The New Real Magazine

Edition Two

Planetary Futures:
AI, Arts and the Environment

Image credit: *'How to Find the Soul of a Sailor'* by Kasia Molga

The New Real Magazine Edition Two

Editors
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EDITORIAL

The New Real editorial team discusses the themes of Edition Two of The New Real Magazine and what you will find inside.

Can AI and Art Help Shape Planetary Futures?

By Matjaz Vidmar, Amanda Tyndall and Drew Hemment

Image credit: *'How to Find the Soul of a Sailor'* by Kasia Molga

This second edition of *The New Real Magazine* features work from artists and researchers to better explore environmental, economic and digital sustainability on planetary scales. We look at our connection to nature and devise new ways to visualise our impact and shape our understanding of the changing environment and technology around us through more than facts and figures.

How do we make sense of environmental change in an age of artificial intelligence? As our planet transforms, we find ourselves caught between unprecedented access to environmental data and an increasing disconnect from the natural world itself. This second edition of *The New Real Magazine* explores an ambitious attempt to bridge this gap through the creation of

Through the works and insights presented in this edition, we glimpse possibilities for how AI might help us not just measure environmental change, but understand it in ways that move us to action.

The New Real Observatory – a unique platform where artists and AI systems collaborate to create new ways of seeing our changing planet.

At the heart of this edition is the story of how The New Real's research, development and commissioning programme evolved from a mobile app guiding people through nature walks during the COVID-19 pandemic, to a sophisticated platform for human-AI collaboration in environmental understanding. Through our Feature section, we trace this journey.

The artworks created through this platform, detailed in our Art section, demonstrate its potential for environmental engagement. Inés Cámara Leret's *'The Overlay'* discovers the precise point where natural and artificial become indistinguishable in AI's understanding of image data. Lex Fefegha's *'Thames Path 2040'* uses AI to imagine how London's neighbourhoods might transform due to climate change. Keziah MacNeill's *'Photographic Cues'* explores a future where the boundaries between natural and artificial ways of seeing have dissolved entirely. Most recently, Kasia Molga's *'How to Find the Soul of a Sailor'* uses AI to explore how personal archives might help us understand environmental change across generations.

Our Spotlights section provides deeper context for these works, examining how the Observatory platform operates and how it has been shared through innovative exhibition formats. What emerges is a vision of how technology might help us understand environmental change not just through data, but through experience. The New Real Observatory suggests that by bringing together artistic practice, artificial intelligence and environmental data in new ways, we might develop more meaningful relationships with both the technology and our changing planet – creating meaning together.

The Reflections section broadens our perspective beyond the Observatory platform to examine wider questions about AI's role in environmental understanding. Martin Zeilinger explores the evolving landscape of data-driven art and its capacity to respond to global challenges. Adam Harvey's *'Circular Diffusion'*, an essay written through an artist commission for the Observatory platform, examines the paradox of using energy-intensive AI to address climate change, questioning the hidden environmental costs of digital art creation. Daga Panas builds on these concerns, critically examining whether AI can meaningfully contribute to net zero goals or whether it might exacerbate the problems it aims to solve. Sophie Mackaness closes the section by considering a fundamental question; can digital technologies ever create the kind of tactile experiences we need to truly connect with our environment?

The Interjections section provides vital counterpoints to dominant narratives about AI and environmental futures. Antonio Ballesteros-Figueroa examines how AI development reflects and potentially reinforces global North-South divides, while Suhair Khan presents an Indigenous framework for thinking about planetary futures. Ramit Debnath argues for

including arts and humanities perspectives in climate-focused AI development, Sophia Brueckner explores how science fiction's predictions about AI are becoming reality, and Kay Poh Gek Vasey asks whether AI art might help save the world it helps imperil.

As we face unprecedented environmental challenges, we need new ways of seeing that can help us grasp both the scale of change and our role within it. Through the works and insights presented in this edition, we glimpse possibilities for how AI might help us not just measure environmental change, but understand it in ways that move us to action.

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FEATURE

Sharing the vision for and evolution of a new platform for genuine collaboration between human and machine intelligence, where artistic practice drives innovation in AI development.

The New Real Observatory: Art and AI in Conversation with the Environment

By Matjaz Vidmar and Drew Hemment

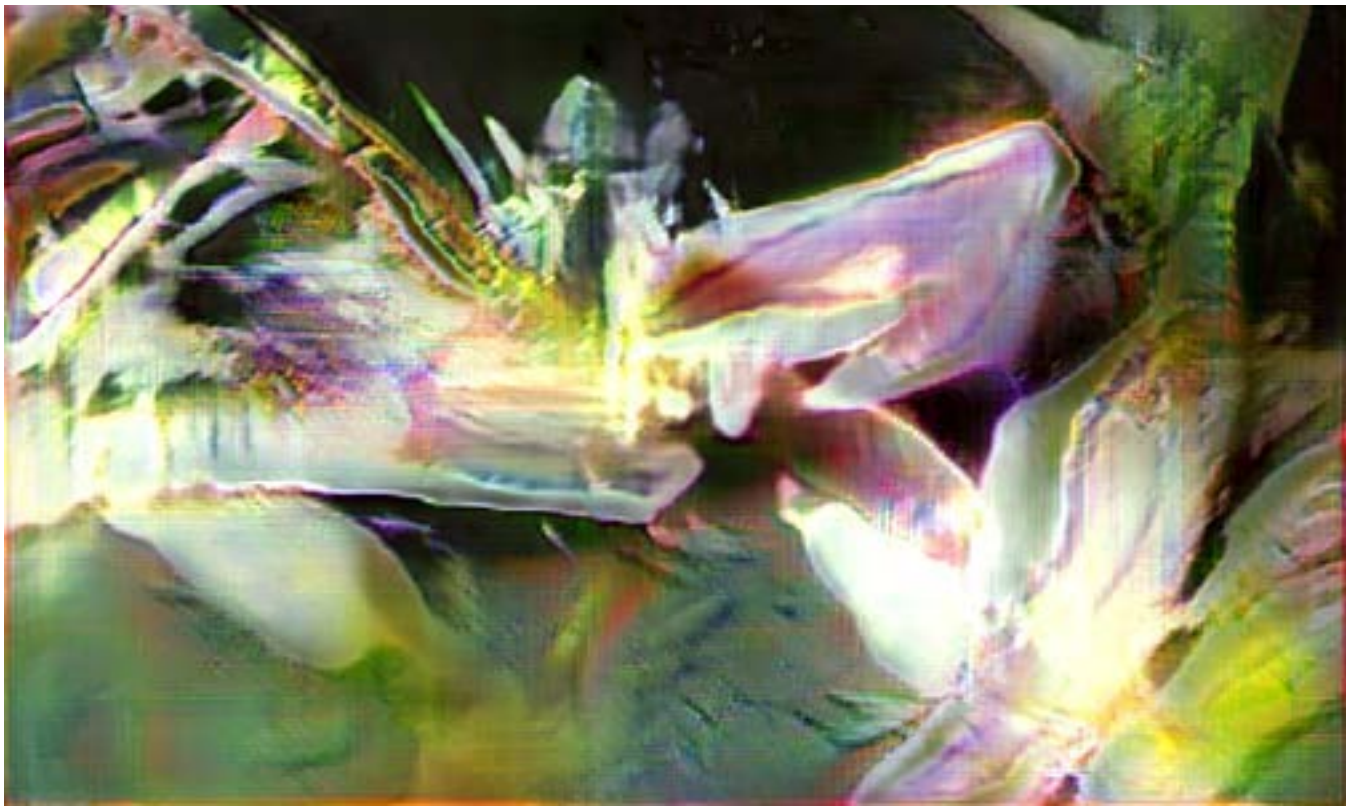

Image credit: The New Real Observatory platform

An artist stares intently at a computer screen. She's not looking at environmental data in the usual way – charts, graphs or satellite imagery. Instead, she's using an AI system to explore how machines and humans might together make sense of our changing planet. As she adjusts parameters on the screen, the system generates new interpretations of local greenery, revealing something profound about how both humans and machines perceive nature. This is The New Real Observatory, where artists and scientists are working together to create new ways of seeing our changing world.

We wanted to bring awareness of the climate crisis directly in conversation with the exploration of AI models, thus co-creating understanding of environmental futures on a planetary scale.

The vision: a new way to explore AI and reflect on its environmental costs

The story of The New Real Observatory begins with a fundamental challenge: how do we bridge the growing disconnect between sophisticated digital life, the environmental data and our embodied lived experience? We live in an age of unprecedented environmental monitoring,

where satellites track global temperatures and sensors measure local air quality. Yet this flood of data often feels removed from our daily reality – abstract numbers that fail to capture the intimate ways we experience meaning behind those numbers.

The challenge we face is not just about collecting more data or making better models, it is about finding new ways to make sense of that data, to make it meaningful and actionable in people's lives. We believed artists could help us discover these new ways of seeing.

This led to an ambitious vision: create a platform where artists could work directly with AI systems to explore environmental data in novel ways. But this wouldn't be just another tool for visualising AI models. Instead, it would be a space for genuine collaboration between human and machine intelligence, where artistic practice could drive innovation in AI development.

The approach, which we call 'Experiential AI', emerged from understanding that meaning comes through the active entanglement of human interpretation and machine computation. Rather than treating AI systems as either pattern recognition engines or simulations of human intelligence, we wanted to explore how new forms of understanding could emerge through their interaction.

Traditional approaches to AI development often prioritise statistical accuracy, but we saw an opportunity to do something different – to use artistic practice to drive technical innovation, particularly in how we create interpretable dimensions and paths through AI systems.

In addition to developing tools to bridge the gap in meaning and interpretation of data models, we wanted to contextualise that these new tools are part of a wider system of digital infrastructure – one with a large carbon footprint. We wanted to bring awareness of the climate crisis directly in conversation with the exploration of AI models, thus co-creating understanding of environmental futures on a planetary scale.

This vision would evolve significantly over the next four years, shaped by collaboration between scientists, artists, engineers and humanists.

The journey: the evolution of The New Real Observatory

The development of The New Real Observatory unfolded across two distinct phases between 2020 and 2024, each marking a significant evolution in how we approached the challenge of connecting human experience, AI and critical environmental reflection.

The journey began during the height of the COVID-19 pandemic, through a collaboration with the Edinburgh Science Festival. The initial concept was to create a digital experience that would help people bridge the disconnect between humans and their environment,

powered by AI. The result was *'AWEN – A Walk Encountering Nature'*, a mobile application that guided users on self-directed walks, using their mobile devices not as barriers to nature but as tools for deeper engagement.

We wanted to prompt people to use their senses differently. The application asked users to notice and appreciate the layering of data and embodied experience. This was the guiding principle behind the conceptual development of The New Real Observatory.

to fine-tune existing image data models with their own curated input and explore the new conceptual dimension they created.

The innovation at the core of this was the composite SLIDER tool – Shaping Latent-spaces for Interactive Dimensional Exploration and Rendering. This allowed for direct exploration and interpretation of the AI 'understanding' of the image data, while at the same time reflecting on their own understanding of the conceptual thinking behind the curation of input images.

We find ourselves negotiating with AI, not just using it as a tool, but exploring how it interprets the concepts embedded in the data and reimagines narratives.

In particular, in the co-creation process involving artists, scientists and engineers, one common question and mission statement started to take shape. How can we enable artists to use generative AI to at the same time explore the data models and modelling, while contextualising such an exploration through the lens of climate change and environmental crisis?

Phase one: exploring how to see (2021–2022)

The realisation of the concept developed above pre-dated the public release of cloud-based image generators, in particular DALL-E. This first phase, in partnership with The Alan Turing Institute, specifically focused on the implementation of a generic, yet controllable generative AI platform, based on the transferGAN algorithm, that allowed users

Furthermore, the exploration was prompted by the direct integration of generic, yet localised environmental modelling data alongside the generative AI tools. This data can be searched in a way that demonstrates the effects of climate change, by juxtaposing present, past and future values such that their difference can be used as a proxy to contextualise how our own perception of the environment will shift due to their impact.

In the arts commission at the heart of this development, we invited artists and AI researchers to investigate a provocative question: how does human cognition differ from artificial cognition when it comes to understanding environmental change?

In addressing this question. artistic practice pushed beyond traditional statistical modeling

of environmental data, exploring instead how different forms of intelligence conceptualise changes in colours, textures and narratives that are in conversation with data on environmental futures.

We find ourselves negotiating with AI, not just using it as a tool, but exploring how it interprets the concepts embedded in the data and reimagines narratives.

This experimentation led to three critical new works being developed: Ines Cámara Leret's *'The Overlay'*, Keziah Macneill's *'Photographic Cues'*, and Lex Fefegha's *'Thames Path 2040'*. These works speak to the profound ways in which humans and AI can collaborate to analyse the environment and co-create visions of environmental futures, and how the embodied analogue experience and its digital representation merge.

Phase two: learning the words (2023–2024)

The second phase, supported by the Scottish AI Alliance, added new capability to the platform's word processing, as well as consolidating these experiments into a platform that supports 'synergetic experiences' – where a number of human and AI conceptual modalities can interact to produce new perspectives on climate-driven futures.

Deploying a Word2Vec training algorithm and working with small, carefully curated corpora of text as training data, rather than the massive internet-scraped datasets typical in AI development, we discovered that intimate, focused data can sometimes lead to more meaningful results than broad, general training. In particular, this approach allows users to have more precise control and detailed interpretation, enabling them to align the relationships found within the AI models with personal experience in ways that create new forms of understanding.

Having to balance the desire for sophisticated AI capabilities with the need for interpretable, controllable systems we again turned to an upgraded version of the SLIDER tool to develop a new approach to latent space navigation. Using strings of words to describe human conceptual dimensions, they were then challenged by the AI model's reordering and associative word generation, which again led to both better understanding of the system as well as reflection on their own (pre)conceptions.

Visualising word-cloud exploration and, as in the second phase, using localised environmental parameters to scale the exploratory process, a number of critical conceptual works emerged that spoke to the theme of *'Uncanny Machines'* - an art commission we framed around this new word processing capability.

Artists Kasia Molga, Alice Bucknell, Linnea Langfjord Kristensen and Kevin Walker, Sarah Ciston, Johann Diedrick and Amina Abbas-Nazari, all explored different conceptual issues arising from engaging with small text-based datasets, from addressing historical

injustices in newspapers to exploring AI's role in modelling extreme weather events. A full commission – that would enable the artist to explore their concept further and to realise an artwork and a workshop that would bring their concept fully to life – was awarded to Molga's project *'How to Find the Soul of a Sailor',* which explores the interplay between textual remnants of her father's identity and the unpredictable future of the ocean due to climate change.

The New Real Observatory isn't about making the machine see like a human, or humans seeing like a machine. It's about discovering entirely new ways of seeing.

By the end of 2024, The New Real Observatory had thus evolved into a platform for human-AI collaboration in exploring generative data models, contextualised by environmental understanding. But more importantly, it demonstrated a new way of developing AI systems – one that values interpretation and meaning-making as much as technical capability.

Image credit: The New Real Observatory platform

The platform: shaping the human-AI understanding of planetary futures

At first glance, The New Real Observatory platform might seem deceptively simple: a web interface where users can explore climate data and train AI models. But beneath this surface lies a radical rethinking of how humans and AI systems can work together to develop new understanding of environmental change.

We wanted to give users a level of control that you do not get in current AI tools, by not just using pre-trained models, but actually shaping how the AI understands and interprets data through an environmental lens. Furthermore, we wanted to ensure that users retain the ownership of both their input data and the models they generate with AI, allowing for a more intimate and personal exploratory environment as well as protecting users' data rights.

This goal led to several innovative features that distinguish The New Real Observatory from conventional AI platforms.

Training the AI's gaze

What makes The New Real Observatory unique is how it positions users in relation to AI. Rather than treating AI as a black box that generates outputs from inputs, the platform creates a space for genuine co-creation. Artists can explore how the AI system

understands their input data, probe its interpretations and use this understanding to shape their creative process.

Perhaps the platform's most innovative feature is the SLIDER. This tool allows artists to define their own conceptual dimensions within the AI's latent space – the internal representation where the AI system organises its understanding. Artists can upload small, carefully curated sets of images or text that represent the spectrum of concepts they want to explore.

both the input data and the generated AI model, allowing for a more ethical data practice and a more intimate co-creation environment.

The co-creation space

In addition to the exploratory negotiation with the platform, its technical constraints became creative opportunities. For instance, the system's limited image resolution (128x128 pixels) initially seemed like a drawback. But artists found ways to work with this limitation, using it to frame particular visual narratives or explore the boundaries between human and machine perception.

The New Real Observatory isn't about making the machine see like a human, or humans seeing like a machine. It's about discovering entirely new ways of seeing.

Small data models

We noted that working with limited, thoughtfully selected data could actually lead to more meaningful results than massive training sets, as users can still recognise the input data, even though there is significant AI extrapolation. This approach turned conventional AI development on its head; instead of trying to eliminate bias through bigger datasets, the platform embraces the specific perspectives that users, in our case artists, bring to their exploration.

This is a promising bridging tool to build transparency and accountability within these data models, as humans can and do evolve conceptual reasoning with AI, rather than having to trust its methodology. The size of these models also enables clearer ownership of

The constraints make us think more carefully about what we want the AI to 'understand'. It is not about processing more data, but about finding the right data to express what we want to explore.

Keziah MacNeill, one of the artists who used the platform, responded to these constraints by pairing AI-generated images with pinhole photography. Thus, the low resolution became part of the work's meaning as it spoke to questions about how machines and humans see differently.

Similarly, when artist Inés Cámara Leret used the platform to explore the boundary between natural and artificial greenery, she found that what initially appeared as technical limitations

– like the AI's tendency toward certain colour patterns – could reveal deeper insights about how both humans and machines categorise nature.

