[A] INSPIRATIONS

NEW VISUALITY HORIZONS IN THE AGE OF ARTIFICIAL INTELLIGENCE

Sylwia Żółkiewska

2024

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The publication was created within the framework of the KPO grant, which aimed to improve competence - knowledge and skills - in the area of application of AI generative techniques and models, such as GANs, DeepDream, diffusion models to create widely understood images (films, animations, gifs or graphics).The publication is a summary of several months of educational and artistic process, consisting in:

- completing English-language courses on AI in the visual arts;
- testing selected AI tools;
- organizing, conducting and recording discussions with visual artists who use various GEN AI techniques and models in their practice;
- applying the acquired knowledge to create a multimedia installation presenting selected formal aspects of AI-created images.

The publication can be useful to artists, designers, educators and cultural animators who want to creatively use generative artificial intelligence tools.

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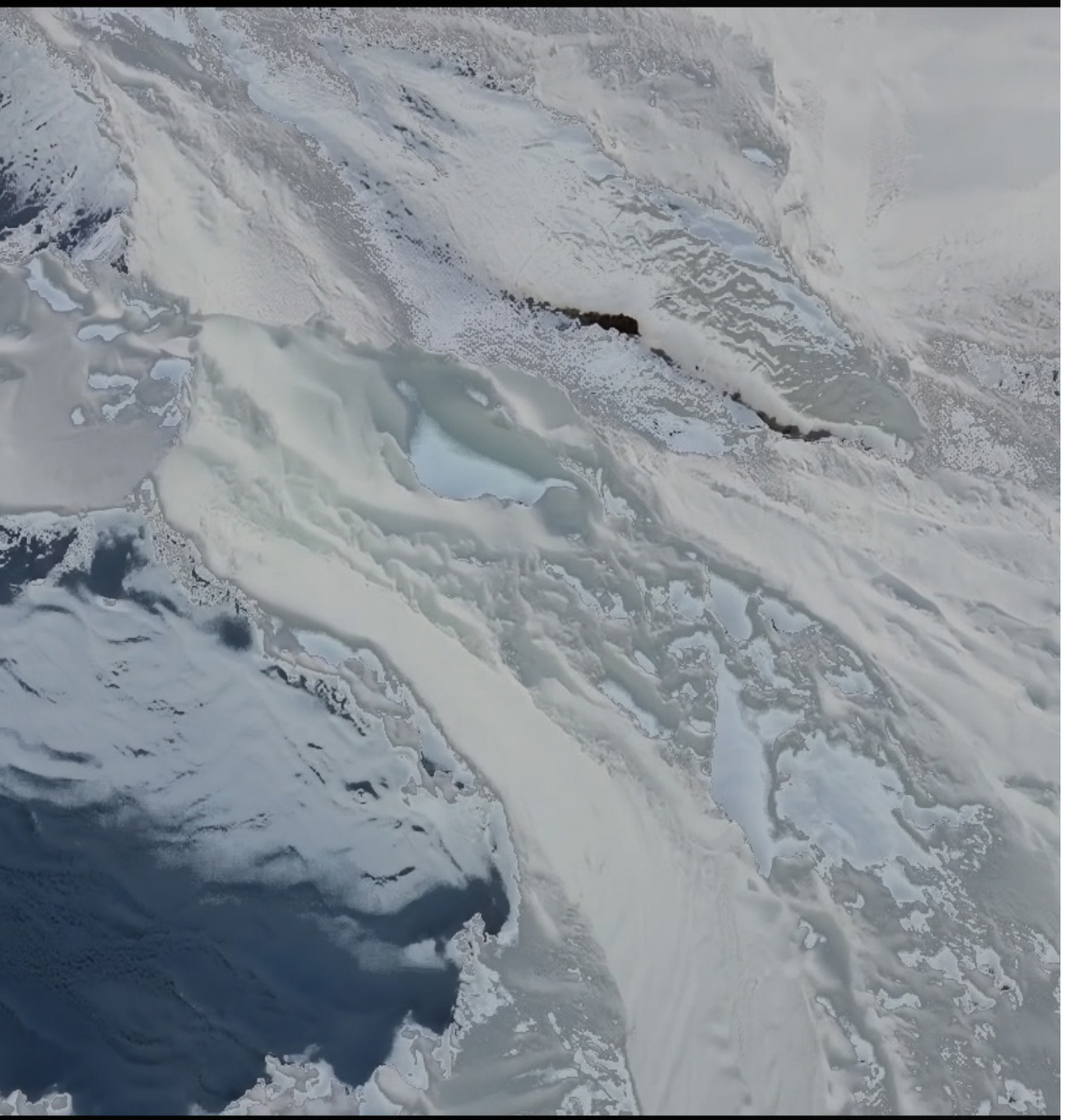

ABOUT THE AUTHOR

Sylwia Zolkiewska (born 1982)— visual artist, designer, researcher and expert in new media. Graduate of the Academy of Fine Arts in Cracow. In 2024, at the Faculty of New Media Art of the Polish-Japanese Academy of Information Technology, she defended her doctoral thesis on aesthetics in the mobile era. Author and co-author of texts popularizing the use of new technologies in art, culture, education and business: books, publications, articles. Lecturer at the University of Warsaw and PJATK. For years she has been creating art and research projects, exploring the impact of technology on perception, memory and emotions. Her installations, films, paintings and graphics have been presented at international festivals and exhibitions, including in Poland, Slovakia, Canada, USA, Brazil, Switzerland, France, Spain and Portugal. Read more: www.art.zolkiewska.pl, www.zolkiewska.pl

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GLOSSARY

Deep Dream - an algorithm based on convolutional neural networks, developed by Google, which enhances patterns and details in images, giving them a surreal, dream-like feel. Deep Dream enhances details in the input data, creating psychedelic effects ("machine dreams").

Deep fake - a technology based on generative AI models to create realistic but fake images, videos or audio recordings, often in ways that are difficult to distinguish from reality. Deep fake raises numerous ethical controversies related to content manipulation and infringement of image rights.

Fine-tuning (model tuning) - the process of further teaching an already trained AI model on new, specific data to improve its performance on a specific task. Fine-tuning allows artists and scientists to personalize models, such as adapting them to a specific aesthetic.

GANs (Generative Adversarial Networks) - a type of neural networks consisting of two cooperating components: a generator, which creates data, and a discriminator, which evaluates its quality. GANs simulate the process of trial and error, creating realistic images, sounds or video, and are used in generative art, animation and design, among others.

Gen AI (Generative Artificial Intelligence) is a technology that uses algorithms and models that learn from large data sets to create new content, such as images, texts, sounds or videos. These models, such as DALL-E, Stable Diffusion and ChatGPT, generate results based on analysis of existing patterns, opening up new creative possibilities in art, science and technology.

LoRA - an AI generative model optimization technique that enables rapid model adjustment (fine-tuning) using smaller data sets. With LoRA, users can customize models, such as Stable Diffusion, in an efficient and accessible way.

Diffusion models - a type of generative models that learn by incrementally scattering and reconstructing data, such as image pixels. Platforms based on diffusion models, such as Stable Diffusion, create realistic images from textual prompts, and their operation resembles a process of iterative image quality improvement.

Medium specificity - a concept that refers to the unique characteristics and limitations of a given medium, which characteristics and limitations determine how that medium is used and how works created with it are received. In the context of AI, it means analyzing and critiquing the characteristic errors and generative aesthetics of artificial intelligence, such as glitches, distortions or hallucinations. Medium specificity complements the sociological and media studies perspective when analyzing the impact of new technologies on art and culture.

Prompt - a textual command or description entered by a user that is interpreted by AI models to generate an image, text or other content. The quality and precision of the prompt are critical to the output of generative AI models.

Scraping (web scraping) - the process of automatically collecting data from the internet, which is often used to extract datasets for training AI models. Scraping raises ethical concerns, especially when data is taken without the consent of its creators.

Neural networks - algorithms inspired by the workings of the human brain, which consist of multiple layers of interconnected "neurons." Neural networks are the basis of machine learning and generative AI, enabling data processing and pattern recognition in complex information sets.

