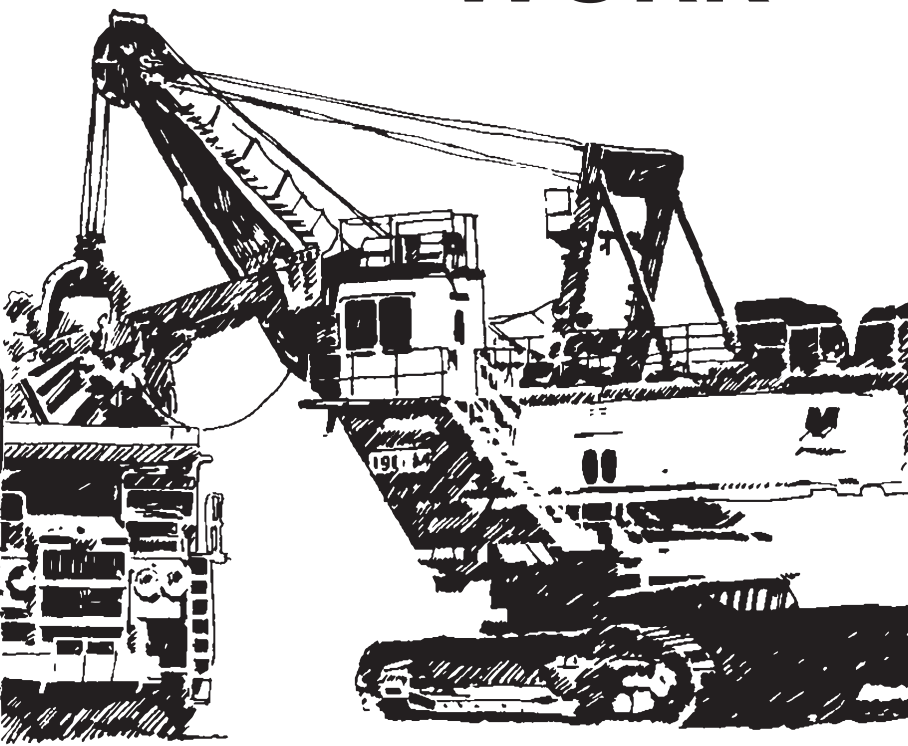
ART / CRYPTOCURRENCY

PROOF OF WORK

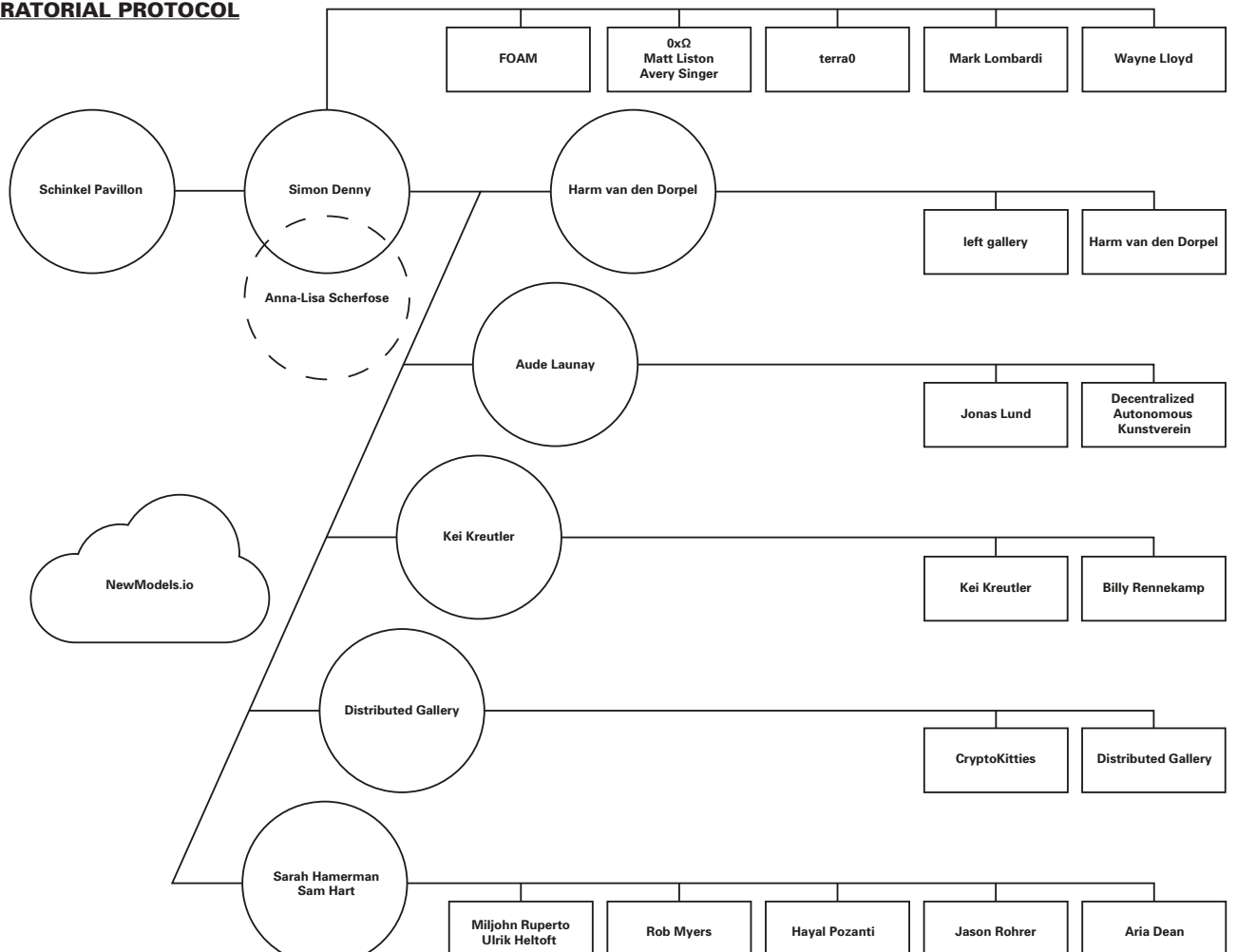


PROOF OF WORK

Schinkel Pavillon
8 September - 21 December 2018

Curated by Simon Denny in dialogue with Distributed Gallery, Harm van den Dorpel, Sarah Hamerman and Sam Hart, Kei Kreutler, Aude Launay, and Anna-Lisa Scherfose.

CURATORIAL PROTOCOL



INTRODUCTION

***Proof of Work* is a group exhibition organized by Simon Denny in dialogue with Distributed Gallery, Harm van den Dorpel, Sarah Hamerman & Sam Hart, Kei Kreutler, Aude Launay, and Anna-Lisa Scherfose.**

The explosion of interest in cryptocurrencies and distributed computing since Bitcoin's emergence in 2009 has led to experiments in alternative governance structures, financing, and peer-to-peer networking. This shift has seeded a cultural conversation that has inspired great creative production on both sides of the traditional ars/techne divide.

Staged in the Schinkel Klause – the Schinkel Pavillon's labyrinthine lower floor and a former GDR restaurant – this exhibition brings together works engaged with the culture around Bitcoin and blockchain, entertaining crypto as a possible new infrastructure for money, computing, and organizing. This includes artwork made by crypto builders, crypto experiments built by artists, and a small number of paintings and drawings that resonate with crypto but predate Bitcoin. The organizers are also diverse, bringing to the show experience as technologists, artists, and curators – often in combination.

Rethinking decentralization, consensus, secrecy, privacy, religion, and societal and/or organizational structures has become popular in circles that discuss and explore the possibilities of blockchain-related systems. Berlin is a busy node in an international network of crypto-interested producers, gathering around amorphous discussion groups. The online group "Crypto Circle" – who use the office chat platform Slack to share ideas – events, and collective "co-working" office spaces like Full Node in Kreuzberg are examples of such self-selecting groups and spaces relevant to many of the positions featured in the exhibition.

A transparent curatorial structure was adopted for selecting the artworks in the exhibition and reflects an interest in distributed decision making. Creators-as-decision-making-nodes were invited to propose positions they felt resonated with blockchain, pushing back on the idea of curating as a singular point of centralized decision-making. The result is a partial picture of activity in this area that is formed by a pre-defined organizational protocol. An organizational diagram is produced and exhibited alongside the exhibition, a record of this structure.