The climate lens

Integral to the platform are three environmental parameters drawn from the Copernicus Climate Data Service: air temperature, precipitation and wind speed. Artists can explore these parameters for any location on Earth, investigating both current conditions and future projections. Rather than presenting this data as mere numbers, the platform allows artists to use it as a dimension for AI exploration.

The vision was to go beyond the use of climate data as evidence of the environmental crisis, instead using it to have a conversation about the future, with both the climate models and the AI. The system allows users to navigate between different climate scenarios – optimistic, realistic, and pessimistic – creating a space to integrate planetary futures directly into the process of experimenting with human-AI sense making.

The platform continues to evolve through use. Each user who works with it discovers new possibilities and pushes its capabilities in unexpected directions. Thus, The New Real Observatory is not just a tool for making art, but rather it is a laboratory for exploring how human and machine intelligence can work together to understand our environment and its change.

The analysis: towards new modes of meaning

Through the development and deployment of The New Real Observatory, we've discovered something profound about the relationship between art, AI and environmental understanding. These insights extend far beyond our initial goals, suggesting new approaches to both AI development and environmental engagement.

Traditional AI systems often operate as black boxes – complex but opaque systems that process inputs into outputs. Through The New Real Observatory, we found that artists could help create more interpretable AI systems, not by simplifying the technology, but by making its complexity meaningful.

When we let users define dimensions within the AI's latent space, we are not just making the system more user-friendly, we are discovering new ways to make AI systems that are inherently more interpretable and meaningful to human users.

Contrary to conventional wisdom in AI development, we demonstrated that technical constraints could become sources of innovation. Limited computational resources, small datasets and bounded latent spaces – typically seen as limitations – became creative opportunities. This insight suggests an alternative to the current focus on ever-larger AI models and datasets.

Through the artworks created with The New Real Observatory, we've glimpsed new possibilities for environmental understanding. Inés Cámara Leret's exploration of artificial nature revealed how AI might help us recognise our constructed relationships with the environment. Keziah MacNeill's speculative future showed how machine and human perception might merge in our understanding of environmental change. Lex Fefegha combined the environmental and visual data to expand awareness of emerging challenges. Kasia Molga created a transcended dialogue with her sailor father about the future of the ocean.

These works don't just represent or analyse environmental data – they create new ways of seeing and understanding our relationship with the environment. As one viewer remarked during an exhibition: *'It made me think about climate change not just as numbers and projections, but as something that changes how we see and understand our world.'*

The impact: AI's role in defining planetary futures

Overall, this programme of work points toward future directions for both AI development and environmental engagement. We've shown that artistic practice can drive technical innovation; that small, carefully curated datasets can be as valuable as massive ones; and that human-AI collaboration can create new forms of environmental understanding.

But perhaps most importantly, we've discovered that the future of AI doesn't have to be about replacing human intelligence or automating human tasks. Instead, it can be about creating new forms of understanding that emerge through the collaboration between human and machine ensembles, and exploring, interrogating and merging our ways of seeing and knowing.

We started by trying to bridge the disconnect between environmental data and human experience, but we ended up discovering new ways of seeing

We started by trying to bridge the disconnect between environmental data and human experience, but we ended up discovering new ways of seeing that might help us navigate our planetary future.

As we face the environmental challenges ahead, these new forms of understanding – these new ways of seeing our changing planet – may be exactly what we need. The New Real Observatory isn't just a platform for creating art with AI; it's a prototype for how we might develop more meaningful relationships with both technology and our environment.

Author bios

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ART

Here we present some of the artworks commissioned by The New Real that involve multisensory exploration of possible futures and investigate the entanglements of people, data, machines and environments using The New Real Observatory.

The Thames Path 2040

by Lex Fefegha (2022)

Image credit: Lex Fefegha

In South London's Peckham neighborhood, artist Lex Fefegha confronts an unsettling reality: over a million Londoners live in flood plains, with 17% of the city at medium to high flood risk. Through *'Thames Path 2040,'* he uses AI to transform familiar streets into evocative visions of possible futures, exploring how rising waters might reshape London's communities.

Fefegha's work responds to a growing crisis; according to the UK government's analysis, around 5.2 million properties in England face flood risk, with that number expected to double over the next 50 years.

Concept and vision

Fefegha's work responds to a growing crisis; according to the UK government's analysis, around 5.2 million properties in England face flood risk, with that number expected to double over the next 50 years. Rather than presenting these statistics in isolation, he sought to create images that would stir emotional connections to this possible future. The project focuses on his home neighbourhood, Peckham, using AI to blend present-day streets with scenes from flood-affected areas elsewhere.

Technical journey

Using The New Real Observatory platform, Fefegha developed a novel artistic approach to exploring these futures. He uploaded two distinct image sets: photographs of flood-devastated areas from around the world, and images of his local South London neighbourhood near the river Thames. The platform allowed him to create a spectrum between these two realities, informed by climate model projections.

Significance

'Thames Path 2040' suggests new possibilities for artistic engagement with climate futures. By using AI as a tool for environmental speculation, Fefegha shows how artistic practice can help us imagine and emotionally connect with possible futures, while making climate projections feel more tangible and personally relevant.

By connecting artistic exploration to climate projections, Fefegha creates visualisations that are both speculative and grounded in environmental data.

Working with the platform's climate data for 2040, Fefegha used projected precipitation increases to guide his artistic process. Rather than trying to create precise predictions, he used these numbers to inform how far along the spectrum between present-day and flood-affected imagery to generate his transformations – creating an artistic interpretation of possible futures.

The work

The resulting images offer provocative glimpses of how London's landscapes might transform. By connecting artistic exploration to climate projections, Fefegha creates visualisations that are both speculative and grounded in environmental data. The familiar streets of Peckham take on an uncanny quality, making abstract possibilities feel immediate.

The work demonstrates how The New Real Observatory platform can help artists create compelling environmental narratives. It suggests new ways of using machine learning to explore possible futures, while reinforcing the urgency of addressing challenges to come.

Image credit: Lex Fefegha

Footnotes

The New Real Observatory is part of The New Real, a partnership between University of Edinburgh, Edinburgh's Festivals and The Alan Turing Institute. Featured artists Adam Harvey, Inés Cámara Leret, Keziah MacNeill, Lex Fefegha.

Supported by UK Research and Innovation (EPSRC, AHRC), Towards Turing 2.0, Creative Scotland, Scottish AI Alliance, and the Data-Driven Innovation Programme.

'*The Thames Path 2040*' was commissioned by The New Real Observatory, developed between December 2021–August 2022, and first exhibited at ARS Electronica 2022, Linz, Austria.

Artist bio

Lex Fefegha spends most of his time leading a small team of designers and coders at COMUZI, a London-based design studio creating future-positive products, services and experiences for governments, organisations and charities.

In his spare time, he has been exploring AI & creativity projects, working with Google AI & Google & Arts Culture Lab to create The Hip Hop Poetry Bot, an AI research project, exploring speech generation trained on rap and hip hop lyrics by black artists. Lex was an associate lecturer at the University of the Arts London's creative computing institute teaching a module on computational futures and AI.

Cite as: Lex Fefegha (2025). 'The Thames Path 2040.' *The New Real Magazine*, Edition Two. pp 20-22. https://doi.org/10.2218/newreal.10920

Links

1. Lex Fefegha
2. Watch The New Real Salon event on Exploring the Future of AI and the Arts

The Overlay

by Inés Cámara Leret (2022)

Image credit: Inés Cámara Leret

In Madrid's Lavapiés neighborhood, artist Inés Cámara Leret wondered: at what exact point does human-made infrastructure blend with what we perceive as 'nature' and vice versa? This question led her to create *'The Overlay,'* an artwork that uses AI to discover the hue where the natural and artificial merge – a critical take on Disneyland's 'go away green,' the colour engineered to make theme park service infrastructure invisible.

Concept and vision

Cámara Leret set out to explore the construction and artificiality of localised representations of nature. Rather than accepting the traditional divide between natural and artificial environments, she wanted to find the exact point where this distinction blurs. The work questions our assumptions about what we consider 'natural' in urban environments, while demonstrating new possibilities for artistic exploration using AI systems.

***'The Overlay'* demonstrates how, unlike conventional AI image generators, The New Real Observatory allows the artist to directly probe and experiment with the AI's internal logic.**

Technical journey

Using The New Real Observatory platform, Cámara Leret uploaded two distinct sets of photographs from her neighborhood: images of natural greenery and various engineered materials. The platform's transferGAN model was fine-tuned with these photos, allowing her to explore the latent space between the two categories. In a critical take on the role of AI in art creation, she developed a computational method to query the model's logic directly. She generated 100 images at equal intervals along this dimension, then analysed their median RGB values to find the precise point where the natural and artificial colour values converged.

This approach emerged through research and experimentation - rather than using the AI as a black box, Cámara Leret developed ways to probe its internal understanding of the relationship between natural and built environments.

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The work

The resulting multi-component artwork operates on several levels. At its core is the discovery of a specific hue – the 'vanishing point' where engineered materials become indistinguishable from natural greenery in the AI's understanding of the images. This colour was then physically (re)created as paint by Antonio Sánchez, Spain's last living colourist, transforming digital analysis into material reality. Working with the ‘Esta Es Una plaza’ local community group, the paint was then applied to reclaimed critters from an old carousel, physically representing the overlay of the somewhat conflicting values of frivolity and entertainment, building a community and care for the environment.

The work extends beyond local discovery through a digital interface that allows anyone to generate their own 'local green.' Using vegetation index data from Copernicus satellites, the system calibrates Cámara Leret's discovered hue to any location on Earth, creating a global mapping of these vanishing points between natural and artificial environments.

Image credit: Inés Cámara Leret

Significance

'The Overlay' demonstrates how, unlike conventional AI image generators, The New Real Observatory allows the artist to directly probe and experiment with the AI's internal logic. The work suggests new ways of thinking about both AI art creation and our understanding of 'natural' urban spaces, while questioning the boundaries we draw between the natural and artificial world.

Through its combination of computational analysis, material production and global data integration, *'The Overlay'* reveals how artistic practice can drive innovation in AI development while creating new ways of seeing our environment. It stands as a prototype for future human-AI collaboration in environmental understanding.

Footnotes

The New Real Observatory is part of The New Real, a partnership between University of Edinburgh, Edinburgh's Festivals and The Alan Turing Institute. Featured artists Adam Harvey, Inés Cámara Leret, Keziah MacNeill, Lex Fefegha.

Supported by UK Research and Innovation (EPSRC, AHRC), Towards Turing 2.0, Creative Scotland, Scottish AI Alliance, and the Data-Driven Innovation Programme.

'The Overlay' was commissioned as a project of The New Real Observatory. Its first iteration was presented as a physical and in-person installation at the Edinburgh Science Festival in April 2022. The second iteration launched *'The Overlay',* at ARS Electronica 2022, as a multi-component artwork featuring a digital interface, that allowed anyone to find their localised green for anywhere on Earth, and as a digital experience.

Artist bio

Inés Cámara Leret is interested in the landscapes we have inherited and the anecdotes, materials and ideas that compose them. She develops long-term, slow, and sometimes fragile, research processes that require a continuous and situated approach. Whilst developing them, she delves into a extensive archival work and surrounds herself with both human and non-human entities. Often these processes materialise in installations where moving-image and sculptural works coexist.

Cámara Leret's work has been shown in galleries and museums alike including: Intermediate Madrid, Museo de Arte Contemporáneo de Castilla y León, Museo Helga de Alvear, Ars Electronica, Copperfield Gallery, Somerset House, V&A & more. Recently, she has developed several residencies including: CC Las Cigarreras, Centro Internacional de Cultura Contemporánea Tabakalera. Currently she is a resident at Matadero Madrid and has been selected as a fellow for the Real Academia de España en Roma for 2025.

Cite as: Inés Cámara Leret (2025). 'The Overlay.'
The New Real Magazine, Edition Two. pp 23-26.
https://doi.org/10.2218/newreal.10921

Links

1. The New Real Research

Photographic Cues

by Keziah MacNeill (2022)

Image credit: Keziah MacNeill

In a world increasingly mediated by algorithms, artist Keziah MacNeill asks a provocative question: what happens when the tools we use to see the world become indistinguishable from the world itself? Through *'Photographic Cues,'* she explores a speculative future where the boundaries between natural lenses (like bodies of water), mechanical cameras and AI systems dissolve into one another.

Concept and vision

MacNeill's work points to the year 2072 – 50 years after the project's creation – imagining a time when the distinction between image-making tools and the images themselves has completely broken down. The project emerged from a fascinating parallel: both a Scottish loch and a camera serve as lenses on the world, one natural and one mechanical. But in an age of AI, where both images and the tools that create them are ultimately reduced to the same digital code, what happens to our understanding of reality?

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Technical journey

MacNeill's approach to The New Real Observatory platform was uniquely exploratory. She uploaded two distinct sets of images: pinhole camera photographs of a loch and digital photographs of the pinhole camera itself. By feeding both the tool and its output into the AI system, she created a deliberate collapse of categories – the observer and the observed, the medium and the message.

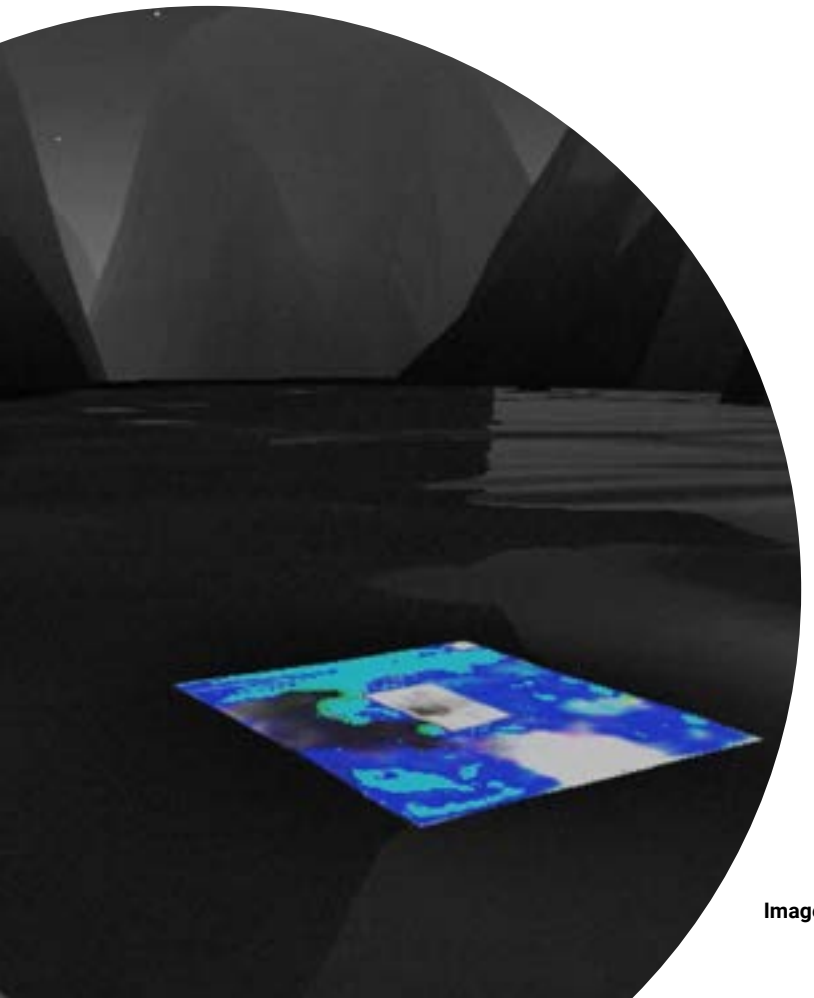
how AI systems might eventually create a self-referential world where synthetic content and the algorithms that create it become indistinguishable.

The work

The resulting work is presented both as a physical installation and a digital interface. In its physical form the images are presented on a digital screen, with new ones emerging when the viewer disturbs the water in the scaled model of the loch in front of them. Thus, MacNeill's generated images exist in a liminal space between photograph and algorithm, natural and artificial. The work suggests a future where a body of water, such as that of a Scottish loch, might serve as the last truly analogue lens in a world where digital tools have merged with their outputs.

MacNeill's generated images exist in a liminal space between photograph and algorithm, natural and artificial.

This technical approach reflected her broader conceptual investigation. Just as the platform allowed her to blur the boundaries between different types of images, she was exploring



Significance

'Photographic Cues' offers a crucial insight about our algorithmic future. The speculative collapse of categories raises profound questions about how we'll understand reality in a world where the boundaries between natural, mechanical and digital ways of seeing have dissolved. The work serves as both warning and meditation on the future of perception itself. When the distinction between tool and topic , media and medium, breaks down completely, what happens to meaning?

Image credit: Keziah MacNeill

MacNeill's exploration suggests that we might need to preserve some forms of analogue seeing – like the natural lens of a loch – to maintain our connection to the physical world.

Footnotes

The New Real Observatory is part of The New Real, a partnership between University of Edinburgh, Edinburgh's Festivals and The Alan Turing Institute. Featured artists Adam Harvey, Inés Cámara Leret, Keziah MacNeill, Lex Fefegha.

Supported by UK Research and Innovation (EPSRC, AHRC), Towards Turing 2.0, Creative Scotland, Scottish AI Alliance, and the Data-Driven Innovation Programme.

'Photographic Cues' was commissioned as a project of The New Real Observatory, first presented simultaneously as a hybrid experience and as a digital experience live at ARS Electronica 2022 in Linz, Austria.

Artist bio

Keziah MacNeill is an artist based in Scotland. Working across construction, narration and analogue photography, her practice employs a loose-parts methodology; seeking direction from props. Utilising sensory actions such as building, looking and listening, her practice aims to grow closer to the character of her moral compass; most vulnerable to feelings of pride and embarrassment. Guided by the response of props, Keziah explores how we may reframe the competitive spirit to support the build of alternative decision-based logics.