Stable Diffusion - a popular open-source platform for generating images, based on the diffusion model. Designed for local installation, it enables the creation of high-quality graphics based on text prompts, with great control over parameters and styles.

INTRODUCTION

Since around 2010, I have closely followed the development of mobile technologies and the app ecosystem, which have radically changed how we communicate, work, and create. These changes have occurred at a pace that allows gradual adaptation for both creators and audiences. In contrast, AI-based technologies and tools have introduced changes of pace and scale that were previously difficult to imagine. AI is redefining our daily lives in ways that are much faster, more complex, and more profound than mobile technologies, almost outpacing our ability to adapt.

This pace of development is why, in making this publication available, I realize that some parts may already be outdated. However, the key issues raised in the text—concerning AI's place in art, its impact on creativity, and aesthetic or copyright issues—remain universal and relevant.

Like mobile technology at the beginning of its revolution, AI raises fundamental questions and simultaneously offers exciting new possibilities. I hope this publication will be helpful both for creatives who want to understand how AI affects contemporary art and for those who would like to start their experiments and create graphics, illustrations, films, gifs or animations with the help of AI. I believe that AI is not just a tool - it is a catalyst for the democratization of creativity, which can give a voice to those who have so far been excluded from the artistic discourse due to their disability, place of birth or education.

1.

ART AND CREATIVITY IN THE AGE OF ARTIFICIAL INTELLIGENCE

The last two years we have been conjugating the acronym "AI" through all cases. A tsunami of tools based on artificial intelligence has revolutionized all spheres of our lives, not excluding the arts. As is sometimes the case with revolutions, the change is happening rapidly and by leaps and bounds, generating controversy and contention. While artists such as Mario Klingemann, Anna Ridler, Memo Akten, Sophia Crespo and Sougwen Chung, who are more familiar with new technologies, are long on the other side of the mirror and use AI tools to create art without restraint, others are wondering how and where to start, remaining in the ariergarde of the new revolution. The division is particularly clear between artistic people practicing post-art or critical art and those relying on classical media, as well as the so-called commercial ones for whom visual creation is a source of income - graphic designers, illustrators, special effects artists, etc.

The former, for whom neural networks are both a tool, a medium and a source of inspiration, create philosophical, critical works, often referring to human-machine relations, experimental, showing the potential, challenges and limits of AI. The truth resulting from experiments and collected data is more important here than *decorum*.

The latter, hitherto relying on masterful technique and workshop developed through digital and analog tools, are getting accustomed to the reality that more proficient in the use of AI, artists can create intriguing visual experiences through their ability to train models, design their own neural networks and manipulate them.

As with any technological revolution, we are again asked fundamental questions: who is an artist? What is art? What is creativity? And further: in a world dominated by AI, is there room for artists who don't want to participate in this race? How is AI changing us artists? Will the precision of the hand eventually be replaced by the precision of prompting and coding?

The changes taking place are creating uncertainty and frustration in some, alien to techno-optimists. However, critical voices are - as always - needed to make the new

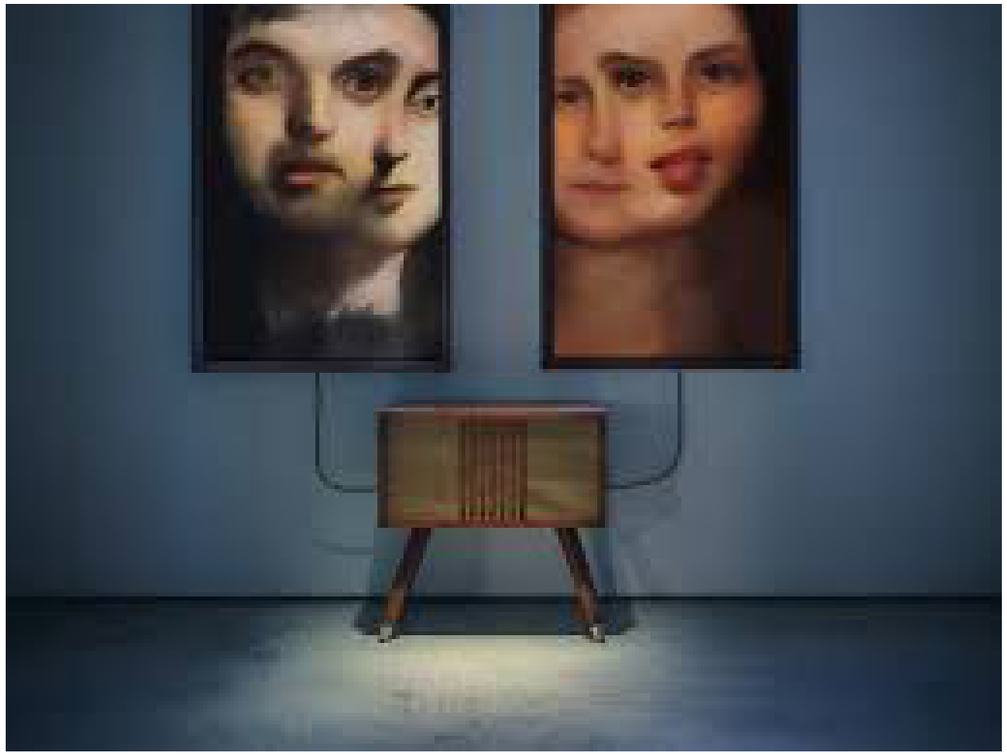
technology not only a tool to speed up production, but also a pretext to reflect on its impact on culture, society and ourselves. The art market also has doubts about the condition of the work and the creator - works created with the help of AI tools (with some exceptions), are seen as less creative, and therefore - less valuable, says researcher Merel Meijer from Rotterdam School of Management, Erasmus University (RSM). This cautious strategy has its basis: at a time when the rules of the game are being set and the copyright discussion is ongoing, and a practice based on fair use, the DSM Directive and the AI Act is just taking shape, rarely does anyone want to invest more money in a work that may be completely devalued (as was also the case with the millions of works of varying quality uploaded to the blockchain network as NFT art).

AI - WHAT IS IT AND WHAT CAN IT BE USEFUL TO ARTISTS?

Artificial intelligence (AI) is a tool that enables machines to create artistic content using algorithms and models learned from large data sets. For artists, generative AI opens up many new possibilities, such as generating images and creating visualizations using popular tools such as DALL-E, MidJourney and Stable Diffusion, which create graphics based on textual descriptions (text-to-image method). AI tools accelerate the creation of concepts, prototypes, visualization of ideas, facilitate the creative process, and enable creative transformation of styles, juxtaposing aesthetics of different eras and artists, leading to surprising, syncretic solutions.

Although AI does not think like a human, it redefines the artistic process and expands the boundaries of imagination. Generative AI creates content based on existing patterns by analyzing the data on which it has been trained. But the real creativity is brought by us, adding context, reflection and emotion. AI does not possess consciousness or creativity in the sense Gary Davis described it in his book Creativity is Forever (1981) - as a set of co-occurring traits such as perceptiveness, openness, humor, curiosity or originality. AI possesses only some of these, making it see the world in a more abstract way and is devoid of the tendency to anthropomorphize shapes and compositions that is characteristic of us humans.

On the other hand, while disruptive technologies, of which AI is one, are opening up entirely new possibilities for artists, they are also profoundly changing previous approaches to art and creativity. While facilitating the realization of artistic visions, they are reducing the importance of technical mastery in favor of surprising conceptual works of art and research projects, in which what matters is less the visual effect and more the approximation of the problem posed.



