overGround:underStory —
more-than-human storytelling with silicon and carbon kin

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Abstract

This paper focuses on "overGround:underStory", an ongoing series of experiments exploring the role of creative and speculative design and media art practice in understanding the uses and implications of established and emerging technologies within broader, more-than-human ecologies. It investigates more-than-human storytelling by positioning the creative practitioner as storyteller, medium or demiurge—an intermediary in a wider network. It looks to materials, methods, and contexts to seek an understanding of broader ecological networks in which we are all implicated—these networks being both physical and digital in nature. Ultimately, this paper is part of an ongoing exploration of material practices that attempt to decenter the practitioner while at the same time remaining ethically and morally answerable to the outcomes.

Keywords

design research, more-than-human, digital ecologies, machine-learning, practice-based research, network ecologies

Introduction

This paper focuses on "overGround:underStory", an ongoing series of experiments exploring the role of creative and speculative design practice in understanding the uses and implications of established and emerging technologies within broader, more-than-human ecologies. It investigates more-than-human storytelling by positioning the creative practitioner as storyteller, medium or demiurge—an intermediary in a wider network. Ultimately, "overGround:underStory" seeks to implicate the digital and the virtual within the more-than-human to better comprehend our phenomenological relationship with technology and its inextricability from "nature" and how this understanding may result in a deeper understanding of the complex networks we are embedded within, with the potential to lead to compelling and unique forms of visualisation for climate communication.

As a practice-based design researcher, informed by new media arts practice, I have always been interested in how technological ecologies and physical ecologies work together (or do not, as the case may be) as an essential part of a more-than-human whole—at the same time asking how creative practice may act in a collaboration or a co-design process with these systems. I am also very interested in world-building in virtual environments – where the term virtual environment has a broad definition that aligns with Rob Shield's description of the virtual (via Proust and Deleuze) as things that are "ideally real" as opposed to being "actually real" [1] —virtual environments then, are not solely technological, or even contemporary, constructs.

The processes of "overGround:underStory" are in pursuit of co-creating narratives between myself and my silicon and carbon kin, including generative computational processes such as machine learning systems, Natural Language Processing algorithms, Australasian Ravens, the Shoalhaven river, stringy bark trees and bare nosed wombats.

"overGround:underStory" is a container for many smaller investigations, and by approaching the project as a suite of practice-based, speculative-design research-led experiments, I can iterate relatively quickly in a series of lab-like experiments. This concept is discussed by Burdick et al., who define a *project* as a "basic unit" of scholarship that involves "iterative processes and many dimensions of coordination, experimentation, and production." [2] Many outcomes arise from a single project as a container, from experiments to resolved creative works to written and discursive outcomes, such as this paper.

Methods and their Contexts

One of the central methods used in the "overGround:understory" practice-based research is the continued development of an experimental practice of constantly shifting between multiple registers of digital and physical spaces and materials and methods, followed by an exploration of the slippages that occur, and the gaps and overlaps that form, as these shifts take place.

The shifts that occur using these techniques represent movements across a number of boundary zones; one of these zones can be described as a contested zone of overlap of what might once have been called the "natural" and "artificial" worlds. These terms are intentionally scare quoted as they are ultimately meaningless, a position that the research underlying this project has only strengthened. Resisting essentialist and reductionist hard divisions, Donna Haraway does away with this divide elegantly by replacing the nature/culture dichotomy with "fields of difference". [3] I imagine these fields to be amorphous and edgeless - intertwined and never "knowable" in their entirety. Multiple

layers emerge at the intersections of the fields as they form blurred boundaries in multiple interlinked zones.

Another critical boundary zone is at play: a navigation of the malleable membrane between the physical and the virtual, which I have previously described as "the physical and the virtual sitting side by side with one, more often than not, bleeding into the other." [4] There are also movements across and through these zones, which come to light in the shifts in the register of the different material forms of data and information at play—a process described by Clemens and Nash as one of (re)modulating data as a creative act, they say "The challenge for the artist in the epoch of post-convergence is to discover as-yet unknown intrinsic algorithms of modulation — a quest for unique qualities." [5] So, from moving from one form to another via modulation, we find the revelation of the novel, the new, the forgotten or the unimagined.