Proof of Work takes its title from the decentralized process behind Bitcoin and other blockchain-based cryptocurrencies. It is the name of the consensus algorithm used to confirm transactions and produce new "blocks" on the "chain," or ledger that makes up a blockchain. From the Bitcoin wiki: "A Proof of Work is a piece of data which is difficult (costly, time-consuming) to produce but easy for others to verify and which satisfies certain requirements."

With this exhibition we aim to highlight a non-representative cross section of the artistic activity being done in the wake of blockchain's emergence.

GLOSSARY

Bitcoin: The most well-known and widely used cryptocurrency, launched in 2009 in the wake of the global financial crisis. Bitcoin popularized the "Proof of Work" system and introduced the blockchain ledger that other cryptocurrencies have adapted and innovated on. Politically, it also popularized the idea of a global currency not issued and regulated by nation states, resonating with free-market ideas and a growing suspicion of "elites" and governmental control.

Blockchain: A digital ledger or database of transactions that happen across a cryptocurrency network – for example, a list of all transactions that happen on the Bitcoin network. All positions on the network update the blockchain database with every new entry or transaction and keep the crypto-currency's full transaction record stored. Everyone on the network can view this ledger and updates to the ledger, so transactions are considered to be transparent. This is said to make intermediaries or third parties, who would otherwise be needed to authenticate and keep records of verified transactions, obsolete. In this way, the blockchain provides an automated version of secure record keeping across a network.

Consensus: Usually defined as a general agreement among all members of a group or community, the idea of consensus takes on a special significance in the context of cryptocurrency, Bitcoin, blockchain and many other forms of decentralized computing. The fact that all positions in a network agree on a shared history of activity in that network is one key aspect of all

blockchain projects. As a core structural design feature of the technology, it has also taken on a special significance in social circles interested in blockchain technology and the design of decision-making processes using consensus (where all parties agree on an outcome or decision) has become popular in organizations that surround blockchain projects.

Cryptocurrency: Digital money that uses coded encryption for security. The most well-known cryptocurrency is Bitcoin.

Decentralization: A network design principle core to blockchain and cryptocurrency where the whole network is part of the distribution of power and processes. Decentralized networks are seen to be more secure than networks wherethere is a central point of power, as the whole cannot be destroyed by the failure of asingle part of the network. The World Wide Web was initially designed as a decentralized system, as are blockchains and cryptocurrencies.

Decentralized Autonomous Organization (DAO): A Decentralized Autonomous Organization, or DAO, is a kind of corporation or collective using blockchain. DAOs collectively fund and vote on the direction of projects they are invested in. All this activity is recorded on a blockchain ledger and managed using automated contracts. DAOs have become popular among blockchain designers as an entity for managing all kinds of processes from collective investing to asset management.

Ethereum: An open source, distributed computing platform and operating system as well as a cryptocurrency network which has more programmable capabilities by design than Bitcoin. It is the second most popular crypto brand after Bitcoin. Software developers can design automated contracts and other applications and tokens on top of the Ethereum platform. Ethereum has its own native currency, Ether, and the crowdsale of this currency before the company's launch in 2014 funded the company's development and set a precedent for a new way of funding companies, later referred to as an ICO or "initial coin offering."

Game Theory: The mathematical study of strategic interaction between rational actors, where incentives for behaving in particular ways, given a certain situation, are designed and analyzed. Popular in military contexts and important in the development of networked computing, game theory principles are also key to cryptocurrency design, where the functioning of networks like Bitcoin rely on rewarding actors with financial incentives to join the network and behave in predetermined ways.

Hardware Wallet: An offline device that can be connected to a computer that holds cryptocurrency and blockchain-based assets in a secure way. Because of the possibility of online storage solutions or currency exchanges like Coinbase being hacked and assets being stolen, keeping cryptocurrencies and other blockchain assets on an offline hardware wallet is seen to be the most secure way to store them.

Mining: In cryptocurrency networks, mining is a validation of transactions in a network. Mining is essentially the consensus algorithm used to confirm transactions and produce new records on the blockchain ledger, or "blocks" on the "chain." Computers engaged in this process are referred to as miners and are rewarded for their participation in the network by being issued cryptocurrency. Mining can be seen as a decentralized network coordination process behind Bitcoin and other blockchain-based cryptocurrencies.

Proof of Work: Another name for the cryptocurrency mining process used to produce Bitcoin and Ethereum. Proof of Work is held to be the most trusted mining process as it has been running the longest on the biggest networks. However, one of the biggest problems with the Proof of Work system remains that it uses a lot of electricity and produces excess heat and is therefore costly to the environment. There are other competing systems called Proof of Stake, Proof of Burn, and Proof of Capacity which are proposed within blockchain communities to replace Proof of Work and would not require this excess energy production. They do, however, have other problems associated with them.

Token: A type of cryptocurrency or unit of exchange that operates within a closed group or platform as a sort of private money. Blockchain projects often issue their own token, which is used within the platform and traded at floating exchange rates with other blockchains' tokens.

CURATORIAL NODES

Simon Denny (b. 1982, NZ) is an artist whose sculptures and installations unpack the practices and aesthetics of technology products and the companies developing and marketing them. He has exhibited a number of artworks documenting the emergence of blockchain in Berlin, New York, Los Angeles, Auckland, and Beijing. Denny had solo exhibitions at MOMA PS1, New York and Serpentine Galleries, London. In 2015 he represented New Zealand at the Venice Biennale.
Curatorial nodes and protocol selected by Simon Denny.
(Selects **FOAM** p. 11, **terra0** p. 13, **Wayne Lloyd** p. 15, **Mark Lombardi** p. 23, **0xΩ** p. 29)

Distributed Gallery (founded 2017, FR) is an art gallery specialized in blockchain-based artwork and exhibition making. Their first project, called the *Ready Made Token*, was reported to be made by Richard Prince – a claim which was then questioned, challenging narratives around blockchain and truth. Members of Distributed Gallery are also active blockchain builders and founders of the blockchain based content collaboration marketplace Wespr.
(Selects **Distributed Gallery** p. 17, **CryptoKitties** p. 35)

Harm van den Dorpel (b. 1981, NL) makes sculpture, installation, works on paper, computer generated graphics, and software. Rooted in the conceptual heritage of net.art, van den Dorpel's works often simulate neural networks. The role of technology in his works is a means to an end: a tool to increase the understanding of our experience. He has engaged in the cryptocurrency context in a number of ways – an early example being selling work for Bitcoin to a museum in Vienna in 2015, the first transaction of its kind. He founded Left Gallery, a gallery which hosts and distributes digital artworks with blockchain, alongside Paloma Rodríguez Carrington.
(Selects **Harm van den Dorpel** p. 25, **left gallery** p. 27)

Sarah Hamerman (b. 1989, USA) is an art librarian and researcher based in NJ/NYC whose work has focused on promoting access to special collections through creating metadata and assisting with reference and outreach. She has collaborated with Sam Hart on a number of projects including a presentation about secrets for the recent Internet Archive's Decentralized Web Summit in San Francisco.

Sam Hart (b. 1988, USA) is a scientist, publisher, and artist living in New York. As a bioinformatician at the Sloan Kettering Institute, Sam works across cancer genomics and cellular engineering. He is the founder and editor-in-chief of Avant.org, a distributed project space for research and practice, and curator of the online technical catalog *Research Tactics*.
(Selects together with Sarah Hamerman **Aria Dean** p. 41, **Rob Myers** p. 43, **Miljohn Ruperto** & **Ulrik Heltoft** p. 45, **Jason Rohrer** p. 47, **Hayal Pozanti** p. 49)

Kei Kreutler (b. 1990, USA) is a researcher, designer, and developer interested in how cultural narratives of technologies shape their use. Besides a diverse participation in artistic, research, organizational, and technology projects, she is currently the strategy director at blockchain prediction market company Gnosis. She also oversees community at the Gnosis-initiated co-working office space Full Node, one of the most prominent spaces for crypto-related activity in Berlin.
(Selects **Kei Kreutler** p. 19, **Billy Rennekamp** p. 31)

Aude Launay (b. 1983, FR) is an independent curator and art writer. She holds a MA in Philosophy from the University of Nantes. Between 2005 and 2016, she was the associate chief editor of 02, a French contemporary art review. She researches contemporary abstraction, the influence of technology on art and society, and algorithmic curating. Most recently she curated a solo show of Jonas Lund whereby they outsourced the curatorial choices to the audience through a website conceived and designed by the artist.
(Selects **Jonas Lund** p. 21, **Decentralized Autonomous Kunstverein** p. 33)

Anna-Lisa Scherfose (b. 1990, DE) is an independent curator based in Berlin and Frankfurt am Main, where she is a masters candidate at the Staedelschule curatorial program. She has worked closely with Simon Denny for the past four years, producing projects with him in institutions and galleries internationally.

