Title: Re-contextualising blockchain based art, outlines of an unkown digital art practice.

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Author : Vera Choudy-Lartisant

"Art is what makes life more interesting than art" — Robert Filliou

Acknowledgements

Foreword

This is the second edition of a thesis written for a Master's degree in *Création et Édition Numérique* at Paris VIII. Originally submitted in September 2024, the current edition dates from August 2025. This edition contains additional notes, images, and langage changes. Most importantly this edition has been translated to english.

This thesis attempts to define what I have called « blockchain based art » or « blockchain art ». In doing so I hope legitimise blockchain art as a contemporary art practice through a reasoned and, logical argumentation which aims to cemet this practice and trace it's origin in the history of digital art, internet art and network art.

It should be pointed out that this thesis was written before the adoption of certain terms such as "protocol art" and "on-chain art" which are now commonplaces in the online discourse surrounding art by blockchain.

with the term « blockchain based art » and « blockchain art » I wanted to focus on the use of blockchain as a medium for artistic creation. It is in no way intended to define a movement, an era or become a convention.

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Introduction

It seems that Web3, blockchain and NFTs (Non Fungible Tokens) have not been able to escape the revolutionary cycles of history. Just as the internet was supposed to be a free digital space, the ideals of cryptocurrencies have not been able to achieve their goals of liberation an decentralisation. For the majority of these ecosystems, the veil of decentralisation has been lifted. Instead of being a paradigm shift, blockchain is embracing, willingly or unwillingly, a market logic that determines its vitality and undermines it's left leaning political objectivs.[1] This world, opaque to the majority of individuals and promising to a niche, appears as a new digital frontier to be conquered.

At the forefront of the conquest, builders[2] and early adopters develop this new economy based on the exchange of information or « operations » and « transactions »[3].Validators, sometimes called miners[4], cryptographicaly verify the authenticity of these transactions as they enter a ledger.[5] This ledger serves as the embodiment of unique and immuable truth as it is safe guarded against any fraud, manipulation or modification.[6] As an omniscient narrator, the ledger recounts the life of the blockchain from its genesis block[7] to present time.

In the periphery of this frontier, users in search of a new digital Eldorado adopt and abandon these blockchain ecosystems.[8] In doing so, these digital community members form a society by adopting specific codes which enable them to communicate in networks and exchange ideas in virtual group chats.[9] This digital eco-system evolves around the changing seasons[10] and market prices.

It seemed like the emergence of web3 would lead to artistic explorations that reflect, or at least attempt to reflect, this new paradigm, how ever, « decentralised art », too often framed as NFTs, is far from questioning the ontological reality of the blockchain : a network of distributed nodes interconnected by a ledger that can form the basis of a virtual ecosystem.[11]

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1 iShares Bitcoin Trust (IBIT) | Spot Bitcoin ETF | BlackRock
   https://www.blackrock.com/us/financial-professionals/investment-strategies/bitcoin-investing,[accessed 22 May 2024].
2 Name given to individuals who adopt and develop applications using blockchain technologies.
3 "Transactions" describe an action that is performed on the blockchain in a programmatic manner. This terminology also reveals the financial nature of the blockchain.
4 "Miners" and "Stakers" are terms used respectively for blockchains known as « Proof Of Work » and « Proof Of Stake. » They use computing power to mathematically verify the validity of transactions.
5 Léonard Lys. Security and reliability of cross-chain exchanges. Emerging Technologies [cs.ET]. Sorbonne Université, 2022. English. ⟨NNT : 2022SORUS228⟩. ⟨tel-03847642⟩
6 The essence of blockchain's appeal lies in the impossibility of altering the information stored in these "blocks".
7 A blockchain begins its life by producing a "genesis block," which is the first block in the chain.
8 The economy surrounding blockchain relies almost entirely on user adoption.
9 Digital communities develop customs and languages such as « gm » which is short for « good morning. » It is customary to start the day by sending this abbreviation to frequented group chats.
10 The seasons referenced here echo the « crypto winter » and « crypto summer », which respectively represent periods of declining and rising economic activity on the blockchain.
11 At the time of writing, the term « decentralized art » was commonly used when referring to any artistic production related to blockchain technology.

Instead, « decentralised art », as perceived by the general public and defined within the web3[12] perspective, became an integral part of speculative and tokenised market that has had little or nothing to do with art.

In this dissertation we will attempt to highlight artists who push the boundries of media art through the use of the blockchain as a medium. In doing so we will also seek re-contextualise this emerging art practice by interweaving the history of media art and these contemporary practices.

What is blockchain?

Before exploring what NFTs and blockchain art is, it is important to be able to define what a « blockchain » is.

A blockchain is a network of distributed nodes enabling data to be stored in a ledger and transmitted using programming languages and algorithmic functions[13].

The birth of blockchain admittedly dates back to 2008 following a loss of confidence in Western banking institutions and governments, widely blamed for the subprime crisis. The blockchain was conceived to be the underlying technology to emerging decentralised digital currencies resistant to censorship which could circulate outside of traditional economic networks. In short, blockchain is a new way of exchanging money without the constraints of borders or the scrutiny of central authorities. This makes the blockchain an inherently political object.[14]

From an economic point of view, the digital data circulating via this network are "tokens" which has been ascribed a monetary value. The value of this token is only "valid" on the blockchain where it has been minted. These tokens are essentially assets for agents, who can use them to buy financial goods, access exclusive communities and participate in the virtual blockchain life.

Over time, this technology became a cultural phenomenon with its own linguistic codes, practices and multitude of agents with motivations that can be radically opposed to one another.[15] This this in term makes the blockchain ecosystem a particularly complex world to navigate.

It is important to remember that although blockchain is now synonymous with speculation and tokenisation and techno-fascism, it's existence is deeply entangled in the history of cryptography. In fact, in the 1980s David CHAUM[16] implemented the first blockchain protocol[17] and later the first electronic currency. It is important to stress that the history of cryptography and blockchain technology

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12   The term "web3" is used to refer to the broader ecosystem that uses blockchain technologies. This term appeared in 2017 and often refers to the ecosystem around the Ethereum, a proof-of-stake blockchain founded by Vitalik Buterin.

13   For a general definition, see: 'What is a blockchain?', https://www.economie.gouv.fr/entreprises/blockchain-definition-avantage-utilisation-application, [accessed 30 March 2024].

14   HADJADJI Nastasia, No Crypto. Comment Bitcoin a envoûté la planète, Editions Divergences, 2023

15   HADJADJI Nastasia, Op. cit.

16   Ibid.

17   A "protocol" refers to the set of rules that define how a blockchain operates.

is closely linked to a political struggle to secure and anonymise exchanges between individuals, in order to protect these individuals from censorship, espionage, and monetary regulations imposed by central governments. With this goal, emerges the ambiguity between libertarianism and fascism.

The emergence of art on the Internet

In the following section we will try to draw a parallel between blockchain art and the of internet art as from a technological standpoint both stem from evolutions that have profoundly changed the contemporary world.

The nineties marked the end of a long transformation period. According to Eric Hobsbawm this transformation is complete when the world became a "global-village"[18] ; a world defined by globalisation i.e. the acceleration of transport and the internationalisation of communication networks[19].

This unprecedented rapid growth of communication networks was made possible by the emergence of the Internet[20] and the World Wide Web[21], supported by the adoption of protocols like TCP/IP[22] and HTTP[23] that revolutionised the way we communicate and exchange information online[24]. Conceived and programmed by Tim Berners Lee at the CERN laboratory,[25] the World Wide Web was designed as an information-sharing platform accessible to all[26] through what we now call "links"[27].

Driven by the emergence of these new tools, the contemporary art ecosystem also underwent a profound transformation in the 1990s. Digital art, which is defined as an artistic practice with a "digital coefficient"[28] began to adopt the computer as a technical tool. Among the practices of digital art, which

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18 To quote Marshall McLuhan in The Medium is the Massage (1967)
19 HOBSBAWM Eric - Age Of Extremes (1994)
20 "A set of interconnected global networks that allows computers and servers to communicate efficiently using a common communication protocol (IP). Its main services are the Web, FTP, email, and newsgroups". -' Definition – Internet | Insee', https://www.insee.fr/fr/metadonnees/definition/c1864, [accessed 22 May 2024].
21 The World Wide Web is a collection of pages on the internet. 'World Wide Web – MDN Web Docs Glossary: Definitions of Web-Related Terms | MDN', https://developer.mozilla.org/en-US/docs/Glossary/WorldWide_Web, [accessed 22 May 2024].
22 The TCP/IP protocol is a set of rules that enables communication over the internet.
23 The HTTP protocol is a set of rules for transferring information such as text and images over the internet. It then allows these images to be displayed on a web page.
24 'Stream ISELP | Listen to Du Net Art Aux NFT - Comment l'art Internet Interroge Les Failles Du Web Playlist Online for Free on SoundCloud' SoundCloud, 2023, https://soundcloud.com/iselp/sets/du-net-art-aux-nft-comment, [accessed 29 March 2024]
25 'The World Wide Web: A Very Short Personal History',https://www.w3.org/People/Berners-Lee/ShortHistory.htm, accessed 28 June 2024
26 The World Wide Web is imagined as a digital world in its own right where individuals can « work, play, and socialize », in the words of Tim Berners Lee.
27 Ibid
28 COUCHOT Edmond, HILLAIRE Norbert, "L'art numérique, Comment la technologie vient au monde de l'art", Flammarion, Paris, 2003, p.38

included video and 3D, appeared a range of new disciplines stemming from "online multimedia"[29]. This "online" connection to the network became a prominent idea within these new art practices at a time where the Internet was still to a world without borders where everything can be done.[30]

Edmond Couchot and Norbert Hillaire establish a typologie of Internet usage within "online multimedia".[31] The first one being the use of the World Wide Web as a universal means of communication, which enabled artists to share their works outside of institutions and galleries.[32] Through the World Wide Web,some artists adopted this model of mass dissemination of their work, thanks to the immediacy of information communication and the absence of digital frontiers.[33] for example, Olia Lialina's *My Boyfriend Came Back from the War* (1996) is a hypertextual story accessible directly via a web interface [34] that examplifies this new and avant-garde artistic intervention.

Figure 1: Olia Lialina, My Boyfirend Came Back from the War (1996), http://www.teleportacia.org/war/

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29   COUCHOT Edmond, HILLAIRE Norbert, Op. cit. p.62

30   For a typology of works of art, please consult: Olats.Org - STUDIES AND ESSAYS, BUREAUD Annick, Pour Une Typologie de La Création Sur Internet (Towards a Typology of Creation on the Internet), http://archive.olats.org/livresetudes/etudes/typInternet.php, [accessed 19 July 2024]

31   Ibid.

32   Mail art, for example, was already breaking the rules in terms of the production and reception of artworks.

33   It should be noted here that this mode of dissemination has become the societal norm due to the ubiquity of social media. This will ultimately characterize Post-Internet art, which we will mention in several places in this thesis.

34   'Speaking in Net Language: My Boyfriend Came Back from the War', Rhizome, 2016, https://rhizome.org/editorial/2016/nov/10/my-boyfriend-came-back-from-the-war/, [accessed 18 July 2024]

In addition to these internet artists, creatives also decide to "play on the specificity of the network" [35] within their artistice practice. Through this category, the Internet becomes a medium which enables a large number of individuals to be interconnected.[36] This artistic research is deeply intertwinded with the legacy of works such as Maholy-Nagy's Telefone bilders (1922), Gallow & Rabinowitz's *Satellite Arts Project* (1977) and Roy Ascott, pioneer of telematic art, with *Ten Wings* (1982) and *La Plissure du Texte* (1983)[37].

Figure 2: Affiche de La Plissure du Texte, Roy ASCOTT (1983) à l'occasion de l'exposition Electra 83

The advent of the World Wide Web redefined the contemporary art into a user who interacts with contemporary digital art. These spectators embody both transmitters and receivers, weaving a web of interconnections with a relationship of "all to all". These connections embody the shift from the old

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35 COUCHOT Edmond, HILLAIRE Norbert, Op.cit, p.62
36 Ibid.
37 'LA PLISSURE DU TEXT', n.d. https://alien.mur.at/rax/ARTEX/PLISSURE/plissure.html, [accessed 14 August 2025].

paradigms of artistic thought and cybernetic philosophy[38] towards a digital artistic culture where the themes of emergence, interconnection and interaction take precedence.[39] Through this second form, the digital art scene sees the emergence of new iterations of network art and net art[40] embodied and examplified by the following works: The File Room by Antoni Muntadas (1994-1998)[41], Communication Creates Conflict by Heath Bunting (1995)[42] and The Thing by Wolfgang Staehle et al (1991 - Present)[43].