This is a project that explores more-than-human storytelling and world-building. In doing so, it attempts to decenter the human and the practitioner—a task, as a settler on stolen land, is doomed to ultimate failure—but that is nevertheless worth pursuing to extend and open perspectives. I approach the more than human as an unknowable network, as suggested by Donna Haraway: "Nobody lives everywhere; everybody lives somewhere. Nothing is connected to everything; everything is connected to something." [6] This is explored further by Thom van Doreen in much of his writing, highlighting the nature of what it is to be "multispecies". With Eben Kirsey and Ursula Münster, he points out that "All living beings emerge from and make their lives within multispecies communities... Life cannot arise and be sustained in isolation. But relationships also have histories. Beyond a static ecological exchange, like the energy circuits mapped by early ecologists, organisms are situated within deep, entangled histories." (Van Dooren, Kirksey, and Münster 2016)

It should also be noted that my embodied, visceral, more profound understanding of the more-than-human is truly indebted to the generous, patient, and first-hand sharing of Indigenous Knowledges and ways of seeing by friends and collaborators Danièle Hromek and Amala Groom. I will quote Hromek in full in defining the more-than-human:

"The term "more-than-human" references the interconnectivity between humankind, culture, animals, plants, geology, elements and other non-human/non-breathing entities. More-than-human recognises the ecosystems within which all of these entities are intertwined, making them more than simply individuals; rather, they are completely reliant on one another. More-than-human includes human as a part of nature rather than separate from or holding authority over nature. More-than-human recognises that entities that are not human hold equivalent agency in places and spaces as humans, and therefore must be considered in design and placemaking." [8]

I would then take the more-than-human a step further from that implied by Hromek by explicitly—including in her "other non-human/non-breathing entities"—digital and virtual ecologies within, and of, the diverse multispecies communities within which we are fundamentally and inextricably entangled. These virtual communities and digital ecologies within which we exist are no less separable from a more-than-human network of connections spoken of by Haraway, van Dooren, and others. We are, then, all Haraway's cyborg, with fluid boundaries [9] unable to extricate our self from the complex entanglements of the "Informatics of Domination" [10] or, for that matter, from the biological ecologies that we exist within. Cyborg as boundary rider, as much tied into the networks of the machine as networks of the planet's physical ecologies (figure 1). The image of the cyborg needs reclaiming for the 21st century, or perhaps we

Figure 1: Cyborg/boundary rider for the second quarter of the 21st century, Dall-e(openAI), Firefly(Adobe), digital collage, Image: the author.

need a better word for this entity, which is in and of itself Queer in its identification, outlook, action, and sensibility.

Backstory

During the 2020 COVID lockdown in Australia, I started working on a project with two life and environmental scientists (Dieter Hochuli (USYD) and John Martin), an environmental philosopher (Thom Van Doreen (USYD)) and another critical design-focused creative practitioner (Zoë Sadokierski (UTS)). "The Urban Field Naturalist Project" was a response to the need to find ways of connecting with the world around us at a moment when our worlds felt very much like they were shrinking. [11]

Our tagline was as follows: "In this time of social isolation, what could be better than taking a moment to learn a little more about the plants and animals we share our homes with? As our worlds are getting smaller, we make them bigger by paying attention to the details."

As part of this, we developed the "Few Simple Steps" to becoming an urban field naturalist: *slow down, observe, record ~~and collect~~, ask questions and share*. These provided a framework for engaging with the ecologies that surround us while treading as lightly as possible - and it is in this attempt at lightness that, in my practice, I remove the action of "collect" from the steps. This was an ongoing debate within the project team and one that the resulting book discusses at some length as a result of these debates. [12]

In moving forward, I also propose here to extend these steps – using them to find a place within extended—more than human systems—that exist in both the physical and digital—as planes within the "fields of difference"—across multiple networks and ecologies with creative and speculative practice being central to this. When transferred to wider ecologies, these few simple steps then allow me to bring my own domain knowledge to bear when trying to come to a deeper understanding of the way these complex ecologies, networks and systems operate.