Keziah MacNeill graduated from Edinburgh College of Art in 2021 with an MA in Fine Art, receiving the Clason-Harvie Bursary upon graduation. Her artwork has been exhibited at Ars Electronica (Linz, 2022), Street Level Photoworks, (Glasgow, 2022), Inspace (Edinburgh, 2022), Hidden Door Festival, (Edinburgh, 2022) and der Lichtspiele des Westens (Leipzig, 2021). Her works have also been broadcast on radio shows for '*-algia*' (2021) and Radiophrenia (2020). Keziah was an artist in New Photographers Guild (2022) and is currently a board member of Hidden Door Festival.

Cite as: Keziah MacNeill (2025). 'Photographic Cues.' *The New Real Magazine*, Edition Two. pp. 27-29. https://doi.org/10.2218/newreal.10922

Links

1. Keziah MacNeill
2. *'Photographic Cues'*
3. *The 'Photographic Cues'* Digital Experience
4. The New Real Research

How to Find the Soul of a Sailor

By Kasia Molga (2024)

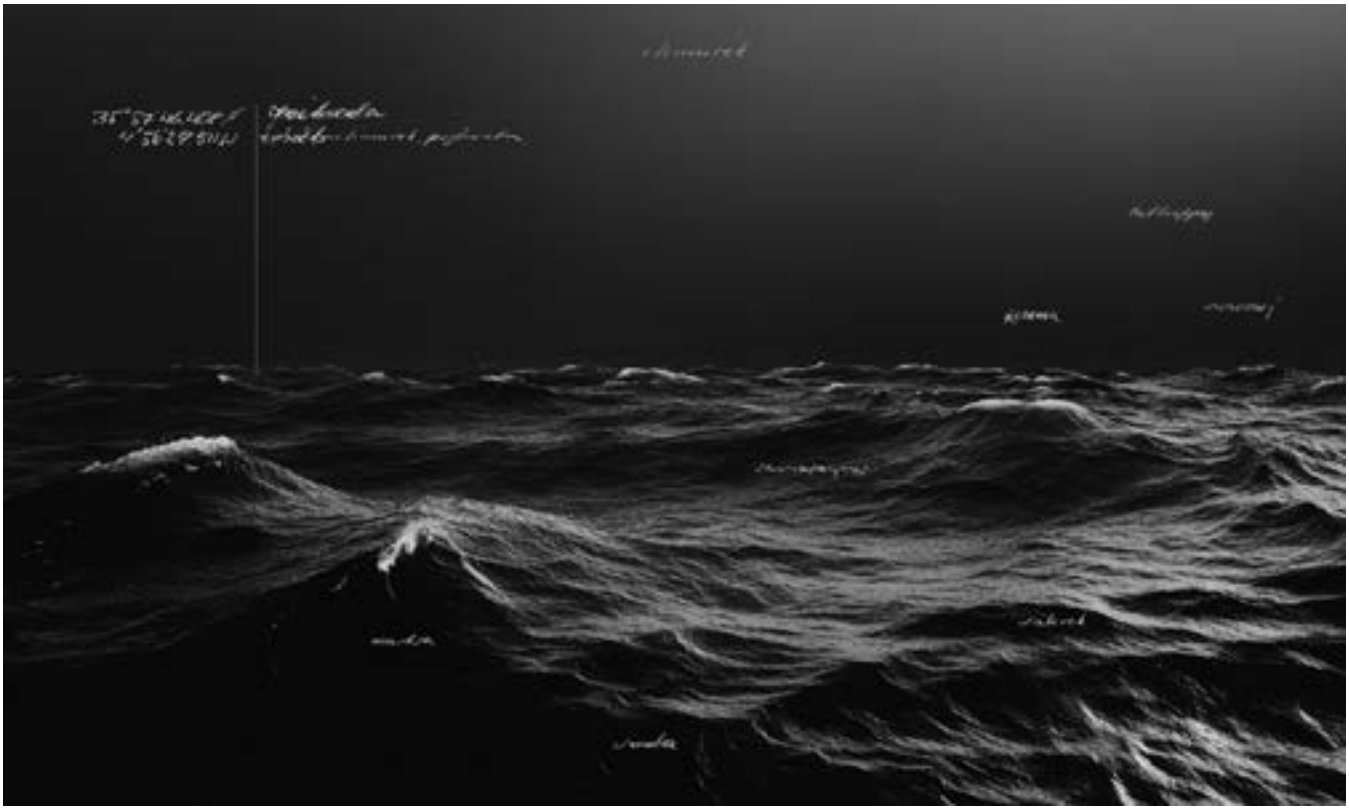


Image credit: Kasia Molga

In a collection of weathered sailing diaries, artist Kasia Molga found more than just memories of her father – she discovered a baseline for measuring how profoundly our oceans are changing. Molga takes her late father's maritime journals – precise records of waves, winds, and weather from 1984 – and uses artificial intelligence to imagine how he might describe those same seas in 2084. *'How to Find the Soul of a Sailor'* emerges as both a memorial and a prophecy – a daughter's attempt to hear her father's voice echo across a century of environmental change.

***'How to Find the Soul of a Sailor'* emerges as both a memorial and a prophecy – a daughter's attempt to hear her father's voice echo across a century of environmental change.**

Concept and vision

The project begins with an intimate archive: the meticulously kept diaries of Molga's late father, Tadeusz, documenting his life as a sailor and the time he spent together with Molga at sea. Fifteen years after his passing, Molga turned to The New Real Observatory platform to explore

how his words might evolve in response to changing oceanic conditions. She chose 2084 as her target – exactly 100 years after her father began his diaries – creating a century-spanning bridge between personal memory and planetary change.

Technical journey

Molga's approach to the material is multi-layered. After transcribing her father's diaries, she used The New Real Observatory platform's Word2vec model to create a mathematical space of word associations based on her fathers' words, both in native Polish, as well as translated to English. Focusing particularly on terms related to ocean, wind and waves, she used the platform's climate modeling tools to guide a linguistic transformation, by metaphorically projecting the diary entries into the future.

Using the platform's most pessimistic climate projections for 2084, she explored how changes in temperature, wind and precipitation might transform the language of seafaring. She moved through the word-association space proportionally to projected environmental changes, discovering new linguistic combinations that reflected both climate transformation and her father's original voice.

The work

The resulting piece operates as both personal memorial and environmental speculation. Molga used the AI-generated word associations as prompts to craft new diary entries for a week in 2084, creating a bilingual narrative in both English and Polish. These entries are presented alongside original and AI-generated imagery, creating an immersive environment that places viewers on the bridge of a ship, surrounded by synthetic projections of future seas.

Focusing particularly on terms related to ocean, wind, and waves, she used the platform's climate modeling tools to guide a linguistic transformation, by metaphorically projecting the diary entries into the future.

Significance

'How to Find the Soul of a Sailor' demonstrates a profound new approach to both environmental storytelling and AI-human collaboration.

Image credit: Kasia Molga

By using climate projections to transform a personal narrative, Molga creates an emotionally resonant way to engage with environmental change.

The project shows how machine learning can help us navigate between past and future, personal and planetary, memory and speculation. It stands as both a daughter's tribute to her father and a meditation on how environmental change might transform the very language we use to describe our relationship with the sea.

Footnotes

The New Real Observatory is part of The New Real, a partnership between University of Edinburgh, Edinburgh's Festivals and The Alan Turing Institute. Featured artists Adam Harvey, Inés Cámara Leret, Keziah MacNeill, Lex Fefegha.

Supported by UK Research and Innovation (EPSRC, AHRC), Towards Turing 2.0, Creative Scotland, Scottish AI Alliance, and the Data-Driven Innovation Programme.

'How to Find the Soul of a Sailor' was commissioned as a project of The New Real and the Scottish AI Alliance as part of *'Uncanny Machines'*, and was first exhibited at Inspace Gallery Edinburgh in December 2024.

Artist bio

Kasia Molga (UK/PL) has refused to be labelled – design fusionist, artist, environmentalist, creative coder and technologist who for over a decade has sought ways of collaboration with nature, predominantly focusing on the ever-changing human relation to and perception of the natural environment and fellow 'earthlings'. Her award winning work has been exhibited worldwide (i.e. Ars Electronica, Tate Modern, MIS [BR], Centre Pompidou and more). Kasia has taken part in many international art & science residencies and has lectured and mentored regularly in the EU and UK. An affinity with the ocean is evident in Kasia's work, born from her time growing up on merchant navy vessels with her sailor father, and she is the proud holder of a diving licence.

Cite as: Kasia Molga (2025). 'How to Find the Soul of a Sailor.' *The New Real Magazine*, Edition Two. pp 30-32. https://doi.org/10.2218/newreal.10923

Links

1. Kasia Molga
2. Watch an artist talk by Kasia Molga

SPOTLIGHTS

Featured special projects and events that explore how the New Real Observatory platform operates – bringing together artistic practice, artificial intelligence and environmental data in new ways – and how it has been used and shared by artists through innovative exhibition formats to help us develop more meaningful relationships with both the technology and our changing planet, creating meaning together.

AWEN: When Data Meets Nature

Image credit: Ciara Flint

Can a mobile phone app help us rediscover our connection to the natural world? In 2021, as the world grappled with lockdowns and virtual interactions, The New Real team created *'AWEN'* – a data-driven walking experience that would lay the groundwork for more ambitious explorations of how technology might help us understand environmental change via local, embodied experiences.

Vision and development

'AWEN' (from the Welsh word for 'inspiration' and the symbol of 'air, earth and water') emerged from a simple but powerful observation: while we have access to unprecedented amounts of environmental data, we struggle to connect this information to our daily experience of nature. The New Real team, led by conceptual artist Inés Cámara Leret, sound designer Tom deMajo and interaction designers Ray Interactive, set out to bridge this gap through a unique combination of environmental science, satellite data, mobile technology and artistic sensitivity.

Unlike typical mobile experiences, *'AWEN'* doesn't demand attention – instead, it gently guides users to notice their surroundings in new ways.

The experience

'AWEN' invites users on a self-directed ambulatory experience, walking through their local environment, with their digital devices becoming windows rather than barriers to engaging with their surroundings. The web-based application tracks location and movement, triggering soundscapes, visual overlays and poetic prompts that encourage reflection and action. But unlike typical mobile experiences, *'AWEN'* doesn't demand attention – instead, it gently guides users to notice their surroundings in new ways.

The technical innovation lies in how the app combines multiple data sources. Global climate models and satellite observations are mapped to users' GPS coordinates, creating experiences that are both locally relevant and globally informed. Each walk becomes unique, shaped by both the specific location and the moment in time.

Beyond technology

'AWEN's' significance extends beyond its technical achievements. The project demonstrated how artistic practice could transform environmental data into meaningful experience – an insight that would prove crucial in the development of The New Real Observatory. It suggested new ways of making global environmental change tangible at a local level.

'We know that people don't necessarily need more information about climate change – the science has been clear for a long time,' explains Matjaz Vidmar, the project's technical lead. *'They need new ways of connecting with that information, of feeling its relevance to their daily lives.'*

As thousands of users created their own unique journeys through their local environments, ...*'AWEN'* began to map not just physical landscapes but our changing relationship with nature itself.

Legacy

Launched at the Edinburgh Science Festival and showcased at COP26 in Glasgow, *'AWEN'*

Image credit: Ciara Flint

established key principles that would inform The New Real's subsequent work. It demonstrated how technology could enhance rather than detract from environmental connection, and how artistic practice could transform data into experience. Most importantly, it suggested how individual interactions with technology might contribute to collective understanding. As thousands of users created their own unique journeys through their local environments, *'AWEN'* began to map not just physical landscapes but our changing relationship with nature itself.

Footnotes

'AWEN' was developed by The New Real with conceptual artist Inés Cámara Leret, sound designer Tom deMajo and interaction design company Ray Interactive in collaboration with the Edinburgh Science Festival.

The *'AWEN'* experience is the outcome of the Experience in The New Real project, made possible by Scottish Funding Council COVID-19 Recovery funding to the University of Edinburgh's Data-Driven Innovation initiative. It was commissioned by The New Real Observatory, and piloted at the Edinburgh Science Festival in April 2021, before a full launch on Earth Day in Summer 2021 and a showcasing of the experience at COP26 in Glasgow in November 2021.

Artist bios

Lead *'AWEN'* artist **Inés Cámara Leret** is inspired by the transformative nature of materials, the methodologies used to understand these and the relations that arise. Exploring life through that which is unseen, portrayed as static or seemingly ephemeral, Cámara Leret works across disciplines. In doing so, she nurtures long-term collaborations that create expanded networks and bridge traditional and academic ways of knowing.

Ray Interactive is a dynamic creative studio specialising in public interactive artworks that seek to inspire, inform and entertain. Directed by Brendan McCarthy and Sam Healy, Ray Interactive seeks to collaborate with other passionate individuals and organisations on purposeful, ambitious and thought-provoking projects.

Tom deMajo is a freelance composer, sound artist and sound designer known for making engaging video games, multisensory installations, architectural interventions and sonic environments. He is a founding partner of Biome Collective, Scotland's first games collective, where he was designer and sound designer of award- winning location-based sound game *'other.'* Co- founder of Warp Technique electronic music. Independent artist and collaborator. He enjoys working with small

teams with big ideas and talks about audio and the place of sound in our world.

Cite as: Matjaz Vidmar and Drew Hemment (2025). 'AWEN: When Data Meets Nature.' *The New Real Magazine*, Edition Two. pp 34-37. https://doi.org/10.2218/newreal.10924

Links

1. Explore *'AWEN'*
2. Explore the underlying science
3. Watch a summary video
4. Watch the *'AWEN'* virtual event video
5. Technical paper explaining development of *'AWEN'*

The New Real Observatory Platform: Connecting Generative AI and the Environment

Image credit: The New Real Observatory platform

The New Real Observatory enables accessible, legible and tangible cultural experiences of our changing climate and our role within it. The platform, and the programmes it supports, provide a way for leading digital artists to experiment with environmental datasets, climate models and generative tools to fuel a new generation of environment-conscious projects.

When users work with commercially available Generative Artificial Intelligence (GenAI), they typically encounter a black box – powerful tools that offer little insight into how they work or control over how they operate. The New Real Observatory takes a different approach, giving users unprecedented access to AI systems,

At its core, The New Real Observatory combines two key elements: machine learning systems and climate prediction data.

while making the connection between AI-powered visions of the future and environmental concerns explicit and manipulable.

explore and define meaningful dimensions within the models they generate using pre-configured tools.

Rather than simply generating outputs, users can fine-tune or train their models on small datasets of their own choosing – with full ownership over the data and the resulting models.

Platform architecture

At its core, The New Real Observatory combines two key elements: machine learning systems and climate prediction data. Developed through close collaboration with artists, the platform has evolved through two major phases. The first phase, launched in early 2022, focused on image generation and resulted in four prototype artworks exploring different aspects of environmental perception. The second phase, in 2023–2024, added text analysis capabilities and led to five development awards to explore the conceptual possibilities of the platform, leading on to one full commission (by artist Kasia Molga as part of the *'Uncanny Machines'*).

The machine learning component consists of two main systems: a visual AI based on transferGAN technology, and a text analysis system using Word2Vec. What makes these implementations unique is how artists can shape their operation. Rather than simply generating outputs, users can fine-tune or train their models on small datasets of their own choosing – with full ownership over the data and the resulting models. In addition, they can

The climate data comes from the Copernicus Climate Data Service, offering projections of temperature, precipitation and wind speed for any location on Earth up to 2100. These projections are based on the Hadley Centre Global Environment Model (HadGEM3), providing artists with scientifically grounded environmental scenarios. We invite users to reflect on this data vis-a-vis exploring AI models, to shift and challenge the conceptual dimensions they find in them with a climate-impacted future.

Image credit: The New Real Observatory platform

The SLIDER tool

Central to the platform is the SLIDER tool (Shaping Latent-spaces for Interactive Dimensional Exploration and Rendering), which allows artists to explore how the AI systems model relationships between concepts (words) or images. For visual work, artists can upload two sets of images representing a conceptual dimension, then explore the AI's interpretation of the space between them. With text, artists can define conceptual dimensions using sequences of words, discovering how the AI understands their relationships.

Environmental integration

What distinguishes the Observatory from other AI platforms is its explicit integration of environmental data as a way to contextualise the conceptual dimensions in the data. Artists can use localised climate projections to guide their exploration of the AI's latent space, creating works that respond directly to predicted environmental changes. This creates a unique feedback loop between environmental data, artistic interpretation and machine learning.

Impact

Four artworks were produced directly on the platform by Ines Cámara Leret, Keziah MacNeill, Lex Fefegha and Kasia Molga, alongside a number of conceptual development projects and critical reflections. The platform continues to evolve through artistic use, demonstrating new possibilities for Experiential AI systems to enable profound exploration of AI technologies as well as inspire environmentally-conscious use. By making both AI systems and climate data more accessible and manipulable, it suggests new ways for artists to engage with the climate crisis through AI technology, while maintaining critical awareness of how these tools shape our understanding of nature itself..

Cite as: Matjaz Vidmar and Drew Hemment (2025). 'The New Real Observatory Platform: Connecting Generative AI and the Environment.' *The New Real Magazine*, Edition Two. pp 38-40. https://doi.org/10.2218/newreal.10925

Links

1. The New Real Observatory Platform

Uncanny Machines: Five Artists Probe AI's Boundaries

Image credit: Andrew Perry

Designed to provide transformative AI-fuelled experiences for audiences, and to present works that address key challenges in AI, the *'Uncanny Machines'* commission explores how artists can push creative boundaries, how AI can be enriched or challenged by the Arts and the social implications of recent developments in AI.

