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Animistic design: how to reimagine digital interaction between the human and the nonhuman

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ABSTRACT

This article puts forward the notion of *animistic design* as an uncertainty-driven strategy to reimagine human–machine interaction as a milieu of human and nonhuman. Animistic design is suggested as capable of fostering affects, sensibilities and thoughts that capitalize on the uncertain, the unpredictable and the nonlinear, and their capacity to trigger creative pathways. Informed by post-human philosophies, theories of mediation and materiality, as well as by affect, agency and aesthesia, animistic design eschews the anthropomorphic and the cute playfulness often associated with animism. Instead, it proposes a practical–theoretical framework to articulate the nexus of digital innovation, interaction design practices, technical materialities and affective responses already emerging in the digital cohabitation of the human and the nonhuman. Using a 'research through making' approach, the article describes in detail a series of animistic design experiments and prototyping methods that explore ways of rethinking interaction as an open-ended and creative enterprise. Animistic design offers an investigative strategy that exploits degrees of collaboratively curated uncertainty and unpredictability to imagine forms of digital interaction, and to engender creative human–nonhuman relationships within a given digital milieu.

One of the main puzzles of Western history is not that 'there are people who still believe in animism', but the rather naive belief that many still have in a de-animated world of mere stuff; just at the moment when they themselves multiply the agencies with which they are more deeply entangled every day. (Latour 2014, 8)

1 Introduction

Human–machine interaction is dominated by devices that execute tasks and achieve results via algorithm-driven systems whose performativity falls resolutely outside the grasp of humans. The immeasurable power of the digital devices, which have become indispensable companions to a substantial portion of the world's population, is counterbalanced by the routine expectations of their users.[1] Users consistently expect speed, instantaneous connectivity, efficiency and friendly interfaces. Interaction is increasingly prediction-driven because the assemblage human–machine is managed through a systemic control and preempting of expectations. Much has been written about this: from Google's ambitious project of telling its users what they 'should be typing' (Morrison 2010), to the filter bubble argument according to which personalized search reinforces users'

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views and perspectives (Pariser 2012), to the uber-connected dystopian scenario envisioned by American writer Eggers (2014) in *The Circle*. Moreover, the field of anticipatory computing promises devices, which are able to make suggestions that anticipate users' needs and desires (Standage 2014). Likewise, neuromorphic chips —microchips that emulate the way neurons behave and can learn through experience rather than programming—will be used to analyze complex sets of data and to predict future patterns, thus augmenting levels of ambient intelligence.[2] Neuromorphic chip-enabled smartphones will become cognitive companions that pay attention to users' actions and surroundings, learn their habits and anticipate their intentions (Marenko 2015a). Such developments constitute dispositives of affective capture that, by 'taming potential' and by narrowing down open-ended choices, effectively turn potential into prediction (Munster 2013, 128).

Can these tendencies be counteracted?

Although existing approaches to interaction design are certainly useful and valuable, they are not always adequate to account for the increasing complexity of the digital objectscape, where recursive affective and perceptual modulations across nonhuman data, things and humans generate scenarios characterized by 'noise', uncertainty and indeterminacy. We suggest that degrees of uncertainty can be productive: by disrupting linear predictability, uncertainty can broaden the cognitive spectrum of the (human and nonhuman) actors involved in the interaction.

The value of uncertainty and instability advocated here resides in their role in shifting and reconfiguring established perceptions, and in showing the range of possibilities that can be accessed by operating in a state of indeterminacy, where the construction of what is possible depends on random, contingent and not fully known components. This, it can be argued, is the essence of creativity. The philosopher Grosz (2008), who has written extensively on how the production of art is tied

up with the unpredictable chaotic emergence of the future, describes creativity as 'the capacity to elaborate an innovative and unpredictable response to stimuli, to react or, rather, simply to act, to enfold matter into itself, to transform matter and life in unpredictable ways' (Grosz 2008, 6). A similar argument is found in the science of nonlinear systems where indeterminacy is deemed essential to the emergence and evolution of life. Physicist David Bohm sums this up neatly when he writes: 'if we were to remove all ambiguity and uncertainty, creativity would no longer be possible' (1986, 198).

On these grounds, this article advocates an uncertainty-driven animistic approach to interaction design to be established both in practice and in discourse. To pursue this objective, the article proposes *animistic design* as a strategic and experimental tool to rethink human–machine interaction. Deployed as a speculative method of investigation, animism is a post-cognitive framework that produces new fictions and fosters new myth-making narratives. Animism offers a way of thinking about interaction differently: neither from the perspective of the user, nor from the perspective of the object but from the ongoing modulation of their less-than-predictable interaction.

The idea that an element of unpredictability might add value to otherwise straightforward forms of interaction was recently explored in the *Delirious Home* project presented at Milano FuoriSalone in 2014.[3] The outcome of collaboration between students of Industrial Design and Interaction Design at Lausanne's ECAL, this project presented a series of domestic objects —armchair, lamp, spoon, mirror, wall clock, curtains and so on—whose uncanny behavior subverted user expectations. Although the purpose of *Delirious Home* was mostly to inject wit, delight and satire into the notion of the 'smart home', what is noteworthy is how—by stopping users in their track—the unexpected behavior of mundane objects can prompt a soft

reassessment of the roles, conventions and discourses underpinning the design of interactions.

1.1 A case for animism

Animistic responses emerge when technologies become smarter, more pervasive, yet less and less visible. When enough devices are able to remember, recognize, adapt to and even pre-empt users' wishes, via a largely invisible, immediate, networked digital apparatus, users tend to anthropomorphize the behaviors of said devices. Users increasingly tend to attribute personality, agency and intentionality to devices because it is the easiest route to explain behavior. In addition, when users project onto products behaviors that may have nothing to do with how the devices actually function, they will in turn expect more complex, intuitive and skillful capabilities from their devices. It becomes crucial, therefore, to frame theoretically this *unpredictable relationality*: the potential for a wider range of behaviors to take place, rather than the predictable and mechanical ones. These ideas have gained substantial traction in recent critical assessments of interaction design (van Allen and McVeigh-Schultz 2013; Beran et al. 2011; Kuniavsky 2004, 2010; Laurel 2008; Marenko 2009, 2014; McVeigh-Schultz et al. 2012; Rod and Kera 2010), which resonate significantly with versions of animism circulating from the different standpoints of neo-materialism, agency and thing theory (Franke 2010, 2011). Latour (2014), for instance, has long championed a worldview that eschews the spurious divide between a premodern animated world and a modern de-animated one.

