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What's it like to be Alexa? An exploration of Artificial Intelligence as a Material for Design.

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Abstract: Technology is a material, though we don't often perceive it as something we can easily manipulate with sensuous knowledge. In particular, we don't consider digital algorithms within Artificial-Intelligence (AI) as a material we can design with as we generally lack the intimate knowledge a carpenter has of the grain of wood and the chisel in hand. Despite this lack of understanding, designers are contributing to the rapid implementation of AI in diverse areas, having a profound effect on the lives of millions. If designers lack a material knowledge of AI, how are they to adequately consider the desirability of its use? How do we pierce the veil of something that is perceived as intangible, where the interplay between materials and forces are obscured? In this paper, we present a design approach that utilises philosophical lenses to help designers adopt a material perspective of AI aiming towards a more considered use.

Keywords: Artificial Intelligence; Object Orientated Ontology; Material; Design.

1. Introduction

What is AI? There are many theories as to what this weighted, and in some contexts, uncertain term means, and a great deal of speculation as to what it can achieve. To some, notably Stephen Hawking and Elon Musk, the creation of superhuman intelligence, or artificial general intelligence is inevitable, to others, it is merely a geek myth (Kelly, 2017). Some experts advocate that we should reconsider what we call AI, given that AI in most applications is what is known as narrow AI, carrying out a few relatively simple tasks such as recommender systems for television, a stark contrast to 'general AI' which might be considered an enabler of a human-like robot. Despite the many applications of AI, it is opaque, often viewed as a digital black box with access limited to those in privileged positions, leading even experts to question how the machine works, how it has been trained and if it is always correct. Yet despite not fully understanding the effects, constructs or the



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arrival of outputs, AI technology is being hastily utilised in a wide variety of applications, rather than cautiously implemented by design.

Our approach to this design challenge is to focus on the materiality of AI, to redefine it and make legible its complexities. This approach rejects considering AI as simply an abstract concept. Instead, AI should be seen as a material in the original sense – as “active constituents of a world-in-formation.... relentlessly on the move – flowing, scraping, mixing and mutating” (Ingold,2011, p.28). A tangible thing to design with rather than the current incorporeal entities which increasingly manage and manipulate people’s lives producing an imbalance of power. In this paper, we present a material approach of AI and suggest design tools to facilitate a philosophical materialistic-tinted perspective.

To develop alternative perspectives of AI, our approach presents alternate ways of viewing it. Here we introduce the notion of philosophical probes as lenses to augment the design process and to assist in constructing a theoretical framework for the materiality of AI. The complexity of AI concerning its entanglements with and experience of the world is often misinterpreted, not known or simply overlooked. The application of philosophical theories, such as Object Orientated Ontologies (OOO), within the design process, provides an alternative approach and potential for designers to interrogate and reinterpret the complex nature of objects and their interactions (Lindley et al,2019).

There are many interpretations of OOO, and in this research, we have embraced OOO from the theoretical understandings of the philosopher programmer Ian Bogost. In particular, we present a design framework consisting of three philosophical probes developed from Bogost’s OOO concepts of Ontology, Metaphorism and Carpentry.

This paper is organised as follows. Firstly, we provide the necessary background on AI and OOO that will subsequently enable us to introduce the philosophical probes with interwoven examples of their use and demonstrate how they offer novel perspectives on the materiality of AI.

We subsequently bring all these constructs together into a design process of an ontological artefact to illustrate such an alternative perspective and morphology of Amazon’s AI assistant Alexa. Finally, we conclude by reflecting on the use of philosophical probes in the design process and the fruition of a materialistic and tangible perspective of AI.

2. Artificial Intelligence

The increased magnitude of quantitative data sets generated via various sources has coincided with significant enhancements in computational power, catalysing considerations of what AI can achieve (Pilling & Coulton, 2018). To this effect, AI has been plugged into a myriad of applications from parole to financial management, positioning algorithmic decision making as an emerging governing power. The consequences of such technology on society are already significant. Though we are increasingly exposed to AI, it is often not perceived as such, and even when it is, the inner workings and parameters of its decision-

making process are obscured and therefore challenging to contest (Burrell,2016). This obscurity is fostered by the ambitious historical visions of creating a machine with a human-level of general (or strong) intelligence. The desire to create an AI capable of human-level intelligence is a dominant catalyst for anthropomorphising AI-infused technology. In reality, the typical AI applications in use (e.g. Bayesian networks, machine learning and artificial neural networks) are narrow or weak AI, which is arguably the outcome of failed attempts to develop strong/general AI.

