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INTERVIEW BY SIMONE BRAUNER

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Touching Grass: Golan Levin on Systems Re-Pairing

"I'm interested in the moments when computation stops being certain of itself." Golan Levin

Golan Levin is an artist who transforms technology from a mere tool into a space for reflection and inquiry. He treats code as a creative material, using it to shape interactive systems that intertwine logic and sensation, where algorithms become mirrors for human experience.

For over thirty years, Golan has developed instruments and interfaces that reimagine the dynamic between observer and process, questioning both how machines see, listen, respond and what these interactions reveal about ourselves.

Well before the rise of artificial intelligence as a cultural metaphor, Golan explored how meaning emerges within machines and where the human subject resides amid networks of computational perception.

As Professor of Art at Carnegie Mellon University, Golan not only develops new works but also inspires critical discussion through his practice. His projects resist straightforward answers, instead setting questions into motion: how does one experience the world when every gaze is reciprocated by intelligent systems? What happens to wonder when even our questions are shaped by algorithms?

The interview takes place during Art on Tezos: Berlin, where Golan is presenting *Directrix* on objkt.com

Simone Brauner. Your course "Drawing with Machines" at Carnegie Mellon University explores the relationship between gesture, perception and automation. What have your students discovered or created in this class that surprised you or revealed something new about the connection between drawing and machines?

Golan Levin. Thanks for asking about this! A good deal of my creative energy goes into devising courses to respond to the current moment, and guiding students to explore new ideas within it. My *Drawing with Machines* class is a course in which we "use our brains to write code to control machines to do new things with art supplies." The goal is to discover new intermediaries between mind, hand, machine, and paper.

Most of the work in this course has involved making generative art with equipment like AxiDraw pen-plotters, Bantam drawing machines, and sometimes more unusual tools like CNC embroidery machines and ILDA laser projectors. We are also using some HP pen-plotters from the mid-1980s, which are astounding devices: they're built to last decades, and they use simple, human-readable communications protocols. They have no encryption, license verification, software updates, popup notifications, or digital rights management.

The fact that this electronic equipment is still usable after 40 years is remarkable to the students, and one of the conversations we've had is how encountering these machines is like traveling to a parallel universe of technology...of how things used to be, or how things could have been, before enshittification.

To your question, yes, there have been many times where I sensed my Drawing with Machines students were on the precipice of something new, untrammled, and surprising.



Jean Cho, *Drawing with Machines*, class by Golan Levin, Carnegie Mellon University, Fall 2021.

For example, one of my favorite student projects is [this one](#) by **Jean Cho**, which doesn't quite look like anything I've seen before. She made these remarkable figurations in a custom "thrice-drawn," cybernetic workflow that blurred the boundaries of human and machine: first, she drew 3D forms in VR using TiltBrush; projected these drawings to 2D in Blender using custom Python code, and plotted them with an AxiDraw; and then drew over them by hand using the exact same pen.



Vincent Wolfe, *Drawing with Machines*, class by Golan Levin, Carnegie Mellon University, 2024.

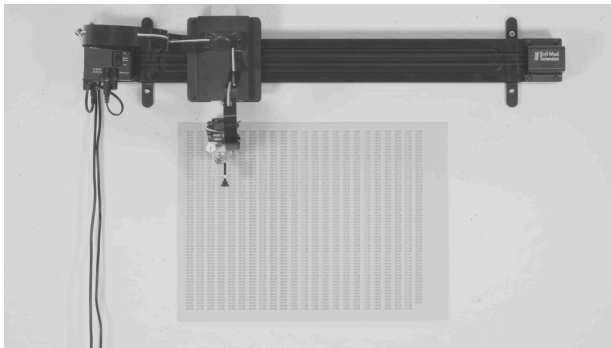
A few other student projects also come to mind in showing new approaches to drawing and machinery. There's not a lot of generative embroidery out there; I adore [these generative plants](#) by my student **Vincent Wolfe**, who "grew" them virtually in Processing with an L-system algorithm, and then executed them in thread using our homegrown PEmbroider library.



Yon Maor, *Drawing with Machines*, class by Golan Levin, Carnegie Mellon University, 2024.

Golan Levin - Touching Grass

My student **Yon Maor** connected machine art to both a new medium and a new audience in [this project](#), in which he microengraved generative art and anti-capitalist messages into coins, and then placed the coins back into circulation.



Leo Lin, *Drawing with Machines*, class by Golan Levin, Carnegie Mellon University, 2024.

And my student **Leo Lin** reconceived the act of drawing as both a performance and a real-time utility, in this [24-hour-long-event](#) in which a plotter became a clock.