Ilustration 1.1. *Memories of Passersby I*, Mario Klingemann (2018).
Source: https://quasimondo.com/

Ilustration 1.2. *Mosaic Virus (Tulips)*, Anna Ridler (2019).
Source: https://annaridler.com/

Ilustration 1.3. *Soft Sea of Awareness (Neural Zoo)*, Sofia Crespo, (2018-2022).
Source: https://sofiacrespo.com/

AI IMAGE GENERATION METHODS

The basis of generative AI is machine learning, a process in which algorithms learn from the data provided to predict outcomes and make more accurate decisions. An important component of AI is natural language processing (NLP), which enables machines to understand and generate responses in the language humans use, rather than in code, for example. Generative models, such as ChatGPT, do not "perceive" the world in human terms. Generative artificial intelligence (GEN AI) creates content based on patterns that exist in the data on which it has been trained. However, it does not copy them 1:1 or create completely new content from "nothing." In a way, the process can be compared to an artist who is heavily inspired by learned techniques, trends and styles to create something of its own - in the case of AI, the role of "own vision" is played by a set prompt. The final result is generated, but it is not an exact reproduction of the original, although it may indeed resemble it.

Models such as GANs (Generative Adversarial Networks) and DeepDream from Google generate content in different ways. GANs work on the principle of cooperation and competition between two neural networks - a generator and a discriminator - which train the model together. The generator creates images, while the discriminator evaluates their authenticity, aiming to distinguish them from real data. This process, reminiscent of the phenomenon of mimicry in evolutionary biology, leads to images that are increasingly close to reality.

DeepDream, on the other hand, based on convolutional neural networks, works by enhancing specific patterns and details present in images, resulting in surreal, almost dreamlike compositions. Just as a lens focuses light, highlighting selected parts of reality, DeepDream enhances certain elements in an image, exposing them in an exaggerated and non-obvious way. The result is a hallucination-like vision of the world, in which details are duplicated and transformed, creating fascinating but unreal visual landscapes.

In the case of diffusion models such as Stable Diffusion (often used in popular platforms such as LeonardoAI or MidJourney, for example), the creation process involves splitting images from the database at the pixel level into "noise" and then recreating them and adjusting them to fit the prompt. This recreation allows the compilation of abstract structures into new, coherent (or not) visual content.

AI thus generates images that can be both completely unobvious and surprisingly close to what we consider aesthetic. In this way, it creates new spaces in art - places where human intuition meets the non-linear logic of machines, opening up a field for exploration and redefinition of creativity.

UNBEARABLE AUTHORSHIP DIFFUSION

Each of the aforementioned models works only if it is provided with the right set of training data, which plays a key role in the quality of the works generated by AI. Currently, companies offering cloud-based tools for generating video and images train their models on the basis of huge data sets collected from the Internet, often without the creators' informed consent. Examples include the most popular AI models, such as Stable Diffusion, DALL-E and MidJourney, which rely heavily on the LAION dataset. LAION is made up of image-text pairs extracted by web-scraping and allows the models to generate images that resemble those in the training set, and easily mimic the styles or techniques of specific artists. This raises controversy, as artists who have spent years developing their unique styles may see their work reduced to an Instagram-like filter function.

This raises questions about the creative contributions of prompt authors and the lack of legal protection for AI-generated images. Current laws assume that property and moral rights are vested only in humans, not algorithms. Therefore, AI-generated content, if it bears no trace of human creative input, is not protected by copyright and must be labeled "AI-generated."

Interestingly, the prompt itself, i.e. an instruction or command given to AI tools, can be protected by copyright, but only if it is a manifestation of creativity, e.g. has a unique form or literary form, such as a poem or essay. In practice, this means that legal protection in the world of generative AI is more concerned with the human being as the initiator of the process than with the results of the algorithm itself.

To balance the development of AI in 2024, the EU introduced the AI Act, the first regulation on artificial intelligence, which aims to harmonize rules for AI use, increase trust and protect copyrights. The AI Act requires transparency in the data used to train models and the labeling of inauthentic content, such as deepfakes. The regulation is linked to the DSM Directive, which is intended to provide creators with the right to remuneration and the ability to reserve non-use of their works by AI (e.g., by including an appropriate clause on the website to prevent scraping. However, it is worth remembering that these regulations do not apply in the US and UK).

The situation is different with works created with models trained by artists themselves, who have used their own work or public domain materials to do so. Training our own models, over which we have full control, is not equally available to all artists. The threshold for entry remains high, as training requires both time to learn and experiment, as well as familiarity with the code. The better we understand how algorithms and neural networks work, the more precisely we can control the visual effect. However, as AI artist Agata Lankamer[1] notes, training models comfortably also requires access to advanced equipment, which many artists cannot afford.

1 The statements by Agata Lankamer and Ivona Tau quoted in the article are from a discussion I conducted in November 2024 entitled [A] inspiration. New Horizons of Visuality in the Age of Artificial Intelligence, available on YouTube: https://bit.ly AI-art-discussion-2024

ART AND AESTHETICS IN AI ERA

AI, like computers or the Internet before it, is accelerating the democratization of creativity. On the one hand, this raises concerns among artists, critics and audiences, who perceive a complication of evaluation criteria and a potential devaluation of the position of artists, which has been developed over years. On the other hand, it opens the door for those who have not had the chance for formal art education, but have ideas and the desire to create. As AI artist and author of *Machine Gaze* (2023) book, Ivona Tau, points out, works that are generated quickly, easy on the eyes and lack depth will lose their importance, giving way to original, artistic and research-based projects. According to Tau, in the age of AI we are moving toward a greater conceptualization of art, its "spiritualization" and critical reflection.

The aesthetics of AI are still taking shape, bringing a resurgence of surrealism - sometimes in kitsch form, as a side effect of the democratization of tools. An important hallmark of this aesthetic is the intermingling (morphing) of shapes, forms, textures and styles, and the presence of discontinuous surfaces that can create visual dissonance. The process of generating images by AI also makes visible fuzzy, indeterminate areas, fragments disturbed by repetitive patterns or pixelation. These distortions - referred to as glitches or AI hallucinations - are the result of the algorithm seeing patterns or objects that do not exist. These glitches, while seemingly imperfect, often become the starting point for artists exploring the specifics of AI.

Works by one of the pioneers of AI art, Mario Klingemann, such as *Mistaken Identity* and *Memories of Passersby I* (2018), explore the boundaries between reality and fiction, using system interference to create surreal, hybrid worlds. Klingemann refers to this aesthetic as neurealism - a combination of the words realism and neural networks. Neurealism, in his view, is not just aesthetics, but also a critical look at the capabilities and limitations of AI.

A similar play on machine errors is seen in *Learning to See* (2017-) by Turkish artist Memo Akten, where the artist explores how neural networks "learn" to see the world, emphasizing that their perception differs from human perception. Akten shows how algorithms interpret reality, transforming it into abstract, sometimes surreal compositions that reveal the inner workings of machines.

Ivona Tau's project *Mythic Latent Glitches* (2019) goes a step further, combining human creativity with the generative capabilities of AI. "Glitches" - digital distortions and imperfections - become in her work a metaphor for human perception and the difficulties in understanding complex technologies such as artificial intelligence. Tau uses it as an artistic tool, creating visions on the borderline between dream and reality, inspired by Lithuanian landscapes and mythology.

Anna Ridler, on the other hand, in her project *Mosaic Virus* (2018), introduces a reflection on history and capitalism, using AI to create surreal representations of tulips whose shapes and colors are dynamically changed depending on the volatility of the bitcoin exchange rate. Ridler refers to the "tulip fever" of the 17th century - the first known speculative bubble. In doing so, she draws parallels between past financial obsessions and the modern cryptocurrency market. Her project is not only aesthetically intriguing, but also critically examines the relationship between technology, economics and culture, raising questions about beauty, manipulation and history. All of these works explore the limits of contemporary generative art and invite the viewer to reflect on the relationship between human creativity and machine precision.

DESERT OF POSSIBILITIES?

While the development of artificial intelligence and its application in the arts opens many new doors, it also brings fundamental ethical and environmental questions. Good hardware, training our own models or fine-tuning (enriching existing models with our own data) confront us with dilemmas of environmental impact. ChatGPT's generation of a 100-word text consumes about 500 ml of water, according to a widely cited article titled Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models from 2023. Data-training centers, sprouting up like mushrooms, are increasingly located in semi-arid areas where access to natural resources was already limited. These large facilities consume huge amounts of energy and water, which is needed to cool the servers. The cost of such operations is often borne by the local community, as described by the author of an article titled, AI Is Taking Water From the Desert (*The Atlantic*, 2024). Artist Ivona Tau notes that the training of small models by artists has minimal impact on the environment, and that responsibility for climate degradation lies mainly with corporations, which train huge models on an unprecedented scale. However, artists can remind people of this responsibility and put pressure on technology corporations to act more sustainably.