Research at the intersection of these fields deserves to be expanded not only because of its practical applications, but also as a feeder of theoretical insights on how the potential for creativity emerges in designed interactions. For instance, in her research on how children interact with digital and mechanical animated toys, developmental psychologist Ackermann (2005) uses the notion of *AniMates* to describe toys whose features, behaviors, attitudes and 'social skills' are to a child synonymous with being alive. *AniMates* are then evaluated as a type of cognitive probe able to generate new knowledge via affective engagement, which Ackermann (2005, 1) describes as the 'mental elbowroom each provides for exploring and enacting issues of agency, identity, attachment and control'. Put differently, the importance of *AniMates* is their capacity to shift children's perceptions, to lead them to question attitudes, to change the children's perspectives, and promote different modes of learning. Animistic designers focus on these capacities for change.

An animist outlook may prove relevant in a world of ubiquitous computing where a shift is taking place from fulfilling, managing and anticipating user expectations, to disrupting and subverting them. If unpredictability can have the immediate effect of augmenting the value of an experience via surprise and delight (as in the *Delirious Home* and the *AniMates*), its significance is broader. Other, more utilitarian, scenarios may benefit from forms of designed unpredictability. Ultimately, an increasing disregard for predictable and mechanical behavior requires a remapping of conventional parameters of user experience.

The notion of animism we propose draws on ideas of affect, agency (both human and nonhuman) and the material relationality of interactive ecosystems, thus moving away from the anthropomorphism and the emotional manipulation often associated with liveliness, easy playfulness and anthropomorphic cuteness. Instead, our version of animism is a strategy to frame and articulate the nexus of digital innovation, interaction design practices, technical materialities and affective responses that are already emerging within the cohabitation of humans and nonhumans. In this coevolution, the more agency objects manifest, the less predictable they eventually will become.

Animistic responses were already profoundly embedded in the way humans deal with objects before Apple's Siri or movies such as *Her* gave

them a narrative; digital devices are only magnifying these tendencies. The question, however, is: Can animism be deployed as an agent of creativity-inducing disruption? If, following Grosz (2008), creativity is rooted in contingency (and a little chaos), then the designed environments proposed in this article should be taken as experiments in building uncertainty-driven scenarios where animism is the trigger to rethink the role and the agency of both humans and nonhumans, while testing the spectrum of the potential creative responses elicited. Put differently, animism is a strategy to reimagine interaction with technodigital objects, by way of reformulating agential issues. By enabling the agency of nonhuman actors, especially when this agency produces outcomes not necessarily aligned with the human ones, an animistic perspective could offer insights into what being human means in a world of increasingly smart(er) objects.

It must be stressed that animistic design introduces liveliness and animation not as ends in themselves, but as means to embrace the multiplicity of cognition that cannot be exhausted by language and human intelligence. If this can be seen as harking back to more primitive forms of animism—including borrowing from myth-making practices that imbue the environment with unbounded nonhuman vitality—then it is with the purpose of experimenting on how to negotiate the challenges of human–nonhuman digital entanglements. In this sense, animistic design takes uncertainty and indetermination as key components of the process of interaction, not as obstacles to be smoothed over.[4] It explores forms of knowledge that are situated, embodied and, as we will see below drawing on philosophers Giles Deleuze and Félix Guattari, *par le 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 are distributed, immersive, somatic, below-the-radar and remarkably intuitive.

What this article advocates, then, is a shift toward uncertainty-driven scenarios where the unexpected is fostered, instead of closed loops, prediction and linearity, and where conversations *with* things, rather than about or to things, take place. Reimagining interaction demands a rethinking of the boundaries between object and subject, between the world of humans and the world of things, in short, between the human and the nonhuman. Animistic design aims to do precisely this.

1.2 A critique of current interaction models

Conventional task-oriented and efficiency-driven interaction design is underpinned by the notion of cognition as something rational and linear. Although the system of expectations in interaction design is highly naturalized, it is not, however, entirely unproblematic. For instance, current approaches to interaction tend to foster specific narratives about a device that may imply solutionism (Morozov 2013), blackboxing (Latour 1999), fixed notions of interfaciality (Hookway 2014), unrealizable expertise or annoying dumbness. More often than not, these narratives are underpinned by the notion that the device will behave in a consistently predictable manner.

Users assume their digital devices to be mechanistic, reliable and verifiable. Delight or frustration ensues 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.[5] Such 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 that could disturb interaction.

But what if the aim is actually to disturb interaction? What if, as we have argued, the unexpected is to become a potential resource?

Then, what we need is a shift to cognition as context-based, situated, distributed and emerging from a continual modulation of environmental influences. It would also mean that contingencies and uncertainty become constitutive of interaction, feeding into the formation of ecologies of things that are mutually responsive and interdependent. Far from maintaining representation and simulation as the bedrocks of interaction, this scenario puts forward the notion of a manifold faceted cognition unfolding within the environment, and continuously negotiating it. It also reflects accurately the human experience of ideas growing out of multiple points of view, contradictory concepts, dialogue, tentative proposals, seasoned positions, reversals, humor, satire, biases, degrees of intensity and so on. If the unforeseen is to become *a resource*, then digital objects ought to operate in ways that—in some circumstances—enable uncertainty rather than shun it or flatten it.

In a model driven by the expectation that digital devices provide answers and solutions, we see digital devices as providers of certainty. If this certainty is perfectly desirable in the majority of circumstances when an interaction with a machine takes place—it would be infuriating and counterproductive if I could not rely on my laptop's 'dumb intelligence' as I type this—then what we advocate here is for greater emphasis to be placed on uncertainty in situations of human–machine interaction where the need to foster difference, novelty and creative engagement is more relevant.

This is not a plea for uncertainty for its own sake, rather for research and development purposes. Thus, it may appeal to interaction designers searching for trajectories not already mapped by user-centeredness; likewise, it may offer the discourses of 'thingness' in the Internet of Things (IoT) a new perspective to deploy in practice. For instance, there is a need to explore the limitations of smart touchscreen interfaces, which rely heavily on the closed loop of a given repertoire of bodily and cognitive gestures; similarly, there is a need to expand the capability of existing hardware in augmented reality. In these cases, the introduction of uncertainty via animistic design may lead to design for a richer gamut of responses, to a rethinking of the stakeholders' roles, and to a different framing of how we conceptualize those interactions.

In short, animistic design offers insights into how interaction can foster *new* affects, sensibilities and thoughts. As Deleuze (1991) pointed out, we should not see the new as something transcendent, a mysterious founding break, or a drastic interruption. Instead, it is a process (and production) happening in time; a container of manifold tendencies or propensities that can be actualized, rather than a fixed sequence with a teleologically predetermined goal; an urgent, insistent, unpredictable force that inserts itself into (and breaks apart) the tangibility of concrete reality. In other words, there is no tabula rasa: creative expression 'always takes place in a cluttered world' (Massumi 2002, xxix).