Simone Brauner. You have been both a pioneer and a teacher in new media and creative coding. Over the past two decades, what changes have you observed in how young artists understand and use technology? How do their motivations and working methods differ from your own generation?

Golan Levin. The younger generation no longer has to argue that it's even *possible* to make art with a computer. Digital art may not be to everyone's taste, and it still occupies an uneasy place in the broader art world, but at least no one says "That's not art!" anymore. What's changed instead is the atmosphere around technology itself.

My students have grown up inside its failures: social media toxicity, filter bubbles, misinformation, addiction, cyber-bullying, deepfakes, scams, spam, dark patterns, and enshittified platforms. They see technology less as a frontier and more as an ecosystem in decline. The heroic, utopian narrative that once surrounded "new media" has collapsed into something more ambivalent.

Many now pursue computational art through professionalized channels—animation, games, music tech, UX—but they do so with a wary intelligence. Their skepticism can look like cynicism, but it often signals a kind of maturity: a desire to use these tools with awareness rather than awe. If my generation's motivation was discovery, theirs may be repair.

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Simone Brauner. In your 2009 TED Talk, you scrolled through the new App Store asking: "Where is art?" Sixteen years later, how do you see that question now? Has the relationship between art and technology deepened, distorted or simply changed in unexpected ways? Where is art now?

Golan Levin. Well, there's still no "Art" category in the App Store! Clearly, a decade later, the blockchain has provided a platform on which creative coders can publish and sell software art, an opportunity which Apple did not deem worthwhile. In retrospect, I'm not surprised that a distributed, global, open platform offered a ready solution for the arts that a commercial entity would not. I'm thrilled that so many creative people were able to find livelihoods and a marketplace for their work on the blockchain—particularly during the COVID lockdown, when opportunities to present one's art had substantially dried up. I have to hand it to **Kevin McCoy** and **Anil Dash**, who had the foresight to see and understand this potential as early as 2014, when they created *Quantum*, the first NFT artwork.



Golan Levin, *Golan Levin Makes Art That Looks Back at You*, TED video, February 2009.

Unfortunately, despite the open nature of the blockchain, I feel that the nature of software art has nonetheless been deeply warped by the blockchain's hype bubbles and market forces. The financial promise of the blockchain as a locus for art has distorted creative practices in countless ways, whether it's an abundance of copycat work, or mountains of art that glorify money itself, or just biases in the kind of work that gets seen and becomes successful.

To take just one example, out of all the software art that is on the blockchain, only a tiny amount of it is interactive—yet interactivity is one of the truly distinctive potentials of software.

Since 2021, terms like “NFT,” “software art,” and “new media art” have come to be seen as interchangeable by many people, and even some galleries. But software art on the blockchain is such a narrow slice of the kind of art that has become possible with computation—cramped into a subset of possibilities defined by what's technologically possible within a web browser. The relative absence of interaction modalities like cameras, microphones, and multitouch interfaces; or media types like random-access video, synthetic sound, or immersive 3D; or real-time communication with online databases or other users—represents a retreat to a baseline of multimedia work that has scarcely evolved since the 1990s—even if its idioms of generativity are much more current.

I also think about longevity and archival issues a lot, for software art. The App Store was terrible for this. For example, I released an interactive artwork on iOS in 2009, and Apple bricked it two years later, when they updated their SDK (software development kit). I recompiled it with the new SDK and released the updated version; a year later, Apple broke it again. I think this is just cruel to artists and small developers. It's certainly not something that painters have to deal with. Again in theory, the blockchain presents a powerful solution for this—art written directly into the code of the blockchain, or so-called “on-chain” art, probably has good durability—but for anything larger than a few kilobytes, one has to continually “pin” (pay to host) the artwork or else it evaporates.

Simone Brauner. *Is that also a reason you've started taking a more hands-on approach with your students again?*

Golan Levin. I think we are now in a kind of hangover from virtuality. Over the past couple of years, the rise of AI slop has increasingly made virtual media feel cheap, fungible, and nugatory. This has been worsened by the isolation of our virtual lives in post-COVID Zoom-culture, and also by a growing sense that the outrage machines of social media are a kind of sickening force. My students tell me they feel ill from using computers—even (or perhaps especially) the ones who are adept at programming them. This is one of the main reasons I've shifted my teaching to focus on plotter art: making art with plotters is a kind of “touching grass,” leading to something truly *real* and unique that students can do with their creative coding skills. Twenty-five years ago I thought that making physical art was a

quaint relic of the past; now, I value the creation of physical art as a critical practice of self-repair.

