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Growing Through Algorithms: Reimagining Plant Life with AI Art

Abstract: This article examines the intersection of artificial intelligence, ecology, and contemporary artistic practice through the lens of plant representation. Focusing on AI-generated botanical art, it explores how algorithmic processes counteract plant blindness and foster new modes of human-plant relationality. Plants are repositioned as active agents within digital-ecological narratives, disrupting their marginal status in scientific and cultural discourse. Emphasis is placed on the dual role of AI – as both a medium for ecological imagination and a source of environmental strain due to its intensive resource consumption. By integrating post-humanist perspectives, the paper frames AI-generated botanical art as a critical space where aesthetics, technology, and ecological ethics converge.

Keywords: AI art; plant blindness, AI generated botanical art; artistic innovation; digital art.

AI art and ecology

Artificial intelligence is increasingly intersecting with ecological concerns, offering new ways to understand and engage with environmental issues. While many AI systems mimic human cognition, researchers propose[1] that integrating ecological principles – drawing from the interconnectivity and self-regulatory mechanisms of ecosystems – could lead to more adaptive and socially responsible AI. This shift has significant implications, particularly in addressing climate change, biodiversity loss, and habitat degradation.

AI-generated botanical art transcends digital aesthetics, engaging with ecological complexity and highlighting the dynamic relationships between flora and their environments. By incorporating ecological models, AI art challenges the traditional depiction of plants as static, ornamental, or symbolic, instead representing them as evolving, interdependent phenomena. This aligns with the broader movement toward

[1] Barbara A. Han, Kush R. Varshney, Shannon LaDeau, Ajit Subramaniam, Kathleen C. Weathers, and Jacob Zwart, "A Synergistic Future for AI and Ecology," *Proceedings of the National Academy of Sciences* 120, no. 38 (September 19, 2023): e2220283120, https://doi.org/10.1073/pnas.2220283120. "Ecology and Artificial Intelligence: Stronger Together," ScienceDaily, accessed December 24, 2024, https://www.sciencedaily.com/releases/2023/09/230911191010.htm.

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ecological AI, where technology fosters deeper awareness of and interaction with environmental systems.[2]

The integration of AI and ecological research provides powerful tools for understanding and mitigating environmental crises.[3] AI's ability to process vast datasets enables researchers to model and predict ecosystem changes over time, offering insights that contribute to sustainability and resilience.[4] Simultaneously, the post-anthropocentric shift, influenced by globalization and technology-mediated interactions, reshapes human agency in relation to the non-human world, altering the very definition of *anthropos*.[5]

Through the manipulation of plant forms, AI art can expose hidden connections between the digital and organic realms, encouraging reflection on how technological interventions shape our understanding of nature. Historically, artists have played a crucial role in raising awareness about climate change, producing works that challenge perceptions, evoke emotional responses, and inspire action.[6] The convergence of art and ecology has led to new creative practices that push artistic expression beyond aesthetics into environmental activism.

However, the ecological costs of AI must also be addressed. The increasing computational demands of AI systems raise urgent concerns about energy consumption and environmental degradation. Ethical deployment strategies must be implemented, including comprehensive environmental impact assessments prior to AI deployment, identifying risks to ecosystems and determining mitigation strategies.[7]

Contemporary art increasingly engages with ecological politics, integrating art criticism, political philosophy, environmental activism, and postcolonial thought.[8] This has given rise to eco-aesthetics, a discourse examining how art addresses ecological crises across diverse global contexts. Unlike politically neutral 'green' consensus narratives often promoted by governments and corporations, art can expose

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[2] "Ecology and Artificial Intelligence: Stronger Together."

[3] United Nations Environment Programme, "How Artificial Intelligence Is Helping Tackle Environmental Challenges," UNEP, November 7, 2022, https://www.unep.org/news-and-stories/story/how-artificial-intelligence-helping-tackle-environmental-challenges. Molly Flanagan, "AI and Environmental Challenges," Environmental Innovations Initiative, University of Pennsylvania, August 23, 2023, https://environment.upenn.edu/events-insights/news/ai-and-environmental-challenges. Cary Coglianese, "Deploying Machine Learning for a Sustainable Future," University of Pennsylvania Law School, Public Law and Legal Theory Research Paper No. 20-17, May 2020, 7, https://ssrn.com/abstract=3613804.