An extensively implemented application of narrow AI is machine learning (ML). Computational algorithms often process devices of socially consequential classifications and rankings, and in contemporary practices, it is more common that ML algorithms are determining these classifications. In our present era of big data, trillions of data and properties of data, termed features are analysed, adding to the complexity of an already complicated ML code. It is also worth noting human bias resonates and is amplified through ML processes, via the data and the coding, which disseminates from both into learning bias. In detail, the internal decision logic that has been coded in the ML algorithm is altered as it learns from the data, where the configuration of learning is intelligible to humans. Processing at such an elevated level, the ML techniques face computational resource limits and manage this using, again, procedures written into the code known as 'principal component analysis', which emphasise variation and bring out the strongest patterns in a dataset, once more adding to the opacity (Ibid). ML is applied to various 'problems' for which encoding an explicit logic of decision-making does not work, and that the act of coding is a two-sided operation and communication, where the human codes for the machine to learn (Ibid). Simply put, the algorithm evolves beyond human intelligibility and understanding, to work out problems concealed within the matrix of the machine's logic.

To this end, narrow AI facilitates a myriad of functionalities such as facial recognition and natural language processing, which are implemented into diverse contexts including surveillance, personal assistants such as Alexa, chatbots and recommendation services like Netflix. Though, the two categories of AI (strong/general and weak/narrow) have a long-shared history, which has materialised into often confusing one category for the other. This historically entrenched confusion, whereby it is difficult to distinguish between these two 'AI pillars', together manifests as 'AI's definitional dualism' (Lindley et al, 2020). A term used to label the co-evolution of meaning across these two very different and broad interpretations of AI. With that in mind, the popular discourse around AI leans towards strong AI. A field that is no doubt dramatically entertaining, though highly speculative, hypothetical and the stuff of science-fiction. However, it is frequently believed to be the reality of AI technology for several reasons; an echo of the historical ambition of AI, the openness of (the theoretical) discussions regarding strong AI, scaremongering from the media about the impending doom of Skynet and the predisposition to anthropomorphise AI. Though, the obscure nature of narrow AI on many different levels is problematic. Such as, its implementation into diverse, profitable trade secret applications, the algorithmic processing that is rendered unintelligible to humans and the complex layers of independent motivations

(i.e. business model, data gathering etc.) which are roles of interdependent systems delivering services like Alexa.

To this end, the adoption of OOO into design approaches can enable the designer to compose alternative perspectives on AI, its assemblage, and map the morphology of things, which can, in turn, facilitate the process of designing systems that are legible to users and designers alike. The philosophy of OOO, which will be detailed in the next section, directly addresses the multiple perspectives of things, by which different things can be considered beyond what may be presented to an observer.

3. Object Oriented Ontology

OOO is a relatively new school of philosophy emanating from a materialist line of thought. OOO is submerged in the philosophical thinking of Speculative Realism, the belief of a reality outside of the mind that exists independent of human experience. Thus, OOO theorises that every individual 'thing' has its *own* reality, which does not necessarily correlate with human experiences. Consequently, it is a rejection of Correlationism - the view that being exists only as a correlate of the mind, in other words, if things exist, they do so only for us (Meillassoux, 2008). As a collective, these philosophical speculations offer different perspectives regarding ontology, considering "being a problem of access, and human access at that" (Bogost, 2012a, p.4).

Speculative Realism broke away from continental philosophy and emerged from a one-day symposium that featured presentations aimed at forging a new positioning distinctly different from Idealism, by the distinguished philosophers Harman, Grant, Brassier and Meillassoux. Despite the unanimous rejection of Idealism amongst these philosophers, their own philosophical interpretations have slightly furcated and broken apart into various splinter groups that bear little resemblance to one another. Harman's OOO is constructed with and from the notion of phenomenology, particularly in challenging Heidegger's theory from *Being and Time* (1927). To anchor this thinking, Harman makes clear that phenomenal experience is a process of showing us numerous different qualities by which we can distinguish between different things (Harman, 2018, p.153).

Heidegger advocated that 'things' are impossible to understand in themselves, but instead are related to purposes: if a thing is ready-to-hand one can concentrate on the task rather than the tool; it is present-at-hand when such concentration is broken. This is simply described by Harman: "[w]e generally notice equipment only when it somehow fails" (Ibid, 2011a, p.38). Harman's counterpoint to this view reveals that things are not merely defined through human use but through any use, including object to object situations.

Objects are seen in OOO as existing independently of their relations with other objects. An attempt to examine an object based on its relations is what Harman calls *overmining* and *undermining*. When an object is undermined, it is treated as a composite of things which are themselves built of more fundamental things; "in the crude present-day materialism that

holds objects to be nothing more than conglomerates of molecules” (Ibid, 2011b). Harman states that we can also dissolve them upwards or to overmine, where objects are real only insofar as they perceive or affect other things. An example of where this happens often is in scientific materialism, where undermining occurs when it identifies components from which our everyday objects are built, but overmines when it thinks these tiny pieces are nothing over and above their mathematizable properties. In a nutshell within the realms of OOO, the experience of a thing cannot be reduced to scientific description. Which is a divergent perspective from the common undermining positions to “understand reality as smaller bits, be they quarks, DNA or mathematics”, or overmining positions to “take objects to be less real than the processes and circumstances that produce them”(Bogost, 2012b). For clarity, Bogost further explains that the sciences tend to undermine, and the humanities to overmine (Ibid). The philosophical history, for Harman, from Aristotle to Zizek is overshadowed by ideas that overmine and undermine the reality of objects.

