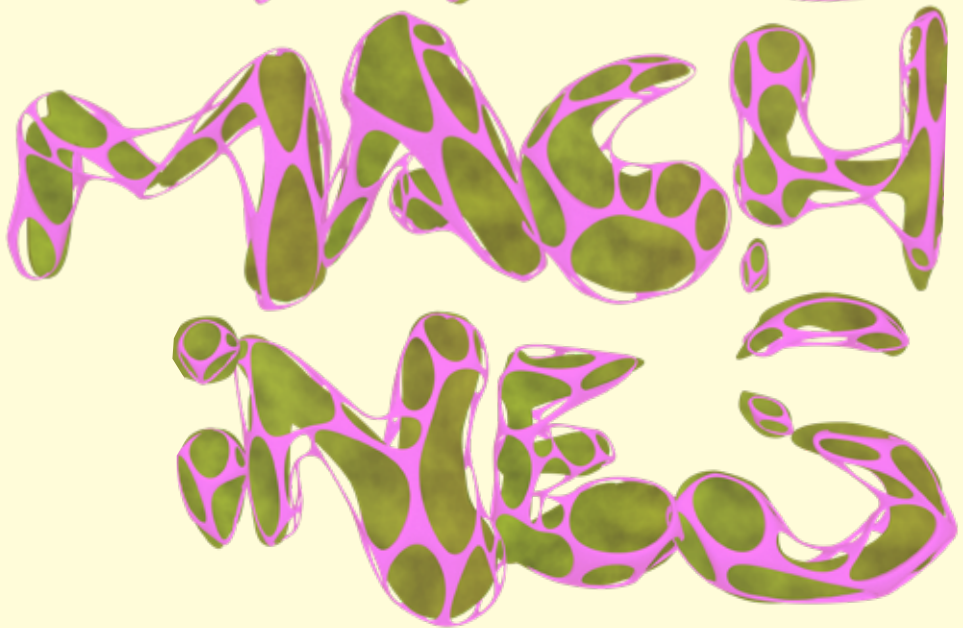


Rebecca Allen K Allado-McDowell
Ian Cheng Freire Barnes
Simon Denny Lauren Studebaker
Aleksandra Domanović Ashley Hockney
Jake Elwes Joe Parslow
Lynn Herschman Leeson John Gouigah
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Marguerite Humeau John Kenneth Patonada
Keiken Rebecca Edwards
Lauren Moffatt Paul Waeber
Tabita Rezaire Laurie Cluitmans
Theo Triantafyllidis Domenico Quaranta
Anicka Yi Lucy Rose Sollitt



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Elizabeth Neilson Director, Zabłudowicz Collection

Technology has crept into our lives, augmenting and changing our abilities. Human evolution has been influenced by the intervention of machines; we have accepted technology into our bodies with little resistance. Pacemakers and insulin pumps regulate when the body is unable to; prosthetics support and enable us; our handheld devices hold our memories and influence the way we think, communicate and remember.

The *Among the Machines* project explores interactions between humans, machines and non-human entities. This relationship is new and still evolving, and also affects how humans interact with one another. The thirteen artists, from different generations and continents, are connected by their interest in technology's impact on human social development. From disrupting the biases contained within datasets to imagining new types of consciousness, these artists materialise possibilities for co-existence. The exhibition took the form of a group show, but one that contained a series of solo installations, plus a digital layer of augmented reality artworks, produced in partnership with Daata.

This publication, created as an extension of the exhibition, contains newly commissioned texts by thirteen writers from a variety of backgrounds and positions, each of whom approaches an artist's work in their own style.

The introduction by the exhibition's curator, Paul Luckraft, expands and theorises on the context from which the project emerged. Taken together, this book offers a compendium of views on the evolving impact of technology on human existence. Adding to this multi-layered experience is the documentation of two newly commissioned performances, by Jake Elwes and Libby Heaney, which took place within the exhibition, playfully addressing the messy materiality of artificial intelligence and quantum computing.

So often technology is spoken of with fear and suspicion, as can be seen in many books and films of the sci-fi genre. Yet here the artworks, which are all from the Zabłudowicz Collection, take a more nuanced, less pessimistic approach. Art and artists occupy a unique vantage point: on the periphery of society, yet able to see and comment on important topical issues. For decades pioneers such as Lynn Hershman Leeson and Rebecca Allen examined issues that are today some of the most relevant and contentious, such as surveillance technology and the impact of the internet on individual identity and mental health. A new installation by collaborative group Keiken updates Hershman Leeson's and Allen's investigations with contemporary, experimental haptic and gaming technologies. In the case of all three artists the approach is one of careful optimism.

Huge thanks go to all the authors whose work is published here, as well as to the artists and their galleries. Thanks also go to the curatorial and installation teams at the Zabłudowicz Collection, who took the concept of curatorial support to new levels – for example, growing, feeding and curing kombucha cultures for Anicka Yi's sculpture. Lastly, our heartfelt thanks go to the Zabłudowicz family for their ongoing commitment to advancing our understanding of what it means to collect and care for artworks in the twenty-first century.

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Paul Luckraft

Among the Machines

One of the most urgent cultural questions of our time, being addressed across disciplinary fields in the arts and sciences, is what impact new forms of data technology will have on our relationship with ourselves as individuals, our relationships with each other as a society, and our relationship with the planet and the life forms we share it with.

As artificial intelligence (AI) develops in the coming decades to – potentially – surpass human intelligence, *Among the Machines* reflects on how, as a species, *Homo sapiens* will respond to a stage of evolution beyond the human. The work of thirteen international artists from across the generations has been brought together in the form of a dialogue around such questions, first as an exhibition and now as this accompanying publication. We have invited writers, curators and artists to respond to the individual artists presented in *Among the Machines* in newly commissioned texts. The focus was the works exhibited in the exhibition; however, contributors were encouraged to set these pieces in context and discuss the broader practice of the artists and the wider cultural, social and technological environment. Through a variety of approaches, the projects mapped and discussed in this book investigate how humans interact with machines and non-human entities at this precarious tipping point in the story of life on Earth. They explore alternative branches of evolution and new types of consciousness.

Among the Machines comprises artworks from the Zabłudowicz Collection in a range of forms, including sculptural installations featuring organic and inorganic materials, videos in the form of linear narratives, and live simulations that use game engine software familiar from video games to produce non-repeating, ever-mutating worlds. And a number of works require direct interaction from the viewer to activate them through play. A central component is new augmented reality (AR) experiences overlaying the physically installed exhibition and viewed via the screen of a smartphone or tablet. Created by artists Joey Holder, Lauren Moffatt and Theo Triantafyllidis, the experiences have been commissioned and produced in partnership with the team at Daata. Activated through the scanning of printed image targets integrated into the artists' physical installations, these site-specific animated digital sculptures respond directly to the gallery space in the former chapel.

From these artworks, distinctive atmospheres emerge, shifting between optimistic excitement and dystopic warning, sometimes within the practice of a single artist or collective. *Among the Machines* foregrounds the ways in which artists speculate through narrative and materials, and this process invariably draws from the deep well of sci-fi stories that have been told over centuries, both the well-known and the more obscure. Significant, influential artists such as Lynn Hershman Leeson and Rebecca Allen have been pioneering figures, over a number of decades, in drawing on such myths and cultural stories, while setting a new agenda through technical innovation, thereby asserting a feminist challenge to social norms. The installations of the artists Keiken and Tabita Rezaire take up this positive agenda of redefining identity and asserting agency through a feminist harnessing of technology, as Donna Haraway famously did in *A Cyborg Manifesto* (1984). This is a transformation of the human – but not in order to retain a dominance over other people or other organisms. Rather, it is a necessary adaption and resetting.

The work of the artists in *Among the Machines* highlights how historical ideas and motifs reverberate from the past through to our present, and filter through to our possible futures. The destabilising effect that machines have had on the idea of human agency and ascendancy on Earth is not new, however. In 1863, four years after Charles Darwin wrote *On the Origin of Species*, a New Zealand newspaper published a letter titled 'Darwin among the Machines', mysteriously signed 'Cellarius'.¹

¹ The exhibition title came from Samuel Butler's article 'Darwin among the Machines' (published in *The Press* newspaper, 13 June 1863, Christchurch, New Zealand).

Contemplating the implications of Darwin's new theories, the letter compares human evolution to machine evolution, prophesying that machines will eventually replace humans: 'In the course of ages we shall find ourselves the inferior race'.² The only solution, the letter claimed, was to wage a war to the death on the machines.

The author was English writer and critic Samuel Butler (1835–1902), who developed his ideas into the satirical novel *Erewhon* (1872). In this utopian satire a traveller discovers a new civilisation, then finds that it has chosen to destroy its machines, such as pocket watches and steam engines, in order to preserve itself. In part, the book is a critique of Victorian morality about the deserving and the undeserving, explored through inverting notions of crime and punishment, illness and care. But Butler is also pointing to the absurdity of trying to halt technological progress, and taking seriously the radical changes already in motion in his time. Butler's acute perceptivity led him to speculate through fiction. If life on Earth emerged from inanimate matter, as Darwinian theory suggested, then surely, as the rapid development of machines continued, they would form a complex consciousness of their own? If the mere cabbage was once the apex of living things, might the human species also be a staging post along the way to an unknowable future?³

In 1936 Alan Turing, a British mathematician who, during the Second World War, helped to break the code the Nazis used for the Enigma machine, published a paper that outlined two revolutionary mathematical objects, machines and programs, which together underpin all AI and machine learning technology today. In a 1951 lecture Turing referenced Butler's *Erewhon* and the writer's predictions, asserting that: 'Once the machine learning method had started, it would not take long to outstrip our feeble powers.' More recently, computer scientist Stuart Russell has led the debate around the dangers or unintended consequences that may come with an artificial intelligence that is untethered from any human checks and balances. In his 2021 Reith Lectures and his book *Human Compatible* (2019), Russell sets out the implications of the arrival of a more powerful form of AI, known as general purpose AI, or AGI.⁴

This new form of machine intelligence would be a fundamental departure from all current standard models of AI in that it would not need – or, indeed, heed – objectives set out by

² [https://en.wikipedia.org/wiki/Samuel_Butler_\(novelist\)#Career](https://en.wikipedia.org/wiki/Samuel_Butler_(novelist)#Career)

³ See also George Dyson (1997), *Darwin Among the Machines* (Penguin).

⁴ Stuart Russell (2019), *Human Compatible: AI and the problem of control* (Penguin). See also 'The Reith Lectures 2021: Stuart Russell – Living with Artificial Intelligence', BBC online: <https://www.bbc.co.uk/programmes/m001216k>

humans. AGI could quickly learn to operate across the varied fields of human activity. It is worth remembering that AGI would not be an intelligence or a consciousness as we conceive of it in human terms. Indeed, scientists and philosophers do not agree on what human consciousness is. AGI would be unique. Although it's very hard to predict how rapidly AI will evolve in this direction, Russell suggested that in a few decades AGI could be with us. And when it arrives, it will be 'the biggest event in human history, and perhaps the last event in human history'. Quite a prediction.

The conception of AGI as a new life form is a central provocative premise for *Among the Machines* as a project. The connections to be made between theories of biological and technological evolution serve as a metaphorical jumping-off point. We are talking about the emergence of a new type of human. For some this provokes fear and resistance, but for others it is an opportunity, or even an inevitability. Transhumanism – extending our bodies and minds beyond their current confines – doesn't necessarily mean a rejection of flesh or a dismissal of the wonders of human emotion and imagination. Writer Jeanette Winterson, citing philosopher and AI expert Nick Bostrom, believes that we must merge with AI to be an active player in the game, rather than an observer on the sidelines. AGI will set the rules unless we take part. Winterson argues that 'we need to recognise ourselves as an evolving, emerging species' and that '*Homo sapiens* is a means and not an end'.⁵

Such positive sentiments don't mean that troubles are glossed over. AI permeates much of our contemporary existence, allowing us to move through a city or between countries, and to purchase goods or access services. These algorithmic tools reflect, mirror-like, the patriarchal and racist inequalities that persist in the tech industry (but which, of course, pre-date it and are merely amplified by it). The dystopian sci-fi vision of being under threat from the machines is, for many, a hard contemporary reality. There is control and exploitation of humans by other humans through the application of new technologies under the guise of efficiency and progress, and there is a risk that this will only increase. Several artists in *Among the Machines* explicitly draw attention to the racial, sex and gender biases that operate in the data sets that underpin AI tools, as brilliantly and forcefully outlined in Ruha Benjamin's book *Race after Technology* (2019). And the data of every user, of every nationality or identity, is increasingly

controlled and monetised by a handful of global corporations in our age of 'surveillance capitalism'.⁶ The direct effects of data being harvested and our privacy being eroded has been the funnelled feeds of misinformation and conspiracy, leading to the dissolution of the public commons and a rise in violence. This hate permeates online spaces, but also leaks out into real life. The need for fundamental change is clear and urgent. Artists are part of this pushback, and this can be seen in the work of Jake Elwes, who 'queers' the dataset through reverse-engineering AIs or adding new sets of images to normative models to give a truer picture of the range of human life.

We are at a point where the virtual world – the 'metaverse' – could soon be all-encompassing, and function in parallel to the real world. At this juncture, the definition of what the 'real' world is begins to dissolve. The metaverse extends the screen- and browser-based interface of the internet into a haptic, fully immersive experience which we enter as avatars – hopefully, of our own choosing. Who gets to design these new spaces of human/machine hybridity and be an active agent in them, rather than a mere content consumer? Resisting the drive of Meta (which owns Facebook, Instagram and WhatsApp) and other monolithic corporations to brand the concept and carve up the terrain of the metaverse feels crucial. Artists and writers are of central importance in disrupting the disruptors, asserting that the shared spaces of the future should be open to adaptation and subversion.

Another key new terrain that must be mentioned, if only in a limited way owing to the scope of the topic, is the blockchain and crypto currencies. The blockchain is an entirely new paradigm at the very beginning of its story. Fuelled by the desire to escape models of finance and governance deemed to have failed to bring stability in the twentieth and twenty-first centuries, the blockchain pioneers a distributed model based on a trust in mathematics and computational capacity. As Portuguese politician and author Bruno Maçães puts it, 'True believers do not think of crypto as an investment or even as a technology. They think of it as a new way to organise the economy, society and the state'.⁷ Such radical pioneers may well be joined by more traditional investors, desperately seeking, paradoxically, 'a more solid form of money, assets that, like gold, are not a liability held by someone else'.⁸ Artist Simon Denny presciently outlined the political ideologies at play in crypto back in 2016, and since then has been producing subtle, but barbed, projects about its

⁵ Jeanette Winterson (2019), *12 Bytes: How we got here. Where we might go next* (Jonathan Cape, p. 248).

⁶ Shoshana Zuboff (2019), *The Age of Surveillance Capitalism: The fight for a human future at the new frontier of power* (Profile Books).

⁷ *New Statesman*: <https://www.newstatesman.com/comment/2022/05/what-the-terra-crash-means-for-the-future-of-crypto>

⁸ *New Statesman*: <https://www.newstatesman.com/comment/2022/06/russia-threat-global-financial-order>

leading personalities and its structural workings. A model that is not answerable to governments or transnational corporations carries with it a risk of social atomisation, perhaps even a digital feudalism. If a pure new realm of finance opens up, a section of society might cleave itself away from the rest.

Quantum computing is a further paradigm-shifting departure. In its frozen chambers a quantum computer allows a state of constant flux beyond the binary of digital ones and zeros. With this comes the possibility of computational speeds far exceeding those we currently enjoy. There is an almost spiritual dimension to this fast-developing oracle-like machine, and a Buddhist quality to the unfixable ‘neither one thing nor the other’ realm. For artist and scientist Libby Heaney, who presented a newly commissioned performance lecture, *slimeQore*, as part of the *Among the Machines* programme, this slippery shape-shifting offers the possibility of moving beyond the biases that have calcified inside the tech industry, and beyond the linear sense of time and progress that Newtonian physics has asserted. Producing moving-image montages using an IBM quantum computer, and combining this with the associative properties of language and humour, Heaney embraces all the possible futures that quantum ‘entanglement’ might bring. Large corporations are, of course, the key investors in quantum computing, as they seek to be the first to harness its power. As ever, the future pathway is uncertain.

Among the Machines responds to the notion of a transition from one life to another – even from one epoch to another. At the core of the project is the human desire to control – but what can we shape, and what will shape us? Rather than fearfully destroying the machines as the inhabitants of Samuel Butler’s *Erewhon* do, this exhibition and publication bring together artists who collaborate with technology to extend the possibilities of being human. The artists critically draw attention to how human nature often sabotages potential routes to a better way of being in the world. Artists and writers, alongside scientists and researchers, should be in the vanguard of exploring and materialising the complex tensions brought by rapidly developing phenomena such as AI. We can only hope that human exceptionalism gives way to some humility.

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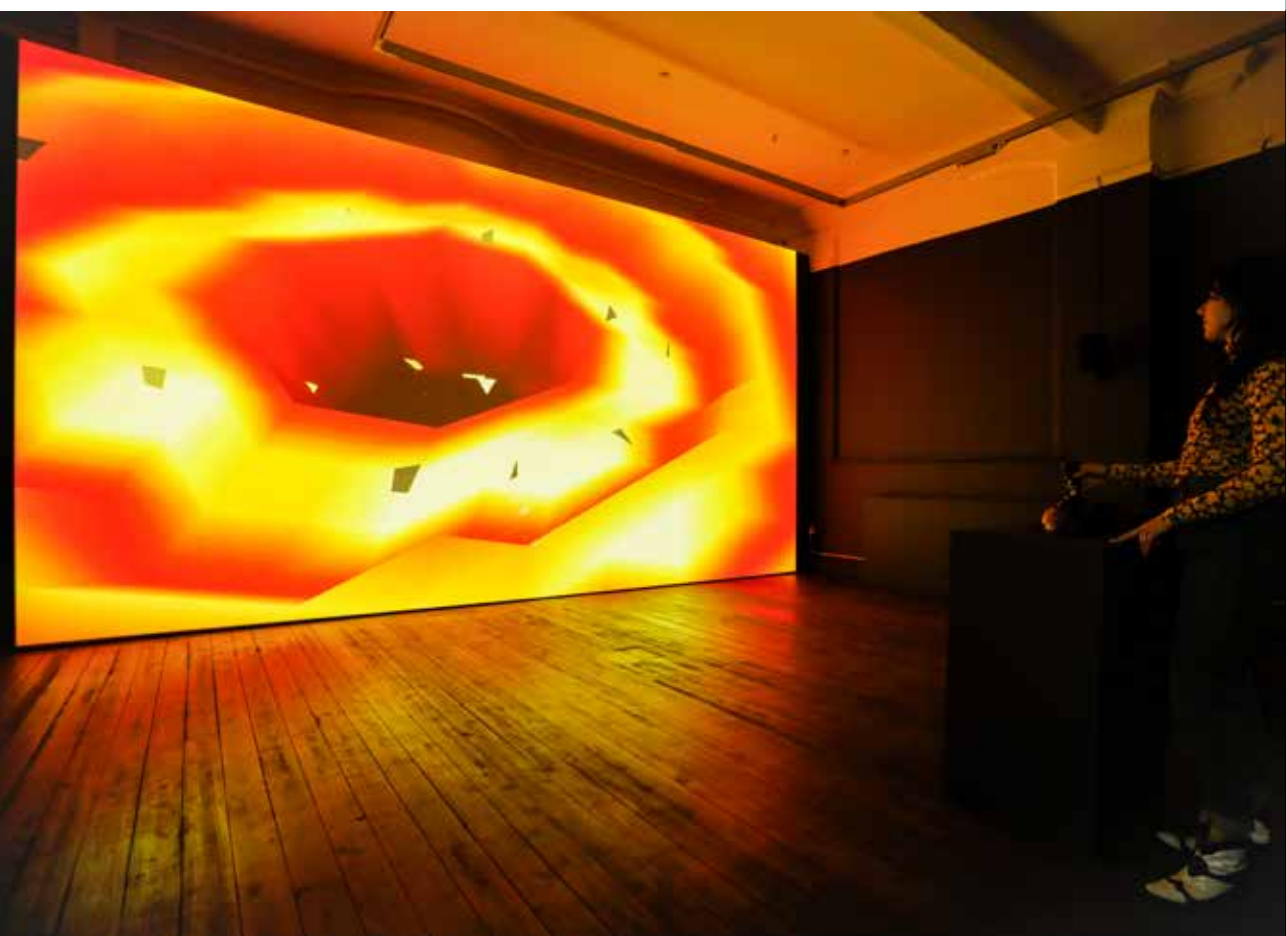
Colophon 176–177

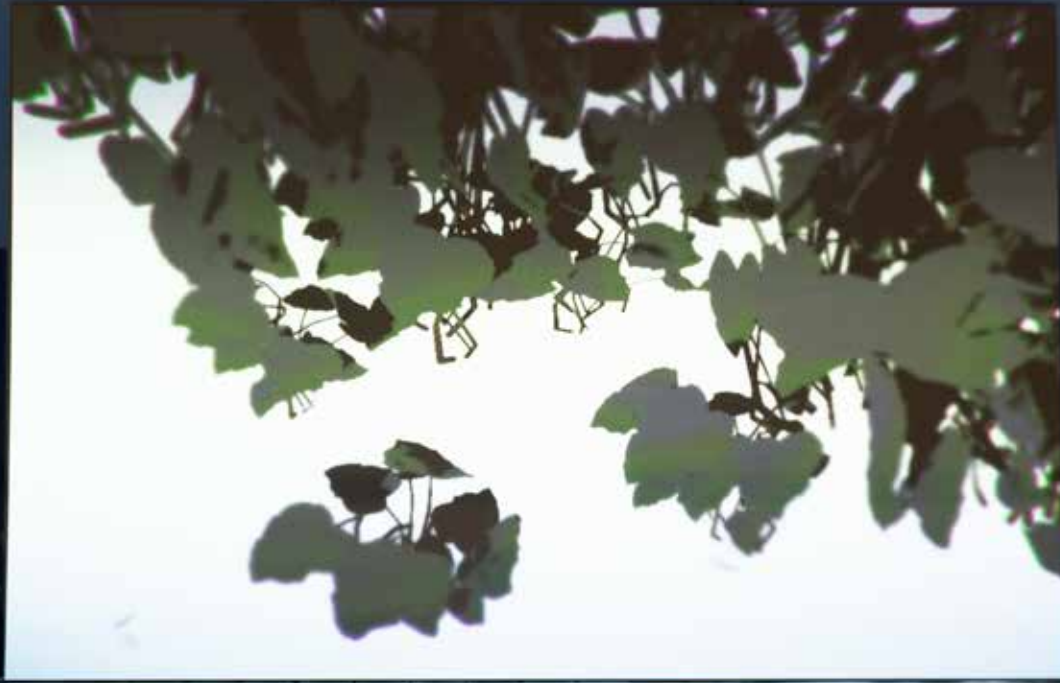
Among the Machines,
exhibition view, Zabłudowicz
Collection, 2022

