

Crypto Art

A Decentralized View

**MASSIMO FRANCESCHET, GIOVANNI COLAVIZZA,
T'AI SMITH, BLAKE FINUCANE, MARTIN LUKAS OSTACHOWSKI,
SERGIO SCALET, JONATHAN PERKINS, JAMES MORGAN
AND SEBASTIÁN HERNÁNDEZ**

ABSTRACT

Crypto art is limited-edition digital art, cryptographically registered with a token on a blockchain. Tokens represent a transparent, auditable origin and provenance for a piece of digital art. Blockchain technology allows tokens to be held and securely traded without the involvement of third parties. Crypto art draws its origins from conceptual art—sharing the immaterial and distributive nature of artworks, the tight blending of artworks with currency and the rejection of conventional art markets and institutions. The authors propose a collection of viewpoints on crypto art from different actors within the system: artists, collectors, gallerists, art historians and data scientists. A set of emerging themes and open challenges surfaces.

PROLOGUE

Crypto art is a recent artistic movement in which the artist produces works of art, typically still or animated images, and distributes them via a crypto art gallery or their own digital channel using blockchain technology. In order to illustrate the movement from a variety of perspectives, as well as to highlight open challenges, we wrote a “decentralized” position paper on crypto art, which includes viewpoints from different actors within the system. The writing process went as follows:

1. A general definition of the topic was put forward by Massimo Franceschet and Giovanni Colavizza and used as reference in asking a set of diverse authors

to contribute their viewpoints asynchronously and independently. Franceschet and Colavizza offered no guidelines before the authors submitted their first drafts.

2. Afterward, all authors read and commented on one another's work, and Franceschet and Colavizza encouraged the authors to make connections among viewpoints explicit. Franceschet and Colavizza further asked each author to suggest open questions and future perspectives on the topic of crypto art from their vantage points. Each author kept full control of their own section at all times.
3. Last, Franceschet and Colavizza distilled a set of emerging themes from a comparison of all viewpoints.

This process allowed for multiple voices to freely emerge and blend to create contributions on a common topic. The full position paper that evolved out of this process is available in the online supplemental materials. In this article, we first provide an introduction to crypto art and then summarize the main findings from the comparison of the viewpoints in the position paper.

CRYPTO ART: RARE DIGITAL ART ON THE BLOCKCHAIN

We describe the crypto art system by first considering the gallery SuperRare, a major crypto art marketplace. When an artist uploads an artwork to the SuperRare gallery, a transaction is created on the Ethereum blockchain. This transaction creates a nonfungible token (NFT), uniquely associated with the work of art, and transfers the token to the artist's cryptographic wallet. The transaction is digitally signed by the artist, using asymmetric encryption, in order to prove the authenticity of the work. The token is permanently linked to the artwork and is a one-of-a-kind asset that represents ownership and authenticity of the underlying artwork.

The gallery distributes the artwork file over the nodes of the peer-to-peer InterPlanetary File System (IPFS) network.

Massimo Franceschet (data scientist, artist), Department of Mathematics, Computer Science, and Physics, University of Udine. Email: massimo.franceschet@uniud.it.

Giovanni Colavizza* (researcher), Department of Media Studies, University of Amsterdam. Email: g.colavizza@uva.nl. ORCID: 0000-0002-9806-084X.

T'ai Smith (art historian), Department of Art History, Visual Art and Theory, University of British Columbia. Email: tai.smith@ubc.ca.

Blake Finucane (art historian), Department of Art History, Visual Art and Theory, University of British Columbia. Email: blake@blakefinucane.ca.

Martin Lukas Ostachowski (artist), ArtbyMLO. Email: martin@ostachowski.com.

Sergio Scalet (artist), Hackatao. Email: sergio.scalet@hackatao.com.

Jonathan Perkins (gallerist), SuperRare.co. Email: jperkins@pixura.io.

James Morgan (gallerist), KnownOrigin.io. Email: james.morgan@blockrocket.tech.

Sebastián Hernández (collector), the Momus Collective. Email: sebdecentr@protonmail.com.

*Corresponding author

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The IPFS network names the image with a code that uniquely matches its content. This means that the same image, even if distributed over several nodes of the network, will always have the same name and will be conceptually identified as a single resource.

The digital work now begins its life on the blockchain, where a collector or fan can purchase it and where it can be subsequently exchanged, traded or held by collectors like any other rare artifact. Typically, artworks are sold via auctions: Bidders make offers, and the current owner of the asset has the ability to accept an offer. When an asset is sold, the corresponding token is directly transferred to the buyer's wallet, while the corresponding price in Ether—the cryptocurrency used on blockchain Ethereum—is moved to the seller's wallet.

