

(EN)TANGLING WITH ARTIFICIAL LIFE

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ABSTRACT | This article explores the artist's relationship with Nature and her experience of Nature as a form of digital "consumption". The author analyzes the limit that divides what can be qualified as "natural" or "artificial" life. Taking into consideration the artistic practice of the author, where she considers that curating a set of data, training a neural network and exploring the results of the model produced can be understood as a form of meditation around a subject. Finally, it exposes how artificial life can be an experimental interface, for within the digital we can find countless ways to create experiences and interactions. It is also possible to create digital life forms that can be understood as autonomous actors. It can be a place where we can explore a potentially countless amount of alternative narratives that in turn will perhaps allow us to see our physical world in a slightly different light.

KEYWORDS | Nature, artificial intelligence, artistic practices, artificial life, generative life forms

Nature, as a term, subject, concept, and experience seem to seep into all aspects of our lives and individual practice these days. It's at once a source of inspiration, solace, of hope, and worry. This realm of the "more-than-human," a term that is less divisive than "non-human" and one that helps us see that even our own bodies are comprised of more than just "us," we exist as a continuous, shifting whole that is made up of permanent and temporary parts. Furthermore, it imparts greater importance by saying that it is "more-than," rather than "different," with difference often being a slippery slope to subconsciously continuing our cultural imprinting of ourselves as the superior form of life.

As humans in a more-than-human world, what is Nature, anyway? Commonly it seems to be defined as that which isn't human or created by humans. A simple binary divide that sorts "us" from "them," bootstrapping the mechanisms that create identity and sense-of-singular-self. This segregation has led to the easy justification of extraction, exploitation and displacement of all that isn't "us" as it is both a difference and a hierarchical construct. So Nature is a blanket term for

everything we don't contain within our sense of identity and that is naturally occurring (here we go, biased language and all) around us and our sphere of being. Yet we evolved alongside all other forms of life on this earth, in geological history we've only been propagating a different story about our place in the last second or less of our existence, what gives? Can we say that Nature even exists as we assume it does?

Honestly, it may not be very helpful to nit-pick on a word that does help us organize our experience of the world, were it not for the fact that we tend to not recognize equality in that which we deem different from ourselves. This plays out even in the backyard of our species with dehumanizing rhetoric being a steep, slippery slope down to discrimination, abuse and worse of those who are us, or ourselves, genes and all. Sharing a genetic makeup is meaningless without there being an emotional, empathic and rhetorical narrative of equality and equal worth.

For those who fall under the umbrella category of "Nature", they are automatically the other, one outside our community, a source of raw materials, of sustenance or entertainment.

A status that we find little evidence of being a division of mutual consent. Insects, plants and other animals seem not to experience any such difference, we make good food, shelter, fertilizer and more for them, as do they for us. Nature doesn't appear to know or understand that it is Nature.

So, even if we are unsure of its existence, where do we find Nature? As someone who binge-watches Nature documentaries, loves to be outdoors and obsesses over wonderful, strange creatures and ecosystems found in scientific research, online on social media, I find myself, in this brief moment of introspection, seeing that a significant part of my input about the more-than-human world stems from third-party, digital sources. My experience of Nature is one that due to a variety of reasons occurs in the form of digital "consumption", the digital has become part of a day-to-day experience of nature. Platforms, such as Instagram, have algorithms galore that tailor my experience as a user, serving me up countless wildlife rather than influencers. Commonly this is referred to as a "filter bubble", that is, the digital space constructed for me by machine learning models and algorithms that work ceaselessly to provide me with content I most probably will engage with.

With machine-learning we have this interesting issue of the unknown, current deep learning technology (for now and the short-term foreseeable future), is comprised of different types of models, these models contain the knowledge "learnt" by the neural networks from the data they were fed. This might be images, databases of numbers, videos, etc. Any form of digital information can in theory be fed into a neural network that has been correctly configured. However, even though we can process a huge variety of data, the neural network still only can learn and make inferences from the data it was fed.

