Reimagining Interaction Through Animistic Design

BETTI MARENKO
CENTRAL ST MARTINS
UNIVERSITY OF THE ARTS LONDON
B.MARENKO@CSM.ARTS.AC.UK

PHILIP VAN ALLEN
ART CENTER COLLEGE OF DESIGN, PASADENA
VANALLEN@ARTCENTER.EDU

ABSTRACT

This paper takes animism as the key narrative to explore alternative models of interaction between humans and digital objects beyond the constraints of user centered design, solutionism and blackboxism. This approach seeks to move beyond dominant linear, one-dimensional, forms of interaction by mobilizing a range of protagonists, each providing different opinions or perspectives, not necessarily aligned, and even in conflict with each other. If animism can elicit new meanings and provocations in a world populated by smart objects and intelligent things that we use all the time yet barely understand, how can it be evoked in the human's imagination? How can it be deployed to grasp the materiality of the digital and the experiential, material-affective effects it produces? Can data "things" be processed animistically, or given their own agency? How can animism foster a new type of ecology of actors – where the human and non-human co-participate and co-create? How can it stay away from the anthropomorphic, the cute, and the superficial?

INTRODUCTION

The world of human-machine interaction is dominated by devices whose capabilities perform tasks and achieve results beyond human comprehension. Such immeasurable power is counterbalanced by the almost trivial daily interaction we have with our smartphones, tablets, laptops and all the digital devices that have become our indispensable companions. Current modes of interaction manage this discrepancy between the power of our devices and our mundane expectations through linearity, predictability and invisibility. This model is underpinned by a notion of cognition based on representation and simulation.

Significant developments in digital technologies are however questioning and broadening this current scenario. For instance, research aimed at giving physical and tangible form to digital information and computation is transforming existing immaterial experiences into increasingly embodied ones.[1]

Likewise, the field of anticipatory computing promises to enable devices to make suggestions that anticipate user's needs, wishes and desires (Standage 2014). Both developments will affect the linearity of interaction by broadening the cognitive spectrum involved, by disrupting linearity and predictability, and by increasing complexity, potential 'noise', and uncertainty. Both will have an impact on design and behaviours and, most important, on the way interaction is conceptualized and practiced.

On these grounds, we believe we need new figurations, new stories, new fictions and new mythologies to rethink the human-machine interaction. Thus, we want to propose a "mini-festo": a platform to advocate a new approach to interaction design to be established both in practice and in discourse. We maintain that existing approaches to interaction design are useful, but no longer adequate to account for the increasing complexity of our digital objectscape. We would like to propose the notion of animistic design, founded on an animistic understanding of interaction.

Animistic design reintroduces 'liveliness' and animation not as ends in themselves, but as means to access the messiness and multiplicity of cognition that cannot always be fully conveyed by language and human intelligence alone. It takes uncertainty and indetermination as key components of the process of interaction - not as obstacles to be smoothed over. It explores forms of knowledge that are situated, embodied and, as we will see below drawing on philosophers Gilles Deleuze and Félix Guattari, *par le*

[1] See MIT Tangible Media Group http://tangible.media.mit.edu/vision/

milieu. Animistic design, in short, capitalizes on the fluidity and continuous renegotiation of what we call the 'post-cognitive' relationship between human and machine: modes that tend towards the distributed, the immersive, the somatic, that can be perceived as 'below-the-radar' and apprehended via intuition, empathic and sympathetic tools, open-ended, non-linear invention and sensorial engagement.

One of the biggest failures of much of our current systems is that they simply speak at us rather than "converse". New modes of interaction should instead foster a dialogue, with the open-endedness and unpredictability that this implies. But how can this dialoguing be fostered? How do we shift from talking about, or to things, to talking *with* things? Reimagining interaction demands that we rethink the boundaries between object and subject, between our world and the world of things, in short, between the human and the nonhuman. Animistic design aims to do precisely this.