Figure 3: «Muntadas: Media Architecture Installations», anarachive number 1, Centre Georges Pompidou, 1999

From web1.0 to web2.0

As we just expressed, artistic experimentation with means of networked communications predates art on the Internet. However, the emergence of the World Wide Web marks a turning point in

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38 ASCOTT Roy, Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness, ed.
by Edward A. Shanken (University of California Press, 2003)
39 COUCHOT Edmond, HILLAIRE Norbert, Op. cit. p.66
40 Pour reprendre la formulation d'Antoine Moreau dans 'La voie négative du Net Art', Terminal, 101, 2008, doi:10.4000/terminal.4532
41 Accessible on : https://sites.rhizome.org/anthology/thefileroom.html
42 Accessible on : https://anthology.rhizome.org/communication-creates-conflict
43 'NET ART ANTHOLOGY: The Thing', NET ART ANTHOLOGY: The Thing, 27 October 2016 <http://anthology.rhizome.org/the-thing> [accessed 14 August 2025].

the practice of digital art as the artists in the space we're quick to experiment, appropriate and hijack these new technologies to create and share works of art.[44]

In fact, Web 1.0[45] was not the only object to inspire artists and their practices. At the dawn of the XXIst century the Web underwent a new mutation that propelled it into a new era: Web 2.0[46]. This web can be succinctly described as a participative web, built by collective intelligence,[47] based on relational databases[48] instrumentalised by major companies such as Google, Amazon and Yahoo to transform the Internet into a "service based platform"[49]
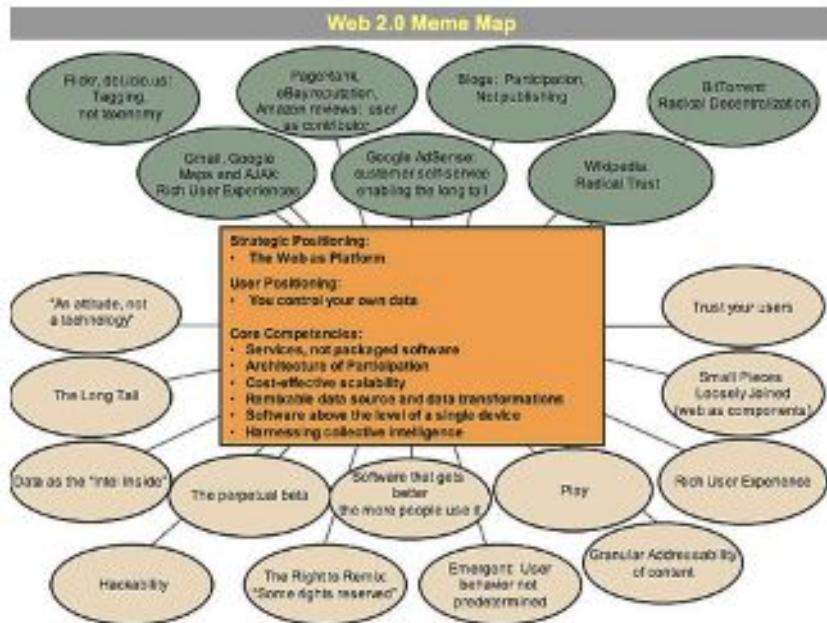
Figure 4: Meme map du Web 2.0 (2005),
https://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html

The emergence of this new iteration of the web marks the failure of Web 1.0, which aimed to make the Internet a free and decentralised platform.[50] With Web 2.0, the Internet became a centralised eco-system, controlled by a handfull of large corporation monetising users.

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44 CHOUCHOT Edmond, HILLAIRE Norbert, "L'art numérique, Comment la technologie vient au monde de l'art", Flammarion, Paris, 2003
45 Le web 1.0 désigne la première période du web caractérisé par la bulle spéculative *« dot com »*.
46 O'REILLEY Tim, 'What Is Web 2.0' ,https://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html, [accessed 30 March 2024].
47 O'REILLEY Tim, Op. Cit.
48   Technologie basée sur le langage SQL(Structured Query Language) permettant de stocker et distribuer l'information diffusée sur le web.
49 O'REILLEY Tim, Op. cit.

Web 2.0 has also saw the emergence of a large number of changes, such as social networks, which offered users a new dimension of networked sharing. These networks became the Internet's epicenters and quickly concentrated a large number of social activities, profoundly changing our conception of the Internet as a tool for socialisation.

From these two dynamics, respectively the commercialisation of data and the adoption of social networks, two distinct artistic practices emerged.

On the one hand, artist activists[51], identifying to hacker culture, such as the Etoy collective[52], ÜberMorgen and ®TMark[53] used these new digital tools for political ends.[54] For instance, Vote Auction by ÜberMorgen (2000-2004)[55] offered US citizens the chance to sell their ballot papers during the 2000 elections between Al-Gore and George Bush.

Figure 5: Sceau arboré par Vote Auction d'ÜberMorgen, https://www.ubermorgen.com/vote-auction.net/

50 Vienna Business Agency, 'Hijacking the System', The Culture & Technology Podcast, https://culture-technology.podigee.io/s1e9-cornelia-sollfrank-hijacking-the-system, [accessed 30 March 2024].
51   Sometimes referred to as "hacktivists"
52   'Etoy.CORPORATION – HOME', https://etoy.com, [accessed 27 July 2024]
53 '®™ark (Biography)', n.d. <https://www.fondation-langlois.org/html/e/page.php?NumPage=81> [accessed 15 August 2025].
54 'Stream ISELP | Listen to Du Net Art Aux NFT - Comment l'art Internet Interroge Les Failles DuWeb Playlist Online for Free on SoundCloud' SoundCloud, 2023, https://soundcloud.com/iselp/sets/du-net-art-aux-nft-comment, [accessed 29 March 2024]
55 'Voteauction - UBERMORGEN.COM', n.d. <https://www.vote-auction.net/> [accessed 15 August 2025].

On the other hand, artists such as Brad Troemel with The Jogging (2009-2014)[56], questioned web culture and social network aesthetics. These Post-Internet artists used these platforms as a framework for the creation and dissemination of art while establishing a dialogue between the web as a cultural context, a distribution platform, and an exhibition space, in a mode of mediation comparable to a 'Webcube'.[57]

Web3 and NFTs

Following on from Web 2.0, "Web3" emerged in the years 2015-2020[58] developing a rhetoric that opposes the FAANG web. Introduced by the Ethereum blockchain and its "Smart Contracts", Web3 explores the use of the Ethereum blockchain for use cases such as identity management, decentralised finance video games or even NFTs like Larvalabs' Crypto Punks (2017 - Present)[59].

Figure 6: CryptoPunk #4824, https://opensea.io/item/ethereum/0xb47e3c d837ddf8e4c57f05d70ab865de6e193bbb/ 4824

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56 'Immaterial Incoherence', Rhizome, 5 May 2010 <https://rhizome.org/editorial/2010/may/05/immaterial-incoherence/> [accessed 16 August 2025].

57 CThis is a proposed description of works from Post-Internet Art, referring to the "white cube." For more information, please see: O'DOHERTY Brian, "Inside the White Cube. The Ideology of the Gallery Space," The Lapis Press, San Francisco, 1986.

58 Not to be confused with Web 3.0, which today seems to refer to the so-called Semantic Web.

59 'CryptoPunks', n.d. <https://cryptopunks.app/> [accessed 17 August 2025].

By 2021-2022, NFTs witnessed a surge in popularity among specialists, the general public and cultural institutions such as the Centre Pompidou[60]. The explosion is such that NFTs became a cultural object that reflect a "creative and critical appropriation of a new technology by artists [that] disrupts and displaces the art ecosystem"[61]. As a result of this new notoriety, NFTs are now associated with blockchain technologies and are seen as a form of *"decentralised art"*[62] , although there is no systematic connection between NFTs, decentralisation and art.

Figure 7: Schéma de la popularité des termes "Cryptomonnaie" et "NFT" selon Google Trends
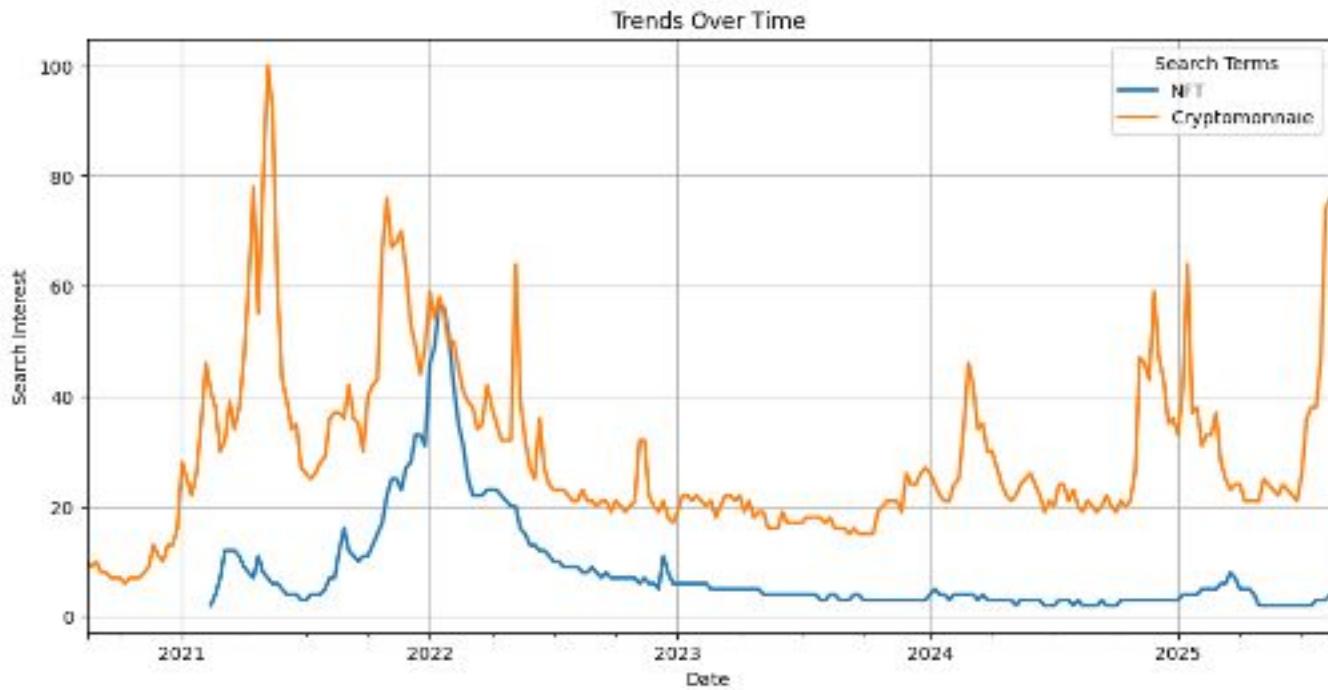
It all seems as if, there has been a fundamental misunderstanding of what blockchain art is. Indeed, in the imagination of the public opinion NFT's and « decentralised art » can only be financial assets[63], despite a significant artistic production that began in the 2010s with, for example, Nakamoto (The Proof) by Émile Brout and Maxime Marion (2014-2018)[64]. In fact, we will argue in this

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60 'Le Centre Pompidou passe à l'heure NFT' Centre Pompidou, 2023,
    https://www.centrepompidou.fr/fr/magazine/article/le-centre-pompidou-passe-a-lheure-nft, (accessed 30 March 2024).
61 Ibid.
62 Nitish Arora, 'Decentralization in Art & Cultural Production', Medium, 2023,
    https://medium.com/@nitisharora41/decentralization-in-art-cultural-production-ade2a8be3fc0,[accessed 30 March
    2024].
63 NFTs are, for the most part, financial assets before they are works of art.
64 https://www.eb-mm.net/en/projects/nakamoto-the-proof

dissertation that blockchain art, which we will distinguish from NFT, remains unknown to the general public.

Figure 8: Nakamoto (The Proof) 2014 – 2018, https://www.eb-mm.net/en/projects/nakamoto-the-proof

It is interesting to note that, even within scientific papers[65], artistic production using the blockchain is systematically categorised as an intersection between digital art and the socio-economic trends intrinsic to cryptocurrency[66]. In Crypto Art: A Decentralized View, we read: *"Crypto art is limited-edition digital art, cryptographically registered with a token on a blockchain"*. We note that for these authors there is only a question of the "hyper-portability" of art, a *"rejection of institutions"* and a *"financialisation of the dematerialisation of art".* Yet to paint such a systematic portrait of this multifaceted practice only serves to deny its complexity and its existence within a history of digital art.

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65 Franceschet, Massimo, Giovanni Colavizza, T'ai Smith, Blake Finucane, Martin Lukas Ostachowski, Sergio Scalet, and others, 'Crypto Art: A Decentralized View', Leonardo, 54.4 (2021), pp. 402–5, doi:10.1162/leona02003
66 Ibid.

Similarly, we note that the traditional narratives of digital art history almost never include blockchain art in their stories and databases, as is the case with the ADA - Archive of Digital Art[67]. However, there is no question of placing the blame on cultural and artistic institutions, as the players in the crypto-currency field themselves do not seek to historicise this practice[68] which in term reduces the credibility of the art practice as a whole.

Our work will therefore be twofold, as we wish on the one hand to paint a pragmatic portrait of what art through blockchain is and on the other to recontextualise this practice within the history of digital art. We will try to understand to what extent there is art on blockchain, and what its modes of existence and specificities are.

To answer these questions, we will first identify the ontological originality of art on blockchain. We will then look in detail at this practice in order to draw up a typology and identify its modes of existence. Finally, we will broaden our perspective in an effort to compare network art and art on blockchain.

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67   https://digitalartarchive.at/archive/keywords/kw/1373/
68   'History of Crypto Art - Martin Lukas Ostachowski', 2021, https://mlo.art/research/history-of-crypto-art/, [accessed 15 August 2024]

A) From digital media to crypto-media

A.1) NFTs and the art market: a contradictory union?

NFTs, or Non-Fungible Tokens, are unique media objects, such as images or videos, which have non-fungible metadata created by Smart Contracts[69]. A Smart Contract is a computer program that establishes rules and conditions governing the existence of NFTs. They provide the basic functionalities of an NFT i.e. creation, destruction, transfer of ownership, the state of the digital object, and may or may not follow pre-established standards such as ERC 20 or ERC 721.

