

The background is a complex digital collage. It features a central dark, textured shape resembling a rock or a piece of ancient parchment. This central element is surrounded by various geometric and organic shapes in shades of blue, yellow, and white. There are also faint, stylized green plant-like motifs. The overall aesthetic is modern and digital, with a focus on layered, overlapping elements.

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ALGORITHMIC *imaginary*

**Art on the Blockchain and
in the Metaverse**

Christoph Merian Verlag

Art and

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INTRODUCTION

This publication is both a catalogue and a theoretical compendium to two joint exhibitions on the topic of Web3 and decentralization presented at HEK (House of Electronic Arts) in Basel. The exhibition *Exploring the Decentralized Web - Art on the Blockchain* examines the dynamics and mechanisms of blockchain technologies, as well as their economic, social, and cultural significance. The exhibited works test the creative potential of the blockchain by experimenting with the parameters of smart contracts and raise questions about controversial issues that the technology entails. The exhibition *Collective Worldbuilding - Art in the Metaverse* explores collaborative practices specific to the Web3, in particular activities in online virtual spaces called metaverse and the creation of decentralized autonomous organizations (DAOs). The exhibited projects creatively occupy online virtual spaces to tell stories and address issues related to the development of decentralized technologies or explore the application of DAOs for the collective management of creative content in the arts.

What links the themes addressed in the two exhibitions and in this publication? The answer is blockchain, decentralization, metaverse, and DAOs. These are technologies, concepts, and applications that revolve around the idea of the Web3, or decentralized Web, considered by some to be as much a revolution as the evolution from Web 1.0 to Web 2.0. We must bear in mind that these designations are arbitrary conventions: the Web is not an edition-changing program like software or an operating system. We must therefore take these labels

with a grain of salt as long as they are not accepted by most users. The transition from Web 1.0 to 2.0 was characterized by the multiplication of participative applications and interactive content managed by users; social networks were exemplary of this transformation and today the terms are commonly accepted. It takes a consensus for the attribution of an evolution to be recognized, but there is still no consensus on the characteristics that describe a new generation of the Web. Tim Berners-Lee, James Hendler and Ora Lassila suggested that the future generation of the Web will be characterized by metadata that make online content analyzable by programs, a phenomenon they called the semantic Web, and some referred to as Web 3.0.⁽¹⁾ This process is not yet fully realized. On the other hand, promoters of blockchain technologies consider decentralization as a revolution that justifies the naming of a new generation of the Web; the term Web3 was proposed by Gavin Wood, co-founder of Ethereum and the Web3 Foundation.⁽²⁾

ARE WE ON THE THRESHOLD OF A NEW INTERNET REVOLUTION?

A revolution that justifies the designation, albeit artificial, of a new Internet must, after all, pass the test of time and users. We can ask ourselves whether blockchain technology has therefore substantially altered the use of the Internet and the online behavior of the majority of the population to justify the attribution of a third iteration. Blockchain technology was created primarily to solve the problem of how to carry out currency transactions without an intermediary body guaranteeing their verification. The cryptocurrency Bitcoin designed by

Web3

Decentralization Put to the Test

the mysterious Satoshi Nakamoto is considered the first real functional application of blockchain technology.⁽³⁾ However, blockchain technology can be applied to other purposes, as blockchain advocates often note. Ever since Ethereum's blockchain implemented the ERC-20 token enabling smart contracts and the ERC-721 non-fungible token, the market for digital works has surged and seen the multiplication of online platforms for buying and selling digital assets whose authenticity is guaranteed by their identification with non-fungible tokens (NFT). Another famous example of applications enabled by the blockchain are Decentralized Autonomous Organizations (DAOs), i.e., organizations whose decentralized, non-hierarchical structure is guaranteed by rules and decision-making mechanisms inscribed in automated contracts registered on the blockchain. Existing well before the appearance of blockchains, decentralized organizations have been identified as effective systems in different fields; entrepreneurs and economic analysts Ori Brafman and Rod Beckstrom, in their publication praising the benefits of such organizations, state that "In many arenas, a lack of traditional leadership is giving rise to powerful groups that are turning industry and society upside down."⁽⁴⁾ With the arrival of blockchains, such organizations have found a technology that has enabled not only decentralization but also algorithm-based autonomy. DAOs thus offer a meeting point between blockchain technology and the organization of autonomous, online communities, while exemplifying the crypto-anarchist ideology that characterizes the philosophy of decentralization. The commerce of virtual assets and the use of cryptocurrencies could not flourish,