“In place of undermining and overmining” asks Bogost, “what if we decide that all things are equal - not equal in nature or use or value, but equal in existence” (Ibid). This ontological positioning is not customary in philosophy or more generally for that matter. In a flat ontology as defined by Bryant, everything exists: even things of the imagination, such as unicorns and magic, exist. A flat plane emerges where existence is non-hierarchical, no existence is more primary and no more original than any other, where “humans are not at the centre of being, but are among beings” (Bryant, 2011, p.249). This open-mindedness is necessary for OOO, forging the concept that the term ‘object’ is not limited to material things but extends to any given idea or construct.

An eminent example of placing humans at the epicentre is the construct of AI. The intelligent aspect demonstrated by machines is used to describe functions that mimic the cognitive functions, such as learning conjuring principles of the human mind. Alan Turing’s influential paper *Computing Machinery and Intelligence* (1950) begins with a question that continues to dominate the technological discourse of AI: ‘Can machines think?’ in the section unironically titled the *Imitation Game*. We can ascertain, without knowing the details of the game, that the objective is to relate machine behaviours and functionalities to those of a human, conforming to the singular human correlation. A computer is considered intelligent if successful, though paradoxically as soon as an AI solves a problem, it is frequently declassified as non-intelligent, and merely computational or used “brute force methods” of crunching massive amounts of data (McCorduck, 2004, p.433). The theory of AI is always positioned to be out of reach. Regarding the current ontological System Operations, science assumes that the nature of the computer is correlated to the nature of human experience, as Bogost positions it “[t]o discover the true nature of computation is also to discover the true nature of human reason” (Bogost, 2012a, p.15). It is apparent that in the six decades since Turing’s question, the operation or the thought of machines has been entangled with humanistic conditions. The construction, programming and improvement of machines are a global industry worth billions, where there is little room to understand the machine as a thing in itself.

Within OOO, there is an appreciation that the machine possesses its own existence, and “capable of more than the purposes for which we animate it” (Ibid, p.16). OOO opposes the human world correlate, but it does not reject human beings or their place in the world, a posthumanist ontology is one where “humans are no longer monarchs of being, but are instead among beings, entangled in beings, and implicated in other beings” (Bryant, 2011,p.44). Bryant theorises that there can be a ‘democracy of objects’, where, rather than there being two distinct ontological domains, a flat ontology can unite and synthesise the human and nonhuman into a common collective (Ibid, p.24-5).

4. Bogostian Proposition

To better understand how OOO can provide an alternative material perspective on AI and a way of assisting design practice, we turn to the Bogostian proposition of OOO; he called *Alien Phenomenology*.

Bogost points the way to the application of his theory to AI with his flat ontology of the doomed 1982 video game E.T.: The Extra-Terrestrial for the Atari Video Computer System (Bogost, 2012a, p.17-8). Bogost’s initial point to flatten the ontology is to ask, ‘what is E.T.?’. His flat ontology takes the form of a diverse list of ontological things thrusting alien units together, from the human-made, or the naturally formed, to theory and everything in-between. Thereby amplifying the potency of a flat ontology by speculating on an alien experience. Lists are abundantly found in both Latour’s and Harman’s work, as lists capture the many and varied forms of being, their interconnectedness and their inherent partitions.

“E.T. is - 8 kilobytes of 6502 opcodes and operands, a moulded plastic cartridge held together by a screw, a product packaged in a box and sold at retail, a system of rules or mechanics that produce a certain experience, a story of an alien botanist stranded on earth, an interactive experience players can partake in, a unit of intellectual property that can be owned, a sign that depicts the circumstances surrounding the videogame crash of 1983” (Ibid, p.18).

To illustrate how this works in practice, let us ask a similar question - what is Alexa?

Alexa is – a cloud-based conversational voice service, a female presenting voice assistant completing various sound-based interactions and actions such as voice and music playback for a user, listens for users making sounds via the seven microphones in the housing unit, listens for its own name “Alexa” to be at the attention of the user, AI operations are located within the backend systems known as the Amazon Web Services (AWS) such as automatic speech recognition (ASR) that converts audio into words...

The practice of creating a flat ontological render of a thing reveals that Alexa, or any *thing*, is simultaneously many different things. There is no elementary unit that comprises Alexa, nor is it its composite, and to say so would be an Irreduction, according to Latour. Here Bogost offers us a model called “unit operations” to describe the sorts of being that exist simultaneously with, yet independently from one another (Ibid).