LITERATURE AND THEORY

1. Critique of current interaction models

Current models of interaction are described here as 'de-animated' to distinguish them from our proposed animism-driven interaction. A de-animated approach to interaction, we argue, tends to foster, unintentionally, specific narratives about a device that imply solutionism (Morozov 2013), blackboxing (Latour 1999), unrealizable expertise or annoying dumbness. These narratives tend to be underpinned by assumptions, such as the notion that only one answer/point of view is possible from the device, or informed by dominant tropes, such as dematerialization's double claim for invisibility and immediacy. For instance, the instant visibility of a search outcome i.e. data stream on the device screen is counteracted by a largely invisible material infrastructure that is hardly taken into account by the user experience (Gabrys 2011). In other words, a de-animated way of looking at interaction gives rise to circumstances that have been naturalized and left often un-questioned. This, however should not lull us into thinking they are un-problematic. For instance, a de-animated model is predicated upon a linear logic according to which computers provide answers and solutions. In this model computers are seen as providers of certainty. Now, not only this may be interrogated in itself, but crucially it cannot operate well in contexts that may require a less linear approach. For instance, situations where multiple points of view are engaged, (human and device), or where, as we suggest here, the designed scenarios intend to foster uncertainty, risk and unpredictability rather than rational and linear narratives. These more animated and open-ended circumstances aim at exploring the potential of interaction to be context-driven and to produce unscripted outcomes as it goes along, rather than by preset sequences.

2. Cognitive models

The mental and cognitive model underpinning conventional interaction design posits humans as rational, task-oriented and efficiency driven. Likewise, we humans tend to consider our digital devices as mechanistic, reliable and verifiable. Delight or frustration ensue according to a prescribed set of expectations having been met or not. This mental model of 'good' interaction enlists precise analogy, reassuring feedback, navigability, consistency and intuitive behavior as its key factors (Moggridge 2006). These factors aim to maximize the immediacy and flow of user experience while minimizing to the point of invisibility anything that may be disruptive or unexpected: glitches, blips and any noise than could disturb interaction. In cognitive sciences this model corresponds to the idea that the mind is similar to a computer, with a precise linear sequence of causalities that constitutes its 'script' and makes its operations largely predictable (Brooks 1999).

A different model of interaction draws instead on biology to consider the mind as deeply embedded in the body and responding to the continual modulation of environmental influences. This model is context-based, situated and distributed (Hutchins 1995) and suggests the notion that cognition is a manifold, faceted, open-ended affair, that responds to, interacts with, and continuously negotiates its environment. It also means that contingencies, indeterminacy and uncertainty – not to mention risk - become constitutive of cognition, precisely because of it being an interaction-based process. Interaction is then reframed as a process-in-the-making, or as ongoing modulation defined by two key related factors: 1. it is underpinned by real-time environmental shifts 2. its outcomes cannot be entirely predicted at the onset. Now, a digital object seen through this lens will be designed to be capable of exchanging communications with its immediate environment (made both of humans and objects), and to take part in *ecologies* of things that are mutually responsive and interdependent. Rather than taking representation and simulation as the bedrocks of interaction, this model offers ways of reflecting with greater accuracy the messiness of human experience - ideas growing out of unforeseen connections, multiple points of view, contradictory concepts, ongoing dialogue, tentative proposals, seasoned positions, reversals, humor, satire, biases, degrees of intensity, etc. If digital objects are to be tools that allow us to work with ideas, then they must operate in ways that not only enable such fuzzy complexity, rather than trying to shun it or flattening it, but that are also empowered by it. As roboticist Rodney Brooks wrote "the world is its best model" (Brooks 1999: 167)