1.3 Agencies, aesthesia and animism

The work of digital theorist Munster (2013) is particularly illuminating. Writing about the new forms of experiences that are generated by networks, she describes this process as an 'aesthesia of networks' that, by focusing on the heterogeneity of the relations of humans and nonhumans, is a 'project for generating novel networking sensibilities' (Munster 2013, 10). In her account, an aesthesia—'sensory knowing of the world'—of networks is one that 'does not rely solely on *human* capacities for perception' (Munster 2013, 9). The relationality between human and nonhuman is where novelty emerges and can be encountered, specifically in the technical operations of networks, such as recursion.[6] What matters, therefore, is not human perception per se, but, rather, the 'relation of perception to its difference—the imperceptible' (Munster 2013, 9): what is beyond the realm of the given perception and

can strike as genuinely novel, inventive and creative because it has the capacity to engender new sensibilities and affects. What Munster describes as 'the thingness of networks' is, in other words, precisely this experimental way of nurturing a relationality among humans, objects and data that produces new sensations and new modes of thinking (Deleuze and Guattari 1994).[7]

This perspective, where novel possibilities of human–machine conjunctions are given, is 'very different from the predictive behavior patterns that are becoming normative in contemporary networked cultures and experiences: predictive text, search, and soon, platforms that can predict what we want to buy, experience, or know before we do' (Munster 2013, 14). Wary of established notions surrounding the IoT—as either lauded for the incessant connectivity of human and nonhumans, or critiqued as eroding human creativity (Munster 2013, 15)—Munster perceptively writes:

> The point is not to make everything smoothly pulse, transmit, and glow; the point is both to interrogate in a lively manner and to invent processes that allow us to follow just that movement in which one thing—data packet, smart object, subjectivation—conjoins with or transition into the next. (2013, 15)

Munster warns us that the conjunction between neuroscience diagrams of the brain and networked technologies tend to capture emergent relationality and its capacity to generate new affects, perceptions and concepts, and fence them within the realm of prediction. For instance, describing Google's ambitious plan to preempt wishes by turning search into prediction, she describes this aspiration as a:

> *reterritorialization* of mind/intelligence in which a raft of machine learning technique, from data mining to dataset training, claim the territory of noncognitive dimensions of the brain and thought. In the form of 'serendipity' or 'prediction', these become the resource on which to build artificial neural networks. (Munster 2013, 128)

The point made concerns the 'kind of intelligence that exists interstitially in the nebulous "between" spaces before conscious (human) thought fully emerges' (Munster 2013, 128). It is this space that contains the potential to actualize unknown relations, the potential to express the unexpected and the novel, which is captured by prediction strategies, such as those pursued by Google. These represent, in other words, a process of taming potential. 'Potential then becomes prediction—what *will* happen next' (Munster 2013, 128), and no longer what *might* happen next. She is adamant about the implications of this:

> the broader move away from search per se toward prediction of what "users" desire before they even know what they want signals a more insidious foray into staking a claim on the nonconscious and affective terrain of precognition and all its betweenness. (Munster 2013, 129)

Whereas Munster's timely analysis relies on instances of artistic research to explore the disjunction between the perceptible and imperceptible in the relations of humans and computational machines—where systems are highly determined—animistic design focuses instead on experimenting with designed ecologies where the actors engaged (objects, prototypes, humans, data and things) affect each other in ways that allow not only uncertainty and unpredictability to emerge, but to capitalize on them as a resource to trigger creativity. Thus, the 'nonconscious and affective terrain of precognition and all its betweenness' Munster describes so well is also the territory of intervention of animistic design. In this sense, animistic design is related to 'relational reinvention' (2013, 189) as the way to counteract the tendency to disjoin things and humans. Such tendency is symptomatic of the anxious efforts to reclaim a human agency perceived as under threat, by ultimately 'cutting the flow' of the human into data networks and vice versa. Instead, these flows must be cultivated because it is here that we can find indeterminacy and creative novelty.

There is a potential in the relationality of human–nonhuman within computation and interaction that needs cultivation, care and consideration. Mostly, it needs the spaces where this relationality can be manifested against the systematic capture of potential executed by prediction-driven computation, where narratives unable to account for the noncognitive, the nonlinear and the nonrational underpin modes of interaction. Experiments in animistic design aim at fostering this potential of interaction to become a more open-ended and creative enterprise.

1.4 Thinking par le milieu

Before looking at how this can be achieved, we should introduce the notion of milieu as a more specific and nuanced proposition to adopt, instead of the overused 'environment'. Although often translated actually as 'environment', milieu describes the ambient, atmosphere, or circumstance in which something or someone is embedded. The nineteenth-century philosopher of science Georges Canguilhem used the notion of milieu to designate the external circumstances required for the existence and proliferation of an organism; Deleuze and Guattari, among others, took on the notion of milieu to describe a particular mode of thinking.[8] 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: (a) thinking 'through the middle', without grounding definitions or an ideal horizon, without a specific beginning or end or teleology and (b) thinking 'with the surroundings', which stresses the entanglement of something with its habitat. Put differently, nothing can have an identity separate from its milieu.

Now, reflecting on interaction design in terms of milieu means that information and exchanged communication are no longer the result of an external agent representing and processing them, but they become a set of fluid relationships in which all the agents involved participate. Because of the fluidity and continuous negotiations, agents' boundaries are porous; therefore, the conventional roles of user (subject) and device (object) are no longer tenable. This is why animistic design proposes a move away from the conventions of user-centered design. Instead, by fostering unpredictable interaction among human and nonhuman agents, animistic design creates new narratives of fuzziness and productive serendipity.

2 Research through making

2.1 Animistic design projects

One of us (van Allen) has run a series of design research projects that use several prototyping methods to explore the approaches and potentials of animistic design. This process of 'research through making' offers the opportunity to critique, refine and evolve our thinking as we make, and at the same time develop new design approaches and principles that embrace animistic design. In line with Schön's (1983) analysis in *The Reflective Practitioner*, our methodology uses prototypes as a way to explore the terrain of animistic design. In a manner similar to the reflection-in-action process for architects that Schön describes, we treat our animistic concepts as a kind of 'site' that we are exploring. The prototypes are design experiments that explore interrelationships and investigate constraints and opportunities of animistic design. Building prototypes puts us in conversation with complex ideas in an embodied tacit way, which helps us to understand the 'back talk' of the ideas when they are instantiated in designed artifacts and juxtaposed with themselves and the specific creative context.