When sold, the artwork remains tradable in the secondary market and, in some cases, each subsequent sale rewards the original artist (e.g. with 10% of the sale price on SuperRare). Thanks to blockchain and IPFS technologies, each transaction is cryptographically secured and is peer to peer, meaning neither the funds nor the asset is ever held by the gallery or any other third party. Examples of crypto artworks by some of the authors are shown in Figs 1–2 and Color Plate C.

The Rare Pepe Wallet is considered as the first decentralized platform of crypto art. “Rare Pepe Wallet is a tool created by developer Joe Looney that makes it possible to buy, sell, trade, edition, gift and destroy digital artworks” [1]. To better understand its significance, it is helpful to consider several artists and movements from the twentieth century that could be cited as precursors. To begin with, it seems relevant to look to the history of generative art to understand crypto art's algorithmic foundations. But pop artist Andy Warhol is probably the most notable example whose work “acted” in similar ways to the creation and tracking of Rare Pepees. Having openly proclaimed his affinity for commercial success and making money as he looked to sell his brand to the widest audience possible, he promoted himself as a “business artist.” Warhol melded currency with art creation, thus providing a model for crypto art's reliance on digital tokens.

Alternatively, it is possible to focus on a genealogy that stems from conceptual art and the dadaist Marcel Duchamp, especially those works, like Duchamp's *Tzanck Check* (1919) or Seth Siegelaub's *The Artist's Contract* (1971), that sought to foreground the commercial tendencies of the art world by actively engaging (or exploiting) its institutional frameworks or codes and the legal contract in particular [2]. Many characteristics that were endemic to Duchamp's practice, and to later conceptual art in the 1960s and 1970s, are now visible in the immaterial and distributive logic of a Rare Pepe or other examples of crypto art, though the discourse around the latter has not yet focused on this history.

The “dematerialization of art,” a phrase that was coined in 1967 by critics Lucy Lippard and John Chandler, identified the quintessential features of conceptual practices [3]. As Lippard later defined it, conceptual art was, essentially, “work in which the idea is paramount and the material form is secondary, lightweight, ephemeral, cheap, unpretentious and/or dematerialized” [4]. Conceptual art could be created



Fig. 1. Hackatao, *Rez.Girl*, tokenized on the SuperRare gallery. (© Hackatao)

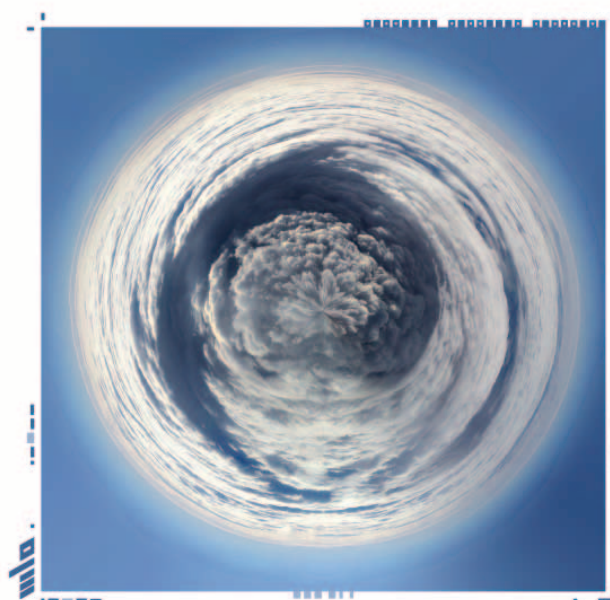


Fig. 2. ArbyMLO, *Tokenized Cloud Sphere One (YYZ to MCO)*, tokenized on the KnownOrigin gallery. (© Martin Lukas Ostachowski)

and viewed outside of major art centers or museums and art galleries, features that helped conceptual artists challenge the elitist tendencies of the art world as well as established practices for how art could be bought and sold. Blockchain technology permits a different kind of immaterial object, but many of the same capabilities apply. The digital and contractual determination of crypto art works in similar ways: Decentralizing art creation and sales allows for the hyperportability of the “object” and the rejection of conventional markets and institutions.

VIEWPOINTS

This section outlines the main themes that emerge from the viewpoints expressed by the authors. For a full discussion, see the online supplemental materials.

Understanding the Crypto-Artistic Movement

Art historians T'ai Smith and Blake Finucane provide much needed historical and critical depth to the discussion of crypto art. While the combination of blockchain technology and digital art is new, the complex relationship between economic and aesthetic modes of valuation has been explored throughout the history of modern and postmodern art practice. In this respect, crypto art offers scholars a singularly compelling entry point to study the encounter of art, technology and socioeconomic systems in the digital space.