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.26;

interface IERC20 {
    function totalSupply() external view returns (uint256);
    function balanceOf(address account) external view returns (uint256);
    function transfer(address recipient, uint256 amount)
        external
        returns (bool);
    function allowance(address owner, address spender)
        external
        view
        returns (uint256);
    function approve(address spender, uint256 amount) external returns (bool);
    function transferFrom(address sender, address recipient, uint256 amount)
        external
        returns (bool);
}
```

Drawing 1: ERC20 Solidity Smart Contract

NFTs are considered a technological innovation, because they allow a digital media objects to be authenticated and their owners publicly known. As a result, there can be no counterfeiting or duplication, ultimately guaranteeing the uniqueness and monetary value of the object.

NFTs are therefore first and foremost a technical tool for creating digital media on the Internet. The question of the artistic degree of the NFT is therefore not specific to the medium, as is the case for any tool. NFTs are not artistic by essence as they appear to be no more than a certificate of possession in the form of a cryptographic key.

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69 'Non-Fungible Tokens (NFT)', Ethereum.Org, https://ethereum.org/en/nft/, [accessed 22 August 2024]

In an article entitled A Celestial Cyberdimension: Art Tokens and the Artwork as Derivative[70] Rachel O'Dwyer examines the motivations and mechanisms behind the purchase of NFTs such as 'Bored Apes Yacht Club' [71] or 'Crypto Kitties' [72], both of which are considered by collectors to be genuine works of art. The author argues that what is really owned is not the work of art and its digital form, but the cryptographic proof of acquisition. In fact, O'Dwyer argues that NFTs are not original works of art, but a derivative form of art that she calls 'derivative art'.

According to O'Dwyer, NFTs are in fact digital media that have been "tokenised". [73] This tokenisation of digital media gives rise to the possibility of buying and selling these NFTs on digital markets, known as "marketplaces", such as Opensea, which would make them rare and collectible. The challenge of tokenisation therefore lies in its scarcity, which the author refers to as "digital scarcity", enabling works of art to have a monetary value, unlike traditional digital media productions.

According to the author, it is this monetary value created by scarcity that is a source of motivation for the purchasing agent. Moreover, drawing a comparison between the traditional art market and the tokenised art market, O'Dwyer shows that buying motivations can in fact stem from several factors. Using the example of "Celestial Cyber Dimension Crypto Kitties", which sold for $140,000 at Christie's in 2018[74], the author identifies the buyer's desire to own a digital object that has meaning, aesthetics and speculative value. O'Dwyer thus emphasises that the purchase of tokenised digital media becomes a means by which the purchaser signals himself and hopes to see his economic capital, cultural capital and social capital increase.

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70 O'DWYER Rachel,
'A Celestial Cyberdimension: Art Tokens and the Artwork as Derivative • Circa, Art Magazine', Circa Art Magazine, 2018 ,
   https://circaartmagazine.net/a-celestial-cyberdimension-art-tokens-and-the-artwork-as-derivative, [accessed 4
   November 2023]
71 https://boredapeyachtclub.com/
72 https://www.cryptokitties.co/
73 O'DWYER Rachel, Op. cit.
74 Elisa Mala, 'Who Spends $140,000 on a CryptoKitty?', Style, *The New York Times*, 18 May 2018
   <https://www.nytimes.com/2018/05/18/style/cryptokitty-auction.html> [accessed 18 August 2025].

Figure 9: CelestialCyberDimension, CryptoKitties Token #127,
https://opensea.io/item/ethereum/0x06012c8cf97bead5deae237070f9587f8e7a266d/127

This is a crucial point, because according to the author's analysis, NFTs and the phenomena that surround them are not revolutionary. On the contrary, these tokenised media do not represent a paradigm shift, but reflect the emergence of a new class of investors within the art market. These

investors may be turning away from the traditional art world, but in term maintain or even reinforce the paradigms of such market.

As a result, NFT buyers are very similar to the actors of the traditional art market. This leads us to the following observation: the ontological nature of the medium, whether digital or tokenised, has no influence whatsoever on its degree of artistry. NFTs are not in essence art.

A.2) From digital scarcity to feasible rarity

The article, Digital Scarcity Feasible Abundance and the Shock of the Nude[75], by Mat Dryhurst develops a counter argument to the thesis supported by O'Dwyer. Instead of 'digital scarcity', Dryhurst proposes the term 'feasible abundance' to describe NFTs. Indeed, the innovation of NFTs does not come from their cryptographic uniqueness, but from their ability to be sold and generate income for creators and collectors, thus creating a viable ecosystem for digital art.

Dryhurst argues that digital media has always been rarefied by the existence of intellectual property rights, which at the same time make them non-reproducible objects. Secondly, the author puts forward the idea that blockchain and crypto-currencies can make digital creation profitable, both for the creator and the purchaser; this is what he calls "feasibly abunance". Finally, even if crypto-media are intrinsically linked to market mechanisms, they are no different from works of art present on the traditional art market, thus responding to the main criticism levelled at NFTs. According to Dryhurst, cryptographic media merely "reveal" what lies behind the art market: the financialisation of artistic creation. This is what the author calls "the shock of the nude". It is this shock, an exposure of the essence of the art market. However, unlike the traditional art market, which is reserved for an elite, Dryhurst argues that crypto-media are "universally accessible", which would constitute a profound paradigm shift.[76]

In Reconnected [77], an article by Paris Marx on decentralised networks invites us to qualify the universal accessibility described by Dryhurst. Even if in theory these digital media are open and accessible to all, in practice they remain largely inaccessible. The first obstacle is the barrier to learning how to use the blockchain. Even if a considerable effort is made in terms of experience and interfaces, the cost associated with the purchase of NFTs is often too high to truly claim that this is a digital medium accessible to the greatest number.

Clearly, there is a debate about the nature of NFTs and crypto-media in general. While some see it as a world full of possibilities, others see it as a vast masquerade. The fact remains that these new media have managed to captivate a section of the traditional art world. As an article published in 2023[78] reveals, the Centre national d'art et de culture Georges-Pompidou has acquired a dozen NFTs, some of

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75   'Digital Scarcity Feasible Abundance and the Shoc…';https://hd.mirror.xyz/S-W2ZXRbrcy8bVGrKwMXSou63gWir7RJ9xs6wUn_h-0, [accessed 4 August2024]
76   'What Is Cryptomedia?', http://cryptomedia.wtf/, [accessed 4 August 2024]
77   'Reconnected', Real Life <https://reallifemag.com/reconnected/> [accessed 4 August 2024]

which can be viewed online on Opensea. Curators Marcella Lista and Philippe Bettinelli explained that they wanted to propose a group of works that would examine the impact of NFTs on the art world, proving that these digital objects have, in a short space of time, carved out a place for themselves in the discourse surrounding contemporary art.

A.3) From digital media to crypto-media: an ontological reversal?

Isn't there a fundamental distinction to be made between digital media and NFT? While O'Dwyer describes NFTs as tokenised digital media, Jacob Horne argues for an ontological reconsideration of the latter. In <u>What is crypto media?</u> [79] Horne proposes a new definition for this type of digital production: crypto media, defined by the following formula: "Cryptomedia = [Hypermedia + Creator + Owner + Market] = Value". Horne thus puts forward the idea that crypto-media is distinguished from digital media by its dual medial and financial nature, but also by a unique and immutable identity that guarantees its authenticity and secures its place in the crypto-media market.

It is worth pursuing this ontological distinction and emphasising that although NFTs remain protean and freely manipulable, they can undergo internal, autonomous or programmatic mutations, according to rules predetermined by the artist or the current owner. These ontological evolutions are intrinsic to the nature of Smart Contracts, which become a new medium for digital artists to explore. Thus, we could propose a new formula that highlights the artistic potenial of NFTs and crypto media in the broadest sense: "Blockchain Art = [Hypermedia + Contract + Creator + Concept] = Art"

Is Art (2014-1015) by Rhea Myers[80] from the Artworld Ethereum series, is a great example to illustrate this idea. According to Meyers: *"'Is Art' takes the conceptual art concepts of dematerialisation (art that is not presented in a fixed physical form) and naming (what is considered art because someone or something says so) and combines them with the net.art idea of an interactive artwork that exists in or interferes with network protocols. [...] In this contract, an Ethereum smart contract contains the statement that it "is" or "is not" art. A web page connected to the Ethereum network displays the state of this assertion to anyone who can access the contract and allows them to toggle between the two states. When this is done, it becomes a secure fact in the Ethereum blockchain, with a computing power of several million dollars a day."*

78 The Centre Pompidou in the Age of NFTs', 2023, https://www.centrepompidou.fr/en/magazine/article/the-centre-pompidou-in-the-age-of-nfts, [accessed 6 August 2024]

79 'What Is Cryptomedia?', http://cryptomedia.wtf/, [accessed 4 August 2024]
80 'Is Art - Rhea Myers'
, https://rhea.art/is-art/, [accessed 18 August 2024]

This contract is art

Figure 10: Is Art, Rhea Meyers (2014-2015), https://rhea.art/is-art/

A.4) *NFTs before NFTs*

We now need to put the NFTs into perspective within a longer history of contemporary art, putting aside the conceptual quarrels that occupy part of the rhetoric surrounding this digital art.

Looking at Parcelle Réseau (1996)[81] an action by Fred Forest whoch is de facto the first auction of a virtual work we can see that NFTs are not new. The virtual artwork is stored on a server where the access is guarded by a private key that the buyer acquires at the time of purchase. The purchaser may or may not share this key in order to display the work publicly on the "network museum", an online museum of decentralised art accessible worldwide.

81 'Parcelle Réseau | Action Fred Forest en 1996', Archives Fred Forest | SITE OFFICIEL, n.d. <https://www.fred-forest-archives.com/fr/actions/206/parcelle-reseau> [accessed 20 August 2025].

We can only note the similarities between what we call NFTs and Parcelle Réseau, which Fred Forest described as an "unprecedented event", reinforcing the idea that NFTs were never innovative in the conceptual sense.

In this first part, we have examined the ontological nature of crypto-media, also known as NFTs. However, we have only scratched the surface of the concept of artistic creation and its digital manifestations. Indeed, NFTs are not and cannot be an end in itself in the field of art on the blockchain. Beyond the code, lies a genuine artistic practice that is developing on the fringes of the contemporary art ecosystem, which is fully in line with digital art and net art.

B) Interactivity in digital art and art through blockchain

It should be pointed out that the topic of digital art has been gradually disinvested by the scientific literature since 2012. In an attempt to revive this litterature and the thoughts it put forward, we will conduct our analysis from a cognitive perspective, following in the footsteps of research established during the 2000s.

Described as a 'new art scene' [82] digital art, like modern art, profoundly challenges paradigms. Edmond Couchot and Norbert Hillaire write: *"Art has always done more than feed on technical progress [...] at the same time as [its] frontiers are constantly receding, the frontiers of art, too, seem increasingly difficult to grasp"*[83] At the heart of this new paradigm lies the question of the relationship between technology and the spectator. However, Couchot and Hillaire also warn against the fragility of the artistic relevance of these new digital arts. It is now the artist's responsibility to use these new digital tools to their full potential; a potential that has the capacity to question "the totality of art"[84].

