# Designing Prosocial More-Than-Human Rhetoric within Experiential Futures

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## ABSTRACT

While prosocial behaviour is often described as behaviour intended to help and benefit others, it is primarily considered through an anthropocentric lens in that the others in question are principally humans. In this research, we consider designed systems whereby the prosocial benefits relate primarily to non-human actants, and although people may gain benefit, it is primarily a consequence of being part of a larger assemblage of humans/non-humans. To achieve this, we go beyond the human centred approaches, often associated with the design of prosocial interactive systems, and draw on post-humanist philosophy to create a conceptual lens that reveals and empowers alternate perspectives. Further we highlight the parallels of experiential futures and game design in that they both employ different forms of rhetoric which is subsequently revealed through interaction. This combination of post-humanist and game design framings has been developed through reflection on our research through design practice during the crafting of the different rhetorics embodied within an experiential future. Taking the form of an interactive game, our experiential future makes legible how our increased interaction with intelligent data driven products/services has associated environmental impacts. The paper presents our development of this framing with the aim of providing a scaffold upon which designers can critically examine potential futures which give greater consideration of non-human actants when designing experiential futures that encourage prosocial behaviour.

## CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI); Interaction paradigms; Mixed / augmented reality.

## KEYWORDS

Experiential Futures, Design Fiction, Speculative Design, Design as Rhetoric

## 1 INTRODUCTION AND INITIAL FRAMING

This research results from our Research through Design (RtD) practice-based methodology during the creation of an experiential future that highlights to individual users the inherent sustainability challenges encountered when new interactive technologies and infrastructures are deployed which go beyond their use by that individual and affect the wider assemblages in which they exist. Although RtD is becoming an established practice within technology design, it is still subject to differing interpretations by different practitioners. Therefore, it is important to highlight our own characterisation. We concur with Bill Gaver that RtD is as an approach to open an opportunity space to develop new lines of enquiry rather than to solve problems [1]. In addition, when articulating RtD, we need to illuminate and reflect [2] on the framing of the design practice (how we perceive the design space) that creates any resultant artefact rather than simply the artefact itself [1, 4]. To shift design practice from what might be considered an individual human centred design perspective to a systemic design perspective, we start from a consideration of what may be termed 'prosocial design'.

Prosocial design' approaches within the field of interaction design and Human Computer Interaction (HCI) are most often considered through the lens of design activities that focus on promoting behavioural change and prosocial outcomes. Such activities revolve around "the design of products, services, and systems that promote positive social and environmental outcomes" [5]. They are generally applied through two main approaches that either seek to directly encourage or discourage a particular behaviour or adopt a more indirect approach that seeks to create an understanding of the consequences of engaging in a particular behaviour [6]. Interaction design approaches that operationalise direct approaches predominantly combine user centred design and feedback mechanisms to encourage or discourage particular behaviours. Such approaches are variously described using terms such as gamification [3], persuasive design [7], and nudge/nudging [8]. Typically, these approaches

focus on what Fogg describes as "captology", which recommends choosing a "simple behaviour to target" which is then promoted to the user through arguments of self-interest [9]. While it is easy to see how such techniques can be effectively applied to simple behaviours, they become much harder to envisage if the behavioural change required is related to highly complex prosocial issues such as collectively working towards mitigating climate change. In such cases, these techniques become reliant on the hope that if enough individuals choose to change their behaviour, then the larger challenge may ultimately be addressed. Further, although research on direct targeting approaches such as gamification reports positive results, these are predominantly related to very short-term studies where there is a severe lack on longitudinal analysis [10]. When coupled with research that demonstrates that even very simple actions take a long time before they turn into habits [11], even when there is a strong intrinsic motivation, then the ability of direct approaches to drive systemic change is hard to argue for. As Blevis notes, "[i]t is easier to state the kinds of behaviours we would like to achieve from the perspective of sustainability than it is to account for how such behaviours may be adequately motivated" [12].

The alternative to such direct approaches are indirect modalities that seek to either create an understanding of the consequences of engaging in a particular behaviour or to reveal the operation of the system to which the behaviour contributes. Indirect approaches of particular relevance to our previously highlighted aim of creating a perpetual shift from a user centred design perspective to a systemic design perspective are inspired by design framings used in persuasive games [13]. In relation to persuasive games, Ian Bogost argues that the basic representational mode of videogames is *"procedurality"* [10]. This is enacted through rule-based representations and interactions which, when used to reveal processes or concepts of another system, presents the player with a procedural rhetoric. Sicart argues against procedural rhetoric from the perspective that it implies "the meaning of the game is not on the act of playing it, but in whatever meaning the designer embeds in the system itself" [15]. While acknowledging this position could be concluded from scholarship in regards procedural rhetoric, we would highlight Sicart is primarily providing a media theory perspective. In contrast, game designers instead discuss procedurality as a way of considering the design of games and acknowledge that "a game becomes a game when it is played: until then it is only a set of rules and game props awaiting human engagement." [16].