Crypto Art Values

The crypto art phenomenon is intimately linked to the values that the blockchain technology has come to represent. Crypto art is, in the words of SuperRare gallerist Jonathan Perkins, “a new idea in an ancient field.” Decentralization, democratization and individual control are themes emerging from the viewpoints of artists, gallerists and collectors. For the artists, crypto art represents in this sense a way to get and keep control of their artworks and reap related benefits. Sometimes these values are not fully materialized yet, as in the case—discussed by KnownOrigin's James Morgan and artist Martin Lukas Ostachowski—of the gallery-centralized verification and authentication of artists and artworks.

Engagement and Community

Crypto art is seen as an artistic phenomenon most appealing to a broader and younger cohort of potential artists and collectors, including—but also spanning beyond—the crypto community. This point is made explicitly by both artists and gallerists, who have an affinity and appreciation for their community of peers and customers. The artist Sergio Scalet of the artistic duo Hackatao highlights how crypto art allows them to move across physical and digital spaces with a speed and freedom of experimentation previously unknown. The space for exploration remains quite wide if we consider that, until now, crypto artists have been focusing on the relatively traditional format of rectangular images and GIFs, as T'ai Smith and Blake Finucane aptly note.

While for the artists crypto art makes for an opportunity to engage with new peers in the digital art space, as well as to attract new buyers, for the gallerists the engagement with the community goes through the task of ever perfecting their platforms' services and ease of onboarding. For Jonathan Perkins, the biggest opportunity in crypto art is to bring the collector side of the market to maturity by designing marketplaces to maximize the benefits of transparency, provenance, liquidity, social signaling and online collection management. Crypto art might be, in this respect, just the beginning of a whole new way to create, exchange and experience art in the digital space, of which the collector Sebastián Hernández gives a compelling example, discussing art exhibition in the VR world Decentraland.

Economics of Crypto Art

The economic aspects of crypto art are crucial to the viewpoints of almost all contributors. For the artists, crypto art

offers a way to directly market their own artworks without mediation and at unprecedented speed—a crucial possibility especially for new artists, as Martin Lukas Ostachowski underlines. Crypto art's immediate economic incentives and their sometimes-unintended consequences are discussed and historically contextualized by art historians T'ai Smith and Blake Finucane.

In a curious twist of history, crypto art has monetized the conceptual art project of dematerialization. If Duchamp and conceptual artists sought to disrupt and expose the market by getting rid of material objects, crypto art has generated a much more rapid market for digital artifacts, whose velocity makes it akin, in some respects, to financial trading. Perhaps as a consequence of the high speed and the relative lack of curatorial control over artwork publishing, a significant current challenge for crypto artists is “artwork hyperinflation” (Sergio Scalet) or “over-tokenization” (Martin Lukas Ostachowski). The sheer amount of new artworks does not allow for users and buyers to experience, digest and eventually buy artworks before a flood of new creations arrives. Hyperinflation can have the effect of lowering prices on average, due to a more abundant offering of artworks, and also of preventing a secondary market from emerging. A possible step forward could be to propose curated experiences, provided either directly by third parties and processes or using Decentralized Autonomous Organizations (DAOs) [5] and Token-Curated Registries (TCRs) [6].

Blockchain Technology and Applications

While crypto art is fully engaging with blockchain technology, there is a shared agreement that the movement has not fully tapped into the potential of the blockchain technology and value system. A relevant point has been made by some of the authors regarding the use of crypto currencies whose volatility makes the market, and collectors' behavior in particular, more difficult to analyze and predict. The recent growth in adoption of stablecoins might offer a way forward in this respect, as discussed by Sebastián Hernández.

Another striking example is the lack of interoperability among galleries, which use different standards and identification of artists and artworks. This has the direct effect of currently limiting the secondary market to within-gallery exchanges. Another, related problem is the system-wide verification of counterfeiting: A solution across the crypto art world might come from DAOs and TCRs in this case as well. System-wide interoperability would also allow for extra-system (re)use of crypto artworks, as well as for the creation of third-party services such as a crypto art analytics platform proposed by Sebastián Hernández.

Crypto Art Analytics

A crypto art analytics platform would require first and foremost the collection and alignment of data from different galleries or, more conveniently, their adoption of a shared standard to expose them programmatically. It would further necessitate the development of crypto art metrics informative to the different users of the platform, such as artists, col-

lectors, gallerists and even bystanders [7]. This direction for future work is proposed by data scientists Franceschet and Colavizza. Crypto art offers the full availability of artwork data (images and metadata), transaction data (bids and sales) and social data (likes and views) and thus will allow researchers to study the mechanics of success in art and creative industries, perhaps in unprecedented detail.