4.1. Unit Operations & Constellations

Bogost's analysis of things is that they are made up of units and uses the word 'operation' to describe how units behave and interact. To investigate a unit operations ontology is a practice of speculation, "If we speculate more - about everything - reality will become more malleable" (Dunne & Raby, 2013). How do all the units within and of Alexa behave and interact? When the flat ontology of being expands something is always something else; a relation in another function or assembly or a part of another whole (Bogost, 2012a, p.26). Things are not merely what they do, but that things or units do in fact do things, tracing the reality of variances between different objects is exposing a unit's operation, the rationale by which objects perceive and engage with their worlds (Ibid, p.29). Bogost believes that a unit's means of making sense to another is not universal and cannot be explained away through natural law, scientific truth, or even its own perspective but through the practice of speculation considering all relations and the perspectives of a thing. Speculative Realism creates an opportunity to make reality more malleable, to use Dunne and Raby's notion, which pertains to Harman's concept that speculation is only a rough sense, a representation - a caricature of new insight.

Bogost emphasises that unit operations fall into the domain of phenomenology. Phenomenology, fundamentally, is "to describe objects just as one experiences them, and to extract philosophy from the process" (Hammond et al,1991, p.2). Bogost's main argument is that as humans, we may be able to describe how objects and assemblages work, but what is it like to be a thing? What is the alien's phenomenology and experience? Can we understand something in its own terms (Bogost,2012a, p.10)?

As aforementioned, the intricacies of AI are a challenge for human understanding. An alternative perspective of things and their impacts can unravel additional ways of interpreting the materialistic characteristics of AI. "Just as the astronomer understands the stars through the radiant energy that surrounds them" says Bogost "the philosopher understands objects by tracing their impacts on the surrounding ether" (Ibid, p.33). The ether of the Internet of Things (IOT) has previously been described using the metaphor *constellation* (Coulton & Lindley, 2019). A metaphor to describe and frame OOO-thinking for designers working in the context of IOT, to illustrate the wild variances in how things can appear depending on the perspective the observer takes. Succinctly described as 'ideas are to objects as constellations are to stars' (Benjamin, 1999). Here we appropriated the metaphor constellation to frame OOO-thinking in the context of AI to address multiple perspectives and thereby consider different forms of unit operations. In summary, by observing an AI constellation from multiple perspectives, designers can speculate, for example, different forms of bias considered beyond simply what may be present in the learning set. The role of OOO through the scope of constellations brings forth multiple perspectives and highlights the interdependent and independent relationships and perspectives within the Alexa assemblage (see figure 1).