3. Thinking *par le milieu*

Before looking at how this can be achieved, a few words should be spent introducing the notion of milieu as a more specific and nuanced proposition to

adopt - instead of the overused 'environment' or 'context'. Although often translated actually as 'environment', milieu describes the ambient, atmosphere, or circumstance something or someone is embedded in. Originated with 19th century philosopher of science Georges Canguilhem to designate the external circumstances required for the existence and proliferation of an organism, the notion of milieu has been used by Deleuze and Guattari to describe a particular mode of thinking. What they call 'thinking par le milieu' is an expression that hinges on the multiple meanings of the word milieu, which in French means middle; surroundings or habitat; and medium. 'Thinking par le milieu' therefore means both thinking 'through the middle', without grounding definitions or an ideal horizon, without a specific beginning or end or teleology; and also thinking 'with the surroundings', which stresses the entanglement of something with its habitat. Put differently, nothing can have an identity separate from its milieu.[2]

Now, if we look at modes of interaction design informed by the notion of the milieu, we can now hypothesize a scenario where information and exchanged communication are no longer just the outcome of an external agent representing, simulating and processing them in a linear way. Rather, they express the fluidity (and non-linearity) of negotiated relationships that all the agents in the milieu participate in. Put differently, the continuous negotiations each agent (human and devices) is engaged in means that identities become less easy to define, boundaries between agents become more porous, outcomes increasingly uncertain and indeterminate. One of the consequences of this welcome messiness is that the conventional roles of user (human subject) and device (digital object) are no longer tenable. Objects may express a range of positions and behaviors that disrupt linearity and expectations. Users may find themselves in need of extra 'mental elbowroom' to negotiate a rapidly-changing and unforeseen situation. All this, we argue, opens up the potential of interaction, beyond established agential roles. This is what underpins our animistic design proposal: a move away from the conventions of user-centered design to reimagine and create new territories for interaction. By breaking computation down into singularities - autonomous characters - animistic design creates new narratives where it is possible to embrace and foster the fuzziness of ideas as an extension of our humanness - rather than framing the computer as the other.

4. A case for animism

Animistic responses emerge when technologies become smarter, more pervasive, yet more invisible. Animism has gained a substantial traction in recent critical assessments of interaction design (van Allen and McVeigh-Schultz 2013, Marenko 2014, Beran et al. 2011, McVeigh-Schultz et al. 2012, Rod and Kera 2010, Kuniavsky 2004), while circulating from the different standpoints of neo-materialism, agency and thing theory (Franke 2011, 2011). Bruno Latour (2014), for instance, has championed a worldview that eschews the spurious divide between a "premodern animated" world and a "modern de-animated" one.

The work done at the intersection of these fields is promising and deserves to be expanded both in terms of theoretical insights and potential applications. For instance, developmental psychologist Edith Ackermann (2005) has devised the notion of *AniMates* to analyse how children interact with a variety of animated toys (mechanical, as well as digital). These toys present common features that to a child are synonymous to being alive and exhibit specific behaviour attributes, attitudes or "social skills". Animated toys are evaluated in terms of the "mental elbowroom each provides for exploring and enacting issues of agency, identity, attachment and control" (Ackermann 2005:1), in other words in terms of their *capacities* to shift perceptions, question attitudes, change perspectives and promote different modes of learning. Put differently, these devices work like cognitive probes with the power to generate new forms of knowledge via affective engagement. These *capacities* – and how to foster them - are what animistic design intends to focus on.

Predicated on these grounds, the notion of animism we propose draws on ideas of agency, material ecologies and affect, moving away from the anthropomorphism and the emotional manipulation often associated to liveliness, easy playfulness and cuteness. Instead, our version of animism is a strategic tool to articulate the technological innovation and design practices already occurring in the current scenario of cohabitation and coevolution human-machine, where the more agency objects possess, the less predictable they eventually will become. Deployed both as a speculative fiction and investigative method, animism is a post-cognitive model that produces new fictions and fosters new myth-making narratives. This is how it can unveil and sustain alternative modes of interaction. Animism, then, offers a way of thinking about interaction differently: neither from the perspective of the user, nor from the perspective of the object but, ideally, from the on-going modulation of their less-than-predictable interaction.