How do we explore the increasingly blurred boundaries between human and machine creativity? In 2023, The New Real Observatory partnered with the Scottish AI Alliance to commission five artistic investigations into this question. Each project would use the platform's new text analysis capabilities to explore different aspects of human-AI interaction, from personal memory to environmental futures.

***'Uncanny Machines'* moved beyond typical AI art production to examine fundamental questions about human-machine relationships.**

The commission

'Uncanny Machines' moved beyond typical AI art production to examine fundamental questions about human-machine relationships. Through development awards to five artists and teams, the commission supported works that would both test The New Real Observatory platform's language modelling capabilities and explore critical issues in AI development. Five development awards were on offer, with a final one funded commission.

The projects

Each selected project approached human-AI interaction from a distinct angle: Kasia Molga's *'How to Find the Soul of a Sailor'* explored the intimate possibility of finding traces of lost loved ones in personal archives. Using her late father's sailing diaries, Molga investigated how AI might help us preserve not just words but ways of seeing the world.

Artists worked with smaller, carefully curated datasets rather than massive training sets, exploring how AI might help us understand specific domains of human experience.

Alice Bucknell's *'Cones of Uncertainty'* drew parallels between extreme weather prediction and artificial intelligence, using meteorological metaphors to help us grasp the complex dynamics of both climate change and AI development.

Linnea Langfjord Kristensen and Kevin Walker's *'Fold Me, Bend Me, Break Me, Said the Computer'* sought new ways to visualise AI systems, using artistic practice to 'unfold' the black box of machine learning.

Sarah Ciston's *'Asking the Wrong Questions about Generative AI'* examined the ethics of AI training data, proposing alternative approaches focused on community-centered dataset curation and data sovereignty.

Image credit: *'Voicing the Unspoken'* by Johann Diedrick and Amina Abbas-Nazari

Johann Diedrick and Amina Abbas-Nazari's *'Voicing the Unspoken'* investigated how AI might help recover missing voices from historical archives, while questioning the increasing prevalence of synthetic speech.

Each of the artists/teams produced a short video lecture and a proposal for the full commission to explore their concepts further and to realise an artwork and a workshop with the audience. You can see the results of their explorations here: https://www.newreal.cc/art

Legacy

The commission marked a crucial evolution in The New Real Observatory platform, focusing on its text analysis capabilities. Artists worked with smaller, carefully curated datasets rather than massive training sets, exploring how AI might help us understand specific domains of human experience. *'Uncanny Machines'* demonstrated the platform's potential for critical, conceptual engagement with the prevalent AI tools of the time - language models. Through these five projects, it suggested new ways for artists to interrogate how AI systems develop, while maintaining awareness of the ethical and social implications of these technologies.

Footnotes

'Uncanny Machines', The New Real 2023 AI Art Commission, was a partnership between The New Real at University of Edinburgh/Alan Turing Institute, the Scottish AI Alliance and The British Library. From the five development awards, Kasia Molga, was awarded a full art commission to bring her concept to life.

About the artists

Amina Abbas-Nazari
Alice Bucknell
Sarah Ciston
Johann Diedrick
Linnea Langfjord Kristensen
Kasia Molga
Kevin Walker

Cite as: Matjaz Vidmar and Drew Hemment (2025). 'Uncanny Machines: Five Artists Probe AI's Boundaries.' *The New Real Magazine,* Edition Two. pp 41-43. https://doi.org/10.2218/newreal.10926

Links

1. Watch a video profiling the *'Uncanny Machines'* development projects
2. Listen to The New Real 2023 Commission Podcast

Read project blogs:

3. Introducing the theme of The New Real 2023 Art Commission
4. *'It Seems the Future of AI is Art'*

The New Real Pavilions and Salons: Creating Spaces for AI Futures

Image credit: Andrew Perry

The New Real Pavilions and Salons explore how to share transformative ideas through art and AI to equip future generations to flourish on a thriving planet in the midst of surprising, joyful and inclusive forms of intelligent life.

These new models of technology-arts-society interaction broke new ground in how we facilitate a joint investigation of these pressing issues of concern.

How do we move conversations about AI beyond technical specifications into meaningful dialogue about our collective futures? Between 2022 and 2024, The New Real created new formats for technology-arts-society interaction through its Pavilions and Salons – physical and discursive spaces where artists, scientists, technologists and publics could explore how AI might shape our future on a planetary scale.

How do we move conversations about AI beyond technical specifications into meaningful dialogue about our collective futures?

A new model for engagement

The New Real Pavilion combines physical stagings of artworks, research activities and technology demonstrations, contextualised in carefully curated narratives that invite deeper engagement – something we refer to as 'wrap around engagement'. Rather than traditional exhibitions, the Pavilion is conceived as a 'concept-touring' space that can adapt to different settings and audiences, creating opportunities for direct interaction with the concepts, works and their creators.

The New Real Observatory (2022)

The inaugural Pavilion and Salon showcased the first artworks created with, and in response to, The New Real Observatory platform. Works by Inés Cámara Leret, Adam Harvey, and Keziah MacNeill demonstrated how artistic practice could help us rethink AI design – embracing human traits like bias and uncertainty as creative opportunities rather than problems to solve. Through interactive exhibits and discussions, we explored how AI-art collaboration might address urgent challenges, from energy-intensive computing to the disconnect between global climate data and local experience.

...the Pavilions and Salons demonstrated how research translation might become a two-way process – not just explaining technology to the public, but bringing public insight into technological development itself.

Another new invention is the accompanying curated 'pop-up research hub' – which offers multiple opportunities for rich data collection in different media (video, text, drawing etc) with impromptu interviews, feedback surveys and observations.

The New Real Salon format complements these physical installations and interactions with focused discussions, conversations and workshops. These gatherings bring artists, curators and scientists into direct dialogue with broader societal concerns, creating spaces for critical reflection on emerging technologies and their implications.

Uncanny Machines (2023)

The Spring 2023 edition focused on the evolving relationship between artists and AI technology. Featuring works from the *'Uncanny Machines'* commission, the Pavilion demonstrated how artists were using the Observatory platform's new text analysis capabilities to conduct profound experiments with AI and climate data. The accompanying Salon discussions examined how artistic practice might enrich or challenge AI development, exploring ways to combine machine learning with human intuition and embodied experience.

Legacy

Through these new event formats, The New Real developed new models for public engagement with AI development. By creating spaces where technical innovation could be explored alongside its social and environmental implications, the Pavilions and Salons demonstrated how research translation might become a two-way process – not just explaining technology to the public, but bringing public insight into technological development itself.

Cite as: Matjaz Vidmar and Drew Hemment (2025). 'The New Real Pavilions and Salons: Creating Spaces for AI Futures.' *The New Real Magazine,* Edition Two. pp 45-46. https://doi.org/10.2218/newreal.10927

REFLECTIONS

Broadening perspective beyond the Observatory platform to examine wider questions about AI's role in environmental understanding. From exploring the evolving landscape of data-driven art and questioning its capacity to respond to global challenges and create the kind of tactile experiences we need to truly connect with our environment; to questioning the hidden environmental costs of digital art creation; to critically examining whether AI can meaningfully contribute to net zero goals or whether it might exacerbate the problems it aims to solve.

Responding to Global Challenges Through Data-Driven Art

By Martin Zeilinger

Image credit: Julie Ann Fooshee

Researcher and curator Martin Zeilinger discusses a landscape review of AI art and artists in the context of responding to global challenges through data-driven art.

Many artists working with AI are engaged in exploring the impact of new technologies on our socio-cultural and ecological life-worlds...

Early in 2021, The New Real, in partnership with the Edinburgh Science Festival, set out to develop a new data-driven artwork that could both engage a global Festival audience (in response to the COVID-19 lockdown) and also inspire behavioural and/or attitudinal change on the climate emergency. Underlying this ambition, a number of crucially important concerns – to do with the usability, sustainability and accessibility of computational technologies – quickly began to take shape. As such, we looked at art practices dealing with large bodies of data, AI systems and other emerging technologies

which concern themselves with a wider range of social and environmental issues that are not always well defined or understood.

Don't be afraid to ask

We carried out a landscape review of existing and emerging practices among artists working with large computational systems and AI, as well as a survey of artists who might be commissioned as a part of any co-creation research emerging from this analysis. In particular, we were asking a range of key questions:

- How can complex computational systems be used to facilitate localised, community-oriented, accessible cultural experiences, so that the artworks can serve to elucidate the workings and capabilities of these same systems, rather than obfuscating them?

- How can we ensure that artworks foster critical literacies concerning immensely powerful technologies that are by many non-specialists perceived to be so complex as to be virtually unknowable?

- How can emerging data-driven technologies such as AI be used in the creation of cultural experiences that invite their audiences to contemplate and tackle the biggest challenges we are facing today, such as humanity's impact on the planet, the climate crisis or issues of surveillance and data privacy – even if these same technologies are by many understood to be deeply implicated in how these challenges were brought about in the first place?

The research revealed an impressive landscape of existing creative practices and art projects and validated one of the founding ideas behind The New Real, namely that for many artists who are experimenting creatively at the forefront of emerging technologies, such questions are already informing much of their work. In fact, artists are often in the lead when it comes to contextualising new technology, as reported in Edition One of this Magazine.

Impacts of new technologies on socio-cultural and ecological life-worlds

Many artists working with AI are engaged in exploring its impact on our socio-cultural and ecological life-worlds, or their work might

Image credit: Julie Ann Fooshee

speculate on the emergence of productive interfaces between such new technologies and their users. These were precisely the kinds of domains we identified as most relevant including AI, the Anthropocene and big data analytics.

Tega Brain: making complex systems human-computable

A good example is the work of Tega Brain, an Australian-born artist now living and working in New York. Brain's art practice often links environmental issues to technological infrastructures and networked data systems, frequently with a focus on conveying highly complex information about the Anthropocene and dystopic climate futures in accessible and engaging formats. Many of her projects are designed with a focus on public engagement, accessibility and educational contexts. Often, this means visualising complex bodies of data relating, for example, to carbon emissions, energy consumptions or climate change. This has resulted both in technologically highly sophisticated work, such as *'Asunder'* (2018), an AI-based 'environmental management' tool that simulates future alterations required to keep the planet safely within boundaries of survivability (often with absurd requirements and/or results), but also strikingly simple works such as *'The Phenology Clock'* (2014), a clock-like installation that conveys critical information about the temporalities of the Anthropocene, such as life cycles of plants native to a specific locality. Both of these works represent efforts to make extremely complex systems – plant life cycles, the ecosphere, large bodies of environmental data – human-computable in the form of art installations in which complexity becomes affective experience. In the case of *'Asunder'*, this also means exploring absurd dystopian elements of futuristic technologies, including, for example, AI-based suggestions to erase or relocate entire megacities in order to keep planet Earth survivable for its human inhabitants.

How can emerging data-driven technologies such as AI be used in the creation of cultural experiences that invite their audiences to contemplate and tackle the biggest challenges we are facing today...

Memo Akten and the nature of nature

Another artist whose work focuses strongly on the making of sophisticated technological systems, and on the exploration of how human users can interact with such systems, is Memo Akten. The majority of Akten's work explores the creative affordances of AI and machine learning, often with the specific aim of making these technologies accessible to wider audiences. A common theme in his work is a focus on 'the nature of nature,' including phenomena such as seeing, sensing and consciousness, all of which represent extremely complex potential interfaces between human users and computational systems. In this sense, Akten's work explores crossings-over between biological and artificial intelligence.

For example, *'Learning to See'*, an extensive series of interconnected projects and experiments first presented in 2017, focuses on the interpretability of data, and speculates on ways in which human and non-human systems can learn from one another while also expressing information for one another. Among the most interesting instantiations of the project is an interactive installation that invites audience members to manipulate simple objects such as cables placed on a table. This simple interaction is recorded by a camera and processed by an AI system that tries to visualise for the human audience what it 'sees.' Because the underlying neural network was trained only on the basis of very specific real-world images (such as waves lapping on the shore, or the flames of a wood fire), the resulting outputs, even though they can be highly realistic, bear no resemblances to the real-world impressions on which they are based. This allows audiences to explore transcendental questions of perception and seeing through the latent space outputs of neural networks, and the series overall, by implication, addresses critical questions about interpretation, meaning and understanding.

Other artists

There are many other examples of AI-driven, technology-based critical art projects that explore the utility of emerging technologies right alongside questions of their sustainability, ethics, aesthetics and medium-specific particularities. Some that instantly spring to mind are Pierre Huyghes installation *'UUmwelt'*, commissioned by Serpentine Galleries in 2018, which deals with the co-evolution of human and non-human agents, or Alexandra Daisy Ginsberg's *'Machine Auguries'* (2019), a sound installation that explores, through AI-generated bird song, how the light and sound pollution of urban lifestyles affect birds, while also demonstrating AI systems' ability to assume the aural identities of real and imagined songbirds.

...for artists working in virtually every medium, new AI-related challenges are developing. These span both the ethical and practical dimensions of creative expression, and more than ever challenge our consistency on the issues of environmental and social sustainability.

Questions for now

While the nexus of a global pandemic and climate crisis in which this survey took place is now behind us, many of the issues and questions it brought to light remain highly pertinent, and for artists working in virtually every medium, new AI-related challenges are developing. These span both the ethical and practical dimensions of creative expression, and more than ever challenge our consistency on the issues of environmental and social sustainability.

So, how does an artwork contribute to global concerns surrounding the environmental impact and sustainability of our manifold uses of technology?

The experiment subsequently conducted by The New Real Observatory sheds some light on critical dimensions that shape such artistic work. Both issues of control and responsibility as well as knowledge and understanding played out over a number of works commissioned by the programme. We are thus called to examine at the same time the generative AI capabilities and the reality of climate-change impact on both algorithmic modelling as well as our knowledge of our planet(ary future).

Author bio

After many years of living in Vienna, Toronto, and London, **Martin Zeilinger** is glad to have landed in Dundee, where he is currently Senior Lecturer in Computational Arts & Technology at Abertay University. His research interests include digital art, appropriation-based art practices, emerging technologies in relation to contemporary art (specifically AI and blockchain), theories of cultural ownership and intellectual property and various aspects of experimental video game culture. Co-curator of the Toronto-based Vector Festival from 2014 to 2020, Zeilinger frequently collaborates with curators/artists/activists on curatorial projects.

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Connecting People, Place and Planet: Can Tactile Embodied Experiences be Created Through Digital Technologies?

By Sophie Mackaness

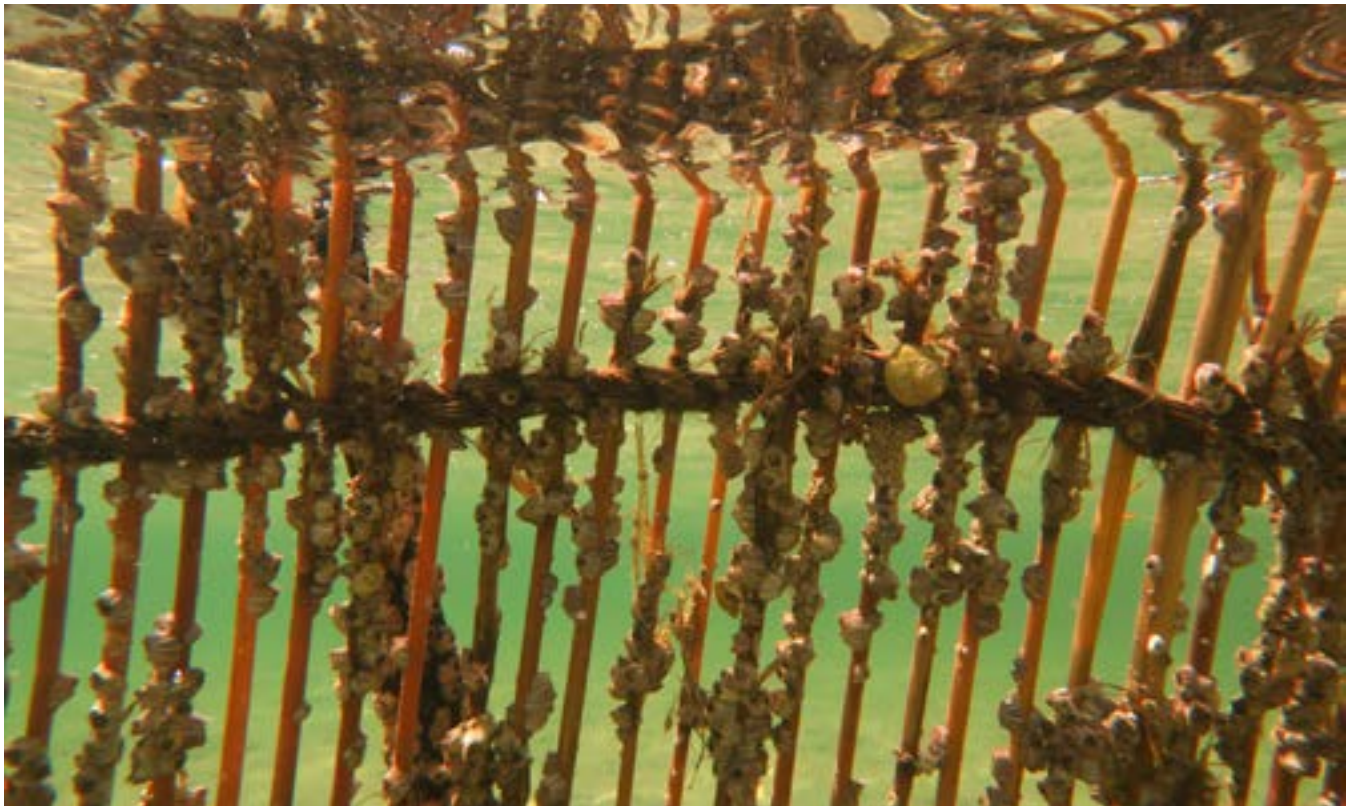

Image credit: Sophie Mackaness

Marine Scientist and Geoscience Research Consultant Sophie Mackaness reflects on the opportunities and challenges of building connections between science, art, and people.