The consideration of rhetoric has also been promoted more generally in Design using Richard Buchanan's argument that "all design is rhetoric" [17] as a foundation. This notion extends beyond procedurality to recognise that every element of a game, including its rules, graphics, sound, its narrative, etc, all contribute to its rhetoric. Importantly however, the recipient (e.g., players and/or spectators) of that rhetoric may interpret it differently from how the designers intended. Thus, the rhetoric of a game is always subject to an individual world view. For example, when the Quaker, Lizzie J. Magie created the Landlords Game in 1904 it was designed to promote a theory that the renting of land produced a subsequent increase in land values that profited only a few landlords rather than the tenants [18]. Unfortunately, the Landlord's Game failed to achieve this laudable aim. It was hindered due to its use of a game mechanic that effectively encouraged the accumulation of money. This conflicted sharply with the rhetoric of the underlying economic theory that this was a bad thing, and likely contributed to its evolution into the capitalistic game now known as Monopoly. Thus, while acknowledging design challenges in regard to the role of rhetoric, we assert that it provides a useful lens for designers to reflect on the design decisions they make when creating any form of interactive system.

In terms of encouraging users to accept a particular rhetorical premise, it is again useful to look for analogies with games, and in particular, the play space in which the rhetoric is revealed. Players of video games will accept abilities and situations within a game that are impossible in the real world, but they must still fit within the overall premise of the game. When creating games exploring real-world challenges or situations, the experience and abilities of the player must be carefully constructed so that its link to the real world is not broken; otherwise, the game world becomes merely another fantastical realm. This notion of connection to the real-world links with games designers' consideration of how games are experienced. Drawing upon Huzinga's characterisation of play spaces as a "magic circle" or "a place dedicated to an act apart" [19], early games scholars considered the experience as happening within its own reality as shown in Figure 1 (a). This notion has subsequently been superseded by the characterisation of the magic circle as a "cognitive structure whose action depends on an undetermined number of variables" [19]. This more porous conception of the magic circle in which the players lived experience of the real-world manifests in the overall game experience, is visualised in Figure 1 (b). Importantly, although this research is principally concerned with creating an experiential future rather than a game, the theoretical substrate of game design provides a useful starting point for considering how our future might be experienced. Accordingly, this perspective will be expanded upon in the subsequent section.

## 2   EXPERIENTIAL FUTURES

Candy and Dunagan describe Experiential Futures as a deliberate mixing of a present experience with a speculative future. Such futures are often concretised by combining immersive scenarios and roleplaying with the types of artefacts normally produced as part of design fiction or speculative designs [14]. In some cases, experiential futures could be seen as an alternative format of a persuasive game and indeed have been described as a form of Live Action Role Play games (LARPs) [21]. Yet not all need be games or require participants to play a particular role, but rather, simply bring their own world view and experience to the consideration of the experiential future. This is evident in the experiential future Elsden et al. described as a speculative enactment [22]. The future Elsden et al. developed considered the role data might play in future weddings. Couples planning their actual weddings were recruited as participants [22] and the experiential future presented therefore strongly linked to their existing reality which made the future seem more plausible when the fictional elements were introduced. This mixing of technology and mundane reality is analogous to what Dourish and Bell described as the myth and the mess of ubiquitous computing [23]. Myth, as they describe it, revolves around the stories that motivate and celebrate the development of new
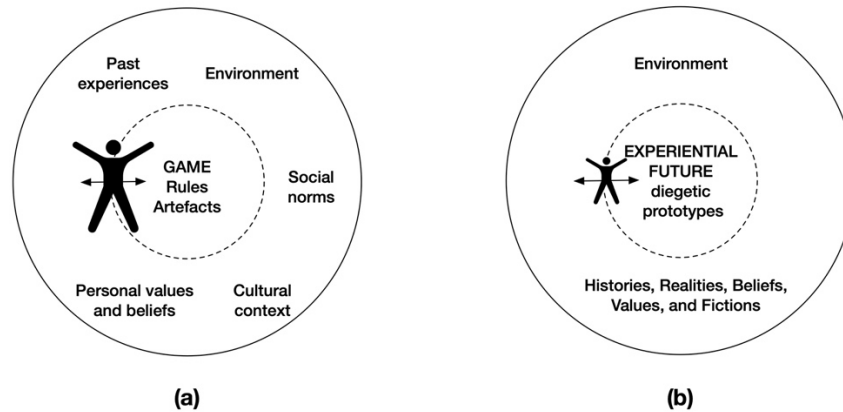
**Figure 1: Games Experiential Magic Circle – (a) Real and virtual elements contributing to the experience of playing a game, (b) Real and fictional elements contributing to experiential futures**

technological futures –particularly grand 'visions' of social transformation delivered through technological innovation. Myth sits uncomfortably alongside 'mess' – the immeasurable complexity of everyday life and the practical realities myth must confront and engage with if it is to transcend its promise. Myth and mess thus exist in a dialectic relationship, their co-existence creating friction, tension, contradiction that must be resolved for myth to become reality and future technologies mundane. This notion is present within the creation of design fiction artefacts within experiential futures in that they provide the delivery mechanism for presenting emerging technological concepts 'as if they have become domesticated' or made mundane [24]. Experiential futures thus present a future world within a familiar frame of current reality as a means to highlight the specific transformations being considered. This discussion provides the scaffold for us to create an experiential futures version of Figure 1 (a) that allows the consideration of the construction of realities that incorporate potential real-world experience of the participants as shown in Figure 1 (b). Note some of the influences shown in the outer circle of 1b will be discussed further in subsequent sections relating to more-than-human considerations of the future.