Figure 2. "Translating the landscape" Image: the author.

overGround:understory

The initial research and development of "overGround:understory" was commissioned by Runway Journal as part of the "asemic" issue, and its creation was made possible by a residency at Bundanon in now-Australia—a transitional rural / bushland zone. Runway Journal Guest editor Nancy Mauro-Flude points us to an important text that frames an element of this project: the possibility of co-creating with machine-based, more-than-human systems and processes.

> "Dismantling dominant ideas of how language and code perform and indulge in illusions of control, the tentacles of the Internet's imbroglios plant themselves into the interstices of our daily lives as a new kind of species that exist with/in us. Designers and activists Lewis et al. (2018) meticulously examine indigenous protocols for Artificially Intelligent (AI) processes: "our goal is that we, as a species, figure out how to treat these new non-human kin respectfully and reciprocally—and not as mere tools, or worse, slaves to their creators"." [13]

So then, part of this process is to look at ways of considering the more-than-human as collaborators and co-creators. It is important to note that I do understand that there is a complex and nuanced discussion around working with so-called artificial intelligence and non-human entities, such as animals and plants and their ecologies, as co-creation. However, I see it as co-creating with, and maybe more importantly, within, a complex network - something much larger than myself, but that my own self is intrinsically entangled within. In this process, I give over a certain amount of my own agency to this network.

The following description of the function of experimental co-creation with the non-human rings true for me:

> "Co-creation offers a hands-on heuristic to explore the expressive capacities and possible forms of agency in systems that have already been marked as candidates for some form of consciousness. Only by probing those possibilities will we be able to move beyond blanket assertions or denials of agency and interrogate ourselves, critically, in the context of possibly intelligent systems." [14]

Translating the Landscape

This co-creation process can take many forms, and the methods outlined here for "overGround:understory" are but a few of the myriad possibilities. One of the first things I thought about as a way into this research was some earlier experimentations that I had labelled "translating the landscape" (figure 2). These experiments took advantage of some "misbehaving" pattern recognition in the Google translation app. These misbehaviours appear now optimised out of the system, polished to a fault, from a playful rather than functional standpoint. Nevertheless, you could point the camera at anything at one stage, not just text. It attempts to translate what it could "see" as text - finding meaning where there was

none, but then again, with a pictographic symbol system such as the Japanese Kanji, it could, for example, momentarily see the Kanji character for forest in the patterns made by a forest.

This led me to wonder how this anomaly might be used to investigate the possible misalignment of the intent of the machine-based system we use every day versus the potential use or play that might arise from them and how, by observing such misalignments, I was able to start to see and translate patterns in the landscape for myself. I then began to imagine how this particular machine reads the world. This created a feedback loop of machines trained to "see" based on a model of how *we* see. Then, me imagining how this process takes place from a phenomenological understanding of my own experiences of seeing.

Margins of Awareness

This imagining of invisible processes is central for me to understand how complex digital and physical ecologies might operate by building a phenomenological model of them, which positions this understanding in what might be seen as being on the "margins of awareness". This margin of awareness exists in between the modulations or in the invisible processes of the modulations themselves, which are often designed to be invisible, unnoticed, and unknown.

Being on the margins of awareness is important in my work. It helps to frame aspects of the hidden, misunderstood, forgotten, misremembered and misappropriated. It also reminds me, once again, and as is apt, that my own complicated relationships with the Country I live and work on as a settler, and try to (re)discover methods for treading lightly on this Country and forge a deeper bond with it, that are based on another place and time, but are never the less, all I have. This is always tempered by the fact that these are stolen lands, and my understanding of them will always remain in the margins of awareness.

There is also a loss involved here, what Haraway points to as "noise" [15], perhaps as a result of competing control strategies [16]. This loss arises with and from the modulation of information from one register to the next, in the same way, that new complex audio and visual outcomes can emerge from feedback (controlled or otherwise) via a small amount of loss, or elaborate textures emerge from out of sync layers in a modulation process, for example Reich's loops or a moiré pattern.