on the other hand, without the existence of spaces that justify these trades beyond mere collecting and financial speculation. This is how several online virtual spaces have emerged that offer social activities while encouraging trade in digital goods by introducing the possibility of using cryptocurrencies through the integration of cryptocurrency wallets. The term metaverse has been eagerly used to define these spaces, although most of them are far more limited than many previously existing online virtual worlds. Such online spaces are not only inhabited by the avatars of real users, but also by non-human agents and complex mechanisms governed by artificial intelligence (AI), whose multiple applications are making exponential progress. A metaverse without AI is therefore not possible.

This leads us to understand how the subject of Web3 touches on aspects such as cryptocurrency trading, production of digital assets sold as NFTs, creation of metaverses and DAOs, online identities, as well as progresses in artificial intelligence. These developments have certainly brought about considerable innovations and are transforming various economic and cultural sectors, although it is still difficult to assess the true extent and durability of these transformations for society. The artistic projects presented here are therefore to be seen as a laboratory for asserting the concept of the technological revolution that the Web3 wants to be. And who better than artists to put a revolution to the test? On the one hand, artists can afford the most visionary endeavors. On the other hand, artists working in the digital sphere have the tools to understand these technologies in depth, and to create new usages for them.

And this is where the revolution can take place, namely in the spaces of experimentation, assimilation, and transformation. When a technology is appropriated by a large segment of the population and employed for needs not imposed but determined by its users, we can then consider that it has contributed to a tangible revolution.

OF BLOCKCHAINS AND NFTS

In the context of digital art, blockchain technology has enjoyed spectacular success with the creation of smart contracts, which are mainly used to sell digital assets in the form of non-fungible tokens (NFTs). The economic success of NFTs has certainly had an impact on the art market, although the impact has eased in recent months. Most works marketed through NFTs are images or videos that are not registered on the blockchain; the NFT contract simply refers through a link to the related work located on a particular server. Some artists, on the other hand, have experimented directly with the mechanics of blockchain and smart contracts to create conceptual works. RHEA MYERS is considered among the first artists to create conceptual on-chain works, often subverting the market logic and mechanisms underlying the functioning of blockchains, sometimes emphasizing their limitations, sometimes playing with their dynamics to create poetic or paradoxical results. Myers' works—*Is Art* (2014) and the more recent *Is Art (Token)* (2023)—allow users who intervene with each new transaction to decide whether to change the instruction of the smart contract, alternating the state of the contract with the consequent public information affirming the work to be art or not. AMANDA E. METZGER uses the large language model GPT-3 to write an intimate journal, *Ever* (2023), in which every memory is saved (minted) on a blockchain, thus opening a debate on future applications combining artificial intelligence and blockchain. SARAH FRIEND has created works in the form of NFTs that test the aspirations of purchasers, often linked to economic speculation: her *Lifeforms* (2021-ongoing) only survive if they are regularly resold, regardless of whether the sale generates profit or loss for their owners, who must decide whether to keep these digital entities alive even at the risk of losing profit. Friend's recent installation constitutes a sort of graveyard for the life forms that have meanwhile ceased to exist. CONSTANT DULLAART's *Aura.lol* (2022) enables the creation of a collective NFT artwork in the