Is AI art, however, less environmentally friendly than traditional techniques? One might assume so, due to the scale and accessibility of the solutions. It is worth noting, however, that traditional painting requires hundreds of hours spent in front of the easel, the use of canvases, paper, and sketching paints, trials, learning, and the transport of works to exhibitions also generates a carbon footprint. While as a society we are increasingly adopting principles of consumption reduction, the criterion of sustainability is still not widely applied in art. Both physical works and the large-scale, interactive installations that have become popular in recent years may seem somewhat excessive, a point that artists and curators are increasingly discussing (including the creators of the exhibition New Art Ecosystems, who critically examine themselves and the art they produce, asking whether it can be zero waste).

Ilustration 1.4. *FLORA SOLARIS*, Ivona Tau (2021).
Source: https://ivonatau.com/

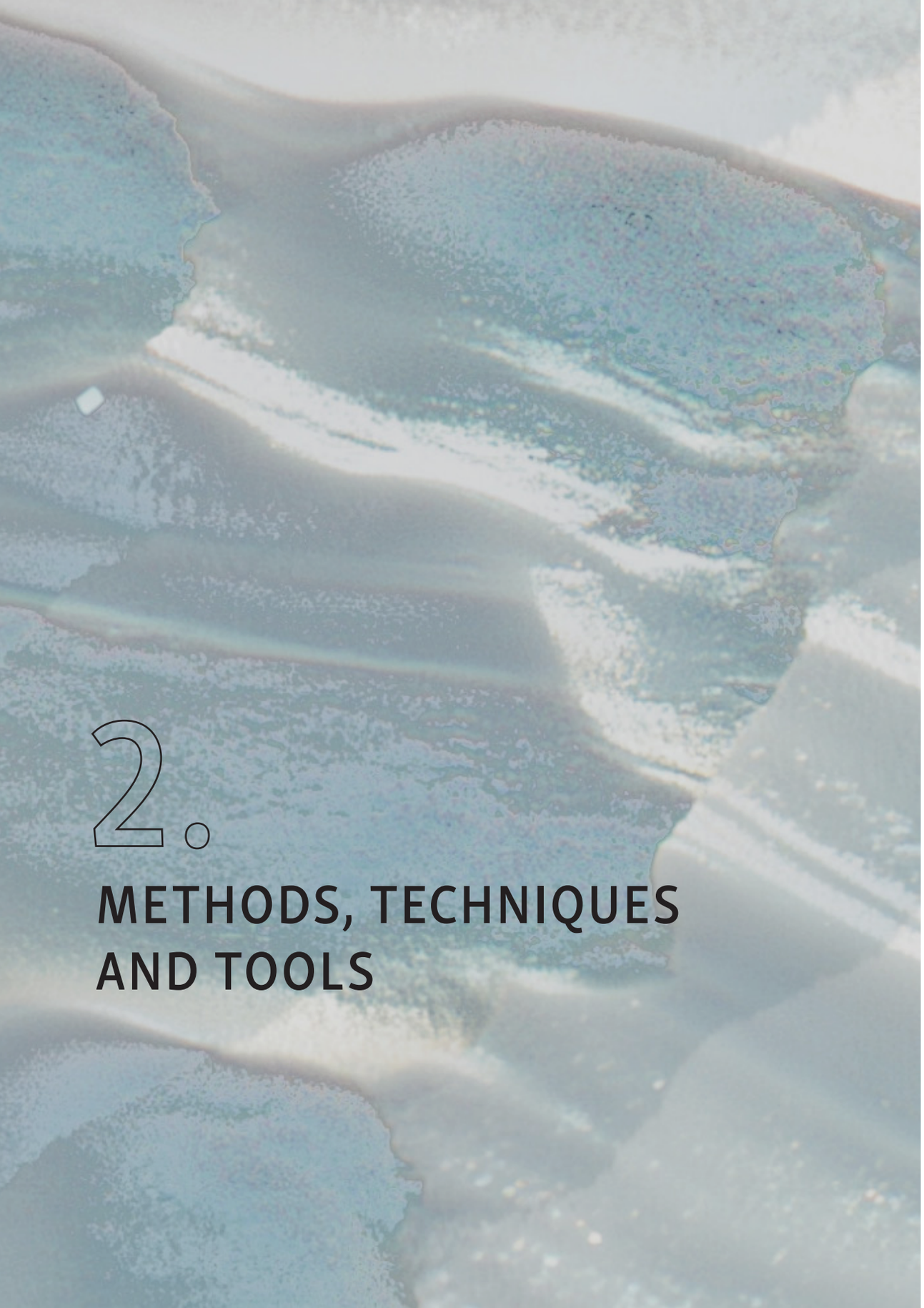
Ilustration 1.5. *Distributed Consciousness*, Memo Akten (2021).
Source: https://www.memo.tv/

Ethical issues also concern questions about global supply chains in technology. Training AI models requires the preparation, labeling, and moderation of vast amounts of data. They are often people from African countries, working in difficult conditions for minimum wage, as shown in a 2023 report by Time magazine titled Exclusive: OpenAI Used Kenyan Workers on Less Than $2 Per Hour to Make ChatGPT Less Toxic.

Another issue is feeding models with data that do not take diversity and inclusivity into account, based on stereotypes, against which Kenyan designer and artist Malik Afegbua protests in his work The Elder Series (2022). The issue of the stereotypical nature of available models is also addressed in the work of Polish artist Agata Lankamer. Activists around the world are also increasingly drawing attention to this, trying to create open, inclusive, non-European or non-American-centric databases. One such organization is Open for Good Alliance.

Despite these challenges, AI offers unique opportunities for previously excluded creators around the world. People who, due to a lack of technical skills, time, or funding, were previously unable to create their own narratives and present their point of view now have a chance to change that. For example, women (and I'm including myself here) who often take on caregiving roles have gained, thanks to AI, a tool that shortens the time needed to realize ideas, acting as an accelerator of creativity. Just like conceptual or digital art in the 1960s, generative art has not yet been dominated by a single group of artists, giving women a greater chance to break into the mainstream. This constitutes a significant counterpoint to traditional fields such as painting or sculpture, where women's works are still often categorized as feminist art and reduced to themes related to femininity, motherhood, or emancipation.

Ilustration 1.6. *The Elders Series*, Malik Afegbua (2022).
Illustration: https://malikafegbua.com/



2. METHODS, TECHNIQUES AND TOOLS

AI-based tools open up wide creative possibilities for artists, but the choice of the appropriate method depends on the level of advancement, available resources, and the specifics of the project. Technical skills, appropriate equipment, and time for experimentation are of key importance. Currently, three basic methods of using AI in art can be distinguished, differing in the level of control over technology, databases, and the required technical knowledge. The greater the control over the process, the greater the originality of the generated works in terms of copyright, because the creator often uses their own works—photographs or paintings—as well as resources from the public domain to train the models.

METHOD 1. Creating your own models: the most advanced method, requiring programming skills, knowledge of neural networks, and access to high-end hardware. It involves building AI models (e.g., GANs and DeepDream) from scratch, allowing artists full control over the creative process. This solution is for those who are familiar with programming and AI algorithms and want to explore the boundaries of AI capabilities by creating unique tools tailored to their own needs.

METHOD 2. Fine-tuning existing models: adjusting already existing AI models using tools such as Stable Diffusion software by introducing your own data. Fine-tuning allows for the personalization of generative results and their adaptation to specific aesthetics or contexts. This is a solution for artists who have a technical inclination, as setting up Stable Diffusion on their own computer requires time and skills. An alternative is to use the paid cloud version of Stable Diffusion available on the rundiffusion.com platform.