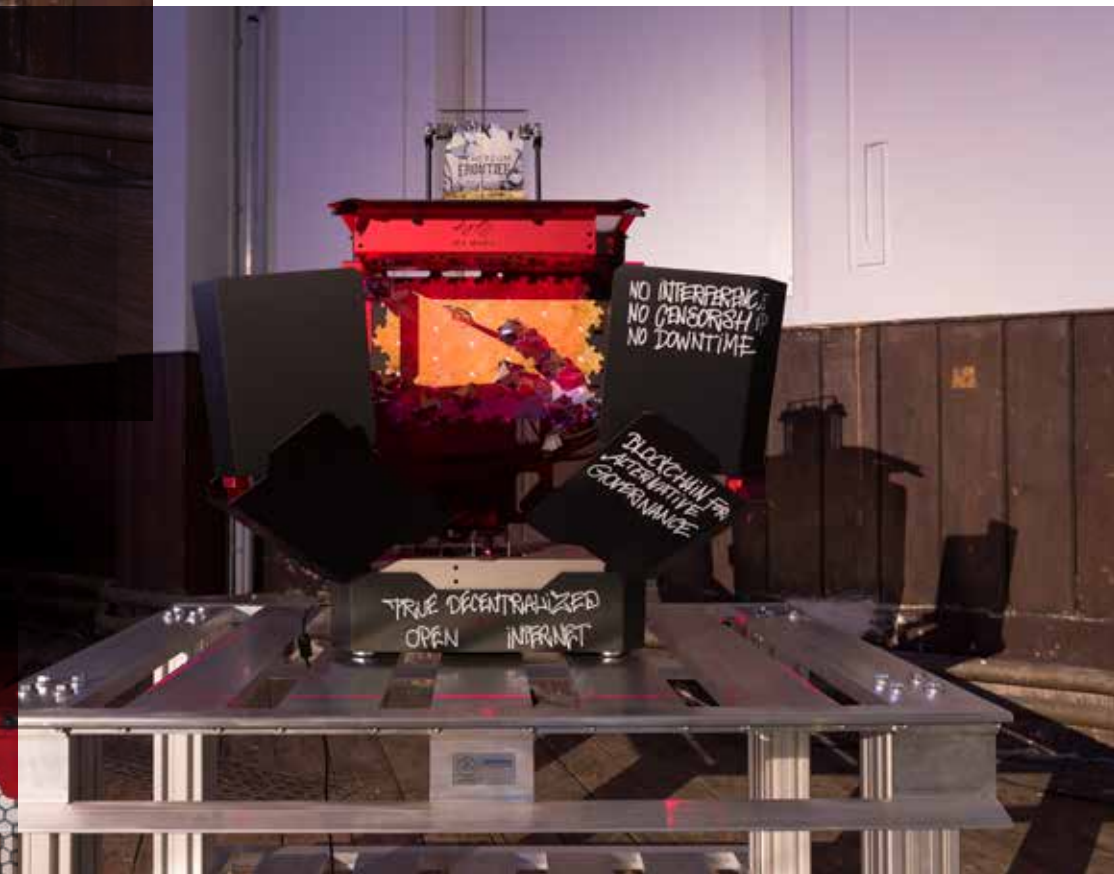
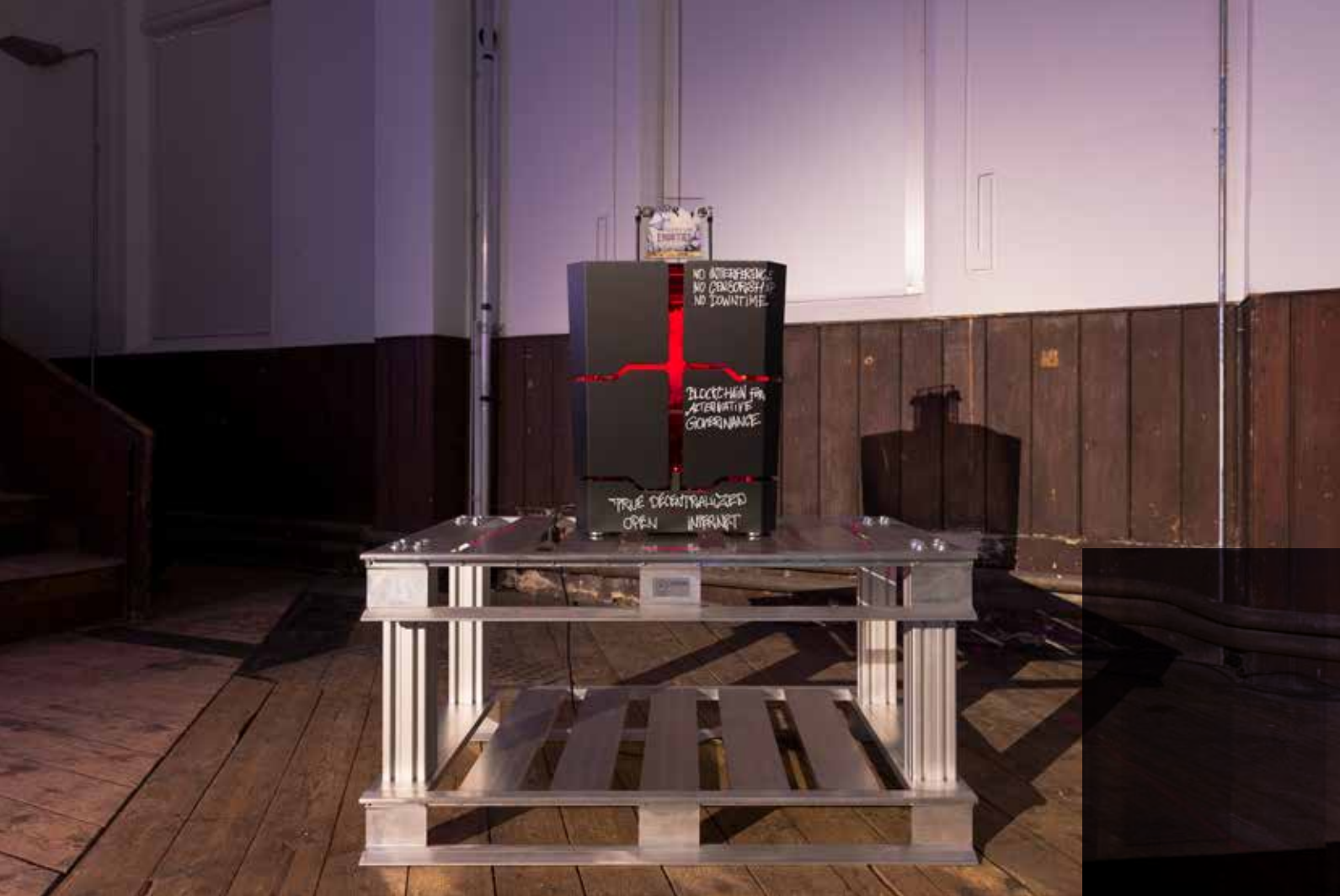
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Rebecca Allen,
The Bush Soul #3, 1999







Aleksandra Domanović,
Kalbträgerin, 2017







Lynn Hershman Leeson,
Seduction of a Cyborg,
1994



Lynn Hershman Leeson,
Reach, 1986

Joey Holder,
*The Evolution of the
Spermalege*, 2014–
present





Joey Holder,
Proetida, 2022





Marguerite Humeau,
JOSEPHE, a female is
drinking its own milk
in a desperate self-
cannibalistic gesture of
survival. The creature's
soul has left its body,
2016

Aleksandra Domanović,
Kalbträgerin, 2017



Keiken,
Player of Cosmic 𐍚
Realms, 2022
Installation comprising
two works: *The Life*
Game, 2021 and
Bet(a) Bodies, 2021–22

Keiken,
Bet(a) Bodies, 2021–22



Lauren Moffatt,
*Reverse Dive (Local
Knowledge, Partial Truth)*,
2022







Tabita Rezaire,
Sugar Walls Teardom,
2016



Tabita Rezaire,
Premium Connect, 2017



Theo Triantafyllidis,
Radicalization Pipeline,
2021



Theo Triantafyllidis,
Genius Loci, 2021



Anicka Yi,
Others of Little Weight,
2015

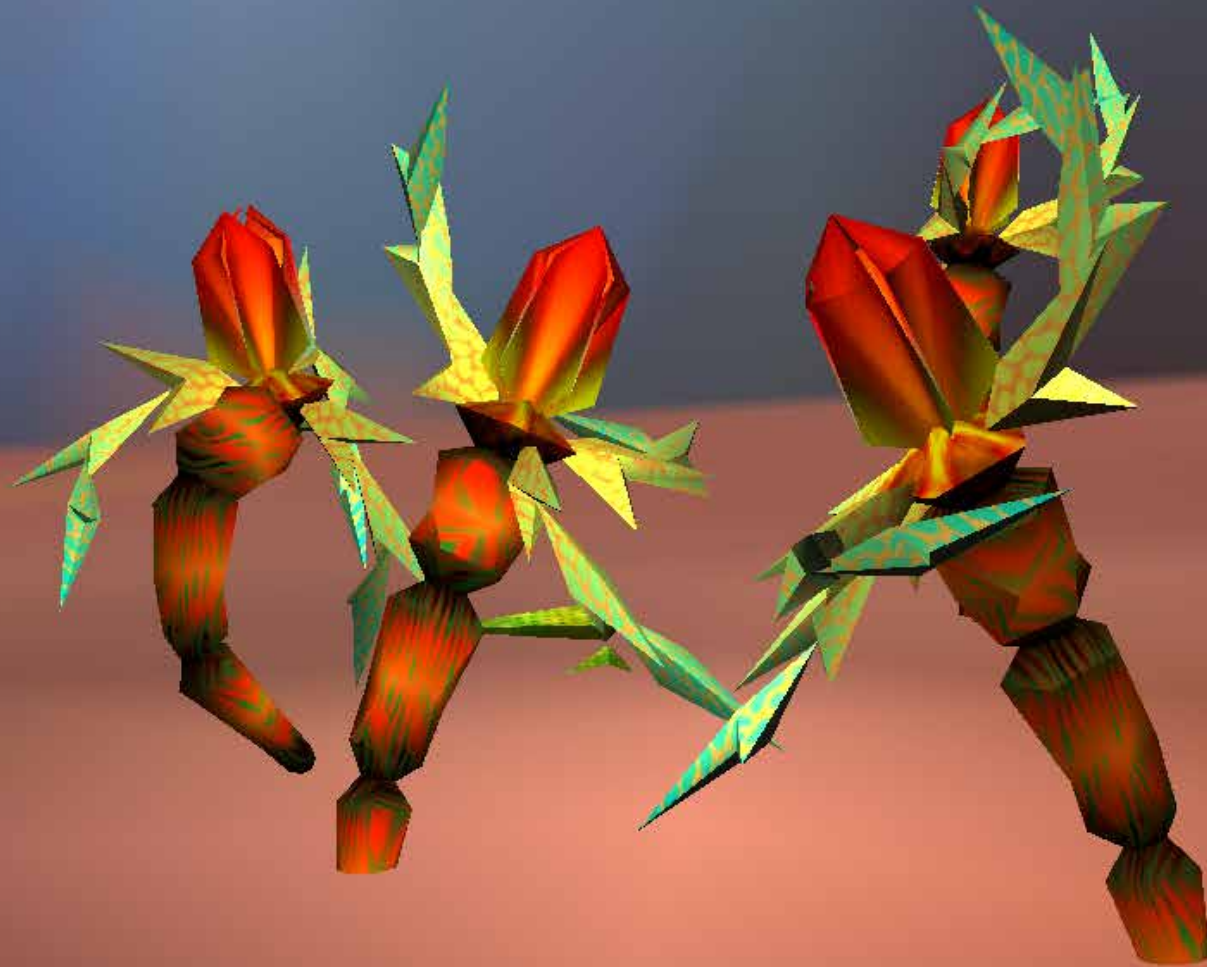
Anicka Yi,
*Of All Things Orange or
Macedonian Wine*, 2015



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Rebecca Allen *The Bush Soul*

By K Allado-McDowell



Futurists don't always get their predictions right. In fact, taken as a whole, futurists are mostly wrong. But when futurists are right, it can be stunning, and it can even shape the future. Think of William Gibson coining the term 'cyberspace' – while Web 1.0 and Web 2.0 looked nothing like his vision, the developing metaverse has begun to prove Gibson right.

The most challenging and generative moments of futurology occur when an artist's image of the future isn't exactly what comes to pass, but isn't exactly wrong either. In recent decades, it has been easy to dismiss previous attempts at creating computer simulations or virtual reality (VR), because they were clunky or low-resolution. However, the recent adoption of VR is revealing that certain artists and designers not only anticipated its modes of interaction but also proposed radical applications for it. Rebecca Allen is one such artist, and her 1997–99 series *The Bush Soul*, comprising three works, is an example of a futurist artwork that is only now fully legible to a mass audience.

The Bush Soul is a virtual world, displayed as a large projection, that is navigable by a haptic joystick. This provides the user with tactile sensations and is inhabited by interactive and algorithmically controlled life forms. Though its polygon count is low by today's standards, the work is remarkable

for how thoroughly it not only imagined, but also implemented, the technologies necessary for a truly emergent virtual world-building. The custom system that does this is called *Emergence*, because it is the interaction between creatures (based on each creature's unique properties) that enables an unpredictable, lifelike world to emerge in the artwork.

The Bush Soul also examines the user's relationship to their own digital life form or avatar. Allen writes in her Centre for Advanced Inquiry in the Interactive Art paper from 1997:¹

We are told that in the not-so-distant future we will spend hours immersed in three-dimensional virtual worlds. These worlds will include 'avatars' – virtual representations of ourselves in the form of computer-generated characters. Our soul, our consciousness, will somehow be embodied in an avatar. The avatar becomes our other body, another container for our spirit.

What is the relationship one has with his or her avatar? Do we control it like a puppet, or is an avatar like a child, containing the spirit of its parents, but with its own set of behaviours? What part of 'us' is in our avatar? Is part of our soul in this computer-generated character?

Questions like this are still largely unexplored, despite the growing metaverse. The thinking behind *The Bush Soul* remains ahead of its time. Yet a work like *The Bush Soul* carries within it not just an image of the future, but an image of its moment of creation – a moment that eventually becomes a past. In this way, it exists in multiple times at once.



¹ Allen, Rebecca, 1997, 'The Bush Soul: Traveling consciousness in an unreal world'. In Ascott, Roy (ed.) *Consciousness Reframed: Art and Consciousness in the Post-Biological Era – Proceedings of the 1st International CAiA Research Conference*. Newport: University of Wales College.

The Bush Soul, and much of Allen's practice, addresses themes that have recently risen to prominence in public discourse: how art and technology interact, the role of the body in virtual experiences, the challenges women face in the tech industry, and the representations of women in digital media. Allen's earliest works depict female bodies moving through a digital void: her first 3D works from the early 1980s, such as *Swimmer* (1981), *The Catherine Wheel* (1982) and *Woman Ascending a Staircase* (1981) render feminine presence and embodied motion. Allen blazed a trail for a generation of women who work with 3D, digital art and video games, and experienced the same challenges they would face. By breaking through patriarchal barriers, she helped create the future she depicted.

Viewing a work like *The Bush Soul* through both present and past politics reveals how much – or how little – has changed since the artwork was created. Take, for example, the relationship between digital technology and the natural landscape. Both nature and technology have taken on drastically different valences since the late 1990s. Since the first blossom of environmental mass consciousness in the modern West in the 1970s, nature has gone from threatened to threat, with 'unnatural' disasters (induced by human-caused climate change) looming on the horizon. Similarly, digital media technology has lost much of its early utopian shine, becoming a source of political division and manipulation. *The Bush Soul*, on the other hand, constructs evolutionary interactions in a purely digital ecology, imagining technology as a natural process. The viewer is invited to explore an alien landscape populated by virtual creatures who interact and whose artificial life-worlds evolve.

Similarly, the concept of the soul has taken on new meanings for a younger generation fluent with technology. The numinous aspects of being that were ignored by materialist science, and the traditional forms of worship rejected by the liberal counterculture that birthed Silicon Valley, have recently reappeared in a turn towards not just syncretic esotericism (à la WitchTok) but also traditional religious practice. With 'soul' a dirty word in Web 1.0 and pre-web Silicon Valley, *The Bush Soul* sought to reintroduce the soul as an affordance for virtual interaction. As the viewer flies through the world of *The Bush Soul*, their avatar appears as a whirling spirit, capable of inhabiting the virtual creatures it encounters. According to Allen, this spiritual model of engaging nature is borrowed, at least nominally, from the West African belief (recorded

by ethnologist Mary Kingsley in the 1890s) that the human soul can travel into the wilderness and inhabit the form of an animal – this is the titular Bush Soul. *The Bush Soul* functions as a spiritual metaphor for a user interaction affordance, that of the virtual avatar, which has its own behaviours, separate from those of the user. Allen writes:²

² Ibid

Kingsley described the West African belief that a person has more than one soul and that there is a certain type of soul, called the ‘bush soul’, that dwells within a wild animal of the bush. A person’s bush soul lives inside an animal though that animal also has a life of its own (Kingsley, 1899).³ This implies that it is not necessary to leave one’s body to experience another world.

³ Kingsley, Mary, 1899, *West African Studies*. London: Macmillan & Co.

An avatar could serve as a place for the bush soul to dwell. The avatar carries a person’s bush soul into the virtual bush by following the guidance of the person attached to it. But it is also ‘alive’ with its own set of behaviours. In this world interactions occur and relationships are developed with forms of artificial life as well as with other avatars and their bush souls.

And here we encounter what looks, from the present, like a shadow aspect of *The Bush Soul*, a political trace of its originary moment. While anthropology points to a variety of world-spanning belief systems that describe shamanic flight and shape-shifting, the phenomenon is named here in Indigenous West African terms. Mapping connections between belief systems can reveal the structural capabilities of the interspecies body and mind, yet appeals to universality often erase important histories and differences between cultures.

Spirit, nature and feminine presence were repressed in the technical regimes of the past, and now seek expression in feminist tech, network spirituality, and computational applications of ecology, all of which appear in Allen’s early work. In employing a specific Indigenous cosmology to stretch beyond the limiting views of technical patriarchy, does *The Bush Soul* overreach?

Current political discourse around language and cultural appropriation demands that cultural actors claim allegiance to one category or another, setting limits on what can be said by whom, in the interest of enabling previously unheard voices



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and cultures to articulate their own terms of engagement. Indigenous cultures that have maintained land stewardship traditions appear to hold many keys to ecological sustainability and long-term civilisational balance. Such land stewardship traditions are often accompanied by animistic interspecies relations that provide richer models for technical development than does alienated consumerism. A canonical example of this can be found in the paper ‘Making Kin with the Machines’, by the Indigenous Protocols for AI Working Group.⁴ As critical Indigenous voices make inroads into tech development, they bring direct experience of cosmologies and worldviews that have long been absent from tech.

⁴ Lewis, Jason, Arista, Noelani, Pechawis, Archer and Kite, Suzanne, 2018, ‘Making Kin with the Machines’, *Journal of Design and Science*. DOI:10.21428/bfafd97b

In viewing *The Bush Soul* now, one encounters all these political nexuses at once, which raise tricky questions about the relationship between Western artists and colonised people. How can we read *The Bush Soul* through multiple histories and perspectives? What lessons can we learn from this work as political subjects in a planetary network of cultural practices? If the terms we and Allen have inherited are inadequate, what can we do to equitably expand our vocabulary? Are we doing those things? Or are we paralysed by the limits of contemporary discourse?

History moves in cycles. In a perfect world, each generation digests the works of its predecessors, moving art forward and discovering that much of what seems new has already been imagined. Building on the groundwork laid by innovators like Allen, we can imagine a further expansion of the underlying conceptions of technology, alongside global collaborators that bring their own cosmology and practice to bear.



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However we approach this, our work, like Allen's, will be read at multiple moments in history, each with its own politics. Our future becomes a present, our present a past. As culture evolves (and, ideally, progresses towards greater freedom for all), the meaning of our own work also changes. Life under climate change makes all of us futurists, and as futurists we will get some things right and others not. We owe our allegiance to the generations that will look back at our actions at this pivotal time, just as we owe our innovative forebears care in the attention we bring to their legacies.

i. Rebecca Allen, *The Bush Soul #3*, 1999. Courtesy the artist, Zabłudowicz Collection and ZELDA, London.

ii. Rebecca Allen, *Swimmer*, 1981. Computer-animated video, 6 seconds. Courtesy the artist, Zabłudowicz Collection and ZELDA, London.

iii. Rebecca Allen, *The Bush Soul #3*, 1999. Courtesy the artist, Zabłudowicz Collection and ZELDA, London.

iv. Rebecca Allen, *The Bush Soul #3*, 1999. Exhibition view, Zabłudowicz Collection, London. Photo: Tim Bowditch.

Ian Cheng

The Conscious Capabilities of a Computer Being

By Freire Barnes



Given the power of their own agency, Cheng's computer-generated beings in *Droning Like a Ur* (2014) and *Something Thinking of You* (2015) exist within a constant altering state where chaos unfolds. Set within natural environments of partially verdant terrains, Cheng's open-ended simulations convey the facets of nature, the scope of behavioural interactions and the possibility of technological evolution.

In a constant state of bafflement, the agents in *Droning Like a Ur* (2014) appear to have no intention, wandering aimlessly, not knowing what they can or should be doing. Yet they never seem to stop; they are forever – and since this is a durational work, it will be forever – in motion: colliding with one another, morphing in and out of the growing flora and fauna and surface matter that surrounds them, even morphing between each other. At times they appear to attack one another, taking on the nature of zombies: they are constantly drawn to one another, as if they are one and the same but at different stages of creation.

The sinister accompanying audio whirrs as if to signal some imminent incident. Just as glitchy and giddy as the agents' activity, it fizzles and splurts, even accelerating to electrifying crescendos. When the agents interact with one another there are audio acknowledgements like in an arcade game when

you kill an opponent, or ‘dings’ to indicate that points have been collected by making contact. One of the agents narrates in a childlike tone, a hotchpotch mixture of declarations that follow an inconsistent pattern, sometimes repeating, sometimes silent, while a synthesiser soundtrack hums in the background. The androgynous voice with notes of a male adolescent recites behavioural statements that could also be interpreted as instructions: ‘Wipe my face’, ‘Fuck him’, ‘Do it now’, ‘Take my crystal off’.

And then there is the habitat in which these agents exist. It is not always governed by gravity. As if layers of different computer games have been superimposed on top of one another, there is a fluidity to the space so agents can fall through boundaries – because there are none – or they can meld with and disappear into the topography. This multifaceted component enables Cheng to alter and confuse our viewpoint, adjusting and flipping it to be multidirectional.



ii

On the mezzanine floor of the former Methodist church that houses the Zabłudowicz Collection, *Droning Like a Ur* (2014) is projected on a large panel which leans at a slight angle. By removing the confinements of a cinema-styled darkened room, Cheng positions the viewer to exist within the same field as the work. For *Something Thinking of You* (2015) he shifts our perspective so we take on a slightly elevated stance. The flat-screen monitor installed flush to the wall creates the frame of a window or ‘portal’ at a lower vantage point so we look down on the simulation. The presentation recalls how Cheng initially came upon the idea of simulations: as he ate sushi in a Whole Foods market in New York watching the activities

and interactions of his fellow shoppers unfold before him down below. This compelled him to make work that ‘embodies life itself’.¹

Cheng describes *Something Thinking of You* (2015) as ‘a vegetable, an animal, a sentience for you’ on his Vimeo account, which feels apt for the creature, which continually mutates as it travels along what might be a seabed or tidal pool, taking on the guise of an indeterminate shape-shifting symbiote. Aspects of the creature are reminiscent of the demon in *Princess Mononoke* by Japanese animation director Hayao Miyazaki. Part crow, part jellyfish, part worm, part fuzzball, part leaf, part tumbleweed, the creature flits around, slithering and writhing between rock formations or levitating above them. Birdsong plays as the blackened creature groans and slurps in a mesmeric manner. Followed around by a glistening aura, the programmed entity moves in poetic, dance-like movements, taking on a mystical element that hovers somewhere between tranquil and uneasy. The longer it exists, the more it adapts to its environment, shedding its form to regenerate, ultimately learning to understand and adjust to its environment – and eventually becoming sentient:

All these qualities describe a World from the perspective of living inside one, already deep within its ongoing history. But this view takes for granted how a World begins, how it comes to be, and how it could ever originate from an individual author. As an artist, this is at the heart of my desire to understand what a World is. Because the dream is to be able to possess the agency to create Worlds – now more than ever – not just inherit and live within existing ones.²



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¹ 'Luma Westbau – artist talk with Ian Cheng, Zurich', 19 September 2021. <https://vimeo.com/609648369>

² Ian Cheng, 'Worlding Raga: 2 – What is a World?', Ribbon Farm, 5 March 2019. <https://www.ribbonfarm.com/2019/03/05/worlding-raga-2-what-is-a-world/>

In 1859, Charles Darwin finally published *On the Origin of Species* after three decades of research and writing. His theories of biological evolution through natural selection led to a schism in society at the time, challenging the principles of science and the religious belief that God created every being. Darwin's discoveries ultimately reconfigured the understanding of our existence. Over a hundred years later, in 1977, American psychologist Julian Jaynes published *The Origin of Consciousness in the Breakdown of the Bicameral Mind*, which posed the new theory that human consciousness is learned as opposed to being inherent. This dramatically impacted – and continues to do so – our understanding of human history. It revealed that established academia may not have fully addressed the complexity of what it means to generate our subjectivities, our being.