According to Hudelot, *"What changes with works of art is that they are particular devices that disrupt habits, accentuating different cognitive functions"*[85]. Like modern art, the work produced by digital technology now carries meaning that goes beyond the aesthetic, appealing to the cognitive, inviting the viewer to become an actor and interact with the work in a participatory way. We are talking here about an interpretation of the work in which *"the spectator is not content simply to process sensory stimuli"*.[86]

Finally, we subscribe to the idea that *"the object of study [in digital art] shifts from the content of the work to the reception of that content, in other words to the subject-receiver of information*[87]. We

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82« Ibid. Page 20.
83 CHOUCHOT Edmond, HILLAIRE Norbert, "L'art numérique, Comment la technologie vient au monde de l'art", Flammarion, Paris, 2003, p.15
84 Ibid.
85 Hudelot Mok Mi, 'L'art et la cognition', Marges. Revue d'art contemporain, 02, 2004, pp. 5–19, doi:10.4000/marges.793
86 Ibid.
87 Op Cit. Hudelot

will therefore focus our analysis on this point, which will enable us to weave links between blockchain art and digital art, demonstrating that this new practice can be part of a history of digital art.

B.1) Net art

"Its name, a concatenation of the words net and art [...] suggests [...] that it is not just art available on the Net, but a specific form of art, created for the Web"[88] or, in the words of Antoine Moreau, *"art with the net, for the net and by the net"*.[89]

It should be noted here that Antoine Moreau places his definition within a certain orthodoxy. According to the author, net art is above all an *"aesthetic that stems from an ethic"*, in other words an art *"through the net"* that is the product of a strict observation of the specificity of the eco-system that is both the medium and the exhibition framework. In fact, according to Antoine Moreau, this specificity is that of a wider cultural substratum, that of hacker culture and copyleft.[90]

From the observation of these specificities, the work is seen to exist in a *"graceful form"*. According to this idea, art almost disappears behind the '*beauty of the gesture*' that is the creation of free software, which ends with the *'donation'* of that software. Or as Moreau formulates it echoing Winckelmann: *"Net art [...] is the exercise par excellence, because it proceeds from a graceful form of gift, data and freedom". Webstalker by the group I/O/D (1997)* [91] et *Net Art Generator*[92] by Cornelia Sollfrank (1997 - Present) are perfect examples of what Antoine Moreau defines as the graceful form of net art.

However, we now need to relate this definition to the art forms created by blockchain. Antoine Moreau's definition remains interesting in our case, because blockchain art is perhaps above all an art produced by the strict observation of the medium's specificities. But what of this "graceful form", the "beauty of the gesture" and the "gift" as described by Antoine Moreau, given that blockchain art seems intimately linked to the financialisation of the medium?

88 Lynch, Garrett,'Le Net Art', trans. by Traduction de Jane Noppe, Terminal. Technologie de l'information, culture & société, 101, 2008, doi:10.4000/terminal.4618 [accessed 16 August 2024]
89 Moreau, Antoine, 'La voie négative du Net Art', Terminal, 101, 2008, doi:10.4000/terminal.4532
90 https://developer.mozilla.org/en-US/docs/Glossary/Copyleft
91   https://anthology.rhizome.org/the-web-stalker
92   https://net.art-generator.com/about.html

B.2) Re-actualising interaction

We need to give some context to the practice of art on blockchain. Firstly, blockchain artists have been utilising this technology since 2015. We can put foreward Bitchcoin (2015-2022) by Sarah Meyohas[93], which is considered a pioneering work in the field[94] questioning the close link between art through blockchain and the financialisation of art. It is also interesting to note that the Bitchcoin work we mentioned migrated from the Bitchcoin blockchain, a fork of bitcoin, to Ethereum in 2017.
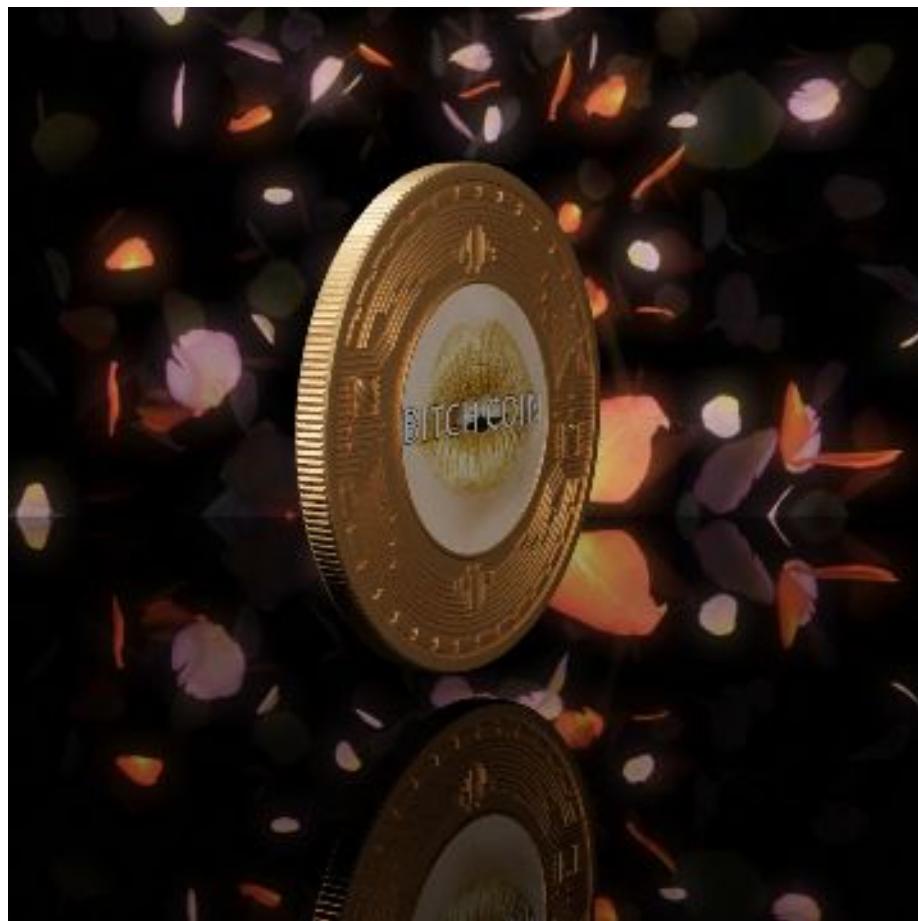
Figure 11: Bitcoin, Sarah Meyohas, 2015 - Présent,
https://opensea.io/collection/bitchcoin

Finally, we will note that this work is a very good example of the re-actualisation of artistic practices from the XXe century. Indeed, the ritual of exchange and the performative aspect of Bitchcoin is not unlike Yves Klein's Zone de Sensibilité Picturale Immatérielle[95].

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93 'Bitchcoin', Sarah Meyohas, https://sarahmeyohas.com/bitchcoin/history/, [accessed 12 August 2024]
94 'Bitchcoin # 9.026' , Centre Pompidou, https://www.centrepompidou.fr/fr/ressources/oeuvre/3z2rngd, [accessed 12 August 2024]
95 Bitchcoin' , Sarah Meyohas, https://sarahmeyohas.com/bitchcoin/history/, [accessed 12 August 2024] & 'The Centre Pompidou in the Age of NFTs' 2023, https://www.centrepompidou.fr/en/magazine/article/the-centre-pompidou-in-the-age-of-nfts, [accessed 6 August 2024]

Now that we have been able to contextualise a little the art of blockchain, or adjacent to blockchain, it will be a question of focusing on the use of the latter as a purely technical tool. It seems that this use of the technical object has developed with the emergence of the web3 and Smart Contracts, which have given blockchain a new depth. In fact, as we mentioned earlier, with the development of Ethereum in 2017 came a new paradigm in the world of blockchain: the "proof of stake". This novelty is accompanied by the development of new technologies such as the Smart Contracts. However, to echo the conclusion of our first part, for the time being we have confined ourselves to an immediate reading of blockchain and art. We would now like to study the use of this tool in a context where the artist wishes to create a work by integrating blockchain, in full or in part, into his or her creative process.

Screen talk by Neil Beloufa (2014 - Present) [96] is a relevant and interesting work for the purpose of our study. The work comprises an interactive journey during which the viewer interacts with games and "episodes" which are videographic elements echoing a fictitious global pandemic.The main subject of the work is the discourse surrounding this phenomenon[97]. As the viewer completes these games, he or she is offered EBB points, which can be invested in a panel on the right of the interface used to customise an image intended to be minted in NFT as part of the *Hands of Vengeance*[98]. It is to be noted that the integration of blockchain as a tool is asynchronous with its conception.[99].

This work is interesting from two points of view for introducing our subject. Firstly, it is a work that is fully in line with the interactivity that characterises digital art. In this work, "the viewer is an integral part of the artistic proposition", to use Olga Kisseleva's words[100]. By adopting a methodological approach and a cognitive reading of this work, we see that the work "consists of a series of action-reactions between a spectator and an interactive artistic device"[101]. This process of understanding identified in cognitive science echoes "an activity of integrating new knowledge, or new problems, into an individual's prior knowledge."[102]. This process of understanding, identified in the cognitive sciences, echoes "an activity of integrating new knowledge, or new problems, with an individual's previous knowledge". Through this interactivity, or stimulation of cognition, the spectator is immersed in a repetition of gesture that enables him or her to assimilate and understand new information.

What's more, within this interaction, a new process takes place, that of decision-making. Decision-making is essential to the interactivity of a work of art. Beyond perception, the spectator as

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96 https://ebb.global/screentalk/desk.php
97 'SCREEN TALK' by Neïl Beloufa - OFFICIAL TRAILER, dir. by Studio Neil Beloufa, 2020, https://www.youtube.com/watch?v=sIREpqJ9TOU, [accessed 13 August 2024]
98 OpenSea, 'Hand of Vengeance #0 - Hands of Vengeance', OpenSea, https://opensea.io/assets/ethereum/0x1de93c906bf3bdfa483bd681d2071aee45313c63/0, [accessed 13 August 2024]
99 *L'artiste Neïl Beloufa : « La blockchain est un outil qui à la fois me fascine et me fait peur »*, 4 February 2022 <https://www.lemonde.fr/culture/article/2022/02/04/neil-beloufa-le-monde-reel-est-indexe-sur-le-numerique_6112275_3246.html> [accessed 22 August 2025].
100 KISSELEVA Olga, Cyberart. Un essai sur l'art du dialogue, Paris, L'Harmattan, 1998, p. 79.
101 Hudelot, Mok Mi, 'L'art et la cognition', Marges. Revue d'art contemporain, 02, 2004, pp. 5–19, doi:10.4000/marges.793
102 Ibid.

'viewer' becomes a 'cognitive subject' [103] through the decision-making process, making it possible to define the work as an interactive experience whose main intervention lies in its ability to offer the spectator an experience. This experience ultimately becomes the real subject of the work.

Here we can link Neil Beloufa's Screen Talk with works from net art such as My Boyfriend Came back from the War (1996) by Olia Lialina and Mouchette (1996) attributed to Martine Neddam[104]. These two works in turn fulfill the criteria of an interactive work. Following the developement of interactivity through HTML, anchor tags[105] and hyperlinks enabling viewers to navigate through a non-linear story, delivering narrative fragments recounting the facts and experiences of the main protagonist.
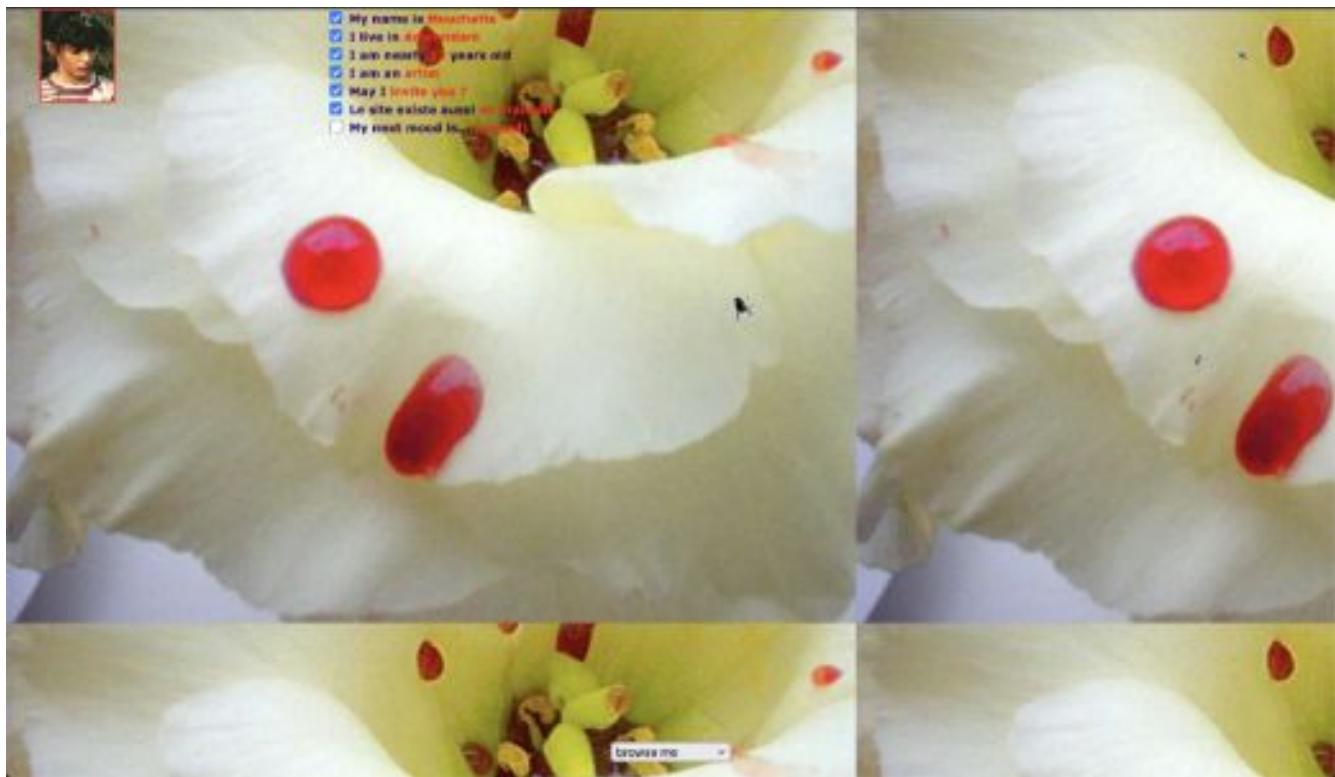
Figure 12: Mouchette, Martine Neddam, 1996, https://mouchette.org/

As we have already mentioned, these elements of understanding, decision-making and knowledge acquisition can be found in Neil Beloufa's work. As a result, his work is rooted in digital art and net art. However, Neil Beloufa has updated the interactive work by offering viewers an initial understanding of what blockchain is, thereby renewing the tool through which interaction takes place.

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103 Hudelot Op. cit.
104 'Mouchette.Org – Martine Neddam', https://www.neddam.info/mouchette-org/, [accessed 13 August 2024]
105 Voir https://developer.mozilla.org/en-US/docs/Web/HTML/Element/a

By introducing this new technology into an artistic practice inherited from digital art, art through the blockchain exists. What's more, by bringing interactivity up to date, blockchain-based art enables viewers to demystify what blockchain is.

B.3) Deconstruction and reconstruction of the subject

As we have been able to demonstrate, certain blockchain art share a common heritage with digital art and net art. However, these works, like those belonging to the net art cited as an example, opt for immediate use of blockchain. In this context, the object and the subject are two distinct entities, uncorrelated and autonomous from each other.

We would now like to turn our attention to a category of works that question the tool, seeking on the one hand to recontextualise it and on the other to define its limits. We will try to prove that there is now a category of works in which the tool is the subject, so that a symbiotic relationship develops between the object and the idea, giving new depth to the work. At the same time, we will continue our cross-analysis with examples from net art that explore the themes of remix, temporality, performance, social systems and the structural contexts of artistic production.

To begin this analysis, we will focus on two works in which technology is both tool and subject. From this dual nature, we will try to prove that the process of destruction/deconstruction carried out by the artist ultimately enables us to draw up an ontological portrait of it and to identify its limits.

To introduce this topic, we will focus on a work by Sarah Friend, crypto artist and software developer. *Clickmine (2017)*[106] is described by the artist as a clicker game[107] about blockchain. It is a work accessible online that has also seen several physical installations. These installations generally consist of a computer with a browser displaying the game interface and a projection of a financial graph covering the screen and the wall behind the installation. This work is fully positioned in a critical and reflective perspective on the blockchain industry.[108]

106 https://clickmine.click/

107 'Sarah Friend', Sarah Friend, https://isthisa.com/clickmine, [accessed 15 August 2024]

108 GLOERICH Inte,'State Machines | Extracting Computerized Desires – a Review of Clickmine',https://networkcultures.org/statemachines/2019/02/05/extracting-computerized-desires-a-review-of-clickmine/, [accessed 15 August 2024]

