



LITHOPY

SPECIAL JURY PRIZE 2020

One of the world's largest lithium reserves was recently discovered at the Czech-German border. Originating with the Big Bang, the element is the most important element for progressive electricity storage. ... Lithopy tells a universal story of power, technology, and ephemeral 4.0 fairy tales in the form of a multi-screen movie backed by blockchain prototypes. Though not yet properly assessed, Czech lithium reserves were quickly turned into a partisan mobilizing tool during the 2017 elections; succumbing to the promise of a lithium paradise for all, the Czech Republic went through a lithium craze without having ever mined a single grain of lithium ore.

— *Broken Nature: The XXII Triennale di Milano*

Lithopy, a social satire, and other futuristic works mark a new direction for digital storytelling.

— *The New York Times*

*Lithopy represented the Czech Republic at the XXII Triennale di Milano, [Broken Nature: Design Takes on Human Survival](#), curated by Paola Antonelli, senior curator and director of R&D at the Museum of Modern Art in New York. Dubbed a "speculative design fiction" by its organizers, Denisa Kera and Petr Šourek, *Lithopy* took the form of a multi-channel film, a TV "news report," a giant lithium "coin," a node-RED computer dashboard for modeling hyperledger transactions supposedly registered by the European Space Agency's Sentinel-2A and 2B satellites, the installation at the design triennial in Milan's Palazzo dell'Arte, a paper presented at the Association for Computing Machinery's 2019 Conference on Human Factors in Computing Systems in Glasgow, and a detailed entry in Github, the world's largest depository of source code — all of it in service of a fanciful fairytale involving an imaginary cult of people who hail from the lithium-rich Ore Mountains on the Czech-German border and who call themselves Lithopians.*

Medium: Film/Blockchain/Open-source
Code/Design Installation

Created by: Denisa Kera and Petr Šourek

Country: Czech Republic

Date: March-September 2019 (XXII
Triennale di Milano)

[LAUNCH PROJECT](#)

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A "SUNNY DAY" IN LITHOPY

It is a sunny day in Lithopy – a hackerish-quakerish community given to transparency, justice and accountability. Sunny days are made for transactions. No clouds prevent satellites and drones from keeping an eye on the contracts being made and assets changing hands.

All the hustle and bustle of sunny days is recorded on the public decentralized ledger via satellites and drones. This is why Lithopians exchange goods, make payments, marry, divorce and settle their disputes under the clear skies. They use coins big enough to catch the eye of a satellite. They shake hands for dozens of minutes. Hugs are big and kisses are many in Lithopy.

Yet there is no excess, no frivolity in these all-or-nothing gestures. Their fits of laughter and floods of tears are in fact all well-measured so the satellites and drones will recognize them and the blockchain record every action and emotion.

Whatever Lithopians do on sunny days, they do before the face of satellites and on the record. In Lithopy, all social contact is a smart contract.

If Covid-19 hits Lithopy one day, it will be no problem to track the virus back to the first carrier and identify all her handshakes and hugs. The social distancing will completely upend Lithopian life. Hugs, kisses, handshakes, tears and laughter will be frowned upon. Satellites will be watching empty streets. The blockchain will start to dwindle and public life will come to standstill. Only polite surveillance will live on forever.



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Photographs by Zdenka Hanakova and Eva Hola

Lithium Punk from Bohemia: Artistic Vapourware Against a Silicon Valley Future

By Denisa Kera and Petr Sourek

THE ORE MOUNTAINS in Bohemia have a history of mining that goes back to the Middle Ages. The 16th-century silver "Joachimsthaler" – a coin coming from Joachim's Valley in the Ore Mountains – lent its name to the [American dollar](#).

At the top of the Ore Mountains there lies an ancient mining hamlet. A loose bunch of houses is divided by the Czech-German border. The hamlet's Czech name, *Cinovec*, means the Mountain of Tin. Its German name, *Zinnwald*, means the Tin Forest.

The tin that gave this mountain its name was a rare metal in Europe and the essential staple of the Bronze Age. Tin was followed by tungsten, for filament in classic light bulbs and a staple in the Cold War arms race. While mining for tin and tungsten, the miners were also digging a silvery metal out of the mountain. They were familiar with the stuff. It was lithium.

Back then, though, lithium was considered junk. Americans wanted to buy the silvery sand, a local legend says. What for? The communist rulers told the American buyers off. The lithium-rich sand was junk but it might be strategic after all, they would have thought.