"Recently my friend Claire Hentschker and I came up with a list of adjectives that, we believe, point to a possible target for creative work in the 2030s: we think the frontier is ephemeral, undocumentable, unscalable, unmarketable, inefficient, and utterly personal. These terms express a sensibility of recoil from virtual glut and computational exhaustion, and point to a cultural inversion and contraction toward the finite, embodied, unrepeatable, and situated."

You asked: "Where is art now?" I can maybe offer a preliminary hypothesis. Recently my friend **Claire Hentschker** and I came up with a list of adjectives that, we believe, point to a possible target for creative work in the 2030s: we think the frontier is ephemeral, undocumentable, unscalable, unmarketable, inefficient, and utterly personal. These terms express a sensibility of recoil from virtual glut and computational exhaustion, and point to a cultural inversion and contraction toward the finite, embodied, unrepeatable, and situated. The premise is that real art, the stuff that means something to people, is not only happening outside of conventional institutions (the white box of the museum, the black box of the theater), but also outside of commercial galleries, App Stores, and other platforms for extractive capitalism where "scalability" is a primary goal. Claire is coming close to this now through her curation of the [Larpa.mill artspace](#) that she runs in Brooklyn, but I have to confess that, other than through teaching and maybe my new works on paper, I'm not certain where my efforts fit into this scheme yet.

Simone Brauner. Defamiliarization is an artistic technique that forces the audience to see familiar things in an unfamiliar or strange way in order to sharpen their perception of the ordinary. How does this idea connect to your work?

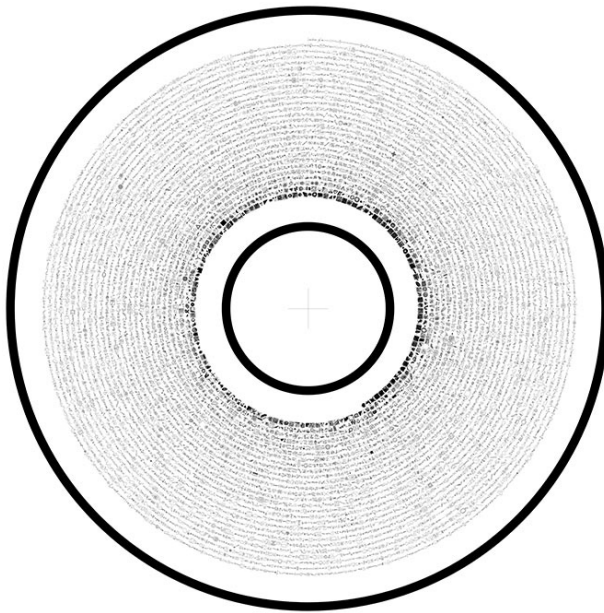
Golan Levin. When I think about defamiliarization, I think about how artworks can interrupt our default ways of seeing. They can force perception to slow down, to become aware of its own mechanisms. I often look for systems that can be turned against themselves to produce that hesitation.



Golan Levin with Lingdong Huang, *Ambigrammatic Figures*, 2020.

A project that grew directly from this interest is [Ambigrammatic Figures](#), which I created with my former student **Lingdong Huang**. It's a series of AI-generated faces that can be viewed both upright and upside down. The algorithm that produced them, StyleGAN2, was trained only on right-side-up faces. By asking it to interpret inverted inputs, we invited it into a state of perceptual confusion—and the images that emerged seemed to contain both orientations at once.

Looking at them, you experience a small perceptual crisis: each flip redefines what you thought you saw. They reveal how fragile recognition is, and how quickly the mind repairs contradiction. For me, that's the essence of defamiliarization—not just showing something strange, but restoring strangeness to what we thought we already understood.



Golan Levin, *The Moon Drawings* disc graphic, showing the nearly 9000 submitted drawings.

Simone Brauner. Have you ever seen someone intervene in your systems, modifying or transforming how they were meant to work?

Golan Levin. As a matter of fact, yes, though the hack was fairly harmless. The example that comes to mind was a project of mine called [Moon Drawings](#), which invited people across the internet to contribute a one-line drawing into an online database.

About 9000 people created drawings, presumably scribbled using their mouse or touchpad. But someone—I suspect it was my friend **Kyle McDonald**, though I don't know for sure—reverse-engineered our web protocol and contributed some impossibly precise drawings that couldn't possibly have been made by hand. The drawings were microetched onto a sapphire disc that was destined for the Moon aboard a robotic lander, but which unfortunately ended up in the Pacific Ocean owing to a fuel leak. Space travel is hard.