Figure 13: Installation de Clickmine, Sarah Friend, 2017, https://clickmine.click/

       To interact with this work of art, the viewer is invited to click to mine - the allegory with bitcoin mining is obvious - a ClickMineToken ($CLK) of the type ERC-20 implemented by the artist in Solidity, which is visible and consultable at the address Ethereum 0xEe3E07092eA9a6f705c2b69F51119BB8A9471305[109]. The spectator's action, the click, calls the click() function contained in the Smart Contract and initiates a transaction on the Ethereum Mainnet[110]. For this transaction, the spectator must pay a fee equivalent to 0.0022544ETH, i.e. approximately $6USD,[111]for each click() performed. In return, the user receives $CLK tokens, which have an infinite

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109 https://etherscan.io/address/0xEe3E07092eA9a6f705c2b69F51119BB8A9471305

110Blockchains are divided into several networks: Mainnet and Testnet, which represent the official network instance and the test instance, respectively, where tokens have no value.

111 15/08/24 13:14 Paris (GMT+2)

reserve and therefore a null monetary value.[112] This in term creates a « mise en abyme » of blockchain and crypto.

All the more so because Sarah Friend, in addition to questioning the financialisation of works of crypto-art and the mechanisms that make up the essence of blockchain, points the finger at the ecological impacts associated with the use of blockchain and this medium. Indeed, through the visual language that is deployed and unveiled during the click() and the destruction of the initial greenery, the viewer is faced with a void after having traversed the substrates of this virtual interface.

A second level of mise en abyme emerges with the repeated click(); in the words of the artist, the application goes into "chaos mode" as a result of an integer overflow in the Smart Contract. For the user, this means fewer $CLK tokens instead of more. This overflow also accentuates the ecological reading of the piece, because at the very moment when chaos mode is established, the landscape presented to the user is filled with a black nothingness evoking the well-known phenomenon of the disappearance of natural resources in a world that has not succeeded or had the opportunity to regenerate itself.

This work questions the blockchain as a financial system by playing on the technological limits of smart contracts. The artist highlights the limits of these systems, which figuratively and literally drain the world and its users of their resources. In a recent conference, Sarah Friend confided that she did not wish to discourage the diversion of her work, by appealing to the programmatic and open possibilities of Smart Contracts[113]. At the same time, she invited viewers to ask themselves whether the standard token could constitute an artistic intervention in itself?

We can link Clickmine to a singular and pioneering work of net art: Webstalker by the group I/O/D (1997-1998)[114]. According to Christiane Paul, this work challenges web conventions by offering users - quite literally - [115] – a meta-browser,[116] an alternative cartography of web data. Within this meta-browser, users should be able to navigate the web in their own way, using the various "crawl, map, extract, stash and dismantle" functions available to access the textual data contained on the web.

In short, it is a work that questions the browser as a tool for processing and distributing digital data. This data is interconnected by various hyperlinks creating the network commonly known as the Web. According to Matthew Fuller, a member of the group I/O/D (1994-1997), *"[Webstalker] was to create a way of interfacing with the web that foregrounded some of the qualities of the network sublimated by other software. [...] We wanted to embed critical operations in software, but by forcing critical ideas to become productive rather than simply being aloof and knowing"*[117].

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112 Site Specific Software - Sarah Friend, dir. by Aura, 2024, https://www.youtube.com/watch?v=gPow0jFyy84, [accessed 15 August 2024]
113 Site Specific Software - Sarah Friend, dir. by Aura, 2024, https://www.youtube.com/watch?v=gPow0jFyy84, [accessed 15 August 2024]
114 https://sites.rhizome.org/anthology/webstalker.html
115 FULLER Matthew, 'Crawl, Map, Link, Read, Copy, Repeat', Rhizome, 2017, https://rhizome.org/editorial/2017/feb/17/iod-4-web-stalker/, [accessed 15 August 2024]
116 PAUL Christiane, l'art numérique, Thams & Hudson, Paris, 2008 p.113
117 FULLER Matthew Op. cit.
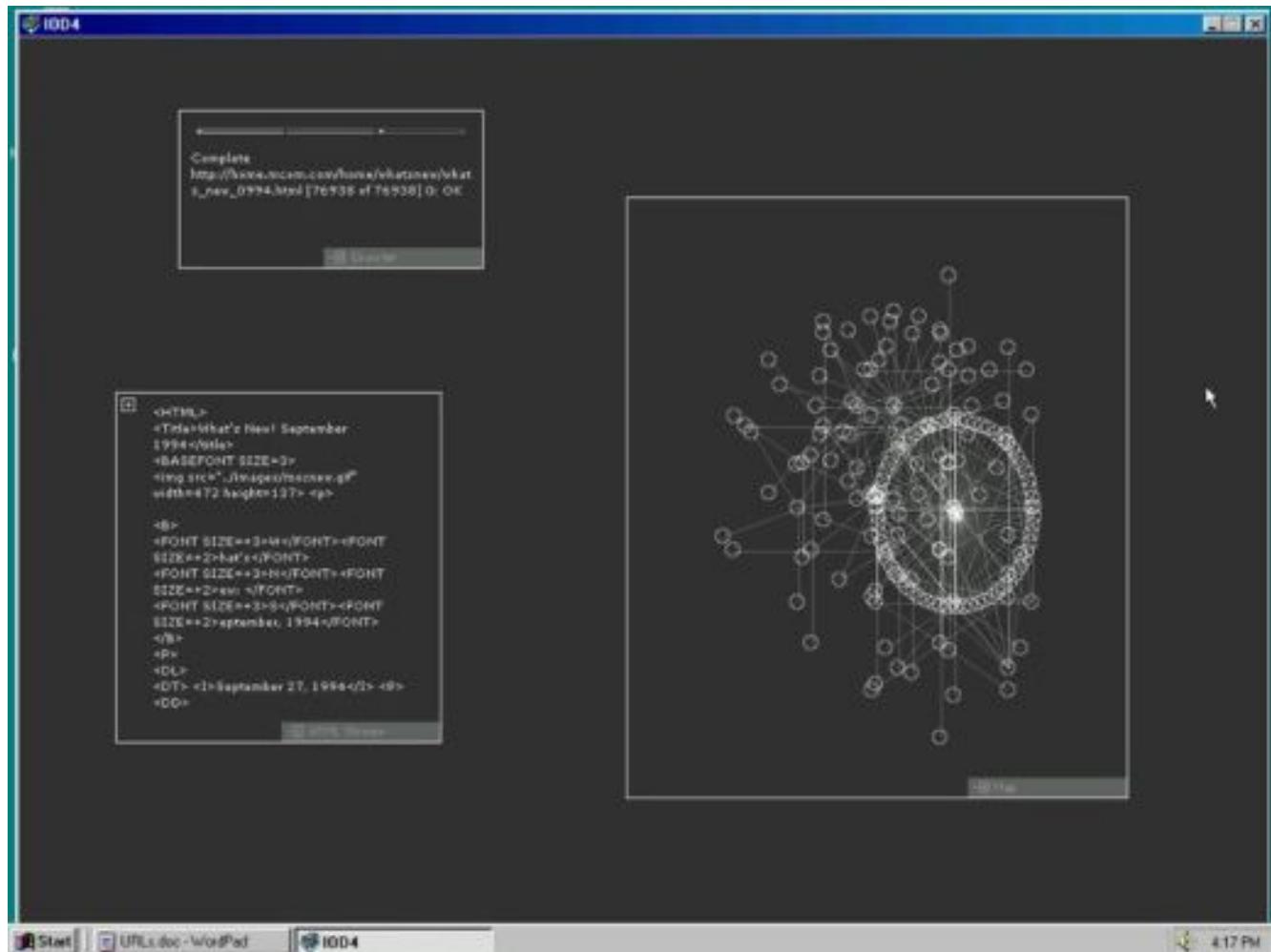
Figure 14: Webstalker, I/O/D, 1997, https://sites.rhizome.org/anthology/webstalker.html

In this way, Webstalker's deconstruction of a classic browser design results in a completely innovative artistic object. Above all, it offers the user navigation through the visual representation of an interconnected network of data, while at the same time providing immediate access to the textual information contained in the form of HTML code outside the traditional context of a web page. From this graphic representation of the web and its interconnections, the viewer sees a new definition of the web emerge: that of a network, complex and interconnected, and not simply a succession of one-dimensional pages.

Clickmine and Webstalker take a similar approach, but adopt radically different attitudes to the technologies they choose to tackle. In the context of the 'browser wars',[118] I/O/D proposes a positivist

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118 Voir https://en.wikipedia.org/wiki/Browser_wars

reading of web technology, while Sarah Friend's work is set against a backdrop of hyperinflation, preceding the bursting of the crypto speculative bubble in 2018[119]. So it's not surprising that I/O/D chose to propose an alternative to the systems in place, while Friend attempts to understand a hyper-volatile system.

It is therefore worth remembering that, from a cognitive science perspective, a work of art can be the product of the artist's perception of the surrounding context. We would also like to remind you that our analyses and demonstrations remain subjective.

B.4) Net art et blockchain

To what extent can we say that the net art movement still exists and how has it adapted to new technologies?

According to Garrett Lynch, at the dawn of Web 2.0 *"Objects will begin to acquire a dual identity and share the attributes of the digital media of the moment. As well as being tangible physical objects, they will become encoded, digitised and networked virtual entities. They will no longer be passive objects that the user has to activate, but ever-active elements of a network where everything will be interconnected in the truest sense of the word".[120]* The parallels between this vision and web3 are immediate. What is web3 if not a network of digital tokens? But has web3 killed off net art? Antoine Moreau would argue that it is not compatible and that there can be no art in its gracious form within web3. However, this does not seem to be the opinion of everyone in the net art world.

Indeed, in a tweet Tim Whidden[121], the creator of the Simple Net Art Diagram, MTAA (1997)[122] approves and encourages the re-adaptation of this work by Rhea Myers - net artist and blockchain artist - through Simple Blockchain Art Diagram (After MTAA ca.1997), (2016)[123].

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119 'Crypto's 80% Plunge Is Now Worse Than Stocks' Dot-Com Crash,
Bloomberg',https://www.bloomberg.com/news/articles/2018-09-12/crypto-s-crash-just-surpassed-dot-com-levels-as-losses-reach-80,[accessed 15 August 2024]
120 Lynch, Garrett,
'Le Net Art' , trans. by Traduction de Jane Noppe, Terminal. Technologie de l'information, culture & société, 101, 2008, doi:10.4000/terminal.4618 [accessed 16 August 2024]
121 Tim Whidden [@twhid], '@mathcastles Has My Full Endorsement :) And @rheaplex of Course: OG o' the Ogs', Twitter, 2024, https://x.com/twhid/status/1748502745898737688, [accessed 18 August 2024]
122 https://www.mtaa.net/mtaaRR/off-line_art/snad.html
123 https://rhea.art/2016/07/26/simple-blockchain-art-diagram/
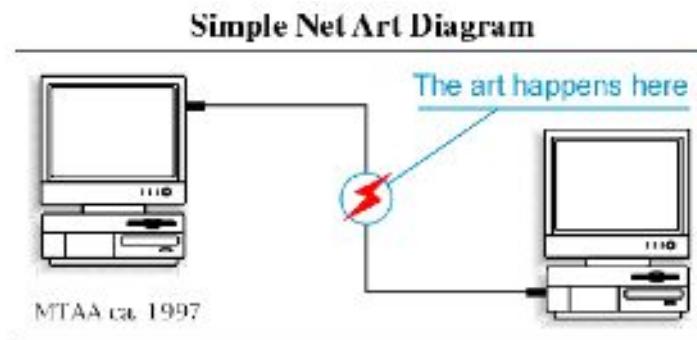
Figure 15: MTAA, Simple Net Art Diagram, ca. 1997. Animated GIF.
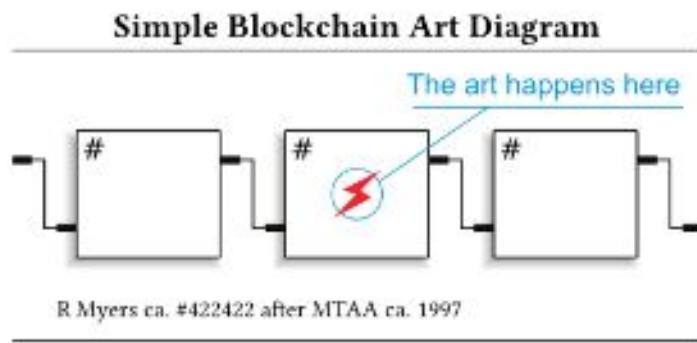
Figure 16: Simple Blockchain Art Diagram, Rhea Myers, 2016

Rhea Myers seems to have already combined these two practices in Is Art, 2014/2015, where she explains that: *"Late 1960s Conceptual Art and mid 1990s net.art are useful inspiration for thinking about the blockchain and smart contracts. These art movements stood in critical tension with the systems of communication, law and commerce of their eras. Each treated rootless information, whether about sense data or network messages, as the critical subject of art and a new potential artworld. Their promise and their eventual recuperation by the existing artworld chimes with the historical experience of the blockchain."* [124]

124 'Is Art - Rhea Myers', https://rhea.art/is-art/, [accessed 18 August 2024]

Beyond the pioneering artworks that mix blockchain and net art, it is worth mentioning a few examples of press articles that raise the question of blockchain as a medium in its own right.

The first is an article published on Le Random, which is a platform dedicated to generative art contained on blockchain. This article, entitled <u>Kevin McCoy on Bridging Net.Art and Blockchain,</u>[125] explores the link between net.art and the first wave of artists investing in blockchain back in 2014. In it, Kevin and Jennifer McCoy, multimedia artists who belonged to the first wave of net.art, shed light on two facts. Firstly, the first experiments with blockchain were fundamentally part of a Do It Yourself and anti-system spirit, just like the first works of net.art, which aimed to hijack this tool for political protest purposes. On the other hand, taking the example of his work Quantum (2014 - 2021)[126] anachronistically considered to be the first NFT[127], the artist tells us that Quantum did not meet its public and its market during the two or three years following its conception, despite a conference given in the prestigious institution of net art: Rhizome.

McCoy explains that despite his work's anticipation of the NFT concept, the market was not there, the public dubious and the institutions merely curious about these new experiments. This was a problem encountered by many artists before the crypto explosion of the 2020s.[128] Rightly so, this explosion is seen as a paradigm shift for the practice of art on blockchain.

But have artists really benefited? That's the whole point of our article, which aims to prove to readers that art on, through or in blockchain exists autonomously and almost independently of NFT and speculative crypto-media. As such, this article offers us a unique perspective on the interest of art applied to blockchain technologies and vice versa. It is almost an art of anticipation which, according to Rhea Meyers, can take the form of "market research" [129]potentially helping to identify types of products, applications and use cases that can be positioned as "innovative" and "revolutionary" paradigm shifts as often discussed in the marketing of web3 products.

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125 'Kevin McCoy on Bridging Net.Art and Blockchain', https://www.lerandom.art/editorial/kevin-mccoy-on-bridging-net-art-and-blockchain, [accessed 18 August 2024]

126 https://www.mccoyspace.com/project/125/

127 'Quantum | Natively Digital: A Curated NFT Sale | 2021' , Sotheby's, https://www.sothebys.com/buy/1122db9b-f3bd-45d5-b299-412bf9d846b5/lots/32fc8f27-fca0-49e4-b1d0-20856bbf118d, [accessed 18 August 2024] Il est d'ailleurs assez drôle de lire la description qu'en fait Sotheby's, comme pour légitimer l'intérêt artistique de l'oeuvre par une série d'analogies aux oeuvres pionnières de la peinture du début XXème siècle : "Timestamped July 1907, Picasso's Les Demoiselles ushered in the chain of Cubism. December 1917, Malevich's Black Square stands as the genesis block of Abstraction. April 1917, Duchamp timestamps the era of the idea. 2nd May 2014 21:27:34, Quantum stands alone in the precision of its timestamp - immutably, verifiably, trustlessly pure"
.

128 'Is Blockchain a Medium?' <https://www.rightclicksave.com/article/is-blockchain-a-medium>, [accessed 17 August 2024]

129 Ibid.
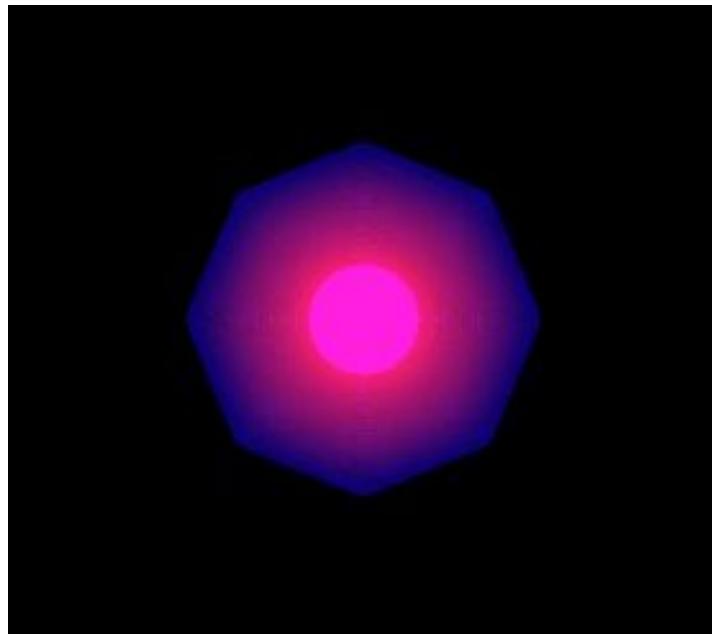
Figure 17: Jennifer et Kevin McCoy, Quantum, 2014,
https://www.mccoyspace.com/project/125/

To conclude this section, we would like to point out that net art was discussed in this section. The question of networks, the network and network art being unanimously absent from the discourse surrounding crypto art and artistic production in the blockchain in general. We will therefore seek to understand the extent to which network art is possible through artistic practice using blockchain as a vector for network creation.