RESEARCH THROUGH MAKING

1. Animistic Design projects

One of us (van Allen) has run a series of design research projects that use various prototyping methods to explore the space presented by animistic design. This process of research through making offers

[2] On the notion of milieu see Deleuze and Guattari 1988, in particular pp. 44-82. Also philosopher of science Isabelle Stengers 2005.

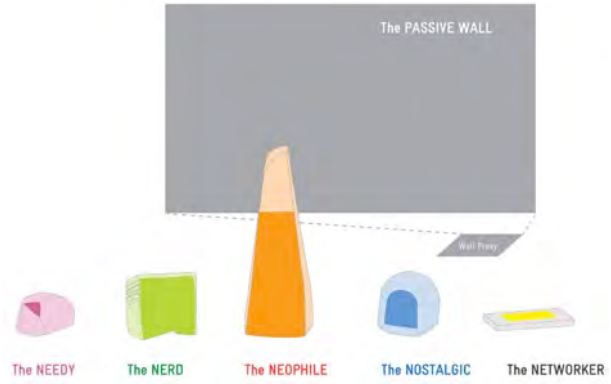
the chance to refine and evolve our thinking as we make. It has also created exemplars that allow us to critique our design ideas, and move them forward into new realms. This process is not meant to propose actual implementations, but to allow us to iterate, create a productive cycle between writing and making, and allow for dissemination of these ideas in more concrete form.

Two projects are discussed in this paper. *AniThings* explores several concepts in animistic design through video prototypes that show general interactions and contexts, but do not go into detail for form, visual design, and specific interactions. As a speculative project, its goal is to imagine potential ways that an ecology of animistic devices could work. The second project, *Little Data Wranglers*, is a set of working, experimental prototypes that use real data, functional interactions, and animistic algorithms to explore design issues in more detail, and to reveal how this approach feels in actual use. Links to videos for both projects are provided in the reference section.

2. AniThings

The AniThings project explores a group of devices in a scenario where a designer is working with the animistic things in a design process. It proposes and demonstrates several key animistic design principles.

AniThings Project Diagram



Heterogeneous Multiplicity – In order to shift people's perception of digital systems away from subject object roles, evoke a sense of agency, and create a productive ecology, AniThings is a system of several independent devices, each with a different "personality," with names such as Nerd, Neophile, and Networker. These personalities play out in how the devices interact with people, other devices, the topic at hand, and with data that is shared by all. This diverse ecology fits in with the discerning, associative, adaptive and selective qualities of people, where one can creatively benefit from a range of perspectives that become familiar over time.

Embodiment – In addition to providing multiple, heterogeneous points of view (which could be represented on a single screen), AniThings gives the "actants" physical form, tangible interactions, and distinct spatial locations. Through this embodiment, agency is located in material space, and allows people to utilize their socio-physio-spatial intelligence as they converse with each device – they can turn towards or away, move devices in relation to each other, and maintain spatial models in their minds so that ideas represented by each device and location can be understood separately and simultaneously

The Human is Smart – The AniThings approach is to utilize the human powers of imagination and extrapolation to build an idea space from the contributions of each actant. This means that the individual actants are not required to be fully intelligent and "conscious", but need only to behave and interact in a way that evokes the fiction of aliveness in the person's imagination and thinking process. We characterize this as a kind of "dumb smartness" where the design of the behaviors (formally and algorithmically) is focused on this evocation rather than the creation of literal intelligence. As such, each actant operates as a kind of living, evolving locus onto which the person projects different ideas that have a certain (literal and figurative) point of view.

Distributed Cognition – The combination of herterogeneous multiplicity, embodiment, and a reliance on the human imagination creates a digitally enhanced version of the milieu discussed earlier. Within this milieu is the opportunity for a rich, socially based, distributed cognition, where the thinking emerges from the milieu, not only for the humans, but for the digital actants as well. The AniThings build their own limited cognitions over time, and contribute back as social members of the milieu. An association of Distributed Cognition has already been made with HCI (Hollan 2000), but our approach takes multiple actants and situates them as embodied characters in a physical milieu rather than on different parts of a single screen. The theory of distributed cognition already moves the center of thinking outside the human brain and into a world that contains culture, history, objects and other actors. Animism takes this further and extends cognition with our digital systems as active social members of our milieu. They have memory and a point of view, and through that they contribute to and alter the milieu independently of, and in relation to people.