The majority of experiential futures, Future LARPs, and speculative enactments created thus far are primarily concerned with the role the human within their futures. Differently, in this research, we take a post-humanist turn that draws from Object Oriented Ontology (OOO). This positionality allows us to consider the creation of experiential futures in relation to interdependent relationships and independent perspectives of the human and non-human actants in the assemblages that form different facets of the experience. In the subsequent sections of this paper, we will unpack this framing [25] as developed through reflection of our research through design practice and how it feeds into the creation of more-than-human experiential futures. Further, we will describe the creation of a particular near-future experience relating to the sustainability of our potential future mundane interactions with Artificial Intelligence and data in our homes.

## 3 MORE-THAN-HUMAN CENTRED DESIGN

In Human Centred Design (HCD), the human (often conceived as the user) and the task they wish to perform are placed at the centre of the design process and resultant designed activity. In a similar way to direct behaviour change methods operate, this focus often prioritises simplicity of action. This simplification often leading to an obfuscation of the wider implications of performing the activity, such as the social impacts or environmental effects. This has led to the call for the adoption of a more-than-human design approaches. Although attaching this prefix infers criticism of HCD, it does not extend to the entirety HCD nor all HCD-informed projects. Rather, the aim is to highlight the need to shift focus from a dominant focus on the individual human actant to what can be considered adopting a more prosocial perspective. Through this lens, an action by an individual is instead presented within the context of their membership of a community of numerous different human and non-human actants. For example, a human interacting with some form of networked product or service would consider more than this interaction and extend the design consideration to all non-human actants which could include algorithms, humans, data, business models, regulations, climate, biosphere, viruses, etc.

The particular more-than-human design approach adopted in this research draws from contemporary Object-Oriented Ontology Philosophies, as characterised by Graham Harman [26], Timothy Morton [27], and Ian Bogost [28]. The main premise which unifies these characterisations is a rejection of correlationism which is the proposition that perspectives derived by human minds and bodies are not the only ones worth considering. This view represents a flat ontology where "humans are no longer monarchs of being, but are instead among beings, entangled in beings, and implicated in other being" [29]. This could be viewed as also flattening power structures, but it is important to note that although "all things equally exist, yet they do not exist equally" [28]. In this way OOO clearly adopts similar considerations to Actor Network Theory [30] in terms of actant relationality and power. The main difference being OOO allows for consideration of a potential internalised view of object from its own perspective [31]. Although that is
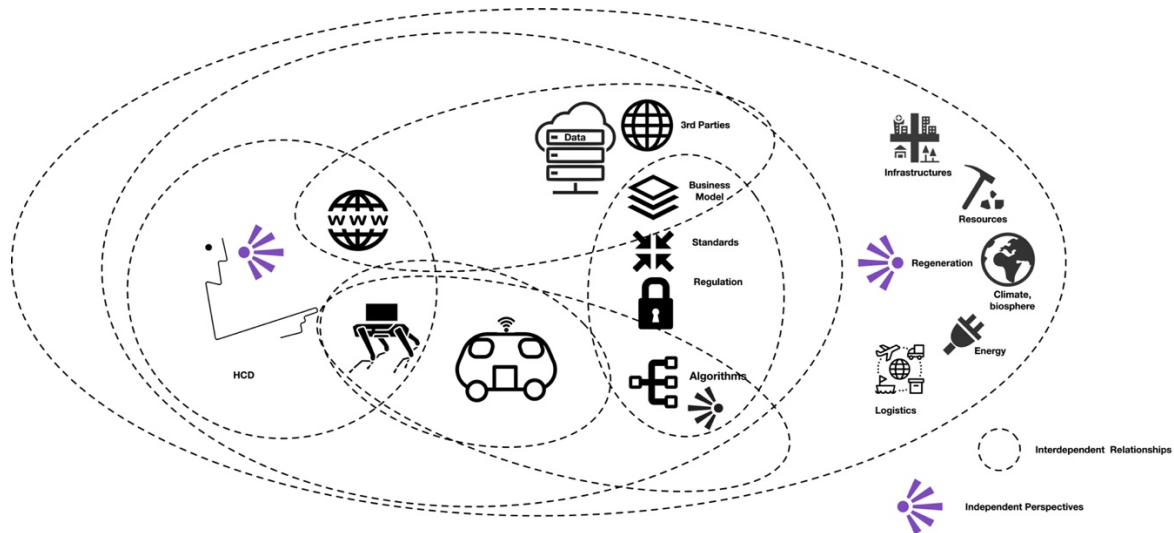
**Figure 2: Speculative ontograph for dog drone last metre parcel delivery system**

not a consideration brought forth in this research and rather its focus is to highlight how human and non-human actants within an assemblage exhibit independent-but-interdependent motivations and perspectives [25].