[4] Han et al., "A Synergistic Future for AI and Ecology."

[5] Rosi Braidotti, "Post-human Humanities," *European Educational Research Journal* 12, no. 1 (March 2013): 5, https://doi.org/10.2304/eerj.2013.12.1.1.

[6] Maja and Reuben Fowkes, *Art and Climate Change* (Thames and Hudson Ltd., 2022), https://www.perlego.com/book/3579969/art-and-climate-change-pdf.

[7] A. Zhuk, "Artificial Intelligence Impact on the Environment: Hidden Ecological Costs and Ethical-Legal Issues," *Journal of Digital Technologies and Law* 1, no. 4 (December 15, 2023): 947, https://doi.org/10.21202/jdtl.2023.40.

[8] T.J. Demos, "Contemporary Art and the Politics of Ecology: An Introduction," *Third Text* 27, no. 1 (January 2013): 1, https://doi.org/10.1080/09528822.2013.753187.

socio-political disparities within ecology, including those linked to race, class, gender, and geography.[9]

AI has fundamentally altered artistic engagement with nature, offering new methods for visualizing ecological transformations and imagining alternative futures.[10] Digital media, machine learning, and AI have expanded artistic possibilities, providing tools for critique, reinterpretation, and resistance against environmental degradation. Instead of conforming to the efficiency-driven imperatives of economic competition, we must reclaim alternative value systems, embracing novel artistic and social practices that reimagine human relations with others and the unfamiliar.[11]

As a result, art and aesthetics assume a pioneering role, countering claims of crisis or decline.[12] Contemporary artistic practices increasingly internalize ecological issues, transforming aesthetics into an extension of ecology itself, while ecology in turn becomes an integral realm within aesthetics.[13] Artistic practices reveal the complexities and contradictions of human existence, analyzing how we interact with and perceive other life forms, often reducing them to mere resources.[14] A fundamental aspect of art's engagement with ecology is its ability to cultivate sensitivity, awareness, and care, while avoiding rigid distinctions between humans and the non-human realm.

In contemporary visual discourse, climate change and environmental urgency have become dominant themes.[15] Human activity is accelerating the sixth mass extinction, leading to species loss at unprecedented rates, even before many plants are documented.[16] Facing overpopulation, environmental destruction, and deepening inequalities, Donna Haraway's Chthulucene[17] proposes an alternative framework in which humans are not the primary agents of history but participants in a broader ecological web. This shift calls for an ethics of attention and response-ability, urging humans to recognize their interconnectedness with all life forms, including plants. As art increasingly internalizes ecological concerns, aesthetics and ecology merge, creating

[9] Demos, "Contemporary Art and the Politics of Ecology," 2.

[10] Fowkes, *Art and Climate Change*, 7.

[11] Félix Guattari, *The Three Ecologies*, trans. Ian Pindar and Paul Sutton (Bloomsbury Academic, 2014).

[12] Anna Zeidler-Janiszewska, "Aesthetics and Ecology in the Post-Modern Perspective," *Polish Journal of Landscape Studies* 1, no. 2–3 (January 21, 2019): 9, https://doi.org/10.14746/pls.2018.2.3.1.

[13] Zeidler-Janiszewska, "Aesthetics and Ecology in the Post-Modern Perspective," 9.

[14] Marina Souza Lobo Guzzo, Susana Oliveira Dias, Alana Moraes, Guilherme Moura Fagundes, Walmeri Ribeiro, Kidauane Regina Alves, and Renzo Taddei, "Artistic Practices in the Anthropocene," *Annual Review of Environment and Resources* 49, no. 1 (October 18, 2024): 223–47, https://doi.org/10.1146/annurev-environ-112922-112400.

[15] Demos, "Contemporary Art and the Politics of Ecology." Fowkes, *Art and Climate Change*. Marianna Michałowska, "Artists in the Face of Threats of Climate Change," *Oceanologia* 62, no. 4 (October 2020): 565–75, https://doi.org/10.1016/j.oceano.2020.03.003.