METHOD 3. Using available online platforms: the simplest way to utilize AI in art requires only a basic understanding of the functions available on online text-to-image platforms, such as MidJourney, LeonardoAI, Runway, or DALL-E. The user inputs commands (prompts), and the platform generates visual, audio, or text content. It's a good option for people starting their journey with AI or working on projects with a short

turnaround time. However, attention should be paid to the issue of copyright for images generated in this way.

ALTERNATIVE METHOD: model hacking – another, still relatively unpopular solution, could be feeding existing text-to-image platforms with data from the public domain or one's own. This process, reminiscent of "hacking" the system, expands the models' resources and allows for influencing the obtained results, making the generated images more ethical from a copyright perspective. This method serves both as a form of creative experiment and as a reflection on the transparency and ethics of generative technology. I described the application of this method in detail in chapter 3 of this publication.

RECOMMENDED TOOLS AI

Although there are thousands of AI tools available for creating art, in practice, those that meet specific criteria work best. When selecting the tools, I was guided by three key aspects:

1. Recommendations from other creators. Opinions of artistic individuals (including Ivona Tau and Agata Lankamer), who have already used the given technology, were extremely valuable to me. Thanks to their experiences, I was able to focus on the most effective solutions and identify truly useful and accessible AI tools.

2. Free or low cost in relation to quality. AI tools can generate high costs, so I recommend those that offer the best price-to-quality ratio. Many platforms offer free trial versions, which allows you to start experimenting without significant investments. Currently, the basic subscription for one platform costs around $120/year, but prices and business models may change.

3. Security and relatively transparent GTC (General Terms and Conditions) and licenses. When selecting tools, I prioritized their security and transparency, also paying attention to the laws in the country where the company is registered. However, at the current stage of technology and law development, the licenses and terms of use of many popular platforms still raise doubts. When sharing materials generated by AI, if our creative input is not sufficient to obtain copyright, they should be appropriately labeled as "created using AI."

The choice of AI tools for creation requires critical thinking and attentiveness to changing rules and technological capabilities. Given the current state of law and technology, it is necessary to carefully label generated materials and monitor changes in licenses.

TEXT TO IMAGE AI GENERATORS

Adobe Firefly — paid models and services on which AI extensions in the Adobe suite are based, supporting the generation of images, textures, and effects (including GenerativeFill in Adobe Photoshop). Adobe Firefly has been trained only on content for which the company holds rights or permissions • https://firefly.adobe.com/.

Civitai — an open community library where users can find and share models, settings, and styles for Stable Diffusion. A downside may be the stereotype-based content of the library • https://civitai.com/.

DALL-E — OpenAI generative model. Useful for visual experiments and illustrations, it allows for the creative combination of styles and objects in unexpected ways. DALL-E 3 is integrated with Microsoft services such as Copilot and Bing, allowing free use of its features with a limit of 30 graphics per day • https://openai.com/index/dall-e-3/

Leonardo AI — a generative AI platform for creating high-quality images, with the ability to stylize and customize compositions. Partially free, artist and designer-friendly thanks to an intuitive interface and various image generation options • https://leonardo.ai/.

Midjourney — popular but paid AI tool that generates images based on text descriptions. It is characterized by very high quality, unique aesthetics, versatility, and a user-friendly interface • https://www.midjourney.com/.

RunDiffusion — a paid cloud service that allows you to work with Stable Diffusion without the need to install software. Option for those without advanced computer hardware and technical skills • https://rundiffusion.com/.

VIDEO AI GENERATORS

Haiper 1.0 — free tool for beginners to create semi-realistic videos based on reference images • https://haiper.ai/.

Pika Art —an AI video generation tool with less realism than other models, but sufficient for rapid prototyping • https://pika.art/.

Runway — paid, quite advanced generative tool for creating and editing videos, animations, and visual effects. It allows for transforming text into high-quality videos and creating films and special effects based on reference images • https://runwayml.com/.

Topaz Video AI — paid software for improving photo and video quality. It uses AI for resolution scaling, noise reduction, and image stabilization, useful in post-production • https://www.topazlabs.com/.

TEXT AND AUDIO TOOLS

ChatGPT —advanced, partially free language model based on GPT architecture, created by OpenAI. Supports the creative process and the creation of prompts for text-to-image platforms • https://chatgpt.com/.

Claude — a language model created by Anthropic, known for high-quality text generation and support in creative writing. Useful for artists, writers, and researchers • https://claude.ai/.

Copilot — an advanced, AI companion created by Microsoft. Helps enhance knowledge, supports productivity tasks, and offers creative solutions. • https://microsoft.com/copilot

ElevenLabs — partially free speech synthesis tool, capable of generating a natural, emotional voice. It allows the creation of narration, audio description, and sound effects • https://elevenlabs.io.

ADVANED PLATFORMS AND TOOLS

Google Colab — cloud platform for running Python code without the need to install local environments • https://colab.research.google.com/.

Stable Diffusion — a series of open-source models released by Stability AI. These models are available for free. They allow the creation of high-quality graphics based on text prompts, with a high level of control over parameters and styles. They require advanced technical skills and high-end computer hardware • https://stability.ai/.

INSPIRATIONS

Malik Afegbua — Nigerian artist and filmmaker, using AI to redefine the narrative about Africa and break stereotypes. In *The Elder Series* (2019), he portrays elderly people in stylized "photographs," challenging ageism and presenting them in a positive light while simultaneously celebrating beauty and fashion. More: https://malikafegbua.com/

Memo Akten — Turkish artist and AI researcher who explores the boundaries of human perception and machine understanding of the world. In his projects, such as the *Learning to See Series* (2017–), he analyzes how neural networks "learn" to see, creating images that are a blend of visual data and machine perception. His works highlight the subjectivity of vision and the differences between human and machine interpretations of reality. More: https://www.memo.tv

Refik Anadol — Turkish digital artist, known for creating immersive installations that combine vast data sets with advanced visual technologies. In *Machine Hallucinations — Space: Metaverse* (2019), he used data related to space to create abstract images exploring the boundaries of perception and narrative about the universe. More: https://refikanadol.com/

Sofia Crespo — AI artist from Argentina, specializing in bio-art and generative art. Her works, inspired by the natural world, create digital ecosystems that explore the complexity of nature and its hybrid forms. In projects such as Neural Zoo, Crespo explores the boundaries between organicity and artificiality. More: https://sofiacrespo.com/

Holly Herndon i Mathew Dryhurst — a duo of artists who explore the role of artificial intelligence in music and society. In the PROTO project (2019), they created an AI named Spawn, which co-created music with them, exploring the boundaries between human and machine creativity as well as questions of collectivity and contemporary understanding of authorship.

Mario Klingemann — a pioneer of AI generative art, exploring the boundaries of machine creativity and their capacity for introspection. In projects such as *Memories of Passersby I* (2018), he generates infinite portraits of fictional people in real-time, questioning traditional definitions of authorship, memory, and identity in art. More: https://www.quasimondo.com/

Agata Lankamer — Polish new media artist, exploring AI aesthetics and narratives, focuses on the errors and imperfections of artificial intelligence. She creates projects that explore how AI interprets human creativity and raises questions about the relationship between humans and machines. More: https://www.instagram.com/agalanka/

Ivona Tau — Polish AI artist and photographer from Vilnius. Her works combine human creativity with the generative capabilities of machines. In the project *Mythic Latent Glitches* (2019), she explores the boundaries between reality and artificiality, using glitch as a metaphor for perception and the difficulties in understanding technology. More: https://ivonatau.com/

Anna Ridler — an artist combining artificial intelligence with historical, economic, and natural themes. In the Mosaic Virus project (2018), she uses AI to generate visions of tulips that change according to the Bitcoin exchange rate, provoking reflection on contemporary capitalism and the beauty of manipulation. More: https://annaridler.com/

Koniec wojny (2023), David Sypnievski, Agnieszka Ryass — a project that explores the boundaries of generative AI in the reinterpretation of archival war photographs. The creators expanded the frames using AI tools, thereby deliberately inducing errors that added surrealism and generated new meanings. The project critically comments on the specifics of AI, raising questions about authorship, realism, and visual narratives. More about the project: https://www.dsignn.online/nr3-2024

The Frost (2023) — a film created by Waymark, in which each scene was generated using the DALL-E 2 model from OpenAI. This film showcases the unique aesthetics and possibilities that AI brings to filmmaking. At the same time, it highlights the challenges associated with achieving photorealistic accuracy. Film: https://www.youtube.com/watch?v=IgPvoPBrlTE. More: https://www.technologyreview.com/2023/06/01/1073858/surreal-ai-generative-video-changing-film/

WONDER WOMAN — 1950's Super Panavision 70 (2024) — an example of one of the many fan-made remakes of well-known films, available on the YouTube platform. The popular cinematic hit has been altered to reference the aesthetics of the 1950s, particularly Super Panavision 70 (Technicolor colors, wide-angle shots). Film: https://www.youtube.com/watch?v=rYGyuOmYmxk

Olympus Got: Celestial Runway (2024) — an example of one of many films created by AI, simulating a fashion show, unconstrained by the laws of physics, inspired by Greek mythology. Film: https://www.youtube.com/watch?v=ThqtXoj3lDE.