Simone Brauner. You once described "the howling emptiness" in much of AI art. What do you mean by that, and what makes a digital work feel genuine or redeeming to you?

Golan Levin. I think making good art is hard. Making good art out of the redigested pulp of everyone else's art is even harder. Perhaps it comes down to **Sturgeon's Law**, which states that "90% of everything is crap"; if one uses AI models that are indiscriminately trained on the landfill of shit which is the internet, which is necessarily what gigascale training sets like LAION-5B and OmniCorpus are, and one furthermore uses these models in unimaginative ways—to chase fads, to make ads—then "Garbage In, Garbage Out" should come as no surprise.

The quality of one's ingredients makes a big difference, which is why I particularly admire the work of [Helena Sarin](#), who has been creating her own training datasets for years. I suppose I have a "genuine artistic experience" when I can (still) perceive the distinctive voice of an author in the work. Slop, definitionally, lacks this; my "nausea" arises because of the ease with which slop is produced at scale.

"This isn't the same thing as training one's own model from scratch—all LoRAs do is enrich and influence existing models—but even this small, almost alchemical change in the process made a big difference in the strength and specificity of the work."

Simone Brauner. What does "access" mean to you in terms of openness, participation, and inclusion?

Golan Levin. Echoing my answer above, I think it depends on whether one can detect one's own creative voice preserved in the results. I'll give a very tiny example. I recently taught an art course focused on generative AI. We began the semester using commercial prompt-based tools like MidJourney and RunwayML. As powerful as these tools were, the students felt utterly disconnected from the output; they described missing a feeling of accomplishment, a sense of overcoming a struggle, and a personal relationship to the output.

Later in the semester, I had them train a LoRA model using a dataset of their own personal images. Using ComfyUI, they then used these LoRAs to guide the same sort of Stable Diffusion algorithms used in commercial tools. This isn't the same thing as training one's own model from scratch—all LoRAs do is enrich and influence existing models—but even this small, almost alchemical change in the process made a big difference in the strength and specificity of the work.



Golan Levin, *Directrix*, 1998, 2025.

Simone Brauner. In Berlin, as part of Art on Tezos, you are presenting your work *Directrix*: an early piece that transforms gestural input and mathematical logic into a kind of generative choreography. The work makes abstract geometry physically tangible and simultaneously reflects the shared agency of human and algorithm. It encourages viewers to understand their own gestures as artistic input, making abstract geometry visible, sensory, and subjectively experienceable. Why did you choose this artwork?

Golan Levin. I chose *Directrix* because it marks a moment when gestural interaction still felt open—before touch and motion became domesticated by consumer interfaces. The piece turns a simple mathematical structure into something performative: a system where the participant's body completes the artwork.

For an exhibition about blockchain and digital provenance, it felt right to show a work that's about authorship as shared process. *Directrix* blurs the line between maker and

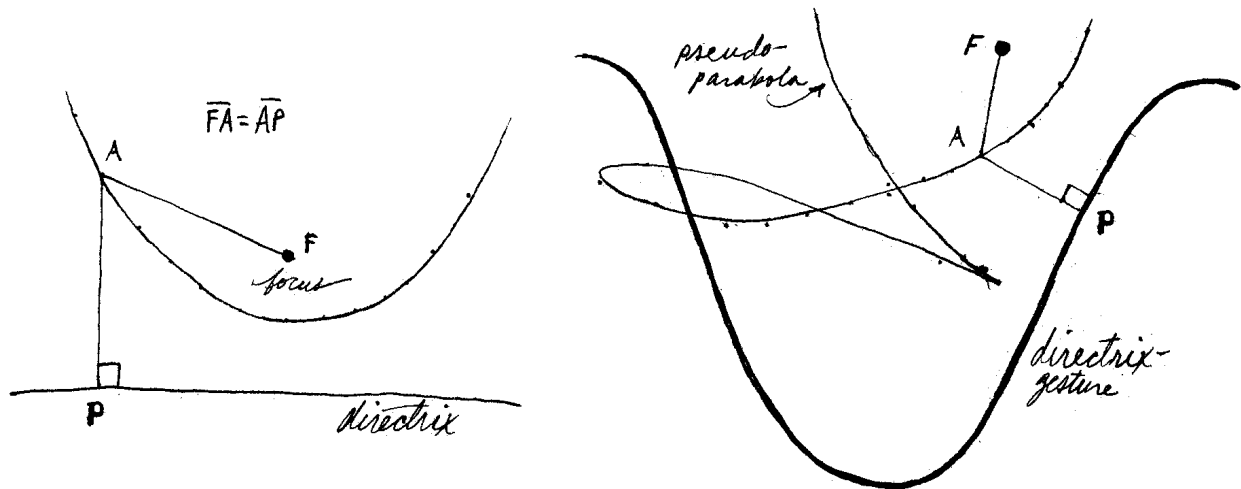
system, human and algorithm. These are precisely the questions that decentralized technologies now raise in a different register.