These practices are part of a long history of experimental practice that, through finding ways of taking a step back from the role that possesses a central "agency", finds means of allowing other more-than-human collaborators into the space—including the material of the practice itself. Allowing other forces to take the lead in this way provides a deeper understanding of the process, systems and networks at play. The Surrealists, for example, or Situationist International and Oulipo developed their own methods; Yoko Ono, Bryon Gysin, William Burroughs, Louise Bourgeois, John Cage, Laurie Anderson, and so many others found their own methods to hand over agency to wider more-than-human ecologies.

In a recent discussion, Wiradyuri conceptual artist Amala Groom likened this process to being connected to a wider realm via a tap:

> "So particularly somebody like da Vinci … is completely channelled from the pure state of consciousness that comes from the universe… there is no way that you can learn all that stuff and do all those things and be human. That is absolutely impossible. So, therefore, he had something that a lot of other people didn't have. What did he have? His tap was on, his little his little energy tap. To the universe, to the indivisibility of human consciousness, was totally awake … We all have the tap. But for a lot of us, the tap just leaks, and Western culture teaches us that there is no tap…" [17]

I reflect on this concept often, seeing some of the processes described here as a way of re-discovering this connection to a wider, universal, networked ecology.

Medium and Demiurge

In his book, The Near-Death of the Author, John Potts described my own processes in a previous set of works collected under the project title of "The Art of Writing with Data" as that of taking on the role of the demiurge." [18] In this role, the creative practitioner sets up conditions for something to take place and then stands back as an observer of what emerges. In hindsight, I was again setting up such conditions during the Bundanon residency.

During my time at Bundanon, I started to walk the landscape, spend time in it and scanning, photographing, and recording with an iPad — I very much felt I was in a process of dowsing or divining. In observing me in this process, Nancy Mauro-Flude wondered if I was in a process of scrying (figure 3). This recalled the reflective surface of the iPad as a mirror or portal becoming an interface for seeing deeper into or through the membranes of these margins of awareness. So we see other, older, perhaps lost-to-view processes emerging here—what could be taken as a heritage of Western connection to the more-than-human, a connection forged in, and for, another hemisphere altogether. Methods that

Figure 3: Right: iPad as intermediary device. Left: public domain image of dowsing in practice, Thomas Pennant - the National Library of Wales

have been eroded and discredited through processes of rationalism, essentialism, and reductionism. Falling back onto intuition and the use of processes such as the Few Simple Steps allow us to revive this lost contact and find a decentered place within a complex entanglement.

I was then slowing down to observe, record, and ask questions—following initially unseen pathways created by the more-than-human networked ecologies— animal, vegetable, and mineral—and remembering that by default, humans are implicated in the more than human, an entangled yet decentered part of this network.

Part of the process also involves looking for non-human mark-making in the environment. For example, taking multiple photographs of the bark of the local stringy bark gum trees and, in doing so, creating a visual dataset of the local language of these trees. Within a short period, I began to see this mark-making everywhere and started to ask questions about it. I initially asked what these trees might be saying, but then realised this was not the right question and wondered who or what they were saying it to instead. If they are not directly saying it for me, then the first question becomes irrelevant. In these thoughts, I am reminded of Umberto Eco's musing on the thoughts of a stone.

"Every thing thinks, but according to its complexity… If this is so, then stones also think...and this stone thinks only I stone, I stone, I stone. But perhaps it cannot even say I. It thinks: Stone, stone, stone... this stone enjoys being almost nothing, but since it knows no other way of being, it is pleased with its own way eternally satisfied with itself." [19]

The many photographs of the stringy-bark's bark were then processed as a dataset to see how a machine system might learn to reinterpret them using style transfer to retrain a model using StyleGAN 2 (figure 4).
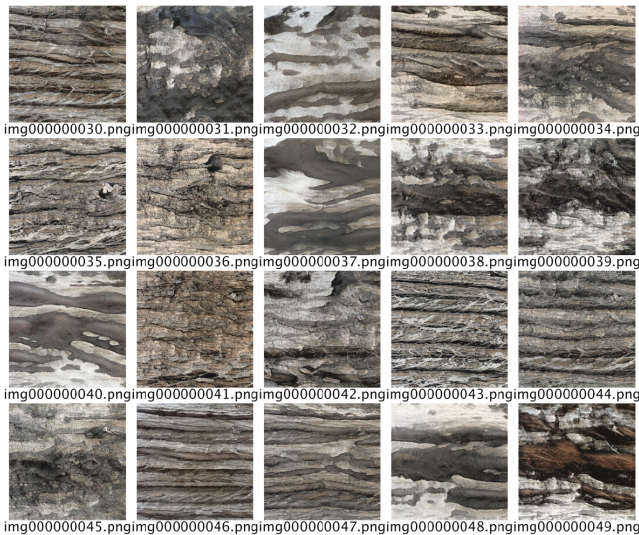