Early in 2021, The New Real, in partnership with the Edinburgh Science Festival, set out to develop a new data-driven project that could both engage a global festival audience (during a COVID-19 lockdown), and inspire positive behavioural change on the climate emergency. While many of us have become used to socialising through the screen and working happily through a webcam, collaborating via virtual environments came with a whole different set of challenges than my usual teaching and research.

A key message I was keen to communicate with our audience is the importance of understanding the interconnectedness of climate issues.

The initial project I was involved with, *'AWEN'*, brought together specialists from many different fields – artists, scientists, researchers, communicators, coders, designers… This was a unique project to be a part of; one in which coming together to work did not actually involve coming together physically. This continued within The New Real even after restrictions on physical gatherings were lifted, as it allowed for a more international collaboration and wider stakeholder engagement.

All the data that currently exists on every aspect of climate change is important and evolving as humans alter our planet at lightning speed to suit our needs.

Communicate to collaborate

It is crucial to note that collaborative creative projects thrive on one essential ingredient – communication. Whether it be voices interrupting and overlapping in a discussion, or ideas sketched out on paper being passed around a table and added to with scribbles and doodles. The human brain works through a combined series of senses and experiences. In the modern age, some of these senses have already begun to include digital forms and online processes but we are still (hopefully) a long way from becoming purely digital beings. And yet this is what we became.

We all noticed the major differences first – who had the worst WiFi, whose cat liked to sit on the keyboard. But the smaller changes didn't become obvious until later: members of the call who were less likely to interrupt and so remained quiet in many meetings; and those who happily filled the airwaves. How many of us were reluctant to directly ask questions of other individuals for fear of pulling them into the unwanted zoom-light? It makes me wonder whose voices would have sung out louder (and whose ideas would have been included) if the meetings had been done round a real table instead of a virtual one.

Nevertheless, we went ahead and combined our knowledge and experiences from many fields to create something unique. Our first specification was clear: the project had to be data driven. And as a Science Festival collaboration, it needed to be backed by solid science and up-to-date global information that would be shared with the general public in an engaging manner. With such a broad framework, however, my task of finding said data was particularly daunting: find the climate data.

The interconnectedness of climate issues

As we know, there are so many aspects to our planet and many contributory forces when it comes to understanding climate change. 'Climate datasets' could include anything from micrograms of mercury stored in the soils of a specific region, to the volumes of plastic being washed into the oceans globally.

Each of these contributing factors to climate change are hugely important – even if their impact on the global or local ecosystem isn't obvious to begin with.

A key message I was keen to communicate with our audience is the importance of understanding the interconnectedness of climate issues. For example, my background in marine acoustics and the impacts on anthropogenic noise pollution on marine fauna, shows that noise can connect climate issues in a powerful way. If we reduce anthropogenic noise (shipping, construction, extraction, traffic…), we reduce these activities and therefore their individual climate impacts. However, the connections between noise and impact isn't necessarily intuitive. Noise doesn't create greenhouse gases, or poison waterways, or collect as a physical entity that can damage ecosystems – so why worry about it?

Questions around the connectivity between climate issues inspired many of the digital prompts inbuilt into The New Real's artistic projects. Each one leading the user to draw their own conclusions about how their experience might impact climate locally (like the tree you rest beneath) or globally (like the ability of the world's oceans to breathe for the planet). Connecting the dots, the artworks emerging from these collaborations encourage exploration of the relationships between air, earth, sea and sound, and how they can have huge impacts at local and global levels.

In this sense, the task of finding climate data becomes much more meaningful. Since each dataset is likely correlated with countless others, basing a planetary future purely on one dataset or aspect of climate change wouldn't show the complete picture. All the data that currently exists on every aspect of climate change is important and evolving as humans alter our planet at lightning speed to suit our needs. Going beyond the platforms developed, art should not just allow the user to learn about climate issues and impacts, it should encourage and explore the essential idea that all of these issues are connected. Connected to each other, connected the planet and connected to us.

Author bio

Sophie Mackaness is a Geoscience Research Consultant, a marine and freshwater biology graduate from the University of Glasgow and the owner of an eco-focused business. Her work in marine biology in Scotland and Australia has led her to assist on many projects, with a particular focus on marine acoustics and the impact on anthropogenic noise pollution on the physiology and behaviour of marine fauna. Sophie's current research focuses on how AI techniques can be used to assess behaviour of deep-sea cold-water reef fish from image and acoustic data. Her work sits within a broader interest in how anthropogenic activity drives changes in climate and how ecologies drive and respond to changes in climate.

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Links

1. Embark on your own *'AWEN'* journey
2. Watch a summary video
3. Watch the event video

Can AI Clear the Net(Zero)?

By Daga Panas

Image credit: Daga Panas

Set the (not easy) challenge of wrestling with the BIG question: Can AI be net negative from a climate perspective?, University of Edinburgh Data Scientist Dr Daga Panas shares her thoughts on some of the paradoxes of working with big data and powerful algorithms for planetary good.

With Transformer models gobbling up preposterous amounts of energy to create fake humans;[1,2] data centres syphoning off vast amounts of water to cool off heated online debates about... well, ironically enough, climate change;[3] and with AI raising both temperatures and eyebrows, the field of Data Science is becoming a bit of an environmental minefield to work in. Frankly, when the question is raised Can AI be Net Negative? (i.e. reduce the carbon footprint, rather than add to it), I suck in my

We...use both big data and powerful AI algorithms, and wouldn't be doing so without *some* hope of being able to balance the books in favour of the environment, rather than our curiosity.

breath through my teeth. While I don't think I am nearly qualified to fully answer this – in fact, no offence, but I don't think anyone really is – what I can offer is a medley of positive examples, some ensuing paradoxes and a question of my own in return.

...it isn't merely about the patience needed, or the tedium of the task, it's also that humans are just not fast enough...AI... can approximate some of our processing capabilities and then perform them on our behalf at scale and at speed.

Our practice in the Data Science Unit at the University of Edinburgh happens to touch on a lot of societal and planetary issues, from the micro-scale of new materials chemistry to the macro-level use of Earth Observation to monitor and manage the environment. We also in many cases use both big data and powerful AI algorithms, and wouldn't be doing so without some hope of being able to balance the books in favour of the environment, rather than our curiosity. Let me explain... starting with the big (bad?) data.

Big (bad?) data

We live in an unprecedented moment in history, having turned the planet into a version of the Orwellian. Putting aside the undeniably troubling political questions, I want to focus on the practical aspects of such mass monitoring. Take satellites for example; a swarm of busy little robots which photograph the surface and atmosphere of the Earth daily, and pretty much from pole-to-pole. This offers the opportunity to observe processes at scales and resolution that were previously unthinkable. There is the climate, of course, but also habitats, mass movements of animals, human activities and their impacts – the list goes on. In our direct practice, we use satellite data to monitor glaciers (and not just any glaciers but the mother of all glaciers, the Antarctic Ice Sheet), classify types of vegetation in the Amazon (used to detect deforestation),[4] estimate population density[5] and calculate travel times needed to reach the nearest health clinic (important considerations for policy-making, particularly in under-developed countries).[6] None of these tasks would be possible without the data, nor without machine learning tools. The number of images we're talking about, and that need to be looked at and processed quickly, is orders of magnitude greater than even the longest holiday pictures slideshow you have ever had to sit through. And it isn't merely about the patience needed, or the tedium of the task, it's also that humans are just not fast enough. That's where AI is so incredibly useful; it can approximate some of our processing capabilities (which I would say is still a far cry from intelligence) and then perform them on our behalf at scale and at speed.

Problem and solution?

And here comes the paradox; given that the speed and scale mentioned above requires extensive data storage and recall, and significant processing capacity, both of which are energy intensive, it seems like I'm saying that without AI we wouldn't be able to monitor things like the burden of AI on the environment? Does this then mean that without AI we wouldn't have the solution, but also the problem?

Of course, it is not as simple as that, and it's probably patently obvious to most that – AI or not – deforestation would still be rampant, glaciers would still be melting and we'd still be in this mess. As these systemic issues are long ingrained in our society, AI is neither the sole cause nor its salvation, but it is *useful* to perhaps be able to better understand and start addressing these deeply rooted problems. It is critical to note that this is all very anthropocentric – we, the humans, build and use AI and it is our behavioural and social, economic and political change that can help shape a better planetary future.

Inventive creativity

To explain this a bit, let's zoom in now on the micro-level. We also face problems in our practice from the other end of the spectrum, where data is not necessarily abundant. The thing about the powerful AI algorithms discussed so far is that they work because they have seen billions of examples and have gigabytes of memory available.

In other words, it acts a bit like a search engine,[7] just not at the level of keywords, but of data patterns.

This works well for satellite data or cat pictures, of which there is no shortage. But for chemistry, for example, where we don't have an endless supply of different materials to show as examples, the issue is rather different, and we have to make do with very little data. We do, however, have a pool of hard-won chemistry knowledge, rules and laws that we know always apply (say the conservation of energy that underlies the sad impossibility of eating the cake while still having it). The problem is that unlike human intelligence, which can seamlessly combine concrete data and abstract rules into sometimes very 'out of the box' thinking, computer 'intelligence' has a hard time with inventive creativity.

Image credit: NASA's Earth Observatory, CC BY 2.0 httpscreativecommons.orglicensesby2.0, via Wikimedia Commons

The difficulty is that we either have to show enough examples to capture the general rule, or we have to explicitly code each rule, but we then run into the problem of which rule to use when? To solve that problem we in turn need more examples, or more rules, and the recursion swiftly blows up.

...unlike human intelligence, which can seamlessly combine concrete data and abstract rules into sometimes very 'out of the box' thinking, computer 'intelligence' has a hard time with inventive creativity.

Runaway data gluttony

This combinatorial explosion – or more plainly, runaway data gluttony – is in fact already starting to cause problems. We're approaching the point where we've fed all we can into Large Language Models (LLMs), as if a diet of everything that anyone has ever written could birth us the next Shakespeare or Dickinson.[8] Well it hasn't and it can't, because all the AI can do is indiscriminately remix – and not in the creative way that musicians do it; it's a cheap DJ that replays greatest hits to a drunken crowd. If you spend any time perusing social media, you may already have noticed an onslaught of fake art that is automatically generated, as often as not saccharinely polished, and quickly elicits a nauseating sense of deja vu.[9] What happens when, all examples exhausted, the LLMs start cannibalising their own productions?[10] If you think that AI is already mindlessly regurgitating shallow imitations of art and amplifying human-generated biases and falsehoods, consider how hollow of any value the internet echo chamber will become when it loops through the tape again, resampled and caricatured.

A bad workman blames their tools

What I am trying to convey is that, try as we might, we humans often fail at approximating things or thinking in very large or very small numbers; we are, after all, tuned to the environment we have evolved in. What do we humans do when we need to augment our limitations? We invent tools. AI on the other hand can process things at planetary scales but is on its own very (very) dumb. It is simply another tool, a complex and pretty amazing one, but a tool nonetheless.

We humans have a penchant for anthropomorphising, and with the advent of LLMs this has become all too easy to do, but we should not be fooled – nor tempted to blame our digital helper. Like any tool it can be designed and wielded for good and for ill – by its owner.

So perhaps the question should not be whether AI can ever become Net Negative, but instead, can we humans ever be?

Author bio

Dr Daga Panas is a researcher at the Data Science Unit for Science, Health, People, and Environment at The University of Edinburgh. She studied Computational Neuroscience and Physics and describes herself as an all-round-geek, when pressed to write in the third person. Daga has a varied background, including, in no particular order: deploying machine learning in a business environment, guiding punting tours on the river Cam, and research on the benefits of naps (often conducted personally).

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Links

1. *'Why AI is a Disaster for the Climate'*
2. *'Generative AI's Environmental Costs are Soaring — and Mostly Secret'*
3. *'AI's Craving for Data is Matched only by a Runaway Thirst for Water and Energy'*
4. More on The University of Edinburgh's Data Science Unit

Circular Diffusion

By Adam Harvey

Image credit: Adam Harvey

In his essay and collection of images, titled *'Circular Diffusion'*, artist Adam Harvey presents a reflection on the perils and possibilities of Generative AI technologies and their unavoidable relationship to energy and propaganda.

'When you have a theory there are two kinds of questions you have to ask. Why are things this way? Why are things not that way? If you don't get the second question you've done nothing.'
Noam Chomsky, 2022[1]

AI is often considered a hopeful technology with unlimited problem-solving capabilities. But new solutions create new problems…

Generative AIs enable ground-breaking new approaches to visual communication. They automate artistic production and auto-complete visual concepts, transforming low-dimensional ideas into high-resolution imagery. But they also create new concerns ranging from computational plagiarism to excessive energy usage.

When Generative AIs are applied to climate change they often produce non-scientific output

cloaked in scientific language. The 'science behind the project' is often not actual climate science, but merely data science built on the theory that 'anything goes', in effect amplifying misinformation and degrading trust in the media.

Not being able to answer these questions is part of the fun of Generative AI. But it is a circular experience. Images are generated to learn how images are generated. The past is represented through new algorithmic lenses, but is still the past. No new knowledge is created.

What the future needs?

Generative AI is compelling, but if its reward function doesn't optimise for global goals, the results are doomed to converge towards a quixotic descent. It could seem that Generative AIs are the opposite of what the future needs: energy intensive fake-image generators that contribute negatively to science. Almost. Their true value is not science but propaganda, or rather their ability to automate the visual layer of communication in cybernetic systems. This is as significant as the JPEG compression algorithm was for photographs or the MP3 compression algorithm was for the propagation of music. Generative AIs just work in reverse, expanding compressed neural potential into formatted visual kinetics. In this way Generative AI contributes a new layer of algorithmic visual communication infrastructure: the power to expand low-dimensional concepts into higher-dimensional representations.

***'Where Generative AI serves as a medium, what there is to know is what is already known.'* Fabian Offert (2021)**[2]

Using AI to address climate change is often a quixotic fantasy. When wind turbines spin they create more energy, which is used to accelerate and improve AI, which increases efficiency and lowers cost, creating more demand. Rather than reducing the environmental impact, more wind turbines must be manufactured to create more energy to meet the surge in demand for more AI, a phenomenon known in economics as the Jevons Paradox.[3]

In a collection of images, titled *'Circular Diffusion'*, I reflect on the perils and possibilities of generative AI technologies and their unavoidable relationship to energy and propaganda, asking the viewer if we can truly escape this paradox of AI and use it to benefit humankind, or will we be sublimated into a submissive state of circular diffusion.

The work

The title *'Circular Diffusion'* is a reference to AI diffusion algorithms, their power to automate the production of awe-inspiring imagery, and the circular logic of extrapolation. The images refer back to the energy waste of their generative production by using this very system to 'diffuse' and propagate an ascendant and sustainable version of itself by cloaking the context in the latent space of classical art and greenwashing stock imagery.

For exhibitions, each image from the panelled artwork is presented as a 2x2 grid (120x120cm total) emphasising a circular clockwise movement of energy being transformed into art promoting the energy systems used to generate the energy-driven art. It is not art but a meta statement about images claiming to be art, while serving the higher purpose of promoting the underlying system, much like the reference to transcendent classical art composition of each image in this work.

Footnotes

The New Real Observatory is part of The New Real, a partnership between University of Edinburgh, Edinburgh's Festivals and The Alan Turing Institute. Featured artists Adam Harvey, Inés Cámara Leret, Keziah MacNeill, Alex Fefegha. Funded by the Arts and Humanities Research Council (AHRC) - UK Research and Innovation (UKRI), Towards Turing 2.0 and Engineering and Physical Sciences Research Council (EPSRC).

'Circular Diffusion' was commissioned as a project of The New Real Observatory, developed between December 2021– August 2022, and first exhibited at ARS Electronica 2022, Linz, Austria.

Author bio

Adam Harvey (US/DE) is a researcher and artist based in Berlin, focused on computer vision, privacy, and surveillance technologies. He received his masters degree from the Interactive Telecommunications Program at New York University (2010) and a BA in Integrative Arts from Pennsylvania State University (2004). Harvey is the founder of VFRAME.io, a software project that innovates computer vision technology for human rights researchers and investigative journalists, which received an award of distinction from Ars Electronica and nomination for a Beazley Design of the Year award in 2019.

Cite as: Adam Harvey (2025). 'Circular Diffusion.' *The New Real Magazine*, Edition Two. pp 62-65. https://doi.org/10.2218/newreal.10931

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Links

1. Adam Harvey
2. Explore the science behind the project
3. *'Is AI Art Soft Propaganda?'*

INTERJECTIONS

Vital counterpoints to dominant narratives about AI and environmental futures to guide us in our intrepid explorations and advance the global conversation around the role of AI and the arts in guiding planetary futures.

AI and the Global North/South Divide

By Antonio Ballesteros-Figueroa

Image credit: Adobe Firefly

AI can bring benefits globally, but it is energy intensive and, combined with existing inequalities in infrastructure, could reinforce power imbalances. Here, researcher in people environment studies and behavioural modelling, Antonio Ballesteros-Figueroa, reflects on this and on the need for increased participation of local communities in how AI is produced.

For most of us, checking the weather app on our phones is part of our daily routine. We want to reduce the uncertainty in our lives as much as possible. Similarly, farmers around the world depend on long-term meteorological forecasts to reduce the uncertainty in highly variable systems. AI systems enable this by allowing the integration of algorithmic models that utilise big data processed by supercomputers.

...while AI tools could help to improve policy decision making, they can also reinforce existing unequal power relations between the Global North and the Global South.