[16] Murphy Westwood et al., "Botanic Garden Solutions to the Plant Extinction Crisis," Plants, People, Planet 3, no. 1 (2021): 22–31, https://doi.org/10.1002/ppp3.10134.

[17] Donna J. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press, 2016), https://doi.org/10.2307/j.ctv11cw25q.

new possibilities for artistic engagement. Through multiple narratives, contemporary art unveils the intricate tensions between human existence and environmental crises, offering not only critical reflection but also pathways to more sustainable futures.

Plant blindness

Despite the substantial political and economic influences affecting contemporary plant science and the increasing risks of extinction, plants remain frequently overlooked[18], a phenomenon with significant consequences for conservation and botanical education. This cognitive bias, termed plant blindness, refers to prevalent inclination to disregard plants as mere passive background elements rather than active, living entities. Coined[19] during a 1998 meeting of the Botanical Society of America, plant blindness diminishes awareness of plants in both daily life and scientific discourse, perpetuating their marginalization in ecological and cultural narratives. Despite being thoroughly documented, the underlying biological and cultural mechanisms driving plant blindness remain an ongoing subject of research.[20] One explanation is perceptual bias; while plants are stationary and often visually blend together, they tend to evade human attention.[21] Additionally, their chromatic and spatial consistency within dense populations makes them more difficult for the human eye to distinguish, further reinforcing their invisibility.[22] This bias extends into scientific domains, as researchers frequently undervalue the ecological significance of plants.[23] Compounded by the underrepresentation of botanical content in biology education, both students and the public often fail to recognize the ecological, aesthetic, and cultural significance of plants, reinforcing the perception of plants as inferior to animals.[24] To address concerns about the ableist implications of the term "plant blindness," certain researchers propose "plant awareness disparity" (PAD) as a more inclusive alternative.[25]

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[18] Sarah B. Jose, Chih-Hang Wu, and Sophien Kamoun, "Overcoming Plant Blindness in Science, Education, and Society," PLANTS, PEOPLE, PLANET 1, no. 3 (July 2019): 169–172, https://doi.org/10.1002/ppp3.51.

[19] James H. Wandersee and Elisabeth E. Schussler, "Preventing Plant Blindness," *The American Biology Teacher* 61, no. 2 (February 1, 1999): 82–86, https://doi.org/10.2307/4450624.

[20] Ainara Achurra, "Plant Blindness: A Focus on Its Biological Basis," *Frontiers in Education* 7 (October 25, 2022), https://doi.org/10.3389/feduc.2022.963448.

[21] Mung Balding and Kathryn J.H. Williams, "Plant Blindness and the Implications for Plant Conservation," *Conservation Biology* 30, no. 6 (December 2016): 1192–1199, https://doi.org/10.1111/cobi.12738.

[22] Wandersee and Schussler, "Preventing Plant Blindness."

[23] Sarah B. Jose, Chih-Hang Wu, and Sophien Kamoun, "Overcoming Plant Blindness in Science, Education, and Society," 169.

[24] Jessica Colon, Nichole Tiernan, Simone Oliphant, Ateev Shirajee, Jonathan Flickinger, Hong Liu, Javier Francisco-Ortega, and Melissa McCartney, "Bringing Botany into Focus: Addressing Plant Blindness in Undergraduates Through an Immersive Botanical Experience," *BioScience* 70, no. 10 (October 16, 2020): 887, https://doi.org/10.1093/biosci/biaa089.

[25] Kathryn M. Parsley, "Plant Awareness Disparity: A Case for Renaming Plant Blindness," *PLANTS, PEOPLE, PLANET* 2, no. 6 (November 2020): 600, https://doi.org/10.1002/ppp3.10153.

Traditional efforts to mitigate plant blindness emphasize education and visual recognition; however, research indicates that emotional and sensory engagement is vital for cultivating an awareness of plant life.[26] Initiatives such as Plant Love Stories[27] emphasize how personal narratives and sensory memories – such as the scent of a childhood garden or the familiar silhouette of a tree – forge profound emotional connection between individuals and plants. AI-generated botanical art provides an innovative method to reinforce such connections. Through the design of creative and evocative plant representations, AI can bridge the gap between intellectual knowledge and emotional experience. Just as storytelling personalizes the human-plant relationship, AI-generated floral imagery can cultivate botanical appreciation by presenting plants in visually striking and unexpected ways. These representations foster interest and emotional involvement, transcending mere physical interactions with plant life.