Furthermore, the open availability of crypto art data might ultimately allow data scientists to model the trans-

action system and predict the future success of individual artworks and artists. This possibility, coupled with the increasing use of AI to generate, in part or whole, new artworks, poses aesthetic, ethical and technical questions. A self-predicting system, by creating redundancies in its (human) input channels, could rapidly drift away from its (human) roots, and move on to explore new creative spaces or, conversely, to become increasingly idiosyncratic. We leave this final consideration open.

References and Notes

- 1 J. Bailey, "Rare Pepe Wallet & the Birth of Crypto Art," *Artname* (25 January 2018): www.artname.com/news/2018/1/23/rare-pepe-wallet-the-birth-of-cryptoart (accessed 20 August 2019).
- 2 B.P. Finucane, "Creating with Blockchain Technology: The 'Probably Rare' Possibilities of Crypto Art" (Master's thesis, University of British Columbia, 2018). *The Artist's Contract*, a legal document and work of art published by Siegelau in magazines worldwide, is more formally known as *The Artist's Reserved Rights Transfer and Sale Agreement*.
- 3 L. Lippard and J. Chandler, "The Dematerialization of Art," *Art International* **12**, No. 2, 31–36 (1968).
- 4 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.
- 5 A Decentralized Autonomous Organization (DAO) is any autonomous organization with a decentralized governance and budgeting system. Cointelegraph, "What Is DAO": www.cointelegraph.com/ethereum-for-beginners/what-is-dao (accessed 6 April 2021).
- 6 Token-curated registries (TCRs) are decentrally curated lists with intrinsic economic incentives for token holders to curate the list's contents judiciously. Mike Goldin, "Token-Curated Registries 1.0": https://docs.google.com/document/d/1BWWC__Kms09b7yCI_R7ys0GFIT9D_sfjH3axQsmB6E/edit (accessed 6 April 2021).
- 7 M. Franceschet and G. Colavizza, "Art Metrics," arXiv:1907.07758 (2019).

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MASSIMO FRANCESCHET is an experienced data scientist. He has published 60 peer-reviewed publications in the fields of data science, complex networks, bibliometrics, logic and artificial intelligence. Under the name HEXox6C, he is also a generative artist, with works exhibited in different digital galleries including SuperRare and KnownOrigin.

GIOVANNI COLAVIZZA is an assistant professor of digital humanities at the University of Amsterdam. Colavizza works on machine learning and data science applied to GLAM (Galleries, Archives, Libraries and Museums) collections and on the use of computational methods in the humanities.

T'AI SMITH is an associate professor of art history and media theory at the University of British Columbia in Vancouver, Canada. Her research focuses on media and economic concepts in art and design. The author of *Bauhaus Weaving Theory* (University of Minnesota Press, 2014), she has published

numerous articles, chapters and museum catalog essays, including for the Museum of Modern Art and Tate Modern.

BLAKE FINUCANE graduated with her master's degree in art history from the University of British Columbia, where she produced one of the first academic theses on crypto art and blockchain technology in 2018. She is currently working at a private equity firm.