Forecasting is not limited to the weather. For instance, in a healthcare setting, the COVID-19 pandemic saw UK and US researchers use machine learning algorithms in attempts to forecast if a person might develop severe illness, based on the first day's symptoms.[1,2] All this forecasting activity comes with a cost that is both economic and environmental. It requires an energy-intensive infrastructure of supercomputers and server farms to process the huge amounts of data involved. The need for this infrastructure not only has a physical impact on the planet – it can also have profound social and political consequences.

The people whose lives might be affected by these forecasts should have some agency in the process of developing these systems.

Forecasting climate-related conflict

The Uppsala University Department of Peace and Conflict Research (PCR) in Sweden uses a Violence Early Warning System (ViEWS) with the aim of forecasting climate-related conflicts.[3] In particular, the goal is to predict how agricultural changes linked to droughts could affect human displacement within the next 100 years.[3] All of these AI forecasting tools expect to influence decision making, not only of the affected communities, but of every stakeholder.

Yet while AI tools could help to improve policy decision making, they can also reinforce existing unequal power relations between the Global North and the Global South. Interviews with ViEWS' members reveal that these tools represent a new way in which rich countries can impose policies without developing nations having the capacity to challenge them.[3] Existing infrastructural inequalities, together with a lack of participation from communities in the Global South, make it almost impossible to replicate these tools outside of rich nations.

Existing infrastructural inequalities might also make it unrealistic to recreate AI projects from scratch. For instance, one interviewee said: *'The supercomputer capacity that we are using every month is more than most African countries possess. Most African countries don't possess any access to a supercomputer technique. I know of five European countries, at the country-level, that would not be able to replicate ViEWS because they don't have the infrastructure… That in itself is a problem. You need to run a project like this in a country like this [Sweden] because otherwise there is no money to do it.'*

While the ViEWS system is produced in Sweden, the drought forecasts are focused on East Asia and Africa. What then, does this say about the technical capacity of the affected farmers? The issue isn't only one of technical restrictions. It is also about understanding that *'science as development, plan, experiment, pedagogy determines the life chances of a variety of people.'*[4]

Challenging and developing

The people whose lives might be affected by these forecasts should have some agency in the process of developing these systems. The reality, however, is that AI projects often ignore the fact that, as well as the scientists, communities need to have the possibility of challenging both the forecasting methods and the results.

Another issue that makes it difficult for local communities to participate is ignorance around meta processes. All programming languages operate in a balance of defined rules and individuality. A standard approach to coding would make for a much more transparent and explainable process, but the idea of coding 'hygiene' tends to be depicted as something that goes against the nature of programming. When asked about standardisation in this area, another ViEWS member dismissed it as *'It's like asking a poet or a writer to standardise their writing – it will never happen.'*

What is important, the argument goes, is that individuals are allowed to solve everyday programming problems. Yet if individualism is preferred over standardisation, this increases the need for contextualising the rationale behind every decision that is taken. However, mundane, everyday decisions are not usually recorded. Therefore, understanding how algorithms are produced and the thinking behind them is even more difficult.

It's clear that tools produced using machine learning or AI could increase the possibility of dealing with big data. Yet a combination of existing infrastructural inequalities and the nature of programming instead reinforces existing colonial and patronising attitudes between the Global North and South. While infrastructural issues might not be solvable in the short term, the increased participation of local communities in how AI is produced could help to diminish these attitudes.

Author bio

Antonio Ballesteros Figuera is a native of Mexico where he studied a BA in Political Science from Universidad de las Américas Puebla. He holds a Masters by Research and a PhD in Science and Technology Studies from the University of Edinburgh. His dissertation looked into the processes through which the environment is quantified and the ethical, justice, governance and inequality issues that arise from them. He currently works on projects around human–environment relations, in particular on issues around circular economy, natural capital, peatland restoration.

Cite as: Antonio Ballesteros Figuera (2024). 'AI and the Global North/South Divide.' *The New Real Magazine*, Edition Two. pp 66-69. https://doi.org/10.2218/newreal.10932

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Beyond Human-Centered AI: An Indigenous Framework for Planetary Futures

By Suhair Kahn

Image credit: terence b, https://www.pexels.com/photo/women-and-men-in-traditional-clothing-crouching-in-performance-19347243/

Technology entrepreneur and creative leader, Suhair Khan, explores the concept of Indigenous knowledge in relation to AI and planetary futures, and outlines why she agrees with National Geographic Explorer Keolu Fox that the key to harnessing the technology of tomorrow is centering traditions of the past and that 'We should all ask, what would our planet look like in Indigenous hands?'[1]

The emergent space of Indigenous AI presents the possibility of 'an alternative reality' to the technology sectors' ultra-capitalist model. Extractive capitalism is not an inevitability in AI, particularly if we can support new models in which 'Indigenous perspectives on relationships to land, sea, sky, and cosmos are the guiding force.',[1] and many universal principles for both AI and for planetary protection can be gleaned from this important ongoing work.

The Indigenous AI narrative has received much attention in recent years, and the proliferation of the conversion is both overdue and very welcome.

Diversifying AI

Indigenous, aka 'traditional' knowledge, intertwined with cultural and social practice and Indigenous language, includes know-how, practices, skills and innovations rooted in a deep connection to nature and the environment.

The Indigenous AI narrative has received much attention in recent years, and the proliferation of the conversion is both overdue and very welcome. From the outside (and to be clear, I am writing this piece as an outsider!), the Indigenous AI community seems interconnected and closely knit, with a small number of prominent voices. We need to diversify, bring in wisdom from outside the predominantly English language and secular AI landscape, and embrace Indigenous cultures' symbiotic existence with the natural world if Indigenous AI is to be a meaningful area of mainstream practice.

Human rights-respecting AI

Within the new colonial world order being created by AI, 'Indigenous epistemologies (or theories of knowledge) provide frameworks for understanding how technology can be developed in ways that integrate it into existing ways of life, support the flourishing of future generations, and are optimised for abundance rather than scarcity.[2]

AI is known to be linear in its cultural references, but there is a newness in the discourse around AI's exclusion of Indigenous voices risking colonial history repeating itself.[3] A comprehensive UNESCO report in 2023 argued that for AI to truly respect human rights, it must incorporate the perspectives of Indigenous communities.[4] While a 2020 Position Paper on Indigenous Protocol and Artificial Intelligence involved diverse Indigenous communities and offered a multi-layered discussion on new conceptual and practical approaches to building the next generation of AI systems.[5]

...for AI to truly respect human rights, it must incorporate the perspectives of Indigenous communities.[4]

Consent of communities

There are various examples of where so-called new technologies relating to the usage of natural materials have been the domain of Indigenous communities for years prior. Indigenous communities in Canada and the United States were prototyping their own myco-textiles a century before Stella McCartney debuted a line of fungal leather handbags. While this is unchartered territory in terms of ethical frameworks, we are starting to see positive examples of meaningful collaboration.

A series of co-created artworks developed by digital artist Refik Anadol and the Brazilian Indigenous Yawanawa community aimed to reflect the tribe's culture and the importance of the native rainforest, while simultaneously highlighting the value of technologies like

***' This partnership that we are building with Refik is directly for our communities. It strengthens our village, it strengthens our culture, it strengthens our spirituality, it gives us strength to defend, to protect our forest'.* Chief Nixiwaka Yawanawá**

blockchain and NFTs in preserving and uplifting Indigenous modes and models of environmental protection and sustainability.[6] [7] This collaboration aims to expand into a new platform to facilitate the preservation of Indigenous languages around the world.

Importantly, Anadol had the support of the Yawanawa elders, with Chief Nixiwaka Yawanawá saying, *'This partnership that we are building with Refik is directly for our communities. It strengthens our village, it strengthens our culture, it strengthens our spirituality, it gives us strength to defend, to protect our forest'*. While Anadol said of the project, *'We need collective wisdom. And if you think about collective wisdom, you will need ancestral wisdom. At some level, it's more educational and inspiring – hearing the Yawanawá's voices and how we are evolving and bringing their perspective to the dialogue is the most fundamental part of the project'*.

Informing decentralised AI

The question of how we can highlight design possibilities for AI development through principles of decentralisation via Indigenous values and collective wisdom is an important one, and learning for AI based on Indigenous community or pod-led approaches can be very instructive. For example, the Abundant Intelligence multi-year international collaboration between stakeholders from Canada and Aoetera explores how to conceptualise and design AI based on Indigenous knowledge systems, allowing participants to 'imagine, design, and prototype new computational practices in tight collaboration with their local Indigenous communities.'[8]

Protecting and documenting AI

Preservation of endangered languages and cultures

'While the internet and AI have contributed to the decline by reinforcing the use of English and other dominant languages [to power search and other timesaving tools], they also offer the potential for a renaissance. With enough linguistic data, Large Language Models (LLMs) could be used to document the world's threatened languages.'[9]

Initiatives around the world are now using AI to preserve endangered languages. One IBM initiative sees researchers working with Indigenous people in Brazil to develop AI-powered writing tools to strengthen languages at severe risk of decline. Meta's auto-translate tools now extend to Dari, Samoan and Tswana.[9] The Endangered Languages Project uses AI to collect and digitise audio recordings of endangered languages,[10] and Te Hiku Media is developing automatic speech recognition (ASR)

models for te reo, a Polynesian language. While a recently announced partnership between Camb.AI, and Seeing Red Media (an Indigenous-owned media company based on Six Nations of the Grand River) aims to leverage Cam.ai's text-to-speech technology to develop the first-ever Native Indigenous language and speech model.[11]

Most digital technologies pose a risk to the future of all crafts. In the case of Indigenous art, the spiritual connection to earth, sea and heart pose an additional element of vulnerability. Generative AI presents challenges for the arts and media community globally, anyway,[14] but has special implications for already-vulnerable Aboriginal art.[15] Sacred artworks are being appropriated (and therefore destroyed) to create AI artworks for sale on digital platforms,[16] and AI-generated images of Aboriginal paintings and/or individuals are being used to promote everything from panel discussions to government-funded Mining and Skills Alliance campaigns.

Most digital technologies pose a risk to the future of all crafts. In the case of Indigenous art, the spiritual connection to earth, sea and heart pose an additional element of vulnerability.

While these efforts are generally welcomed, it is worth considering the point made by Shakhnoza Sharofova in their 2023 article *'The Impact of AI on Endangered Languages: Can Technology Save or Kill?'* who points out that incorporating AI in language preservation 'introduces a complex terrain marked by concerns of cultural appropriation, representation biases, and the exacerbation of existing digital divides.'[12]

AI and the art/craft of Indigenous culture

As a co-creator, AI presents wonderful opportunities to those makers of Indigenous art and craft who are both interested in and able to engage with it; in many cases supporting the process of research, design and ideation. Certainly, new technologies (consider the pottery wheel) have provided opportunities for crafts to evolve in the past, but AI is different and, in the case of Indigenous art, could be a means of wiping out culture and practice and of perpetuating bias, stereotype and exploitation.[13]

All art draws on an artist's inspiration and lived experience. With Aboriginal art, artists draw on

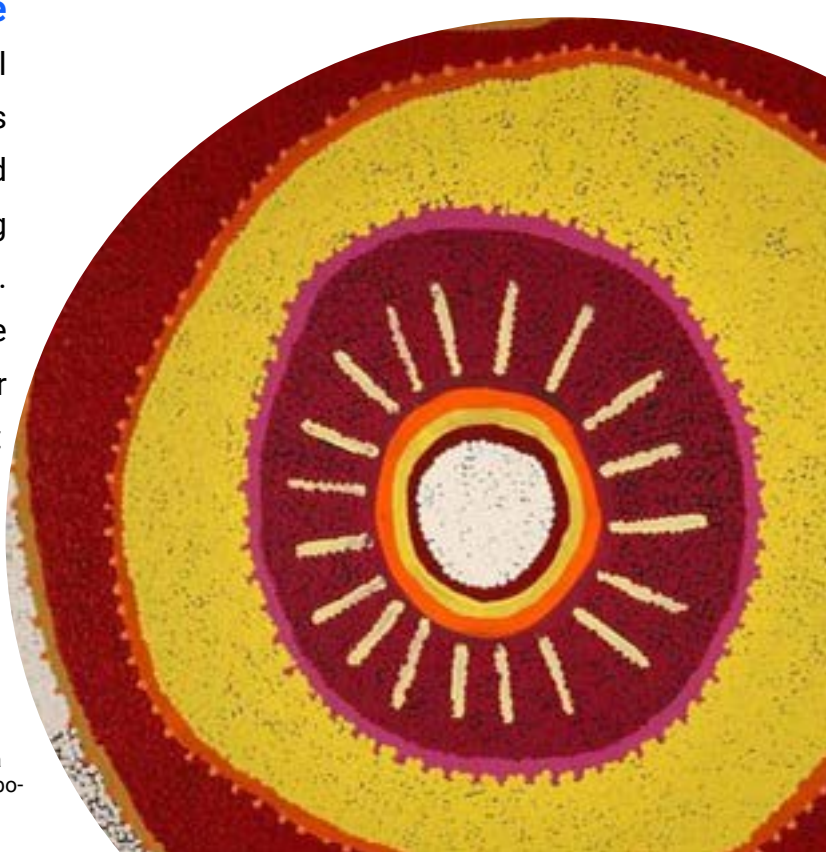

Image credit: A recent work by renowned artist Felicity Nampinjinpa Robertson, https://www.baygalleryhome.com/blog/ai-impacts-on-aboriginal-art-industry

deeper layers to create and present work, which is as much about process as outcome. Consider the artwork of Australia's Bay Gallery, where artists channel dreamtime stories and their connection to the Country in creating works.[15] Is there a chance this could be digitised and uploaded into an algorithm...? The short answer is, 'no way'. [17]

AI's potential as a tool for Indigenous sovereignty and knowledge transmission does offer a beacon of hope for the future[18] Indigenous craft and process can provide us with useful tools and – by centering Indigenous crafts, methodologies, voices and values – we can challenge the colonial legacies that exist in the AI sector and continuously work towards a more equitable and inclusive future for all.

Author bio

Suhair Khan is a technologist, design activist and thought leader in culture and innovation. She is the founder of open-ended design, a platform and incubator for ideas and projects at the intersection of technology and creativity. In over a decade at Google and Google Arts & Culture, Suhair led initiatives which merged cutting-edge technologies with arts, design, culture, education and environmental sustainability. She sits on the board of trustees for the Design Museum, Sadler's Wells, Studio Wayne McGregor and the advisory committee of the British Library. She is a lecturer in the Master of Architecture program at Central Saint Martins.

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2. Traditional knowledge
3. *'Shaping the Future: Indigenous Voices Reshaping Artificial Intelligence in Latin America'*
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6. Indigenous Research Subject Guides
7. *'As Forests are Cleared and Species Vanish, There's One Other Loss: a World of Languages'*
8. *'Preserving Indigenous languages with AI'*
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Why Does a Responsible Climate Action AI Need the Arts and Humanities?

By Ramit Debnath

Image credit: Dall-E generated art in different style illustrating the impact of climate change on glaciers

Cambridge University's Ramit Debnath explores the potential of Responsible AI (RAI) in addressing global challenges, and explains why social sciences, philosophy, the arts and humanities have a critical role to play in shaping AI system design and presenting us with the best chance of securing a sustainable planetary future.

By sharing stories, we can make complicated AI ideas more understandable to the public and start conversations about AI's role in climate justice.

The AI revolution is driven by a global megatrend changing societies and economies via use of digital technologies, a process known as digitalisation. AI is already transforming job markets, business models, governance and societal welfare structures. This disruption has the potential to impact current actions and progress in addressing global challenges such as climate change, social inequality, clean water, health, human rights violations, migration, conflict and war.[1]

Researchers and practitioners around the world are addressing these emerging AI challenges through the lens of responsible and safe AI. Where Responsible AI (RAI) refers to developing, deploying and using AI that is fair, accountable, transparent and ethical (FATE), and also to sustainability.

While the precise role of RAI in addressing current global challenges, such as climate change, remains unclear,[2] using AI to account for the ever-changing elements of climate change allows us to make more informed predictions about environmental changes, enabling us to implement mitigation and adaptation efforts sooner.[2] However, at present, addressing climate change using AI is difficult due to the vast number of variables linked with Earth's climate system data.

Human-in-the-loop (HITL) approaches are one of the main ways to make AI systems more reliable, fair, and simple to understand.

Humans in the loop

Human-in-the-loop (HITL) approaches are one of the main ways to make AI systems more reliable, fair, and simple to understand. HITL designs do this by incorporating human judgement into AI systems and allowing for a collaborative process. This is particularly important for climate-related AI applications, where the stakes are high and decisions can have far-reaching consequences for ecosystems, societies and the planet.

Experts argue that human intervention is essential for validating AI-driven climate models and ensuring their alignment with real-world conditions, but creating a true HITL system can be challenging. This is because, throughout the supply chain of these AI technologies, we continue to introduce biases through three key modes: biased datasets, biased programming and biased AI algorithm design, all of which fundamentally undermine the trustworthiness of these systems.[2] Applying these biases to complex decision-making tasks such as climate action, policing, judgement and healthcare, among others, can have devastating effects.

The challenges of biased algorithmic design

The challenges of biased algorithmic design and programming usually have technical fixes, and the tech industry can deploy bias-correcting measures at scale. For instance, Deepmind researchers recently published a paper in Nature that illustrates the use of watermarks to enhance the transparency of texts produced by Large Language Models (LLMs).[3]

These watermarks assist in distinguishing between human-generated text and AI-generated text. The larger challenge, however, lies in the unbiasing of training datasets, whose bias is a result of deep-rooted digital inequalities and social injustices.