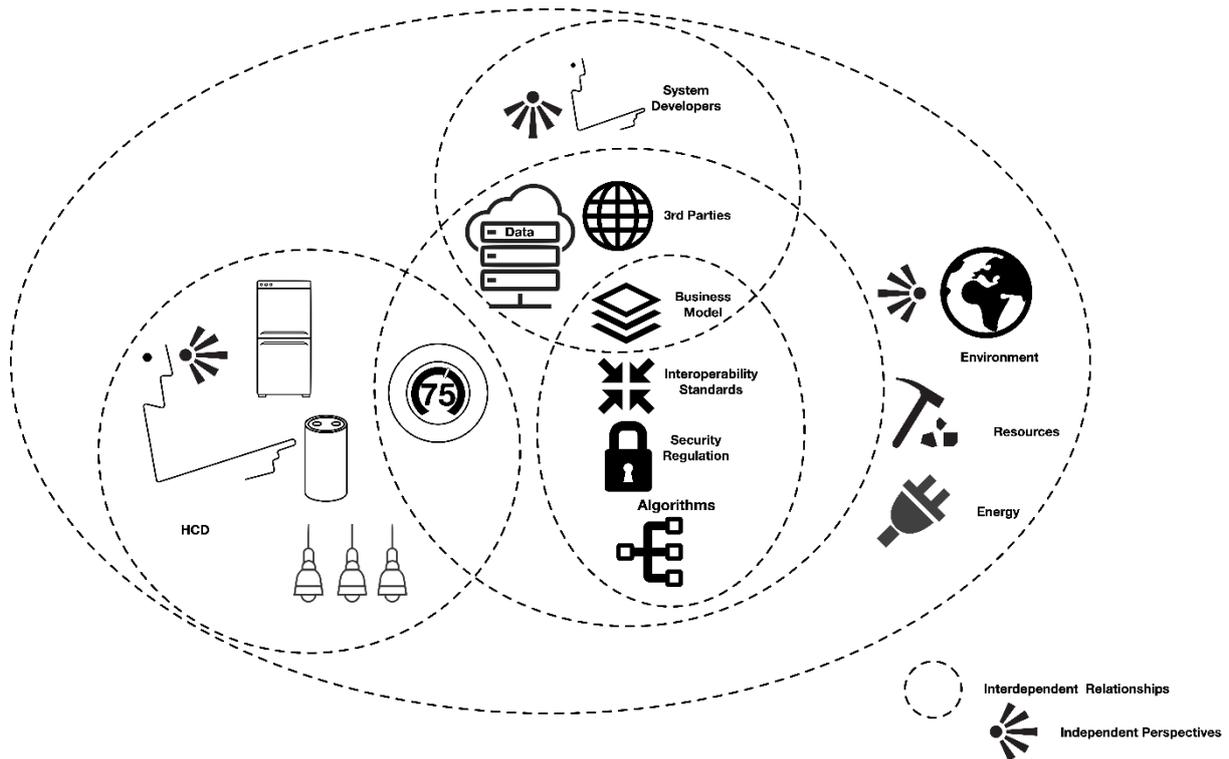


Figure 1 This is an example of a constellation map of various IOT objects, which includes an Amazon Echo and numerous unit operations. This maps the interdependent relationships and independent perspectives that can be considered, brought about using the metaphor of constellations to frame OOO-thinking for design.

4.2 Ontography as Practice

Bogost’s adoption of ontography is an inscriptive strategy that exposes the abundance of units, their operations and their inter-object relations: it is a catalogue of being.

Ontography is a practice that exposes the couplings and chasms between units, where revelation invites speculation (Bogost,2012a, p.50). Leonardo Da Vinci was famous for his exploded view diagrams of speculative flying contraptions and anatomical drawings, exposing the operation of things, the constellations of units and providing a glimpse into something alien.

Figure 2 illustrates our exploded ontographical research of the Amazon Echo and the backend Alexa service using filed Amazon patents. This is a sample of our research, detailing the exposed unit operations engaged: digital units, mechanical units, data units, programming and processing units, and several AI units operating within the backend units of the Amazon Web Services (AWS). This ontological research enables us as designers to observe and trace a unit’s influence and emergent qualities to better understand the things we speak to and place in our homes to record and capture a profusion of data consequently fed into backend AI systems.

What's it like to be Alexa?

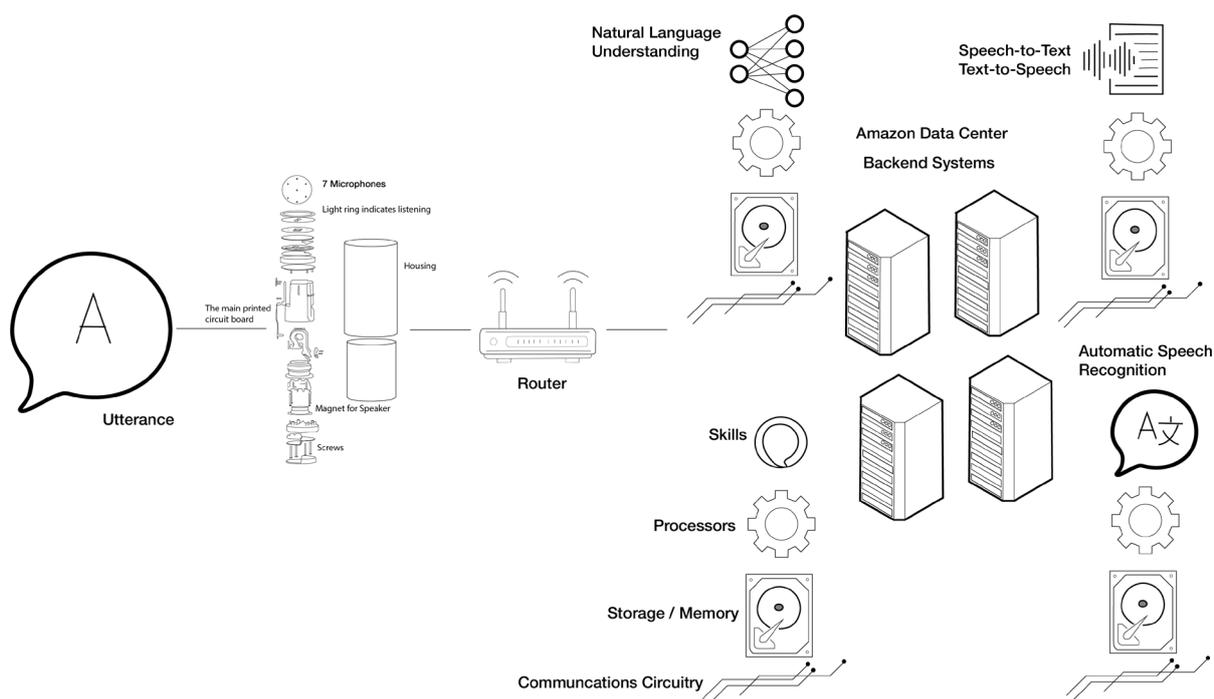


Figure 2 Our exploded ontological diagram of the Amazon Echo and Alexa service, here you can see a user's spoken 'utterance', and the path through the various units and unit operations towards the Amazon backend services where data is fed into various data and AI systems.

4.3 Metaphorism

In his famous paper, the philosopher Thomas Nagel attempted to answer the question "What is it like to be a bat?" (Nagel, 1974, p.435-50). We, following Bogost's example, have titled our work in a similar vein, and use Nagel as our starting point to consider Metaphorism.

