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NOTE: The slides referred to below in parentheses immediately follow the paper, in PDF form.

Ten Theses on Art and Artificial Intelligence

This paper is structured something like the theory equivalent of a poetry slam. I will offer ten theses and questions, ranging from the general to the specific and from the plausible to the wildly speculative, about how the accelerating emergence of artificial intelligence might affect art and creative culture in coming years. Given the time constraints, these are fast and rapid-fire rather than extensively reasoned through, which seems appropriate considering the quickening pace of A.I.’s ingress into human affairs.

(SLIDE ONE) Thesis One: Art’s operation as a difference/*différance* engine will become an increasingly crucial counterpoint to A.I. quantification

Though art has been a problematic philosophical subject since at least the era of Plato, “aesthetics” emerged as a distinct discipline only in the mid-18th century. This emergence was in part a response to the rise of Enlightenment thinking and the scientific method, both of which focus on quantification and objectivity at the expense of the subjective and non-quantifiable. Following on this, what roles might art and aesthetics play today, when every aspect of culture and experience is undergoing quantification at levels of granular detail unimaginable even a decade ago?

Art’s ability to generate and sustain difference might serve as a counter to just such quantification. Consider that information is technically a measure of difference, but most

differences settle. A new fact constitutes a momentary difference, and thus information, but then quickly settles into the equilibrium of knowledge. Art's difference, however, remains weird and different over time, as a process of *differencing*. We all know the fact of a snow shovel, (**SLIDE TWO**) but still debate Duchamp's readymade snow shovel a century later because its difference continues differencing—it never settles. Such sustained differencing suggests art's potentials for resisting high-tech standardization and quantification. An A.I. could tell us everything about the snow shovel or the *Mona Lisa* down to the atomic level, while never quite reaching whatever aspects make these things *art*.

(SLIDE THREE) Thesis Two: Art will become increasingly material-specific relative to A.I.

Reconfiguring Greenberg's notion of medium specificity, where each art discipline must focus only on elements specific to that discipline, artists will increasingly emphasize those aspects of art specific to material existence, and thus resistant to representation via digitization. We see some of this already, as artists like Franklin Evans (**SLIDE FOUR**) and others move away from artmaking modes reliant on planes or screens and explore materiality as it unfolds, exists, and operates in lived space and time. Where Robert Morris (**SLIDE FIVE**) worked with raw materiality to resist formation into objecthood, future art will work with materiality to resist processes of immaterialization into the digital.

Beyond such resistance to digital representation, consider that, while it's easy to program an A.I. to do tasks that humans find difficult—like playing advanced chess or performing complex mathematics—it's incredibly difficult to teach a computer to do things humans can typically do quite easily by the time they're five. Foremost among these is an understanding of

space and spatial extension, which, at the moment at least, remains beyond the reach of A.I. systems. I predict that it is in these areas, of things easy for humans yet highly complex for an A.I., that we might find the purview of art.

(SLIDE SIX) Thesis Three: Art will become increasingly conceptual in new ways, as A.I. textualizes the world beyond anything Barthes or Derrida ever conceived

A.I. systems operate by way of algorithms, which are sets of instructions. In this sense, algorithms are a performative mode of operational textuality. I would argue that A.I. thus constitutes a new mode of pervasive textualization of the everyday. In a world saturated with wi-fi and 4G signals zipping back and forth, and data flows from smart-watches, facial and voice recognition systems, and GPS systems in your pocket or purse, plus a trillion other data points that undergo aggregation every second in vast A.I. databases, contemporary life offers a new take on Derrida's famous and often misunderstood quote that "there is no outside-the-text."

Furthermore, Derrida's notion of *différance*, where meaning is not inherent in a signifier or word but rather ricochets through a system without stopping, is practically indistinguishable from a form of machine learning and meaning/language acquisition known as embedding, or linguistic vector representation. For example, consider this video clip from the Google Research Labs' T-SNE project. **(SLIDE SEVEN: to 1:34 mark)** As we continue to move beyond what Lev Manovich **(SLIDE EIGHT)** describes as older *narrative* modes of culture to a *database* mode of culture, such approaches allow ways to re-organize and re-integrate culture and creativity along relational rather than deterministic lines.

(SLIDE NINE) Thesis Four: Art's relation to (and existence as) information will change as A.I. transforms human modes of visual, oral, and aesthetic communication

As Mario Carpo notes in his recent book *The Second Digital Turn*, (SLIDE TEN) human history has been a series of increasingly thorough ways to compress information. For instance, we've compressed the vast range of human sounds into representation via spoken words, then compressed those further into phonetic letters and so on. Similarly, the scientific method allows us to sum up vast cosmological ideas into simple equations—a strategy by which we maximize inferential possibilities from the smallest possible sets of rules or constraints.

Today, however, these compression approaches we've used as a species are no longer necessary when it comes to big data and A.I., which can brute force aggregate and undo as many options as possible, billions or trillions of times a second. Picasso's (SLIDE ELEVEN) eight months of effort toward the representational and spatial possibilities inherent in the *Demoiselles* would take up less than a nanosecond (SLIDE TWELVE) of combinatorial pattern exploration for an A.I. like IBM's Watson system. This opens up potentials for reorienting human linguistic and aesthetic communication away from issues of compression and toward issues of efflorescent potential and possibility. To give but one, perhaps shallow example, as our information capabilities have increased and as bandwidth needs have loosened, we see the rise of such communication modes as emoji, less reliant on particularity.