Visualising AI — the Google DeepMind initiative, which aims to broaden the discussion about artificial intelligence through collaboration with various artists. The aim of the project is to create open, accessible images that make AI more understandable to the general public. More: https://deepmind.google/discover/visualising-ai/.

The Most Complete Anthology of the Greatest Non-Existent Artists of the Last 100 Years (2023), Roberto Beragnoli — the project combines literature, artificial intelligence, art history, documentary film, and traditional artistic creation. Using popular AI tools, the artist created detailed biographies of one hundred fictional artists, encompassing their artistic styles and hypothetical impact on art history. The project includes photographs and documentary films presenting these narratives, as well as physical realizations of the described works, questioning traditional notions of authenticity in art. YouTube film:https://www.youtube.com/watch?v=xWxGDl6Od2k&t=3s, project description: https://www.lumenprize.com/moving-image-award-finalists-2024/roberto-beragnoli.

Loreart.com (Alternate history) — a portal where you can find AI-generated examples of alternative (speculative) history illustrations, including, for example, Napoleon's entry into Moscow on mammoths. More: https://loreart.com/tag/alternate-history. Example of an educational scenario titled "Alternative Worlds — Interactive Stories with AI": https://biblioteki.org/app/uploads/2024/04/Alternatywne_swiaty_interaktywne_narracje_z_AI_scenariusz.pdf.

Article titled Controversies Surrounding AI-Generated Art: The Future of Creativity or the Replacement of Human Talent? The article is available on the website https://stationof.art kontrowersje-wokol-sztuki-generowanej-przez-ai/?srsltid=AfmBOoqgm6cVhdNodazum2VNi8mkrjtlyf6p7zcL1CNgLcXr0XwBv0YK

A conversation with artists Ivona Tau and Agata Lankamer (November 2024) about artistic strategies, tools, ethics, and ecology titled "[A] inspirations." New Horizons of Visuality in the Age of Artificial Intelligence," available on the YouTube platform: https://bit.ly/AI-art-discussion-2024

AI-based tool search engine: https://www.futuretools.io/

3.

ARTISTIC RESEARCH PROJECT *AI MIRROR: EVERYTHING DIFFUSION*

The knowledge gained during the KPO stipend activities was applied to create a multimedia installation that presents selected formal aspects of AI-generated images, highlighting the limitations of technology and models. I was particularly interested in **how generative artificial intelligence (AI) influences aesthetics and creative processes in contemporary art, as well as its limits and possibilities as an artistic tool.** Clarifying research questions concerned:

Aesthetic features of AI art. What characteristic visual features (e.g., glitches, blurs, symmetry distortions) define the aesthetics generated by AI? Can these features be interpreted as a new form of visual language?

AI self-awareness in creative processes. Can and how can generative models be provoked into "self-reflection" about their own limitations and errors?

Technological limitations. How do the technical limitations of AI models affect the creative process and its outcomes? Can these limitations be transformed into a valuable artistic tool?

Impact on the environment. What are the ecological consequences associated with the use of generative AI in art? How can these aspects be incorporated into the creative process?

The issue of transparency and ethics. How does the lack of transparency in databases and their impact on the aesthetics of generative AI models shape the artistic discourse?

The research problem thus concerned the critical understanding of the place of generative AI in contemporary art: its potential, limitations, and impact on aesthetics, the environment, and society. The creative process was iterative — the knowledge gained from the field of AI drove further tests of solutions and tools, and the experiences resulting from these experiments influenced the development and shaping of the final form of the installation. This feedback loop between exploration and creation was the essence of the project. During the process, I applied a methodology based on artistic research, which included: netnography (Kozinets, 2009), that is, the systematic

collection of examples of AI works from the internet, their gathering and categorization on the Pinterest platform, autoethnography in the form of sketches and notes, testing AI tools (including Leonardo AI, MidJourney, Runway, ElevenLabs) and their creative possibilities.The inspiration for the research and the formulation of the research problem was the medium specificity approach, whose roots can be traced in the medium theory based on the observations of Marshall McLuhan and the writings of Clement Greenberg and Rosalind Krauss. This approach focuses on the key issue of medium and its impact on the message, the work, and the audience, which is crucial for artists. Currently, this approach is sometimes used (Kinder and McPherson [eds.], 2014) to study intermedial and hybrid art, and it can complement media studies and sociological perspectives.

The installation serves as a visual critical essay that both documents and deconstructs the aesthetics of generative artificial intelligence. It provokes questions about the boundaries of contemporary visual art and intellectual property, examining the potential and limitations of AI in creative processes and pointing to new directions in the dialogue between art and technology.

The installation also serves as a critical commentary on the lack of transparency in popular generative AI models. To create it, I used nature photos—glaciers, snow, ice, and water—available in the public domain (CC0) through platforms like Pixabay and Unsplash. These photos served as reference images in MidJourney, allowing for the "hacking" of an opaque database and enriching it with legal, open-source materials. These references not only supplemented the model's database but also introduced more ethical, consciously selected content, which helped neutralize controversies related to the unconscious use of others' work. In this way, open data entered into a dialogue with the closed, non-transparent MidJourney database, resulting in a doubly hybrid work.

Such an approach also gave me greater control over the generated images, their style, composition, content, and origin. The use of nature photos, which in the era of climate warming is undergoing accelerated erosion, aimed to draw attention to the ecological costs of AI and their destructive impact on the environment. The images were generated based on reference photos, but also on prompts (i.e., commands for the AI). In these prompts, I described the errors and hallucinations of AI, such as glitches, blurriness, spatial distortions, and symmetry disruptions, which define the AI's aesthetics. In this way, I provoked the model to visualize its own errors and imperfections, thus leading to self-reflection and engaging in a creative game with its self-awareness. The images generated in this way became both the result of the experiment and a commentary on the system's operation. It was a kind of dialogue between me and the technology, where on one hand I had more control over the effect, and on the other hand, I still had to accept the unpredictability of the algorithm.

The method used can be compared to *guerrilla gardening*, which is the spontaneous planting of plants in developed urban spaces. My method changes the structure of AI "from the inside," introducing something new into its ecosystem. This organic, critical approach has allowed me not only to create multidimensional hybrid images but also to reflect on the impact of technology on contemporary culture and art. This experimental approach can be seen as a form of critical art, where the creative process becomes a commentary on technology itself. It refers to art based on hacking, system intervention, or working with non-transparent structures, such as interventionist, digital guerrilla art, and the works of artists like Joan Heemskerk and Dirk Paesmans (JODI), Eva and Franco Mattes (0100101110101101.org), Heath Bunting, Ryoji Ikeda, or Cory Arcangel. Moreover, my method refers to hacking not only technological but also cultural — by introducing images that represent the beauty of nature, it raises questions about the ecological costs of AI and the limits of machine creativity.

The title of the project, AI Mirror: Everything Diffusion, refers both to the technical process of image diffusion in the stable diffusion model on which MidJourney is based, and to the metaphorical spread of technology's influence on culture, aesthetics, and the environment, as well as to a kind of diffusion of the natural environment, authorship, and art under the influence of AI.