These two formative theorists realigned our understanding of the evolution of nature and the mind. So it's not surprising that they have both influenced Ian Cheng's practice. Here is an artist with a background in cognitive science who uses tech platforms such as Unity and Dramatica, which are normally associated with gaming, to exploit technology's ability to question how behaviours, essence and conscious beings are, and can be, constructed.



iv

The two early works included in *Among the Machines* are critical to the development of Cheng's practice. He leaves the outcome of his unscripted agents up to their own fate. The fact that he describes his protagonists as 'agents' or 'emissaries' reveals how they act on his behalf – his pawns, if you will – yet because he didn't program the simulations with any authorial

control or end in mind,³ just giving them a set of preliminary conditions, he was unable to determine the long-term outcome of his agents. The agents existing and regenerating of their own volition raised the first evolutionary issue for Cheng, as they ended up in meaningless pursuits where chaos prevailed. Yet it was crucial that his agents' pursuits were dominated by entropy, so they would play out as they did, otherwise he might never have evolved them into the narrative agents that exist in his later works: the *Emissaries* trilogy (2015–17) and *BOB* (*Bag of Beliefs*) (2018–19). It also made Cheng realise that there was meaning in the agents' meaningless activities which could be a catalyst for new meaning to emerge, an aspect that would become intrinsic in his later work.⁴



v

Cheng constructs computer-generated ecosystems that are familiar, yet uncanny, which are governed by a certain amount of order, but which allow – and need – chaos to exist. The population of 'agents' is programmed to a degree that they have a sense of autonomy. Playing ad infinitum, the simulations echo the timeframe of a real world, enabling the emergence of the unexpected, which results in the agents revealing the potential for conscious evolution in their artificial environment. Cheng's exploration of creating virtual worlds isn't about dethroning God, replicating reality, or replacing humans with machines. He creates a space where the dynamic tension between the known and unknown generates new knowledge through perpetual disruptions.

i. Ian Cheng, *Something Thinking of You*, 2015. Exhibition view, Zabludowicz Collection, London. Photo: Tim Bowditch.

ii. Ian Cheng, *Droning Like a Ur*, 2014. Exhibition view, Zabludowicz Collection, London. Photo: Tim Bowditch.

iii. Ian Cheng, *Emissaries Trilogy*, 2015–17. Installation view, Serpentine Gallery, London, 2018. Courtesy the artist, Pilar Corrias, London and Gladstone Gallery.

iv. Ian Cheng, *Life After BOB*, 2021. Installation view, The Shed, New York City, 2021. Courtesy the artist, Pilar Corrias, London and Gladstone Gallery.

v. Ian Cheng, *Life After BOB*, 2021. Video still. Courtesy the artist, Pilar Corrias, London and Gladstone Gallery.

3 'Interview with Ian Cheng', *Interview magazine*, 2 December 2015. <https://www.interviewmagazine.com/art/ian-cheng>

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4 'Ian Cheng in conversation with Elvia Wilk', *Cura*, 23, no date. <https://curamagazine.com/digital/ian-cheng/>

Simon Denny
Decentralisation and Disbelief

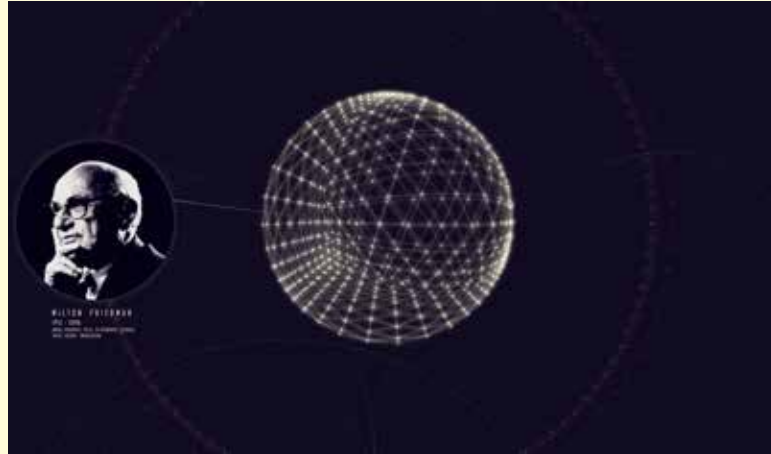
By Lauren Studebaker



When Simon Denny presented his installation, *Blockchain Future States*, at the 9th Berlin Biennale in 2016, the concept of the blockchain was only just becoming familiar to the general public, and was largely unexplored by artists. Like most new technologies, the advent of cryptocurrency came packaged with new ideologies: early supporters of the blockchain promised a way to establish universal truth through decentralisation and trustlessness. Through appropriating the language, tools and aesthetics of the early crypto start-up, Denny approaches his survey of these new technologies from the inside out – an approach the artist has continued to refine in the six years since the Berlin Biennale, during which time the world has been introduced to new blockchains and new modes of financial speculation.

In *What is Blockchain?* (2016), a three-minute-long video included in Denny's Berlin Biennale installation, a benevolent, authoritative voice states: 'There is real beauty in the liberal dream of a perfect market: a perfect information system reflecting the true data of exchanges between individuals, growing a global map of the complexity of human relations.' Layered over an animation in which simplified icons appear over a nondescript celestial backdrop in navy blue, as the nodes on a spherical rhizomatic network blink with the romantic quality

of city lights, Denny appropriates the gestalt of a corporate infomercial. The script frames the blockchain as a perfect vessel for positive social change – not only is it a tool, but it's also an opportunity for the masses to escape the horrors of human error, greed and late-stage capitalism. It also informs the viewer that revolutionising finance is just the beginning, and that the possibilities of the blockchain extend to all parts of life.



ii

This ability of blockchain technology to secure ‘a birth certificate, a contract, or even a vote’, as imagined in *What is Blockchain?*, essentially refers to the function of a smart contract, a concept imagined by computer scientist Nick Szabo in 1994. He defined it as ‘a computerised transaction protocol that executes the terms of a contract’.¹ Although smart contracts were a possibility with bitcoin, the advent of the Ethereum blockchain in 2015 greatly increased users’ ability to construct their own smart contracts within decentralised applications on-chain, in theory allowing them to be tied to real-world assets. Founded by the 21-year-old Vitalik Buterin, Ethereum came packaged with the utopian mysticism echoed by Denny’s video.

A related work also created in 2016, *Zug Blockchain Startup Case Mod: Ethereum, Tribal*, uses items often associated with a very-online lifestyle to aestheticise the incubation and founding of Ethereum in crypto’s answer to Silicon Valley: the canton of Zug, Switzerland. In the work, a collage from the stalwart collectable card game Magic: The Gathering is paired with buzzwords and phrases that surrounded the release of Ethereum, including ‘NO INTERFERENCE/NO CENSORSHIP/NO DOWNTIME’. By making connections between a gamified fantasy universe – where real-life consequences don’t exist –

¹ Szabo, Nick, 1994, Smart Contracts. <https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html>

and the idealism of crypto start-up culture, Denny highlights the suspension of disbelief inherent in the space. Blockchain technologies are tools employed to manage assets tied directly to (crypto)currency, further financialising every interaction. Critics of cryptocurrency, especially Ethereum, also point out the huge environmental impact of mining tokens – that is, energy consumption and rare-earth mining. By incorporating a motorised high-end PC case into *Zug Blockchain Startup Case Mod: Ethereum, Tribal*, Denny further highlights the tension between the utopian and dystopian conditions of the blockchain.



iii

Fast-forward to 2018, when a group of Ethereum developers submitted a proposal for the ERC-721 token, a standard for a new type of smart contract that allowed for the exchange of non-fungible tokens (NFTs) on-chain. Usually tied to a URL hosting a digital file, NFTs offered an unprecedented way of commodifying digital art using crypto, and this has led to the rapid development of a multi-billion-dollar market for NFTs since 2018. Over the same period, Simon Denny continued his exploration of blockchain in his own work and in the company of his peers, curating two exhibitions – *Proof of Work* (Schinkel Pavillon, 2018) and *Proof of Stake* (Kunstverein Hamburg, 2021) – that included artists making art with, or about, these new technologies. Introducing a ‘curatorial protocol’, Denny approached the act of organising the exhibition in a decentralised, transparent manner that mirrored the function of the blockchain. Both were presented as being curated by Denny ‘in dialogue’ with artists and thinkers making innovative moves in the space – a distributed network of creative and intellectual effort.

In a 2017 interview, Denny noted that ‘the most fundamentally disruptive’ possibility of the blockchain was its potential to ‘monetise the attention economy’.² Thanks to the ability of NFTs to tether digital assets, primarily artwork in the form of JPEGs, directly to financial markets, this prediction has come to fruition over the last two years. Many artists creating digital work have found an unprecedented opportunity to package and sell their art in a way that the gallery structure did not provide, and pinning artworks to unique tokens with editable smart contracts has allowed artists to stipulate conditions for secondary market sales, copyright and more. However, critics of the NFT space point out the lack of critical and curatorial intervention that is found in the traditional art world; instead, visibility in the space came easiest to big-dollar projects that privileged membership over concept, such as Cryptopunks and Bored Ape Yacht Club, which led those outside the cryptosphere to write off NFTs as merely speculative assets.

² Catlow, Ruth, Garrett, Marc, Jones, Nathan and Skinner, Sam (eds), 2017, *Artists Re:Thinking the Blockchain*. Torque Editions & Furtherfield.



iv

It makes sense that Denny’s inclination to get involved in these new markets would lead him to create artwork using the ERC-721 token as a medium. Recognising that the market was sorely lacking work that approached the smart contract as a conceptual tool, as opposed to a vessel for financialisation, Denny began to produce NFTs that privileged the medium over the content itself. For example, in a series titled *Backdated NFTs*, Denny replaced the linked images and some metadata linked to tokens minted in earlier years, effectively hijacking the NFT and challenging the ontological assertion that the content of a token is determined at the time of minting. Although the blockchain record of the work’s tokenisation remains the same, the content is entirely different from the original intention. Through this act of hijacking, Denny

revealed a contradiction inherent to the crypto medium: in a landscape defined by its trustlessness, there is still the potential for exploitation.

The ephemerality of the digital is also engaged in *Dotcom Seance* (2021–), made in collaboration with CryptoKitties (a revolutionary early NFT project) founder Guile Twardowski and ‘experimental AI image group’ Cosmographia and published on NFT commissioning platform Folia. The project identified casualties of the early 2000s dotcom crash, most of which had aims that resemble today’s Web 2.0 stalwarts – person-to-person financial transfers, social image-sharing and pet supply ecommerce, to name a few – and memorialised them. Instead of using a web archiving tool to restore their websites, Denny and his collaborators created new logos that were designed by Twardowski and transformed using AI, then minted as ERC-21 tokens. The resulting haunting logos attempt to summon the aura of these defunct corporations, memorialised in perpetuity on the blockchain.

Denny’s work with the blockchain and with NFTs speaks to his overarching strategy of employing the signifiers and aesthetics associated with the technosphere to ground this industry’s fantastical grand narratives in the mundane and metaphysical effects they have on humanity and on nature. Whether he is exploiting blockchain tech through an act of possession with his *Backdated NFTs*, or trapping the spirits of an earlier generation of pioneers inside an ERC-721 token, we’re reminded that, both in real life and online, nothing lasts forever.

i. Simon Denny, *Blockchain Visionaries* (with Linda Kantchev). Installation view, Berlin Biennale 2016. Courtesy the artists, Berlin Biennale and Galerie Buchholz, Cologne/Berlin/New York. Photo: Hans-Georg Gaul.

ii. Simon Denny, *What is Blockchain?*, 2016. HD video, 3 mins, sound. Courtesy the artist, Zabudowicz Collection and Galerie Buchholz, Cologne/Berlin/New York.

iii. Simon Denny, *Zug Blockchain Startup Case Mod: Ethereum, Tribal*, 2016. Courtesy the artist, Zabudowicz Collection and Galerie Buchholz, Cologne/Berlin/New York. Photo: Nick Ash.

iv. Simon Denny, *Backdated NFT/Ethereum stamp*. Date: 2016–2018–2021. Materials: jpeg, Non-fungible token (NFT): 3000 x 2262 pixels. Offset print on adhesive-backed postage stamp paper and rubber stamp: 11 x 8 cm. Courtesy the artist.

Aleksandra Domanović

Reflections on The Calf-Bearer and What we Sacrifice to Athena

By Ashley Hockney



In 2017, I rode in the back of a Subaru from Marfa to Austin, Texas, with a set of identical twins. One, a software engineer, I had been dating and living with for two years; the other was a PhD candidate in bioengineering who spent his days genetically modifying flies using CRISPR-Cas9.¹

They both had a heart condition that they'd discovered was genetic, and dangerous. So, when I started to think about having children, we started to hypothesise: would we let Uncle B genetically alter my partner's sperm and splice out the gene for this condition? First, could we? Then, *would* we?

Uncle B sped along Highway 190, unfazed, asking what kind of traits we'd express (beauty? Intelligence? His nose?) and offering to set up the turkey baster.

He joked but I wondered, seriously.

We were talking just a few months before a set of twin girls made history as the first known humans to be born with modified genes. The experiment's goal made one of the girls, and any of her descendants, immune to HIV. The story made headlines as the world reacted to the achievement and widely criticised the parameters under which the 'clinical trial' had been run.²

¹ 'CRISPR (an acronym for Clustered Regularly Interspaced Short Palindromic Repeats) is a family of DNA sequences found in the genomes of prokaryotic organisms such as bacteria and archaea. Cas9 (or CRISPR-associated protein 9) is an enzyme that uses CRISPR sequences as a guide to recognise and cleave specific strands of DNA that are complementary to the CRISPR sequence. Cas9 enzymes, together with CRISPR sequences, form the basis of a technology known as CRISPR-Cas9, which can be used to edit genes within organisms' (from <https://en.wikipedia.org/wiki/CRISPR>).

Scientists from all over the world condemned the experiment, which was illegal. It was also for show rather than pure necessity, according to Dr Anthony Fauci, who was an HIV/AIDS researcher heading up the US National Institute of Allergy and Infectious Disease at the time.³

Coincidentally, at the same time that I was riding back to Austin, Aleksandra Domanović's exhibit *Bulls Without Horns* was showing at Tanya Leighton in Berlin. It featured twin bulls, Spotigy and Buri. The pair were the first bulls that had been genetically modified to mature without horns. Horns are, to some, a pesky genetic leftover that 'hitchhiked along with the good dairy genetics'.⁴ Researchers are actively breeding them out – to stop cows from goring both themselves and the humans who work with them – using TALEN, a similar system to CRISPR.⁵ If only good dairy was tied to heart defects!



ii

It's from this project that Domanović's sculpture *Kalbträgerin* (Calf-Bearer) (2017) comes. The calf-bearer – created in Kerrock solid surface material, Acrystal synthetic gypsum and polyurethane foam – has arms that fasten a hornless calf across a column-esque pedestal inscribed with the initials 'A.D.', presumably standing for Aleksandra Domanović. The title and form mirror *Moschophoros* (the Calf-Bearer), an ancient Greek statue excavated from the Acropolis of Athens in 1864. Similarly, *Moschophoros*' plinth bears the name Rhombos, thought to be the person who dedicated the statue to the goddess of wisdom.

In forming such obvious similarities and stark differences, Domanović presents *Moschophoros* V2, in which the

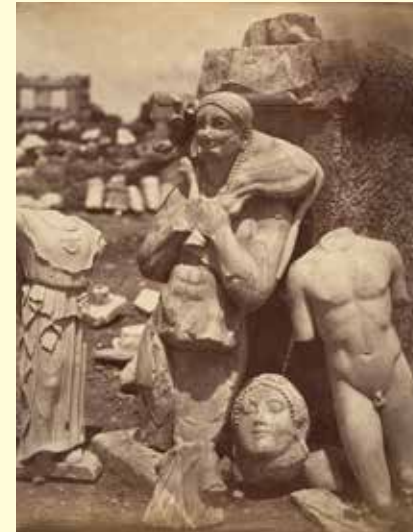
² <https://apnews.com/article/ap-top-news-international-news-ca-state-wire-genetic-frontiers-health-4997bb7aa36c45449b488e19ac83e86d>

³ <https://www.science.org/content/article/crispr-bombshell-chinese-researcher-claims-have-created-gene-edited-twins>

⁴ <https://www.galleriesnow.net/shows/aleksandra-domanovic-bulls-without-horns/>

⁵ Ibid.

Grecian search for knowledge is strikingly familiar, present and relevant in our analogous, albeit cybernetic, quest for intelligence. What feels different is what's changed – and what's missing. The tension of flattened shapes and missing features in *Kalbträgerin* (Calf-Bearer) (2017) could question who – and what – has been sacrificed to the goddess Athena.



iii

Like the name of her show, Domanović's offering seems to be a bull without horns. The calf being carried has presumably been genetically modified. But by whom? To me, it seems that this modification has been done by the calf-bearer. In 2016, Domanović interviewed Alison Van Eenennaam, an animal geneticist at the University of California, Davis, working with Spotigy and Buri. In the interview, Domanović says that what originally interested her in CRISPR 'was that there are two women leading the field' [Jennifer Doudna and Emmanuelle Charpentier]. It becomes apparent that Domanović is curious about women who have made great scientific discoveries – and about the sacrifices they have made along the way.

She explicitly asks Van Eenennaam about her experiences 'being a woman in science'.

'Well, it's been challenging, but not as challenging as it was for my predecessors, who frequently had to make the choice to forgo having children to pursue a career in science. Scientific progress and the discoveries being generated in competing laboratories do not stop for maternity leave or child-rearing. If you take too much time off, you risk your science falling behind,' Van Eenennaam said.⁶

⁶ Ibid.

Is it possible that the goddess Athena needed a meatier sacrifice? Not just a calf, but one that would be genetically modified to keep up with advances in science? Does wisdom require a particularly feminine sacrifice? *Moschophoros* offered up a calf, but Van Eenennaam speaks of femininity, fertility, and the women who risk their children for scientific advancement. What is more significant than giving one's own child, or more common? Wasn't it Abraham who ran through the Old Testament slaughtering cows and sacrificing his sons? Wasn't it Eve who ate the forbidden fruit?

This interpretation, however, wouldn't be possible without a re-narrativising of the *Calf-Bearer*, which lacks *Moschophoros*' signature grin – in fact, it lacks a face and torso altogether. Perhaps then we start to understand the feminine nature of Domanović's arms, and why her work explores the role of women in technical narratives – via their absence.



iv

Domanović's solo show at Tanya Leighton in 2013, *The Future Was at Her Fingertips*, features digitally rebuilt references to the Belgrade Hand, the world's first bionic hand prosthesis equipped with five fingers and a sense of touch, created in former Yugoslavia in 1963. One sculpture makes an apparently religious gesture; another, titled *Little Sister*, holds a bird, conjuring images from Disney's *Cinderella*.⁷ In fact, this is a direct reference to the Reliquary of St. Scholastica, who was the younger sister of St. Benedict. This reliquary, made in 1624, once held a fragment of St Scholastica's right arm.⁸ In the piece *Alan's Apple* a digitally animated Belgrade Hand turns an apple, in a reference to Alan Turing.

⁷ <https://www.frieze.com/article/handmade-web>

⁸ <https://collections.vam.ac.uk/item/O110510/reliquary-unknown/>

These motifs reappear in Domanović's sculptures for *Bulls Without Horns*, where robotic arms cup birds and rabbits. Again, these pieces appear without faces or bodies. The idea of a woman is present, but as herself – physically, or spiritually – not so much. So too with Domanović's plinths. There's an uncanny flattening of *Moschophoros*' Grecian sculpture into a rectangle with robotic arms appearing out of it, as if a woman has managed to punch holes through a box on top of her and waved: 'I'm here.'



v

Of course, these works, having been first displayed in 2016, take on new meaning in 2022: our speculative future has arrived, looking different than expected, and leaving aged daydreams as a data point in current projections. Thus stands *Kalbträgerin* (Calf-Bearer) (2017) in *Among the Machines*. The show features Joey Holder's ancient trilobites/sex toys slithering towards you, ready to co-evolve if you so much as uncross your ankles, and the collective Keiken's haptic womb, a potential future state where you might birth something not totally human. As the calf-bearer asks, 'What are we sacrificing, and to whom?' it seems clear that we're not just genetically modifying calves any more, but ourselves – and, perhaps, especially women.

Five years after *A Bull Without Horns* – and that long ride in Texas – I looked up the genetically modified twin girls. The girls' brains 'may have been changed in ways that

enhance cognition and memory’, scientists say.⁹ The procedure that removed the faulty gene is said to make mice smarter and improve recovery after a stroke. This genetic modification won’t just impact the girls’ lives; it will affect their descendants, ad infinitum. It may also place the girls at greater risk of premature death.¹⁰ Would Athena be happy?

If you’re wondering about my own contribution to science, we did not genetically modify anyone’s sperm (that would be illegal). I did not remove a dangerous birth defect from my child. In fact, I never had a child. Today, I think less about genetically modified organisms and more about the rate of developing vaccines, advances in artificial intelligence, and the algorithms. I’m also debating freezing my eggs – a procedure thousands of women are choosing in 2022.¹¹ I’m painfully aware that many of the tech companies I work with would help to pay for the procedure, allowing me to sacrifice (if you will) a few more years of my thirties to personal, professional and societal progress ... er, wisdom. My original question seems moot: would I genetically alter my kid? It seems that I’ve already sacrificed them for some kind of greater intelligence.

I’m especially curious about the robotic look of the arms Domanović sculpted. I’m not sure they’re mine. In a world where we live among the machines, where we’ve genetically modified children and animals, and where science rides on the back of ovarian sacrifices, I feel as if I might be the one being carried, lulled to the altar, unable to lash out at my fate, just like a bull without horns.

i. Aleksandra Domanović, *Kalbträgerin*, 2017. Courtesy the artist, Zabłudowicz Collection and Tanya Leighton, Berlin and Los Angeles. Photo: Gunter Lepkowski.

ii. Aleksandra Domanović, *Bulls Without Horns*, Installation views, Tanya Leighton, Berlin, 2016. Courtesy of the artist and Tanya Leighton, Berlin and Los Angeles. Photo: Gunter Lepkowski.

iii. The Calf-Bearer and the Kritios Boy Shortly After Exhumation on the Acropolis, Athens, c.a. 1865. Source: Wikimedia commons https://commons.wikimedia.org/wiki/File:-The_Calf-Bearer_and_the_Kritios_Boy_Shortly_After_Exhumation_on_the_Acropolis-;_Danseuse_du_Temple_de_Bacchus_MET_DP150943.jpg#filelinks

iv. Aleksandra Domanović, *Bulls Without Horns*, Installation views, Tanya Leighton, Berlin, 2016. Courtesy of the artist and Tanya Leighton, Berlin and Los Angeles. Photo: Gunter Lepkowski.

v. Aleksandra Domanović, *Kalbträgerin*, 2017. Courtesy the artist, Zabłudowicz Collection and Tanya Leighton, Berlin and Los Angeles. Photo: Gunter Lepkowski.

9 <https://www.technologyreview.com/2019/02/21/137309/the-crispr-twins-had-their-brains-altered/>

10 <https://www.npr.org/sections/health-shots/2019/06/03/727957768/2-chinese-babies-with-edited-genes-may-face-higher-risk-of-premature-death>

11 <https://qz.com/2122021/preserving-fertility-the-growing-popularity-of-egg-freezing/>

Jake Elwes

Queering Artificial Intelligence with Deepfake Drag

By Joe Parslow



One of the prevailing narratives around artificial intelligence (AI) in popular culture is the machines taking over: dystopian representations of the cold inhumanity of algorithms and robots whose downfall is typically their failure to grasp the intricacies of what it means to be 'human'. In their artworks, Jake Elwes offers playful, sticky and messy uses of AI and machine learning, and even messier and stickier representations of human-ness. From the ever-shifting flesh blobs of the computer's wet dream in *Machine Learning Porn* (2016) to the constantly glitching images of tech CEOs spouting an unbroken series of disconnected numbers in *dada da ta* (2016), Jake's work instigates playful critiques of human and technological relationships.