Tropical Mining Station
2017
Pneumatic membrane, cryptocurrency miner, Plexiglas casing, plinth, fans
Dimensions variable

FOAM (founded 2015. Ryan John King, Ekaterina Zavyalova, Nick Axel & Kristoffer Josefsson)

Tropical Mining Station **is a tent-like plastic structure inflated with hot air produced by a computer engaging in the activity of "mining" cryptocurrency on the blockchain platform Ethereum. The spaces created by *Tropical Mining Station* are imagined as a way of spatializing the blockchain into physical zones while capturing the excess energy produced through the action of mining cryptocurrency to create such spaces. The enormous amount of energy used in cryptocurrency systems has often been criticized.**

Inflatable architecture as modes of decentralization echoes similar mid-century utopian architecture inspired by cybernetics. Silicon Valley cultural precedents from the late 1960s such as the *Whole Earth Catalogue*, in which many inflatable architecture projects were popularized, reflect an interest in the values of radical individuality and the creation of independent worlds. This value set continues to be prominent among people who are interested in blockchain technology. These ideas have long been present in dome-like architecture and recall the Biosphere 2 project linked to Trump associate Steve Bannon and recent designs for Seasteading communities, both of which have endorsed cryptocurrencies as part of a path to radical independent sovereignty.

The inflatable bubble-like form also resonates with questions surrounding the vast financial speculation associated with cryptocurrencies and the media's focus on blockchain since the large price spike in cryptocurrencies at the end of 2017.

Closer to FOAM's own interests are definitions of bubbles and spatialisation of plurality associated with Peter Sloterdijk and his systems of thought that categorize spheres "from the discovery of self (bubble) to the exploration of world (globe) to the poetics of plurality (foam)." The group's name was inspired by this system. The FOAM collective has evolved into a prominent blockchain company that describes its mission as being "committed to building spatial protocols, standards, and applications that bring geospatial data to blockchains and empower a consensus-driven map of the world."

They recently launched their "ICO" (Initial Coin Offering), the pre-sale of their own platform-native token that operates as a form of community money or as an indication of interest in projects within their world map. This style of funding blockchain projects has become very popular and represents a new paradigm for funding tech companies – something that previously relied on a small number of prominent venture capital firms as gatekeepers.

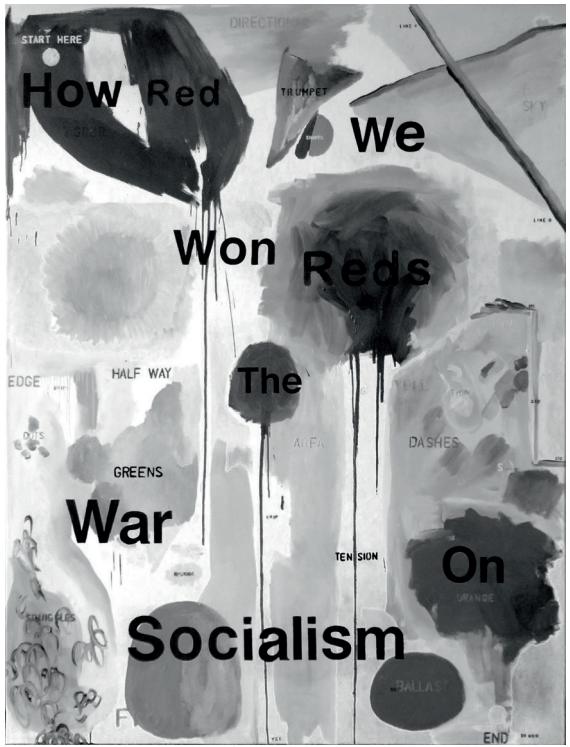
Premna Daemon
2018
Premna Microphylla, cameras, moisture sensor, single board computer, powder coated steel, multiplex wood, Ethereum smart contract, Python backend, JavaScript frontend
70 cm x 130 cm x 115 cm

terra0 (Paul Kolling, Paul Seidler and Max Hampshire)
Front end: Georgia Hansford, Louis Center
Interface design: Gregor Finger

terra0 have built a system whereby a 24-year-old Premna bonsai becomes a cybernetic plant able to act as an agent in its own right. Like most plants, it requires light, water, and caretaking, all of which require resources. By combining the plant with a technological layer including a blockchain – and thereby making it into a hybrid entity – the plant is able to monetize the attention that it attracts and pay for the costs of its own existence.

The bonsai is connected to a web interface and monitored by cameras that broadcast its condition on a screen in the exhibition as well as online. A blockchain-based tipping system makes it possible to donate money for the maintenance, pruning, and care costs of the Premna and a voting system allows the donating party to decide how the tree is cared for and what services it employs. The group of investors/donors are therefore able to influence the future of the tree and how it is managed.

terra0 is a group of developers, theorists, and researchers who explore the creation of offline/online hybrid ecosystems. Driven by a keen interest in remote sensing, machine learning, and distributed ledger technology, they develop tools for the management of natural ecosystems and resources via the creation of meshes of interacting Decentralized Autonomous Organizations. As the artists explain: “Key technologies give us the opportunity to rethink existing and ineffective governance and regulatory structures. New technologies can play a crucial role in creating a sustainable, resilient, and biodiverse future.”



How We Won the War on Socialism
2000
Oil and acrylic on canvas
216 cm x 164.5 cm x 5.5 cm

WAYNE LLOYD (b. 1961 in Kent, UK. Lives and works in Bristol UK.)

Produced before the advent of Bitcoin, this work has been described by the artist as a painting that "[obstructs] intuitive cognition." He continues: "A title punctuates the canvas. Shapes and colors are defined by smaller words. These words may describe an aspect of the abstract painting (e.g. 'directional strokes'), or the color (e.g. 'red'). The description is as much a part of the painting as the abstract shapes and colors." It is a painting that labels its parts.

It recalls the history of the CIA's involvement in abstract expressionism, a now well-known part of the global scaling and branding of figures like Jackson Pollock during the Cold War. Considering the internet's origins within the US military and rumors of US state involvement and/or targeting around the emergence of Bitcoin and its role in expanding the reach of finance and capital, the painting takes on a new significance today. Its format also resembles a style of image-making that became popular with internet memes – glib text clouds over a simple image. Memes became prominent online in the mid-2000s and are now acknowledged as a potent format for political propaganda following the 2016 election of Donald Trump. They are so prominent in public political discourse and information warfare that the US Center for Naval Analyses (CNA) produced a seventy page report on the phenomenon in April 2018, defining a meme as "a culturally resonant item easily shared or spread online". Bitcoin itself has also been referred to as a meme and is critiqued by critics like David Golumbra as a technological gateway drug promoting "right-wing extremism."

Bitcoin and other crypto projects could be seen to be a liberalizing tool, a financial structural layer for a new version of the internet that enables a greater liquification of assets and services than is possible with today's standard infrastructure.

The symbiosis of painting and description in this artwork resonates with new levels of naming and record-keeping enabled by automated blockchain ledgers. *How We Won the War on Socialism* reminds us that all cultural and technological production has a political memory and that granular and fractal forms of financing labeling and tagging can go hand in hand with the expansion of finance.