Beyond the dismissal of correlationism, our particular interpretation of OOO has been heavily influenced by Ian Bogosts discussions regards Alien Phenomenology [27] which is particularly accessible and relevant for design-led inquiry. Bogost coins a series of OOO-related neologisms – e.g. Unit Operations, Tiny Ontologies, Carpentry, and Ontography. The latter is particularly useful when considering designing for human and non-human assemblages. Bogost's adoption of Ontography is a strategy that exposes an object's individual operations, and their inter-object relations – "Ontography is a practice that exposes the couplings and chasms between units, where revelation invites speculation" [27]. This resonates with Karen Barad's consideration of agency not as a property but as something which emerges from how entangled agencies relate to each other [32].

To illustrate how these assemblages potentially future emerging technologies as part of experiential futures, we can create speculative ontographs [33]. For example, consider the last mile delivery service as proposed by tire manufacturer Continental. The company worked with ANYbotics to present a vision for last metre package delivery by combining autonomous legged robots with self-driving shuttles at the Consumer Electronics Show in 2019. Although a speculation, it was based on current and near-future technologies and presents a familiar corporate trope of a seamless and efficient future [34]. We have constructed a possible ontograph of this system, shown in Figure 2, to depict some of the possible internal perspectives between and within objects that designers could consider. However, this visualisation is not meant as an exhaustive mapping. Such ontographs serve as starting points that enable us to ask questions that go beyond the surface of the human centred perspective, that is, a more efficient way of delivering packages. Conversely, the ontographs allows us to consider alternate

perspectives such as embodied carbon of such a system, its environmental impact, energy use, consumption of natural resources, and logistics. Alternatively, it could reveal answers to questions such as what data does the service collect, how is the data used, and who has access to the data? Speculative ontography provides a highly useful way of critically questioning the technological futures proposed for emergent technologies. Thus, Figure 2 will provide a useful foil for the experimental futures platform described in a subsequent section. Before considering this, we first need to address how designers might perceive futures.

## 4 MORE-THAN-HUMAN FUTURING

Potential futures are most often presented as narrative driven scenarios based on the qualifiers – probable, plausible, possible, and the addition of preferable based on the much-hyped Futures Cone (Figure 3 (a)) which is most often attributed to Joseph Voros [35] (although there are earlier similar definitions notably by Hancock and Bezold [36]). The notion of 'preferable', which is the focus used to develop the future scenario can occur within any of the other qualifiers and has become increasingly contested as it is seen as often promoting the privileged vantage point of the Global North perspective [37]. This perspective is evident within the long history of design futures which arguably developed their prominence through events variously termed World Fairs, World Expositions, etc., that emerged in the 19th century and continue to this day. These events are often used to present the technical prowess of particular Global North countries to the rest of the world. Moreover, these visions of the future are often developed through the auspices of technology corporations and are imbued with a rhetoric that these companies provide the gateway to efficient, desirable and benign technology-driven futures [34]. This type of corporate affirmative future has become prevalent in relation to digital technologies as evident from the rebranding of Facebook as Meta and their presentations relating to their ability to enable the so-called 'metaverse'. These visions have been dubbed as 'vapourworlds' as

an extension of the notion of vapourware [34], a term commonly used to describe software and hardware that is announced, sometimes marketed, but is never actually produced. This leads us to assert that 'preferable' should be a critical question the designers ask of themselves within the design furturing activity rather than the principal aim of the activity. Further, there is an implication that outside the cone is the region of impossibility which arguably tends towards maintaining the status quo. As designers, we should also be able to consider the radical and consider how to turn something that seems currently impossible into the new possible [38]. This emphasis towards the present tallies with the critiques of technological futures in ubiquitous computing which are "something yet to be achieved allowing researchers and technologists to absolve themselves from problems in the present" [23].

Another critique of the futures cone relates to its presentation in a way that suggests there are universally accepted notions of the present or a one-world-world (OWW) [39]. This presentation is devoid of relationships to influences drawn from personal experience, history or acknowledgement of our tendency to incorporate imagined possible futures from books, films, television shows, etc within our world view [40]. We can draw inspiration from the writing of Arturo Escobar in Designs for the Pluriverse [41] to acknowledge the different lived experiences of individuals and communities around the world will have on these factors. This understanding results in a requirement to consider a plurality of different perspectives on pasts, presents, and futures within our design processes. ".. transition from the hegemony of modernity's one-world ontology to a pluriverse of socionatural configurations" [41].