In their latest works as part of *The Zizi Project* (2019-ongoing), Jake takes this playful instinct and collaborates with members of London's drag and queer performance scene to explore ideas of gender, queerness and performance in relation to AI and machine learning. *Zizi – Queering the Dataset* (2019), the first work in this series, is a video installation of constantly shifting drag faces. These faces change between recognisable made-up human faces and explosions of drag imagination beyond the confines of human biology. As we watch, the faces merge hypnotically in an endless stream.

The monstrously morphing drag faces provide glimpses of a more-than-human utopia of being unfixed, unfinished and undone. Instead of the cold, inhuman logic of the machine, it is the cold, inhuman logic of the *human* that is laid bare. These are queerly moving pieces. They move queerly and I find myself queerly *moved* – affected, touched – by them. They gesture towards other ways of thinking about and feeling gender. The *Among the Machines* exhibition asks, how will we respond to a stage of evolution beyond the human? Considering the illogical limits placed on the category of ‘human’ by, for example, binary systems of gender and sexuality, the sooner we get beyond human the better. This work fleshes out (literally and figuratively) the category of human, grasping it and expanding it. This engagement with drag aesthetic and performance, and the collaboration with drag acts that sits at the heart of *The Zizi Project*, expands these technologies into new areas of aesthetic invention.



ii

As a producer and academic working in London’s drag scene since 2013, and as a self-confessed technophobe, I have surprised myself with my interest in AI. As I’ve become increasingly exposed to these ideas (an exposure facilitated by Jake), I’ve come to value the potential that these technologies have for revealing us to ourselves. As Legacy Russell notes, ‘All technology reflects the society that produced it, including its power structures and prejudices. This is true all the way down to the level of the algorithm.’¹ What AI systems can learn, for example, depends on the datasets on which they are trained. Those datasets typically reproduce the biases that exist in society.

Artists who use technology are often at the forefront of messing with, and critiquing, those technologies. Art made with AI is no exception. Work in this area corrupts, plays and messes about, pushing at the limits of what these

technologies can do. In *Zizi – Queering the Dataset*, the ways in which gender is understood and represented by these machines is exposed through the aesthetics of drag. This piece sketches out new possibilities for art-making and, perhaps, for humanity.

Queer theorist José Muñoz reminds us that: ‘The here and now is a prison house. We must strive, in the face of the here and now’s totalising rendering of reality, to think and feel a *then and there*’.²

Queer futures are often hard to locate; in the early twenty-first century we have seen rising transphobia despite a supposed increase in LGBTQ+ rights. Muñoz proposes the aesthetic as a place to see and feel queer futures, where queerness is not only a way of being, but a practice *for the future*. In these works, Jake develops queer technological practices, queer digital doings, towards the articulation of new modes of art-making, performance and politics.

In *Zizi – Queering the Dataset*, Jake corrupts a neural network for generating fake faces (which was originally trained on a standardised dataset of 70,000 human faces) by introducing a thousand new images of drag faces. The use of these Generative Adversarial Networks (GANs) – a process of collaborating neural networks, a ‘generator’ and a ‘discriminator’ – to create deepfake images and videos is becoming increasingly prevalent. Deepfakes are the latest dystopian example of technological advancement, where fake images and videos can be generated that are indistinguishable from reality. These images and videos *pass* as real, and are connected to the spread of disinformation and the generation of fake news.



iii

¹ Russell, Legacy, 2020, *Glitch Feminism: A Manifesto*. London: Verso, p. 23.

² Muñoz, José, 2009, *Cruising Utopia: The Then and There of Queer Futurity*. New York and London: New York University Press, p. 1.

The idea of ‘passing’ is intriguing in relation to the notions of gender and drag with which *Zizi – Queering the Dataset* is concerned. In an informal conversation with Jake, when discussing realness and deepfake technology, they connected realness and passing in relation to gender and to the Turing test (a test to show if a computer has a ‘mind’, which is achieved when a human speaks to a computer and another human and cannot tell which responder is the human). It is neatly ironic – or more specifically *extremely telling* – that the Turing test developed from an ‘imitation game’ where an interrogator speaks to two humans, one man and one woman, and the interrogator has to decide which is the man and which is the woman.

Here, passing as either male or female is determined by normative understandings of what counts as male or female. However, Yuval Noah Harari asserts that: ‘The Turing test is simply a replication of a mundane test every gay man had to undergo in 1950s Britain: can you pass for a straight man?’³ In the Turing test, then, it is only a short leap to suggest that a computer might only pass by presenting as normatively human. Here, what is ‘normatively’ human reproduces biases in relation to gender as well as race, class, nationality, sexuality, disability and more.

What *Zizi – Queering the Dataset* charts is an unfixed series of faces that simultaneously *do not pass* (in relation to normative notions of sex, drag or indeed humanity) and *continuously pass* (along a beautifully monstrous set of visages). This passing/not passing paradox is achieved precisely because Jake is not interested in creating a deepfake that is ‘real’, where ‘real’ is a synonym for ‘normative’. Eagle-eyed readers might clock the connection between ‘realness’ and deepfakes, and ‘realness’ as a categorisation in the drag ballroom scene primarily inhabited by Black and Latinx queer and trans communities in the USA.

In ballroom, ‘realness’ indicates a performer’s ability to pass or to be seen as legitimate within a category (for example, to achieve ‘executive realness’ a performer is expected to pass in an office setting, to simplify a rather complex process). Responding to the film *Paris is Burning* (dir. Jennie Livingston, 1990), a documentary filmed in the 1980s chronicling ballroom culture in New York City, critics including Judith Butler and bell hooks consider ‘realness’ as being connected to dominant modes of gendered and racialised identity formations. ‘Realness,’ then, might be about re-performing normativity

rather than resisting it. While this is not always the case (and the liberatory potential of ballroom is undeniable), it is interesting to explore how the ‘fake’ in ‘deepfake’ might offer an interesting departure from ‘realness’ as the aim of drag and queer forms of embodiment.



iv

Here, I don’t want to flippantly draw overly simple links between deepfake technology and ballroom subcultures. Instead, I think playing with the idea of ‘realness’ and ‘deepfakes’ offers a useful lens through which to see how queer and drag performance practices can intervene in conversations about technology. If the end point of normative practices of deepfakes is about creating images that are ‘real’ – where ‘real’ is synonymous with ‘normative’ due to the inherent biases present in datasets and AI systems – then resisting realness in AI is also about resisting normativity. Fundamentally, resisting normativity in art contributes to projects of queer world-building by offering images of alternative forms of gender and identity through which we can imagine better futures.

In *Zizi – Queering the Dataset*, this happens through a process of corrupting the dataset, or injecting queerness into it (in Jake’s words). This is an act of vandalism that results in a smooth cacophony of monstrous visages dancing across the screen before our eyes. These drag monsters sometimes refer back to recognisable drag forms, and sometimes the faces reflect drag practices from Club Kids to tranimals. However, the technology also sketches out the potential for drag icons and futures that show us what we can do when we dare to dream beyond recognisably human forms. *Zizi – Queering the Dataset* uses technology to think beyond the confines of the human body to create a bigger, exciting understanding of what gender could be, could look like and could feel like.

³ Harari, Yuval Noah, 2016, *Homo Deus: A Brief History of Tomorrow*. London: Harvill Secker, p. 265.



v

Perhaps it is time to greet our digital drag overlords, overladies, over-monsters and over-things, and welcome them with open arms. It is time to usher in a new dawn where the horizons of gender (and of what counts as human) are infinitely expanded – beyond what we can imagine. In my own way, I am personifying these vast, number-crunching machines, romanticising them into sentience. However, their queerness is created not just by Jake’s careful manipulation but also by the bodies (and, importantly, the marginalised bodies) on which the AI is trained. The images that emerge in *Zizi – Queering the Dataset* provide blueprints for complex worlds that push at the boundaries of gender and sexuality. In their own way, through their playful morphing and fantastic failures, they map out other potentialities of being alive. As Judith Butler reminds us, ‘The thought of a possible life is only an indulgence for those who already know themselves to be possible. For those who are still looking to become possible, possibility is a necessity’.⁴ Making certain lives unlivable happens by making them impossible or unimaginable, through discriminatory legislation, atmospheres and behaviours. Artworks such as Jake’s push at the borders of what counts as human, opening up space to breathe in stultifying binaries of identity, gender and sexuality. Technology reflects our biases, yes, but in many ways it also illuminates possibilities beyond human classification – when we’re given the chance to dream.

⁴ Butler, Judith, 2004, *Undoing Gender*. Abingdon, UK: Routledge, p. 31.

i. Jake Elwes and Me the Drag Queen, *A Night of AI and Drag*. Performance evening, 4 June 2022, Zabłudowicz Collection, London. Photo: Vicki Couchman

ii. Jake Elwes, *The Zizi Show*, 2020. Montage of a deepfake generation on Me the Drag Queen. Courtesy the artist.

iii. Jake Elwes, *Zizi – Queering the Dataset*, 2019. Courtesy the artist and Zabłudowicz Collection.

iv. Jake Elwes, *The Zizi Show*, 2020. Montage of deepfake drag artists with titles. Courtesy the artist.

v. Jake Elwes, *Zizi – Queering the Dataset*, 2019. Exhibition view, Zabłudowicz Collection. Photo: Tim Bowditch.

Lynn Hershman Leeson

How to Do Things with Art

By Lotfi Gouigah



Rightly described as ‘pioneering’, Lynn Hershman Leeson’s practice has less often been understood as performative. This, perhaps, is due in part to the wide array of media used by the artist, and a prevalent understanding of ‘performativity’ as a notion most relevant to discussing performance and body art. The works brought together in *Among the Machines* tell the story of this artist’s bold multidisciplinary approach, moving from drawing to video in *Seduction of a Cyborg* (1994) and painted augmentations of photographic portraits in *Roberta’s Physical Stance #2* (1997). This work is part of the artist’s iconic *Roberta Breitmore* (1973–78) performance, in which the artist embodied a fictional persona she created: a single young woman with a distinctive, yet unassuming, sartorial style. The artist’s performance of Roberta was all-encompassing. The artist carried out Roberta’s daily activities, such as opening a bank account, looking for a flatmate and even confiding her trauma to a psychiatrist.

In *Roberta’s Physical Stance #2* paint and writing are layered to form a photographic blueprint in which the likeness of the artist is overlaid with modifications aimed at conjuring up the persona of Roberta in the body of the artist. But the performance of Roberta did not just take place through the body of the artist. ‘Multiples’ – people who volunteered to adopt Roberta’s body



ii

language, mannerism and outfits – also emerged. In 1978, the de Young Museum in San Francisco organised a Roberta lookalike contest, and later that year an exorcism ceremony took place at the Palazzo dei Diamanti in Ferrara, Italy, by the tomb of the famous Renaissance noblewoman Lucrezia Borgia. During this event *Roberta* was performed one last time through the body of a woman named Michelle Larson. The association with Borgia's final resting place evokes both the mortality of bodies and the timelessness of iconic personae. While the embodied stage of Roberta's existence had now ended, her persona would live on, in the form of archived clothes and wigs, on the virtual platform *Second Life* as part of *Life Square* (2006) and in *CyberRoberta* (1995–98), a robotic doll with Roberta's signature look. In the photograph *Roberta Multiples* (1977), three identically dressed people become Roberta. Each clasping their hands together in a coy, defensive posture, they stand in front of a *Roberta Construction Chart #2* (1975), a hand-painted, annotated photographic portrait repurposed as a blueprint of Roberta. Standing before this chart, the Multiples resemble clergypersons attending to the altar of a saint or deity. The construction chart is their guide to *being* Roberta. Just as linguist J.L. Austin, in coining the term 'performative', famously pointed to instances in language when we not only describe something but also *do* something in sentences such as 'I do'¹ (during a wedding), so the Multiples – in regulating their body language and appearance – are not only describing Roberta by acting like her; they are also *being* Roberta. In the project

Roberta Breitmore, Hershman Leeson performed the process of subject formation and individuation, and in so doing highlighted the contingencies inherent in the process. Both a performance and a legal person – the artist having changed her name for the duration of the performance – Roberta was seemingly just like the rest of us. This proximity allows us to consider the ways in which our everyday life unfolds as a performative process.

A decade before Roberta came to life, Hershman Leeson had turned to augmenting her acrylic, watercolour explorations of the body with a translucent acrylic layer. Just like Roberta had been overlaid onto the body of the artist, the female figure in *Dress Ray* (1966), visibly pregnant with a fully grown adult, is clothed in an acrylic dress as the sartorial gestation of a personality. Already, in Hershman Leeson's earlier work, body, identity and meaning are intertwined.



iii

In soliciting our gaze, Hershman Leeson's works not only stare back at us from the era in which they were made, but they appear to look *through* us to a constantly unfolding future. They are laced with utopic visions of a better world and a deep sense of concern about the ethics of embodiment. In *Seduction of a Cyborg* (1994) we are introduced to a 'woman born with eyes that lack the ability to absorb light': she undergoes a procedure that seduces her into an addictive state of sensual symbiosis with a computer that helps her explore the world. When placed in front of a computer screen from

¹ Austin, J., 1962. *How to Do Things with Words*. Cambridge, MA: Harvard University Press, p. 5.

which multisensory stimulations emerge, we see her reach out towards the device as though to better sense its emissions. At one point, she glares back at us. Her pupils – themselves screens for her sensory journey – look past the viewer at the horizon of a world in which computers mediate all our senses.



iv

The performance of this triad of bodies, perception and media was present in *Reach* (1986), in which a photographic collage shows us a female figure with a film camera for a head. The camera's viewfinder shows us an image of the same figure unencumbered by a camera head: on the lens, a reflection of the figure it's pointing to holds her hand to her face in a gesture that appears to both show the back of her hand and shield her face from the photographic gaze. Her gaze is defiant. The geometries of looking and being looked at, presenting and representing, here and there, then and now, are being captured as embodied and intimate.

Amelia Jones proposed that photography can be viewed as a 'death-dealing apparatus in its capacity to fetishise and congeal time'.² For similar reasons, Roland Barthes viewed photography as a 'micro-version of death'.³ However, in *Reach*, we are not so much faced with an instance of photography as a strategy for preserving the likeness of the living but with a depiction of the likeness of seeing/looking itself. This dynamic echoes media theorist Marshall McLuhan's famous contention that media act as extensions of our senses.⁴ These extensions are not necessarily emancipating, however; *Reach* shows us a figure beholden to the power of a medium that governs how she sees and is seen. She appears as part body, part camera, and is forever reaching out of frame.

Just like the protagonist in *Seduction of a Cyborg* finds new ways of knowing her world through a computer, the work of Lynn Hershman Leeson points to embodiment as inextricable from technologies that mediate the complex dynamics of subject formation. In the process, the viewer is invited to consider their own place among the machines.

i. Lynn Hershman Leeson, *Roberta's Physical Stance #2*, 1997. Courtesy the artist, Zabludowicz Collection and Altman Siegel, San Francisco. Photo: Robert Divers Herrick.

ii. Lynn Hershman Leeson, *Roberta Multiples*, 1977. Courtesy the artist, Zabludowicz Collection and Altman Siegel, San Francisco.

iii. Lynn Hershman Leeson, *Dress Ray*, 1966. Courtesy the artist, Zabludowicz Collection and Altman Siegel, San Francisco. Photo: Robert Divers Herrick.

iv. Lynn Hershman Leeson, *Seduction of a Cyborg*, 1994. Courtesy the artist, Zabludowicz Collection and Altman Siegel, San Francisco.

² Jones, Amelia, 2002, 'The "Eternal Return": Self-Portrait Photography as a Technology of Embodiment', *Signs* 27: 4, 949.

³ Barthes, Roland, 1981, *Camera Lucida: Reflections on Photography*. New York: Hill and Wang, p. 19.

⁴ McLuhan, Marshall and Gordon, W. Terrence, 2013, *Understanding Media: The Extensions of Man*. New York: Gingko Press, p. 47.

Joey Holder

*Fornication, Fucking, Copulation,
Banging, Mating, Screwing,
Jumping Someone's Bones*

By Penny Rafferty



A chorus of language and naming describes one of the fundamental acts of any living being: sex. It is one of the oldest trades known in human history; people have used it as entertainment, as a tool of survival, as a method of dominance. It brings euphoria and anxiety, it makes our bodies twitch under heavy heartbeats, it allows a constant churning of human flesh out onto this planet, for better or worse.

But humans are not the only ones to enjoy sex in this way. Animals have also been observed to engage in sex for pleasure, social interaction and solace, to demonstrate power or to barter for objects. Artist Joey Holder examines these close socio-emotional links and how they can help us develop more nuanced views on what sex is and how it is used in daily life through her work *The Evolution of the Spermalege* (2014–ongoing). The work consists of a set of usable human-scale skin-safe silicone dildos that are rendered and modelled by Holder from pictures of microscopic insect genitalia pictures, then 3D printed. So far she has crafted sex toys in the abstracted forms of the reproductive organs of insects such as houseflies, bed bugs, honey bees and bean weevils. Now, Holder's motivation for enlarging the genitalia of a variety of species of insect in her work is not because of formicophilia (a sexual interest in and pleasure derived from insects), but to challenge our human-

centric constructs around sexuality. Holder's work questions outdated observations by predominantly heterosexual cis-gendered men such as the evolutionary biologist Charles Darwin, who in his research centred reproduction as the main reason for any human or animal to engage in coitus.

In Holder's view, this idea has seriously damaged our understanding of sex and its multiplicities. Off the back of Darwin's concept, Western society formed a destructive set of moral codes that placed heterosexual reproductive sex as ethically pure and progressive, while all other reasons for having sex became not only amoral but also prohibited or restricted by social custom, cementing the acts as taboo. These assumptions in the field of evolutionary biology have also led to a toxic understanding of gender roles and claims – from researched studies – that males are *naturally* thought to be promiscuous, dominant and aggressive and females chaste and passive. These biologically affirmed traits of what is 'natural' and what is 'normal' have leaked into oppressive structures of human governance, gender inequality and sexual exploitation over the decades, and still do. Of course, since 1871 – when Darwin published his definitive work on sexual selection, *The Descent of Man, and Selection in Relation to Sex* – many popular ideas around sexual acts have changed in the West, thanks to radical intersectional queer gestures and emancipatory action. This has not only brought the right to engage in alternative forms of sexuality beyond reproduction but also the ethical social contracts that need to be set in place for sex to be explored consensually and safely, yet there is still, lamentably, a long way to go.

One of the theorists at the forefront of this argument to create allies and pacts with sex and kin is the feminist scholar Donna Haraway, who states in her book, *When Species Meet* (2008):

We need a multispecies alliance across the killing division of nature, culture and technology and of organism, language and machine. We need new kinds of relations emerging from non-hierarchical alliances, symbiotic attachments, and the mingling of creative agents. If we appreciate the foolishness of human exceptionalism, then we know that becoming is always becoming with.¹

This idea of 'becoming with' is interesting to unpack in terms of Holder's installation *The Evolution of the Spermalege* and the notion of the dildo. As an object, it can be dated back 30,000

years – beautiful, handcrafted, polished, engraved Stone Age stone dildos have been unearthed. When we use a dildo, we typically take the object into our body and give ourselves up to it. In French, the act of climaxing is even called *la petite mort* ('the little death'). To become undone by the act of pleasure is to die – and, through nature's cycles and seasons, we understand this death to allow space for rebirth and transformation. As Haraway suggests, these moments during which we commune with non-human agents – whether this is taking on a siltstone, chalk, antler bone or 3D-printed honey bee dildo – are the moments we can begin to reconnect, to co-exist and to move beyond human folly. Holder's works are, of course, art objects rather than domestic sex toys, which allows for the conceptual affordances of the dildo as an aesthetic, allowing the viewer to be mind-fucked by the diversity of nature and to understand the unlimited possibilities that could exist within the ecological cosmos.



ii

Drawing on research around insect and marine life copulation to frame these ideas, Holder chooses the sexual organs to extrapolate to human-scale by researching the most curious acts of mating – such as the bean weevil, which has a knife-like penis with which he pierces the female's abdomen, then injects sperm through the wound into her abdominal cavity. Another is the honey bee: at the moment of climax, their penises snap

¹ Haraway, Donna, 2008, *When Species Meet*. Minneapolis, MN: University of Minnesota Press.

off and explode into a thousand euphoric fragments. In turn, aided by the entomologist Michael Siva-Jothy, Holder has also examined insects that practise BDSM, such as the dominatrix insect, the female praying mantis, which feasts on their partner during copulation, giving a whole new dimension to ‘eating you’. Another example is the fierce female bed bugs, which protect themselves from sexually transmitted infections by producing lysozyme, a bacteria-killing enzyme that coincidentally also boosts their immune system.



iii

These acts may seem more other-worldly than any foreplay arrangement you have found yourself in. This other-worldly trope often underpins Holder’s work more generally – such as in her recent installation, *Semelparous* (2019–20), which is a tribute to the European eel’s complex migration and reproduction habits. The eel is threatened by climate change, the human population crisis and the complex, lengthy migration route the adult eels take across the globe each year to spawn. Holder’s fascination lies beyond mammals and warm-blooded creatures we can relate to. Instead, she utilises the closest links to living aliens on this planet in her view: insects and marine life. Allowing the viewer to immerse themselves inside natural, earth-bound alien terrains, Holder describes how we can reflect and destabilise our own baffling existence through the familiar, not the unbelievable. Holder’s motivation for making these thought experiments is to undermine what is, culturally and societally, understood as ‘normal’ and ‘desirable’. Letting the mind trip through a kaleidoscope of possibilities, Holder allows the viewer – body, mind and spirit – to begin to commune with something that is not human: a hybrid of us and others.

This weird merger can also be found in the work of ethnobotanist Terence McKenna, who often spoke of taking on the psycho-fluids of nature’s scripts to derail culture and knowledge as we know it. His words come to mind when looking at the spiralling diagrams, morphing mandalas and electric circuit wallpaper that accompany Holder’s *The Evolution of the Spermalege*. In the 1990s, McKenna spoke regularly at lectures about how he was convinced that aliens, as in extra-terrestrials, were already here on Earth, and he believed we could communicate with them and meet them by ingesting psilocybin, a naturally occurring psychedelic drug produced by more than 200 species of fungi, which would, McKenna proposed, help us to speak and see in their language. This is not too dissimilar to Holder, or to Haraway’s *A Cyborg Manifesto* and the use of an addition to the human body, whether this is a dildo, a technological chip or a shroom: all three offer us the chance to experience a pluralistic universe, an act of cognitive reorganisation through the hyper-performativity of becoming alien.

i. Joey Holder, *The Evolution of the Spermalege*, 2014–present. Exhibition view, Zabudowicz Collection. Photo: Tim Bowditch.

ii. Joey Holder, *The Evolution of the Spermalege*, 2014–present. Installation view, Seventeen, London, 2019. Courtesy the artist and Seventeen.

iii. Joey Holder, *Semelparous*, 2020, Pigment prints, single channel video, acrylic on board, living ivy, sound system. Installation view, Springhealth Leisure Centre, London. Courtesy the artist.

Marguerite Humeau

Immaterial Conversions: Are Marguerite Humeau's Artworks Altermodern?

By John Kenneth Paranada



To understand the function of contemporary art in the digital age, we must pay attention to its materiality, looking beyond the physical existence of the work and delving into the chemical reactions and 'immaterial' fissures spawned through contact with an audience. Materiality as an aesthetic concept has evolved through formalism's interest in purely visual aspects of art. It was championed by the likes of American art critic Clement Greenberg in the mid-twentieth century, leading to structuralism's concentration on context and language.