Rosi Braidotti[28] reminds us that "the universe is composed of things such as water lilies and stars, things that do not feed or shelter us, and which most of us, out of choice or necessity, ignore most of the time. However, these things can restore us to our primary relationship with existence, which is one of wonder. When a human artifact does this, we may honor it by calling it art." In this sense, both traditional and AI-driven botanical art have the power to reposition plants as central protagonists in ecological and cultural discourse, challenging plant blindness and fostering a renewed sense of wonder, awareness, and appreciation for the botanical world. Such artistic interventions contribute to addressing the broader climate challenge by reinforcing the urgency of plant conservation and ecological stewardship. Given that human survival is intrinsically linked to plant life, it is imperative to emphasize their importance whenever possible.[29] The visualization of plants in art offers an accessible means of drawing attention to botanical life,[30] especially for individuals with little direct exposure – such as those residing in urban settings – and is particularly significant in depicting endangered or extinct plant species. By making plant life more visible and emotionally resonant, art – whether traditional or AI-generated – plays a crucial role in mitigating plant blindness and expanding our collective understanding of the natural world.[31]

[26] Caitlin McDonough MacKenzie, Sara Kuebbing, Rebecca S. Barak, Molly Bletz, Joan Dudney, Bonnie M. McGill, Mallika A. Nocco, Talia Young, and Rebecca K. Tonietto, "We Do Not Want to 'Cure Plant Blindness' We Want to Grow Plant Love," *PLANTS, PEOPLE, PLANET* 1, no. 3 (July 2019): 139, https://doi.org/10.1002/ppp3.10062. Aideen McGinn, Lorna Donlon, and Joanna Kacprzyk, "Plant Memories: Art Co-created with the Public as a Tool for Investigating How People Build Lasting Connections with Plants," *PLANTS, PEOPLE, PLANET* 23 (July 2024), ppp3.10555, https://doi.org/10.1002/ppp3.10555.

[27] "Plant Love Stories," New Phytologist Foundation, accessed February 2, 2025, https://www.plantlovestories.com/.

[28] Rosi Braidotti, "Post-Human Humanities."

[29] Geetanjali Sachdev, "Engaging with Plants in an Urban Environment through Street Art and Design," *PLANTS, PEOPLE, PLANET* 1, no. 3 (July 2019): 272, https://doi.org/10.1002/ppp3.10055.

[30] Georgina Walton, Jonathan Mitchley, Geraldine Reid, and Sven Batke, "Absence of Botanical European Palaeolithic Cave Art: What Can It Tell Us about Plant Awareness Disparity?" *PLANTS, PEOPLE, PLANET* 5, no. 5 (September 2023): 694, https://doi.org/10.1002/ppp3.10373.

[31] Walton et al., "Absence of Botanical European Palaeolithic Cave Art."

Carbon footprint

As AI progresses, it presents significant environmental challenges, such as increasing energy consumption, electronic waste, and possible ecosystem disruptions – challenging to evaluate due to insufficient transparency.[32] The growing complexity of AI models results in heightened energy requirements and carbon footprints, with emissions from Information and Communications Technology anticipated to represent 14% of global emissions by 2040.[33] Frequent hardware upgrades further contribute to electronic waste, while AI applications in environmental monitoring and resource extraction threaten delicate ecosystems.[34] Despite AI's potential for sustainability-oriented applications, prominent technology companies offer limited data regarding the energy consumption and emissions linked to their AI systems, complicating a comprehensive evaluation of their ecological costs.[35] Enhanced accountability and the advancement of more energy-efficient AI technology are crucial to alleviate these effects.

Environmental resilience should be integral to talks surrounding AI, rather than be solely confined to policy and industrial deliberations. Despite ongoing ethical discussions, technology firms are amplifying energy-intensive computation and data storage on a global scale.[36]

Some researchers argue that AI-generated art and writing require less energy for individual tasks compared to conventional human creative processes.[37] This claim has been challenged, as comparing a single human-created image to an AI-generated output neglects the extensive computational infrastructure supporting AI systems.[38] The environmental impact of generative AI is accelerating rapidly, prompting worries over sustainability, ethical considerations, and potential job displacement.