img000000030.png img000000031.png img000000032.png img000000033.png img000000034.png
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Figure 4, part of the large dataset of "bark language" created via training a style GAN 2 model. Image: the author.

The outcome of this experiment provided a new set of images that emerged out of the latent space produced through the generative adversarial networks trying to reproduce the tree's bark language. The machine does not understand the tree's language any more than I do (perhaps even less). However, these images allowed me to see patterns that the machine "saw" and "thought" worthy of including in the model it produced as it moved towards more "bark-like" images during its training processes.

Thinking about the processes of movement between and across boundaries, I wondered what the different machine processes might see in these images in the latent space produced by the GAN, so I wrote a small script that used the relatively old Mobilenet model.

I asked Mobilenet what it saw in the machine-generated images of the bark language model, and produced a series of whimsical and poetic text labels of mistaken identities—"boa constrictor, maze, labyrinth, velvet, stone wall, trilobite, agama etc." This brought me closer to an understanding of the translations or remodulations between data, image, text, language, physical and virtual. The Mobilenet model is not state-of-the-art, but this is not the point. In using it, we understand some of its inherent flaws, which, in our case, produce poetic results. However, these flaws are still present on much more sophisticated machine vision systems, such as those embedded in self-driving cars and famously visualised by James Bridle in his work "Autonomous Trap 001". [20] In playing creatively with these systems, as in "overGround:understory" and Bridle's work, we can more clearly understand these systems—where flaws are often cleverly and purposefully hidden from view—but where we may rely on them to keep us safe.

I also must wonder, are the patterns I begin to observe, over time and repeatedly, in machine-generated space and physical ecologies and those in between, being trained and generalised in my own cognitive networks – changing how I interpret my sensory input? This process also brings to mind a question of affordances. While the notion of "bark language" is, for example, a poetic notion, it does lead to a broader imagination of the possibilities of what the nature of the bark (textural, visual, etc.) affords through communication with the ecology in which it exists. In a language never meant for me, is it saying "shelter in me" to a local insect? Through the poetic, I am then drawn in to reflect on a broader ecology.

The Overground and Underground

As noted, this project was developed as a series of experiments with many (more or less) "successful" outcomes—success is determined by what has been brought to light rather than an expected deterministic telos. These experiments continued as I followed the non-human mark-making in the physical world. The paths made by wombats both Overground and underground became increasingly significant. I developed a fascination with how the interface of the iPad screen and its attached sensors—camera, lidar, motion—
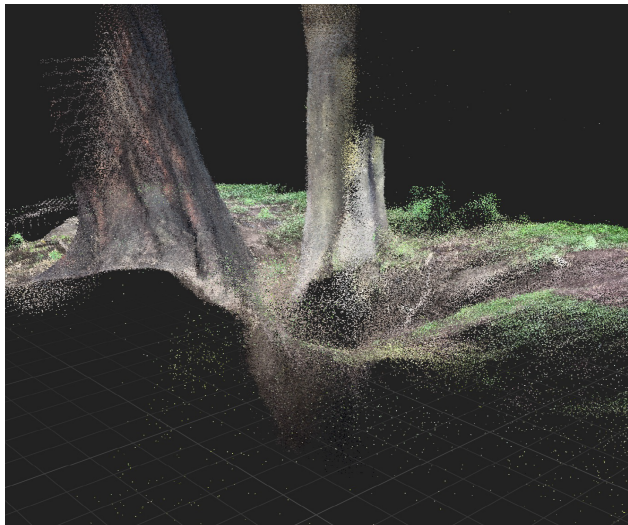
Figure 5, The overground with wombat tunnel entrance to the underground as depicted via lidar scan and point cloud. Image: the author

enabled me to see a little inside their world— a world that I was not usually privy to as I spend my time on the Overground.