In a traditional encounter with art, the aesthetic experience manifests first and foremost through attention to art's physical components, and close intellectual engagement. This process is dialectical and becomes even more complex as contemporary art shifts towards the immaterial and temporal, such as performance and conceptual art, which reframes meaning over and over again through aesthetic juxtapositions and interplay: the object d'art becomes a subsidiary, overshadowed by its 'immaterial' qualities.

But what do I mean by 'immaterial'? Here I refer you to French philosopher Jean-François Lyotard's essay 'Presenting the Unpresentable: The Sublime' (1984). Lyotard was known not just for his ideas surrounding the end of modernity, but also for his writings on the sublime as a central aesthetic category.

He posited that the ‘immaterial’ in contemporary art is not just a mental concept, but is more analogous to radio waves or events that may form connections and separations. This idea echoes Lucy Lippard and John Chandler’s idea about the dematerialisation of art as ‘mental processes’ of ‘ephemeral structures’ and ‘serial progressions’¹, and it reverberates in the practice of London-based French artist Marguerite Humeau, who takes an approach that could be termed pure speculation. Humeau asks what life is like in the twenty-first century. How abstract can it be? How do we imagine leaping in time from the deep past to possible futures?

In theorising that the object of art is ever-transforming, Lyotard co-curated the exhibition *Les Immateriux*² (The Immaterials) at the Pompidou Centre, Paris, in 1985. The exhibition highlighted artworks, objects and materials – such as plants, artificial skin, scientific renderings and technical instruments – alongside the most advanced computers and state-of-the-art technologies of that time. Smells, sounds and images were assembled to question traditional dualisms and to come up with equivalent language and practices to hold emerging ideas about art related to political, social and technological infrastructure. Lyotard pointed at a specific and emergent conjunction of the sensory, beneath and beyond pure sensation itself, that connected us to the sublime. With *Les Immatériaux*, Lyotard called us to bear witness to something inexpressible, beyond the object of art itself. This led to French curator and theorist Nicolas Bourriaud’s theory of relational aesthetics³ (1998) – a pivotal idea around radical art activity that is still influential today. His idea of an art practice in which objects play a minor role and where the primary emphasis is on interactivity – or, rather, dialogical relations between people – has remained inspiring and relevant for artists and curators seeking to dissent from the swollen commodification of art-as-luxury-brand in the age of neoliberal globalisation.

In 2009 Bourriaud curated the 3rd Tate Triennial, titled *Altermodern*, an exhibition that suggested a label for the present ‘void beyond the postmodern’, a ‘modernity from scratch’⁴ – a present that is not about a modernist, ivory-tower perspective of the arts but rather something that favours misunderstandings, displacements, and unbounded art practice. Outside the West, Bourriaud’s ideas have often been criticised as Eurocentric, as they tend to ignore other philosophical and dialectical debates around the concept

1 Chandler, John and Lippard, Lucy, 1968, ‘The Dematerialization of Art’. This essay is followed by the essential anthology: Lippard, Lucy, 1973, *Six Years: The Dematerialization of the Art Object from 1966 to 1972*. New York: Praeger.

2 Linker, Kate, 1985, ‘A Reflection on Post-modernism’. *Artforum*, pp. 104–106. <https://www.artforum.com/print/198507/a-reflection-on-post-modernism-35192>

3 Bourriaud, Nicolas, 2002, *Relational Aesthetics*, translated by Simon Pleasance and Fronza Woods with Mathieu Copeland. Dijon: Les Presses du Réel, pp. 10–24.

4 Bourriaud, Nicolas, 2009, *Altermodern*. London: Tate Publishing, pp. 1–14.

of modernity.⁵ In contrast, for example, in Bruno Latour’s philosophy⁶, being truly modern means embracing hybridity in all its forms. Still, what attracts me to Bourriaud’s idea of the Altermodern is how it attempts to speculate on the language and gestalt of modernities to come: a modernity that Bourriaud claims is specific to the twenty-first century.

Reconsidering these theories in 2022, if by ‘Altermodern’ Bourriaud was suggesting that artists are opening up to a broader plethora of mediums, formats, collaborations and interlinked approaches to knowledge – a shift that has been greatly facilitated by the rapid advance of technology (blockchain, NFTs, AI, digital consciousness), the climate crisis, interspecies and multi-species ethnographies, and the global pandemic – then he might be on to something. The critical relationality he championed we now experience as the primary operational mode for today’s artists, as seen in the exhibition *Among the Machines*.

Suggesting a pragmatic framing for the artistic exploration of fantastical possibilities or worlding, the idea of the Altermodern could help to shape a future human condition, helping to link past, present and future, in what Bourriaud calls ‘immaterial invisibility’.⁷ This idea, itself borrowed from conceptual art, suggests that, in modern art, the unseen or invisible has gradually become more complex, supported by this notion of the ‘immaterial’. For the modern artist, this means that the ‘invisible’ or ‘immaterial’ becomes a raw material and a source of ideas.

Marguerite Humeau’s research-based practice seems to be interested in unsettling the materiality and immateriality of art by using conceptual art itself as her foundational inspiration. Her work often takes the shape of large-scale installations involving sound and sculpture, through which she challenges contemporary critical issues using complex narratives that synthesise past and present. Using the immaterial as a source akin to a dream world allows her to imagine and reimagine speculative futures in which time, space, animals, humans, minerals and nature confront each other. Humeau meticulously weaves factual events into speculative narratives, enabling unknown, invisible and extinct forms of life to be resurrected and re-examined. She combines prehistory, occult biology and science fiction in a bewildering spectacle – her works reanimate the past and conflate deep time while expanding the aesthetics of the information age.

5 Bishop, Claire, 2005, *Art of the Encounter: Antagonisms and Relational Aesthetics*. Published by Circa Art Magazine, pp. 32–35.

6 Latour, Bruno, 1993, *We Have Never Been Modern*, translated by Catherine Porter. Cambridge, MA: Harvard University Press, pp. 1–12.

7 Bourriaud, Nicolas, 2021, ‘Materialist Invisibility: Art as Organic Development in Pamela Rosenkranz’s Work’. *Flash Art*. <https://flash--art.com/article/pamela-rosenkranz/#>

In Humeau's 2016 commission, titled *FOXP2*, at the Palais de Tokyo in Paris, she produced a series of works that played with the space between research and fiction. These were developed with the help of specialists, including linguists and scientists. With *FOXP2*, Humeau conceived of the exhibition space as a 'biological showroom', a place to re-create and display prototypes of non-human intelligence with varying degrees of sentience. In doing so, she inferred an expanded version of a 'contact zone'⁸ – James Clifford's (1997) term for the place where subjects previously separated by geography, time and history can come together.



ii

Humeau imagines an evolution beyond the human, asking questions such as 'How might elephants have evolved? What if elephants had become sentient beings, able to use language? Would their tusks have evolved into horns with sensory feelers at their tips?' These questions suggest that the 'contact zone' functions as a narrative device in her work, as in science fiction. The artist's interest in *FOXP2* (the gene that enabled humans to develop and articulate language through the mutation of the human larynx during the last ice age) is used as a departure point to investigate the speculative futures of various animals.

Continuing the explorations of her *FOXP2* series, the sculptural work Humeau presents in *Among the Machines*, titled *JOSEPHE, a female drinking its own milk in a desperate self-cannibalistic gesture of survival. The creature's soul has left its body* (2016), gives life and form to imagined evolutionary 'what ifs' in an attempt to blur the boundaries of science fiction and evolutionary history and to utilise the mythological power of a scientific narrative.

⁸ Srinivasan, Ramesh, Becvar, Katherine M., Boast, Robin and Enote, Jim, 2010, 'Diverse Knowledges and Contact Zones within the Digital Museum.' *Science, Technology & Human Values* 35(5), 735–68. <http://www.jstor.org/stable/25746392>.

The artwork resembles a classical sculpted matte marble, but is made of resin, polystyrene, fibreglass, white paint and acrylic parts. The elephant head has two elongated horns sprouting in a curl, and in the middle of those horns is a trunk that resembles a tongue. The sculpture looks like an alien life form. The work is accompanied by a sprayed white metal stand and a pink acrylic box that emits the eerie sound of an elephant breathing heavily, which the artist considers to be elephant proto-language. Devised in collaboration with Pierre Lanchantin of the Machine Intelligence Laboratory at the University of Cambridge, it is based on a vast archival dataset of elephant sounds. The AI was instructed to imagine the sound of elephants, should they have inherited the genetic mutation that allowed humans to develop vocal cords and thus develop speech.

The blending of science and fact in *FOXP2* induces a sense of wonder and evokes a bizarre feeling of marvel and something uncanny: it seems to be a doorway into a dream world or the other side of a portal, like a threshold that splits the material and the immaterial, the synthetic and the organic, the known and the unknown. Humeau's explorations might also trigger a connection to novelist Anaïs Nin's writings and ideas of practices, which are rooted in nature and associated with the feminine, a sense of giving birth to ideas and worlds: worlds that don't just elucidate the world of ordinary appearances, but new worlds in which we see through technology and machines with other forms of non-human presence and intelligence.⁹

⁹ Nin, Anaïs, 1965, 'Beatrice Wood'. *Artforum*, January, pp. 118–19. <https://www.artforum.com/print/reviews/196501/beatrice-wood-76193>



iii

One might infer that Humeau's *FOXP2* project is inherently tethered to the foundational ethos of the space for which it was commissioned: Palais de Tokyo, the space founded by Nicolas Bourriaud and Jérôme Sans between 1999 and 2006, dedicated to artworks that refuse to settle or be easily categorised as art. Bourriaud even changed the standard opening hours of the museum to run from midday to midnight to better accommodate visitors and the flow of life itself. The evolution of the concept of relational aesthetics to Altermodern seems to distil exactly how contemporary art mirrors the human condition in the twenty-first century, reflecting speculative futures through its prism.



iv

With *Altermodern*, Bourriaud wanted to highlight works that critically examine and complicate history through the mixing of disciplines and a deeper understanding of immateriality. In that case, Humeau's work must be Altermodern. After all, to understand the materiality of art, regardless of whether the form itself is classified as immaterial or decidedly physical, means being able to describe its history – its interconnectedness – with critical sharpness, understanding how attitudes become form, and knowing how to master the archaeology of knowledge in the age of Google.

i. Marguerite Humeau, *JOSEPHE, a female is drinking its own milk in a desperate self-cannibalistic gesture of survival. The creature's soul has left its body*, 2016. Courtesy the artist, Zabłudowicz Collection and C L E A R I N G, New York/Brussels/Los Angeles. Photo: Richard Ivey.

ii. Marguerite Humeau, *Echo, A matriarch engineered to die*, 2016. Exhibition view, Palais de Tokyo, Paris, 2016. Polystyrene, white paint, acrylic parts, latex, silicone, nylon, glass artificial heart, water pumps, water, potassium chloride, powder-coated metal stand, sound. Courtesy the artist and C L E A R I N G, New York/Brussels/Los Angeles. Photo: Spassky Fischer.

iii. *Rubatois, The unsettling awareness of your own heartbeat, a muscular beat, the tapping in complete darkness. Inspired by the Foxglove, rhythmically structured on the stem: like a music notation for inhalation and exhalation, it shows the rhythmical expansion of the human heart palpitations*, 2022. Wax, sugars, mineral dust, pigments, thermochromic pigments, plant-based and synthetic resin, nylon, bronze. Courtesy the artist, Zabłudowicz Collection and C L E A R I N G, New York/Brussels/Los Angeles. Photo: JSP Art Photography.

iv. Marguerite Humeau, *Migrations (Kuroshio, La Niña)*, 2022. Installation view, 59th Venice Biennale, curated by Cecilia Alemani. Courtesy the artist and C L E A R I N G, New York/Brussels/Los Angeles and White Cube. Photo: Roberto Marossi.

Keiken

Instruments for a Metaverse

By Rebecca Edwards



Episode 1

A trio of jagged rocks line the circular stage, which is set with a sparkling reflective resin surface. Lit from underneath, a bespoke circular mattress sits atop another rounded platform, reflecting the project in front of it. The bed is the perfect size for a couple of expectant players to feel at home: comfort is paramount to the immersion players' experience in achieving objectivity through subjectivity.

The single tablet is a portal into this metaworld, awaiting a touch to begin transportation. Sliding a finger across the surface creates rippling waves in the computer-generated pool. Its gridded overlay undulates with the water beneath and mirrors the fluidity and permeability of the real.¹

The Life Game is formed of three separate game-and-watch episodes that follow the protagonist ME and their digital twin MI on a journey of discovery through a borderless metaverse. In their eight years of collaborating, Keiken have explored what experience means in the digital realm through a practice that involves world-building as a way to question what reality is. Through interactive films, multidimensional games, immersive installations and various other CGI creations and experiments

¹ All quotations without a source in this essay are descriptive responses by the author to *The Life Game*.

with AR, VR, XR, film and performance, Keiken ask us to broaden our current approach to inhabiting the metaverse through more radical gaming environments and by focusing on ethereal manifestations of the self and the other. *The Life Game* encompasses this multidimensional technique of game design and game experience. The game is set in a platformed arena. Keiken have adopted a holistic practice of building scenarios and experiences to encourage play and intimacy with the work and to subtly transport players into the narrative. Although the screen does not inherently allow for the translation of our bodies into a virtual environment, Keiken experiment with ways of reaching beyond players' presence in dual realities, in both the quotidian and the virtual world. Lighting, seating, props and devices are used to control the work, and players' bodies can be extended through the use of various input devices to allow them to perform through avatars. These additional physical components are all set within frameworks that foster immersion on a more spiritual level and promote Keiken's emancipatory practice of world-building. Participating in the work first-hand affords players access to the principle of conscious life, one that mediates between body and soul.

In Episode 1, we meet ME and their digital twin MI.

Glass skin matches latex outfit, matches shiny landscape, matches glossy surroundings: everything is illuminated, everything is reflective. This is ME, pronounced 'me', who has found themselves in an overbearing routine of information-age bombardment and requests for time and labour. ME is lonely and wants physical connection again, instead of communicating inside their head. They download a screen extension that records their data to help them separate their online and onsite lives.

A cell-like shape morphs from one into two, and from two into one, at the left-hand side of the screen. An upgrade on the extension means that we soon encounter a twin, ME's digital copy, who is just the same but somehow different: shorter in stature and more animated in her gestures. This is MI, pronounced 'my', who is now a human-shaped representative of ME's data trail. Every behaviour, every gesture, every thought, culminating in a digital version.

'They just really understand me. I don't think I've ever had a friend like this before,' ME exclaims excitedly.

Thoughtful actions are implicit in the hybridity of the human-centred interaction within the avatar-populated landscape: this subtle connection to the digital through live interactional moments becomes paramount to understanding the protagonist's relationship to their digital self, and their dependency on screens and other self-centred technologies. The animistic nature of these becomes clear as the live experience unfolds: the blurring of ME and MI at the beginning is intentional and creates an opening for players to understand how their own reliance on skeuomorphic interfaces is shared with their digital counterparts. Self-representation in the digital world in this way is alive and animated: players are bodiless but not entirely disembodied.



ii

Episode 2

In Episode 2 we witness ME and MI navigating a new decentralised system in the metaverse. Their relationship somewhat fraught, ME and MI traverse separate paths in a quest for clarity and understanding of each other and themselves.

The camera pans around to a solemn face with tired, bulging eyes and porous skin. Confusion spreads across a furrowed brow; a sense of overwhelm flashes across them.

'Hold me. I want to feel alive,' she whispers over and over again.

Longing for physical touch, ME and MI try to reach each other. Their faces blur in and out of focus across pop-ups that are waiting to be dragged across the screen. But it's not enough. ME has become too detached and wants out.

With our collective future in the metaverse comes a proclamation of ‘the way things are’ – we long for safe digital public spaces, equilibrium, organic structures, sensory technology, nuanced communication, shared mixed reality and purpose, but what we have is shame, screen suffering, traumatised cultures, a capitalist lobotomy, reward and punishment, and endless dopamine loops.

Entering Keiken’s metaverse is an attempt to resist corporate-capital models of the future of the internet – something not dissimilar to the ‘Declaration of Independence of Cyberspace’ put forward by John Perry Barlow in 1996. The main argument in this short, but powerful, statement is that cyberspace is a separate, global place without the physical boundaries that define and give power, so it should remain naturally immune to sovereignty. For Barlow, ‘cyberspace is something that happens independently of the physical world in exactly the same way as the mind and body’²; for Keiken, the metaverse is a process of dis-embodiment and re-embodiment: an internal consciousness transported in a spiritual act not tied to tangibility, but malleable and open to embracing otherness and transformation.

² Barlow, John Perry, 1996, ‘A Declaration of the Independence of Cyberspace’, Electronic Frontier Foundation. <https://www.eff.org/cyberspace-independence>

Exiting the cloud and entering ALL – a decentralised reflection technology for nuanced and collective experiences – a pill-shaped therapist-cum-Uber vehicle transports ME to a self-sovereign world with a glittering, endless sea.

The decentralisation of the self, transactions of exchange, and a new form of currency based on ideas of wisdom, love and spirituality: this is a profoundly transcendent approach towards new ways of existing in Keiken’s metaverse. However, this idea opposes Mark Zuckerberg’s ideas for Meta. While Keiken speak of a radical form of currency and exchange of ‘value’ in their metaverse – one based on sharing ancestral knowledge, history and memories to explore multiple consciousnesses and dreams – Zuckerberg places commerce at the heart of his. Keiken’s metaverse is about an internally sustainable form of exchange, while Meta’s is a closed platform that is sustained through extraction, and exists as a continual hollowing out for the same purpose. Speaking about identity and avatars, Zuckerberg states that now the goal is to integrate all of these disparate spaces (game worlds, social media,

chat software) and create a technology that can allow a person to seamlessly swap between all their online identities in a way that feels natural.³

With Meta’s transition of assets between software comes a different kind of economy, one that’s more abstract than buying, selling and owning in the real world; still, it’s rooted in capitalist culture. Virtual clothing, for example, is becoming bigger with the more time people spend in virtual environments. According to Zuckerberg, users want to be able to express themselves and dress their avatar as they do their physical body. At the moment, the issue is with allowing these digital assets to cross over to multiple other software platforms. This creative commerce will be a big part of the Meta metaverse: ‘Because if the digital goods you buy aren’t just dedicated to one platform or use-case they end up being more valuable, which in turn means that people are more likely to invest in them, spurring this economy to grow exponentially.’⁴ But where does this leave a metaverse that’s decentralised and open to any interpretation and use if it relies on monetary transactions for goods, upgrades and access to create a hybrid form of human-to-computer existence?

³ Lex Fridman podcast, 2022, ‘Mark Zuckerberg: Meta, Facebook, Instagram, and the Metaverse’. 26 February. <https://lexfridman.com/mark-zuckerberg/>

⁴ Ibid.

Kaleidoscopic and glittering, this reality is depicted as a series of games – casino-like and addictive, with bright colours whirling around and destabilising perception of time and location.

S>>W>>I>>P>>E – the portal beckons, so you swipe, pulling the trigger on the same game as ME. Faces pop up on the tablet portal and in ME’s surroundings, a selection of three with a score attached; the player enters a feedback loop, a never-ending cycle of play-and-watch-play-and-watch innately tying them to the narrative.



On social media today, AI bots moderate content and accounts that they deem to be malicious, harmful or promoting disinformation, or that are used to troll, bully and intimidate users. This effort to sustain community integrity is criticised by some for being vulnerable to those who know how to hack the system, or by advertisers who know how to bend the rules via loopholes and dark patterns. Multinational technology companies that promote communication and connection to their users are increasingly coming under scrutiny for not providing their users with a suitable level of care. In a 2021 interview, Frances Haugen, a former Facebook product manager, discussed a now-dissolved Facebook team, Civic Integrity, which was intended to curb misinformation.⁵ Among other accusations, Haugen states that Zuckerberg has failed to show that he can protect the public from the negative effects of his networks. At work she saw conflicts of interest between what was good for the public and what was good for Facebook, with the documents Haugen leaked showing a ‘disparity between the company’s internal research and its public statements on the societal impact of its products’.⁶ Ultimately, company capital gains were assumed to be more important than the health and wellbeing of its users.

Will any attempt at moderation be viable in the metaverse, where there may be an infinite number of spaces and zones for people to inhabit?

Episode 3

Wanting access to memories lost and forgotten, ME transforms into their avatars MA and MX. MA creates Dream Time Life Simulation, a technology that allows access to hidden memories, forgotten and untold pasts. The avatars traverse the ways in which present moments stretch, and unsuspected portals open, to an inescapable mirage of dreams. Vaseline is smeared over the viewport.

In Episode 3 we watch as ME transforms into avatars MA and MX, who create liberating technologies to use in the metaverse to connect with their ancestral entities. The Ancestor Tool they create is able to listen to ancestral whispers, intimately connecting the avatars to their harbingers of wisdom.

Exploring *The Life Game* as a player, it becomes clear that narrative is at the basis of Keiken’s metaverse.

⁵ Pelley, Scott, 2021, ‘Whistleblower: Facebook is misleading the public on progress against hate speech, violence, misinformation.’ CBS News, 4 October. <https://www.cbsnews.com/news/facebook-whistleblower-frances-haugen-misinformation-public-60-minutes-2021-10-03/>

⁶ Albergotti, Reed, 2021, ‘Frances Haugen took thousands of Facebook documents: This is how she did it.’ *The Washington Post*, 26 October. <https://www.washingtonpost.com/technology/2021/10/26/frances-haugen-facebook-whistleblower-documents/>

Two human-shaped characters navigate real-world-situated topics of energy, conflict, reality and dreams, and simulations. Within this test drive of the potential for an alternative metaverse comes the gamification of life – but also the ‘lifification’ of gaming. Players follow and invest in avatars that perhaps live parallel lives to themselves in Episode 1 and advance through the metaworld to find an inner sanctuary via their multiple consciousnesses and links to their ancestral wisdom: they return ‘home’. What effect does this blurring of life and gamification have on the way we live our lives, online and offline?



iv

This way of performing to rethink is reminiscent of Cassie Thornton’s book *The Hologram*, about a feminist-centred project that promotes a viral peer-to-peer health network. Drawing on radical models developed in the Greek solidarity clinics during a decade of crisis, the premise in *The Hologram* involves regular meet-ups between a ‘triangle’ of participants. The triangle focuses on the physical, mental and social health of a fourth participant – the ‘hologram’. In turn, the ‘hologram’ teaches the caregivers how to both offer and accept care: ‘Each member of their triangle becomes a hologram for another, different triangle, and so the system expands.’⁷

This expansion of the self via other, elected members is similar to the way in which players of *The Life Game* help to uncover the hidden – but within reach – other identities of ME. Like *The Hologram*, *The Life Game* relies on parafiction – or fiction presented as fact to the players. It exists both as a rumour about the possibility of a new metaworld and as a device for thinking about the multifaceted nature of the human/avatar condition.

⁷ Thornton, C., 2020, *The Hologram: Feminist, peer-to-peer health for a post-pandemic future*. London: Pluto Press.

Floating in the bluest water, a glass-like womb that extends from MA contains multiple consciousnesses of ME. A familiar face from the slot machine appears in the corner and guides MX through an understanding that their body holds many perspectives and experiences: this reality will unfold when they have the knowledge and want to unlock it. This new reality in the metaverse pierces the membrane of everything we know.

The Life Game is an aspect of Keiken's practice that expands their creation of a metaworld. Everything in it can be linked back to previous works – memories, nuanced details and frameworks for interaction are borrowed from other Keiken projects, expanding the idea of their metaverse and their world-building approach.