The lithium mica glittered under the sun. The glittering sand became popular among the miners who were building their family houses in the surrounding area. From the dump they stole what the Americans were not allowed to buy. This gave birth to the phenomenon of the lithium-clad houses. Quite many of them were built around the Mountain of Tin.

Then the Iron Curtain fell. The arms race stopped. The tungsten mines were closed down after the border opened. New technologies redefined tungsten filament bulbs as heating units. Miners lost their jobs. The rust took up its silent work. Only the lithium facades of their



houses glittered under the sun. And then, all of a sudden, the [Mountain of Lithium](#) was born out of the eviscerated Mountain of Tin and Tungsten, once again pregnant with promise.

This is the time for lithium, the lightest metal and the basis of the lithium battery, the leading technology in electricity storage. Some three per cent of the world's lithium reserve may be buried in the hard rock of the Mountain of Tin and Tungsten. Once again, the mountain stands for staple, the promise of supply, the source of wealth.

Emotions ran high as the Mountain of Promise became the staple of the 2017 election race and its discontents were virtually mined for campaign promises (many of them contradictory or even mutually exclusive).

The lithium facades keep glittering under the sun. Made of then-junk, their apparent disregard for value, commodity and promise makes them devoid of any credit, their sin of décor perpetuating the inherited lack of frugality. This is the place of non-supply, the non-source.

Now imagine what would happen if we were to mine them as cryptocurrency.



WE TRAVEL THROUGH the rust belt under the Ore Mountains. We meet former tungsten miners and most importantly, we see the facades of their houses. They are grey but they are still all glittering with lithium mica!

What if people in this impoverished mining region really owned the lithium deposits? Perhaps one could map the lithium riches on the rags of their houses' facades. Their DIY mica stuccos could store value the same way Milton Friedman's huge pieces of [stone money](#) did once [on Yap Island](#). The lithium of their run-down stuccos would represent a family treasure. Could our artistic vapourware be of any help here? Yet another promise we are not to deliver on, are we?

The performances in front of satellites to trigger [smart contracts](#) may not be the most efficient and smart solution, but they do offer a precedent. They are more a ritual than a business plan or a policy solution. Our sun dance practice connects the Big Bang nucleosynthesis with modern-day [blockchain](#) hypes and explores ideas of owning your future.

Lithium Punk is our response to the post-scarcity techno-utopia behind the popular [solarpunk movement](#). Instead of solarpunk fantasies, we offer a dark, lithium-inspired sarcasm.

Our seven-screen installation and the Github open-source project respond critically, materially, and metaphorically to the problem of the extraction of the Earth's minerals, the scarcity of resources and man's drive to endless energy production.

These lithium "punk" speculations from the impoverished mining region perform and mock present fantasies of automation, blockchain technologies and the like: These are modern versions of the old alchemist dreams of limitless energy sources. Look! Here comes perpetual mobile of renewables that will lead to liberation and an end to colonialism! And what about a fair trade in minerals? We track every supply-chain for your energy consumption. We share in the current speculative craze in ICOs we mock as we invite you shamelessly to invest in glittering facades of a ghost mining village to support the local ex-miners.

Lithium is the first metal after the Big Bang. It was created in the first seconds of our Universe. Who is the rightful owner of our cosmological heritage? From the Big Bang nucleosynthesis to modern-day corruption, lithium and all of our metals and minerals are a constant source of conflict.

We offer low-tech, messy folklore and DIY hacks for everyone to explore these issues and come up with their own version of Lithopy. Even if you are not about to set up an activist takeover of your local resources, you can still use our Lithopian Github page and installation to explore issues of algorithmic governance and take part in our workshops and adventures, where we design future smart contracts and create a space for code to meet metals, satellites to meet ledgers and smart villages to arise instead of cities.



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Dr. Denisa Kera is a philosopher and designer who experiments with various creative strategies of public engagement in emerging science and technology issues. She uses design methods (UX, critical design, design fiction, future scenarios, participatory design), ethnography and prototyping to research Science, Technology and Society issues. She spent the last decade as an assistant professor at the National University of Singapore, as a senior lecturer on future design at Prague College, and most recently as a visiting assistant professor in Arizona State University, where she is an affiliate member of the Center for the Study of the Future. She is now researching distributed ledger technologies (blockchain) and applications (smart contracts) as a Marie Curie senior fellow at the Bioinformatics, Intelligent Systems and Educational Technology (BISITE) group at the University of Salamanca in Spain. Her current project is "translating" Shakespeare's *The Merchant of Venice* into a Hyperledger business network to demonstrate the possibilities and limits of this emergent infrastructure and to involve stakeholders in deliberations about its future.