The installation is available on the YouTube portal: https://bit.ly/AI-mirror-art-EN

Illustration 3.1, 3.2. and **3.3.** Public domain photos from Unsplash and Pixabay, used in the project as reference images for MidJourney.

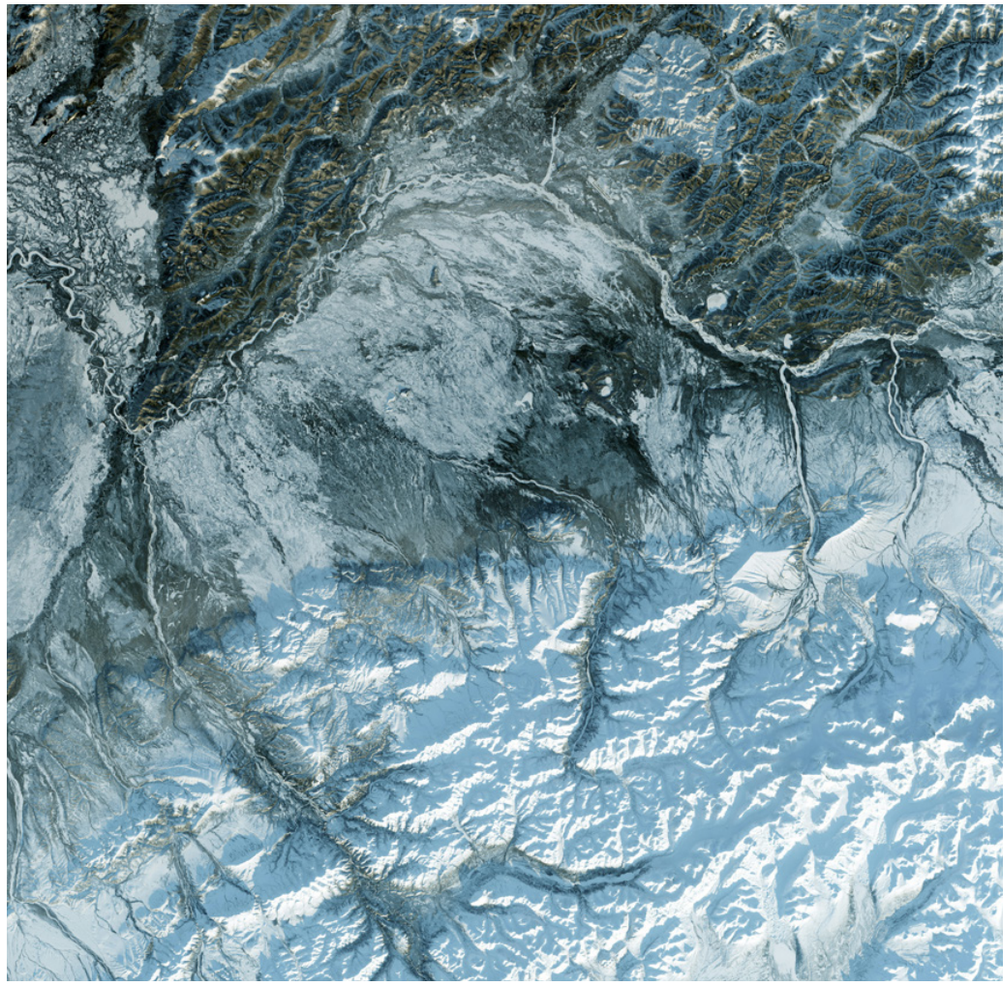


Illustration 3.4, 3.5, and 3.6. Public domain photos from Unsplash and Pixabay, used in the project as reference images for MidJourney.

THE COURSE OF THE CREATIVE PROCESS

Netnography and documentation

- Systematic collection of examples of AI generative art in the online space, such as platforms, digital galleries, and social media (Pinterest).
- Identification of typical visual and aesthetic patterns, such as glitches, irregular gradients, or symmetry distortions, characteristic of generative AI models.

Concept and theoretical research

- Developing an idea for a multimedia installation using personal reflections, notes, and AI tools such as ChatGPT and Copilot.
- Analysis of scientific and journalistic texts concerning AI aesthetics and medium specificity.
- Interviews with female artists working with AI to learn about their experiences and challenges.

Description of AI aesthetics and preparation of materials

- Creating a list of key aesthetic features of AI based on research and interviews, including: glitches, blurs, symmetry disruptions, and schematicity resulting from technological limitations.
- Preparation of precise prompts in ChatGPT and MidJourney, describing identified aesthetic features.
- Selection of nature photos, such as glaciers, snow, and water, from the public domain (Pixabay and Unsplash), which served as reference images in the visualization generation process.

Experiments with generative AI and creating visualizations

- Generating images in MidJourney based on prompts with attached reference images.
- Editing selected images using tools such as Photoshop (Generative Fill) and MidJourney (Inpainting).
- Preparing prompts for creating animations in Runway, which allows for the creation of videos based on static images.

Editing and post-production

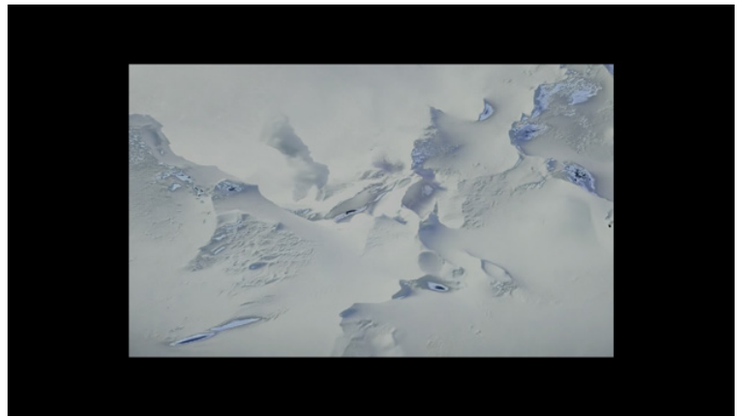
- Editing the installation in Adobe After Effects, including the addition of visual effects (VFX) and the unification of color grading and lighting.
- Creating AAA-level audio descriptions using ElevenLabs, which makes the project accessible to blind and visually impaired people.
- Remixing sounds and musical fragments from the public domain (Pixabay), adapted to the visual narrative of the installation.

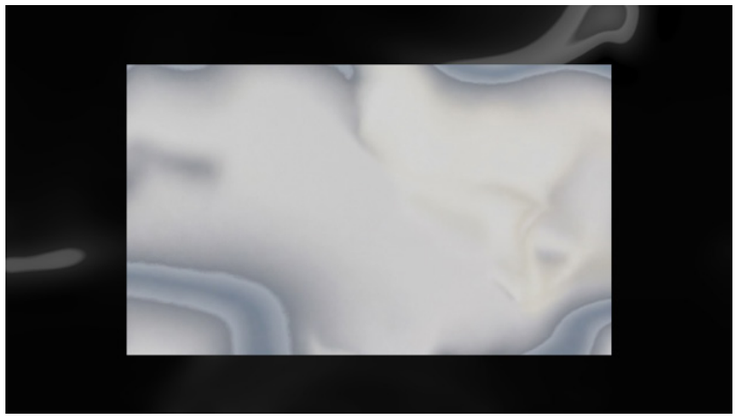
Presentation and reflection

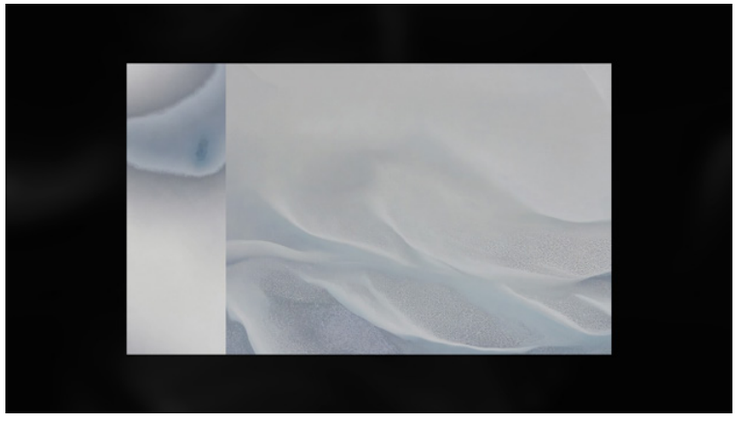
- Sharing the installation on websites and platforms like YouTube and Instagram (fragments).
- Analysis of generated images and videos in the context of contemporary art, ecology, and the dialogue between humans and machines.
- Analysis in the form of a text on the limits of technological creativity and the possibilities of "hacking" non-transparent AI models by feeding them legal, open-source data.