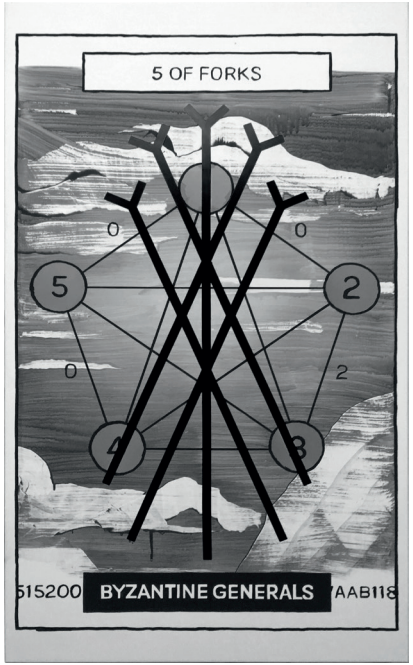
Chaos Machine
2018
Various materials
92 cm x 52 cm x 52 cm

DISTRIBUTED GALLERY (founded 2017)

***Chaos Machine* is a crypto-jukebox that burns banknotes and turns them into cryptocurrency as an exaggerated model of the potential effect of the emergence of cryptocurrencies on existing monetary structures. Each time a banknote is inserted into the machine, it falls on a heater resistor and ignites. This in turn triggers two mechanisms. First, a randomly selected piece of music is played from the speakers of the *Chaos Machine*. Afterwards a paper wallet containing a "chaos coin" token is printed from the machine. This "chaos coin" allows the user to add music to be played on the machine. The machine is intended as a representation of the transition from the traditional economy to the crypto-economy.**

Cryptoeconomics is a blockchain-related subgenre of economics which combines software and network design principles, game theory incentive strategies, and free-market economic ideas. The historical development of this discipline follows a path from "cypherpunk" interests in privacy and independence developed in hacker circles in the 1980s and 1990s through to Bitcoin and the current blockchain industry. Whereas some actors see blockchain as a utopian opportunity to re-boot the institutions surrounding the design, control, and distribution of money and sovereignty, others see it as a hyper-financialization and privatization of money and the internet. The *Chaos Machine* distils this tension into a sculptural machine which forms the center of the exhibition.

A second *Chaos Machine* will be present at Full Node, a blockchain co-working space in Kreuzberg.



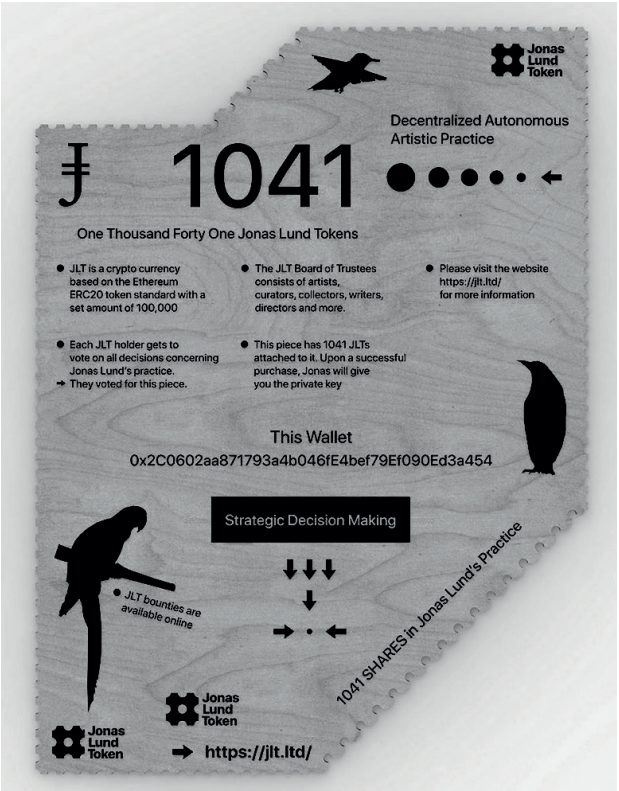
The Pareto Deck: 2 of Swords
2018
Acrylic on canvas
140 cm x 80 cm x 2 cm

The Pareto Deck: 5 of Forks
2018
Acrylic on canvas
140 cm x 80 cm x 2 cm

KEI KREUTLER (b. 1990, Boston, USA. Lives and works in Berlin, DE.)

For *Proof of Work*, Kei Kreutler has produced specially commissioned paintings executed with painter Joe Hoyt that visualize game theory concepts popular among the crypto community using imagery from tarot cards.

Blockchain communities are often interested in how to design systems and coordination structures for groups. Discussions around collective governance and how to structure rewards and incentives for participation in group efforts using blockchain rely on game theory – a discipline long influential in computer and network design and conflict modeling. The game theory tarot paintings tease out this phenomenon and link it to belief structures in an effort to both esoterically and comically point to the discussion of game theory and recurring collaboration dilemmas as archetypal, intractable problems. Tarot's links to divination and occult practices echo the sometimes-fanatical devotion and utopian ambition of activity around crypto projects.



Jonas Lund Token (JLT) 1041
2018
CNC, engraved wood, acrylic
120 cm x 90 cm x 1.5 cm

JONAS LUND (b. 1984 Linköping, SE. Lives and works in Berlin, DE.)

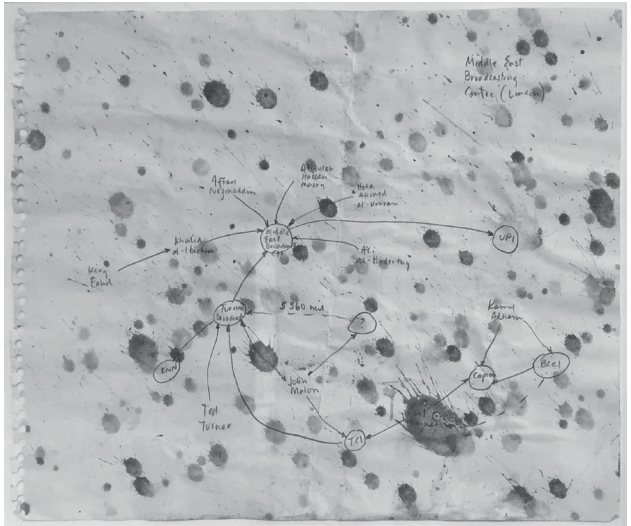
Jonas Lund is one of a number of artists experimenting with the blockchain-enabled "tokenization" of artwork production and art practice collective governance. This wall piece is part of a series in which the artist has created 100,000 shares in his artistic practice. It has a stated value of 1041 "Jonas Lund Tokens (JLT)" and its unique cryptographic "hash" number as a part of its form.

The blockchain-based system designed by the artist in 2018 gives shareholders and purchasers of the artworks agency and voting power over future decisions concerning Jonas Lund's practice and the future of the Jonas Lund Token. Each share is represented by a Jonas Lund Token, a cryptocurrency built on and distributed via the Ethereum blockchain. Similar to a corporation, one share equals one vote and owners of the tokens become part of the Jonas Lund's board of trustees and will be consulted each time a strategic decision needs to be made via the Jonas Lund Token website. 25,000 tokens and a stake in this decision-making experiment will be available by purchasing a physical Jonas Lund Token artwork.

The Jonas Lund Tokens create a system in which the token holders have a financial incentive to reach a consensus for what's the best strategic decision – the logic being that the better Jonas Lund's career is doing, the more valuable the token becomes.

The artwork on display in this exhibition was decided by Jonas Lund Token holders through a vote on four different options proposed by the artist.

https://jlt.ltd



Middle East Broadcasting Centre (London)
C. 2000
Graphite on paper
23 cm x 30 cm

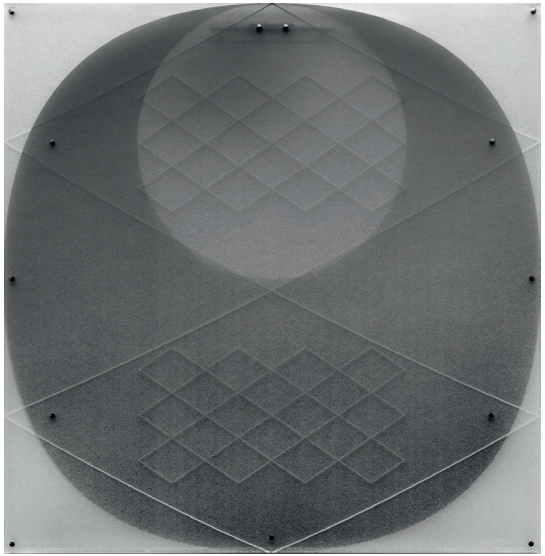
Paul Helliwell Castle B&T Mercantile (2nd Version)
1999
Graphite on joined paper
27 cm x 71 cm

Lansky Banks
1994
Ballpoint pen ink on paper
28 cm × 35 cm

MARK LOMBARDI (b. 1951 Manilus USA; d. 2000, New York USA.)