form of a generative manifesto, thereby blurring the distinction between art collectors and creators. OPERATOR, a duo composed of Ania Catherine and Dejha Ti, interweaves body performance with blockchain: *Human Unreadable* (2023), described as a three-act experiential artwork. Operator developed an on-chain generative choreography method, and then used the motion data from the dances to generate images. These were sold on the Art Blocks platform. The first 100 collectors who purchased NFTs in the series will register their acquisitions on Operator's website and automatically generate a second token—a choreographic score—that will be performed live. LEANDER HERZOG and MILIAN MORI released *DOM1* (2023), a series of 256 generative NFTs, on fx-hash. The artists exploit the variables and HTML elements of the Document Object Model (DOM), an interface and representation model for documents on the Web, to generate an infinitely changing document accompanied by audio synthesized by its generative elements. The work is emblematic of a production of generative and programmatic art that has a long history, and is partly also related to the glitch art that broke out in the 1990s and is enjoying renewed success among artists active in the production of NFTs.

WEB3 AND THE IDEOLOGY OF DECENTRALIZATION

The ideology associated with Web3, based on the concept of decentralization, is promoted by those who see blockchain technology as a tool that guarantees greater democracy, equality, and freedom precisely because it allows the development of transactions and the creation of organizations that are independent from state or central authorities. Yet blockchains still depend on several systems and services that are centralized for their operations, and they also entail other drawbacks, ranging from energy expenditure to issues related to tax fraud, security, and stability. Several artists have critically addressed the Web3 philosophy. SIMON DENNY created the *Metaverse Landscapes* (2022-23) paintings by depicting details of how plots of virtual territories offered for sale are represented in online trading spaces. On the right side of the frame two QR codes refer to the parcel of territory depicted in the painting offered for sale, and to the non-fungible token created by the artist. With this series of works, Denny exposes the financial speculation that characterizes

the economy developed around cryptocurrencies and more specifically the so-called metaverse spaces that have proliferated in recent times. A work by SIMON DENNY and GUILLE TWARDOWSKI, *Dotcom Séance* (2021-22), is a biting critique of the Web3 economy, creating a link between this and the early financial speculations associated with Web1.0. The artists exhumed 21 companies that were born and died during what is considered the first "dot-com bubble" and generated new logos for these companies in the form of NFTs that, when minted, allow buyers to claim sub-domains for these companies and become their CEO. CHLOÉ MICHEL has produced a mining rig for the Monero blockchain as an artistic installation with four Raspberry Pi, *Proof of Faith* (2022), taking the form of an altar at which the public is invited to worship and meditate, emphasizing with this gesture the quasi-religious character with which some venerate cryptocurrency trading and the philosophy associated with decentralization. EEEFFF, a collective formed by Nicolay Spesivtsev and Dzina Zhuk, developed *Economic Orangery* (2021), an online and live action role-playing game with interactive elements, including video sessions and Discord chat groups. Set in a future in Belarus, the game intertwines collective economy, decentralization, gymnastic exercises, and revolution. With the work composed of three sculptures—*Amends* (2022)—KYLE MCDONALD intends to fully mitigate the negative impact calculated before Ethereum's split of the three major marketplaces for NFTs: OpenSea, Rarible, and Foundation. The money the artist obtained from the sale of the three sculptures, which can also be purchased as NFTs on the respective platforms, is entirely donated to NGOs working in ecological fields, such as Project Vesta, Nori, and Tradewater.

EXPERIMENTS IN DAOS

Decentralized Autonomous Organizations (DAOs), which are made possible by the introduction of smart contracts in certain blockchains such as Ethereum, allow the creation of non-hierarchical organizations whose ruling systems are automated for token holding members. In the artistic field, DAOs have been founded with purposes ranging from humanitarian and ecological initiatives to experimental art. In 2018, JONAS LUND created the Jonas Lund Token, built and distributed on the Ethereum blockchain, which allows holders to participate in decision-making process-