Unlike the professionals described by Schön, our goal is to explore a diverse range of approaches that raise questions, rather than narrowing down to applied solutions for a

design brief. Animistic design goes against many design conventions and lacks established design traditions from which to work. We, therefore, need to invent new modes and paradigms of design before we attempt to create fully conceived implementations. Through this exploratory approach, we are practicing a kind of meta-design work that is grounded in a reflexive making process, and moves us toward the establishment of robust animistic design patterns from which we can build useful systems.

In this sense, it has a relation to the speculative approach of Dunne and Raby (2013), where our prototypes explore implications for designers, design and culture. Indeed, one of our goals is to generate discussion among designers and others who are interested in alternative futures of smart devices. We are engaging in a reflective dialogue with our designed speculations, in which, as designers and theorists, we can experience a series of 'proof of concept' prototypes of our ideas in a process of 'designer testing', rather than formal user testing, which at this early conceptual state would produce limited insights.

Two projects are discussed in this article, and for both, we chose the scenario of a designer creating a new product, primarily doing research, collecting references and examples, and developing. We believe that creative practice in particular can benefit from the animistic approach, where digital systems can diverge from a task and efficiency orientation, and instead encourage and embody imagination, contemplation, ambiguity, multiplicity, story, point of view and even provocation.

The *AniThings* project explores several concepts in animistic design through video prototypes showing general interactions and contexts, but does not go into detail for form, visual design and detailed interactions. Its goal is to imagine ways in which an ecology of animistic devices might work for a creative person. The second project, *Little Data Wranglers*, is a collection of interactive prototypes on tablet

and phone-sized devices that actively collaborate in the research of images and articles, implementing experimental interactions and algorithms to discover how animistic design feels in actual use. Both projects are documented in videos, which can be viewed in the URLs provided at the beginning of each project description.

2.2 AniThings: animism and heterogeneous multiplicity

AniThings is a system of several independent devices, each with a different 'personality', which form a heterogeneous ecology of multiple independent devices that interact and respond to each other and people (Figure 1). The project explores a fictional scenario, portrayed in a series of stop-action videos, where a designer, Stella, is working with the devices as part of her design process for a new, wearable medical device. In the videos, she is progressing through a process of inspiration, research, ideation and collaboration with another designer (Figure 2). The autonomous devices, or actants, each have their own goals and intentions, sometimes conflicting and live as separate physical entities on Stella's desk. The actants have names such as Needy, Nerd, Neofile and Nostalgic, which reflect how they behave. For example, the Needy one is constantly vying for attention from the designer and the other actants. The Neofile is almost manically searching for new and novel information, for example, finding the very latest in wearable technology fashion, while the Nostalgic is more methodical and relies more on historical references, for example, displaying a *Wired* magazine article Stella has forgotten she owned. Each actant has a distinct abstracted shape to help differentiate one from another. They are sized so that several can live on a desk and be easily moved about to change their physical and conceptual relationships. However, these shapes are primarily intended to be 'blank' in the sense that
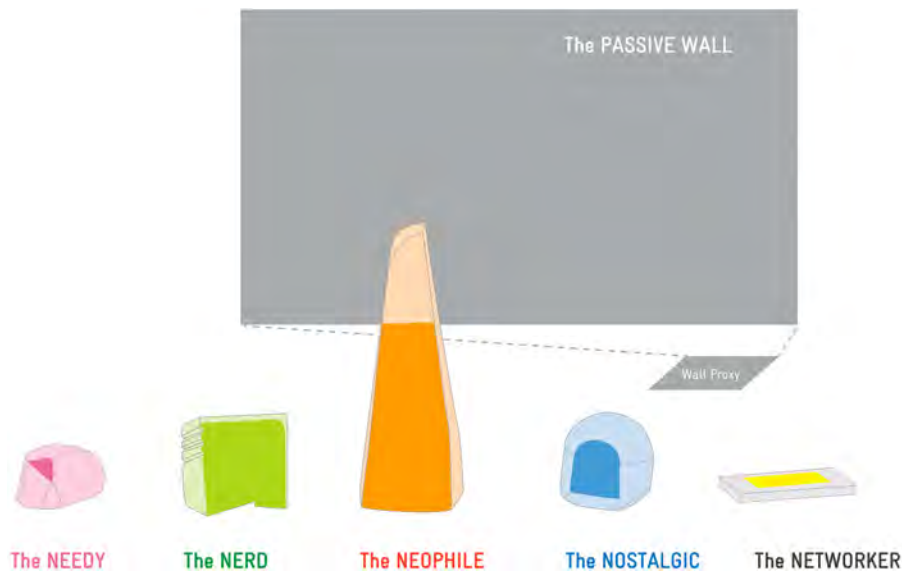
Figure 1. *AniThings* project diagram.

the design focus of this project was not on their form.

Stella, the designer, interacts with the *Ani-Things* on her desk as she does her research and idea development, asking them to search and to present image, text and audio results.

The behavior of the actants differs from the dictate of interaction design methodologies. Instead of following a rational efficient approach with reassuring feedback, consistency and intuitive behavior, the actants daydream, digress from the current topic, act rudely,

Figure 2. *AniThings* video still: Designer working with actant devices.

become obsessive about a topic, argue with each other, collaborate, juxtapose different points of view, and provide unexpected and sometimes useful content. In other words, they are more like peers and colleagues than a slavishly dutiful assistant who tries to satisfy requests with only the answers the boss wants to hear.

AniThings proposes and demonstrates several key animistic design principles as we describe next.

2.2.1 Heterogeneous multiplicity

AniThings consists of several distinct devices, which create a heterogeneous multiplicity that forms a rich milieu for creative work. The diversity of perspectives and behaviors embodied by multiple actants gives the designer a range of possibilities to engage with, and shifts her perception of digital systems away from subject/object roles and evokes a sense of object agency. This active ecology fits with the discerning, associative and adaptive qualities of creative people, where a divergent process can benefit from a range of perspectives. The designer, Stella, can converse (or not) with each different personality; she can pursue a line of inquiry that evolves through this multifaceted conversation, while creating, shaping and sharing a common set of images, text and audio. The resultant milieu evolves and emerges as a consequence of the participation of the actants and the designer as collaborators, forming a kind of team.