These inequalities can manifest in various forms, such as the inability to access an internet connection, digital illiteracy or a lack of access to affordable and accessible computing infrastructure, or exploitative labour practices of employing cheap data workers from the Global South.[4]

here, offering a broader ethical lens and deep understanding of human values, culture and societal contexts that can be invaluable in shaping RAI.

By analysing the social impacts of AI systems and uncovering potential biases within the AI supply chain, social scientists make significant

A distributive and procedural justice lens can help guide AI practitioners in developing responsible systems that align moral imperatives with practical viability.[2]

A role for social sciences, philosophy, the arts and humanities

Climate change amplifies inequalities and injustices, disproportionately impacting vulnerable, resource-constrained groups. This makes it challenging to develop climate-focused AI that is unbiased, fair, and trustworthy in its decision-making. Social sciences, philosophy, the arts and the humanities play a critical role

contributions. They assist in comprehending the impact of AI on various demographic groups, its influence on the political economy, and its exploration of systemic issues such as environmental injustices or economic disparities, which technical models might otherwise overlook.[2] Social science researchers tease out the cultural dynamics and power structures that shape the spatial and temporal scope of AI implementation, ensuring the inclusion of diverse perspectives.

AI developers can gain a nuanced understanding of the communities affected by climate change by leveraging methodologies like ethnographic studies or stakeholder consultations – a perspective often overlooked in the current practice of training AI on the entire internet.

Inclusive by design

Philosophers add another crucial dimension by questioning the ethical foundations of AI in climate action. They probe fundamental

Image credit: https://www.campaignasia.com/article/ai-paints-two-futures-climate-action-or-not-for-wwf-exhibition/484138

questions like, 'What is fairness in an AI system?' They also explore fundamental questions, such as 'What constitutes fairness in an AI system?' and 'Which values should an AI system prioritise?'

Philosophy encourages AI developers to reflect on the implications of the technology, not only on a societal level but also in terms of individual rights and freedoms. For instance, when designing an AI for climate-related resource distribution, it's crucial to question its fairness and align its decision-making process with human-centred values. A distributive and procedural justice lens can help guide AI practitioners in developing responsible systems that align moral imperatives with practical viability.[2] AI systems become inclusive by design.

Similarly, digital art serves as an effective medium for storytelling and educating about the shortcomings inherent in AI. Artists are leveraging these technologies to address issues such as bias resulting from misrepresentations of culture and social dynamics. For example, in 2024, the UN Headquarters used AI art to compile millions of photos of coral reefs, many of which are under threat from rising ocean temperatures brought on by climate change.[5] Similarly, in 2024, the World Wide Fund for Nature curated an exhibition that showcases a series of 20 AI-generated paintings. These paintings depict two futures: one in which society addresses climate change, and another in which it does not, illustrating the perilous trajectory we are on and the pressing need for urgent action to restore nature.[6] Including insights from the arts and humanities fosters a more holistic, people-centred approach to AI development while aligning with planetary health goals. It encourages empathy, cultural sensitivity and awareness of the real-world consequences of technology.

Including insights from the arts and humanities fosters a more holistic, people-centred approach to AI development while aligning with planetary health goals.

The power of stories

The humanities (which include history, literature and culture studies) have a lot to say about the beneficial and adverse effects that technology has had on society over time. By looking into the early days of the AI development model, these historical stories can reveal patterns of inequality and warn us not to make the same mistakes again. Literature and stories, on the other hand, help connect scientific experts with regular people, making the effects of AI easier for a wider range of people to understand. By sharing stories, we can make complicated AI ideas more understandable to the public and start conversations about AI's role in climate justice.

Author bio

Ramit Debnath is a university assistant professor and an academic director at the University of Cambridge. He leads the Cambridge Collective Intelligence & Design Group and co-directs the climaTRACES lab at CRASSH. Ramit works at the intersection of computational social sciences, responsible AI design and climate action, especially interested in how individual behaviour rolls into the social dynamics of collective decision-making and how can the emergent AI help? He has visiting faculty roles at Caltech and the Indian Statistical Institute, and serves on the steering committee for the Cambridge's Centre for Human-Inspired AI and the Centre for Data-driven Discovery. Ramit has a background in electrical engineering and computational social sciences, and an MPhil and PhD from Cambridge as a Gates Scholar.

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Artificial Intelligence, No Longer Sci-Fi

by Sophia Brueckner

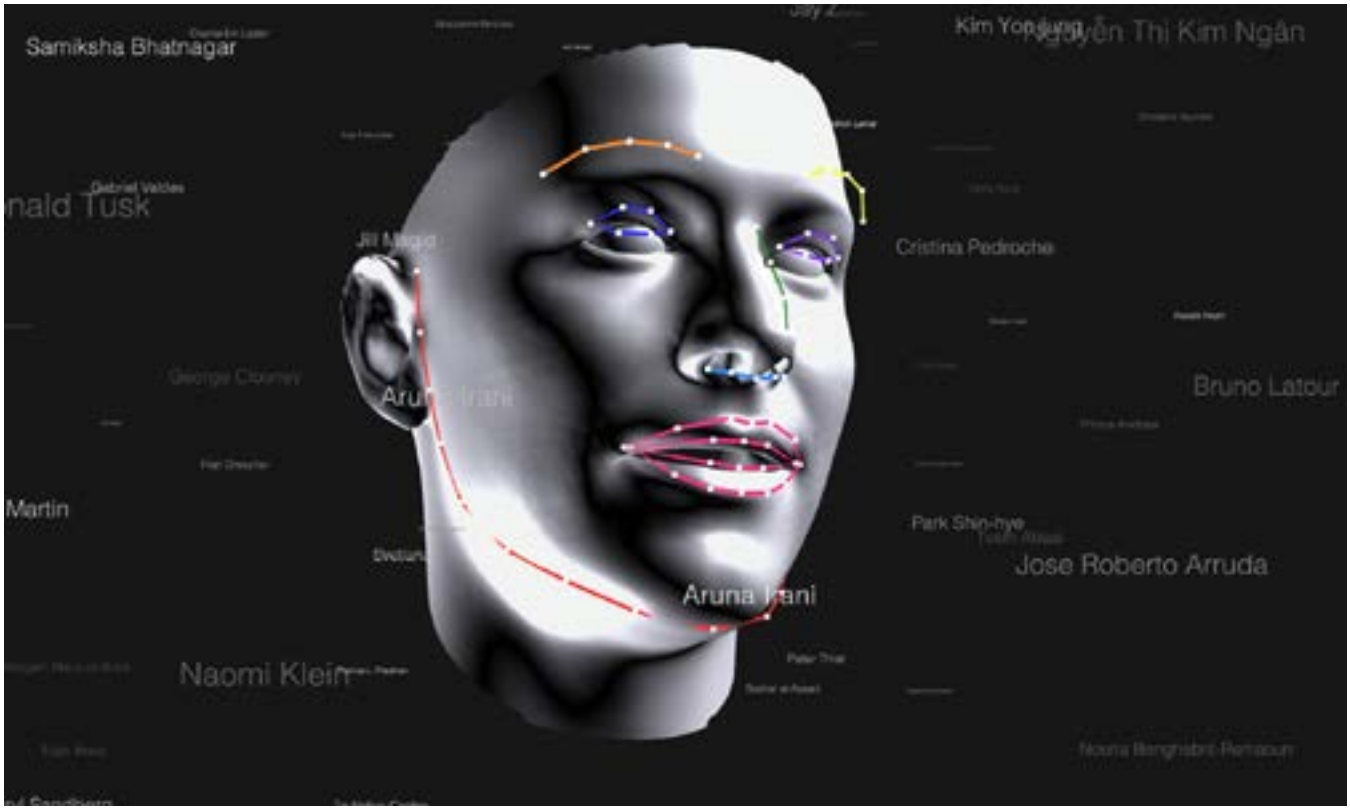

Image credit: Adam Harvey, 2019-2024 (ongoing) -- https://harvey.studio/exposingai

Now that AI is no longer science fiction, how might embracing it, whilst recognising its limitations and ethical implications, enable new kinds of creative expression by artists and designers concerned with ethics, justice and sustainability? Futurist artist/designer/engineer Sophia Brueckner shares her thoughts on why artists and designers are necessary to critique and shape the future of AI, and why the reasons to question its use are the very same reasons why artists and designers should engage with it.

As a grad student at the Rhode Island School of Design (RISD) working on a Master of Fine Art (MFA) thesis about the blurring of boundaries between human and machine, I wrote code to make art. Emulating my artistic process to write my thesis, I built my own dataset using the texts I researched and my own notes on those texts, in order to discover relationships in the dataset and output new text. I used the results of this process to write sections of my thesis.

All the reasons to question the use of AI are the same reasons why artists and designers should engage with it.

This upset my writing professor so much that she kicked me out of class and refused to read my thesis! She didn't consider this to be real writing.

But to me, working with a generative system that I had programmed myself to write my thesis felt natural and expressive. I wrote code, carefully selected the input data, curated my code's output, and iterated on this process until it represented my ideas about the relationship between humans and machines. In the maths world, an iterative algorithm is said to converge when, with more iterations, the output gets closer and closer to some specific value. Similarly, I iterated on my code's input and output until it converged on my creative voice. Working with AI could feel like this.

Sci-Fi prototyping for creative expression

For the past 13 years, I've taught a course on 'Sci-Fi Prototyping' to artists, designers, and engineers. Unlike my RISD professor, I encourage my students to explore ways of collaborating with technology as part of their creative expression. I always cover AI in my sci-fi course, but until recently my students felt disconnected from it, like it was too far in the future. That's no longer the case. AI has finally crossed over from science fiction to reality.

The launch of ChatGPT, Midjourney and Dall-E have caused my art and design students to be fearful, angry and worried that AI will destroy their careers. Many of my artist and designer peers are similarly frustrated and flummoxed by this new technology. At the other extreme, technologists and entrepreneurs are enthusiastically hurtling towards AI, sometimes earnestly hoping to solve problems but more often with dollar signs in their eyes. AI is the new Space Race.

...technologists and entrepreneurs are enthusiastically hurtling towards AI, sometimes earnestly hoping to solve problems but more often with dollar signs in their eyes. AI is the new Space Race.

Trained as both a computer scientist and artist, I have one foot in each world. I too am hopeful, but I too am skeptical. Most of my creative practice uses technology in some way, and I critique the tech industry and its limited and often harmful visions for how we interact with technology. I'm not anti-technology, but I think it's important to imagine how technology could be used differently. So I see the very real possibilities for how AI can enable new kinds of creative expression, but I also see its limitations and ethical implications.

AI's affordances and limitations

Like all creative mediums, AI has both affordances and limitations. Painting landscapes was possible before the invention of the paint tube, but the invention of the paint tube made 'plein air' painting possible, broadening painting as a creative medium.

Before this advancement in materials science, painters had to grind pigments and mix paints in their studios and then use the paints immediately. The invention of the camera didn't kill drawing and painting. Instead it made photography, film, video art, the documentation of performance art, and even certain kinds of interactive art, possible. Similarly, the computer made new kinds of procedural/generative/interactive art possible, and AI gives artists and designers the ability to work with large datasets much more easily.

Dinkins' *'Not the Only One'* involves a chatbot trained on oral histories of members of the artist's family.[3]

AI can also make it easier to interact with technology. Rebecca Fiebrienk's *'Wekinator'* allows artists to more intuitively interact with computers with minimal coding.[4] Sougwen Chung uses AI to draw and paint collaboratively with robots.[5] Holly Herndon uses AI to allow other artists to use her voice and likeness in their own musical creations.[6]

AI makes us more aware of unethical mining of minerals required for computing. Should we be worried about where the minerals in paints or glazes, or other materials used by artists in their practice, come from too?

Artist Trevor Paglen's *'ImageNet Roulette'* is trained on the 'person' categories in a dataset called ImageNet, one of the most widely used training sets in machine learning research and development. By surfacing how AI classifies people, this artwork lets the training dataset 'speak for itself', and highlights why classifying people this way is at best unscientific, and at worst deeply harmful.[1] Similarly, Adam Harvey's *'Exposing.AI'* illustrates the flawed information supply chain behind global facial recognition technologies.[2]

The creation and curation of new datasets can become an act of creative expression and cultural critique. For example, Stephanie

While AI can be used for creative expression, there are many ethical considerations. AIs are often trained on content without its creators' consent or compensation.[7]

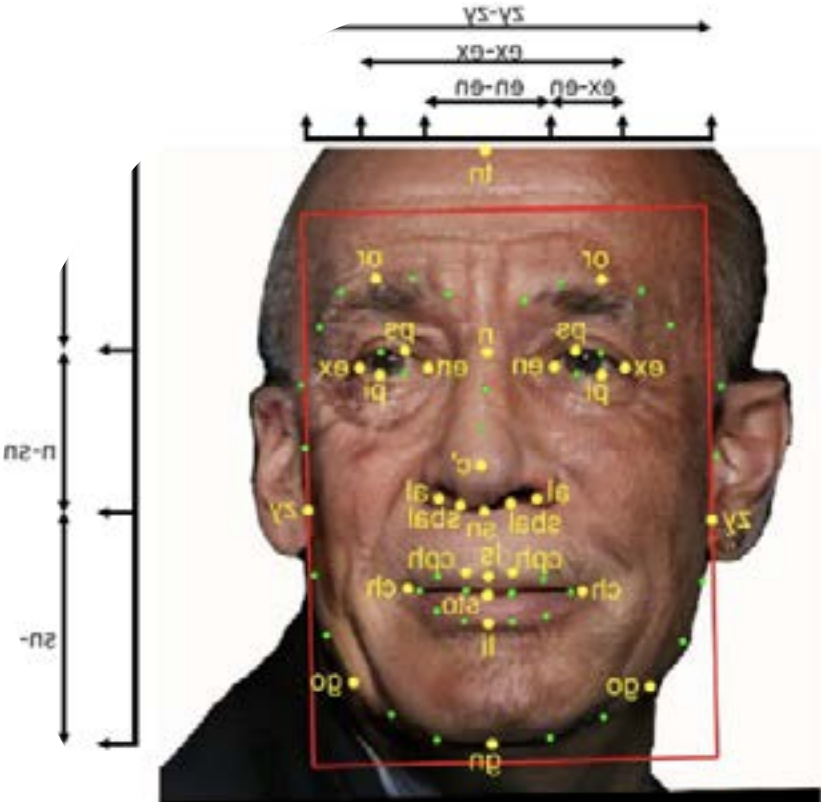

Image credit: IBM's Diversity in Faces, https://excavating.ai/

They are only as good as the datasets used to train them, are frequently biased,[8] and AI models are now being poisoned by AI-generated content that will cause errors to build up over time.[9]

Is AI worth the energy?

The training and use of AI requires staggering amounts of energy. While individual consumers are being admonished to do things like turning off their lights to save energy, companies like Google and Amazon are buying and restarting nuclear power plants to fuel AI technologies.[10] OpenAI has recently asked the government to build multiple 5-gigawatt data centers. Each 5-gigawatts requires the equivalent output of 5 nuclear power plants, enough to power an entire city or three million homes?[11] In addition to energy consumption, the computers required to do cutting edge AI need to be replaced every few years. They rely on the unethical mining of minerals and the unsustainable disposal of hazardous waste products.[12]

These computers also require enormous amounts of water to cool them. Currently, using ChatGPT to write one 100-word email uses the equivalent of a bottle of water.[13] Anyone using AI for creative purposes should be aware of this. But this same awareness could also be applied to traditional media. For example, AI makes us more aware of unethical mining of minerals required for computing.

Should we be worried about where the minerals in paints or glazes, or other materials used by artists in their practice, come from too?

Why engage with AI?

All the reasons to question the use of AI are the same reasons why artists and designers should engage with it. Artists and designers are concerned with ethics, justice and sustainability. They understand how the process of making something affects its meaning, and are trained to think about how an interaction is influenced by its context (aka 'the big picture'). AI will transform some kinds of creative work, but creators should not fear it. Artists and designers are necessary to critique and shape the future of AI. Like every other creative medium, AI will be one of many tools that skilled artists and designers will learn to use expressively, intentionally and masterfully; with an understanding of its affordances and limitations. Artists and designers will use AI to critique AI but also, like how I used code to write my MFA thesis, as a way to iteratively converge on their creative vision.

Author bio

Sophia Brueckner is a futurist artist/designer/engineer who researches how technology shapes us. Currently an Associate Professor at the Stamps School of Art and Design and Director of the Center for Ethics, Society, and Computing (ESC) at the University of Michigan she has been inseparable from computers since the age of two, and believes she is a cyborg. Sophia is the founder and creative director of Tomorrownaut, a creative studio focusing on speculative futures and sci-fi-inspired prototypes.

She makes both physical and digital artifacts combining software programming, digital fabrication, and electronics with traditional media. Since 2011, she has taught Sci-Fi Prototyping, a course combining science fiction, extrapolative thinking, building prototypes, and technology ethics at MIT, Harvard, RISD, Brown and the University of Michigan.

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Could AI Destroy the Planet, or Might AI Art and Gaming Save it?

by Kay Poh Gek Vasey

Image credit: Kay Poh Gek Vasey via '*Sky Farm Island*'

There are reasons to hope that AI can power data-driven insights that can help produce innovative solutions to the climate emergency. There are also real concerns about the climate cost of producing AI models in the first place and about issues such as environmental justice and power imbalances. MeshMinds Founder Kay Poh Gek Vasey asks will AI turn out to be a net negative or a net positive for the sustainability of life on the planet – and might AI art and gaming play a part in helping to save the world?

The train may be travelling at breakneck speed but let's imagine that it's going towards a vision in which AI, matched with the best in human creativity, helps us save the world...