Nagel's work focuses on the idea that consciousness has a subjective character, which cannot be reduced to its physical components. For Nagel even if the experience of a thing can be explained as a unit operation, it fails to describe the experience of a thing, known as "the subjective character of experience" (Ibid, p.436).

The subjective character of experience – 'what it is like to be a thing' is out of reach or withdrawn. A bat's sonar is a form of perception; however, it is alien to us. We possess no similar senses; thus, there is no reason to subjectively link it to anything we can experience or imagine, according to Nagel (1974). The best thing we could do is try to invoke what it might be like to be a bat, but this is a task we will always fail in. We are as Nagel says, "restricted to the resources of our own mind", imagining what is like to be a bat is not the same as being a bat (Ibid, p.439). Nagel asks for an "objective phenomenology" one that is "not dependent on empathy or the imagination" (Ibid, p.449).

However, as Bogost points out in his analysis of Nagel's work, to understand how something operates on its surrounding or they on it, is different from understanding how that other thing understands those operations. They are isolated unit operations - the bat's sonar perception exists separately from the bat's grasping of that apparatus (Bogost, 2012a, p.63). To understand the effects of high-frequency vibrations of sonar has nothing to do with understanding what it's like to be a bat (Ibid). For Bogost, Alien Phenomenology accepts that the subjective character of experience cannot be fully known objectively. Therefore, the only way to "perform alien phenomenology is by analogy: the bat, for example, operates like a submarine" (Ibid, p.64).

We create caricatures to understand things though we do this by placing human agency on them to make claims about the reality of things, such as using the anthropomorphic metaphor that a bat's sonar operation is akin to a submarine. The liability of anthropocentrism is unavoidable (Ibid, p.64). Though negotiating with things via metaphors, we can recognise that we are *omitted* from the experience of things, as the sonar of a bat can be understood by the metaphor of another thing. In other words, metaphors assess the perception itself, not the perception of things, which recedes just as any object does—thereby releasing things from the relation of reductionism between objects, creating a flat ontology (Ibid, p.67).

What is the metaphorism for Alexa? An obvious, analogy would be that Alexa speaks and responds like a human, a would-be contestant for the 'Turing's Imitation Game'. Amazon effectively uses the metaphor 'assistant' for commercial advertising and provides an insight into its operational dynamics for the user. However, we should start from an alternative position of inquiry, rather than falling into the trap of anthropomorphising technology. Perhaps a critical analogy is that Alexa is like a listening device, akin to those utilised since the 1950s by the CIA. Similarly, both devices listen and transmit data for a human at the backend to listen to, process and tag information. Here the analogy finishes due to the differences going forward of how the information or data is handled, therefore permitting a further metaphorism at this point. At this juncture, we start contending with the digital units, where data is fed into various backend routes, such as Alexa Voice Service (AVS) where numerous processes, including ML occur. In practice, we would start to ask questions such as; what is it like to be data going through a neural network?

The practice of metametaphorisms opens up a multitude of possible speculations about the "weird relations between objects" (Ibid, p.81).

4.4 Carpentry

Bogost's most potent probe, to illustrate the perspectives of objects, is derived from the ideas surrounding Carpentry; the process of constructing artefacts that conduct philosophy, where the making of things is championed.

Bogost's ideology is – "[I]f a physician is someone who practices medicine, perhaps a metaphysician ought to be someone who practices ontology" (Ibid,p.91). There is primary

importance in the act of doing as “craft holds the key to knowledge” (Latour, 1988, p.218), which forges opportunities for understanding phenomenology (Ihde,1986). Due to the rejection of Correlationism, the act of Carpentry automatically refuses to address only the human actant within the artefact.

The practice of Carpentry has been developed from two sources: primarily the conventional sense of carpentry where one grapples with and creates from materials; secondarily from Harman’s reference to Carpentry as the “metaphysical way in which objects are joined or pieced together, as well as the internal composition of their individual parts” (Harman, 2005, p.2). Bogost’s analysis of Harman’s thesis – “[the] phrase [carpentry of things] to refer to how things fashion one another and the world at large. Blending these two notions, carpentry entails making things that explain how things make their world” (Bogost, 2012a, p.93). As Bogost defines it, the act of carpentry is to create ontological tools to identify the diversity of being, to facilitate the emergence of its own ontology.

An example of Carpentry given by Bogost’s is Ben Fry’s Deconstructulator, an exploded view of the Nintendo Entertainment System’s memory architecture which displays the sprite and palette systems of current gameplay, depicting the internal units of the game and the machine’s manipulation of them (Ibid, p.96).

In summary, Carpentry is a hands-on approach to experimentation through the manipulation or the vivisection of objects, consequently creating artefacts that attempt to reproduce the unit operations of another thing’s experience. Admittedly an experience we can never fully understand, but by speculating, we can trace the outline of their effects on the surrounding world (Ibid, p.100). This is the process of metaphorising things for human comprehension.