Invariably, this has led to the ever-important discussion of bias, e.g. when face-detection algorithms fail to reliably detect faces with skin colours outside those present in the original, overwhelmingly Caucasian, image dataset. Another troubling example is the 'Excavating AI', an investigation into how a dataset that is typically used as the standard for benchmarking various neural networks was riddled with inaccurate, sexist and otherwise negatively biased labels wherein people were give labels such as "failure", "troll", "alcoholic", "addict" etc. It goes without saying that there are no grounds for these labels to be applied to any of the persons present in the dataset. Yet, even though steps are being taken to remediate these "inaccuracies", it teaches us an important lesson that whatever data and labelling exist, it should be considered to be plagued by our prejudices, ignorance and preferences.

But wait, weren't we talking about Nature? What does the horrible labelling of people have to do with Nature and our digital realm? As it turns out, quite a lot. We are after all naturally biased towards all things human, we are after all humans and most of our daily interactions are influenced by

other humans, so it makes sense, but what of that which we categorize as "not human"? How well-represented is it?

Let's take the hashtag "#nature" as it appears on various famous social media networks for images, at first glance we see a huge amount of the images tagged with "#nature" containing human portraits. Similarly, "#animal" contains a majority of pets (yes, cats & dogs) as well as the animals most commonly represented in pop-cultural media, for instances, lions, hummingbirds and elephants to name a handful that sticks out.

Ok, so in itself this isn't so bad, is it? We share and post what we know, after all. On the face of it, that's perfectly true, the world represented on social media very much reflects the day-to-day western worlds experiential sphere. That doesn't however mean that it is in any way representing the actual more-than-human world around us, in fact, compared to the biodiversity that surrounds most of us in any given pocket of Nature we may encounter, it visibly pales. It's not a stretch to say that the Nature represented in "#nature" isn't close to what is actually out there. So should we train a neural network on these self-labelled datasets of the natural world, we might not end up with models capable of recognizing or representing the actual biodiversity commonly present around us.

These machine learning models have another influencing factor that stems from us, namely our aesthetic bias, we tend to gravitate towards things that we find familiar and beautiful. A key factor of this is relatability, we can easier relate to a mammal than an insect. It's easier to find an empathic resonance in mammalian form and behaviour than in an earthworms vital contortions.

Again, in itself, this might not be so bad, after all, as individuals we have the capacity to change that relationship, to learn appreciation and empathy outside our baseline cultural upbringing. What becomes disturbing is when we scale it up, and the digital layer of our lives is nothing if not a magnifying mirror of ourselves. The multitude of algorithms that make up the underpinnings of our daily feeds of information, interaction and more are tailored to our preferences, biases and interests, inadvertently creating a self-reinforcing loop that propagates world-views and values.

The mirror becomes a contagious caricature, obscuring our view of our living co-inhabitants. It's also horribly mundane. These aren't flashy, futuristic processes that are made explicitly representative of their function through their interface form. Quite the opposite, they are subtle, background elements that go entirely unnoticed unless they happen to fail in a jarring manner.

It isn't hard to forget that the mundane is equally a powerful space for our stories as the silver screen, music and other mediums of art. After all, isn't it so dull? So when along

comes shiny interfaces holding the promise of effortless, positive stimuli that you ought to fear missing out on, it's a no-brainer really: I mean, come on, I can distract myself on the go without expending much more than a thumbs worth of energy and simultaneously make sure I haven't missed out on anything socially important, how can we say no to that? Not to mention Nature documentaries have far better camera-work and editing than any real forest. It knows our weaknesses, this mirror.

Looking to the edges of the mirror, as an artist working with Nature as a subject, the scientific corpus of data is often the only real visual/otherwise representation of anything more than contained in our cultural sliver of the so-called natural world presence. Whilst the scientific method attempts objectivity, the very means of classifying, cataloguing and organizing observations, in turn, lends itself to a certain way of seeing & deconstructing the world.

It also doesn't tell a different narrative of our co-inhabitants role and our relationship to them. Biology is a human-made study of our surroundings that also is built upon a societal foundation, one that reinforces it as a framework for studying difference. Could it be there are more intuitive, less rigid models for experiencing the world where art meets biology meets actual interactions?

