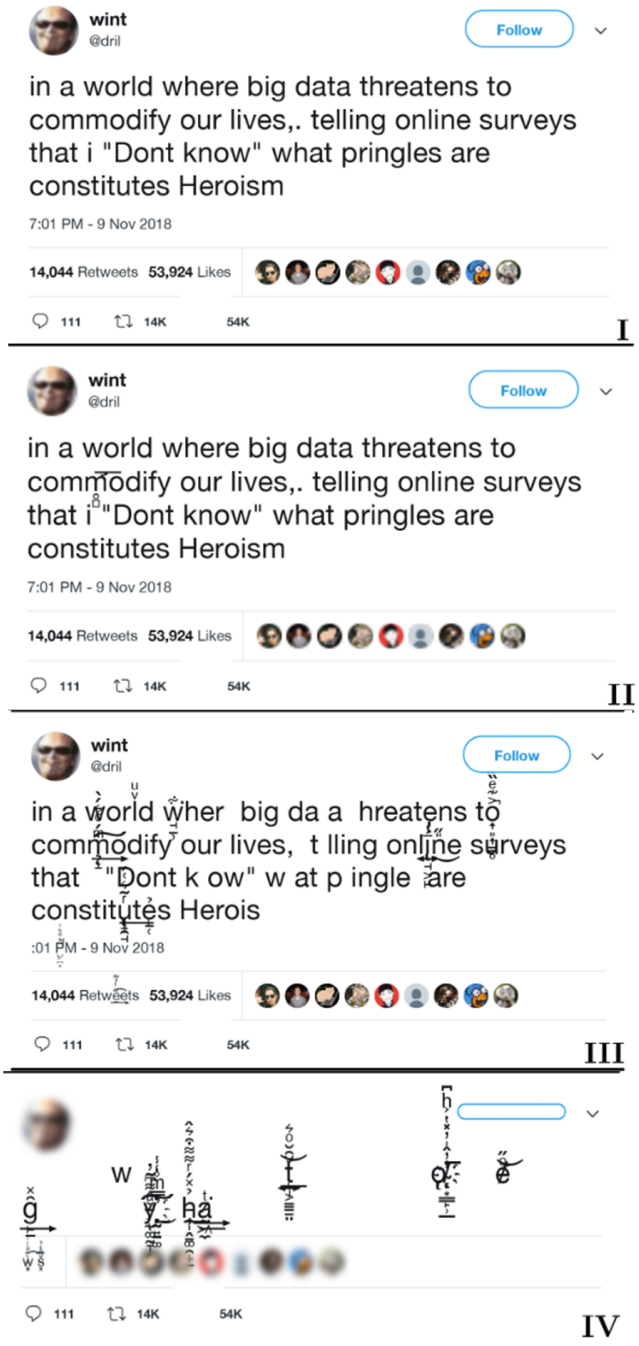


Figure 4: The Tithonus intervention on a Twitter feed from Escher and Banovic [19]. Each image shows the decay of a Tweet into an almost illegible version. The extension materially modifies the platform's content, forcing it to change. © Escher, Banovic

The project embodies Materiality, Symbolic Representation, and Physicality, in the creation of the magic function and the engagement with it through the interface of the automated car.

3.2.5 Summary of Observations. Across these examples, magic appears not merely as aesthetic reference, but as a mechanism for reorganizing relations of power between humans and AI-heavy systems such as automated cars and social media. These projects introduce a magic function that re-organizes agencies and resists the infrastructures that control them indirectly. The Tithonus extension interrupts the engagement mechanism of the infinite scroll; Digital Esoterism ritualizes predictive targeted content and invites interpretation over passive consumption; Screen Guardian blocks uninterrupted access to digital content; and Autonomous Trap 001 exposes the fragility of the recognition algorithms of automated cars. Collectively, these projects invite to occupy very different positions from what one might be used to, by inviting (and sometimes forcing) engagement or intervention. In this sense, the projects move beyond the metaphorical or aesthetic use of magic and instead reconfigure relationships between humans and the beyond-human of AI processes.



Figure 5: 'Autonomous Trap 001', 2017, Installation [6]. The autonomous car trapped in the salt circles, surrounded by the scenery of Mount Parnassus, Greece. © James Bridle

4 DISCUSSION

In the following section, we discuss how the *function of magic* can have positional and methodological, and *magic as a function* could have designerly and practical potential for HCI.

4.1 The Potential Function of Magic in Design Research

HCI has been interested in magic from an aesthetic and metaphorical point of view. We propose that HCI may consider the *function of magic* as a positional and methodological orientation for engaging with uncertainty in computational systems, drawing from the historical role of magic as a tool to contest conditions beyond individual control, negotiate agency and activate alternative realities.

The possibilities of magic and its emancipatory potential have been slowly but consistently de-legitimized by the rise of the rationalistic perspective and its "undisputed assumption of magic's unreality" [12]. The future is now open, predictions are based on real data, and the world is understood numerically. Yet, uncertainty persists [25], and the human condition seems to have barely shifted: "In ancient times the future appeared to be unknowable to humans, but not to divinity, not to God. As for today, the future appears to be unknowable to humans but not to algorithms" [20], as Esposito argues.