Our endeavour to further our understanding about the fabric that embodies Alexa continued when we focused on the opportunity of developing a third-party Skill available through Amazon’s developer site, complete with a developer console running on the coding language Node.js. A Skill enables users to interact with Amazon’s Alexa service via voice interaction. Examples of Skills includes music playback or setting an alarm. Skills consist of two main components: a Skill service located on the cloud, that is coded working with the second component, the Skill interface, that is configured in Amazon’s Alexa developer console. The interaction between code and interface creates a Skill.

Through the act of making Amazon’s own Skill tutorial exercise *Cake Walk*, we were able to expose and grapple with the units that compose and bring functionality to Skills. Thus, explain how things make their world (see figure 2). For more clarity, the process of coding utterances and intents would expose them firstly as units. Subsequently exposing their operations of being processed through the conversational AI technology, via automatic speech recognition, for conversion to text, and natural language understanding to recognise the intent of the text. Consequently, through the act of Carpentry, we were able to explode a small portion of the ontography of units that form Alexa.

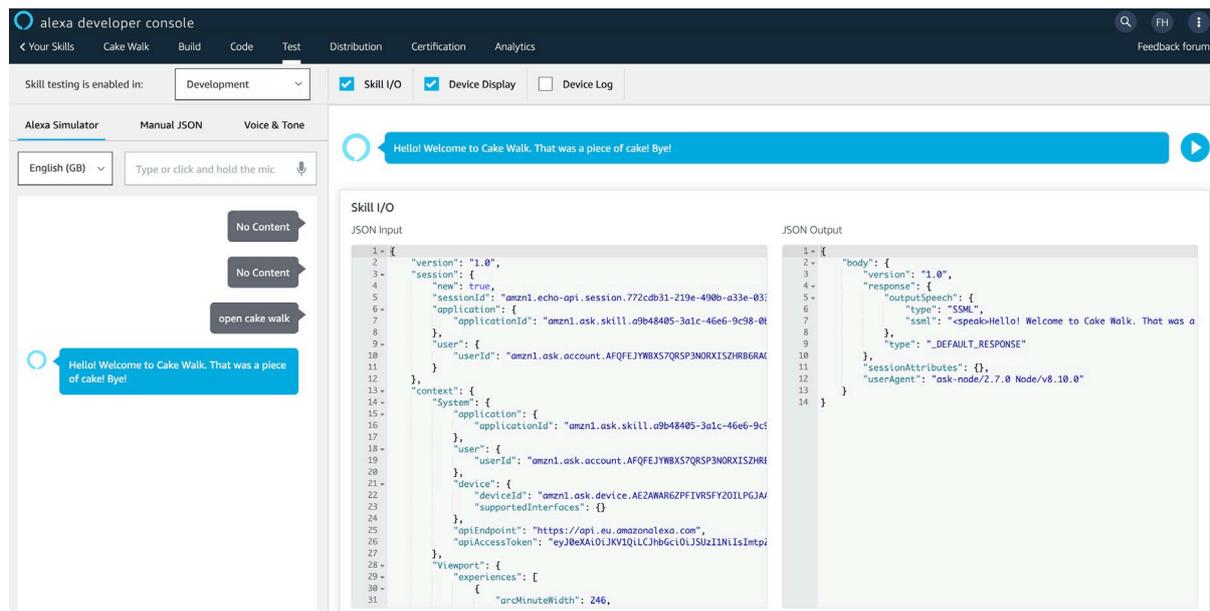


Figure 2 The Alexa Developer console, where developers can build and test skills through an Alexa simulator. The process of making exposes the code or the units that compose and bring functionality to the Alexa Skill, as well as the AI units that complete the Skill System.

Here we take the opportunity to interlace all our probes and findings into a single artefact, a VR speculative animated flythrough of Alexa’s unit operations (See figure 3). The rationale for creating a VR animation was to compile all philosophical studies into one onto-graphical experience machine, simultaneously presenting an exercise in Carpentry of an exploded flat-ontological constellation of unit operations. The visual dimension of the animation provides context; a fictional skin and narrative further metaphorising the being of Alexa and mapping the morphology of Alexa’s assemblage. The VR implementation is a play on the subjective and objective notion of phenomenology.