Each of the protagonists in the three episodes, ME, MI, MA and MX, forms a network akin to peer-to-peer (P2P). Unlike corporatised client/server models of information-sharing across computers, a pure peer-to-peer network is inherently decentralised by the nature of the way it operates. All people, or 'nodes', in the group are equal, since there is no dedicated server for information to pass through before reaching them. Each node in the network, therefore, serves as both a client and a server, making use of resources while simultaneously providing resources to others. Using P2P network architecture as a tool to rethink how memories, experiences and understanding are coagulated and disbanded in the metaverse could expand Keiken's method of embracing otherness and transformation where 'nothing is fixed'⁸. In this framework, notions of labour, care, shared goals and accountability are foregrounded through the partitioning of tasks, workloads and accountabilities between nodes. Here, nodes are equally privileged, equipotent participants in the application.⁹ Viewing the transfer of the self in the metaverse as a horizontal structure, where information is stacked circularly, outside a centralised model, the environment for consent is one that is governed by setting sharing permissions on individuals. The metaverse may offer us many possibilities for discovering and projecting our being, our material or immaterial existence, but this needs care, optimism and an openness to the speculative nature of future-thinking, as well as a shared vision of development outside the monetised corporate model of capitalism. The movement of individual mental and physical attributes towards a digitised space needs collective intention.

i. Keiken, *The Life Game*, 2021. Exhibition view, Zabłudowicz Collection, London. Photo: Tim Bowditch.

ii. Keiken, *The Life Game*, still from Episode 1, 'Viral Energy', 2021. Digital still. Courtesy the artist.

iii. Keiken, *The Life Game*, still from Episode 2, 'Battle of Reality', 2021. Digital still. Courtesy the artist.

iv. Keiken, *The Life Game*, still from Episode 3, 'Dream Time Life Simulation', 2021. Digital still. Courtesy the artist.

⁸ Angelos, Ayla, 2022, 'Nothing is fixed in our metaverse: Keiken proves that anything is possible in its virtual, cinematic world', It's Nice That, 3 March. <https://www.itsnicethat.com/articles/keiken-digital-210621>

⁹ Cope, James, 2002, 'What's a Peer-to-Peer (P2P) Network?' Computerworld, 8 April. <https://www.computerworld.com/article/2588287/networking-peer-to-peer-network.html>

Lauren Moffatt

Suzanne in the Chthulucene

By Pau Waelder



‘Can you imagine that, Edward? An entire city! All those hundreds of white hotels transformed into stained glass – it must be like Venice in the days of Titian and Veronese, or Rome with dozens of St Peters.’

Her husband laughed. Suzanne lowered her glass, disappointed in him. He never understood the significance of the forest. Maybe Edward would understand. He had been inside the house of jewels and had seen its mesmerising beauty.¹

In *The Crystal World* (1966), J. G. Ballard imagines an apocalyptic scenario in which a cosmic event causes the gradual crystallisation of every plant and being on the planet. Its sources are in three regions: the Florida Everglades, the Pripet Marshes of the Soviet Union, and a forest close to the Matarre river in Cameroon. In the midst of this forest we find Suzanne Clair, a doctor who runs a clinic near Mont Royal with her husband Max. After witnessing the fantastic transformation of the trees, flowers and animals into masses of iridescent crystals, she excitedly writes to her colleague and ex-lover, Dr Edward Sanders, describing what is taking place. The novel centres on Sanders’ journey from Libreville to Mont Royal in search of Suzanne, crossing the jewelled forest and encountering a cast of enigmatic characters driven

¹ This paragraph is taken from Ballard’s novel. I have added an imaginary description of Suzanne’s thoughts, inspired by Lauren Moffatt’s approach to the character.

All quotes from the book are taken from Ballard, J. G., 2012, *The Crystal World*. London: HarperCollins.

by violent passions, fighting and dying against the backdrop of miraculous scenery that they fail to see or understand. Suzanne, who – like the other female characters in the novel – is given a passive role, almost as an accessory, seems to be the only one capable of appreciating the eternal beauty of the forest and its significance as a space where time stops, where matter and anti-matter find a perfect balance. Sanders first encounters this beauty as a jewelled orchid he finds at a native market in Port Matarre: a crystallised flower he mistakes for a skilfully crafted ornament. He intends to purchase it, but a disturbance interrupts him. The stallholder disappears with her merchandise, taking the flower which, we might presume, would have been a gift for Suzanne.

The distant presence of Suzanne Clair looms over the protagonist's odyssey through the forest, like a patient Penelope who the reader, empathising with Sanders, longs to meet. However, when she finally appears, she seems absentminded, daydreaming, a shadow of herself. Both her husband and Sanders seem to pity her, ignoring her words and dutifully trying to protect her from her own choices. Artist Lauren Moffatt finds in this character an inspiration for the voices that are not heard, the viewpoints that are dismissed, the sensibilities that are brushed aside. How would this science-fiction novel unfold if Suzanne had been the protagonist, if her views had guided the narrative? Could the crystal forest signal not the end of the world, but the beginning of a new one? The artist imagines a parallel world inhabited by speculative fiction writer Suzanne B. Clair, whose unread books would speak of alternative and desirable futures. But the question that Moffatt suggests is not just a matter of literature; it addresses our understanding of the natural environment in a way that circumvents a belief in the realm of Man to which every other living being and matter on Earth is subject.

The Anthropocene, a term that has been interpreted as the final attestation of humankind's dominance of the planet, but also as 'an apocalyptic fantasy of both human and world finitude',² often leads to techno-solutionist utopias such as those offered by geoengineering projects, or the assumption that nothing can be changed, because the damage is already done. Both visions put humans at the centre of creation and conceive the world (with all its life forms and natural systems) as a passive recipient of human activity. Donna Haraway confronts these ideas with the notion of the Chthulucene,

² Emmelhainz, Irmard, 2015, 'Images do not show: The desire to see in the Anthropocene'. In Davis, H. and Turpin, E. (eds) *Art in the Anthropocene. Encounters Among Aesthetics, Politics, Environments and Epistemologies*. London: Open Humanities Press, p. 131.

which places all living beings at the centre of our geological era, stressing that humans do not have a separate condition from that of other living matter. 'We are humus,' she states, 'not Homo, not anthropos; we are compost, not posthuman'.³



ii

Haraway's words seem to describe the effects that Ballard's crystallised forest has on the humans trapped in it: their bodies merge with the land and the trees, and truly become compost. But she takes her ideas away from an anthropocentric view by naming our present after the chthonic ones, the beings of the Earth, which she imagines 'replete with tentacles, feelers, digits, cords, whiptails, spider legs, and very unruly hair'.⁴ The particular physiognomy of these creatures leads them to perceive the world through their limbs, reaching out, feeling their environment and therefore integrating themselves into it, instead of adopting the detached stance of the erect human. The promiscuous involvement of these tentacled beings with the world around them connects with another fundamental concept in Haraway's *Chthulucene*: string figures. Both metaphor and activity, string figures imply interdependence, bonds, giving and receiving. They constitute the only way of being present in a time when everyone and everything is affected by the same emergencies and the same disasters.

Lauren Moffatt's *Of Hybrids and Strings* (2022) draws inspiration from the Ballardian forest and its most memorable, yet silenced, inhabitant to build an immersive, meditative experience that connects with Haraway's ideas and our present geological time. The viewer finds herself inside a virtual reality environment that simulates a moonlit forest populated by all sorts of strange flowers, hybrids of different species, and wild animals. In the forest, a humanoid character made of flowers mimics her every movement, while luminous

³ Haraway, Donna J., 2016, *Staying with the Trouble. Making Kin in the Chthulucene*. Durham and London: Duke University Press, p. 55.

⁴ Ibid, p. 2.

strings come out of her hands, threading connections with the specular entity and with everything else around. Gradually the strings solidify, building the scaffolding of a geometric structure that invades the whole forest and brings every element to a state of stasis. As this crystallisation process reaches the viewer, her avatar slows down and becomes frozen. At this point she can detach herself from it and observe it momentarily, before sinking into darkness.

The forest is not just a stage for this scene to unfold. Moffatt conceives her work as an ecosystem⁵ in which every element plays a role: the flowers and animals are layered with textures taken from photogrammetric scans and paintings that she created for the covers of Suzanne's books and for each of the creatures; the soundtrack, designed by Antoine Bertin, combines the chirps of crickets and nocturnal animals with other sounds not audible to human ears; the forest itself is generated anew in every experience, using atmospheric data collected from a forest in the south-east of France that was razed to the ground because of a beetle infestation. This attention to detail gives the virtual forest an atmosphere of authenticity and a certain personality, while underscoring the artist's intention to give a proper presence, a real existence, to the non-human. Conversely, the flower creature can be interpreted both as a metamorphosed Suzanne Clair and a personification of the forest. As a humanoid entity, it provides an interface, a possibility of relationship and dialogue with the environment.

In the augmented reality (AR) experience *Reverse Dive (Local Knowledge, Partial Truth)* (2022), Lauren Moffatt confronts the viewer with a gigantic version of this character, now detached from the strings and the subservient position of the imitator, impassively observing the humans below as the flower creature walks around the room. The transformation of the character from one environment to another brings to mind the concept of the *tulpa*, a mental companion or imaginary friend, which is also the embodiment of an idea. In her previous work *The Tulpamancer* (2017–19), the artist explored a subculture that has developed around the creation of virtual characters, suggesting that these could take on a life of their own. Here, this idea has evolved into a metaphor for our changing relationship with the environment, in which we must understand that humans are just some of the many critters populating the Earth, and that our planet can surely exist without us.⁶

⁵ Personal interview with the artist on 11 March 2022.

⁶ As is bluntly stated by Erle C. Ellis: 'This is not the end of Earth or human history. Conditions will probably support life on Earth for at least another billion years. Our species, like most others, will almost surely be gone by then' (Ellis, Erle C., 2018, *Anthropocene. A Very Short Introduction*. Oxford: Oxford University Press, p. 165).



iii

Of the natural disaster stories written by Ballard,⁷ Lauren Moffatt chose *The Crystal World* both for the beauty of its outcome and its unlikelihood. However, it may be argued that the crystallisation process has already started to take place alongside the development of digital technologies and the growing IT industry, which has led to the massive exploitation of natural resources, particularly rare minerals. As stressed by Jussi Parikka, digital media cannot be separated from its materiality, which is to say its dependence on the precious metals and minerals that have enabled its miniaturisation and ubiquity.⁸ In addition to this, Ballard not only speaks of crystals and jewels but also of a compression of time and a form of existence in a seemingly desirable stasis. In a letter to his friend Paul, Sanders explains how, after seeing the wonders of the crystallised forest, 'the rest of the world seemed drab and inert by contrast, a faded reflection of this bright image'.⁹ These words could well describe the immersiveness of VR environments at a time when technology allows for increasingly vivid experiences in outlandish fictional worlds. Conscious of the power of this medium and its use for escapism, Moffatt suggests the creation of a 'deceleration machine'¹⁰, a simulation that leads the viewer to engage in a state of meditation and merging with their environment: a state of being in the Chthulucene, freed from the load of a physical body and the burden of being human.

i. Lauren Moffatt, *Of Hybrids and Strings* 2022. Virtual reality experience. Courtesy the artist.

ii. Lauren Moffatt, *Compost VIII (flowers for Suzanne Clair)*, 2021. Digital still. Courtesy the artist.

iii. Lauren Moffatt, *The Tulpamancer*, 2017–19. Digital still. Courtesy the artist.

⁷ In *The Wind from Nowhere* (1961), *The Drowned World* (1962) and *The Burning World* (1964), J. G. Ballard imagined apocalyptic scenarios that nowadays seem all too familiar.

⁸ Parikka, Jussi, 2015, *A Geology of Media*. Minneapolis and London: Minnesota University Press, pp. 137–8.

⁹ Ballard, *The Crystal World*, p. 81.

¹⁰ Moffatt, Lauren. 'A Deceleration Machine'. Fabbula. <https://fabbula.com/artists/of-hybrids-and-strings-by-lauren-moffatt/>

Tabita Rezaire

An Agent of Healing

By Laurie Cluitmans

Translated by Michele Hutchison

Tabita Rezaire describes herself as ‘infinity incarnated into an agent of healing, who uses art as a means to unfold the soul’. This mystic/artistic endeavour is expressed in videos, installations and video sculptures in which she asks questions about dominant worlds of thought by analysing contemporary technological and social developments. When I first saw her work, I was struck by the unique way she combines a sharply critical tone with a fearlessly loving, healing power.

Rezaire’s films can be described as visual essays in which she interweaves, and reflects on, technological, organic and spiritual themes. Just as the French word *essai* refers to an attempt or try-out, I see her films as essays: attempts to redefine the relationship among these themes. Rezaire critically opposes the straightforward Western narrative of progress, modernity and colonial history that has scarred our landscapes, communities and people. Instead she draws inspiration and hope from ancient cosmologies, spiritual practices from the African continent, and nature’s systems. Rezaire’s films offer a complex re-evaluation of ancient spiritual knowledge and the relation between humans and nature to offer a basis for peaceful recovery from the traumas inflicted by colonialism, capitalism and patriarchal structures. In her search to redefine the connection between the spheres of the technological,



organic and spiritual, Rezaire seems to avoid simplified narratives, as well as clearly defined artistic forms and formats. Instead, her work brims with ambiguity and freedom. Rezaire's visual language is emphatically collage-like, the logical, eclectic result of working with these diverse sources. Though they are entirely different in scope, her two works featured in the *Among the Machines* exhibition, *Sugar Walls Teardom* and *Premium Connect*, are typical of her practice and her attempts at redefinition and re-evaluation.



ii

The original technology

In *Sugar Walls Teardom* (2016), Rezaire addresses trauma carried in the womb, particularly the wombs of Black women, who have historically been the victims of exploitation and violence, subjected to medical experimentation and forms of control. In the film, Rezaire interweaves footage of, among others, an internet search for a gynaecological chair, diagrams of wombs, and historical footage of the medical experiments Dr J. Marion Sims conducted in Alabama from 1845 to 1849 on enslaved women without their permission. The words 'Modernity, coloniality, capitalist patriarchal medical complex attacking womb' appear on the screen. In her essay 'Undeclared War' Sylvia Federici writes:

My thesis [...] is that we are witnessing an escalation of violence against women, especially women of colour, because 'globalisation' is a process of political recolonisation, intended to give capital uncontested control of the world's natural wealth and all human labour, and this cannot be achieved without attacking women, who are directly responsible for the reproduction of their communities.¹

¹ Federici, Silvia, 2017, 'Undeclared War: Silvia Federici on violence against women', *Artforum*, Summer, p. 285.

Through the lens of Rezaire's work, her words become even more topical. She sees the traumatised womb as a metaphor for the violence that has been, and is still, perpetuated against women, particularly women of colour. In the film, Rezaire describes the womb as:

the original technology, portal, womb of the earth ... Wombs used to be celebrated within cosmologies all over the world as a creative force of the universe. They tried to erase our powers. But deep down in each of our wombs we know. Because our wombs are our connectors to the earth and universe. To this galactic womb we need to nurture its voice and soothe its wounds.

If we return to 'the attempt' of the film essay, then this is a typical example of how Rezaire tries to redefine the relations between the technological, organic and spiritual. Her response to this deeply rooted trauma is one of emancipatory healing. *Sugar Walls Teardom* ends with a minute-long meditation by Rezaire and with the loving, calming, healing words: 'Gratitude and unconditional love – give yourself a big hug – you are loved – you give and receive love.'



iii

Divination

In the 2017 film *Premium Connect*, 'divination' is one of the keywords. Critically evaluating the concept of binary code, Rezaire draws on the work of African philosopher Sophie Oluwole (1935–2018) to take a new look at network technologies. Oluwole draws a link between binary code, computers and the Ifa divination system of the Yoruba people of West Africa, who live mainly in what is now Nigeria. This divination system is not based on oracular powers, but uses

an extended corpus of texts and mathematical formulas. It is a system of signs which, collectively and individually, people consult when choices must be made. Telepathy, ancestors, plant teachers, akashic records and spiritual technology go hand in hand with digital network technologies and binary codes. The wide range of reference points in *Premium Connect* are interwoven with mundane questions such as: ‘How do we deal with a digital life? Are relationships conducted through Messenger, WhatsApp and Instagram just as “real” as physical encounters?’ Morpheus from *The Matrix* appears to give prophetic answers. Unseen violence, micro-aggressions, the traumas that need to be healed, both individually and collectively, lurk here in what is recognisable and mundane.

Rezaire points out that the digital world we live in is a direct result of modernity, but can also be understood in other ways. It can be identified as having a different origin: ‘Encoding is the translation of data from one format to another. A piece of data is abstract information. In order to read this data, we must encode it into a format we understand. We could potentially see the same world differently through another format’ – for example, by placing its origin within the Ifa system. Another source of inspiration that returns throughout is the plant teacher. If we see the Wood Wide Web as network technology, the interconnectedness of the forest and its underground hyphal network of fungi and bacteria can teach us different ways of being together. Symbiosis can inspire a new form of cooperation. And if we zoom out further, we find computer code ‘writ into the fabric of the cosmos’. When a network technology combines the organic, electronic and spiritual, it has the potential to heal.

A centre for the wisdom of the earth, the body and the sky

In the same article, Federici describes the power of women to hold their communities together. That is exactly what Rezaire puts into practice. She expresses it in her films by denouncing wrongs and offering healing solutions. But these forms of solidarity must extend beyond strictly human relations if they are to be future-proof. Non-human life forms are also an inherent part of this whole.

All of Rezaire’s films seemed to be building towards Rezaire’s recent *Gesamtkunstwerk*: Amakaba. In the Amazon rainforest of French Guiana, she has founded a centre where all her fields of interest come together: art, knowledge of the earth, the



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body, heaven, the spiritual and the ancestral. Here she intends to celebrate more-than-human ancestors, she has built an ecological cocoa farm and a yoga retreat, and a doula centre is part of her plan. ‘Amakaba is about birth on so many levels, from the birth of a plant, to a child, to another dimension of existence,’ says Rezaire. ‘I literally see Amakaba as a womb that you can go into in order to be rebirthed – to cleanse.’ In this place, far away from urban life and the constant pressure to perform, she invites us to take root in the forest and find guidance in a different way.² From the perspective of the two works discussed here, it is not surprising that Rezaire is returning to her ancestral home, the place where her father was born and with which she has become reacquainted in recent years. In Amakaba, Rezaire is taking her attempt to redefine the relations between the technological, organic and spiritual one step further. Here she is putting her beliefs into practice. Practise what you preach.

i. Tabita Rezaire, *Sugar Walls Teardom*, 2016. Exhibition view, Zabłudowicz Collection, London. Photo: Tim Bowditch.

ii. Tabita Rezaire, *Sugar Walls Teardom*, 2016. Digital still. Courtesy the artist, Zabłudowicz Collection and Goodman Gallery, London.

iii. Tabita Rezaire, *Sugar Walls Teardom*, 2016. Digital still. Courtesy the artist, Zabłudowicz Collection and Goodman Gallery, London.

iv. Tabita Rezaire, *Premium Connect*, 2017. Digital still. Courtesy the artist, Zabłudowicz Collection and Goodman Gallery, London.

² Quotes from an interview that can be found at <https://wepresent.wetransfer.com/story/serpentine-groundwork-tabita-rezaire-amakaba/>

Theo Triantafyllidis

Live Simulations

By Domenico Quaranta



‘OK, I’m gonna be honest with you: I don’t get painting,’ the brawny, blue-haired Ork says to the camera. He is wandering around a conventional studio space, with a prepared plywood board on the wall behind him. I’m using the male pronoun, but the fantasy character is in fact wearing a bikini, and sporting both male and female physical attributes. ‘Like, why would people wanna paint today? [...] You know, this medium has such a great history but, you know, why do it ... right now?’ To get to grips with painting, the Ork starts making gestural brushstrokes and dripping colour onto the board before adding objects and – ‘as I’m supposed to be a media artist’ – a plasma screen to it. Ork formalism: brutal yet accommodating at the same time.¹

Theo Triantafyllidis developed the Ork character in 2018 as his own avatar for the exhibition *Role Play* at Meredith Rosen Gallery in New York. In the virtual space of the studio, the Ork is controlled by his body (via motion capture), speaks in the artist’s voice (slightly altered) and creates the works on show (the aforementioned painting, as well as sculptural assemblages of 3D objects printed on plywood cut-outs and installed in the physical venue). The exhibition thus becomes a mixed reality experience in which the real space awkwardly doubles the virtual space of the studio inhabited by the Ork, which is ‘performed’ on a few large screens on wheels.

¹ Triantafyllidis, Theo, 2018, *Painting* – Preview. <https://vimeo.com/562546985>

Triantafyllidis' ironic commentary is not so much on painting in general; it is targeted at modernism and the survival of modernist painting in the post-digital age. Yet I feel this piece works not only as a joke on 'how you can get to simplicity either by extreme sophistication or by sheer stupidity', as the artist put it in an interview,² but also as an introduction to what appears to be one of his favourite media so far: the live simulation.



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At the very beginning of modernism, Edgar Degas reportedly wrote: 'The frame of a painting by Mantegna contains the world, whereas the moderns are only capable of rendering a tiny corner of it, a mere moment, a fragment.'³ In a world accelerated by industrialisation and fragmented by the advent of photography, and witnessing the change from painting as the main mode of artistic representation, modernist painters focused on the instant and increasingly, as Clement Greenberg pointed out, on the medium of painting and its material qualities: the shape of the canvas, its flatness, the pigment, the brushstroke.

The live simulation not only enables images to 'contain [a] world' once more, but it also replicates the ability of pre-modernist painting to imprison the infinite within a finite surface, and to generate timelessness using an object that exists in time. In paintings, this happens because, as John Berger noted, 'there is no unfolding time'.⁴ All elements are present simultaneously, still and silent: it's up to the viewer to navigate the surface, home in on the details and connect them in a story, in an act of contemplation that has a beginning, but no intended end. Live simulations achieve a similar result by bringing to life complex systems that can basically go on forever. While the movements of the camera can be programmed in a way that recalls the cinematic experience, guiding the viewer's eye and not

² 'Queering Ork aesthetics & existing beyond the virtual: Theo Triantafyllidis in conversation with Faith Holland', Aqnb, 23 July 2018. <https://www.aqnb.com/2018/07/23/queering-ork-aesthetics-and-existing-beyond-the-virtual-theo-triantafyllidis-in-conversation-with-faith-holland/>

³ Growe, Brend, 2001, *Edgar Degas 1834–1917*. Cologne: Taschen, p. 10.

⁴ Berger, John, 1972, *Ways of Seeing – Episode 1*. https://youtu.be/0pDE4VX_9Kk

permitting them the free, autonomous exploration possible on a painted surface, the generative behaviour of the environment and the creatures inhabiting it, as well as the infinite duration of the simulation, makes it closer to the experience of a still image than of any time-based medium. In live simulations, infinite duration equals stillness.

If we accept this parallel between pre-modernist painting and computer-generated live simulations, it comes as no surprise that most live simulations effectively re-enact and build on the classical genres of Western tradition: the still life, the landscape painting, and the historical, religious, mythological or allegorical painting. *Still Life with Yummyums* (2016), one of Triantafyllidis' first simulations, explicitly addresses the still life. On a rotating wooden surface, a vibrant, teeming micro-world develops autonomously, inhabited by both inanimate objects – a banana skin, a melted candle, a smartphone, a hamster wheel, some toy weapons – and various colourful, meowing, semi-abstract living creatures. Inspired by a 1994 paper and research by Karl Sims, 'Evolving Virtual Creatures',⁵ Triantafyllidis designed a number of creatures by joining 3D primitive shapes like cubes and spheres with artificial muscles, then equipping them with DNA that defines their behaviour and leads them to mate and evolve, adapting to their environment. This developing ecosystem is watched over by a flying, sausage-like red worm that attempts to keep the creatures' behaviour under control, preventing orgies and mating that could result in excessive population growth. Cruel yet playful, childish and obnoxious at the same time, *Still Life with Yummyums* is a *memento mori* that takes the form of a fish tank: it places the viewer in 'God view' mode, eliciting wonder, amusement, indifference or even horror, and prompting an inevitable analogy with our life on Earth.

While the world the Yummyums live in has some order and rules, that constructed in *How To Everything* (2016) borders on chaos. Various 3D animated objects, each with its own behaviour pattern, appear and disappear in an abstract, otherwise empty environment that changes colour at every cut: falling stones, flying drones, a knife that slices into whatever it finds, a hovering hand that points, waves, glides around, strokes things, and a clucking chicken that runs around flapping, trying in vain to take flight.