Mark Lombardi produced network diagrams that mapped financial transactions and political connections among financiers, business people, politicians, corporations, and governments. A large part of the late artist's process was the meticulous review and structuring of vast amounts of information drawn from books, newspaper articles, and archival material and then tracing links not made by journalists. This research resulted in complex pencil diagrams that Lombardi described as "narrative structures."

Viewed alongside blockchain projects, Lombardi's drawings resonate with one of blockchain's defining features – its immutable list of all transactions that happen on the network that cannot be changed. The transparency and legibility of this ledger is one of the key innovations blockchain offers both to finance and other organizational systems.



Nested Exchange Series
2018
Generative software, infinite duration, no sound, 4K

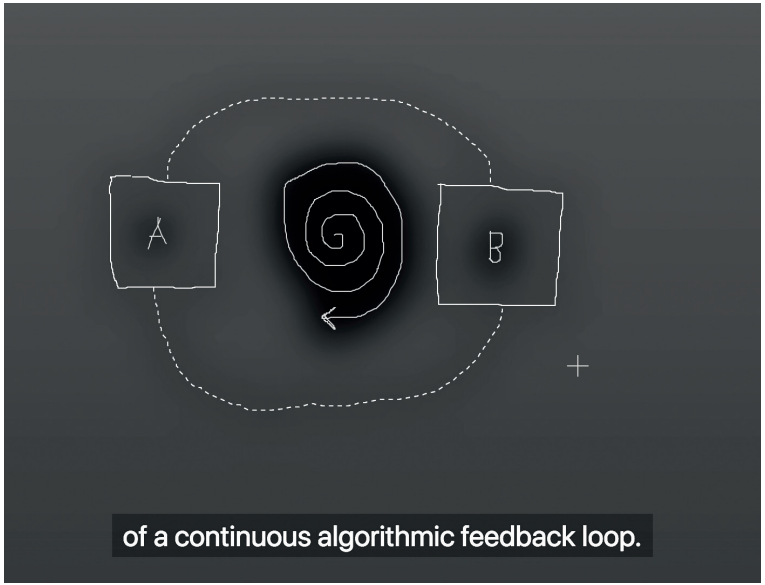
Lammer Asbestus (Second Generation)
2018
UV Print on 3 CNC routed sheets of acrylic glass
100 cm × 100 cm

Wyn (Generation Unknown)
2018
UV Print on 3 CNC routed sheets of acrylic glass
100 cm × 100 cm

HARM VAN DEN DORPEL (b. 1981 Zaandam, NL. Lives and works in Berlin, DE.)

Harm van den Dorpel's *Nested Exchange Series* is a group of abstract drawings and Plexiglas assemblages that generate their patterns and shapes using an automated process designed by the artist. The artwork produced is a record of a moment in this automated evolution. This mirrors blockchain's ledger system, which also documents and displays all activity on its network.

To produce each artwork, two designs are taken from a determined population and then communicate by swapping a node from their respective structures in a process that can be described as "gossiping." This process is designed to encourage diversity. Each specimen is designed to evolve towards being as different from all the others as possible: The total amount of information shared among all specimens in the population does not increase over time and is rather merely recombined towards an optimal diverse distribution. The record of changes in shapes driven by this process produces new designs as a kind of snapshot of a certain moment. These snapshots can be compared to a blockchain ledger in that they are a record of all activity that made them. The chromosomes of the specimen are stored as nested recursive "tree" structures, similar to those used in linguistics.



left gallery Explainer
2018
Software, no sound, loop
21 minutes

Launched by Harm van den Dorpel and Paloma Rodríguez Carrington in 2015, *left gallery* is a blockchain-based art gallery that commissions, produces, and sells downloadable artworks. Works are stored and bought on the blockchain. Upon purchasing a work, the buyer receives a download link via email that allows them access to the file. Ownership of the work is stored on a blockchain and is verifiable as unique.

The animated lecture *left gallery Explainer* by Harm van den Dorpel is an attempt to make clear some of the conceptual and economic reasonings behind their blockchain-based online gallery. The animation follows a style and logic often used in online university lectures championed by Khan Academy, a popular online learning video series endorsed by Bill Gates, Google, and other Silicon Valley figures invested in independent learning and alternatives to conventional education models. Having trained in computer science and art – but not in biology – Harm van den Dorpel also gained much of his own understanding of cell division and genetics from Khan's videos.

Connections between digital ontology, artificial scarcity, tokenization, and provenance on the Ethereum blockchain are made in the animation.

By combining his scribbly drawing style with subjective annotations, van den Dorpel hopes to make the cerebral and often complex subject matter of this project accessible – and perhaps sometimes even funny.

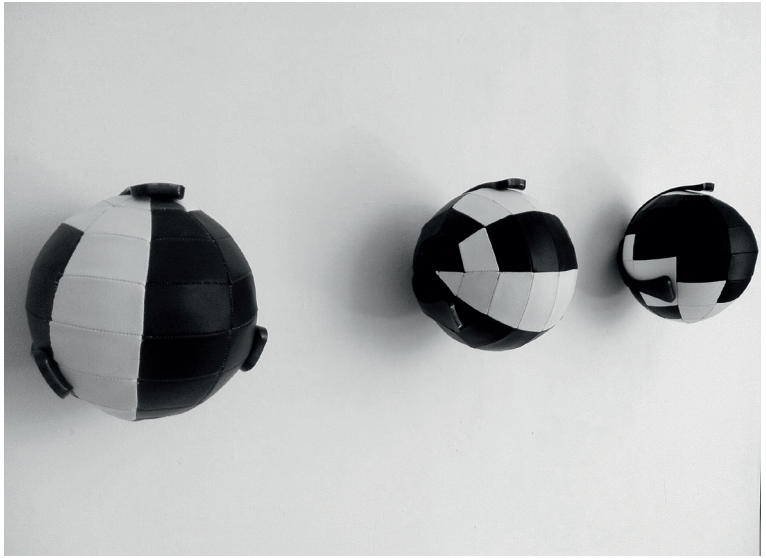
left gallery (Harm van den Dorpel and Paloma Rodríguez Carrington)

Dogewhal
2018
3D print, stainless steel
28 cm x 43 cm x 43 cm

0xΩ is a blockchain-based religion project launched by technologist Matt Liston and artist Avery Singer at the New Museum's Seven on Seven conference in New York. Its first "sacred object," the Dogewhal, was designed and 3D-printed for this event. The totem sculpture resembles a narwhal-toothed whale with the head of a Shiba Inu dog – both animals that often appear in internet memes. The Shiba Inu dog became the icon associated with a popular early cryptocurrency project, Dogecoin, which addressed the connection between cryptocurrencies and meme culture.

0xΩ is described as a religious framework that can allow for evolving belief sets to update quickly and democratize the relationship between membership and convergence on what participants believe. The 0xΩ model allows for believers to identify, approve, and evolve their own sacred texts via a smart contract, a blockchain-enabled code that gives users the assurance they're all viewing the same data without a middleman to verify the content. The religion will launch in earnest with the future release of Omega, a crypto token that empowers and enables participation in the faith system.

0XΩ (Matt Liston and Avery Singer)



Leather Spheres
2013
Leather, thread, and rubber mounted with The Ball Claw™
Dimensions variable

BILLY RENNEKAMP (b. 1988 Louisville, USA. Lives and works in Berlin, DE.)