es regarding the management of Jonas Lund's work and artistic career as well as the JLT cryptocurrency itself. At the same time, the artist develops a reflection on the mechanisms underlying an artist's career, determined by economic imperatives and networking. HOLLY HERNDON & MATHEW DRYHURST have recently made available to the community a customized voice tool that allows anyone to upload a polyphonic audio and receive a piece of music sung in Holly's distinctive voice. This community project is furthermore managed by Holly+, a DAO which enables members to vote on the certification of new works created by the voice model. *nolsl* (2021-ongoing) is a NOIS1 LABS AND DEZENTRUM project realized in cooperation with the Swiss Federal Institute of Technology in Zurich, with the University of Zurich, with the Zurich University of Applied Sciences in Winterthur and with the Digitalization Initiative of the Zurich Higher Education Institutions. In this project, a housing module is managed autonomously by a DAO and smart contracts, thus creating the first example of a house that does not belong to anyone but can be used by the community. With the installation *Undergrown* (2023), LUKAS TRUNIGER has invented a hacking kit for repurposing obsolete crypto mining hardware for scientific research, also managed by a DAO. Truniger points out with this work the issue of energy consumption associated with the existence of data centers and cryptocurrency mining, while offering a model of hardware recovery for projects of collective interest. PRIMAVERA DE FILIPPI created a series of interactive blockchain-based sculptures in the form of mechanical plants called *Plantoids* (2014-ongoing). Similar to other life forms, Plantoids aspire to reproduce and invite the public to participate in their reproductive process through donations in cryptocurrency and by contributing to the selection of new offspring. The Plantoids then draw on financial resources, managed through a DAO, and commission a new artist to create the new progeny, according to predefined parameters that condition their evolution. In this case, De Filippi cleverly uses the mechanisms of DAOs to manage the activity of non-human beings, while exploring the possibility of artworks to ensure their own autonomy and prosperity.

ARTISTS OCCUPYING THE METAVERSE

The metaverse is a concept developed back in the 1990s by science fiction writer Neal Stephenson.⁽⁵⁾ It has now reappeared to describe multi-user virtual online spaces.

The term is often adopted by entrepreneurs particularly active in the Web3 economy to describe virtual spaces that integrate wallets for the payment of virtual goods via cryptocurrencies.⁽⁶⁾ In this context, metaverses are thus strongly associated with the Web3 environment. Although a single metaverse does not yet exist, several multi-user online virtual spaces, or multi-user video games that often combine online and offline commerce, have been occupied by artists who contribute to a reflection on the meaning of such spaces. KATHARINA HAVERICH has visited the online social spaces VRChat and interviewed women who described their violent dreams, which in this case involve violence carried out by women on men. Haverich has then reproduced details of these dreams, allowing the public to experience them in her VRChat world *...dreams about girls* (2021-22). ANYOUNG KIM also has created a virtual environment in VRChat, *Surisol Underwater Lab: VRChat World* (2022), an imaginary laboratory situated temporally in the near future, dealing with scientific research into algae cultivation and water quality, which is considered carbon negative and therefore ecologically less polluting. The lab, although a fiction, is figuratively located near the Oryukdo Islands in Korea, which are well known for harvesting seaweed. ELOÏSE BONNEVIOT & ANNE DE BOER carried out online actions in *Farming Simulator*, a multi-user online video game created by Swiss company GIANTS Software in 2008, to analyze and deconstruct the game's ideology and mechanics. The game is often used by farmers who want to try out virtual solutions for their real agricultural industries. The artists modified the virtual landscape to make it even wilder, thus going against the logic of exploitation of nature that is typical of farming activities. *Mechanimal* (2021) is a collaborative interactive online game created by LOOPNTALE, a duo composed of Youngju Kim and Hoyoun Cho, that reflects on the theme of being together with and relating to non-human beings. The players enter a 3D space similar to the research laboratory of a mysteriously disappeared scientist; there, they contact non-human agents who request their help. Through documents hidden in the lab, the players accumulate information that is simultaneously distributed on a Discord messaging account, which then allows multiple players to share their findings and collectively contribute to the narrative.