How To Everything introduces a practice that has become customary in Triantafyllidis' work: the use of modernist devices and tropes to reveal the artificial nature of the simulation,

⁵ Sims, Karl, 1994, 'Evolving Virtual Creatures'. <https://www.karlsims.com/evolved-virtual-creatures.html> and Sims, Karl, 1994, 'Evolving Virtual Creatures', *Computer Graphics* (Siggraph 1994 Proceedings), July, pp. 15–22. <https://www.karlsims.com/papers/siggraph94.pdf>

challenge the viewer's expectations, and make the generated environment more chaotic and hybrid. Here, the modernist device of cinematic montage fails to generate a consistent narrative by connecting each scene with previous scenes. The background is flat and monochrome, inhabited not just by animated 3D objects and creatures but also by brushstrokes of paint, moving lines and bi-dimensional user interface icons.



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Rejected as sterile conventions in *Painting* (2018), modernist tools return here and in Triantafyllidis' subsequent simulations as instruments that say: the world you are looking at is not a representation; it's a construction. It doesn't follow reality; it lives by its own rules. Triantafyllidis' computer-generated worlds are never a reconstruction or a representation of the so-called 'real' world, even when they get closer to the kind of photo-realism used in mainstream video games, as happens in *Prometheus* (2017): the live simulation of a pigeon endlessly and aggressively pursuing a pretzel. Here, everything is realistically emulated, except the pretzel, which moves around autonomously as if it's a living being, seems to have the rubbery consistency of liver, and never crumbles.

While *Prometheus* is set in an urban environment, which we experience from the limited point of view of the pigeon, *Seamless* (2017) is a large landscape simulation that recreates a post-apocalyptic natural environment inhabited by animals (such as bears and deer), giant robots, flying spaceships and the debris of a dead civilisation. No human life is present, but although the work is usually displayed horizontally on three synchronised screens, the viewer's gaze is somehow included in the environment as an activating element, as happens in virtual reality. In an interview, Triantafyllidis recalls the experience of navigating Google Earth in VR as an inspiration,

explaining: 'The way you navigate and manipulate this 3D model in VR totally changes your relationship with, and perception of, the Earth – you feel like the whole planet is an object, but on a different scale.'⁶ This perception is strengthened by the fact that the landscape is actually unfinished, meaning that the blank background emerges here and there, brushstrokes sweep slowly among deer and palms, and transparent mountains with a visible wireframe lie peacefully behind more realistic ones.



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Three years later, *Ritual* (2020) picks up the same line of research, but instead of allowing us to lurk and observe the landscape as if it was a painted panorama, it guides the viewer inside the environment, at floor level. Again, the 3D space and the objects and characters that inhabit it are realistic, but the sky is flat and monochrome and painted interventions are visible in almost every scene and on almost every surface. There's no human presence, but the micro-events of this indefinable ritual are set in a decaying suburban setting that seems to have been recently abandoned, as traces of human activity can still be seen: columns of smoke signal the presence of working factories; machines are still running; two mean hyenas are dancing to the music from a car radio; crows race by on Bird™ scooters; and a colony of ants is picking up and carrying everything from microchips to bottle caps to flowers, and occasionally writing mysterious words on the ground.

Both the far future of *Seamless* and the near future of *Ritual* – which, like the virtual reality of *Staphyloculus* (2017), is inspired by an actual physical location, 3D-scanned and used to generate the live simulation – preserve the memory of an undisclosed dramatic event in which human life disappeared from Planet Earth. So what happened? One possible answer is

⁶ 'Talk to me: Eva Papamargariti + Theo Triantafyllidis in dialogue on the entanglement of human, machine + nature', Aqnb, 31 May 2017. <https://www.aqnb.com/2017/05/31/talk-to-me-eva-papamargariti-theo-triantafyllidis-in-dialogue-on-the-entanglement-of-human-machine-nature/>

offered by *Radicalization Pipeline* (2021), to date Triantafyllidis' most direct engagement with current affairs. The title, borrowed from Joshua Citarella's artistic research and political theory, refers to 'the algorithmic bias towards extreme content that threw a large number of people down a rabbit hole of political radicalization on YouTube and various social media platforms',⁷ the most visible and dramatic consequence of which was the storming of the US Capitol on 6 January 2021. Watching the footage captured by those who took part in the event, the artist was shocked by the 'other-worldly trance'⁸ that these people seemed to be in, and this was a key source of inspiration for *Radicalization Pipeline*. In the simulation, hordes of dumb non-player characters (NPCs) are engaged in a mass riot: aliens, furies, medieval knights, Orks, protesters, elves, bikers, cops, soldiers, fantasy and futuristic characters, as well as regular Joes holding a range of flags, are running around killing each other with melee weapons. When they die, they sink into the ground and respawn, endlessly. The events unfold in slow motion, set to a soundtrack by the composer and sound designer Diego Navarro that mingles medieval versions of pop songs with the sounds of explosions, gunshots, clashing swords and samples of conversations taken from social media. The images inevitably call to mind battle-scene paintings, as well as the various triumphs of death and the teeming paintings of Bruegel the Elder, and war video games. In this work, gaming culture is explicitly addressed as one of the cultural influences thought to affect the process of radicalisation.



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Although it – unusually – depicts humans, *Radicalization Pipeline* has a lot in common with Triantafyllidis' previous simulations. Driven by algorithms – just as we are on social media, both individually and as a group – the mob behaviour of his rioters recalls the simple life of the Yumyums, or the

⁷ Bittanti, Matteo, 2021, 'Theo Triantafyllidis: *Radicalization Pipeline*', VRAL. <https://slimetechnology.org/news/vral-28-radicalization-pipeline>

⁸ Ibid.



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repetitive tasks performed by the ant colony in *Ritual*. In the worlds constructed by Triantafyllidis, artificial intelligence is always dumb, instinctual, linear, responding to a single imperative: eat, shit, breed, accumulate, fight, kill, survive. His lone heroes are no different: the blind red worm, the chicken, the pigeons, the pretzel, the spaceships, the crowds all do what they are programmed to do, endlessly. Some of them have the task of surveillance, which is also carried out by the viewer: they are the gods of their worlds, sometimes indifferent, sometimes proactive. The best example of this can be seen in Triantafyllidis' recent AR application, *Genius Loci* (2021). Conceived as a site-specific application that can be adapted to various environments, *Genius Loci* allows us to watch a giant pink creature flying around. Like Artemis of Ephesus, the creature has many breasts (a symbol of fertility) that can be milked by the viewer but, rather than following a classical ideal of beauty, its body looks more like a giant worm, sausage or penis. In the artist's description, it's 'arrogant, sexy, snarky, sometimes obnoxious but also cute and lovable'. As it floats around the venue, it shows us the people inhabiting the space – ourselves included – as Yumyums: dumb creatures busy surviving and evolving, unaware of the laws governing the world we live in.

i. Theo Triantafyllidis, *Radicalization Pipeline*, 2021. Digital still. Courtesy of the artist, Zabłudowicz Collection, The Breeder Gallery, Athens and Meredith Rosen Gallery, New York.

ii. Theo Triantafyllidis, *Role Play*, 2018. Digital still. Courtesy of the artist and Meredith Rosen Gallery, New York.

iii. Theo Triantafyllidis, *How to Everything*, 2016. Live simulation. Digital still. Courtesy of the artist and The Breeder Gallery, Athens

iv. Theo Triantafyllidis, *Prometheus*, 2017. Live simulation. Digital still. Courtesy of the artist and The Breeder Gallery

v. Theo Triantafyllidis, *Ritual*, 2020. Live Simulation. Digital still. Courtesy of the artist and The Breeder Gallery, Athens.

vi. Theo Triantafyllidis, *Radicalization Pipeline*, 2021. Digital still. Courtesy of the artist, Zabłudowicz Collection, The Breeder Gallery, Athens and Meredith Rosen Gallery, New York.

Anicka Yi

*Contamination Versus Containment
in the Work of Anicka Yi, or How to
Live Well in Alien Ecologies*

By Lucy Rose Sollitt



Using ‘biofiction’ and multisensory experience, Anicka Yi’s stylish conceptual practice explores emergent states of hybridisation and co-subjectivity: between the human and non-human, technology and biology, natural and synthetic. Yi’s work operates in the lag created as technology evolves faster than the dominant paradigm of today. It embraces and exposes the contradictions that come with this lag, making us feel the dissonance – even ingest it – at a bodily level.

For me, this plays out with the most potency in Yi’s work when she creates tension between multivalent ontologies of contamination and containment, both physical and metaphorical. Felt by the body, the interplay between these states highlights and destabilises the prevailing paradigm, as well as exploring the potential to realign our relationship with increasingly hybrid ecologies. Yi’s art is a lens through which we can intuit, integrate and begin to move beyond the contradictions.

Dissonance

As advances are made in biotechnology and machine learning, our understanding of what constitutes life and its materials is expanded, and Western categories and hierarchies of the



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species are reshuffled and blurred. The evidence signals that a new philosophy is forming, yet logics of extraction, human exceptionalism, capitalist and colonialist power structures still metabolise bodies, identities and intelligences. Anicka Yi exposes this dissonance through staging what art historian Caroline A. Jones refers to as ‘biofictions’.¹ Yi’s biofictions result in strange assemblages and tableaux that merge the organic and metabolic with the industrial and high-tech, folding in narrative and politics.



iii

In many of Yi’s biofictional scenarios, boundaries and categories are simultaneously reinforced and ingested. *Le Pain Symbiotique* (2014) is set within a transparent PVC dome, reminiscent of a decontamination tent but also acting as a ‘giant synthetic stomach’.² The stomach contains, within its hybrid microbiome, smears of bread dough and ochre pigment that metabolise, along with plinths exhibiting abstract glycerine and resin

¹ Caroline A. Jones, in a conversation on ‘Contamination and Containment’, presented in conjunction with the Hugo Boss Prize 2016. Anicka Yi: *Life Is Cheap*, on view 21 April–5 July 2017. https://www.youtube.com/watch?v=_bCOMZWtNE8

² Anicka Yi: *Metaspore*. Exhibition at Pirelli HangarBicocca, Milan, 24 February–24 July 2022. Gallery guide.

sculptures and projections of micro-organisms. *Immigrant Caucus* (2017) requires visitors to go through a cage-like metal doorway, like entering a holding zone or immigration border. On passing the threshold, industrial spray cans (like the ones exterminators carry) emit an unknown aroma that the visitor inevitably inhales.

On show as part of *Among the Machines*, Yi’s works *Others of Little Weight* (2015) and *Of All Things Orange or Macedonian Wine* (2015) also suggest similar, albeit lo-fi, combinations: kombucha leather pegged on steel lab stands, brass and smears of acrylic paint suspended in a transparent cube.

These works, like others in Yi’s oeuvre, create ambiguous states of containment and contamination. In *Immigrant Caucus* and *Le Pain Symbiotique*, in particular, the uncertainty elicits a kind of embodied paranoia (and justified fear). The fear evokes a sense of the conflict that emerges when we have not yet integrated the paradigmatic shifts under way nor remedied the past, when we do not yet know how to live well within the hybridity. This could be what Yi describes as ‘a biopolitics of the senses’.³

Our bodily interdependence with bacteria can be experienced as a fearful fight against unstoppable mutation in one moment and a celebration of interspecies collaboration in another. *Immigrant Caucus* was conceived of amid the Ebola outbreak of 2014, and the work reflects the Western obsession with hygiene – a recurring theme in Yi’s art. Perhaps it is no surprise that fear of contamination comes at a moment of increasing hybridity: globalisation, migration, rapid viral transmission

³ Berggruen Institute, Anicka Yi: Fellow Biography. <https://www.berggruen.org/people/anicka-yi/>



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between species, bioengineering. Yi highlights and counters this discomfort by endowing the inhaler with the consciousness of a hybrid organism (the aroma one ingests has been engineered from the sweat of Asian women and emissions from carpenter ants). The idea, Yi explained, was to create a trans-species scent that could allow us to perceive ‘something more universal’.⁴ Similarly, the microbiome of *Le Pain Symbiotique* highlights the symbiotic relationship we have with other life forms inside our own bodies (phenomena that bioimaging technologies have allowed us to see).

As the synthetic and natural, the human and non-human merge, the borders between things can feel at once precarious and porous, while also real and powerful. The personal biographies folded within today’s material blurrings can heighten the sense of this. *Immigrant Caucus* reflects Yi’s experience of colonialism and her fear of difference growing up as a Korean in the United States in a ‘stinky household’ (due to the Korean food her family cooked), amid a perception of Asians as exploitable ‘hard workers’.⁵ More broadly, the solidity of a customs border is vastly different depending on one’s geography, body or socioeconomic status. While porosity may not be something to welcome wholesale, someone carrying trauma from abuse may need stronger boundaries.



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Anicka Yi’s art embraces the complex co-existence of personal, political and material identities and events, challenging the narrative of ourselves as somehow independent. Porosity underpins the entanglements that Yi’s work highlights. But at times, having some sense of a border is important too. The interplay between containment and contamination brings these contradictions to the fore.

⁴ Anicka Yi: *Metaspore*. Exhibition at Pirelli HangarBicocca, Milan, 24 February–24 July 2022. Gallery guide.

⁵ Anicka Yi, in a conversation on ‘Contamination and Containment’, presented in conjunction with the Hugo Boss Prize 2016. Anicka Yi: *Life Is Cheap*, on view 21 April–5 July 2017. https://www.youtube.com/watch?v=_bCOMZWtNE8

Integration

The use of machine learning in many of Anicka Yi’s recent works complicates the entanglements in new ways. By combining emergent synthetic and organic intelligences, Yi anticipates future–present ecologies that comprise organic and machine hybrids. Today, machine learning, robotics and generative technologies are making machines more lifelike, while bodies and cells are increasingly augmented and redesigned through biotechnology, wetware and 3D printing. Yi’s biology–machine assemblages expand and pull at the boundaries of what constitutes life in new ways.



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Yi’s kelp pod and lamp works reflect the ongoing decentring of the human as lifelike forms of machine intelligence emerge. This series comprises ethereal spheres made of a kelp-based substance, each one filled with buzzing animatronic flying insects. A decentring of the human, argues theorists like Donna Haraway, is an antidote to the Anthropocene – a geological time marked by planetary despoliation, imperialism, and mass extinction of species and cultures. At the same time, ‘new species’, like the animatronic insects, can feel like a threat. Uneasy ontologies of contamination and containment seem evident here too. The presence of the animatronic insects highlights the precarity of the ‘natural’ and brings to mind fears about genetic modification or the extinction of our own species. They are also a humorous nod towards the current limitations in human attempts to recreate life through AI. What does it mean, Yi asks, to reshuffle the categories of the species, to modify and redesign life’s materials?

Yi's desire to 'foreground a biological approach to cultivating machines'⁶ speaks of one approach to exploring the question. This can be seen in her installations *Biologizing The Machine (tentacular trouble)* and *We Have Never Been Individual*. The organic-machine learning interfaces tested in these artworks point towards a realignment of our machines and technologies with planetary biological intelligence. When this redesign is done with gentleness and care, a new kind of interspecies dynamic can emerge, like the xenojellies and planulae that floated around Tate Modern's turbine hall as part of *In Love With The World* (2021).



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Life, even that born out of the machine, needs context in order to thrive. The question is, what paradigm will this context originate from? In works like *Immigrant Caucus*, Yi has shown how 'biology can no longer be separated from its narrative and its biography'⁷: as machines become ever more entangled in life, they need context too. Yi provides context for the xenojellies and planulae species by exploring what their 'natural history' could feel like. In conversation with Yi, Jones has observed how it is not enough to think that species – say, a jellyfish – can simply be remade (even saved from extinction) by 3D bioprinting them. This struck me. What is a jellyfish without biography, without an ecology?

The narratives that inform the use of a technology matter. Synthetic biology can be used for much good, – treating disease by programming bacteria, for example. But to date, the prevalent approach to developing technologies remains within the modern Western worldview: technologies are developed within sanitised monocultures in which innovation

6 Jeffries, Stuart, 2021, 'I sculpt the air' – what does scent artist Anicka Yi have in store for Tate's Turbine Hall?' *Guardian*, 6 October 2021. <https://www.theguardian.com/artanddesign/2021/oct/06/anicka-yi-tate-modern-turbine-hall-commission>

7 Anicka Yi, speaking at the Verbier Art Summit, 2018. <https://www.youtube.com/watch?v=kBUyXv3nCxU>

and profit are prioritised over planet and context. When the difference between made and unmade creature becomes blurred, so too does the difference between commodity and creature. In a moment of environmental destruction that threatens us with extinction, we continue on this trajectory at our own peril – indeed, at the risk of our own existential and spiritual impoverishment. In a more integrated paradigm, technology would work with, rather than against, planetary life.

What if bodily intelligence – human and non-human – led the development of our technologies? What if, Yi asks, machines could learn through the senses? What if they exchanged information with bacteria, plants and other life forms? By foregrounding biology and the multisensory in her work, Yi foregrounds bodily intelligence and interspecies collaboration. In doing so, it seems to me, Yi refocuses the narrative from outdated power structures and categories towards the primal and futuristic.

Embodied intelligence intuits the contours of today's hybrid existence and may be capable of integrating its contradictions and complexity. This kind of intelligence might well be our best tool for learning how (to borrow from Haraway) 'all critters can live and die well' in alien ecologies. If the xenojellies and planulae are anything to go by, the outcomes could be life-enhancing and celebratory.

i. Anicka Yi, *Of All Things Orange or Macedonian Wine*, 2015. Exhibition view, Zabludowicz Collection, London. Photo: Tim Bowditch.

ii. Anicka Yi, *Le Pain Symbiotique*, 2014. Installation view, Pirelli HangarBicocca, Milan, 2022. The Museum of Contemporary Art, Los Angeles Gift of Chara Schreyer. Courtesy the artist, 47 Canal, New York, Gladstone Gallery, and Pirelli HangarBicocca, Milan. Photo: Agostino Osio.

iii. Anicka Yi, *Immigrant Caucus*, 2017. Installation view, Pirelli HangarBicocca, Milan, 2022. Courtesy the artist, 47 Canal, New York, Gladstone Gallery, and Pirelli HangarBicocca, Milan. Photo: Agostino Osio.

iv. Anicka Yi, *Of All Things Orange or Macedonian Wine*, 2015. Exhibition view, Zabludowicz Collection, London. Photo: Tim Bowditch.

v. Anicka Yi, *We Have Never Been Individual*, 2019. Installation view, Gladstone Gallery, Brussels. 2019. © Anicka Yi. Courtesy of the artist and Gladstone Gallery.

vi. Anicka Yi, *Biologizing The Machine (tentacular trouble)*, 2019. Kelp, acrylic, animatronic moths, concrete, water. Dimensions variable. Image courtesy of the artist, 47 Canal, New York, and Gladstone Gallery. Photo: Renato Ghiazza.

vii. Installation view of *Hyundai Commission: Anicka Yi* at Tate Modern, October 2021. Photo by Will Burrard Lucas.

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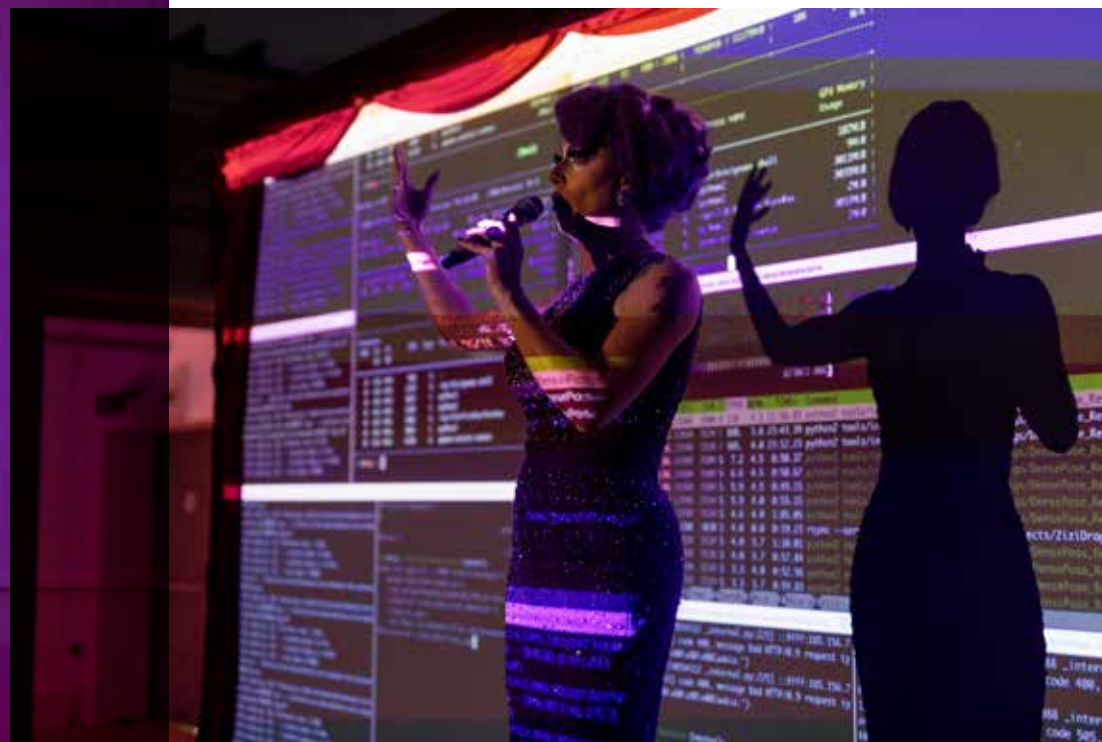
Jake Elwes: *A Night of AI and Drag Performance evening at Zabłudowicz Collection* 4 June 2022

Jake Elwes and Me the Drag Queen presented an evening of performance utilising artificial intelligence and real-life drag to explore the intersection of queerness, cabaret and technology. Specially invited artists joined them to probe what it means to ‘queer the dataset’. The performance was part of *The Zizi Project* (2019–ongoing), a collection of works by Jake Elwes.

Guest performers: Bourgeoisie, Egon Centrik, Byuka Krow, Joy Less, Oedipussi Rex, Flourent Venet and Charlie Wood

Photos: Vicki Couchman







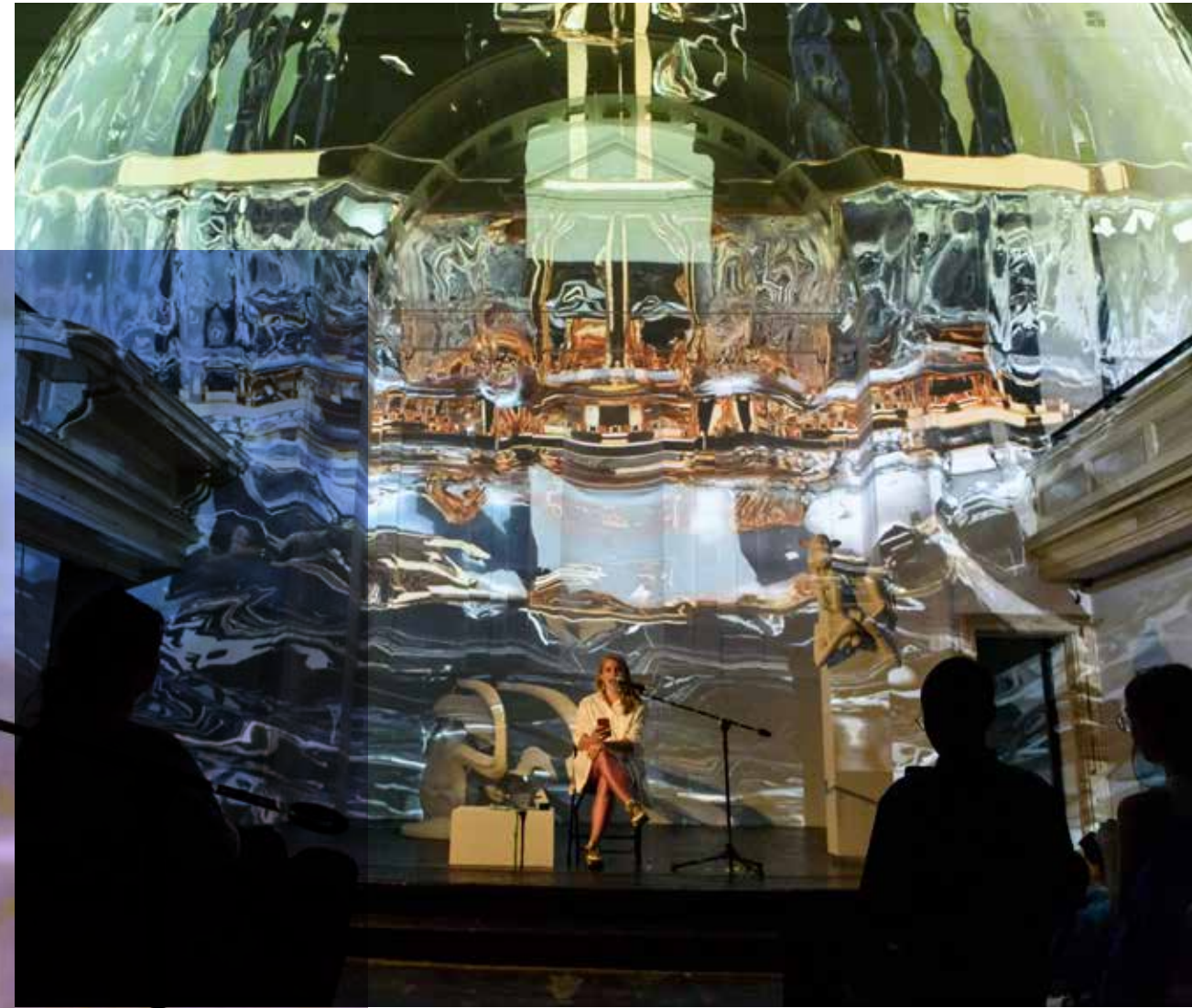
Libby Heaney: *slimeQore*

*Performance lecture
at Zabłudowicz Collection
18 June 2022*

A live performative lecture sliding into the slimy world of quantum computing as both medium and subject matter. Artist and quantum physicist Libby Heaney presented the premiere of *slimeQore*, an immersive video montage and spoken narrative that utilises slime as a metaphor for the blurry, slippery quantum world and also the ‘slimy’ corporations developing quantum technology.