Petr Šourek is a philosopher, a playwright and a new media and performance artist based in Prague. He likes experimenting with new formats across various media. In 2012 he founded [Corrupt Tour](#), the world's first corruption tour agency, which takes tourists to see the homes and offices of the country's most notorious business leaders and politicians. ("Corruption is everywhere," he told *The Wall Street Journal*. "So, I thought, let's use it as the raw material for a business. It has really captured the Zeitgeist.") Petr also writes for the stage and for radio and television. His latest radio play, "Der Mechanische Türke," is currently being produced by the Swiss broadcasting corporation SRF.

Lithopy was supported by the Czech Ministry of Culture and the Czech Industrial Design Museum. The research into anticipatory prototyping, algorithmic governance and design is supported by a Marie Skłodowska-Curie Individual Fellowship under the European Union's Horizon 2020 research and innovation program.



ASK THE CREATORS

Why Lithopy? Why now?

Petr: We both were into mining. I happened to cover a lithium mining project at the Czech-German border for German ARD television. I met former miners who used to steal lithium-rich sand from their mine's dump. Back then, lithium was no big deal. The miners used what was then seen as mining junk to stucco their family houses. Their houses were all glittering with lithium ore in the sun.

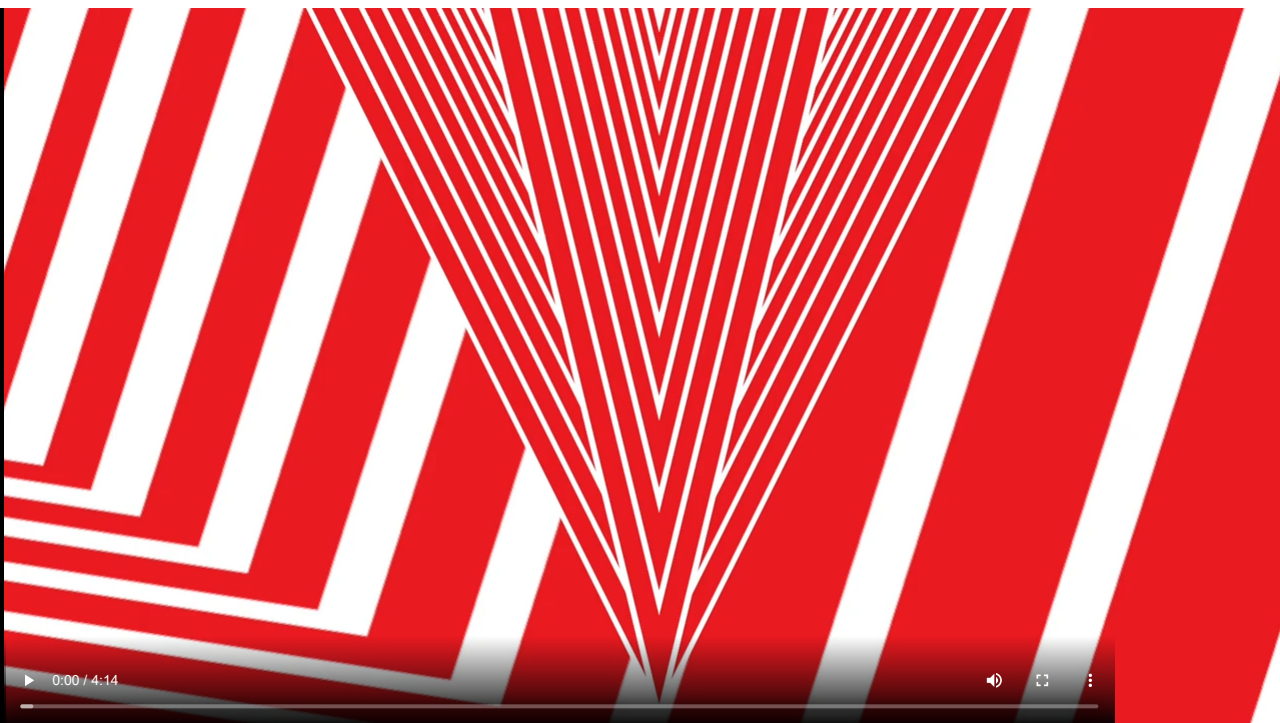
Denisa: I liked the story Petr told me. How much would their lithium stuccos cost now? Lithium is the gold of renewables, electromobility. . . At that time, I made my first forays into blockchain technology because of my interest in algorithmic governance. Mining and speculation was something I was trying to avoid. But the metaphor kept coming. All the big data mining is after all about the junk we leave behind while searching for information and products. So we started with this idea of mining.