AniThings Video Still – Designer working with devices

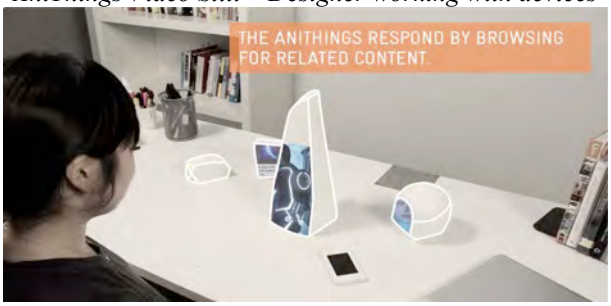


Figure 2

3. Little Data Wranglers

Little Data Wranglers revisits the scenario of a designer working on a project in collaboration with her ecology of animistic devices, each with a different set of behaviors. This project uses a collection of data (text and images) shared amongst the group, as well as drawing on the Web as an external source of data to be searched and potentially integrated into the group collection. As the data is worked with, it is reviewed, tagged, selected, grouped, foregrounded, and stored by both the devices and the designer.

The project explores more specific interactions and behaviors, and proposes a range of approaches for expressing personality and point of view.

Little Data Wranglers – Working with prototypes

Figure 3

Variable behavior – Several of the actants in this system implemented algorithms that produced different results each time they were interacted with. For example, as a person was tagging images with the Tagger device, the device would intervene at random times and reject tags (shaking them off the image) if it "felt" they were not right. The designer could preserve the rejected tag if they wanted. Another device acted as a repository for images and showed them in a stacked, on-edge format when placed in an upright orientation, but showed full images in a grid when moved to a horizontal orientation. This variability helped to create the fiction of aliveness, and provided a wider range of experience of the material at hand.

Indicating personality and mood – Two of the devices were paired as "the twins" who have similar function, but different personalities. The person sends a search request to the twins, and they look for matches on Google image search. The "Good Twin" adds its own positive terms to the search, thereby customizing and skewing the search. The "Bad Twin" adds negative terms, and comes up with different image results. Hence the devices seem to have different personalities based on the way they interact and respond and how these contrast with each other. The twins inject these idiosyncratically curated, found images back into the milieu, moving the conversation forward.

Little Data Wranglers – Good Twin Bad Twin

Figure 4

Wrangling – Each actant has different ways of communicating with people, distinct from how they communicate with each other. Specifically, one device, the "Wrangler" acts as a conduit for the designer's textual requests to be sent to all the other devices. For example, when the person enters "fashion+wearables," this request is communicated wirelessly to all the devices, which act on the request in their own unique ways. In this way, the Wrangler can be seen as a kind of cultural translator between the person and the other actants. The Wrangler is also an example of more complex social relationships that are possible within the milieu – relationships that emerge naturally when designing from an animistic point of view that considers the needs of a social system that includes actants and people, but that may seem odd from a user-centered design perspective.

Interacting with the Wrangler

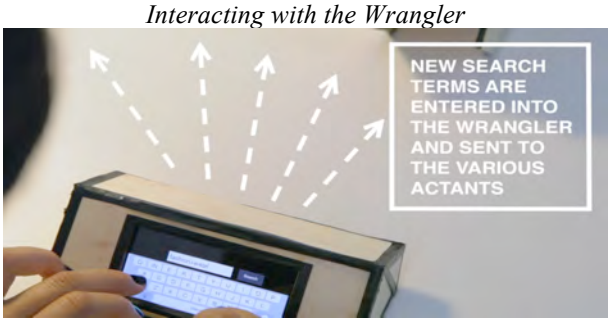


Figure 5

Data as actant – While physical embodiment is critical to the animistic design approach, not every entity has to be physical. In one of the Little Data Wrangler prototypes, the person works with sets of images contributed by other members of a team over time. Images have been assigned different characteristics, and later a person can merge sets of images to create a mash-up. They will be blended together into a subset of images where the images are kept or eliminated based on an algorithmic assessment of the "personalities" of the images. This approach views data not as a passive collection, but as an active entity with it's own life, history, and behaviors. The idea of animistic data that can traverse networks and interact with other data, processes, and people offers interesting opportunities