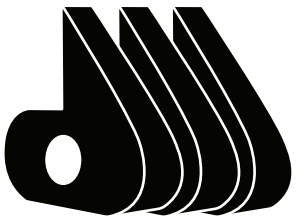
Billy Rennekamp is a designer, developer, and artist whose sculptural works explore game theoretical concepts relevant to his software projects. His blockchain-based project *Clovers* uses patterns found in the game play of the board game Othello as the basis for a version of the blockchain "Proof of Work" mining mechanism. These patterns are recorded as crypto tokens and are translated into sculptures like the soccer ball forms on display.

Each ball is hand sewn from leather with each panel on the ball representing a square on an Othello board. Othello was used in early AI research because it has simple rules and a large number of possible outcomes. Rennekamp first encountered the game in a cognitive science class where he was tasked with designing a bot that would play the game by searching for a winning strategy. Instead, he designed his software to search for symmetrical endgames. This turned into a challenge that the artist found similar to finding four leaf clovers and ultimately inspired the production of a range of corresponding paintings and sculptures.

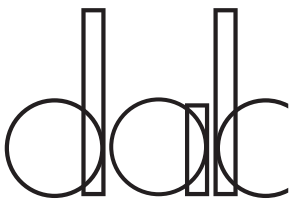
Rennekamp recently collaborated with a small team to create the crypto-game *Clovers Network* to reward the discovery of new symmetrical endgames. Similar to cryptocurrency mining, the search for symmetrical endgames provide a "proof" that serves as a basis for securing the network. Whereas Bitcoin "Proof of Work" crypto miners are guessing the answer to a mathematical problem until a solution is found, *Clovers* miners guess the moves needed play a game of Othello that results in a symmetrical endgame. Once a symmetrical example is found, it can be claimed on an Ethereum contract for a reward and moved into various secondary marketplaces.

Tri R* by Wesley Simon

Continuous Lines by Damien Pierre



Cogged by Francisco Alarcon



Clinical T1 by Franziska Opel

Decentralized Autonomous Kunstverein
2018
Institutional identity designs on self-adhesive stickers
Dimensions variable

NICK KOPPENHAGEN (b. 1987 Hamburg, DE. Lives and works in Berlin DE.)
WESLEY SIMON (b. 1983 Pikeville, USA. Lives and works in Boston, USA.)

Koppenhagen and Simon have commissioned a design process for the branding of a new kind of art institution enabled by blockchain technology: the Decentralized Autonomous Kunstverein or "DAK". Competing entries are produced as stickers and displayed in clusters across the exhibition.

The DAK constitutes an attempt to create a functioning decentralized art association inspired by developments in blockchain technology and the unique tradition of non-profit art associations in Germany, the *Kunstvereine*.

Being a Decentralized Autonomous Organization (DAO), the DAK will be a net-based organization that is directed and funded by its members on a voluntary basis, without a permanent space or home jurisdiction, initiating projects however and wherever on the globe its members decide. The organization's mission is to promote experimental approaches to creating and curating contemporary art, exploring the potential of decentralized collective work within the context of contemporary art and technology.

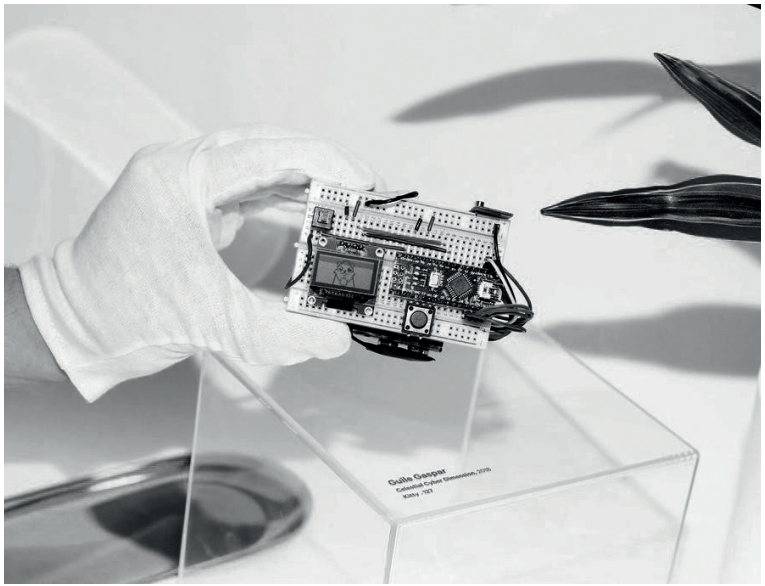
The DAK will make use of a variety of of member-supported software platforms and decentralized apps to conduct its operations: first and foremost Project Aragon on the Ethereum blockchain for token weighted voting – i.e. the more tokens one possesses, the more votes one gets – on all primary operations and Are.na for public exhibition application documents and collective research.

The DAK is currently in the initial test-phase. A test DAO is live on the Ethereum Rinkeby Testnet – a network that simulates the Ethereum network – and all interested individuals are invited to join the DAK communications channels and think, write and discuss about future forms and actions of the decentralized *Kunstverein*.

Ultimately, the DAK will make use of a calibrated voting mechanism realized on the Ethereum blockchain as soon as technically feasible. During the test-phase, the DAK will discuss and test a variety of mechanisms, including a non-transferable merit token (MRT) that gives weight to the votes of active members.

For the time period of the exhibition at Schinkel Pavillon, the DAK is holding its very first vote as a collective entity in the DAK-Slack #voting channel, presenting four potential visual identities to represent the organization moving forward.

Until October 25, everyone interested can become a DAK proto-member at http://dak.international/ and vote on their preferred visual identity.



Celestial Cyber Dimension (Kitty . 127.)
2018
CryptoKitty, hardware wallet, display case
Dimensions indefinable

CRYPTOKITTIES/GUILE GASPAR (founded 2017)

Specially designed for *Proof of Work*, this display is a cardboard reconstruction of one of the most notorious crossovers between an art context and blockchain. The structure depicts a display from a Christie's-supported auction of a blockchain asset storage device containing a digital crypto relic from *CryptoKitties*, a blockchain game that allows players to purchase, collect, breed, and sell virtual cats.

The game became very popular in late 2017, attracting the most network activity on the Ethereum platform. The "digital decentralized artwork" *Celestial Cyber Dimension* was sold for $140,000 at the Christie's auction initiated by art/blockchainstartup Codex and Rare Art Labs at a conference in May 2018. The most expensive CryptoKitty to date, it was designed by Guile Gaspar and was housed in a specially produced "hardware wallet," or offline storage device, designed by Richard Moore.

The artwork reflects an interest in blockchain by art market players as a way to innovate sales and artwork collecting infrastructure. A number of startups like Codex are developing systems for provenance tracked on a blockchain's immutable ledger, collective share-based "fractal" ownership, and artwork-backed financial trading. Established art auction houses like Christie's are interested in the potential of these innovations and in access to the recently acquired wealth of early adopters of Bitcoin and other cryptocurrencies.

The technical developments on Ethereum's blockchain that enable *CryptoKitties* have inspired other experimental projects in an art context. Artists have been seeking the possibility to make digital files unique and tradable in a similar way to offline objects for decades. *CryptoKitties* is a promising example of this phenomenon – one that may pave the way for different ways of financializing digital artwork and may no longer need the existing art sales infrastructure models. However, gaps in the design of such systems still have many questioning the technical and ideological compatibility of blockchain systems with art infrastructure.

The artworks outlined in the following section were selected by Sam Hart and Sarah Hamerman as a kind of exhibition-within-an-exhibition based on a theme of secrecy, a popular topic among those who design and participate in the cryptocurrency community. It sits in a concealed room within the Schinkel Pavillon that is sometimes used by the venue as a bar. A form of parallel exhibition, it is intended as a reflection on the way blockchain projects tend to fracture off into parallel projects based on a refining of the aims of the communities that use them. Splits in the development of various blockchains, described as "hard forks," are common and have created many parallel yet distinct blockchains. Well-known examples in cryptocurrency circles include Bitcoin's split into Bitcoin Cash and Bitcoin in 2017 and Ethereum's split into Ethereum and Ethereum Classic in 2016.

SECRETS

Sarah Hamerman and Sam Hart

Secrets examines the aesthetic and political dimensions of the secret as an information structure. The artworks on display operate beyond the technics of secrecy, posing the secret itself as an originary technology for the administration of power.