C) Network art and blockchain

Now that we have defined net art, it is appropriate to examine the notion of network art in more detail, in order to arrive at a conceptualisation that remains accurate, despite the protean nature of the works that characterise this form of art. In this section, we will examine and define networked art and networked art through blockchain.

C.1) Network art and its specific features

The first step is to sketch out a comprehensive definition of network art and how it differs from net art. In 2008, multimedia artist Garrett Lynch offered us an initial response in <u>Le Net Art, Au-delà du</u>

navigateur... un monde d'objets. [130]. In this article he asks readers: *"What if Net Art was neither a movement nor a style?"* and if it was indeed *"an art form centred on a much broader question: the identification and importance of networks in all spheres of society"*.

To begin with, we need to re-contextualise Lynch's thinking. The author published this article in 2008 at a pivotal moment in the history of the World Wide Web. As we mentioned, this was the beginning of Web 2.0, which was becoming a web of platforms where the user became the product. In this context, our relationship with networks is changing profoundly. Indeed, as Julian Bleecker put it in 2006, *"We are now evolving in the era of networks that are everywhere; in fact, we are in the networks, rather than on the network".[131]*

It is in this context of the Internet's paradigm shift that Garett Lynch examines the question of Net Art. Indeed, a few paragraphs after stating his question, Lynch clarifies his terminology, sketching out a conclusion at the same time: *"in fact, we should call it [Net Art] Networked Art or Connected Art to emphasise the importance of networks as a concept overarching the Internet, which is only a particular implementation of it".* [132]

Network art therefore seems to be an art form in its own right, and we would add here - and clarify our thinking in a few paragraphs - that network art is anterior to net art, since the subject of the latter is interaction *"with the net and through the net",[133]* whereas the subject of network art is the very nature of interactions on networks, whether they be material or immaterial, physical or digital, existing or non-existent.

It is important here to remember the contribution of cognitive science to our approach. According to the latter, understanding digital art involves observing the relationship between the work and the viewer. But in the age of net art and networked art *"the project has become [...] more complex, since on the one hand, because of the evolution of art towards a conceptual form, it is no longer just a question of representing reality, and on the other hand, because the role of the spectator is no longer the same either"* [134]. Indeed, with the development of these new forms of art - namely network art and net art - the role of the spectator in digital art is undergoing a major transformation.

On the one hand, in digital art, the viewer moves from being a passive agent to an active one through the singular process of interaction. On the other hand, with the development of net art - as defined by Antoine Moreau - the agent is no longer a spectator but becomes a user of a tool. According to this paradigm, the work becomes a technical tool that the user can freely use to access the underlying subject or idea.

Network art differs from net art in that it introduces a subtlety of its own. Network art observes the interaction that is possible on the network between an idea and several users. It is in this

130 LYNCH Garrett,'Le Net Art', trans. by Traduction de Jane Noppe, Terminal. Technologie de l'information, culture & société, 101, 2008, doi:10.4000/terminal.4618 [accessed 16 August 2024]
131 BLEECKER Julian, A Manifesto for Networked Objects — Cohabiting with Pigeons, Arphids and Aibos in the Internet of Things, University of Southern California, 2006
132LYNCH Garrett, Op.cit.
133 MOREAU Antoine, Op. Cit.
134 HUDELOT Mok Mi, Op.cit

transformation from a 1:1 relationship to a 1:n relationship, or even an n:n relationship, that network art exists. According to Garrett Lynch, the mode of communication is reversed in network art. The viewer's place is no longer in individual interactivity, but in collective interactivity. Art no longer maintains a unique link with the viewer. The network becomes the means by which there is communication and exchange between a multitude of spectators. As a result, unlike the examples of net art and crypto art, art is not in code but on the network. The dematerialised subject is carried by the immaterial network. Whether physical or digital, the network in network art becomes the matrix of the work. To quote Roy Ascott: *"The work of art occupies a pivotal point between two sets of behaviors, the artist's and the spectator's. It is essentially a matrix, the substance of the work. It is essentially a matrix, the substance between"* [135] It is precisely this network as a matrix that allows network art to exist; or to simplify this idea by quoting Antoine Moreau once again: "Art is the network".[136]

C.2) Network art before the Internet

Now that the subject has been set out and we've established a - we hope - comprehensive definition, it's time to illustrate these ideas through an analysis of the work that inspired us to write this piece: Territoire du m2 by Fred Forest (1979 - Present)[137]. According to the art critic Pierre Restany,[138], Territoire du m2 artistique is the result of an experiment carried out by Fred Forest in 1977 with the aim of *"demystifying art"*. Fred Forest's first experiment, entitled "m2 artistique", aimed to criticise *"the fetish of beauty in art that sells itself as such"*.

This work/action was intended to criticise speculation in the art market, and ended with the sale on 22 March 1977 of a simple white sheet measuring one metre by one metre, entitled "m2 non-artistique". The resulting media coverage led the artist to embark on a wider project called "Territoire du m2 artistique".

135 ASCOTT Roy, Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness, ed. by Edward A. Shanken (University of California Press, 2003)
136 COUCHOT Edmond, HILLAIRE Norbert, "L'art numérique, Comment la technologie vient au monde de l'art", Flammarion, Paris, 2003,
137 Selon l'historienne de l'art Maud Jaquin sa pratique artistique se situe dans le prolongement de Mai 68 et des revendications liées à la critique des médias de masse. De ce fait, l'oeuvre de Fred Forest s'est plus ou moins toujours inscrite sous les prismes des médias et de la communication201 comme le témoigne la première oeuvre grand-public Space-Média (1972)
138 Territoire M2 Artistique Par Fred Forest, dir. by Borjan Zarevski, 2013, https://www.youtube.com/watch?v=UzIxbicAp6A, [accessed 8 October 2023]

Les aventures du mètre carré artistique de Fred Forest

La vente du 22 mars
Six mille cinq cents francs nouveaux... plus les frais

C'était chouette, le mètre carré artistique de ~~d~~ Forest, il y avait des affaires à faire. ~~plaçait~~ son fric à la fois dans l'art et dans ~~i~~mobilier ! C'était du terrain, de la bonne ~~r~~e de la campagne française, et ça pouvait ~~m~~per à la cote comme du Picasso ! Par-des~~sus~~ le marché, c'était à deux pas de la frontière ~~su~~se, à Fillinges très exactement, en Haute-~~Savo~~ie. On a beau dire, quand on a mis des ~~sou~~s quelque part, même si c'est pas rationnel, ~~on~~ aime bien savoir que ce quelque part n'est ~~pas~~ loin du pays où l'argent n'a pas d'odeur et ~~n'es~~t pas menacé par le collectivisme du « Pro~~gra~~mme commun ».

Fromage immobilier

~~V~~ingt mètres carrés, numéro 72 au cadas~~tre~~, feuille B, au lieu dit « Chez Marmier », le ~~métamorphosé~~ en société civile immobilière et élevé au ~~ran~~g de terrain artistique par Fred Forest lui-~~mê~~me, Comme le disait la publicité parue dans ~~le~~ Monde » du 10 mars et dont nous nous ~~somme~~s fait l'écho (1), ce mode d'investissement, ~~por~~tant à la fois, en une opération unique, sur ~~deu~~x types de placement qui ont largement fait ~~leur~~s preuves, l'achat de terrain et l'acquisition ~~d'œ~~uvres d'art, s'accommodait de la meilleure ~~faço~~n possible aux perspectives de développe~~men~~t de notre société libérale très avancée. ~~Res~~tait à savoir ce qu'allait donner la mise en ~~ven~~te aux enchères, l'autre semaine, à l'Espace ~~Car~~din, lorsque maître Binoche, commissaire-~~pris~~eur, proposerait ces mètres carrés artistiques ~~aux~~ amateurs, entre une sculpture de César et ~~une~~ toile d'Hantaï.

~~E~~h bien ! les enchères n'ont pas pu avoir

(1) « Le Fric de l'art et l'Art du fric », « le ~~Nou~~vel Observateur » n° 646.

lieu. Fred Forest, au cours de la vente, prit la parole pour dire que, le lendemain même de la parution de son placard de publicité, il avait été convoqué par la police économique, quai de Gesvres, et interrogé plusieurs heures. La gendarmerie d'Annemasse, la police judiciaire de Lyon et les renseignements généraux, sur ordre du parquet de Paris, enquêtaient de leur côté auprès du vendeur des vingt mètres carrés de terrain, interrogeaient le notaire, bref, les rouages de la répression s'étaient mis en branle sans avoir manifestement aucune intention de laisser les choses aller comme Fred Forest les avait prévues.

Mieux, la Chambre des Notaires, semble-t-il, est intervenue auprès de la Compagnie des Commissaires-Priseurs pour lui faire savoir qu'il n'était pas question que les notaires se laissent dépouiller de leur fromage immobilier au profit des commissaires-priseurs, sous prétexte d'un prétendu privilège artistique que de l'immobilier pourrait se voir conférer. Deux heures avant le début de la mise en vente, la Chambre de Discipline des Commissaires-Priseurs, qui s'était réunie en séance extraordinaire, interdisait la vente sans autre forme de procès.

L'artiste ou l'expert ?

Il n'y avait pas à dire : Fred Forest avait posé le doigt quelque part où ça faisait mal. Tous les états-majors des gardiens de sa sainteté le fric partaient en guerre contre lui.

Cette vente, qui n'a pu avoir lieu, ne se fera sans doute jamais. Il faudrait que Fred Forest gagne le procès qu'il a bien l'intention d'intenter. C'est que c'est finalement sur ordre du parquet du tribunal de grande instance de Paris

que maître Binoche se voit contraint de remettre *sine die*. Elle devait se dérouler ai~~nsi~~ ce qui était proposé aux enchères, c'était ~~un~~ encadrement de bois blanc, d'un mètre ~~sur~~ un mètre, destiné à encadrer une des ~~di~~ parts sociales du terrain devenu artistique. ~~Au~~ cadre de bois blanc était attaché un droit pr~~éfé~~rentiel d'achat d'une des parts désignées. ~~Ces~~ subtilités juridiques, outre qu'elles mettaien~~t en~~ boîte les mécanismes artistico-économiq~~ues~~ devaient permettre, dans l'esprit de Fred Fo~~rest~~ et du commissaire-priseur, de passer outre ~~aux~~ empêchements de compétence soulevés par ~~les~~ notaires, la police, la justice. Il n'en fut r~~ien~~ Fred Forest fut bien content. Son « *inten*~~~~ *tion critique* », comme il désigne son type d~~'ac~~tion, montrait bien que la liberté de l'ar~~t~~ s'arrête à l'endroit où la liberté du spécula~~teur~~ commence. Il aurait pu s'en tenir là. Il est ~~allé~~ plus loin.

A l'entrée de la salle des ventes, sur ~~la~~ moquette, Fred Forest avait cousu un morc~~eau~~ de Tergal blanc, un morceau d'un mètre c~~arré~~ évidemment. Ce morceau de Tergal blanc ~~il~~ le mit en vente. Tout le monde avait mar~~ché~~ dessus, il était dégueulasse, un clochard ~~ne~~ l'aurait pas ramassé dans une poubelle. F~~red~~ Forest le déclara « *mètre carré non artistiqu*~~e~~ Pierre Restany, consulté comme expert, le ~~dé~~clara « *mètre carré artistique* ». Qui est le p~~lus~~ compétent, demanda alors Fred Forest, l'ar~~tiste~~ ou l'expert ? Artistique ou pas, le mètre c~~arré~~ de Tergal blanc fut proposé à la vente pa~~r le~~ commissaire-priseur. Fred Forest, pour que ~~les~~ choses soient bien claires, présenta la fact~~ure~~ des établissements Gasmey, où il l'avait ach~~eté~~ le matin même pour la somme de cinqua~~nte-~~ neuf francs, dont huit francs quatre-vingt-~~onze~~ de T.V.A. Ce fut le prix de départ. Les enc~~hè~~res flambèrent... Un amateur enleva le morc~~eau~~ de chiffon pour la somme de six mille ~~cinq~~ cents francs nouveaux, six cent cinquante m~~ille~~ anciens francs, plus les frais. Les choses r~~en~~traient dans l'ordre. L'immobilier restait l'~~im~~mobilier, l'art restait l'art. On avait vendu ~~des~~ taches sur un morceau de toile, il était nor~~mal~~ que son prix atteigne celui des mètres ca~~rrés~~ de toiles peintes que barbouillent les bouff~~ons~~ de l'art pour alimenter le marché. »

« La seule esthétique »