Petr: But we did not stop there. We wanted to imagine how big data mining, pattern recognition, blockchain and surveillance technology would come together and create a new reality. That new technology will not run smoothly, quite the opposite: It will require people to make up for its deficiencies. People try to see themselves through the eyes of the machine (both to make themselves visible and to hide from it) and to speak to the machine (both to make themselves understood and to lie effectively). People adapt fast, change their behavior — and you may call it, tongue-in-cheek, "human-centred design" — i.e., redesigning people by new technologies.

Denisa: We decided to develop further this unlikely scenario of "polite" surveillance and algo-governance that Lithopians indulge in. They are constantly performing something for their satellites and drones to record on the blockchain. For me, it was essential that this be not only a fiction but also a proof-of-concept — so we have a smart contract that uses satellite data about a land art type of intervention to trigger a change-of-ownership contract.

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Why do Lithopians speak by buzzing?

Petr: In order to be able to see themselves from above their heads, Lithopians develop Cartesian minds. They see themselves in a system of [Cartesian coordinates](#) and take into account the resolution of the satellite's camera. Besides descriptive geometry, there is the analytical geometry of Descartes, which allows you to move freely between realms of geometry and arithmetic. And this is what we did in terms of storytelling: Denisa coded narrative bricks of actions and transactions. She made the blockchain scaffold. I created the geometry of gestures/signatures captured in 3D Cartesian coordinates. The story is both told in its algebraic form of blockchain formulae and situated in the "real life" geometry of space and time.

Their Cartesian mindset is the reason why Lithopians worship 3D printing. The Lithopian Church of 3D Printing teaches them how to speak, how to think, how to see themselves properly (i.e., locate themselves within the system of coordinates), how to act meaningfully. So the buzzing of 3D printers comes to them as the most natural idiom.

Satellites do not hear Lithopians. People buzz off-record. Strangely enough, while Lithopians' whereabouts are under permanent surveillance, their spoken words remain private, so they just buzz along. Perhaps they voice their discontent with malfunctioning technology, they agree on movements they have to do, etc. Again, this is the case in many failing democracies today: Freedom of speech remains intact, as it doesn't really matter under algorithmic governance and "polite" surveillance.

Denisa: Petr is an optimist. I have a different view. Lithopians don't actually speak, they produce data. The buzzing is just signals analyzed and fully understood only by the machines. But they think they are free.

What were you surprised to learn as you were developing all this?

Denisa: I was surprised by the fact that our movie/installation worked even for people who didn't care about the technologies, surveillance or any issue. Yesterday I looked from my window and realized why: Lithopy has this vibe of a community with strange, almost ritualistic behaviour that is just hilarious to watch from outside and wonder why they do what they do. And it is exactly what I'm seeing on the streets now (in April 2020): people avoiding other people and moving in bizarre trajectories. (Goodness, the satellite/mobile surveillance may catch us and accuse us of transmitting the virus!) They wear masks of various kinds and look like in some massive conspiracy. They are asked to stay within 100 meters of the place they live like in some algorithm. They should not touch anything, especially not their faces.

So our streets today are actually like a Lithopian stage: We are adapting and performing for the virus and for this massive surveillance tech, for disciplinary technologies of all kinds, just like Petr's actors. So I guess a sign of good storytelling is that the tech/props don't actually matter, you just make people feel wonder about how something familiar can change so rapidly. In that sense it is political.

Petr: Lithopy is political and it is also speculative. Speculation works like a looking glass. There is nothing behind the mirror, only in front of it. The mirror may reverse your image, but it is still the right reflection. We got the actual prediction spectacularly wrong but the spectacle works all right; it gives you an opportunity to reflect and wonder, what if it is us?

What was the most challenging aspect for you?

Petr: It felt very much like digging an undersea tunnel from two islands. I wondered if we would ever meet up in the middle or we would both dig like crazy all the way long missing each other's tube by a couple of inches.

Denisa: It was extremely difficult to synchronize and connect the work that Petr was doing as director with the actors and my programming and work on the interface for smart contracts. We tried and repeatedly failed to bridge the difference between the stage and the server, sets and prototypes, performative storytelling about extreme but polite surveillance and the descriptive but readable JavaScript smart contracts.