Despite the fact design futures can help to highlight the potential benefits of emerging technologies, it is important to acknowledge they also operates in tandem with defuturing. As previously highlighted, corporate visions regularly present futures which invoke a rhetoric that suggests that the products and services of the particular organisation represent (or soon will) an inevitable future. Tony Fry [42] stresses the active role that design and designers play in producing undesirable futures through the design and implementation of the products and services that we create. He argues we do this because: "[f]undamentally, we act to defuture because we do not understand how the values, knowledge, worlds and things we create go on designing after we have designed and made them." [42]. Fry's observation embodies much of our argument towards the need to adopt more-than-human design approaches as well as emphasise that designers should broaden their perspectives when considering a particular design challenge to better explore protential unwanted affects. To this end, Fry suggests designers should seek to: "Disclose the bias and direction of that which is designed and how it is totally implicated in the world we conceptually constitute, materially produce, waste (rather than consume), occupy and use as an available material environment." [42].

Putting this consideration of defuturing alongside previous discussions of the Voros futures cone leads us to adopt an alternative shown in Figure 3 (b). The top half of this figure that shifts the framing towards an actionable present and the bottom shows how it can be used for the consideration of multiple human and non-human perspectives producing greater consideration of a plurality of futures. This shift from the OWW futures cones allows us to better consider the questions such as those posed by Laura Forlano of how

do we move towards "Black futures? Feminist futures? Queer futures? Trans futures? Crip futures? Working-class futures? Asian futures? Indigenous futures? and multispecies futures?" [43]. It is through the lens that we have developed and experiential futures platform and crafted the rhetoric for prosocial interactive experience described in the subsequent sections.

## 5 EXPERIENTIAL FUTURES PLATFORM

The approach to designing our experiential future platform was to utilise the design fiction as worldbuilding approach [20]. This method enables us to diegetically situate audiences directly within an artificial world in order to better explore and experience how today's emerging technologies may become tomorrow's mundane reality. Putting the framing of More-than-Human futuring as discussed in the previous section into action, requires a grounding in the research associated with the emerging technologies together with a cultural understanding of the potential audience for the future proposed. This means technical research from from scientific papers, patents, and protypes should also be used alongside fictional representations to create design fiction artifacts that project the emerging technologies into mundane futures as shown in Figure 4. Note, that in the figure, we place design fiction artefacts alongside vaporware and vapourworlds. This is because design fiction deliberately adopts many of the forms used by technological companies to illustrate potential future technologies. Crucially however, design fiction as a speculative practice is free from commercial constraints so is not aiming to project the technology myth of inevitability of corporate futures, nor an ability to deliver such futures, but rather, provide a space to better consider the potential challenges these technologies will encounter and create when confronted by our messy reality.

With this mind, the Future Mundane was developed as a mobile platform housed in a teardrop caravan. This supports the creation and delivery of experiential futures that can be deployed at almost any location to allow interactions with a wide variety of potential stakeholders [45] beyond what might happen in a university laboratory, in a gallery or museum. The platform presents a familiar representation of a (UK) living room, including a sofa, TV, lamps, etc., but with a variety of integrated, interactive smart devices, as well as the means to monitor and capture the experiences of participants in an unobtrusive manner. It is possible for three participants to be seated on the sofa at the rear. The diagram shown in Figure 5 is the foundation ontograph of the platform which shows how it connects to a wider assemblage of perspectives. What is notable here in comparison with Figure 2 is that data and its processing is shifted to the control of user as the platform operates all the IoT devices within its closed network with access to the wider web controlled via a Databox [46]. The Databox is an open-source personal networked device operating at the edge of the network. It collates, curates, and mediates access to an individual's personal data by verified and audited third party applications and services. In doing so, it forms an integral part of the rhetoric created for the experiential future described in forthcoming section.