2.2.2 Embodiment

Embodiment is critical to the animistic design approach because it creates a physical milieu for a person to use their spatial perception to organize ideas from each actant, tangibly manipulate the actants and what they represent, and participate as a social actor with the actants (Dourish 2001). In *AniThings*, agency and ideas are located in space on the designer's desk rather than as a disembodied collection of data inside a computer. This allows the designer to utilize her socio-physio-spatial intelligence as

she converses with each device: she can turn her head toward or away from them, move devices in relation to each other, and create spatial models in her mind that represent the different perspectives and ideas that each actant embodies. This milieu becomes a kind of extended mind, where a range of digitally enhanced concepts and points of view are represented in physical space on her desk. In part, this was inspired by a conventional designer's studio, full of conflicting ideas, objects, sketches and references. Think of Charles and Ray Eames's studio and home, and how these rich environments must have influenced them, which were filled with a wide range of influences that included books, toys, photographs, seashells, sketches and cultural artifacts from around the world.

2.2.3 The human is smart

AniThings relies on the human powers of imagination and extrapolation to construct an idea space from the actants' diverse contributions. The actants do not have to come up with perfect 'answers', but instead focus on stimulating the person to discover them. This means that the individual actants are not required to be strongly intelligent themselves; they need only to evoke the fiction of aliveness and intention to occupy an active role in the person's imagination and thinking process. They do this by providing a sense of backstory, humor, irony, attitude and intention. As such, they are each operating as a kind of living evolving locus of different ideas with a certain (literal and figurative) point of view.

2.2.4 Distributed cognition

The theory of distributed cognition ' … extends the reach of what is considered *cognitive* beyond the individual to encompass interactions between people and with resources and materials in the environment' (Hollan, Hutchins, and Kirsh 2000, 175). *AniThings* embraces this fully and extends the 'resources and materials' to be active intentional actors within

the environment or milieu as we are calling it. Within this milieu is the opportunity for a rich, socially based, distributed cognition, where the thinking is in, and emerges from, the milieu, not only for the humans, but for the digital actants as well. The *actants* build their own (limited) cognitions over time and contribute back as active social members of the milieu, which forms a distributed and shared cognition.

2.3 Little Data Wranglers

Scenario: http://www.youtube.com/watch?v=Q7e7XkeEnW8

Data as actant: http://www.youtube.com/watch?v=u9xrfpc139g

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. In this scenario, the fictional designer is Nancy, and she is doing research for a new, yet to be invented, wearables product. She interacts with the animistic devices as she does her research and brainstorming. In contrast to *AniThings*, which simulated the interactions with simple stop-motion video, the *Little Data Wranglers* project video shows functional prototypes built as apps in iOS with

the Objective-C programming language on iPad and iPod Touch devices. These prototypes or actants (Wrangler, Good Twin/Bad Twin, TickerTape and Archive) access a shared cloud-hosted database, respond to user interactions, communicate with each other and do their own real-time Google searches. Over time, the designer and actants assemble a collection of data (PDFs, images, quotes, etc.) that can be reviewed, tagged, eliminated and grouped. Both designer and actants can manipulate and interpret these collected data.

The Wrangler communicates the designer's search requests to the other actants. The Good Twin and Bad Twin respond to search requests with distinctly different points of view and present different sets of images related to the request, drawn from a Google image search. TickerTape works by following the group conversation in a more asynchronous manner; it displays names of related academic research papers it finds (from Google Scholar). The designer can select images or papers from the Twins and TickerTape and send them to the Archive actant, where the collected assets can be viewed, tagged and grouped.

The project explores specific interactions and behaviors of the actants and designer, and

Figure 3. *Little Data Wranglers*: Working with functional actant prototypes.
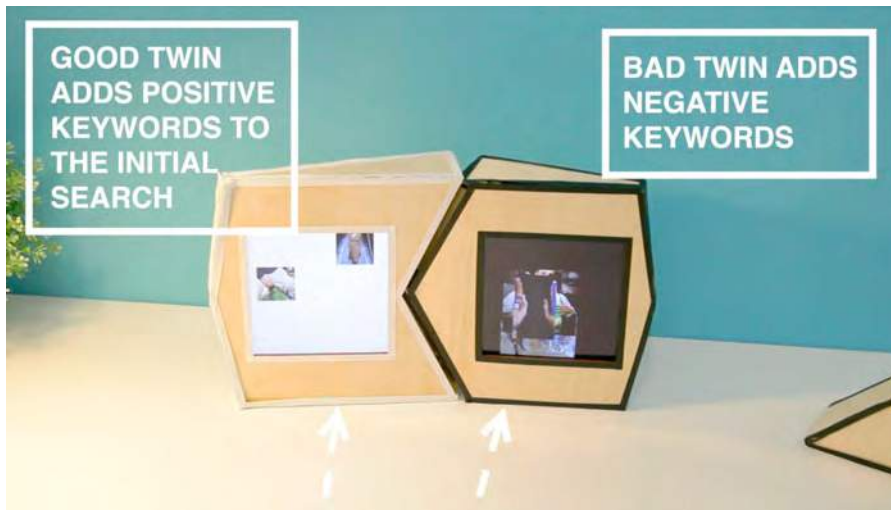
Figure 4. *Little Data Wranglers*: Good Twin/Bad Twin.

proposes a range of approaches for expressing actant personality and point of view. Our intent for the project was to see for ourselves what it is like to experience and interact with functional devices designed with our animistic concepts and methodologies. Out of this interactive experience, several animistic design approaches became evident (Figures 3 and 4).

2.3.1 Indicating personality

As an example of how the *Little Data Wranglers* actants evoked their personality, we paired two of the devices as 'the Twins' each with a similar function but different approaches in their use of simple algorithms to perform searches. Nancy sends a search request to the Twins via the Wrangler, and they look for matches on Google image search. The 'Good Twin' adds its own randomized *positive* search terms, thereby customizing and skewing the search. The 'Bad Twin' adds randomized *negative* terms and comes up with different results. In addition to each twin producing different results, they would also show different results each time a search was done. These different responses to the same search request gave us a sense of personality, intention and even mood because of the contrast between the Good and Bad results,

as well as the variability each time a search was performed. For example, an anthropologist colleague gave a search request from her research to the Twins and was surprised at how the images presented by the Good and Bad Twins seemed to have distinct points of view in the context of the search request (Figure 5).

2.3.2 Wrangling

Each actant has different ways of communicating with people, distinct from how they communicate with each other. One actant, the 'Wrangler', acts as a conduit for the person's typed requests to be sent to all the other actants. For example, when the designer types 'fashion +wearables', this request is communicated wirelessly to all the actants, which act on the request in their own unique ways. In this way, we can see the Wrangler as a kind of cultural translator between the person and the other actants. The Wrangler is also an example of the more complex social relationships that are possible within the milieu: relationships that emerge naturally when designing from an animistic point of view that consider the needs of the actants, but that may seem odd from a user-centric perspective (Figure 6).