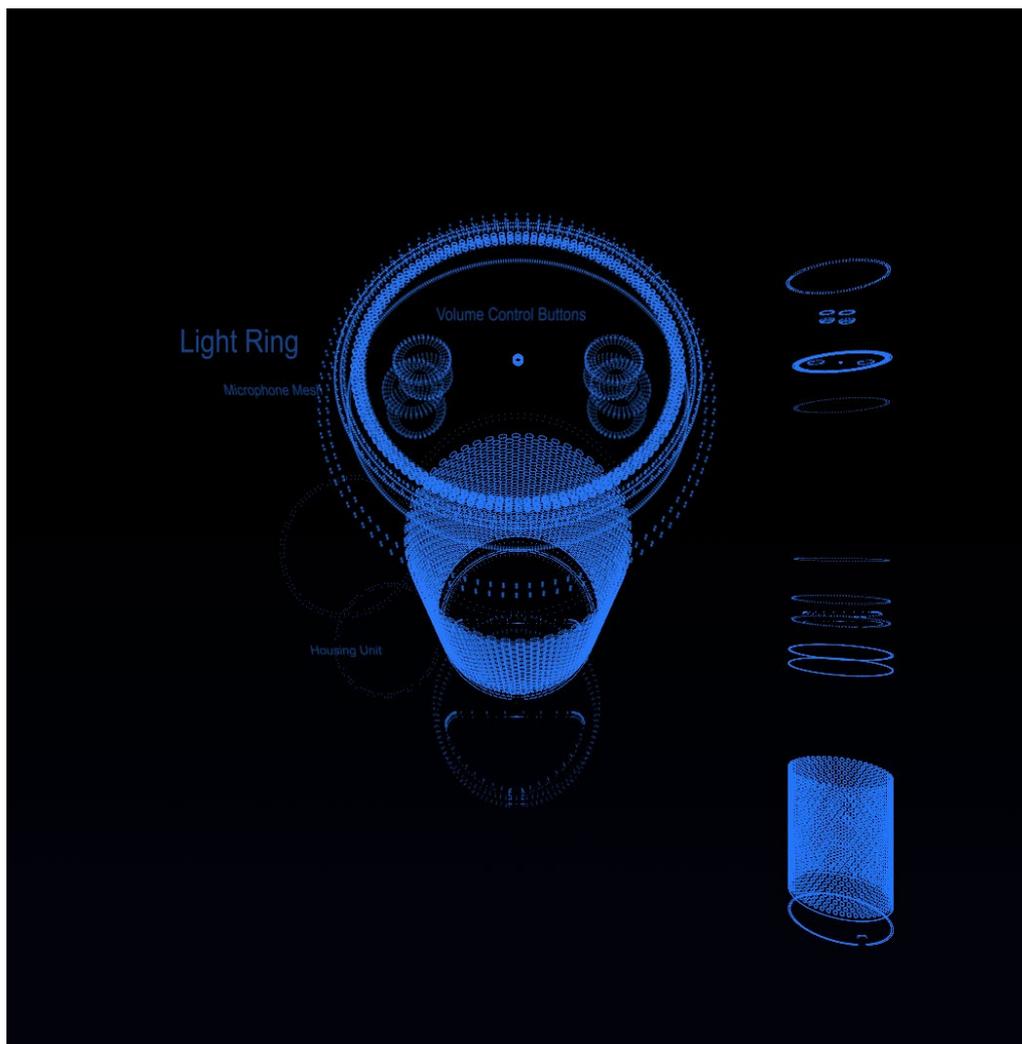


Figure 3 A screenshot from the VR animation flythrough, which is about to enter the ontologically exploded Amazon Echo, showing the passage through the different units.

5. Conclusion

Within this paper, we have provided a detailed account of utilising philosophical thinking to create design probes. Where the role of OOO can be used to illuminate the interdependent and independent relationships within AI assemblages.

While anthropomorphising AI might allow these relations to surface, OOO-thinking enables the designer to map the morphology of assemblage, thereby speculate beyond the remit of the observer's perspective of a thing. It is also worth noting that while this paper has clearly defined that the anthropocentrism is unavoidable, there is a formidable need to consider alternative methods, like OOO, of engaging with technology. A necessity, as AI currently stands as unintelligible to humans. The philosophy of Alien phenomenology also prompts the clear separation of the two pillars of AI, and their definitional dualism of strong/general and weak/narrow, by perceiving them as things on a flat ontology. Amongst humans rather than a conflation through anthropomorphism.

Due to the opaque nature of AI, the speculative and metaphorising prospect of probes provides the opportunity to experimentally engage with theories, offering alternative avenues of thinking about *things* and beyond. We have demonstrated what the practice of Carpentry and ontographical probes has to offer for design, forging approaches to disassemble and resemble new meanings from things. This creates opportunities for unexpected conclusions and theories, leading to greater awareness, and potentially for designing preferable ways of implementing governing technologies.

We have also demonstrated throughout how we have actively engaged with these philosophical probes in practice by vacillating, deconstructing and expanding our perspective of Alexa from the physical to the digital compositions, to the frontend and backend services and displaying the diversity of materialistic units and their operations that compose AI systems.

Our approach to design is a practical process of making and Researching through Design (RtD) to capitalise on alternative ways of seeing. In this case, we use philosophical notions, especially Carpentry, to cultivate new methodologies apt for a critical approach towards subversive things. Our research into AI as a material is not at an end, but a proposition to bring in alternative methodologies and strategies from disparate disciplines to question the nature of technology as a material we can design with.

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