We argue that AI technologies, in particular, contribute to creating oppressive realities, structures of behaviour control, and existential risk [2, 27, 34, 53, 63], for which collective action and participation could be meaningful ways of regaining agency and perform possible alternatives. Although magic practices cannot be considered inherently emancipatory, many historical and contemporary magical traditions have functioned as informal practices of negotiation, protection, refusal, or alternative world-making outside dominant institutional structures. We therefore call on HCI researchers to include the *function of magic* in their discourses and in their designs for a more in-depth engagement with its historical and ethnographic implications. Although appealing to magic as an instrument of refusal cannot immediately change very real contemporary problems, it can first set conditions for collective struggle [59], and empower individuals in the life of protest [54]. Moreover, even in situations where it is not acceptable to treat magic as *real*, it can still be treated as *useful*, and as such it has been deployed to change political situations [33, 60].

Notable is the presence of the witch archetype in its various manifestations [31, 32, 43], and we highlight the potential for methodological exploration of this archetype in the field of HCI as a generative lens from which to design – in a similar vein to purposefully constructing the 'eco-harmonist' archetype to explore HCI's response to planetary limits [37].

4.2 The Potential of Magic as a Function

On the practical side, we suggest that HCI may consider *magic as a function* in designing artefacts and experiences; particularly with regards to AI technologies. The latter rely on probabilistic computation to derive patterns from incredibly large amounts of data. While their operations and outputs are thus intrinsically uncertain (cf. [4]), interfaces filled with text-based, commercially viable information continue to dominate. While this can produce a sense of control over reality, it leaves AI users with little agency as they come to increasingly rely on calculated outputs [49].

We see a particular potential in the space of the interface, an object serving as the material intermediary between humans and data, dealing with scales that are beyond-human, crossing many dimensions often unintelligible to humans [7, 26, 30]. Whilst contemporary interface paradigms tend to be optimized for reliability and predictability, historically magical objects operate through uncertainty, ambiguity and partial efficacy. This tension may itself be productive for HCI, particularly for AI systems whose probabilistic nature is often concealed behind conventional text-based interfaces.

Poliks and Trillo characterize interfaces as "limited portals" that transcribe and translate the vastness of data, such that there are "no guarantees" of what might come out of it [46]. Yet, we argue that the way interfaces are designed can alter the affordances of the AI technologies that are being deployed. It seems especially needed in the realm of conversational interfaces, where "the embodied nature of language is in stark contrast with the disembodied nature of bots" [46]. As designers, we call for new ways of communicating, perhaps even detached from language [45], that may be informed by the material, symbolic, or physical aspects of magic as a function. There are only limited examples of this type of work in HCI, for instance the depiction of eyes has the magic function of averting evil (Figure 2, center) being adopted in interaction design to avert anti-social behaviour [13].

Thus, we propose that a more in-depth engagement with magic would open new design possibilities in HCI for human and more-than-human / beyond-human entanglements in which agency is co-created [10], stressing the importance of Materiality, Symbolic Representation, and Physicality for interfaces with the unknown. We argue that our reading of magic as a function may be especially relevant for critical design [44], as it would widen the grounds of debate from specific concerns to the level of "cosmological meaning" [39]. We propose that this opens possibilities for critical design to operate outside of the known and accepted rules of reality. As in the case of the 'Screen Guardian' (Figure 1, Section 3.2.3), where the door shapes new ways of relating to screens, to web interfaces, but also to one's technologically mediated yet non-technically meaningful being in the world rather than the direct critique of, e.g., a particular feature of surveillance capitalism. On an actionable level, with this late-breaking work we invite HCI design researchers examining magic to go beyond the current aesthetic-focused view through a set of recommendations / creative opportunities:

- Treat AI interfaces as cosmological mediators of human relations with beyond-human scales, rather than tools for efficiency (*Function of Magic*)
- Designing the material-symbolic-physical qualities of mediation with scales beyond-human (*Magic as a Function*), specifically allowing for interfaces that:
  - Redistribute agency by exposing uncertain behaviors
  - Obstruct, slow, or redirect interactions from oversimplified outputs
  - Engage with ambiguity or even incompleteness
  - Allow and design for refusal and alternative pathways

5 Conclusion

This paper articulates two key distinctions when discussing magic in the context of HCI. Firstly, the distinction between magic as a generalised idea from synthetic culture – predominantly Western fantasy, but also stage magic and related practices – and magic as a socially and culturally embedded practice and worldview. The second is between magic as a function (i.e., what it is designed to do in the world), and the function of magic (i.e., the socio-material practices that enable and are enabled by magic). By clarifying these distinctions, we give the HCI community a more nuanced and rigorous ground on which to discuss magic in HCI research. Based on this, we hope to encourage more alternative epistemic frameworks for shaping new social and technological imaginations.

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