A personal motivation for exploring an artistic practice through the medium of deep learning has been how through the process of first curating a dataset, then training a neural network before finally exploring the outputs of the model produced by the sum of the networks knowledge can be described as to perform a meditation upon a subject. The essential qualities of the dataset are distilled, given space to emerge "at a distance" from the very personal process of initial curation.

To meditate is also to spend time focused upon a single point. It's no secret that most deep learning processes are arduous at best, requiring time, patience and a fair bit of luck most days. This contrasts to the "end experience" most people have of these models who normally invisibly and near-instantaneously tweak our experiences online and offline. This duality lends itself to the artistic process, to spend time in a space is to become intimate, not with the technology, but with how the subject creates a dialogue between itself and the medium it is being channelled through, enacting a feedback loop. These feedback loops allow us to erect new interfaces that can enable new understanding and outcomes from a seemingly given starting point.

Take, for instance, a very formative experience with jellyfish in my childhood. My parents took me to a 3D cinema experience, of the type where you wore blue/red glasses, wherein I was scared stiff by a jellyfish swimming towards me

on the screen. This early fright leads to what became a phobia of jellyfish and in turn, later on, a certain fascination with the aesthetic of jellyfish. In turn, this dread-laden awareness became a source of creative inspiration and the aquatic an artistic subject that has by now become transformed into a fully-fledged practice.

From this, I'd like to examine something easily neglected, namely that the formative experience was not, so to speak, in Nature, but in a reproduction of something we define as Nature, in a place, we clearly define as Artificial. Nature, as a physical presence wasn't required to be formative, its reproduction sufficed. Daring to be bold, the argument can be made that we don't need Nature to have strong experiences of Nature, the artificial can match the conceptual form we generally give Nature. It is storytelling.

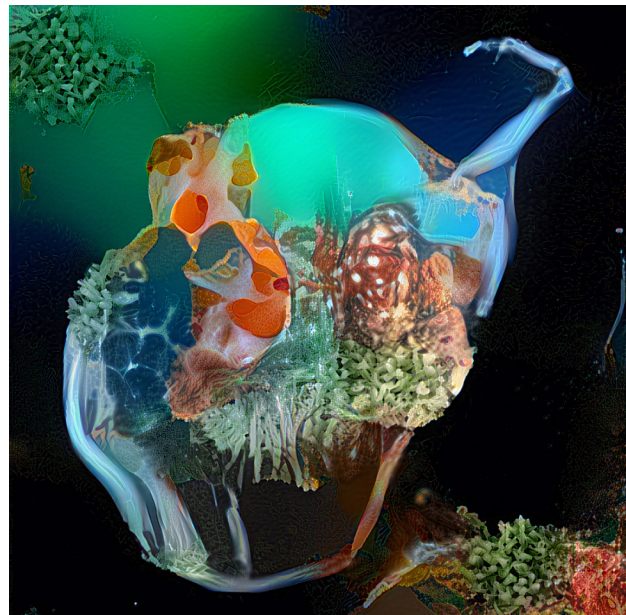
The story can exist abstractly and still concretely shape our impressions, experiences and behaviours in our interactions with the more-than-human. Our ability to tell and re-tell stories allows for a recursive feedback loop to be enacted, one that can be seeded with the potential of new perspectives and values. The algorithms that help us automatically organise and shape our impressions of the world act as unwitting storytellers, magnifying and multiplying a multitude of preference-tailored images of the world. These story-pumps, or mirroring mechanisms, allow us to inhabit a lossy, yet more uniform story.

We often image our digital world somehow more platonically pure than the "real" and "physical" world, this experience is reinforced by the design of the devices and the interfaces that inhabit them. It's easy to think that what occurs in the digital world somehow belongs to another plane of existence, one that barely touches our realm. Experiencing, in this manner, technology makes it hard to believe that our digital realm is interconnected and entwined with the sticky, messy, complex web of life elsewhere.