Heaney used IBM’s five-qubit quantum computing systems to compose a video montage that was projected over the *Among the Machines* exhibition, alluding to the layered reality inside quantum computers, and highlighting the vast multidimensionality in quantum. Small black boxes containing slime made by Heaney were distributed to the audience, who were encouraged to open them and play with the material at designed points in the spoken text she delivered, making tactile some of the phenomena of quantum explored in the performance..

Photos: Richard Eaton





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Rebecca Allen (b. 1953, Michigan, USA. Lives and works in Los Angeles, CA) is an internationally recognised artist inspired by the aesthetics of motion, the study of perception and behaviour, and the potential of advanced technology. Starting out in the late 1970s, Allen was a rare female artist working in the early stages of computer design and digital technology. Her pioneering artwork, which spans four decades and takes the form of experimental video, large-scale performances, live simulations and virtual and augmented reality art installations, addresses issues of gender, identity, and what it means to be human as technology redefines our sense of reality.

Ian Cheng (b. 1984, Los Angeles, California. Lives and works in New York). Since 2012, Cheng has produced a series of digital simulations exploring an agent’s capacity to deal with an ever-changing environment. These works culminated in the Emissaries trilogy, which introduced a narrative agent whose motivation to enact a story was set into conflict with the open-ended chaos of the simulation. Most recently, he has developed BOB (Bag of Beliefs), an AI creature whose personality, body, and life story evolve across exhibitions, what Cheng calls ‘art with a nervous system’.

Simon Denny (b. 1982, Auckland, New Zealand. Lives and works in Berlin) produces objects and installations that analyse and reflect on themes entrenched in modern society’s globalised culture: technological obsolescence, corporate culture, television broadcasting, and national identity. Denny deploys language and graphics borrowed from commercial display to highlight connections between the utopian goals of the new media economy and those of historical modernism.

Aleksandra Domanović (b. 1981, Novi Sad, former Yugoslavia. 1984, relocated to Slovenia. Lives and works in Berlin) looks at the history and development of technology through a gender-conscious lens. Her work focuses on the point at which the machine meets and touches the human user. Domanović concentrates on the intersection of a technological future and the marginalised representation of women in popular culture, often using cinema, literature, historical archives and science fiction as source material for her videos, prints and sculptural objects.

Jake Elwes (b. 1993, London. Lives and works in London) researches and works with machine learning and artificial intelligence, looking for poetry and narrative in the successes and failures of these systems, while also investigating and questioning the code and ethics behind them. His current works in *The Zizi Project* explore AI bias by queering datasets with drag performers. They simultaneously demystify and subvert AI systems.

Libby Heaney (b. Tamworth, UK. Lives and works in London) is an artist and lecturer who holds a PhD in Quantum Information Science from the University of Leeds and an MA in Art and Science from Central Saint Martins in London. Her post-disciplinary practice includes moving image works, performances, and participatory and interactive experiences that span quantum computing, virtual reality and AI. Heaney uses affect, humour, surrealism and nonsense to subvert the capitalist appropriation of technology: the endless categorisations and control of humans and non-humans alike. Instead, Heaney uses tools like machine learning and quantum computing against their ‘proper’ uses to undo biases and to forge new expressions of collective identity and belonging with each other and the world.

Lynn Hershman Leeson (b. 1941, Cleveland, OH. Lives and works in San Francisco and New York). For over fifty years, Hershman Leeson has mined the intersections of technology and the self through her work. Known for her ground-breaking contributions to media art, Hershman Leeson has consistently worked with the latest technologies, from artificial intelligence to DNA programming, often anticipating the impact of technological developments on society.

Joey Holder (b. 1986, London, UK. Lives and works in London and Nottingham). Inspired by continued dialogue and collaboration with researchers and practitioners from various fields, Holder creates fictional worlds and constructed environments that respond directly to contemporary, real-world events. Each artwork is considered a ‘set’, with filmic, narrative, architectural, visual and sound elements created uniquely for the conceptual underpinning of the project. She has worked with computational geneticists, marine biologists, behavioural psychologists and investigative journalists to address themes including future farming, synthetic biology, and deep-sea ecosystems.

Marguerite Humeau (b. 1986, in Cholet, France. Lives and works in London). Humeau’s research spans prehistory to imagined future worlds, with the artist covering great distances in space and time in her pursuit of discovering the mysteries of human existence. Filling gaps in human knowledge with speculation and imagined scenarios, her aim is to create new mythologies for our contemporary era.

Keiken is a collaborative practice, co-founded by artists Tanya Cruz, Hana Omori and Isabel Ramos in 2015, who frequently work with multiple collaborators. Based between London and Berlin, they come from mixed diasporic backgrounds (Mexican/Japanese/European/Jewish). Keiken, named after the Japanese word for ‘experience’, creates speculative worlds using moving images, CGI, gaming software, installations, extended reality, programming and performance to merge the physical and digital. Their work simulates new structures and ways of existing, exploring how societal introjection governs the way we feel, think and perceive.

Lauren Moffatt (b. 1982, Australia. Lives and works in Berlin, Germany and Valencia, Spain) works between video, performance and immersive technologies. Her works, often presented in multiple forms, explore the paradoxical subjectivity of connected bodies and the friction at the frontiers between virtual and physical worlds.

Tabita Rezaire (b. 1989, France. Lives and works in Cayenne, French Guiana) pursues a cross-dimensional practice which envisions network sciences – organic, electronic and spiritual – as healing technologies to serve the shift towards heart consciousness. Embracing digital, corporeal and ancestral memory, she digs into scientific imaginaries and mystical realms to tackle the colonial wounds and energetic misalignments that affect the songs of our body-mind-spirit.

Theo Triantafyllidis (b. 1988, Athens, Greece. Lives and works in Athens and New York) is an artist who builds virtual spaces and the interfaces for the human body to inhabit them. He creates complex worlds and systems where the virtual and the physical merge in uncanny, absurd and poetic ways. These are manifested as performances, mixed reality experiences, games and interactive installations.

Anicka Yi (b. 1971, Seoul, South Korea. Lives and works in New York). Yi is known for her experimental work, which explores the merging of technology and biology. Through breaking down distinctions between plants, animals, micro-organisms and machines, she asks us to think about further understanding ourselves as humans and the ecosystems we live in.

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K Allado-McDowell is a writer, speaker and musician. They are the author (with the AI language model GPT-3) of the books *Pharmako-AI* and *Amor Cringe*, and co-editor of *The Atlas of Anomalous AI*. They record and release music under the name Genric. Allado-McDowell established the Artists + Machine Intelligence programme at Google AI. They are a conference speaker, educator and consultant to think tanks and institutions seeking to align their work with deeper traditions of human understanding.

Freire Barnes is a London-based visual arts editor, online broadcaster and curator. She’s worked for *Time Out*, Bon, the BBC and Culture Trip, and she curated the Dazed Converse Emerging Artists Award from its inception. She’s the founder and creator of London Public Art, a mobile app which extends beyond the parameters of a guide book to provide insight into, and encourage engagement with, London’s public art. She was among the first cohort to graduate from the Royal College of Art with an MA in Critical Writing in Art and Design.

Lauren Studebaker is a Los Angeles-based art historian and writer exploring internet art and digital culture. Her previous writings have been published through Rhizome and Platform, and she is currently the deputy editor at *Outland*, an art magazine dedicated to fostering critical conversations around emerging digital technologies and their connections to contemporary art.

Ashley Hockney is a fiction writer and technology consultant whose artistic practice investigates the human impact of emergent technologies through storytelling. She’s been on the ground floor of multiple unicorn startup companies, including Codecademy, Zapier, and Buffer, noteworthy for their focus on the future of work. She currently resides in Brooklyn by way of the University of Kentucky where she worked closely with Gurney Norman, one of Ken Kesey’s Merry Pranksters.

Dr Joe Parslow is a queer researcher, writer, teacher and producer. They are a lecturer in Contemporary Performance Practice at the Royal Central School of Speech and Drama in London, where they also support research ethics and integrity and the development of practice research. Outside higher education, they have worked extensively as a producer of performance events in queer nightlife settings. Their research focuses on queer performance and queer studies, and they examine how queer communities come together in spaces where drag and queer performances take places. Their monograph, *Their Majesties: Drag Performance and Queer Communities in London* (Routledge, 2023), examines London’s drag scene between 2009 and 2019. Their current research projects explore drag performance and Artificial Intelligence (AI), and a larger ongoing project examines contemporary queer hope.

Lotfi Gouigah is an art historian with a PhD from McGill University in Montreal, Canada (2021). He is a lecturer at the Bristol School of Art. Focusing primarily on the work of multimedia artists, his research is at the intersection of theories of performativity, the philosophy of technology, and new materialism. He is currently researching the work of multimedia artist Nao Bustamante and working on *Different Bodies/Different Knowledge*, an independent curatorial project with New York artist and film-maker Eduardo Shlomo Velázquez.

Penny Rafferty is an independent writer and thinker. She is the co-founder of Black Swan DAO, a proto-institution for interdisciplinary research and practice. She is also the co-principal investigator at Serpentine Galleries Blockchain R&D Lab, and co-developed the think-tank series *Artworld DAO* and the *Radical Friends* summit (2019–2022) with Ruth Catlow and Ben Vickers, in coordination with Serpentine Galleries, Furtherfield, Haus der Kunst Munich and the Goethe-Institut London. In 2022 she released the book *Radical Friends – Decentralised Autonomous Organisations and the Arts* with Catlow: it consolidates five years of research into a toolkit for connectivity that moves beyond the established systems of centralised control in the art industry and to wider financial networks through Web3 thinking.

John Kenneth Paranada is a London-based curator, writer and researcher. His curatorial practice is geared towards developing critical cultural forms, environmental consciousness and community-engaged projects, and platforming marginalised narratives. His interdisciplinary approach focuses on experimental futures, decolonial art and new media technologies. He was Curator: Performance & Engagement (maternity cover) at Zabłudowicz Collection (2021–22) and has curated internationally, including: *IdeasCity* project, New Museum, New York (in partnership with Nanyang Technological University's Centre for Contemporary Art Singapore) (2019); *New Curriculum for Old Questions*, National University of Singapore Museum (2019); *Anthropocene Curriculum: The Human Delta*, Haus der Kulturen der Welt, Berlin (2019); and *Shanghai Curators Lab*, Shanghai Biennale (2018). In 2020 he was invited to curate the Cultural Center of the Philippines' 50th anniversary project *21AM*, a digital contemporary art museum.

Rebecca Edwards has been the curator at arebyte Gallery since 2017. She curates the on-site exhibition programme as well as the online programme at aos.arebyte.com. Her interests lie in cultivating new curatorial methods across physical and digital spaces, employing existing technologies, software and back-end development in experimental ways. Her practice interweaves fluid approaches to the production, dissemination and presentation of artists working at the intersection of technology, online culture and new media.

Pau Waelder is a curator, writer and researcher who specialises in art and digital media. He holds a PhD in Information and Knowledge Society from the Universitat Oberta de Catalunya, where he is also adjunct lecturer. Senior curator at online platform Niio, he is also editor and advisor at the online DAM Digital Art Museum. He has curated numerous digital art exhibitions, lectured at universities, and contributed text to publications internationally. He is the author of *You Can Be a Wealthy/Cash-Strapped Art Collector in the Digital Age* (Printer Fault Press, 2020), a book about contemporary and digital art collecting.

Laurie Cluitmans is a curator of contemporary art at the Centraal Museum in Utrecht, the Netherlands. Here she has curated exhibitions by a.o. Basel Abbas and Ruanne Abou-Rahme, Philipp Gufler, Tamara Henderson, Wendelien van Oldenborgh, Jaya Pelupessy, Janis Rafa, Tabita Rezaire and Jessica Stockholder. She was awarded the Prize for Young Art Criticism (Prijs voor de Jonge Kunstkritiek) 2016 for her essay 'The Possibility of a Garden', which was about the gardens of Derek Jarman and Ian Hamilton Finlay. This essay led to deeper curatorial research into the garden as a metaphor in times of climate change, culminating in the exhibitions *The Botanical Revolution* at the Centraal Museum in Utrecht and *Is it possible to be a revolutionary and like flowers?* at NEST art space in the Hague, the Netherlands, and editing a book, *On the Necessity of Gardening: An ABC of Art, Botany and Cultivation* (Valiz, 2021).

Domenico Quaranta is an art critic, curator and educator interested in the ways in which art reflects the current technological shift. He has published articles in numerous magazines, newspapers, books and catalogues. He is the author of, among other things, *Beyond New Media Art* (2013) and is the editor of several books, including *Gamescenes: Art in the Age of Videogames* (2006, with M. Bittani). Since 2005 he has curated several exhibitions, including *Collect the WWWorld. The Artist as Archivist in the Internet Age* (Brescia, Italy, 2011; Basel, Switzerland, and New York, 2012); *Cyphoria* (Rome Quadriennale, 2016) and *Hyperemployment* (International Centre of Graphic Arts (MGLC), Ljubljana, 2019–20). He lectures in interactive systems, and was a co-founder of the Link Art Center (2011–2019).

Lucy Rose Sollitt trained as a philosopher, and her research-led practice maps the contours of emerging art and how it intersects with technologies, economies and ecologies. She is motivated by a belief in art as felt knowledge, and the pursuit of fairer, more meaningful forms of coexistence. Lucy's work includes writing, curation, strategy and policy development for organisations ranging from FACT, Serpentine Galleries and Rhizome to the Goethe Institute, DACS, Tate, Arts Council England and the UK government. Lucy regularly teaches and participates in panel discussions – for example, at the V&A, QUAD, Christie's and the Royal College of Art. Lucy is an advisory board member for Furtherfield, arebyte and Banner Repeater.

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Rebecca Allen

The Bush Soul #3, 1999

Interactive installation. Generative AI live simulation. Infinite duration, sound

Ian Cheng

Something Thinking of You, 2015

Live simulation, infinite duration, sound

Droning Like a Ur, 2014

Live simulation, infinite duration, sound

Simon Denny

What is Blockchain?, 2016

HD video, 3 minutes

Zug Blockchain Startup Case Mod:

Ethereum, Tribal, 2016

InWin H-Tower, aluminium pallets, aluminium profiles, UV print on Hasbro B2606100. Magic: The Gathering board game, laser-cut Plexiglas, UV print on Alu-dibond cut-out, steel bearing, powder-coated steel components

Aleksandra Domanović

Kalbträgerin, 2017

Solid surface material (Kerrock), synthetic gypsum (Acrystal), polyurethane foam and Plexiglas

Jake Elwes

Machine Learning Porn, 2016

Digital video, silent

12 minutes, looped

Machine Learning Porn, 2022

Audio file

5 minutes 25 seconds, looped

Music by Breaka

Courtesy the artist

Zizi – Queering the Dataset, 2019

Digital video, 7 channels, silent

135 minutes, looped

Lynn Hershman Leeson

Dress Ray, 1966

Acrylic, watercolour, pen and pencil on paper

Roberta Multiples, 1977

Black-and-white photograph

Reach, 1986

Black-and-white photograph

Seduction of a Cyborg, 1994

Digital video, 7 minutes

Roberta's Physical Stance #2, 1997

Vintage photographic print with hand painting

Joey Holder

The Evolution of the Spermalege,

2014–ongoing

3D prints, skin-safe silicone, spray paint, baby oil, acrylic, wallpaper

Ambunticoris sulawesicus, 2021

Polymer, spray paint, acrylic

Courtesy the artist

Proetida, 2022

Augmented reality experience

Commissioned by Zabłudowicz Collection and Daata

Marguerite Humeau

JOSEPHE, a female is drinking its own milk in a desperate self-cannibalistic gesture of survival. The creature's soul has left its body, 2016

Part A: High-density polystyrene, resin, fibreglass, white paint

Part B: Powder-coated metal stand, acrylic, latex, nylon, sound

Keiken

Player of Cosmic ୧୯° Realms

Installation comprising two works:

The Life Game, 2021

Multiscreen interactive installation

Sound score and sound design by wavesovspace

Bet(a) Bodies, 2021–22

Silicone, LED light, Arduino, haptics, touch sensor, amp, headphones

Digital audio, 9 minutes 12 seconds

Interactive design by Alejandro Ball

Courtesy the artist

Lauren Moffatt

Reverse Dive (Local Knowledge, Partial Truth), 2022

Augmented reality experience

Commissioned by Zabłudowicz Collection and Daata
With thanks to Fabbula

Of Hybrids and Strings, 2022

Virtual reality experience

Courtesy the artist. Originally commissioned and produced by Fabbula

Tabita Rezaire

Sugar Walls Teardom, 2016

Gynaecological chair, mechanical arm

HD video, 21 minutes 30 seconds

Premium Connect, 2017

HD video, 13 minutes 4 seconds

Theo Triantafyllidis

Radicalization Pipeline, 2021

Live simulation, infinite duration

Sound by Diego Navarro

Genius Loci, 2021

Augmented reality experience

2022 *Among the Machines* version produced by Zabłudowicz Collection and Daata.
Courtesy the artist and The Breeder Gallery, Athens. Originally commissioned by Grand Palais and produced by Fabbula

Anicka Yi

Others of Little Weight, 2015

Acrylic paint, brass, cardboard, resin, string

Of All Things Orange or

Macedonian Wine, 2015

Kombucha leather, metal, paint, stainless steel

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Among the Machines
24 March–17 July 2022

Curated by
Paul Luckraft and Julia Greenway
Exhibition identity and design
Burgess & Beech, Benjamin Bostock
Exhibition installation and production
Christopher Spear
AR production
Daata, with Oliver Ellmers and Finley Stewart
Keiken interactive design
Alejandro Ball
Exhibition Intern
Rosie Halford

Publication edited by
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Burgess & Beech and Benjamin Bostock
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pp.33, 43, 48: Kristian Lam-Clark

pp.178–79 *And then they hit run*, 2022
Short fiction text, author anonymous.

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And then they hit run

Abe didn't realise it, but his jaw clenched, expending calories at a rate slightly above his normal, meaning he'd eat just a bit more at lunch. The cost of that could be measured in gallons of water, spread over time, to grow the grain and the vegetables tossed around his delivery salad that he ate haphazardly, staring at the screen and biting his nails.

The woman's breath caught in her throat.

And the team leaned over the computer.

Abe had raised one billion dollars for Zero + One AI. The employees had taken pay cuts on joining (the \$1,000,000,000 couldn't be allotted to human needs). Together they dreamed about the next advancements in AI research. More concretely, they bowed to the exorbitant amount of money it takes to run and, more importantly, cool, the servers that facilitated their experiments.

They say there's a 50% chance of creating artificial general intelligence by 2099.

One billion dollars buys you four tests. And now.

They hit run.

A transistor passed a current.

0 says no.

1 says yes.

Together, yes.

And the currents moved.

From the mouse, through the USB, interrupting the CPU, small transistors passed electric currents that turned on lights, changed colours dictated by hex codes, added text on the screen to let them know it was working.

Datasets were thrown into models and matrices – the ones she'd built at 3 a.m. The ones the woman had yearned for, sacrificed for. Fuck, she'd frozen her eggs. Bloated.

They hit run.

And tax dollars were put to use to form land and lakes, basins becoming riparian dreams moving towards electricity plants built from sums deducted automatically from pay cheques. And the money moved the water with the efficiency of government, which planned, and put it to use building pipes that groaned under the weight of the world.

The team hunched forward as the dams held, water rushed, movement spinning hydroelectric wheels generating gigawatts of power creating steam to cool the stack, racks, rows of servers blistering and blinking cute winks to the future, which was arriving now on the fibreboard holding up one laptop on a standing desk.

And it ran.

Ran on the cracked earth, the valley forged, the calves falling down rocky ledges pushed up from the crust of the current world, fracked and hacked in a desperate search for resources, to feed life into the future.

And it ran.

The currents passed along the wires beneath the feet of a corporation's internal communications director, holding a mic to her rose-pink lips as she explained the efforts the conglomerate had made to achieve carbon-neutral data centres.

And it ran.

Thousands of women searched for alternative forms of birth control. Ordered organic chicken via grocery delivery. Lulled madness out of their partners, sons, daughters, colleagues, helping them find the greatness of a calm mind every day after a long day at work. Smiled as someone else took credit for their work. Got paid.

And it ran.

The team's partners soothed their babes, chopped kale for dinner, and hired tutors who would teach their children languages they themselves didn't know. Made dinner plans. Texted 'that's OK' as the experiment continued into the night. They tucked themselves into bed.

Silence.

And then.

Black screens and white text and data logs. One per cent, two per cent, so on and so forth. Checking hosts, services and source. Predictive models growing generally more accurate. Spikes in adrenaline. Corners of lips rising like upside-down rainbows, ROYGBIV refractions cutting across the sky.

Had they done it? They'd have to check. Would they pass a Turing test?

And the venture capitalists who had funded the project wiped butter from their lips and tweeted to the world that they'd overthrow empires, while their own people begged for health insurance.

And Abe's roommate did the dishes because she knew he was having a busy week.

And his mother hummed softly to herself.

People are going to lose their jobs, a reporter would say.

And the numbers were the same. Nine digits, whether you built the AI or divided the numbers into ramen packets. All of them, hunched over bright screens. Doing the maths. Figuring out how to make it work.

And, like everyone who came before them, they suffered on the edge of progress.

The news outlets would write about their experiment: the advances in AI, new intelligence augmenting the human experience.

'People are quite afraid of AI and robots,' the scientists said. 'But do you know how to spell every word you've written in the past five years? No. We rely on spellcheck on our computers to correct us. In the same way, we no longer need to learn to use tools, just how to manipulate them.'

But if everyone has the knowledge to work in today's most in-demand jobs, the reporter would ask, then who do you hire?

Sacrificed, they'd all think, passing judgements of their own as to what that meant.

And the reporter put the microphone away, and Abe took the subway back to his apartment, while someone read the resulting article on their phone, bored with the teen drama playing on their TV.

And the woman? She went back to work. As always. The last one in the office.

The future was at her fingertips.

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