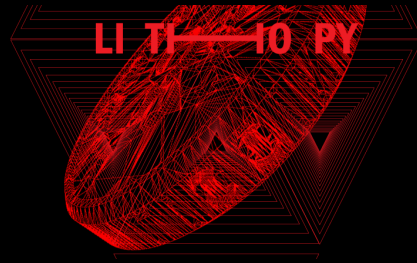
Petr: I worked with Denisa's husband Yair on synchronizing six screens across the multi-screen installation. At first sight it looked like a subsidiary technical problem, but in the end of the day it helped us to understand each other's progress much better.

Denisa: For Petr the technologies are just props for interesting stories. For me the stories give good metaphors for new prototypes/services and engage the "participants" and users in reflecting upon the future. So it is about creating a trading zone, a contact



language.

Petr: This kind of collaboration stimulates a sort of role playing. We both are trained philosophers. We do have quite a lot in common in terms of education, shared knowledge, outlooks. . . . In fact, all the differences seem marginal and slight by any measure, but they got reinforced in the course of this collaboration between art and R&D. I felt almost a caricature of an artist and Denisa played her part so well I almost believed she was a coder. I liked performing on a divide like this very much, and I am willing to play my part (any part) in any future collaboration across whatever divide of this sort you can imagine.



"Probably my favourite international exhibit, though, is the completely weird and out-there contribution from the Czech Republic, which imagined a world called Lithopy: 'a future utopic land where life is based on lithium reserves, blockchain and satellites'. The project was inspired by lithium, which was recently rediscovered in the Czech Lands, and is a multi-screen movie with a fairy-tale meets science fiction feel, complete with futuristic outfits, singing and strange actions and movements. This fantastic humorous imaginary world is from the minds of Denisa Kera and Petr Šourek, curated by the Museum of Decorative Arts in Prague with a huge team of collaborators."

— Penny Craswell, *The Design Writer*

"Not quite a fantasy, and certainly not reality, the conceptual project 'Lithopy' is a satire of both a global phenomenon (bitcoin and the distributed-ledger technologies that enable it) and a local one (the current lithium-rush in the Czech Republic to meet Europe's car battery demand). . . .

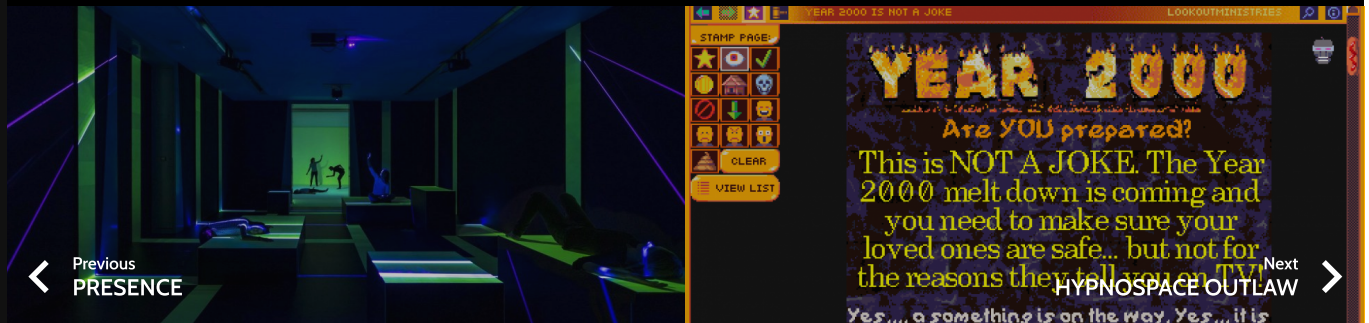
"The project is part of a growing movement called design fiction that applies design to speculative, science-fiction type situations. Until now, design fiction has been the province of disparate, interested parties: designers and researchers swapping ideas with underground hackers, political activists and science fiction writers. But as the Digital Dozen award for 'Lithopy' shows, design fiction is moving beyond the niche of academia and highbrow design studios. . . .

"As our world today becomes increasingly unrecognizable, these scenarios, where outlandish, dystopian impossibilities are taken as fact, have a very specific allure. How might species survive plagues, changing climates or even extinction? . . . The answers of design fiction demonstrate our capacity for adaptation: a message exactly right for our own surreal times."

— Josie Thaddeus-Johns, *The New York Times*

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BACK TO AWARDS



The Digital Dozen: Breakthroughs in Storytelling Awards are presented by the Columbia University School of the Arts' Digital Storytelling Lab