Simultaneously, climate change compels artists to confront its effects not just thematically but also materially, since increasing temperatures, severe weather events, and scarcity of resources are impacting artistic creation and exhibition practices.[39] Although digital technologies have broadened artistic possibilities, they also present

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[32] Kate Crawford, "Generative AI's Environmental Costs Are Soaring – and Mostly Secret," *Nature* 626, no. 8000 (February 20, 2024): 693–693, https://doi.org/10.1038/d41586-024-00478-x.

[33] Alokya Kanungo, "The Green Dilemma: Can AI Fulfil Its Potential Without Harming the Environment?" Earth.Org, July 18, 2023, https://earth.org/the-green-dilemma-can-ai-fulfil-its-potential-without-harming-the-environment/.

[34] Kanungo, "The Green Dilemma."

[35] Crawford, "Generative AI's Environmental Costs Are Soaring – and Mostly Secret."

[36] Aimee van Wynsberghe, "Sustainable AI: AI for Sustainability and the Sustainability of AI," *AI and Ethics* 1, no. 3 (2021): 213, https://doi.org/10.1007/s43681-021-00043-6.

[37] Bill Tomlinson, Rebecca W. Black, Donald J. Patterson, and Andrew W. Torrance, "The Carbon Emissions of Writing and Illustrating Are Lower for AI than for Humans," *Scientific Reports* 14, no. 1 (February 14, 2024): 3732, https://doi.org/10.1038/s41598-024-54271-x.

[38] Jo Lindsay Walton, "Is AI Art Less Carbon Intensive than Human Art?" *Medium* (blog), August 23, 2024, https://medium.com/@jolindsaywalton/is-ai-art-less-carbon-intensive-than-human-art-3b7c61a4c333.

[39] Fowkes, *Art and Climate Change*, 10.

ethical dilemmas concerning energy consumption and resource utilization. Despite its innovative potential, AI-generated art requires substantial computational power, leading to carbon emissions and highlighting the paradox of using technology to address environmental issues while concurrently intensifying them.[40]

The environmental crisis requires fundamental transformation in artistic practices, transitioning from conventional depictions of nature to immersive, experimental forms of ecological involvement, redefining art's position as a catalyst for change in the Anthropocene.[41] Ultimately, as digital and AI-driven art continue to evolve, addressing their ethical and environmental implications becomes critical in fostering sustainable artistic practices.[42]

AI artistic practices: reimagining plants

AI art's engagement with plant life and ecology extends beyond theoretical discourse into artistic practice, where digital tools reshape how we perceive and interact with the natural world. Artists such as Andrea Brewster, Refik Anadol, Mat Collishaw, and Hannes Hummel explore the intersections of AI, organic forms, and ecological narratives, using machine learning and generative algorithms to reimagine plant life in ways that challenge traditional representations of nature. Their works interrogate plant blindness, the tendency to overlook plant life's significance, and highlight the broader ecological footprint of AI, questioning the sustainability of digital art production. Through these diverse practices, AI art becomes a speculative space where organic and digital ecologies merge, prompting new ways of thinking about conservation, environmental activism, and the ethics of technological intervention in nature.

Mat Collishaw

Mat Collishaw's *Petrichor* exhibition at the Royal Botanic Gardens, Kew, is a multi-room installation that critically examines the intricate connections among nature, art, and artificial intelligence. Encompassing several galleries, each room presents a unique ambiance and thematic focus, guiding visitors through a series of sensory and conceptual experiences, transforming traditional garden imagery into unsettling, dystopian visions that explore nature's deterioration and the influence of technology.[43]

A central work, *Alluvion*, features AI-generated still lives modeled on 17th-century Dutch vanitas paintings, revealing the capacity of machine learning to reproduce and violate art historical traditions. Collishaw utilizes AI not merely as a tool of reproduction, but as a mechanism of transformation – integrating floral forms with elements of decay and mutation that highlight the instability of life in the Anthropocene.

[40] Fowkes, *Art and Climate Change*, 19.