Figure 5. Interacting with the Wrangler.

2.3.3 Data as actant

Not every animistic entity has to be a physical device. In one of the Little Data Wrangler scenarios, the designer works with sets of images contributed by members of a (human and machine) team. The designer and actants assign personalities to images and then the designer can request to merge sets of images to create a new mash-up. The images will be kept or eliminated from the resulting new collection based on an algorithmic assessment of the compatibility of the 'personalities' of the images. This approach views data not as a passive collection, but as an active entity with its own life, history and behaviors; in this case, the images are the active entities. 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, imagine that in a medical context, a patient's medical data could have a unique personality that includes the owner's ethical rules, sharing/privacy protocols and history of use. This would allow the data to interact with
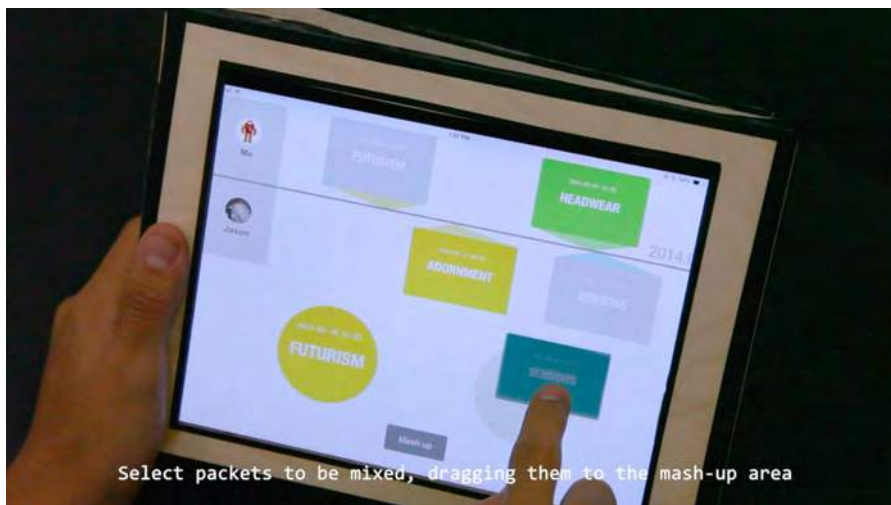

Figure 6. Creating a mash-up between data actants.

Figure 7. Designer working with the actants.

external digital systems in a way that coincides with the desires of the patient; particular histories *would not* be shared with an employer database, but detailed information *would* be provided to an emergency room's computers (Figure 7).

3. Summary of projects and design insights

The *AniThings* and *Little Data Wranglers* projects use video and interactive prototypes to investigate the qualities and outcomes of animism as a paradigm for interaction design. While not intended as proposals for actual systems, they demonstrate potential strategies and guiding design patterns such as heterogeneous multiplicity and wrangling. They are examples of new ways for people to interact with digital systems, driven by different motivations and conceptions for what the design of interactive systems should be. These two projects focus primarily on research and ideation in a design context, but we can see these ideas being extended into more general areas that can benefit from an open-ended expansive kind of interaction: from planning a family vacation, to developing

legislation, to managing a factory full of autonomous robots.

Animistic design approaches—giving things a sense of intention, attitude, point of view, goals and provocation—aspire to extend people's creative thinking into a digitally augmented, tangible world and make complexity and ambiguity useful. In the same way that researchers used to walk through library stacks, catching a random reference and digressing in a productive way, animistic ecologies may be able to provide a similar, but more powerful serendipity: a personal and diversely opinionated group of libraries and colleagues available in a creative collaborative workspace. And, more than this, an animistic approach allows people, things and data to coexist in an ecosystem that is influenced by each participant, creating a milieu that evolves organically. This system is not bound by the constraints of user-centric solutionism, which can narrow the creative process too early and inhibit risk taking and experimentation. Instead, it can form a complex and unpredictable milieu that becomes relevant because it has grown out of the intentioned input and investigation of its participants, and therefore offers the opportunity for targeted serendipity and synthesis. It opens up new

opportunities for nonlinear open-ended collaborations between people, things and data, embracing the unpredictable, the nonrational and the emergent. By taking the focus off the user and considering the points of view of the digital actors and by considering how to foster a fuzzy emergent milieu, animism can offer a novel use of digital technologies that supports creativity and can complement traditional interaction design approaches.

We are proposing new metaphors and models for device behaviors and the roles they play. Because of the inherent complexity of the IoT (algorithms, networks, massive sensor data archives, data mining, etc.), these systems can become opaque and inhibit human agency and creativity. Animistic design aims to provide a metaphorical, tacitly relevant narrative to these complex systems, so people can make use of and influence them rather than endure the seemingly arbitrary outcomes of automated systems.

Animism reframes and makes practical these IoT black boxes, not by revealing the *literal* inner workings of the system (which are too complex to unravel for the end-user), but through animistic fictions that use personality and narrative to explain the behavior and intent of the system. For example, an actant with a mischievous personality can indicate a certain kind of provocative and variable search strategy that is useful in open-ended creative contexts. In other situations, an actant with an efficient task-oriented personality, like Apple's Siri, indicates intent for accurate and functional answers where that is appropriate. Over time, these animistic behaviors, narratives, metaphors and myths can give people a sense of familiarity and event intimacy for their highly complex, technologically imbued milieu, because the complexity and unpredictability become more understandable in terms of intent and behavior.

There are several areas revealed in the *Ani-Things* and *Little Data Wranglers* design speculations that need further work. The idea of designing active intentional 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 reproduction of intelligence, but a new set of relations between people and the digital. On the one hand, the use of faces can create expectations of high intelligence, authority, subservience, complex or unintended social relations or, worse, they can lead to the 'uncanny valley'; the uncanny valley is a situation that roboticists have identified where simulations of life that are just short of the real actually cause revulsion in people (Mori 1970/2012) because a sense of undeadness is manifested. On the other hand, successfully indicating aliveness in a meaningful way without using the problematic and superficial techniques of faces and cuteness creates a new design challenge. While trying to create well-developed animistic design patterns, several insights came to light through the projects.

3.1 Find a 'native' form of animism

In the design process for these projects, we tried several dead-end approaches that used skeuomorphs based on humans or animals. Whether using LEDs that seemed like eyes, or applying studded leather as 'clothing' for a device, the literal character of these design choices took away from the seemingly more 'real' inner life. Instead, we found that using design cues more native to the devices' function and personality better communicated a useful backstory and sense of intention. For example, in a side experiment, an animistic iPad app mined an Evernote account that contained an author's writing from which it extracted, displayed, and sometimes spoke randomly selected sentences. Each sentence was prefixed by random, positive, supportive comments or negative skeptical comments. These 'readings' gave a sense of agency, personality and intent to the system without using skeuomorphs and cuteness. Seeing and hearing the sentence selections and comments was like having an opinionated colleague pick out bits

of your own work, and forcing you to see them in a new way. We think this approach, where the personality indication is related to the content rather than being a façade, points the way to building an animistic design vocabulary that has its own vernacular that is suited to and more native to this new form of interaction.