for further exploration. For example, medical data could have a unique personality that includes the owner's ethical rules, sharing/privacy protocols, and history of use.

Creating a mash-up between data actants

Figure 6

Designer working with the actants

Figure 7

RESULTS

The *AniThings* and *Little Data Wranglers* projects use video and working prototypes to provoke an investigation of the qualities and outcomes of animism as a paradigm for interaction design. While not intended as proposals for actual systems, they demonstrate potential implementation strategies and guiding design patterns such as heterogeneous multiplicity and thing wrangling. They argue for new ways for people to interact with digital systems, driven by new motivations and conceptions for what the design of interactive systems should be.

Rather than trying to solve problems, animistic design creates systems that create useful complexity and ambiguity for people, distributing their thinking into a digitally augmented, tangible world. And more than this, an animistic approach allows people, things and data to co-exist in an ecosystem that follows its own path, and is not restricted to the narrow constraints of user-centric solutionism. Through the use of approaches such as heterogeneous multiplicity, animism takes the design focus off of the human, and opens up new opportunities for non-linear, open-ended collaborations between people, things, processes, and data; embracing the uncontrolled, the non-rational and the emergent milieu.

This new approach is urgently needed given the advent of the Internet of Things, which through the sheer quantity of devices requires new methods for design and interaction. When everything has a computational component and is connected together in massive networks, we need new metaphors and models (such as wranglers) for device and data behaviors and the roles they may play. It is critical that people have a practical, tacit understanding of these unknowably complex systems, so that they can make use of and influence them rather than endure seemingly arbitrary outcomes based on an overly rational interaction design approach.

By rejecting user-centered, efficiency oriented, literal approaches, animistic design offers a way to open the contemporary digital black box, unpacking it into understandable and accessible parts that, because they are fictional, serve the roles that metaphor, story telling, and myth have long played in culture and design.

DESIGN INSIGHTS

There are several areas revealed in these design speculations that need further work. The idea of designing active, intention filled digital systems has many potential pitfalls. From the beginning of the work on this project, it became clear that an anthropomorphic approach would lead away from the intended outcome, which is not a full blown simulation of intelligence, but a new set of relations between people and the digital. We are not interested in creating a master/slave relationship, or a new, optimized source of reliable information. The use of faces in particular can create expectations of high intelligence, authority, subservience, complex or unintended social relations, or worse, lead to the uncanny valley that simply leaves people cold.

On the other hand, avoiding faces and other features that read as superficial, cute, and emotional creates a design challenge to successfully indicate aliveness. Several insights came to light through the *AniThings* and *Little Data Wranglers* projects.

Find a "native" form of animism – In the design process for these projects, we frequently ran into dead-end approaches that used skeuomorphs based on humans or animals. Whether using LEDs that seemed like eyes, or applying studded leather as "clothing" to a device case, the literal character of these design choices took away from the suspense of disbelief that gave the devices a believable inner life. Instead, we found more success in using design cues that were more native to the devices' function and digital personality. For example, the Tagger would "shake" off a tag it didn't like, indicating its recalcitrant attitude. In a side experiment, a device mined an Evernote account that contained an author's writing and extracted and displayed random sentences. To show conversational tone, one version prepended positive, supportive comments, and another version prepended negative,

skeptical comments.