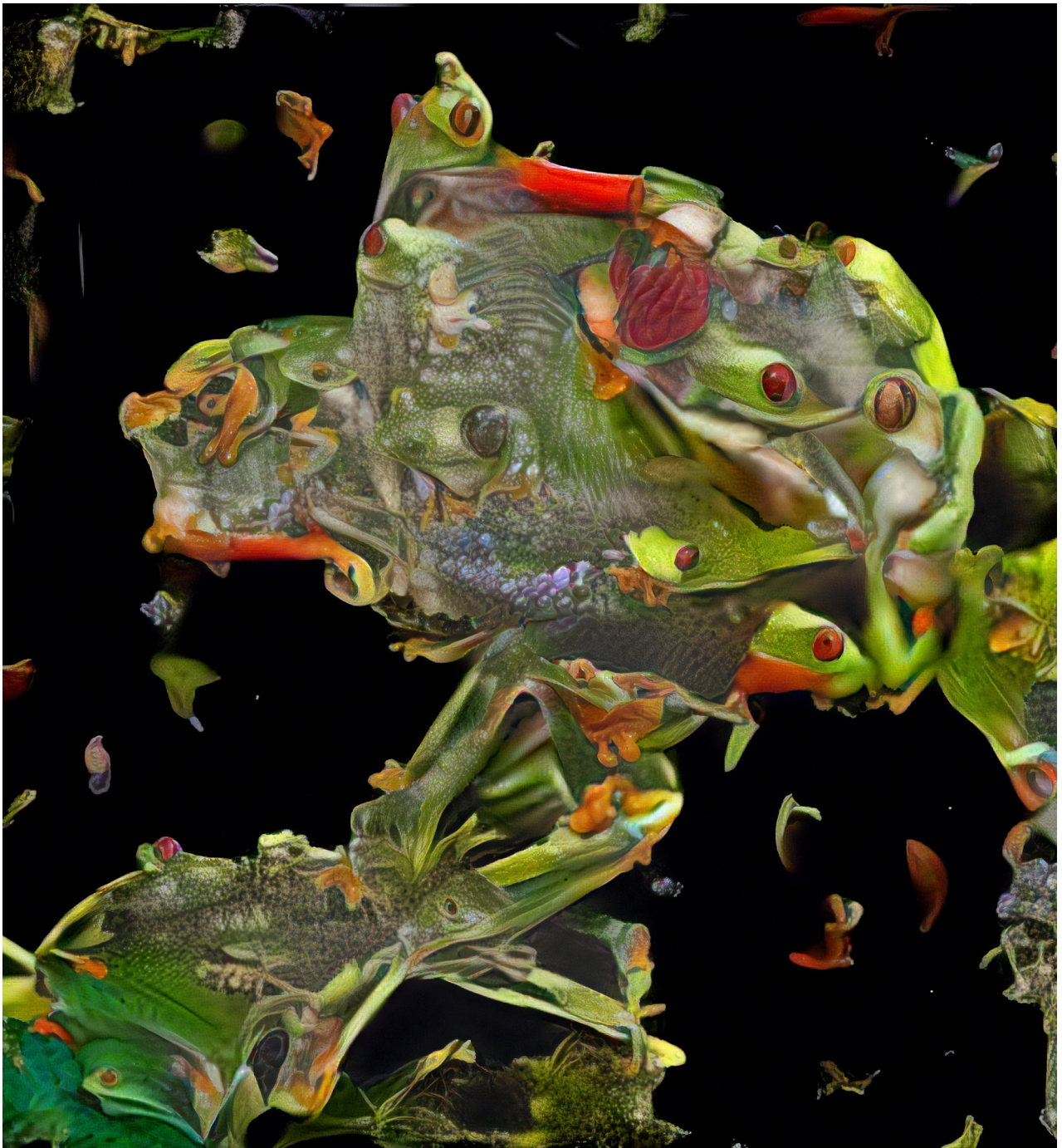
Yet, there a variety of systems, machines or even organisms if you will, that convert various raw materials into energy that in turn power a whole ecosystem of digital agents, some that you hold in your hand, others that allow messages to bounce around, changing physical properties and even the shape of our physical world. Some are slaves to others, some are semi-autonomous or even autonomous, performing, interacting and experiencing life-cycles of iteration, growth and more.

The sum of our digital lives resembles very much an ecosystem of organisms in play, one that furthermore is enmeshed in the physical, Natural world. Those physical influences shape, and change the physical world and are in turn changed, and influenced. Solar flares disturb electrical grids, storms blow down power lines.