Bien entendu, Fred Forest dérange. Pour ~~lui~~ « *l'action du mètre carré artistique était une* *action destinée à déborder le cadre restreint du* *micro-milieu de l'art et sa réussite ou son éc*~~hec~~ *devait se mesurer à son niveau d'existence d*~~ans~~ *les supports d'information, sur les mass m*~~é~~ *dia* ». Qu'est-ce qu'ils ont fait, les *mass med*~~ia?~~ Ils n'en ont pas parlé. Aucun quotidien, à ~~la~~ part « le Figaro » où l'immobilier occupe ~~une~~ place que l'on sait, ne fit écho à l'événem~~ent.~~ Les journaux qui en parlèrent furent « ~~les~~ Echos », « la Vie française », « le Nouvel E~~co~~nomiste », les journaux qui traitent du pogn~~on.~~ « Le Figaro » n'en a retenu que le côté su~~per~~ficiel, l'apparence d'un canular. Les journ~~aux~~ économiques furent généralement plus b~~ai~~gneux. Ce silence de la presse d'informat~~ion~~ générale, s'il peut avoir des explications con~~tin~~gentes, fut trop universel pour ne pas av~~oir~~ une signification. Il confirme, venant après ~~l'in~~terdiction de la vente, écrit Fred Forest, « q~~u'il~~ *était inconvenant de proposer une œuvre d'*~~art~~ *qui mette en question les pratiques de la spé*~~cu~~ *lation, les pratiques de l'immobilier, les pr*~~ati~~ *ques de la publicité. Le message artistique d*~~e~~ *notre société ne peut être admis que dépou*~~illé~~ *de toute réflexion critique et cantonné dan*~~s le~~ *champ dérisoire de la seule esthétique.* »

Il est moins marrant quand il écrit que qu~~and~~ il agit, Fred Forest, mais il a raison. L'est~~hé~~tique, c'est pas beau.

D.D.

The Territory is formally made up of a 1000m2 plot of land in Anserville in the Oise department, a building and a concept: that of an autonomous government occupying a territory declared independent of France[139].

Within the reality of the territory, subdivided into m2, exists the imaginary reality of the autonomous government. Inside, the building is fitted out with the symbolic equipment needed for the autonomous government to function and exercise its power. There is, for example, a red telephone with a direct link to Moscow, robot guards, a purification room and a collective memory on a printed circuit... The possession of a title deed is accessible to everyone and allows holders to become citizens of the Territory and to enter the social network, both physical and imaginary, created by the artist. Citizens "are [...] automatically invited to take part in the game of communication and simulation that has been initiated",[140] hus participating in the life, organisation and exercise of political power through networked interaction. The result, as Fred Forest describes it, is a *"game of communication and simulation, [...] like a complex collaborative work with multiple levels of meaning and intervention".[141]*.

Firstly, embodies the notion of "infinite art"[142] as formulated by Antoine Moreau in terms of the role of citizen interaction in the Territory. The work has been evolving for almost 50 years, and has taken many forms, including an adaptation for Second Life in 2008.[143].

At the same time, the work explores the themes of media and communication through the symbolic equipment present in the political centre of the Territory. By explicitly designating this autocratic governmental organisation, where the managing artist has free reign of all rights, Fred Forest takes a satirical and ironic approach to questioning contemporary forms of political organisation, their modes of existence, the way they function and the dynamics of power. As such, it is a more general critique of the ways in which power is exercised, and a work that aims to address the problem of society through simulation.[144] To conclude this summary analysis, we'd like to emphasise that it's a homothetic interplay between reality and fiction that "*allows [Fred Forest] to critically and relevantly question the latter through the former".[145]*

Indeed, what is at stake here, like all the themes we have mentioned, is the Territory as a network of communication and information exchange, but also as an immaterial and imaginary place

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139 Territoire M2 Artistique Par Fred Forest, dir. by Borjan Zarevski, 2013, https://www.youtube.com/watch?v=UzIxbicAp6A, [accessed 8 October 2023]

140 'Web Net Museum-Fred Forest-Retrospective-Art Sociologique-Esthetique de La Communication-Interrogation-Oeuvres Actions-Le Territoire', http://www.webnetmuseum.org/html/fr/expo-retr-fredforest/actions/22_fr.htm#text, [accessed 18 August 2024]

141 Ibid.

142 HILLAIRE Norbert,"Internet all over ?", Artpress, l'Art et la Toile, Novembre 1999, P.9.

143 'METAVERS Territoire du M2 | Action Fred Forest en 2014', Archives Fred Forest | SITE OFFICIEL, https://www.fred-forest-archives.com/fr/actions/235/metavers-territoire-du-m2, [accessed 18 August 2024]

144 Territoire M2 Artistique Par Fred Forest, dir. by Borjan Zarevski, 2013, https://www.youtube.com/watch?v=UzIxbicAp6A, [accessed 8 October 2023]

145 Ibid.

where art exists through and for the network. According to Fred Forest, *"The device functions as a simulation and communication game that uses the mechanisms of the imaginary, organised delirium, irrationality and common sense to deal with the problems of society in a dialogic and interactive way".[146]* We find in this quotation all the elements of network art; an immaterial object that organises and conditions the transmission of information interactively between a multitude of agents.

What makes the work relevant and interesting is that the network here is not a digital network, but an immaterial network existing within the real framework provided by the 1000m2 of the Territory. The network exists only through and for the Territory, which acts as a boundary between reality and the fictional world of self-government. Conceptually, it is a *"physical place of interactive exchange, developed from the notion of network, communication and simulation, where physical persons, on site or at a distance (by post, telephone, fax, citizen band or amateur radio) engage in different types of relationship…"* [147].

In effect, this is a work in which the citizens who make up the system are encouraged to become contributors to the work of art, which is both evolving and collective. So *"spectators become users involved in a form of art that becomes a real system of behaviour. It [network art] is a form of behavioural art [Ascott, 2003] which involves users in the action necessary to give life and meaning to the art, to act on the meaning of the work, to integrate it into a network, to distribute it, to copy it, etc., while the message it conveys, strongly impregnated with the desire of users to react, constitutes the fruit of these actions and the behaviours brought into play".[148]*

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146 'Web Net Museum-Fred Forest-Retrospective-Art Sociologique-Esthetique de La Communication-Interrogation-Oeuvres Actions-Le Territoire',http://www.webnetmuseum.org/html/fr/expo-retr-fredforest/actions/22_fr.htm#text, [accessed 18 August 2024]
147 Ibid.
148 LYNCH Garrett, Op.cit.

Figure 18: Bâtiment du Territoire

Le Territoire du M2 Artistique is therefore a networked work of art that existed long before the Internet, during the Internet and which we hope will exist after the Internet. Fred Forest is using the network to create a work of art. Through a mode of collective and imaginary simulation he creates a real network that becomes the matrix of the Territory, a matrix or "substance between" to use Roy Ascott's formulation, where dematerialized art takes shape and can exist in this immaterial network. This is done solely through the active or passive participation of those who communicate and make up this network. All of this leads to a questioning of the very essence of a network and what its limits might be, if they exist at all.

C.3) The dematerialisation of the idea, towards networked art through blockchain

Alexander Galloway writes in <u>Protocol: How Control Exists after Decentralization</u>: *« The Web Stalker doesn't produce art but, in Matthew Fuller's words, 'produces a relationship to art.' The Stalker slips into a new category, the 'not-just-art' that exists when revolutionary thinking is supplemented by aesthetic production. »*[149]. Alexander Galloway is implicitly referring to a conceptual approach to the work of art as formulated by Lucy Lippard, a pioneer in the field who is particularly interested in the dematerialisation of art. Lippard describes the dematerialised work as one *"in which the idea is paramount and the material form is secondary, lightweight, ephemeral, cheap, unpretentious and/or dematerialised"* [150].

As we shall see, this concept of dematerialisation and the primacy of artistic thought become essential in our third level of reading, that of the concept; a level of reading where the idea is considered more important than the formal object. To this end, we will look at artists such as the Mathcastles collective and Antoni Muntadas. Our aim is to re-examine network art in depth, while updating the question of the future of this art form in the age of blockchain art.

Let's start by looking at Terraforms by the Mathcastles Collective (2021- ongoing)[151]. On the surface, this is a collection of NFTs described as *"Onchain land art from a dynamically generated onchain 3D world"*. Basically, each token or NFT is a 32 × 32 px grid filled with text characters, stored in an SVG and animated in the browser using javascript[152]. Formally, each NFT, by virtue of its tokenised nature, contains properties or metadata that determine its specific form, the whole determining the nature of a parcel contained in an immaterial world. This immaterial world can be recomposed using the titles of each token and x & y coordinates, for example Level 13 at {9, 5}[153]. When these levels are recomposed according to the order established in the titles, all eleven thousand tokens form a hyperstructure called *Hypercastle*.

As the metadata and titles are contained in Smarts Contracts, they are referenced in an immutable "on-chain" and networked manner. This means that the information is publicly available and can be used in various projects, such as an API that would use data linked to the hypercastle in the context of a video game. It should be noted here that by making the data available, several applications have been developed by the Terraforms community. We can see that this work is a very good example of what is understood as 'decentralised' art in the world of blockchains.

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149 Galloway, Alexander R., Protocol: How Control Exists after Decentralization (The MIT Press, 2004), doi:10.7551/mitpress/5658.001.0001

150 L. Lippard, "Escape Attempts," in Six Years: The Dematerialization of the Art Object from 1966 to 1972 (New York: Praeger, 1973) pp. vii–xxii, p. vii.

151 https://opensea.io/collection/terraforms

152 W, Kirk,'An Introduction to Terraforms by Mathcastles', Medium, 2023,https://medium.com/@KirkW35/an-introduction-to-terraforms-by-mathcastles-74eb34d90386, [accessed 16 August 2024]
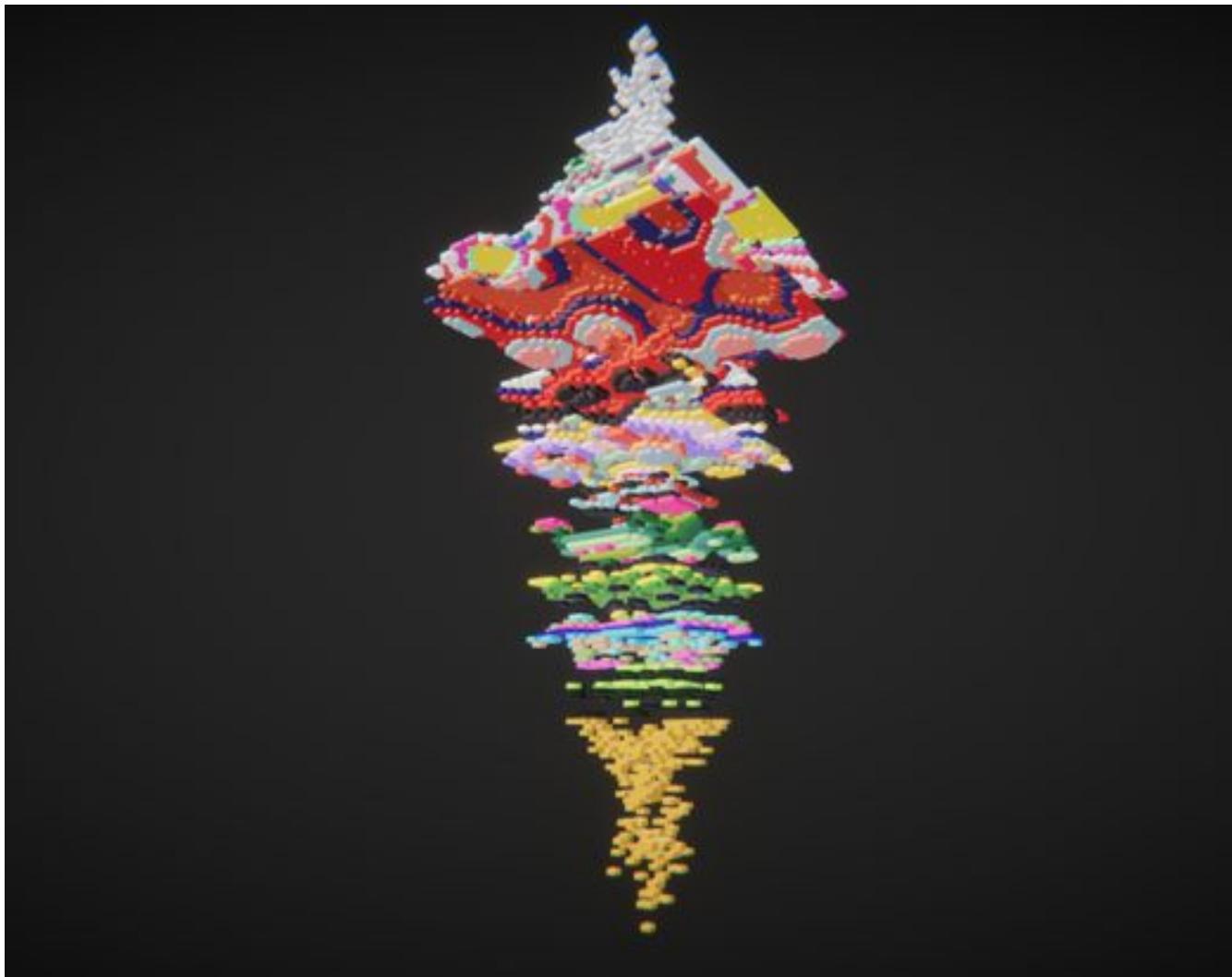
153 https://opensea.io/item/ethereum/0x4e1f41613c9084fdb9e34e11fae9412427480e56/1

Figure 19: 3D visualisation of the Hypercastle,https://thousandant.itch.io/hypercastle-explorer

This ontological decentralisation means that the work becomes virtually autonomous from its creator. In this case, the degree of artistry does not come from the individual form of the tokens, or even from the collective form of the Hypercastle, but from the interaction between artists and users. To borrow Antoine Moreau's phrase, *"Art is the network"*[154] and here the network is the set of means by which viewers interact with the work, and with Masthcastles and its respective members 113 and xaltgeist. Moreover, we would emphasise that this interaction is only made possible by the open nature of Terraforms and the metadata that make up the Hypercastle. Through the accessibility of this data, the community can build new worlds, imagine a continuation of the work and, in a way, seize this tool to produce something new. In this way, we can put forward the idea that despite the initial financialisation associated with NFTs, Mathcastles' work is nonetheless part of a logic of 'giving' and of a gracious form.

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154 HILLAIRE Norbert, "Internet all over ?", Artpress, l'Art et la Toile, Novembre 1999, P.9.

Finally, we'd like to highlight a new theme emerging from Terraforms and network art: temporality. In the immaterial world constructed by Mathcastles, there is a date inscribed in the Smart Contract when the hypercastle will be destroyed. This date corresponds to the disintegration of the entire hyperstructure and its parcels. To date, the immaterial world of Terraforms will not see its disintegration for around eighteen thousand years, assuming that the Ethereum blockchain persists until then...