Ideas are not toys – In creating characters that play in this new digital milieu, we found that it was one thing to design animistic "toys" as described by Ackermann that operate primarily in the realm of physical motion, and a very different thing to create animistic conversationalists who can operate in the realm of ideas through text, image, video, and audio. Not that physical motion and playfulness aren't useful in these "adult," idea-driven systems, but animistic expressions that involve a range of media forms seem to require an entirely new design approach.

Make animism readable – The *Little Data Wranglers* project made it clear that there is much further work to be done to develop an animistic design vocabulary. In creating behaviors and forms, the use of contrast, history, variability, and tone are helpful strategies to spur the imagination of people. For example, the Good Twin and Bad Twin devices successfully indicated their character because of their names, and because the person could see the twins' "take" on the search request in contrast with each other in real time.

Use a spectrum of animism – We found that as we implemented the different actants, they evoked different kinds and amounts of personality and aliveness. Some, like the tagger, seemed quite alive and opinionated because it "shook off" tags with seeming intention. While others, like the Good and Bad Twins, were on the dumber, less sentient end of the animism spectrum, more methodically retrieving their respects takes on a search request. While not initially a conscious design strategy, we believe that the amount and qualities of animism should be on a spectrum that matches the underlying role being designed. Further, depending on context and need, an actant may move on the spectrum.

Keep myth and play – Despite our intentions to stay away from the overly functional, we easily fell into common interaction design patterns that caused the projects to lose their animistic feel. To counter this, we found it was essential to design into the actants a sense of backstory, as well as humor, irony, or other strong attitude. In addition, a sense of play in the micro-interactions (such as a quirky movement) was also meaningful in building important social bonds between people and devices.

Artificiality, Believability, Conviviality – Our experience also aligns with Ackermann's three attributes of artificiality ("The artificiality… makes it possible to engage and confront their "attitudes" in ways not possible with people or pets."), believability ("consistency in manners of being and doing, more than humanoid traits or realistic features, are what fosters playful exploration"), and conviviality ("[an actant] engages you in a dialog... It is responsive, yet it won't just give in. It is not malleable like clay. Nor is it stubborn as a donkey."). These serve to create enough of a sense of life and conversational potential to occupy one's imagination, while simultaneously maintaining a sense of pretend and dumbness that sets expectations for appropriate and interesting interactions in the context.

CONCLUSION

The experiments discussed in this paper through the proposed animistic design framework indicate the potential for a line of investigation that combines design practice with a theoretical framework steeped in philosophy and cognitive sciences. In this context, animism gains a position as both a valuable research method and a practical design perspective that perfectly embodies the fruitfulness of a 'research through making' approach, one that acts in order to know and produces knowledge that hinges on practice.

Our research on new modes of interaction based on animism has found that these modes question three main given assumptions that underpin the way interaction design is usually conceptualized. First, animism-driven interaction questions the prevalence of cognitive modes of apprehension. Instead, it favors the non-cognitive, the empathic, the somatic, the sympathetic, the 'below the radar', even the non-rational and contradictory. Second, by working at the fuzzy boundary between user and device, and by embracing the non-linearity and messiness of this process, animism-driven interaction questions the centrality of the user, which is still the mainstream perspective in interaction design. Instead, it experiments with and promotes a spectrum of subtle – and not so subtle - strategies of object animation to challenge the existing focus on the user's needs, wishes, and expectations. Finally, animism-driven interaction represents a timely contribution to a practice-based articulation of what has been described as a 'flat ontology'[3], that is, a non-hierarchical landscape where the human and the non-human engage with each other beyond established dichotomies. In this sense, animism-driven interaction is also a theoretical model for rethinking from the bottom–up strategies of negotiating the relationship between us and things, whether these are animated or not.

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Project videos

AniThings
Five scenario videos:
http://www.philvanallen.com/animism-interaction-design/

Little Data Wranglers
Scenario:
http://www.youtube.com/watch?v=Q7e7XkeEnW8
Data as actant:
http://www.youtube.com/watch?v=u9xrfpc139g

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