A secret delimits the horizon of what can be seen or understood. Control of this structure thus presents an opportunity to reconfigure the relationship between the artist and the observer. This point was most radically underlined by the conceptual art practices of the 1960s and 1970s, many of which experimented with secrecy as a logical extension of the "dematerialized" art object.

Perhaps the best-known conceptual artwork about secrets is Douglas Huebler's *Variable Piece 4: Secrets* (1970). For the work, Huebler asked visitors to submit an "authentic secret never before revealed" in a box provided at the museum. Visitors' secrets were photocopied daily and distributed the following day in exchange for a new submission.

Echoing conceptual art's removal of the material art object in favor of ideas, social processes, and the transmission of information, secrets are a subtractive medium. In concealing the secret's content, the works in this exhibition offer various models for considering the secret's architecture as well as the patterns of discourse that secrecy thwarts and catalyzes. Whereas Rob Myers' and Jason Rohrer's respective works are grounded in the technical dimensions of secrecy, Hayal Pozanti considers the personal dimensions of secrets by creating an encrypted character set whose meaning only she knows.

Works by Miljohn Ruperto/Ulrik Heltoft and Aria Dean point to the secret's seductive and metaphorical qualities. Ruperto/Heltoft cite the "undecipherable"Voynich botanical manuscript and attempt to extrapolate from this source material rather than decode it. Dean plays on the multiple meanings of the "black box," perhaps suggesting the relationship between algorithmic systems and black identity online.

The direct experience of asymmetry between artist and viewer offered by the works in *Secrets* point to the broader implications of secrecy in today's sociopolitical context. Secrets are often viewed with suspicion within liberal societies, which view openness and transparency as foundational to the project of democratic governance and shared knowledge production.

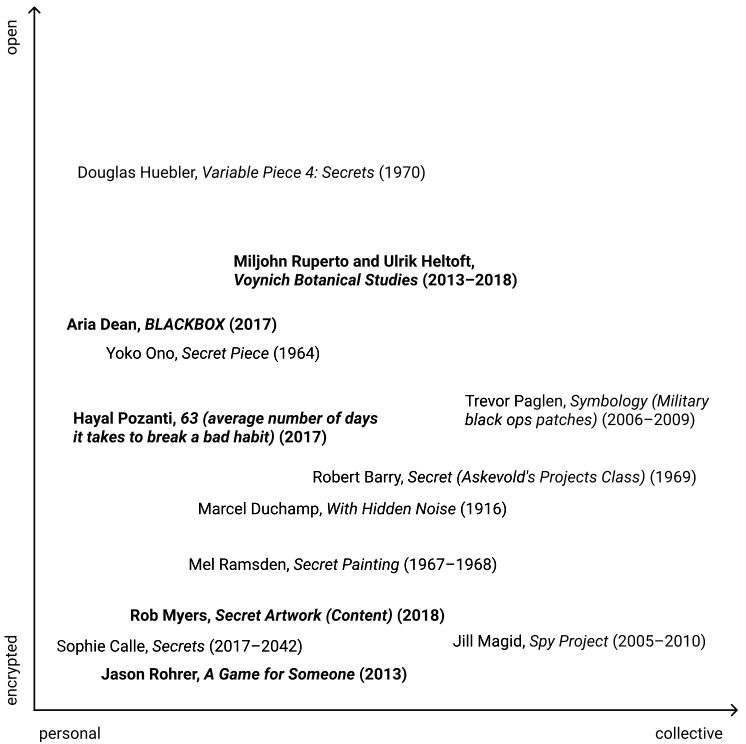
Today's platform economy extols "sharing" and "transparency" while profiting from the user data collected by their proprietary software services. By deploying the rhetoric of openness, corporations mask a practice of materializing secrecy though cryptographic data caches that facilitate commoditization of their users.

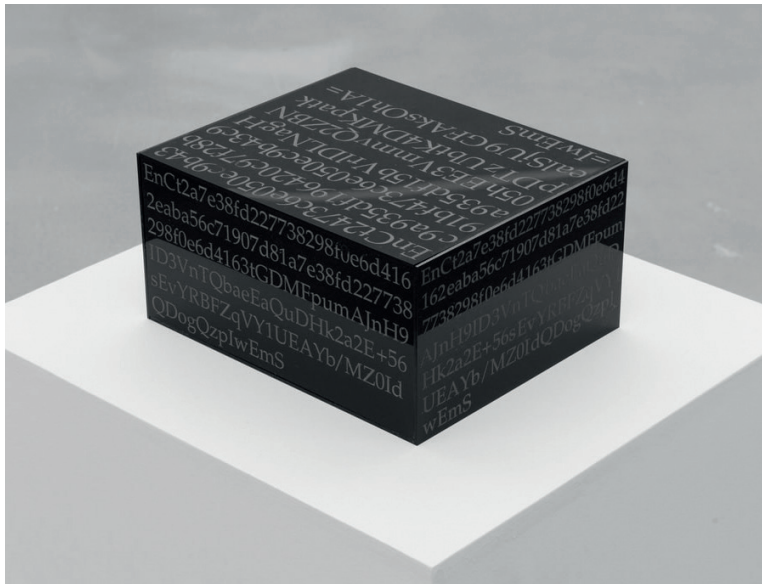
The black box algorithm operationalizes the secret as an abstract account of the unknown or unknowable. Similarly, the state classification scheme subtracts from public view information that is central to carrying out government intelligence, military, and surveillance aims – but that often conflicts with basic social freedoms and the ethical foundations of civil society.

Much contemporary critique of these forms of power focuses on the issue of data privacy, positioning the individual as the primary subject of security and protection. While secrecy overlaps with issues of individual privacy, it also encompasses broader collective and institutional measures of safeguarding information and power.

A secret might be clandestine, or it may be used for legitimate purposes to guard private information from exploitation. Often the sharing of a secret fosters intimacy and trust among communities, friends, and peers. Secrecy doesn't have a singular politics: It is both pervasive and ambiguous. *Secrets* acknowledges the danger of secrets while tracing the space of possibility that they open.

Dimensions of the Secret, 1916–present

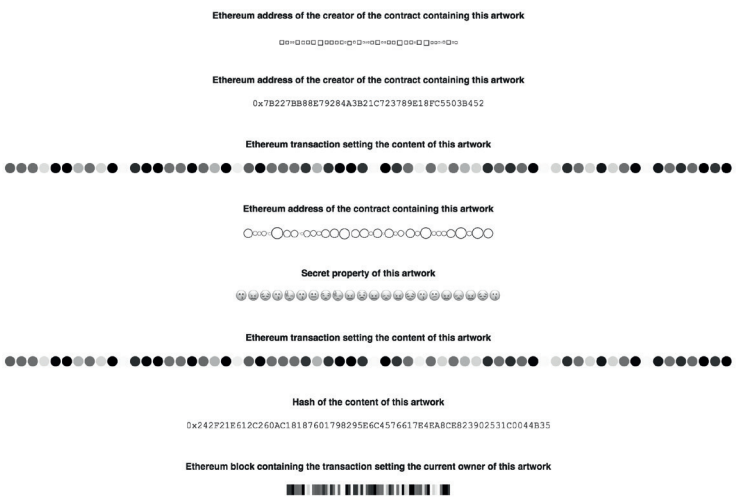




BLACKBOX
2017
Etched Plexiglass
15 cm x 31 cm x 25 cm

A glossy black box with the following three encrypted quotes by the artist Ad Reinhardt engraved on its surface:
“The bondage of appearance;”
“The laying bare of oneself is obscene;”
“Sign which refuses to signify.”

ARIA DEAN (b. 1993, Los Angeles, USA. Lives and works in Los Angeles, USA.)



Secret Artwork (Subject)
2018
Ethereum ERC720 Token DApp

ROB MYERS (b. 1973, Chertsey UK. Lives and works in Vancouver, CAN.)

In *Secret Artwork (Subject),* an Ethereum contract stores the cryptographic hash – salted sha256 – of the content of an artwork, a unique but meaningless numeric identifier. This proves that the artwork exists to the extent it can be cryptographically verified, but offers no clue as to its subject.

The artwork is "ownable" as an Ethereum ERC720 token, tying the uniqueness and identifiability of the content to a unique (quasi-)property relationship. Yet the owner knows no more about the subject of the artwork than the general public: They own something unknowable, or that which cannot be fully owned.