[41] Fowkes, *Art and Climate Change*. Ibid.

[42] Fowkes, *Art and Climate Change*, 19.

[43] Emily Steer, "How Gardens Became an Artistic Metaphor for Our Dystopian Times," *Artnet News*, January 29, 2024, https://news.artnet.com/art-world/gardens-dystopian-art-trend-2419915.

These works challenge the viewer to contemplate the role of AI in the formation of novel aesthetic paradigms and ecological visions.

The exhibition's digital focal point, Heterosis, showcases a fantastical landscape of generative flowers with petals akin to insect wings and organs, merging the distinctions between flora and fauna, as well as organic and synthetic. These dynamic, impossible hybrids are created with video game software and occur in real-time, showcasing AI's ability to simulate evolutionary processes and construct imaginary ecologies. In a separate area, the panoramic film *Even to the End* reconstructs a shipping disaster involving imperial botanical collections, highlighting the colonial histories that inform plant collection and classification. Petrichor utilizes AI to interrogate aesthetic representation and reveal the underlying epistemological and political influences that have molded our comprehension of nature.[44] Collishaw's work ultimately stimulates critical reflection regarding the role of technological mediation in both preserving and threatening the natural environment. It examines our relationship with nature, blending digital and natural elements to illustrate the conflict between our desire to nurture and to dominate the environment, raising questions about authenticity and control in human interactions with the environment.[45]

Refik Anadol

Refik Anadol is a multimedia artist who integrates AI with environmental themes, as exemplified in his Large Nature Model (2024) – the first AI system dedicated solely to environmental and ecological data, using information exclusively from natural sources like flora, fauna, and fungi. Trained on a vast dataset sourced from institutions such as the Smithsonian, National Geographic, and the Natural History Museum, in collaboration with 29 specialists,[46] this project aligns with Haraway[47]'s idea of interconnectedness, where scientists, artists, communities, and nonhuman beings collaborate to address urgent issues. Anadol's work reimagines nature as a constantly evolving digital landscape.[48] His Living Archive uses evolving algorithms that mimic ecological processes, reflecting symbiosis and ecological interdependence. However, one could argue that such abstract representations may oversimplify the complexity of these interdependent systems, failing to fully capture their depth.

According to Fowkes,[49] the environmental crisis requires a significant shift in

[44] Jackie Wullschläger, "Mat Collishaw, Kew Gardens – Nature's Unstable Beauty; Man's Destructive Ingenuity," *Financial Times*, November 18, 2023, https://www.ft.com/content/7f2d7ffd-6a9e-48db-8c8e-eb4f33718ae1.

[45] Jonathan Jones, "Mat Collishaw Review – AI Plants Put the Shock and Sensation Back into British Art," *The Guardian*, October 20, 2023, sec. Art and design, https://www.theguardian.com/artanddesign/2023/oct/20/mat-collishaw-review-fabricated-plants-put-the-shock-and-sensation-back-into-british-art.

[46] Heather Schoell, "Eco-System Upgrade: AI Plants a Digital Forest at NVIDIA GTC," *NVIDIA Blog* (blog), March 11, 2024, https://blogs.nvidia.com/blog/ai-refik-anadol-gtc-2024/

[47] Haraway, *Staying with the Trouble*.

[48] "Large Nature Model–Living Art," Refik Anadol, accessed February 3, 2025, https://refikanadol.com/works/large-nature-model-living-art/.

[49] Fowkes, *Art and Climate Change*, 7.

artistic practices, moving away from traditional depictions of nature toward more avant-garde and immersive ecological engagement. Anadol's team collaborated with perfumers to develop 12 distinct scents synchronized with the visual content, such as the evolving smells of a forest before and after rainfall, thus deepening viewers' connection to the represented environments.[50] Anadol envisions his AI model as a new way of perceiving, recording, and preserving nature, with applications in art therapy, offering simulated natural experiences for those with limited access to real-world environments.