Simone Brauner. Almost 30 years have passed since you created *Directrix*. What does it feel like for you to present it today, and in the context of blockchain and digital distribution?

Golan Levin. It's indeed strange to see *Directrix* surface again after so long, but also fitting. When I made it in the late 1990s, gestural interaction was still a kind of magic—an unclaimed territory between drawing, choreography, and computation. Today, those languages of dynamic abstraction have been absorbed into every touchscreen and motion interface. What once seemed experimental now reads as almost archaeological.

Yet the piece still lives, or lives again, not because of its technology but because of the loop between body and system. Each participant reanimates its geometry through their own gestures, and that keeps it contemporary. The blockchain context adds another layer: it shifts the question of authorship from “Who made this?” to “Where does authorship reside—in the code, the gesture, or the transaction?”

(I managed to locate some [sketches](#) from my 1997–1998 notebook, in which I figured out the mathematics for the *Directrix* project):



Golan Levin, Sketches for *Directrix*, 1997–1998.

Simone Brauner. The line arises from your gesture, the form reacts directly, and a playful dynamic emerges between the work and the participant. Mood, action and the unexpected take center stage, where intuitive making matters more than reflection. Yet there is always a moment when pure experience recedes and the desire to understand takes over. Do you expect that perception of *Directrix* will always oscillate between experience and analysis?

Golan Levin. As for the oscillation between experience and analysis, that's essential. *Directrix* is built to invite both wonder and understanding. You start by moving your hand and seeing the lines dance; then, curiosity takes over and you begin to reverse-engineer the logic that governs the piece. I like that alternation. It mirrors how I work: intuition leading to inquiry, and back again. The piece hasn't aged so much as it has ripened into that rhythm. It's less a relic of my early interactive art than a reminder that perception itself is generative.

About the artist

Golan Levin is Professor of Electronic Art at Carnegie Mellon University, where he also holds courtesy appointments in the School of Computer Science, the School of Design, the School of Architecture, and the Entertainment Technology Center.

As an educator, Golan's pedagogy is concerned with reclaiming computation as a medium of personal expression. He teaches "studio art courses in computer science," on themes like interactive art, generative form, and information visualization. From 2009–2022, Golan also served as Director of CMU's Frank-Ratchye STUDIO for Creative Inquiry, a laboratory for atypical and anti-disciplinary research across the arts, science, technology, and culture.

Code as Creative Medium by **Golan Levin** and **Tega Brain**.

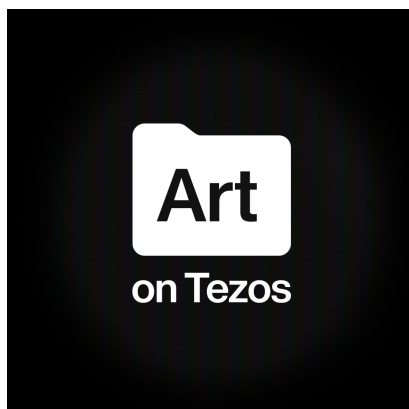
About the author

Simone Brauner is co-publisher of The AI Art Magazine.

About the exhibition

Directrix is part of Art on Tezos: Berlin, 6–9 November 2025.

Exhibition on objkt.com



Art on Tezos: Berlin, November 6–9, 2025.

Directrix (1998, 2025) is a long-form generative artwork, and an interactive drawing environment, which co-creates animated "pseudo-parabolas" with its viewer.

These complex curves are the result of an interplay between a set of dynamic and static gestures. When several of these curves are layered together, the results can vary from sparse and delicate constructions of gently curved lines, to violently twitching, thatchy masses.

Directrix creates images from a generalized model of parabolas—the set of points which are equidistant from a special point called the focus, and a (typically) straight line called the directrix.

This environment was designed to explore the implications of two premises: firstly, that the shape of a parabola's directrix could be an idiosyncratic line created by a user, and secondly, that its focus could be a moving point animated along the trace of a participant's recorded gesture. *Directrix* is interesting because of the interplay it establishes between a strictly spatial specification (the directrix) and a spatio-temporal one (the path of the focus).