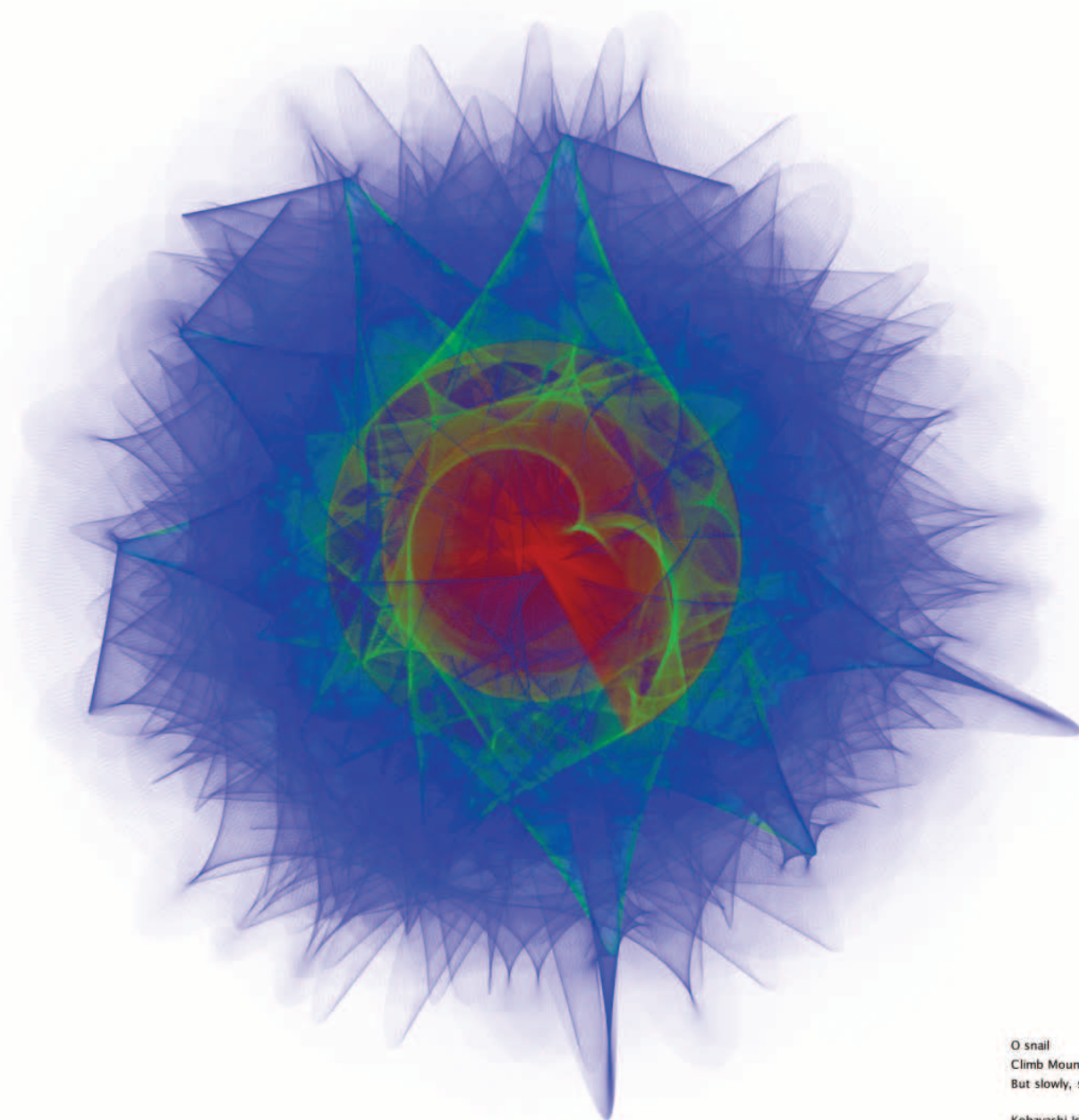
MARTIN LUKAS OSTACHOWSKI is a geometric abstraction artist based in Quebec. He explores blockchain technology through the subject of clouds in physical and digital media. His solo exhibition *Tropopause Contemplation—Blockchain Technology and Inclusive Decentralization* (September 2019) was one of the first blockchain and crypto-art-themed solo exhibitions in North America.

SERGIO SCALET is part of the artistic diptych *Hackatao* (with Nadia Squarci). *Hackatao* merges cultured quotations from the past into bold and ultracontemporary forms, standing out as an innovative exponent of current artistic scenarios like crypto art. *Hackatao* was formed in Milan in 2007 while Scalet and Squarci were working together on the creation of the *Podmork*, sculptures with soft and totemic forms that are at the center of their imaginative research.

JONATHAN PERKINS is an American entrepreneur whose work has spanned technology and art as a performing musician, recording engineer, computer programmer and creative technologist. In 2018, he cofounded SuperRare, a social platform for artists and collectors to trade crypto art. He holds a bachelor's degree in digital media arts from San Francisco State University.

JAMES MORGAN has been involved in the digital arts space for only 18 months (as of writing) and feels he still has much to learn, while recognizing how far the KnownOrigin team he is a part of, and he personally, have come. The technology, the people and the artworks have shown to Morgan the power of what a fairer system could look like and he hopes to help push such a system forward in the future.

SEBASTIÁN HERNÁNDEZ is a technologist and entrepreneur who happens to love physical art. His involvement in the *Momus Collective*—a group of crypto enthusiasts who build Virtual Reality experiences—led him to purchase over 300 crypto art tokens through multiple providers including SuperRare, KnownOrigin, snark.art, CryptoArte.io and Larva Labs.

COLOR PLATE C: **CRYPTO ART: A DECENTRALIZED VIEW**

O snail
Climb Mount Fuji,
But slowly, slowly!

Kobayashi Issa

HEX0x6C, *O Snail*, tokenized on the SuperRare gallery. (© HEX0x6C)
(See the article in this issue by Massimo Franceschet et al.)