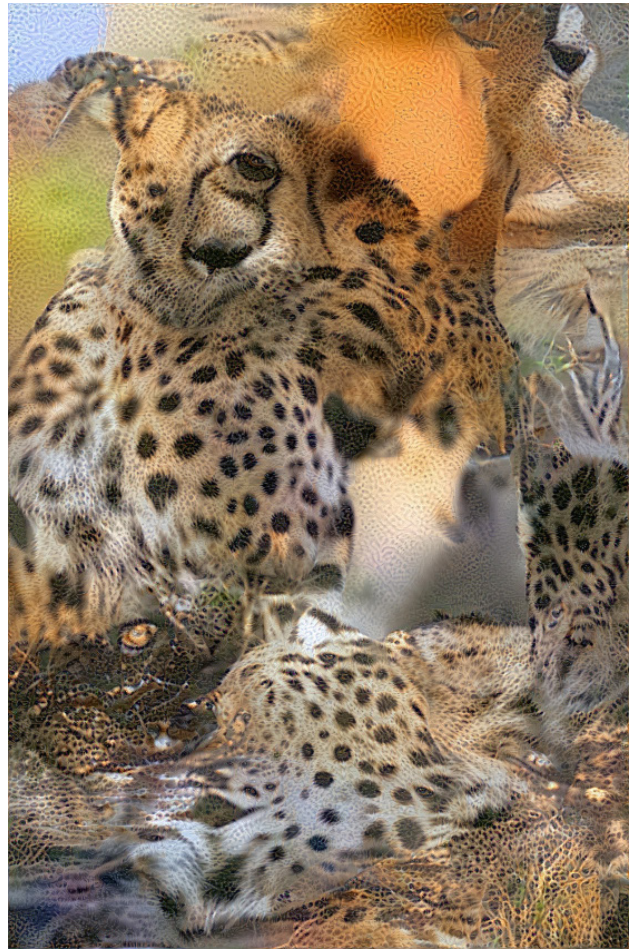












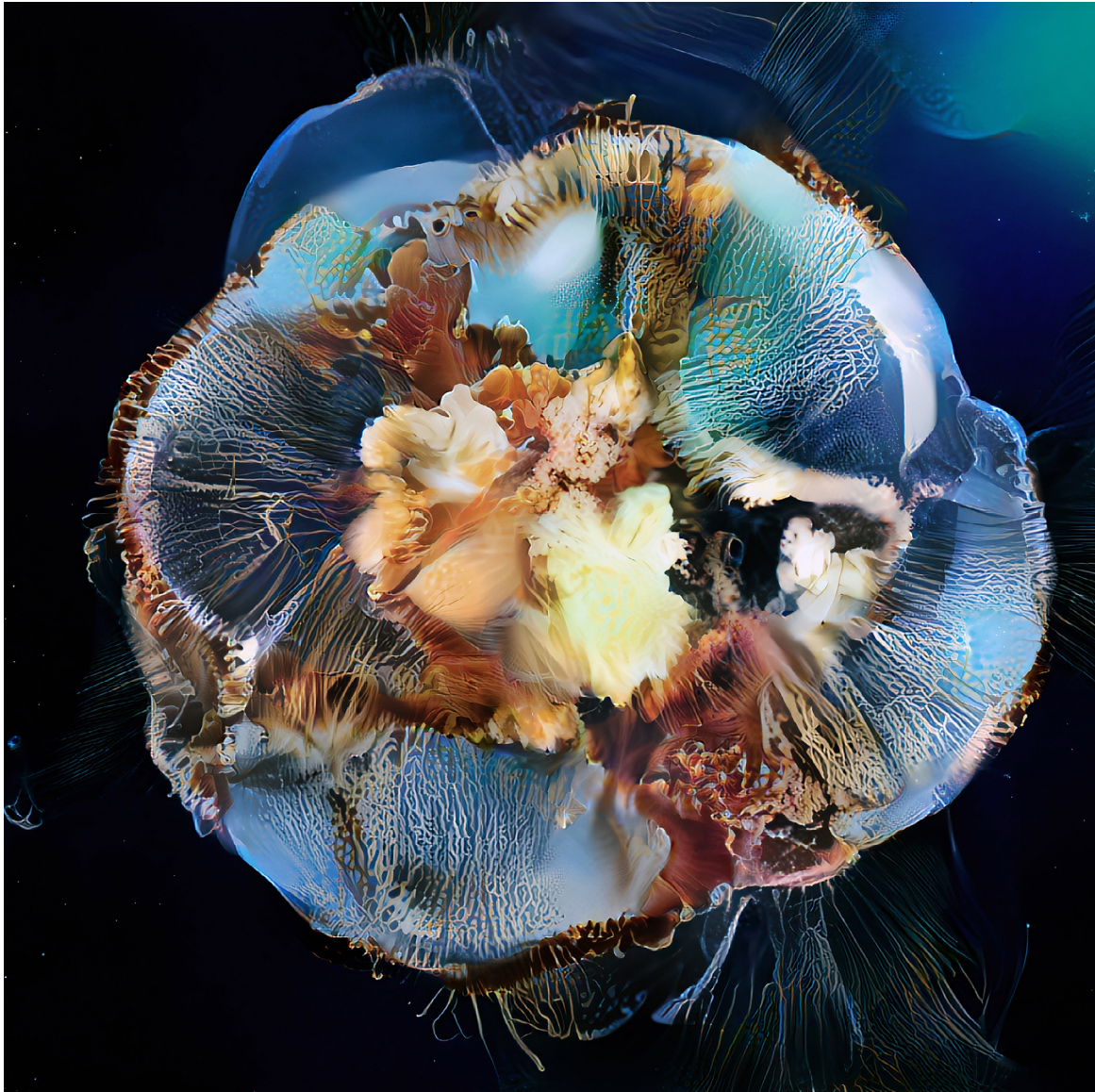


Figure 1 to 18. Sofia Crespo. *Neural Zoo*. 2018/2019 Convolutional Neural Networks Digital / Acrylic Prints

What emerges from the sum of all these interlinking systems is an emergent ecosystem, one thoroughly entangled with our natural world as it takes input from, extracts nourishment and raw materials as well as transforms and provides new spaces for other lifeforms. Additionally, life implies a complexity that can be messy, organic, or even untameable. Frankly, just what we need in order to see the digital having a complex interaction with its context.

So, the very digital ecosystem that turns out to be quite enmeshed in the more-than-human space, is simultaneously mirroring our own stories, obscuring the far more entangled reality we inhabit. Our world is, when seen like this, suddenly far more plastic than we ever could have hoped for: we have the potential to in our digital realm explore dialogues directly with the more-than-human as co-presence. Our platonic interface is ripe for weeds and wildflowers.

So, what on earth does it all mean? After all, it's easy to claim "smartphones are nature too!" and go home, right? To be fair, there is absolutely a fantastical (in the story-telling sense) aspect to the viewing of the digital and would-be natural world being seen as interacting ecosystems, but straying away from the scientific edges and further outwards it can be thought of as a narrative mechanism, a tool for introducing a new scene or character. So let's have artificial life enter from stage left.

Artificial life is nothing new, in fact, various forms of automata and ideas of automatons have been around for many centuries. These often took the form of complex mimics of living creatures, be they a duck or a musical band (and some chess-playing variants in-between). With the Renaissance, we can see how a worldview expanded into this space with

the ideas of the non-human being purely mechanical and thus possible to emulate or design, in time this further led to the idea of being able to create self-replicating machines (a later sci-fi staple).

Quirky as these machines have tended to be, they eventually reached new levels of fruition with the age of computers that allowed for both hardware (robots) and software to take automata to whole new levels of ability and complexity. It was first coined as “Artificial Life” towards the end of the 1980s, defining it as “the study of artificial systems that exhibit behaviour characteristic of natural living systems.”

What can be in practice qualify as life, “natural” or “artificial” is naturally a very unclear borderland. If an artificial lifeform or ecosystem exhibits a suitable number of qualifications, or features, that are indistinguishable from the inhabitants of our physical world, are they at all alive? What of emergence in chemical circumstances, wherein complex compounds begin to exhibit life-like behaviour? In the end, attempting to define any clear divide becomes an exercise in re-enactment, drawing lines where there are none. What remains vividly in focus is that to explore artificial life is to be present in the world, seeing and mimicking the processes inside, around, before and after us.