3.2 Develop myth and play

Despite our intentions to strive for new animistic modes of interaction, we easily fell into traditional interaction design patterns such as efficiency that caused the projects to lose their animistic feel. We found it was critical to design in a sense of backstory, humor, irony or other strong attitude; in other words, to develop a myth around each actant. In addition, a sense of play and humor in the interactions was also meaningful in building important social bonds between people and devices, as well as implying a sense of the propositional to the positions that the actants took.

4. Conclusion

The animistic design experiments discussed in this article indicate the potential for a line of investigation that combines design practice with a theoretical perspective informed by new materialism, post-human philosophies, theories of mediation and cognitive sciences. In this context, animism gains a position as a valuable research method/practical design perspective that 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 animism-driven modes of interaction suggests that these modes are post-cognitive, post-user and post-human. They are post-cognitive because they engage the nonrational, the somatic and the 'below the radar', by working at the fuzzy boundary between user and device and by embracing the nonlinearity and messiness of this process. They are

post-user, insofar as animated objects' behavior challenges the significance of user-centeredness, still the mainstream perspective in interaction design. They are (and will have to be) post-human, because they tend toward what has been described as the 'flat ontology'[9] that places human and nonhuman on an increasingly equivalent stand.

What does this mean for design and digital creativity? Turkle (2015) argues in *Reclaiming Conversation: The Power of Talk in a Digital Age* that designers should make apps that encourage the user to put them down because they inhibit the benefits of engaged social interaction, empathy and human solitude. However, as Franzen (2015) points out in his *New York Times* book review, this runs counter to the economic goals of software developers. It is a kind of bandage approach to design, where the main goal is an addictive engagement, 'fixed' with a whitewash admonishment to consume responsibly. Instead, animistic design proposes an interaction model that has different strategies, goals and values that may not be so alienating. This model creates a new kind of digital relationship: instead of a flattened out, shallow form of communication, there is a deeper, more complex relationship between individuals' digital and data worlds. It is a model that instead of minimizing contemplation and empathy, embraces uncertainty, ambiguity, imagination, debate, reflection and collaboration, and is better aligned to the empathic patterns of human–human interaction for which Turkle (2015) is arguing.

Instead of continuing to treat the digital (and through it, our family, friends and co-workers) as a purely functional task-oriented realm, animism explores a new direction in design where the digital is a more open-ended, conversational, heterogeneous realm. This is not to say that all digital interactions should be animistic. Instead, there can be a more balanced range of interaction options that brings the nonrational and noncognitive into the digital equation alongside the rational.

In nondigital creative practice, there is an important relationship between the creative practitioner and the tangible interaction with what they make, as they make it. This reflective practice, as Schön (1983) has detailed, depends on the intellectual and spatial juxtaposition and manipulation of conflicting options, ideas and their relationships. In the traditional digital realm, the channels for this juxtaposition are typically narrowed to a single disembodied screen, and a mode of interaction that is command-oriented rather than conversational. As this article has argued, animistic design creates a different interactional model that more closely supports a divergent, opportunistic and constraint-revealing juxtaposition of digital material. It is a kind of re-embodiment of the digital, which has the character and intention that nondigital materials (like the parts of an architectural model) seem to have. Animistic design can imbue digital materials with the kind of voice that physical materials possess, whether the painter's life model, the texture of a fashion designer's fabric or grain of the sculptor's stone. We are proposing that giving digital devices and digital materials intention, behavior and personality can allow the practitioner to actively converse with and reflect on the grain of the material in a creatively productive way. Our additional intention is that animistic design can affect a much broader context than creative practices such as design. There are many contexts where the non-rational, embodied, intentioned, animistic system can augment and sometimes replace the conventional, user-centered, solutionistic approach that we have today. We can imagine a rich economy of animistic systems—from open source to fully branded devices, from proprietary systems used inside corporations to bespoke devices created by the digital tailor in a neighborhood shop. Animism can articulate decentered forms of digital interaction that capitalize on collaboratively curated uncertainty and unpredictability to enable the production of new human–nonhuman relationships, while accruing the potential for creative outcomes in a given milieu.

Notes

1. It is estimated that smartphone users form almost a quarter of the world's population, while world Internet usage is estimated at 45%. Sources:
    http://www.emarketer.com/Article/2-Billion-Consumers-Worldwide-Smartphones-by-2016/1011694
    http://www.internetworldstats.com/stats.htm
2. The World Economic Forum has included neuromorphic chips in the key 10 emerging technologies
    https://agenda.weforum.org/2015/03/top-10-emerging-technologies-of-2015-2/
3. http://www.ecal.ch/en/2245/events/exhibitions/ecal-milano-2014-delirious-home-
4. See also Marenko (2015b) where Marenko examined uncertainty, contingency and indeterminacy in the context of computational making and articulated them as virtualities: modes of reality implicated in the emergence of new potentials, producing actual affective experience.
5. These are the key factors listed by interaction designer Gillian Crampton Smith in her foreword to Bill Moggridge's seminal volume *Designing Interactions* (2007).
6. Relational agencies that are emergent and not a priori given are also discussed in Mitew (2014) where the notion of heteroclite sociable objects in the Internet of Things is articulated drawing on actor network theory and object-oriented ontology.
7. In *What is Philosophy*, Deleuze and Guattari (1994) discuss at length the parallel between science, art, and philosophy, which are all engaged with the creative practice of producing, respectively, prospects (functions), percepts and affects, and concepts (24), each bringing back from chaos, respectively, variables, varieties and variations (202).
8. On the notion of milieu, see Deleuze and Guattari (1988), in particular pages 44–82, and philosopher of science Stengers (2005). For a detailed genealogy of the term and its deployment in design practices, see O'Reilly (2015).
9. See De Landa, M. (2002, 47). Also, Bogost (2012) for the idea of flat ontology in relation to videogames, interfaces and computer programming codes.

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References

Ackermann, E. 2005. "Playthings That Do Things: A Young Kid's 'Incredibles'!" IDC 05 Proceedings. Interaction Design and Children, New York, ACM, 1–8.

van Allen, P., and McVeigh-Schultz, J. 2013. "AniThings: Animism and Heterogeneous Multiplicity." CHI 2013, New York, ACM Press. 2247–2256.