Returning to Figure 5, not only does it illustrate the potential interconnections the platform could be used to consider, it also shows
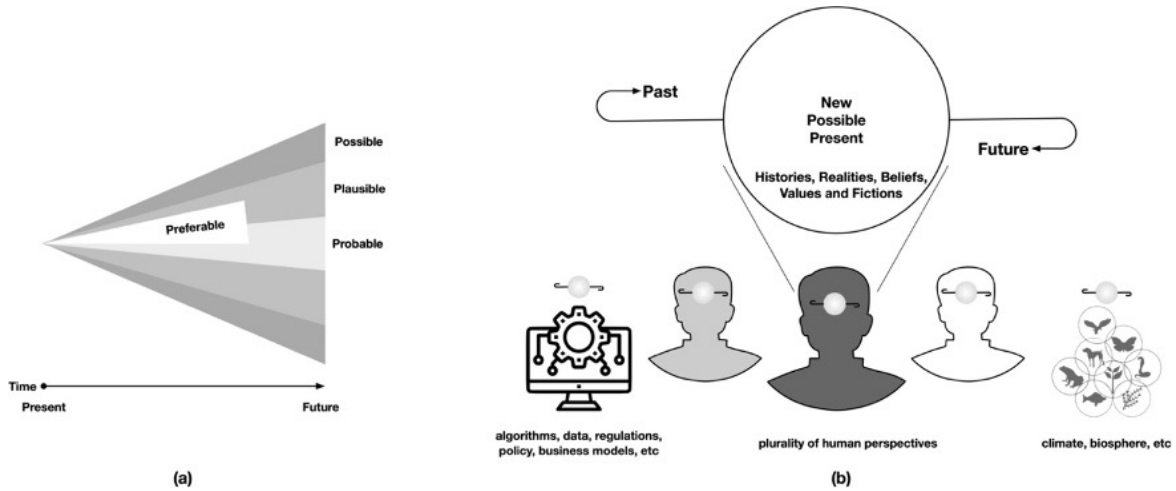
**Figure 3: (a) Futures Cone as defined by Voros 2003 (b) More-Than-Human Futures: encompassing a plurality of futures for different human and non-human actants extended from the work of Gonzatto Et al, [37]**
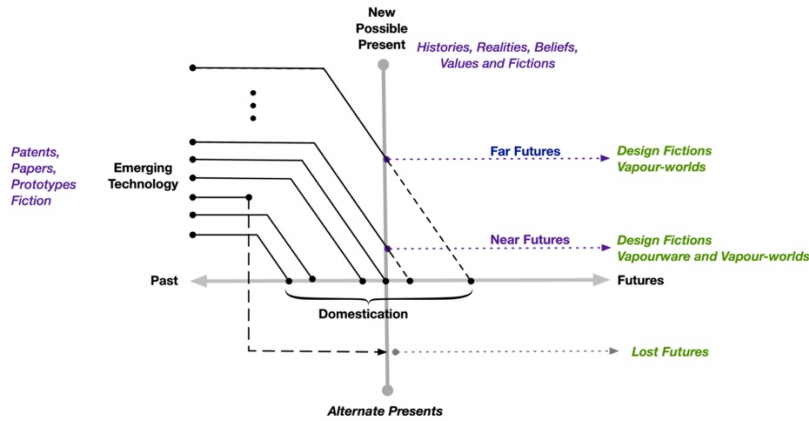


**Figure 4: Design approach to creating design fiction artefacts within a world building approach. Expanded from a diagram originally produced by James Auger [44]**

the platform's current range of devices, sensors, and actuators available that could be used within an experience. Experiential futures are crafted on this platform using a version of Twine, which is an open-source tool for telling interactive nonlinear stories. Twine has been enhanced in this instance to allow the sensors and actuators to be used, and the subsequent experience can then be loaded onto the caravan platform. Note that in addition to these sensors and actuators microphones and cameras are also installed to afford both the recording of participants experiences but also to allow researchers to shape the experience based on the interactions by the participants with particular events with the experience. For example, when answering questions posed by the AI voice of the caravan which converses with participants during experiences.