```
/* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
* INTERNAL: TOKEN DATA
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * */
/// @notice Returns the amount of decay to apply to the token structure
/// @dev Decay begins unless there are enough dreamers
/// @param timestamp The point in time for determining decay
/// @return The years of decay affecting the tokens
function
_yearsOfDecay(uint timestamp) internal view returns (uint) {
uint decayBegins = REVEAL
TIMESTAMP + dreamers * 3
_
_
650 days;
if (dreamers >= 500 || timestamp <= decayBegins) {
return 0;
} else {
return (timestamp - decayBegins) / 365 days;
}}
```

*Drawing 2: Extrait de code qui détermine quand
l'hyperstructure est détruite*

This mechanism serves a dual purpose: on the one hand, it encourages the community to interact with Terraforms plots. On the other hand, it places Terraforms in a temporality that runs counter to the paradigm of immutability attributed to blockchain and NFTs. It is a finished work, which is not immutable but which - just as computers give life to the blockchain - will one day perish under the effects of time. Just as the pioneering works of net art are threatened by the evolution of browsers, Terraforms seems threatened by its very essence...

But isn't it fair to say that the influence of networked interactions will live on into time immemorial? Constituting, at the same time, an unfinished work? It would be hard to argue otherwise.

The same is true of The File Room by Antonio Muntadas (1994 - Present)[155] which, according to the typology established by Annick Bureaud, belongs to the so-called network artworks[156]. According to

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155 'The File Room | Net Art Anthology', https://sites.rhizome.org/anthology/thefileroom.html, [accessed 8 October 2023]
    & https://www.thefileroom.org/
156 'Olats.Org - ETUDES ET ESSAIS Pour Une Typologie de La Création Sur Internet',
    http://archive.olats.org/livresetudes/etudes/typInternet.php, [accessed 9 October 2023]

Christiane Paul, it is a work of digital art that can be likened to the "tactical media" [157] that examine the impact of new technologies on our culture.

In the case of The File Room, it is formally a database that records cases of censorship around the world. These cases are reported by members of the public who have access to this tool as part of an installation or on the internet. With this work, the artist is reminding us that freedom of expression has only recently been achieved. Although the Internet is the vector par excellence for the free circulation of information, this technology remains a fragile tool because it can be censored by those who control it. Just imagine The File Room's server being attacked by pirates or seized by the courts, and the original work is no more.

Conceptually, it is a work that questions the collection and dissemination of information through an open digital network, but also between the spectator-users themselves. Indeed, the Internet network, as it has been conceived, is in essence the best means of ensuring freedom of expression for the agents who interact with it. What is really at stake here is the digital network through which viewers or users interact with the work in order to transmit and consult information. From this interaction emerges a new network in the form of human interconnections. This vast network, whose nerve centre is The File Room's server, enables the work to be networked net art.

C.4) What networked art through blockchain?

We have shown that a form of networked art is possible through the use of blockchain. However, Terraforms is not, strictly speaking, a networked work. So we'll be looking at how networked art is made possible by blockchain. What might be at stake in incorporating this technical tool into networked art? What forms might it take?

According to Garret Lynch, *"Networked artworks seem to have two characteristics. On the one hand, they show a retreat to general ideas formulated before the age of the Web [...] At the same time, these networked artworks show signs of progression and diversification by exploring new emerging technologies that will allow them to function as relevant and provocative contemporary art."* [158]

It is once again quite surprising to see how the way in which scientists have approached the question of network art remains relevant today. Whether in the case of Territoire du m2 artistique or Terraforms, the approach is sensitive to previous artistic issues - media and communication for Fred Forest, net art and generative art for Mathcastles - while at the same time taking an experimental and genuinely avant-garde approach.

Similarly, now that we've made a direct connection between Terraforms and Territoire, we could ramble on about the similarities between the two works. How might Territoire serve as a conceptual

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157 PAUL Christiane, l'art numérique, Thams & Hudson, Paris, 2008 p. 204

158 Lynch, Garrett,'Le Net Art', trans. by Traduction de Jane Noppe, Terminal. Technologie de l'information, culture & société, 101, 2008, doi:10.4000/terminal.4618 [accessed 16 August 2024]

reference for understanding Terraforms? What is at stake in a fictitious territory if there is to be networked communication between what belongs to matter and form and what belongs to form and idea? What links can we make with deterritorialisation and psycho-geography? What constitutes the work? Is it the immediate performance resulting from the interaction of networked agents, or is it what emanates from the unfinished object or *the 'runtime artwork program that runs forever',* as 113 puts it? [159].

It would be too big a task to answer all these questions here, and there may not be enough sources to take a real look at networked art through blockchain. However, we cannot stop our analysis at these aphorisms. In the few lines we have left, let's try to draw up a portrait of the discourses surrounding this emerging artistic practice, in the particular context of blockchain.

In 2019 Fred Forest devised a project called "Territoire du m2 artistique planétaire"[160]. Like the Territoire du m2 artistique, this is a project that takes several forms. Fred Forest's main idea lies somewhere between his Territoire du m2 and his Nouveau marché du virtuel that we mentioned at the very beginning of this article. Fred Forest wants to divide the globe into digital planetary m2s, which will then be put up for sale. The purchaser of a planetary m2 will then be able to personalise his or her m2 in a participatory way, not unlike Space-Media (1972). Subsequently, the purchaser of a planetary m2 will be able to join an online social group to form a community that will play a decisive role in the life of this digital ecosystem. The artist's ultimate aim is to create a 'digital republic' in which citizens can participate both physically and on the network. This project is unique in that it has been conceived and made possible solely by integration with the Ethereum blockchain, by virtue of its intrinsic qualities. The global m2 will be a token created by a Smart Contract. Although this token is a conceptual artistic product, it will retain a speculative value on the art market.

Territoire du m2 artistique planétaire tells us about the possible use of blockchain in networked art. As we have described, this project is about a dematerialised and tokenised digital work... But do contemporary artists have to limit themselves to tokenising their work for there to be art through blockchain? What has happened to cryptographic technologies since 2019, when the Territoire du m² numérique planétaire was conceived? How can these technologies influence the new form of networked art that we are trying to design?

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159 After NFTs: Network Art and the Third Era - 113, dir. by Celestia, 2024, https://www.youtube.com/watch?v=ltU-j6FlMvo, [accessed 14 August 2024]
160 Le site web surlequel ce document été stocké n'est plus accessible
https://www.fredforest.org/m2planetaire/_M2_planetaire_brouillon__28_09_2019.pdf

To try and answer this question, we'll use a talk by 113, a member of Mathcastles, entitled Network Art and the Third Era[161]. In his talk, 113 sketches out a chronology of the evolution of blockchain: first there was Bitcoin, then Ethereum and finally, in 2024, a transition to a third era.

According to 113, first there was net art as we have described it, made up of a DIY and activist culture. Then, the movement changed - entering a period of « *ketman* »[162] during which Post-Internet art was practised according to the specific system of networks that emerged with web2.0, and which at the same time embraced artistic thought and creation on the net[163]. Finally comes the "third era", which seems to characterise a new artistic practice that coincides with developments in blockchain, which is becoming a medium in its own right. At the same time, this practice is re-actualising network art thinking and, as we have shown, taking full inspiration from it. All of this is happening in a cultural context in which blockchain-based art is beginning to be recognised as a practice with a place in art history in its own right.

More so, this is a new age in the blockchain era because of the technological innovations it presents: Rollups, Layer 2, Zero Knowledge Proof, Fully Homomorphic Encryption, Multi-Party Computation, Trust-Infrastructures, CRDT, local-first and other technological advances. According to 113, these technologies have the potential to restructure the world we live in and the way we transmit and access information. For example, Zero Knowledge Proof, defined as a means of verifying the veracity of cryptographically proven information, allows the artist to play with the concepts of truths, information asymmetry and the transmission of knowledge and data. Mathcastles has already begun a cycle of research into this question with Zero-Suite/Angelus (2022 - Present)[164].

From 113's perspective, artists must play a key role in this third age, because it is their duty to immerse themselves in these new technologies and fully understand them, just as the pioneers of blockchain art did. It's not about being the first artist to create this or that work using new technologies. On the contrary, it's about adopting a process of deconstruction and reconstruction to understand the medium and identify its specific features and limitations. It's important for 113 that this art can address the important things in this world and question as best it can the reality in which these new works are set, while approaching it from a critical point of view.

However, as we have already outlined, blockchain is not just about the appearance of a new technology on the media landscape. It is also a means by which artists ensure their survival in the art world. According to 113, there is a market for computer art. Because of the emergence of this market, the creator of digital art can be autonomous and avoid the traditional art circuits altogether in order to devote more time to artistic research and experimentation. Finally, in the words of 113, blockchain is above all an "affordance substrate" or a means by which the artist can subsist on these needs.

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161 After NFTs: Network Art and the Third Era - 113, dir. by Celestia, 2024, https://www.youtube.com/watch?v=ltU-j6FlMvo, [accessed 14 August 2024]

162 Czesław Miłosz, La Pensée captive, 1953

163 Unsound Presentation: D I G I T A L - L O C A L – The Post Internet Artists (Abbey Pusz), dir. By Unsound Festival, 2022 <https://www.youtube.com/watch?v=-84fO4bKH5o> [accessed 30 March 2024]

164 Droitcour, Brian, 'Computation Degree Zero', Outland, 2024 <https://outland.art/mathcastles-zero-suite/> [accessed 8 August 2024]

We are also seeing a renewal of the paradigm of more global thinking about the net brought about by the new blockchain technologies. Political science is leading us to think about decentralisation as a serious alternative to the corruption of the current web. Local-first is becoming a Trojan horse for the re-possession of user data. Social networks are tending to evolve towards distributed forms, [165] and individuals online constitute micro-circles existing within a web of interconnections between private and public bubbles. Sam Hart, in a lecture given in 2024 [166] and in a subsequent article[167] proposes to define blockchain as a cultural institution - operating on different levels of reading - that can be conceptualised as a leviathan as formulated by Hobbes [168].

Through this re-reading and re-definition of what a blockchain is, Sam Hart also proposes conceptualising blockchain protocols as works of art in their own right, adjacent to the social sculptures of the German artist Joseph Beuys[169]. In an interview, Sam Hart invited us to explore the idea of blockchain as a collective performance. Blockchain could have a strong link with sociological art and the question of the behaviour of individuals in the interactions that are the subject of network art.

What's more, with the progress of research into 'Autonomous Worlds' by the 0xPARC [170]foundation, networks and their implications for our world have never seemed so important. The place of art in the context of advanced technologies is all the more important. Could we even imagine a networked art without human actors, so to speak, where automation and on-chain data have replaced active human intervention? What truths might emerge from these virtual territories that cannot be extinguished? Could network art help to deconstruct these worlds and identify their limits, use cases and risks of misuse? These are all questions we can't answer at the moment.

Conclusion

At the beginning of this article we wondered to what extent there is art in blockchain. Today, we are saying that there is art from the moment there is an idea or subject that emanates from the mental or physical interaction between the viewer and the object work. These modes of existence are mainly manifested through digital works, although they can also be inscribed and exist within the framework of physical installations. Its specific features are those of its medium and the technologies that make it up: Smart Contracts, tokens, communities, immutability, decentralisation, financialisation and networks. Through the use of this medium, the art produced is a critique of the system. It can be a

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165 'Figure 1: Centralized, Decentralized and Distributed Network Models By...', ResearchGate , https://www.researchgate.net/figure/Centralized-decentralized-and-distributed-network-models-by-Paul-Baran-1964-part-of-a_fig1_260480880, [accessed 19 August 2024]

166 Artchains: Low-Level Protocol-Design as Art - Sam Hart, dir. by Aura, 2024, https://www.youtube.com/watch?v=S-rvS7uCymc, [accessed 19 August 2024]

167 'Crypto's Three Body Problem' , https://otherinter.net/research/three-body-problem/, [accessed 19 August 2024]

168 Thomas Hobbes, Léviathan, 1651

169 Artchains: Low-Level Protocol-Design as Art - Sam Hart, dir. by Aura, 2024, https://www.youtube.com/watch?v=S-rvS7uCymc, [accessed 19 August 2024]

170 '0xPARC', https://0xparc.org/blog/autonomous-worlds, [accessed 19 August 2024]

question of self-destruction, of mise en abyme and of questioning. However, art through blockchain is also meaningful in that it educates the public about this new technology, identifies new positive uses for it and revisits the old questions theorised by the first contemporary artists about art and its relationship to the market.

Finally, blockchain art must be integrated into the history of digital art. We have demonstrated through meticulous analysis that it inherits the codes of digital art and updates the questions raised by net art. In the same way, we assert that blockchain-based art is not separate from network art, just as network art should not be separate from blockchain. On the contrary, blockchain-based art has strong historical, conceptual and formal links, so the practice of network art needs to be updated. Networked art, will eventually give new substance to art on the blockchain and at the same time enter a new era enabled by these technologies.

"I do deeply believe that artists can operate at a fundamental level in the world. They can say things, create things and show things that are co-equal with what science and philosophy are doing." - Kevin McCoy

I would like to thank the reader for having had the patience to read this article.
Vera Choudy-Lartisant

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TIM WHIDDEN [@TWHID], @mathcastles has my full endorsement :) and @rheaplex of course: OG o' the OGs [courriel], sur Twitter, 20 janvier 2024, [consulté le 18 août 2024] https://x.com/twhid/status/1748502745898737688