For our intent and purpose, let us think of artificial life as an experimental interface to other worldviews. Within the digital, we have countless ways of not only creating experiences and interactions but also to create digital lifeforms that themselves can be thought of as autonomous actors. We and they are both interacting with limited means, our respective experiential interfaces, within the same framework or platform. In the virtual, equality of ability and potential can be easily enforced, creating opportunities for different experiences of “the Other” as an equal or even better. We can explore potentially countless alternative narratives that in turn might help us see our physical world in a slightly different light.

A moment of empathy towards an insect-like digital being might in turn help encourage less immediate intolerance for its physical cousin through a shift in the story of “bloodthirsty bugs”. Any single experience is doomed to be relatively weak in its influence but multiplied and mutated it might create enough new experiences to warrant some small change or awareness. By enacting digital meditations and inviting others to become part of them as viewers and participants more and more time is spent on a subject or idea.

Equally crucial, it allows for fictional windows, experiences of speculative, parallel realities. Allowing the visitor to experience the “what if” and more importantly “how small” a change of a single part of the world we take for granted can result in such a radically different outcome. By allowing the artistic process to diverge away from the real and into the

fantastic is also a bridge to finding and (re)building agency. The consequences of a single variable changed, one that might even be considered possible to change on a personal level is empowering as it helps us experience that we have agency.

It can also help us better understand ourselves, not as singular beings, but as symbiotic ecosystems of interacting lifeforms that exist in a constant interchange with their environment and co-inhabitants. To dissolve the rigidity of self is an entry-point into seeing a more entangled world wherein our thriving hinges upon our ability to change what we experience and how we choose to weigh it in our actions.

This particular approach isn’t meant as a solution, rather, it is part of a larger idea of “death by a thousand papercuts” as a model for engaging wicked problems. These types of problem, for example, climate change, are the result of so many complex systems in multitudes of interactions that any one, single approach is doomed to fail. We can’t feasibly solve anything with a single solution, especially as it is rather hard to get any large group of people to agree on virtually anything. Nor can we let apathy infuse us when met with the sheer scale and depth of the issues at hand, to purport doom and gloom leads very easily to a dampening of the individual’s sense of agency and motivation for engaging with change.

It’s especially important when we see how technology, due to its natural complexity or ignorance, isn’t sufficiently critically and constructively engaged outside the realm of the product. Already we see many attempts at powering conservation efforts with the help of deep learning. These are great, powerful attempts, but they as digital actors don’t occupy any mundane space in most day-to-day lives. That still leaves most of the larger narrative loop unchanged, and crucially, unchallenged.

We exist in feedback loops, large and small, these are generally either emergent in nature (societal scale) or products (social network algorithms, that is, individual/group scale). What if these loops were subtly warped to also inject new ideas, worldviews and interactions that didn’t cater entirely to a human-centric model? What if they could promote different interfaces with our world, ones that pull back the curtain and better allow us to see and appreciate our actual entanglement with the natural world?

The more we interact with the digital, the more it becomes a natural ecosystem of its own, one that has always been there, ready to spring forth if only the right combination of ones and zeros were aligned. could it be artificial life, in its multitude of forms, that emerges from a space of potential, a pool of “just waiting to happen”? if so, what does the entanglement of life artificial and organic mean going forward?

NOTES

¹ Kate Crawford and Trevor Paglen, "Excavating AI: The Politics of Training Sets for Machine Learning, Septiembre 19, 2019. <https://excavating.ai>

SOFÍA CRESPO is an artist working with a huge interest in biology-inspired technologies. One of her main focuses is the way organic life uses artificial mechanisms to simulate itself and evolve, this implying the idea that technologies are a biased product of the organic life that created them and not a completely separated object. Crespo looks at the similarities between techniques of AI image formation, and the way that humans express themselves creatively and cognitively recognize their world. Her work brings into question the potential of AI in artistic practice and its ability to reshape our understanding of creativity. On the side, she is also hugely concerned with the dynamic change in the role of the artists working with machine learning techniques.

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