The increasing intersection of technology and environmental practices raises important questions about the ecological footprint of art production. While AI-driven installations are powerful in simulating ecosystems, they may inadvertently contribute to the very environmental degradation they aim to address, prompting concerns about their sustainability. Anadol's studio is addressing these challenges by partnering with Google engineers to ensure the model operates on renewable energy, aligning the project with a commitment to sustainability (Studio, Refik Anadol, 2024). By combining art, technology, and ecology, Anadol's projects demonstrate how AI can foster ecological understanding and inspire collective responsibility for the planet.[51]

Andrea Brewster

Andrea Brewster's artworks combine traditional techniques with artificial intelligence, creating semi-abstract floral compositions that capture nature's essence through vibrant colors and dynamic light. Her work invites viewers to engage with nature in unexpected ways, using AI to produce images that feel both familiar and otherworldly. This fusion of technology and organic forms reflects Brewster's deep curiosity about the natural world and encourages reflection on its future in an increasingly digital age.[52] In her exhibition *Improbable Blossoms* (2022), Brewster uses AI as an artistic tool, utilizing the AI image generator Midjourney to create floral compositions that reinterpret traditional botanical illustration. She inputs text-based prompts related to botanical themes, and carefully curates works that highlight the fragility and impermanence of natural forms, such as petals resembling dragonfly wings. This process underscores AI's ability to synthesize aesthetic patterns that evoke both familiarity and innovation in botanical representation. Brewster's exploration of AI-generated imagery is also informed by her historical connection to two 19th-century naturalist ancestors, framing AI as a contemporary extension of the scientific and artistic traditions of botanical documentation.[53] Through her work, Brewster raises import-

[50] Adam Schrader, "Refik Anadol Launches the First Open-Source Nature-Based A.I. Model," *Artnet News*, January 16, 2024, https://news.artnet.com/art-world/refik-anadol-living-archive-nature-2419482.

[51] Schoell, "Eco-System Upgrade."

[52] Hue&eye, "Andrea Brewster | Flowers Blooming through AI," Hue & Eye, April 21, 2023, https://www.hueandeye.org/andrea-brewster-flowers-blooming-through-ai/.

[53] "From Pandemic Plant Obsession, AI-Generated Flowers Sprout," The San Francisco Standard, December 17, 2022, https://sfstandard.com/2022/12/16/ai-flowers-sprout-oakland/.

ant questions about the ontological status of AI-generated art, particularly regarding authorship, creativity, and the mediation of nature through algorithms. Despite the uncertainties surrounding AI's role in art production, Brewster adopts a critical yet exploratory stance, recognizing its potential to foster new ways of engaging with both aesthetic and ecological concerns.

Hannes Hummel

Hannes Hummel's *Dreamlike AI-Generated Flowers* exemplifies the fusion of artificial intelligence and botanical aesthetics, where neural networks simulate organic forms beyond natural limitations. These AI-generated flowers challenge the concept of authenticity in nature and raise questions about humanity's role in shaping biological futures. Hummel's work visualizes speculative plant species that could emerge in response to climate change, genetic engineering, or hybrid ecologies, positioning AI-generated flora as a medium to explore themes such as plant resilience, biodiversity loss, and climate adaptation. AI-driven botanical art suggests a paradigm shift, making AI not just a tool but a collaborator in envisioning ecological futures.[54] Hummel's approach aligns with phenomenology, relational AI, and plant awareness. His use of AI in artistic creation mediates human perception and experience, moving beyond the view of AI as merely instrumental and towards a more collaborative framework, where AI and human interaction co-create meaning. This co-authorship concept reinforces the idea that AI-generated works are not passive outputs but entities that shape perception. Hummel's speculative and digital aesthetic reframes our perception of nature, presenting AI as a means to bring attention to plant life in a post-digital world, potentially counteracting the phenomenon of plant blindness. The blending of realism and synthetic elements in his work raises questions about trust in AI-generated representations, challenging traditional notions of authenticity and authorship. This, in turn, engages broader concerns about how AI-generated content is perceived and trusted within ecological, scientific, and artistic contexts. Furthermore, Hummel's art highlights the potential for AI to mediate and raise awareness of plant life, fostering greater societal appreciation and understanding.[55]

Conclusion: AI, ecology, and the future of artistic engagement

As AI becomes increasingly integrated into artistic practice, its role extends beyond mere aesthetic exploration into ecological storytelling and environmental activism. AI art can challenge plant blindness, a phenomenon that diminishes our awareness of plant life and its ecological significance, by reimagining plant forms and ecosystems through digital means. Through the works of artists such as Andrea

[54] Leandro Lima, "Algorithmic Gardener: Hannes Hummel Combines His Botanical Pictures through AI to Create Dreamlike Flowers–Visualflood Magazine," *Visual Flood* (blog), October 1, 2024, https://visualflood.com/post/hannes-hummels-dreamlike-ai-generated-flowers.