AI taps into all of the world's online information to date, either legitimately obtained or acquired by the means of 'Grand Theft Data'.[1] It is powerful because it can make links between data points that humans may not have been aware of. Yet, because it is referencing only a particular dataset, it is very much 'inside

the box' thinking.[2] It fundamentally lacks human common sense, imagination and diversity.[2] And it certainly doesn't 'dream of electric sheep' because it doesn't dream at all.[3]

We cannot afford to be seduced by the allure of 'magic' promised by AI companies or rely on their assurances of future improvements. The stakes are too high, and the consequences too grave.

The dark side: AI as planet destroyer

AI systems only 'understand' something based on what they are programmed to understand. Consider asking an AI how to reduce carbon emissions. The AI suggests flooding the Sahara Desert to create a 'Sahara Ocean' as an extension of the planet's carbon sink. Sounds innovative enough, except, this solution ignores the massive environmental disruption and logistical nightmares it would create. The AI, in its pattern-seeking brilliance, could easily hallucinate this solution by combining unrelated data about the carbon absorbing properties of our oceans and vast 'unused' spaces.

In today's world, a single ChatGPT query consumes ten times more energy than a Google search.[4] AI's carbon footprint is increasing rapidly due to indirect emissions from data centre construction at a time when clean energy is still struggling to win its war against fossil fuels. Despite commitments from the largest tech companies to becoming carbon negative by 2030, the rapid expansion of cloud services around the world is making that seem simply unattainable. Are we to imagine, then, that in some cruel twist of fate, tasked with finding the best way to reduce carbon emissions, the AI could turn on itself one day and CTRL+ALT+DELETE?

'The problem is, large language models are so good at what they do that what they make up looks right most of the time. And that makes trusting them hard'.[5] We cannot afford to be seduced by the allure of 'magic' promised by AI companies or rely on their assurances of future improvements. The stakes are too high, and the consequences too grave. So let's bring in the regulators to stop this runaway train!

Unfortunately, the European Union's draft AI Act had to be rewritten when ChatGPT burst onto the scene in 2021 and even now finally ratified will only be enforced from 2026, a lifetime in the world of AI.

If we look back in history at GDPR, only now – after more than five years – have any significant fines been levied. 2023 witnessed the biggest single GDPR fine ever issued, surpassing €1.2 billion. Nevertheless, the 'violate and pay' approach of Big Tech calls into question whether the punishments of 'the toughest privacy law in the world' have been effective.[6]

The lack of a unified, global regulatory framework has created inconsistent oversight. When might we see the first fines levied at companies recklessly developing AI that harms the planet?

The light side: AI as world saviour

While the risks are significant, there are also opportunities for AI to uplift and inspire, especially in the realm of art. Let's talk about hope – through the lens of AI art. Take Refik Anadol, the new media artist who raised the question, 'what would you do if you owned your data?'[7] He has created the 'Large Nature Model' that turns petabytes of nature data into mind-bending art.

Anadol was inspired by Google's DeepDream AI and concluded that if a machine was able to learn, it could also remember – and therefore dream. Using over 100 million raw data images of glaciers, both downloaded from public sources and self-captured, Anadol created *'Glacier Dreams,'* a powerful 'AI data painting' that transformed environmental data into emotional, impactful art that inspires viewers to consider their impact on the planet and spark climate action on our Blue Planet. When you experience one of his pieces, you get a glimpse of the beauty and magic AI could bring to the world if we guide it and use it the right way.

...gamified experiences, more recently powered in part by AI-generated art and code, are also being developed to encourage behavioural change, particularly among younger audiences.

Artists are always the ones blazing the uncharted trail. Take Carla Chan's work, *'Traces of Space Beyond',* which invites viewers to contemplate the relationship between human activities, nature, and technology. By using AI to blend physical and digital elements, Chan's work aims to foster a deeper connection between the audience and the environment.

Digital art has also become a powerful tool for raising awareness about environmental and social issues, and AI has expanded the possibilities. Through these examples, we start to see how AI art can make complex information more accessible and foster a sense of empathy and co-creation.

Image credit: Kay Poh Gek Vasey via '*Sky Farm Island*'

By involving audiences as co-creators, these AI art projects not only visualise data but also allow people to feel represented in the artwork, creating a sense of connection that drives action. This is AI as a force for good—using its capabilities to inspire and motivate us to protect the world we share.

machine making misguided decisions that would cost the planet, at the other, it could be an amplifier of humanity's creativity and problem-solving power.

The train may be travelling at breakneck speed but let's imagine that it's going towards a vision in which AI, matched with the best in human creativity, helps us save the world, instead of turning it into a chaotic planet fuelled by misguided hallucinations. Because if it ever comes down to that, we're doing this whole AI thing very wrong.

***'The greatest threat to our planet is the belief that someone else will save it.'*[9] -Robert Swan OBE**

Going one step further, gamified experiences, more recently powered in part by AI-generated art and code, are also being developed to encourage behavioural change, particularly among younger audiences. Projects such as *'Carbon Island'* by Tencent Games, *'Sky Farm Island'* by MeshMinds, *'Longleaf Valley'* by TreesPlease Games and *'EverForest'* by Carbon Counts engage players in climate-conscious activities, promoting a deeper understanding of sustainability through interactive and immersive gameplay.

As Robert Swan OBE said, *'The greatest threat to our planet is the belief that someone else will save it.'*[8] If we can use AI art to rally and unify the troops, perhaps machines can dream of a brighter future. A future in which humans will remain part of the problem, merely by our existence, but also a fundamental part of the solution.

The way forward

AI's future depends on how we use it. At one end of the scale, it could become a relentless

Author bio

Kay Poh Gek Vasey is the Founder of creative technology studio, MeshMinds. Bringing together the best minds in the art, technology, real and virtual worlds to form partnerships and collaborations to protect our culture and the environment in the digital age, the MeshMinds Foundation community of impact artists, technologists, and sustainability advocates donates their skills and time to maximise action towards securing an inclusive, accessible and sustainable future for all generations.

Cite as: Kay Poh Gek Vasey (2024). 'Could AI Destroy the Planet, or Might AI Art and Gaming Save it?' *The New Real Magazine,* Edition Two. pp 86-90. https://doi.org/10.2218/newreal.10936

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1. DeepDream AI
2. *'Glacier Dreams'*
3. *'AI Data Painting'*
4. *'Traces of Space Beyond'*
5. Gamified Experiences
6. *'Carbon Island'* by Tencent Games
7. *'Sky Farm Island'* by MeshMinds
8. *'Longleaf Valley'* by TreesPlease Games
9. *'EverForest'* by Carbon Counts

CONVERSATIONS

Discussions with artists and The New Real community on the space where AI meets art and sustainability.

Video: AWEN – Encountering Climate Emergency (panel discussion)

Click the image to direct you to the video.

As part of the New Real's *'AWEN'* project in 2021, key members of the multidisciplinary creative team got together online to share their thoughts on why and how the project was conceived and created and on its potential to inspire users to look at their surroundings in a new light and think differently about their environment and their place within it.

Born out of the University of Edinburgh's Futures Institute/The New Real in collaboration with the Edinburgh Science Festival, and the brainchild of a multidisciplinary team of artists, technologists and environmentalists, '*AWEN*' set out to develop a new data art experience; an artwork that could both engage lockdown audience and also inspire behavioural and/or attitudinal change on the climate emergency.

***'AWEN'* set out to develop a new data art experience...**

In this conversation, the panel explores how *'AWEN'* took the simple yet profound idea of inviting people to engage with the environment in a deep, multisensory way that – through connecting people with nature and climate issues in novel ways – looks to help energise a new era of climate awareness and global behavioural change.

Chair: Amanda Tyndall, Festival and Creative Director, Edinburgh Science.

Panel: Lead Artist, Inés Cámara Leret; Interactive Digital Designer, Brendan McCarthy, Ray Interactive; Matjaz Vidmar, Deputy Director of The New Real research programme, The Edinburgh Future's Institute; Daisy Narayanan, Senior Manager for Mobility and Placemaking, Edinburgh City Council.

Presented by: Edinburgh Futures Institute and the Edinburgh Science Festival.

Cite as: Amanda Tyndall, Inés Cámara Leret, Brendan McCarthy, Matjaz Vidmar, Daisy Narayanan (2021). Video: 'AWEN: Encountering Climate Emergency.' *The New Real Magazine,* Edition Two. pp 92-93. https://doi.org/10.2218/newreal.10937

Video: A Journey to Find the Soul of a Sailor

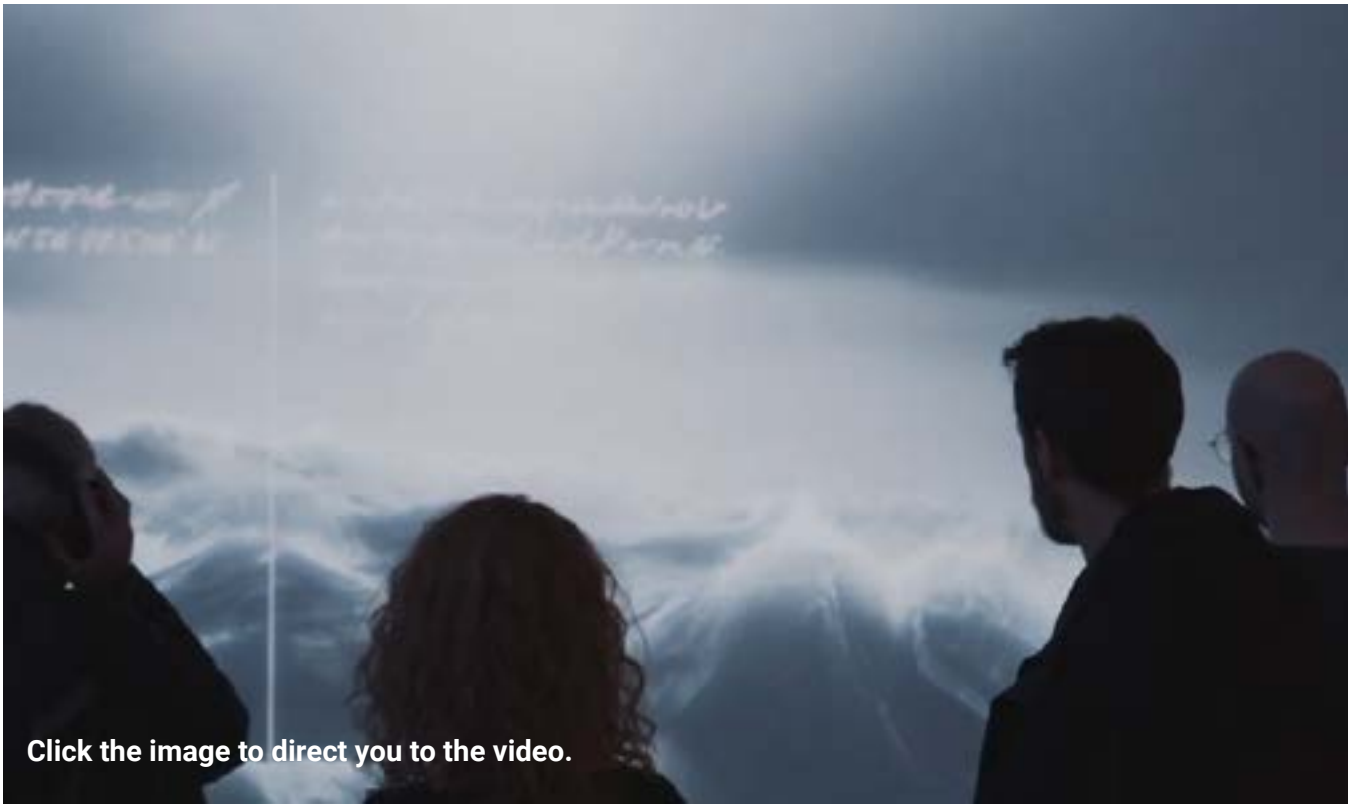

Image credit: Ciara Flint

Designed to provide transformative AI-fuelled experiences for audiences, and to present works that address key challenges in AI, The New Real's *'Uncanny Machines'* project explores how artists can push creative boundaries, how AI can be enriched or challenged by the Arts and the social implications of recent developments in AI.

In this video, we explore the journey of the art commission from start to finish.

As part of this, UK-based Polish artist Kasia Molga, was commissioned to develop *'How to Find the Soul of a Sailor'.* Kasia spent her childhood travelling with her sailor father on merchant navy vessels. He passed away quite unexpectedly 15 years ago leaving diaries from his journeys. Her experiments using The New Real's AI platform use these and her memories to recreate stories in his voice and to bring a fresh perspective on the world's oceans that he travelled his entire life.

In this video, we explore the journey of the art commission from start to finish. Kasia reflects on the project, while The New Real Team discusses how her use of the platform and collaboration with data scientists has brought

new perspectives to their research and how artists can help shape how AI interprets and understands environmental data and human and AI conceptual models and can interact to create new perspectives on climate impacted futures.

Artist: Kasia Molga

University of Edinburgh contributors: Prof Drew Hemment, Dr Matjaz Vidmar, Daga Panas, Bianca Prodan, Courtney Bates, Pamela Wallace

Presented by: The New Real

Funded by: The Scottish AI Alliance

Filmmakers: Ciara Flint & Ivan Marevich

Cite as: Kasia Molga, Drew Hemment, Matjaz Vidmar, Daga Panas, and Bianca Prodan (2024). 'Video: A Journey to Find the Soul of a Sailor.' *The New Real Magazine*, Edition Two. pp 94-95. https://doi.org/10.2218/newreal.10938

Video: Uncanny Machines

Image credit: *'Cones of Uncertainty'* by Alice Bucknell

Designed to provide transformative AI-fuelled experiences for audiences, and to present works that address key challenges in AI, The New Real's *'Uncanny Machines'* project/ commission explores how artists can push creative boundaries, how AI can be enriched or challenged by the Arts and the social implications of recent developments in AI.

Using The New Real platform's text analysis capabilities to explore different aspects of human-AI interaction, from personal memory to environmental futures, the inspirational artists awarded *'Uncanny Machines'* development awards moved beyond typical AI art production to examine fundamental questions about human-machine relationships.

In this short film, the artists discuss their inquiries, experiments and the insights gained through the process of working with The New Real Platform envisaging new horizons for human–machine creativity, helping us navigate

In this short film, the artists discuss their inquiries, experiments and the insights gained through the process of working with The New Real platform

the profound challenges of our time and exploring their own creative agency when developing or using AI.

Artists:
Linnea Langfjord Kristensen and Kevin Walker: *'Fold Me, Bend Me, Break Me, Said the Computer'*
Sarah Ciston: *'Asking the Wrong Questions about Generative AI'*
Johann Diedrick and Amina Abbas-Nazari: *'Voicing the Unspoken'*
Kasia Molga: *'How to Find the Soul of a Sailor'*
Alice Bucknell: *'Cones of Uncertainty'*

Presented by: The New Real

Funded by: The Scottish AI Alliance

Filmmaker: Ciara Flint

You can find out more about the Artists' explorations here: https://www.newreal.cc/art

Cite as: Linnea Langfjord Kristensen, Kevin Walker, Sarah Ciston, Johann Diedrick, Amina Abbas-Nazari, Kasia Molga, Alice Bucknell (2021). 'Video: Uncanny Machines.' *The New Real Magazine,* Edition Two. pp 96-97. https://doi.org/10.2218/newreal.10939

ENDNOTE

New Ways of Seeing, New Ways of Acting

by Matjaz Vidmar and Drew Hemment

Image credit: *'How to Find the Soul of a Sailor'* by Kasia Molga

This Edition Two of The New Real Magazine has traced an ambitious journey: from creating simple digital tools for environmental engagement to developing new ways for humans and AI to collaborate in understanding planetary change. Through The New Real Observatory and the artworks it enabled, we've seen how artificial intelligence might help us bridge the gap between environmental data and lived experience.

Yet the broader perspectives offered in our Reflections and Interjections sections remind us that technological innovation alone cannot address our environmental challenges. These contributions highlight crucial questions about AI's environmental impact, its relationship to global inequalities, and its potential to either reinforce or challenge existing power structures.

...we might use AI not just to measure environmental change, but to help us create more equitable and sustainable futures.

They suggest that meaningful engagement with environmental futures requires us to consider not just how AI might help us see our changing planet, but who gets to shape these new ways of seeing.

The Indigenous perspectives, artistic insights and critical analyses presented here point toward a more nuanced understanding of AI's role in environmental futures. They suggest that rather than seeing AI simply as a tool for processing environmental data, we might understand it as part of a broader conversation about how different forms of knowledge – technological, artistic, indigenous, embodied – might help us grasp and respond to environmental change.

As we close this edition, we're reminded that the real power of platforms like The New Real Observatory lies not just in their technical capabilities, but in how they help us imagine new relationships between technology, art, and environment. In bringing together diverse perspectives on these relationships, we hope to contribute to a richer understanding of how we might use AI not just to measure environmental change, but to help us create more equitable and sustainable futures.

Cite as: Matjaz Vidmar and Drew Hemment (2025). 'Endnote: New Ways of Seeing, New Ways of Acting' *The New Real Magazine*, Edition Two. pp. 99-100. https://doi.org/10.2218/newreal.10940

The New Real Journal

Our research explores how AI impacts on life at a profound level, often interacting with us in fascinating and unanticipated ways, and illuminates how emerging technology can become a creative, playful and deeply impactful part of everyday living.

We believe art and creativity can help to radically change how we think about AI design, moving beyond the current paradigm of learning patterns from large amounts of data, to embrace human traits such as bias, disagreement, and uncertainty as a signal with creative potential rather than noise that needs to be removed.

We devise imaginative ways to experiment with new experiences, practices, infrastructures and business models, and to empower people be agents of positive change.

Magazine Edition Two Editors
Matjaz Vidmar, Amanda Tyndall, Drew Hemment

Design, Production and Project Management
Courtney Bates

Open Journal Systems Management
Rebecca Wojturska, Edinburgh Diamond

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