The Overground and Underground (figure 5) are not to be read entirely literally, that of the physical space - the space I inhabit and the wombats (sometimes) and the other space the wombats (sometimes) and worms (always) inhabit. The Overground is also a space of my presumed knowledge or a space of awareness where I have the potential to gain knowledge. The Underground, on the other hand, is out of my reach. I can imagine its existence and speculate or use speculative methods to try and draw it out. However, it will always remain unobtainable because the Overground is beyond an impenetrable boundary, impervious to my complete understanding. Hence, the use of methods to remove the "I", the self as agent, and the undeniable need for co-creating with the more-than-human that does have access to it. The Overground and Underground are also the micro and macrocosm of the Hermetic "as above, so below" — small and seemingly insignificant observations and outcomes can inform or be replicated at other scales.

All these elements became the material for thinking about world-building together and in collaboration with the more-than-human.

Further Outcomes

The materials, methods and outcomes described here were the beginnings of a much longer process. The work presented at https://overground-understory.net/asemic was the first in a series of "finished" pieces. The practice-based research and outcomes are ongoing and include a series of performance lectures and other web-based outcomes. https://overground-understory.net/ provides a container for these as they emerge.

The Few Simple Steps

Which brings me to the question of what the Few Simple Steps actually mean in this space—how do we, as practitioners who critically engage with emerging technologies and wider ecologies, slow down, observe, record, question and share? In particular when both our virtual and physical environments are changing at such a rapid pace.

Anyone working with emerging technologies will understand the rapid speed at which they change. This is a speed we cannot keep up with in any way that allows us to slow down and spend time with these technologies and critically understand what they mean for both our material practice and our place in a wider digital/physical networked ecology.

Sitting and spending time with processes that may not be considered cutting-edge but are nonetheless underexplored is one way of doing this. Not simply grabbing the shiny new thing. Creative practice can then become central to the ultimate question of "just because we can, should we?"

These ongoing experiments provide ways for me to start to imagine how the more-than-human in the digital space — the machines, so to speak —are seeing, knowing, or understanding the networks and ecologies that they are part of, both physically and virtually and ultimately remember that those things do not actually see, know, or understand in any sense that we experience these words. So the outcomes that emerge from the experiments, as digital objects of speculative design, are possible ways of entering the Underground and allow others, through the encounters this creates, to reflect on and come to a deeper understanding of these spaces as part of their own trajectory.

This imagining requires an understanding of the offers made by current and emerging technology. In doing so, it is critical to understand that because of the imaginings of our predecessors, we are at a moment when it is impossible to outright reject these offers if we wish to participate in any way in contemporary society.

We are implicated and entangled within complex networked systems so that while it is possible to critique the systems, moving outside of them is impossible. The approaches I have offered here centre imagination, creative thinking and doing, and attempt to decenter the human. They rely in part on intuition and an understanding that the phenomenological experience of a metaphor can be as powerful as the actual. Approaches where agency in a larger conversation is reclaimed, yet at the same time, agency is given over to more-than-human systems as co-creative partners in collaborative efforts to understand and ultimately communicate through storytelling and making what is invisible, visible. Often, what is invisible is only invisible because we are looking the other way. So I return to the Few Simple Steps to conclude - which force us to look in the right direction if only we take the time: *slow down, observe, record, ask questions, share.*

Figure 6: "overground:understory", web-based outcome at https://overground-understory.net/asemic. Image: the author

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Author Biography

Andrew Burrell is a practice-based researcher and educator exploring virtual and digitally mediated environments as a site for the construction, experience, and exploration of memory as narrative. Their ongoing research investigates the relationship between imagined and remembered narrative and how the multi-layered biological and technological encoding of human subjectivity may be portrayed within, and inform the design of, virtual environments. Andrew's networked projects in virtual and augmented environments have received international recognition. Andrew uses creative practice to research and understand the complexities of emerging and speculative technologies and is particularly interested in how these are implicated in more-than-human ecologies.