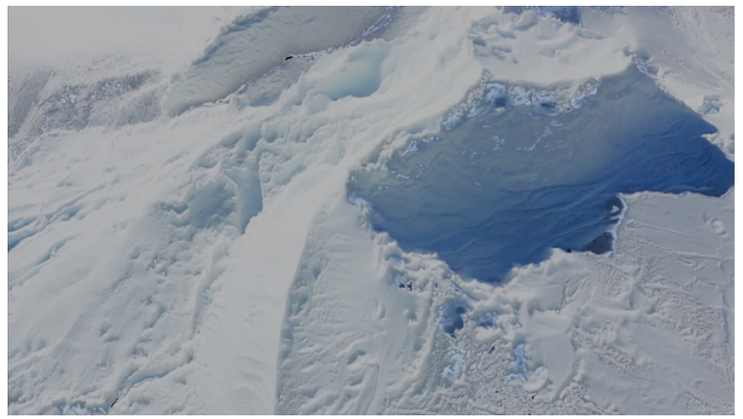
The artistic-research process presented above reveals the potential of AI as a creative medium and a tool for critical analysis of the relationship between humans and machines. An inclusive approach, involving the creation of audio descriptions and the integration of various technologies, increases the project's accessibility while simultaneously pointing to new directions in new media art.

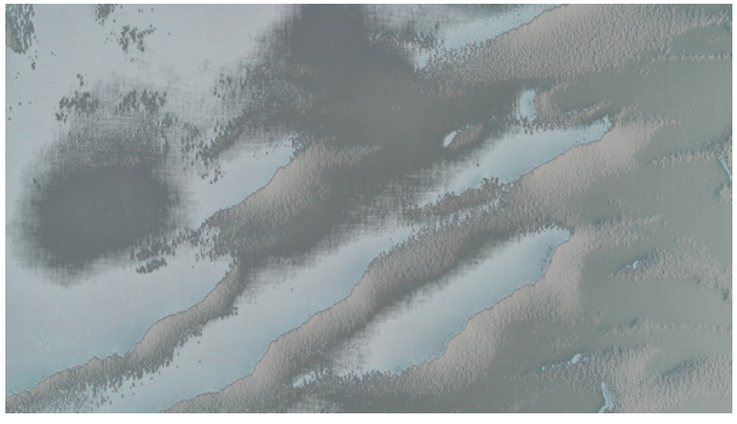
INSTALLATION
— CHOSEN KEY FRAMES

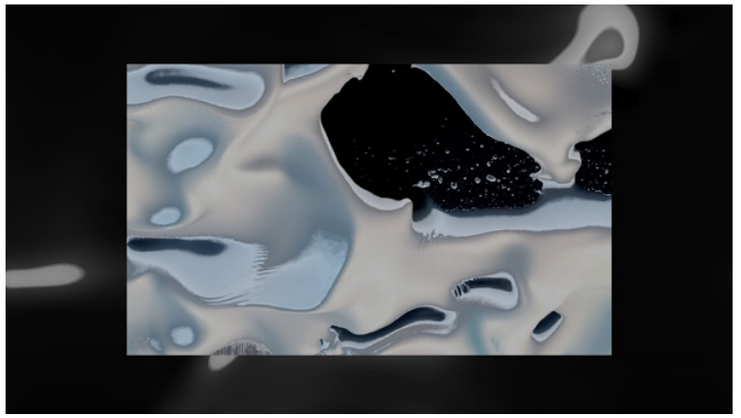


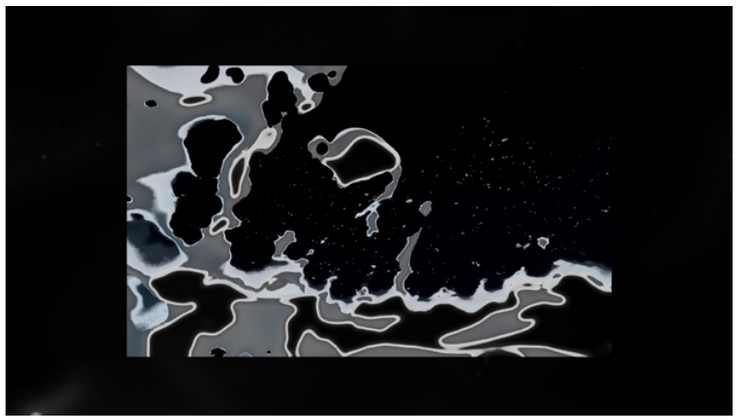


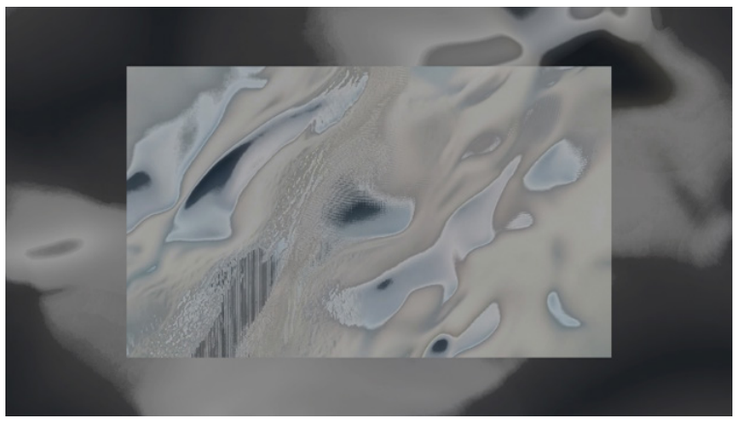












INSTALLATION IN EXHIBITION SPACE

SUMMARY

Artificial intelligence is currently one of the most rapidly developing areas of technology. It creates enormous opportunities, but also poses serious ethical, social, and environmental challenges. In generative AI art, tools such as deep learning and diffusion models enable artists to explore new forms of expression, redefining the boundaries of creativity and technical craftsmanship. At the same time, they raise questions about the essence of creativity: who is the author of the work, where does the responsibility for data usage lie, and what are the boundaries of collaboration between humans and machines.

Technologies such as generative AI act like a barometer of our times, sensitizing us to social and technological changes, but also provoking speculation about the future of art. The works of artists such as Mario Klingemann, Anna Ridler, and Memo Akten show how artificial intelligence can simultaneously inspire, document, and deconstruct the surrounding reality. Creating art with AI is a process that allows not only for rapid prototyping and experimentation with new forms of aesthetics but also for deeper reflections on the human-machine relationship.

In my artistic and research project *AI Mirror: Everything Diffusion*, created as part of a scholarship, I paid particular attention to the issues of AI model transparency, their aesthetics, and their environmental impact. Creating a multimedia installation using open visual data, I posed questions about how AI transforms data while simultaneously provoking the model to self-reflect by describing its own errors in the prompts. This action not only explores new creative paths but also serves as a critical commentary on the dominance of non-transparent AI systems created by corporations that insufficiently address the ethical aspects of the trained models.

At this moment, it is difficult to find a definitive answer to the question of whether AI will restore the value of traditional art—physical, imperfect, tactile artifacts—or rather accelerate the digital revolution. At this moment, perhaps the most significant contribution of AI to art is its potential to redefine creation as a collaborative process—a hybrid one in which humans and machines interact rather than compete. The future of art — much like the future of AI itself — remains open, full of both challenges and opportunities.

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DESIGN AND TEXT COMPOSITION
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TRANSLATION
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