Beran, T., A. Ramirez-Serrano, R. Kuzyk, M. Fior, and S. Nugent. 2011. "Understanding How Children Understand Robots: Perceived Animism in Child–Robot Interaction." *International Journal of Human-Computer Studies* 69 (7–8): 539–550.

Bogost, I. 2012. *Alien Phenomenology, or What it's Like to be a Thing*. Minneapolis: University of Minnesota Press.

Bohm, D. 1986. "Time, the implicated Order and Pre-Space." In *Physics and the Ultimate Significance of Time: Bohm, Prigogine and Process Philosophy*, edited by David R. Griffin, 177–208. Albany: State University of New York Press.

Crampton Smith, G. 2007. "Foreword." In *Designing Interactions*, edited by B. Moggridge, vii–xx. London: MIT Press.

De Landa, M. 2002. *Intensive Science and Virtual Philosophy*. London: Continuum.

Deleuze, G. 1991. *Bergsonism*. New York: Zone Books.

Deleuze, G., and F. Guattari. 1988. *A Thousand Plateaus. Capitalism and Schizophrenia*. London: Continuum.

Deleuze, G., and F. Guattari. 1994. *What is Philosophy?* London: Verso.

Dourish, P. 2001. *Where the Action is: The Foundations of Embodied Interaction*. Cambridge: The MIT Press.

Dunne, A., and F. Raby. 2013. *Speculative Everything: Design, Fiction, and Social Dreaming*. Cambridge: The MIT Press.

Eggers, D. 2014. *The Circle*. New York: Vintage Books.

Franke, A. ed. 2010. *Animism 1*. Kunsthal Antwerp: Sternberg Press/Extra City.

Franke, A. ed. 2011. *Animism. Modernity Through the Looking Glass*. Köln: Verlag der Buchhandlung Walther Konig.

Franzen, J. 2015. "Left to Our Own Devices." *New York Times*, October 4, BR1.

Grosz, E. 2008. *Chaos, Territory, Art. Deleuze and the Framing of the Earth*. New York: Columbia University Press.

Hollan, J., E. Hutchins, and D. Kirsh. 2000. "Distributed Cognition: Toward a New Foundation for Human-Computer Interaction Research." *ACM Transactions on Computer-Human Interaction* 7 (2): 174–196.

Hookway, B. 2014. *Interface*. Cambridge: The MIT Press.

Kuniavsky, M. 2004. "Animist User Expectations in a Ubicomp World: a Position Paper". Lost in Ambient Intelligence workshop. CHI2004. http://orangecone.com/archives/2007/03/animist_user_ex.html

Kuniavsky, M. 2010. *Smart Things. Ubiquitous Computing, User Experience Design*. Burlington, MA: Elsevier.

Latour, B. 1999. *Pandora's Hope. Essays on the Reality of Science Studies*. Cambridge: Harvard University Press.

Latour, B. 2014. "Agency at the Time of the Anthropocene." *New Literary History* 45: 1–18.

Laurel, B. 2008. "Designed Animism." In *(Re)Searching the Digital Bauhaus*, edited by T. Binder, J. Löwgren, and L. Malmborg, 251–274. London: Springer-Verlag.

Marenko, B. 2009. "Object-Relics and their Effects: For a Neo-Animist Paradigm." Objects & Communication. MEI 'Mediation and Information' (edited by B. Darras and S. Belkhamsa), 30–31: 239–253 (Centre of Image, Research, Culture and Cognition, University Paris 1 Panthéon-Sorbonne). Paris: Editions de l'Harmattan.

Marenko, B. 2014. "Neo-Animism and Design. A New Paradigm in Object Theory." *Design and Culture* 6 (2): 219–241.

Marenko, B. 2015a. "Digital Materiality and the Intelligence of the Technodigital Object." In *Deleuze and Design*, edited by B. Marenko, and J. Brassett, 107–138. Edinburgh: Edinburgh University Press.

Marenko, B. 2015b. "When Making Becomes Divination: Uncertainty and Contingency in Computational Glitch-Events." *Design Studies* (Special issue: Computational Making. Edited by T. Knight and T. Vardoulli) 41 (Part A): 110–125.

Massumi, B. (ed.) 2002. *A Shock to Thought. Expression after Deleuze and Guattari*. London: Routledge.

McVeigh-Schultz, J., J. Stein, J. Watson, and S. Fisher. 2012. *Extending the Lifelog to Non-human Subjects: Ambient Storytelling for Human-Object Relationships*. New York: ACM.

Mitew, T. 2014. "Do Objects Dream of an Internet of Things?" *The Fibreculture Journal* 23: 1–25.

Mori, M. 1970/2012. "The Uncanny Valley." Translated by K. F. MacDorman and N. Kageki. *IEEE Robotics & Automation Magazine* 19 (2): 98–100. doi:10.1109/MRA.2012.2192811

Morozov, E. 2013. *To Save Everything, Click Here: The Folly of Technological Solutionism*. New York: Public Affairs.

Morrison, S. 2010. "Google CEO Envisions a 'Serendipity Engine'." *Wall Street Journal*. Accessed October 28, 2015, from http://www. wsj.com/articles/SB100014240527487038824 04575520390567286252.

Munster, A. 2013. *An Aesthesia of Networks. Conjunctive Experience in Art and Technology*. Cambridge: MIT Press.

O'Reilly, J. 2015. "Milieu and the Creation of the Illustrator: Chris Ware and Saul Steinberg." In *Deleuze and Design*, edited by B. Marenko, and J. Brassett, 191–218. Edinburgh: Edinburgh University Press.

Pariser, E. 2012. *The Filter Bubble*. London: Penguin.

Rod, J., and D. Kera. 2010. "From Agency and Subjectivity to Animism: Phenomenological and Science Technology Studies (STS) Approach to Design of Large Techno-Social Systems." *Digital Creativity* 21 (1): 70–76.

Schön, D. 1983. *The Reflective Practitioner: How Professionals Think in Action*. London: Maurice Temple Smith.

Standage, T. 2014. "When Smart Becomes Spooky. Phones Turn into Mind-Readers." *The Economist. The World in 2015*. 115–116. Accessed October 28, 2015, from http://www. economist.com/news/21631910-phones-turn-mind-readers-when-smart-becomes-spooky.

Stengers, I. 2005. "Introductory Notes on an Ecology of Practices." *Cultural Studies Review* 11 (1): 183–196.

Turkle, S. 2015. *Reclaiming Conversation: The Power of Talk in a Digital Age*. London: Penguin Press.

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