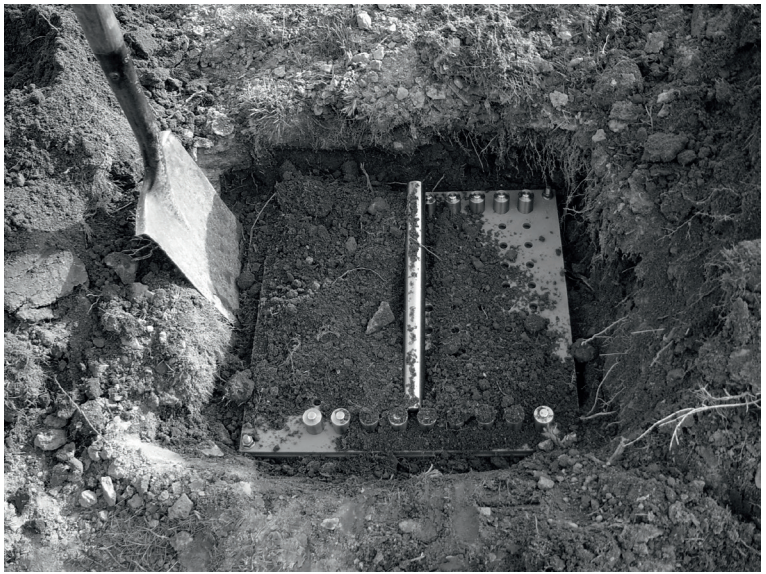
As each block in Ethereum's blockchain is layered on top of the last, the cost of the computing power with which the secret and its almost-ownership is asserted quickly exceeds the price of the world's most expensive artwork. And the certainty with which these facts are established quickly surpasses that of the most secure physical provenance.

Voynich Botanical Studies 10r Leto
2018
Silver gelatin print on fiber-based paper
64 cm x 54 cm

MILJOHN RUPERTO (b. 1971 Manila, PHL. Lives and works in Los Angeles US.)
ULRIK HELTOFT (b. 1973 Svendborg, DK. Lives and works in Copenhagen DK.)

Carefully rendered by Ruperto and then manually printed by Heltoft, this image is one of a series of otherworldly photographs of twenty unique "specimens" that have been inspired by the *Voynich manuscript*, an illustrated book of botanical studies written in an unknown writing system. The book has become a famous case in the history of cryptography as no one has yet deciphered its contents.

The photographs are based on the manuscript's more than 100 ink and colored wash botanical illustrations detailing unidentifiable plant species. Using computer imaging software, the artists construct three-dimensional visualizations of the individual plants, make a negative from each digital file, and then print them as silver gelatin prints.



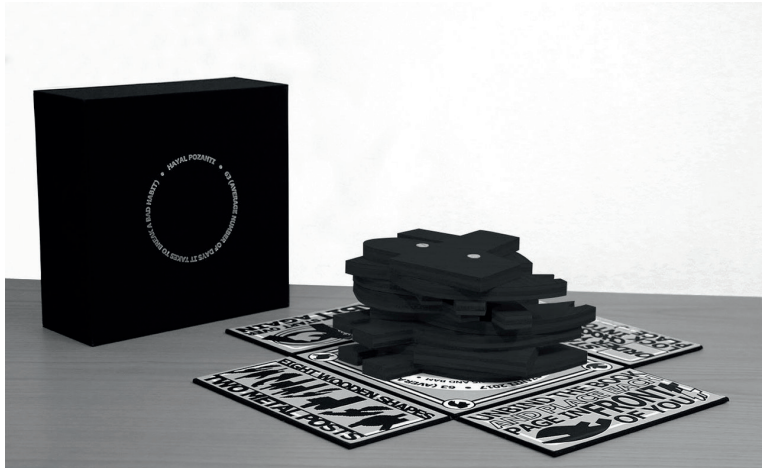
A Game for Someone
2013
Titanium, paper, map reproduction, photographs, mixed media
Dimensions variable

A Game for Someone **is a secret, hidden board game designed by game designer Jason Rohrer and buried in a location in the Nevada desert. A map puzzle, photographic documentation of its creation, and an envelope containing a set of GPS coordinates are its footprint in the exhibition.**

Revealed at the Game Design Challenge in 2013, the game was created by programming rules into a computer and letting an AI system iterate on the game design. This automated process ensured that Jason Rohrer would never play the final version, even as the initiator of the project. From these results, the artist created a titanium board and playing pieces, printed the rules on archival acid free paper, sealed them inside a titanium baton, and buried all items in a secret location. Creating the possibility for the game to be found at a future point, Rohrer gave each Game Design Challenge attendee an envelope containing multiple GPS coordinates – over one million in total. Rohrer estimates that if one person checked one location every day, it could take over 2,700 years before the game is discovered.

This secret game resonates with the tension between transparency, encoding, and game theoretical mechanisms present in cryptocurrency design.

JASON ROHRER (b. 1977 Akron, USA. Lives and works in Davis, USA.)



63 (average number of days it takes to break a bad habit)
2017
Screw post bound wooden pieces in drop-wall lidded box with screen printed interior
8 cm x 22 cm × 22 cm

SimplerTerms_001
2015
Digital animation
3 minutes, looped

HAYAL POZANTI (b. 1983 Istanbul, TU. Lives and works in Los Angeles, USA.)

Hayal Pozanti has created 31 symbols called "Instant Paradise" that form an alphabet around which her work is centered. Using this alphabet, she has created a series of books called *63 (average number of days it takes to break a bad habit)* that focus on Pozanti's interest in data verification, truth, and imagining the future. Each edition of the sculptural book features eight wooden pages in four different shapes from the "Instant Paradise" alphabet. The pages are preserved through a traditional Japanese wood burnishing technique and bound with metal screws.

With *SimplerTerms_001*, Pozanti has created an animated version of her invented alphabet "Instant Paradise." The animation reproduces a translation of a conversation she had with a chat bot from English into her alphabet. The work is an encrypted version of a conversation, the original of which can only be seen if one has the key to see the source-code, reflecting the cryptographic encoding at the center of blockchain based projects.

Proof of Work
Schinkel Pavillon
8 September - 21 December 2018

Text selection/composition: Simon Denny
Copy editing: Melissa Frost
Layout and design: Simon Denny, Gustav Heinsen
Studio Simon Denny: Anna-Lisa Scherfose, Julia Alfert
Print: Fatamorgana

Schinkel Pavillon: Nina Pohl, Annina Herzer, Marie-Therese Bruglacher, Annika Kuhlmann, Adriana Pauly & Olga Inozemtceva

Thanks to all the artists, curators, lenders, galleries and contributors to the exhibition, as well as the funding bodies which have supported the project.

With the generous support of Hauptstadtkulturfonds, Westendartbank and Belfry.

Schinkel Pavillon e.V.,
Oberwallstraße 1, 10117 Berlin

Schinkel
Pavillon

WESTENDARTBANK

Curated by Simon Denny in dialogue with Distributed Gallery, Harm van den Dorpel, Sarah Hamerman and Sam Hart, Kei Kreutler, Aude Launay and Anna-Lisa Scherfose.

CryptoKitties
Aria Dean
Distributed Gallery
Harm van den Dorpel
FOAM (Ryan John King, Ekaterina Zavyalova, Nick Axel and Kristoffer Josefsson)
Sara Hamerman and Sam Hart
Decentralized Autonomous Kunstverein (Nick Koppenhagen and Wesley Simon)
Kei Kreutler
left gallery (Harm van den Dorpel and Paloma Rodríguez Carrington)
Wayne Lloyd
Mark Lombardi
Jonas Lund
Rob Myers
Hayal Pozanti
Billy Rennekamp
Jason Rohrer
Miljohn Ruperto and Ulrik Heltoft
0xO (Avery Singer and Matt Liston)
terra0 (Paul Seidler, Paul Kolling and Max Hampshire in collaboration with Georgia Hansford, Louis Center and Gregor Finger)

With a conversation program by:
NewModels.io (Caroline Busta, Lil Internet, Daniel Keller)

Schinkel
Pavillon