ONLINE IDENTITIES AND AVATARS

If metaverses are related to flourishing multiusers' virtual spaces, an avatar is the virtual identity that occupies such spaces and interact with others. It is no surprise that artists have creatively approached questions about what it means to be an avatar and to have a digital identity. The origin of the work *Heart of an Avatar 3* (2023) by OMSK SOCIAL CLUB is a real-life game that lasted 58 days without interruption, in which nine people took turns collectively playing the role of Eastyn Agrippa as a compound being. Over the course of two months, the avatar interacted with a community of 175 real people through social spaces such as Discord. During this experience, Eastyn Agrippa collected their memories and considerations of their existence, thus contributing to theories of identity analysis, and what it means to be a human, an avatar, or a hybrid between the two. The installation *An invite to eternity* (2022) by LEA ERMUTH explores the question of identity and how modern technologies and social networks allow individuals to modify their identities to fit the expectations of the circles of family, friends, and acquaintances that constitute personal networks. Ermuth conducted a motion capture performance in which she modelled her digital self by following the suggestions of the audience, and then created 3D printed terracotta models as evidence of this ideal collective portrait of the artist. With this work, Ermuth shows not only how individuals contribute to the construction of worlds through digital technologies, but how communities at the same time shape the identities of individuals. Artist and avatar LATURBO AVEDON exists and acts, by their very nature, solely in digital spaces. *The Materia collection* (2022-23), their latest creation, consists of expandable series of artefacts sold as unique non-fungible tokens, released during specific moments via the Ethereum and Tezos blockchains, in which collectors are invited to participate. Materia owners can decide to use their tokens as decorative elements for virtual spaces or place them in dedicated sockets that are part of the Materia system to influence the future development of the Materia universe and their virtual artefacts and avatars.

COEXISTING WITH AI

Artificial intelligence has made considerable progress in recent years, particularly with applications for the creation of generative images and with large language

models such as ChatGPT. In fact, various applications of artificial intelligence are now fundamental to the functioning of online virtual worlds, including non-human agents, and are therefore important elements in a discourse related to decentralization. If Web 2.0 has been characterized by social spaces autonomously managed by users, of which social networks are a significant example, we may wonder what happens when the contents of social spaces are generated by increasingly effective artificial intelligence programs. Certainly, tomorrow's decentralized Web increasingly will have to deal with AI-generated content. SARAH FRIEND used Stable Diffusion, and trained AI algorithms from a database of photographs of her person, to produce erotic images based on this database. At the same time, Friend experiments with putting these images online via social networks that allow interaction with a dedicated audience of fans, who in turn influence future content productions. The video installation *Mouthless Part III* (2023) by DOROTA GAWĘDA & EGLÉ KULBOKAITĖ explores the representation of nature by crossing folk narratives with technological innovations. The landscapes of the two-channel video were artificially constructed with the Unreal game engine, and partly created by generative adversarial networks. A peasant and the Poludnica demon, two archetypes from Slavic mythology, confront each other in these rural landscapes. Not only the conversation but also the rendering of the characters and the environment gradually become fragmentary, chaotic, and confused, eventually revealing the synthetic, artificial nature of both the protagonists and the environment. The anime series *Life After BOB* (2021-22) created by IAN CHENG and built on the Unity game engine, revolves around the increasingly important implementation of artificial intelligence programs for ethical and moral choices. The first episode of the series, *The Chalice Study*, tells the story of young Chalice, whose father Dr. Wong has created an artificial intelligence system called BOB (Bag of Beliefs) implemented in his daughter's nervous system. The young girl is then faced with a dilemma: whether to follow the decisions suggested by the artificial intelligence or to remain free in her choices. Conceived by Mario Klingemann, BOTTO is a decentralized autonomous artist that uses a combination of software models such as Stable Diffusion, VQGAN + CLIP, and GPT-3, and that has been trained with millions of works of art, literature, real objects, and people, to autonomously generate artworks that are then submitted

to a community structured in the form of a DAO, whose members eventually decide which works to publish and trade as an NFT.

CONCLUSION

The constant evolution of information technologies coincides with profound social and cultural changes, signaling how online digital dynamics—considered under the misleading term “virtual”—are radically anchored in our real life and world. If artists put the applications associated with Web3 to the test by creating models for the large-scale execution of potential projects, their works are to be appreciated as necessary think tanks for the future of the Internet, helping to make it more fair, accessible, and decentralized for all.

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