[55] McGinn, Donlon, and Kacprzyk, "Plant Memories."

Brewster, Refik Anadol, Mat Collishaw, and Hannes Hummel, AI art serves as a bridge between human perception and ecological awareness, fostering new narratives that engage with biodiversity, conservation, and the fragile balance of our ecosystems.

However, while AI art offers new ways of seeing and engaging with the environment, its ecological footprint cannot be overlooked. The energy demands of generative AI models – driven by intense computational power, electricity use, and cooling systems – raise urgent concerns about sustainability. Research shows[56] that training a single large AI model can emit as much carbon dioxide as five cars over their entire lifetimes, underscoring the environmental cost of current AI development practices. Nevertheless, emissions persist beyond the training phase. The continuous implementation and optimization of these models consume significant energy and water resources, burdening electrical grids and exhausting municipal water supplies, potentially disrupting local ecosystems. The increasing demand for high-performance hardware to enable these systems results in significant environmental costs due to the extraction, manufacturing, and global transit of physical components.[57]

Addressing these issues requires a shift toward more responsible, sustainable[58] AI development, including energy-efficient algorithms, optimized hardware, and renewable energy sources.[59] Ethical AI practices, such as sustainability-focused deployment and impact assessments, can help balance technological innovation with ecological responsibility.

Rosi Braidotti's vision of a post-anthropocentric humanities[60] would provide a useful framework for understanding this potential shift, as she argues for an expanded field of inquiry that moves beyond human-centered perspectives. Although AI art's interaction with ecology gestures toward this, it frequently risks superficiality unless it aggressively challenges anthropocentric assumptions and emphasizes genuine interconnectedness with the more-than-human realm.

This approach could also reflect Donna Haraway's insistence on "staying with the trouble" – a commitment to engaging with complex, interconnected systems rather than seeking simple solutions, but only if AI evolves into a sustainable and ethical being, it can be perceived as tentacular, interlinking human and non-human futures, rather than merely serving as a techno-solutionist instrument.

In the Chthulucene, AI art does not merely simulate nature – it *participates* in ecological world-making, merging digital and organic forms of existence. These artistic practices create hybrid narratives, where algorithmic processes interact with natural elements, reshaping our understanding of the plant world. The plant, traditionally

[56] Karen Hao, "Training a Single AI Model Can Emit as Much Carbon as Five Cars in Their Lifetimes," *MIT Technology Review*, June 6, 2019, https://www.technologyreview.com/2019/06/06/239031/training-a-single-ai-model-can-emit-as-much-carbon-as-five-cars-in-their-lifetimes/.

[57] "Explained: Generative AI's Environmental Impact." MIT News, January 17, 2025. https://news.mit.edu/2025/explained-generative-ai-environmental-impact-0117.

[58] Aimee van Wynsberghe, "Sustainable AI: AI for Sustainability and the Sustainability of AI," 213.

[59] Alokya Kanungo, "The Green Dilemma: Can AI Fulfil Its Potential Without Harming the Environment?"

[60] Braidotti, "Post-human Humanities."

seen as a symbol of resilience and continuity, becomes a site of negotiation between biological processes and digital reinterpretation. AI-generated botanical art, in this sense, mirrors Haraway's broader thesis: that contemporary existence is defined by interwoven, interdependent systems that resist simple categorization.

Ultimately, AI art's engagement with ecology challenges us to rethink our relationship with the environment. It can function as an instrument to raise awareness, shifting perspectives, and initiating critical discussions around conservation and sustainability. However, while we leverage AI's capabilities, we must always recognize and address its environmental repercussions. The future of AI and ecological art must emphasize sustainability, cultivating innovative artistic and technological practices that are both ethically and ecologically responsible, rather than solely aesthetic.

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