## 6 CRAFTING THE RHETORIC OF AN EXPERIENTIAL FUTURE

The experiential future presented was developed for a project relating to data sustainability within the home and its likely expansion through increased augmentation of everyday objects with data and Artificial Intelligence (AI) capabilities. The experience is an extension of previous work whereby a serious game was created and presented on a bespoke gaming console [47]. Presented within the Future Mundane platform, our experiential future was designed to initiate deeper discussions than achieved by the game console regarding how well people understand how their online activities contribute towards climate change. Before discussing the narrative of the experience used to help guide participants, we will highlight the rhetoric which scaffolds how we approached the design the experiential future.
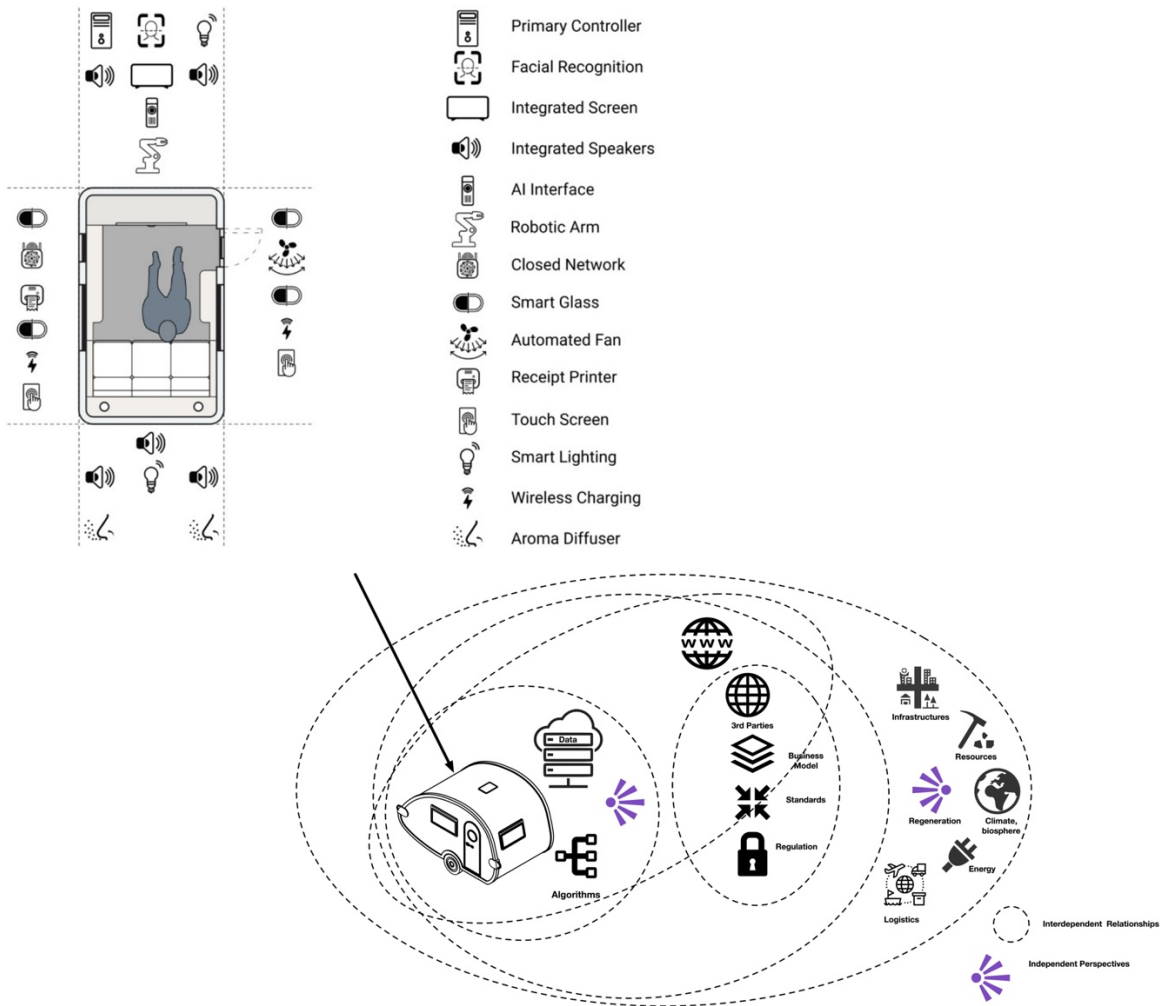
**Figure 5: Future Mundane experiential futures platform and ontograph**

## 6.1 Networkification

The ever-increasing power and decreasing cost of microprocessors has resulted in an increased use of computing within an array of products, often with the aim of enhancing functionality or automation and replacing analogue or mechanical controls. During the last decade, the incorporation of computation, and subsequently AI, into products has coincided with what has been dubbed the "networkification" [48] of everyday devices (vacuum cleaners, thermostats, fridges etc) such that they now often defined as 'smart' devices. Apart from promised advanced functionality this networked capability introduces new product-platform assemblages that are facilitated by the internet and have fundamentally altered our relationships with devices, manufacturers, service providers, regulators, and the interactions between them. One aspect of this change manifests through a disconnection between what products "actually are and do and the ways in which they are presented as things for use" [49]. This decoupling of appearance and function reflects the increased complexity of the assemblages of human and non-human actants in which these products and services operate, with the actants variously operating operate both independently and interdependently. The creation of these products and services through HCD approaches typically simplify the user experience by focussing solely on the users defined tasks. This reductive focus masks the vast majority of the wider assemblage. In contrast, the experiential future created in this research seeks to make the implications of the wider assemblage more legible.

## 6.2 (Un)Sustainability

Although 'the Cloud' serves as the primary infrastructure for the vast majority AI and data products and services, its role as a key facilitator of data-driven unsustainability – principally the creation of CO2 emissions – goes widely unrecognised and unacknowledged. This is arguably because the metaphor of 'the Cloud' makes it easy for us to imagine such infrastructures as a singular, benign, and even ephemeral. As Maxime Efoui-Hess stresses, our contemporary "digital mythology is built on words like cloud. . . something that

**Figure 6: Future Mundane experiential futures platform in action**

isn't really real" [50]. Whereas 'The Cloud' is in fact, an immense, permanent, physical infrastructure facilitating the generation, processing and storage of data and its transmission from devices and services situated at the 'edges of computing networks' to 'the Cloud' and back again [47]. This activity is significantly contributing to ICT's total carbon footprint, which is now believed to account for around 3.9% of global CO2 emissions. Globally, Cloud data centres are said to currently consume 200 terawatt hours annually – which is approximately the same amount as South Africa [51], while it is estimated that by 2030, Internet technologies will account for more than a fifth of the world's electricity consumption [52]. Based on these figures, the use of digital technologies will soon eclipse the civil aviation industry in terms of both fossil-fuel derived energy consumption and harmful carbon emissions.

While edge computing, such as the Databox, is primarily seen as a means to improve security and privacy across data infrastructures, the decentralised and localised nature of edge computing means it could also potentially provide means to better manage data sustainability. It has th potential to enable data to be processed where it originates, reducing the amount of data needing to be stored or transferred thus reducing the environmental impact of the cloud. Despite this benefit, it is unlikely that edge infrastructure would replace the Cloud in its entirety. Resultantly, in the context of the home, the introduction of a Databox data management might facilitate the decarbonisation of networked products and services. This potentially is the essence of the discussion the designed experience facilitates.

## 6.3 Interplay Between Narrative and Rhetoric of the Experiential Future

The fundamental narrative of the experience is designed to initiate a conversation with participants (video recorded during the experience and afterwards the via interviews and vox pops) in regard to the environmental impacts that result from their interactions with AI and data-infused products and services.

This particular experiential future is split into two main parts. To begin, the participants seat themselves on the sofa in front of the television screen, as shown in Figure 6 The experience is then introduced by an AI voice assistant called gAIa, which seeks to gain consent from users to collect, process and store their data. The experience prints out a permission slip using the thermal printer, which the audience must sign in order to proceed and if they express doubts, they are jovially cajoled by the AI into accepting the conditions. Here, gAIa repeatedly asks participants 'are you sure' and highlights that if they do not sign, they will either get a reduced experience or have to exit through the giftshop. This part of the narrative is designed to make tangible the transactional nature of the way in which we interact with these smart products and services in that we are effectively trading our interaction data for functionality of the object.

In the second part, gAIa offers the opportunity of choosing Cloud and Edge data management before it says it will play a film related to data extracted from their social media and viewing habits. Participants invariably choose the cloud - no doubt due to familiarity of the term and the likelihood they already use some cloud-based services. Before the film actually starts playing, another AI, Prometheus, attempts to wrest control of the caravan's smart systems from gAIa. Participants are then talked through a number of measures to counter the intrusion by gAIa, which is also setting up a localised

and secure edge-based processing/storage package for their data. During the set-up, participants are also informed as to the extent of their $CO_2$ emissions created through their data-driven interactions. This foregrounds the unsustainability rhetoric previously discussed and is intended to encourage a discussion around their own data-based interactions and whether understanding the environmental implications would make them think about how they manage such services going forward. The narrative deliberately suggests it is the system under attack rather than their personal privacy and security, which is the more prevalent discussion around data management. This is because we wanted to explore how environmental concerns might encourage people to have an active role in data sharing services rather than hitting the 'accept all' button. After the new network is set up, participants are thanked for their assistance and informed that sadly there is no longer time to play the movie, but they can 'exit through the gift shop'. Participants who have agreed are interviewed by the researchers after they exit or are invited to comment via a vox pop. The aim of this paper is to emphasise how the framing of the design of experiential futures rhetoric was developed through our RtD process. Therefore, rather than provide a detailed discussion of the particular designed experience and resulting conversations, the above prototype's role in this paper is to provide an example of how the framing can be put into practice. Having said this, we highlight that the experience has proved to be a highly effective starting point for discussing sustainability in relation to data services with hundreds of participants at a variety of venues in a very accessible way.

## 7 CONCLUSION

This paper has explored the various theories and approaches that have framed our approach to the creation of an experiential future that is capable of supporting the incorporation of prosocial more-than-human rhetorics. In relation to interactive systems, we draw and extend theories from game design both in terms of how procedural rhetoric can be used to reveal the underlying processes or concepts of system to players, and how players own values and beliefs feed into the experience as the game unfolds to create the framing shown in Figure 1 (b). Further, we suggest that if humanity is to address existential threats such as climate change, we need to go beyond individual considerations to promote collective considerations of actions that will produce positive social and environmental future outcomes. We suggest this is best achieved by following the lead of design as a discipline in moving from a purely human centred perspective to more-than-human perspective to better reflect the complex assemblages of human and non-human actants that need to be considered. To this end, we have presented an alternative to the much-criticised OWW futures cone. Our framing (Figure (3b)) encourages greater plurality as to how futures can be explored through the acknowledgement that we are always dealing with multiple differing perspectives and world views. We have illustrated how this framing can be enacted through the creation of a procedural rhetoric within an experiential future that, to a degree, allows participants to directly experience a plausible near future world in which they can tangibly mediate environmentally damaging data-driven CO2 emissions. This interactive experience acts as a powerful medium allowing participants to explore the

wider environmental and societal impacts of alternative presents and plausible futures involving emerging technologies and allows us to challenge the narratives of current digital realities and imaginaries that promote self-interest. Overall, we believe the frames developed and demonstrated in this paper can provide a scaffold on which designers can build to create experiential futures that do not amplify technological myths but rather seek to consider how technologies can be best deployed within our messy reality.

## ACKNOWLEDGMENTS

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