Consider also how human communication began as emotional and free-form, but has since evolved over time to incorporate logic and structure—from emotive hominid screeches to oral speech, to syntactically and grammatically-structured writing. At the same time, A.I. is starting to go the opposite way: from very formal and logical to increasingly affective, as pioneered by Rosalind Picard's Affective Computing Research Group at the MIT Media Lab.

(SLIDE THIRTEEN) Art since at least the Renaissance has oscillated between the expressive and the rationalistic, so it will be interesting to see where the zeitgeist goes next as new potentials open up.

(SLIDE FOURTEEN) Thesis Five: A.I. could (or at least *should*) also stand for Artificial Imagination

In complex adaptive systems studies, *complexity* is non-linear and hard to predict—think of things like swarms, daily weather, stock markets and so on. A jet plane, however, despite its hundreds of thousands of parts, is not truly complex but merely *complicated*, because those myriad parts serve a predictable function.

Along these lines if, as MIT physics professor Max Tegmark says, **(SLIDE FIFTEEN)** “Consciousness is what information feels like when processed in certain complex ways,” what about the potential for a machine consciousness? Due to the deterministic rules of computation, an A.I. would seem incapable of reaching a state of *complexity*, but would stay merely *complicated*. Rephrasing Tegmark, what might information feel like when processed in certain vastly complicated ways? **(SLIDE SIXTEEN-blank)**

Among the differences between complex consciousness (like ours) and merely complicated information processing would surely be some sort of imaginative capability. So, why not an alternate A.I. of *Artificial Imagination*? For example, reinforcement learning, also called curiosity-driven learning, is a feedback process whereby an A.I.’s attempts toward achieving a goal self-improve toward increasingly optimal outcomes. Here A.I. takes its first steps toward desire, as various subroutines of the system correlate the actual result at each stage

relative to the outcome desired, comparing what it *has* with what it has been programmed to *want* (so to speak).

Of course desire is not quite imagination. The start-up firm *Vicarious* (**SLIDE SEVENTEEN**) has unlocked current modes of neural network architecture—through which data typically only flows one way—so that the data can instead move multi-directionally through the system, reinforcing and recontextualizing previous steps. Accordingly, their A.I.s are not only able to analyze data but to extrapolate and consider it in contexts other than its present situation. Data considered in terms of other data starts to uplevel toward information, and—in my opinion at least—information iteratively reconsidered in different contexts is a pretty good, if rudimentary, definition of imagination.

(SLIDE EIGHTEEN) Thesis Six: Imaginative A.I. will evolve into Ambiguous/Aesthetic/Indeterminate Artificial Intelligence, or A/A/I.A.I.

What would fuzzy, aestheticized A.I. look like? What would happen if someone much more tech-savvy than I created an A/A/I.A.I. (*Ambiguous/Aesthetic/Indeterminate Artificial Intelligence*)? I envision this as a giant refrigerator-sized mainframe equipped with a slider bar for input/output options, (**SLIDE NINETEEN**) ranging from literal and specific to increasingly conceptual, metaphoric and interpretive.

A/A/I.A.I. might—and admittedly this is a *big* “might”—help realize not only artificial imagination, but artificial consciousness. While consciousness and subjective experience are too open-ended, slippery and ambiguous to code in and of themselves, *coding for open-ended, slippery ambiguity itself* might do the trick for us. If A.I.s can already simulate non-existent but really great Beatles song analogs—look them up—through nothing more than brute force data-

mining, pitch and tempo analysis, and generative processing, might something like the Singular Computing company's fuzzy processing chip, which is hardwired to resist precision, simulate the slippery ambiguities of consciousness? In other words, A.I. is already doing things thought impossible a decade ago using nothing more than brute force iteration and calculation. What might happen if that brute force approach were applied not to specific data but to fuzzy, ambiguous, so-called approximate calculation? **(SLIDE TWENTY)**

A particular mode of human consciousness that appears oriented toward ambiguity is, of course, that of artistic or aesthetic experience. One of the best examples of computational ambiguity is the Google Deep Dream project. We've all probably seen these images before, which result when a neural network, trained on image recognition with tens of millions of images of faces and animals, is given little or no data to work with—in this case an image of static. . .

(SLIDES 21–46) The result is the generation of vast complexity and strangeness as the system undergoes a kind of A.I. equivalent of Kant's free play of the faculties. **(SLIDE FORTY-SEVEN: BLANK)**

Along similar lines is the suggestion that A.I.s won't begin to approach human cognition or consciousness until their deterministic equilibria are dynamic and complex enough to be disrupted into new, alternatively functional modes of operation by relatively tiny inputs—which Andrew Smart describes as the computational equivalent of an acid trip, **(SLIDE FORTY-EIGHT)** as he outlines in his compelling book *Beyond Zero and One: Machines, Psychedelics and Consciousness*.

(SLIDE FORTY-NINE) Thesis Seven: Art's role as a reality-enhancer will shift to reality-stabilizer as discourse flux is amplified within so-called post-truth contexts iteratively interwoven and unraveled by self-improving disinformation bot swarms

The internet was hailed in the 90s as a peer-to-peer blow against centralized one-to-many authoritarian media control. **(SLIDE FIFTY: Blank)** What we now have, alas, is something quite different, a reverberative feedback system of criss-crossing bot-swarms, profit-driven distortions, and misinformation. While Bakhtin described the formation of ideological consensus and shared belief systems as a kind of polyphonic and heteroglossic swarm formation of shared speech that weaves together the social sphere in which it operates—an idea later borrowed and amplified by Deleuze and Guattari as collective assemblages of enunciation—A.I.-enhanced bots, news algorithms, and deep-fakes allow for a simultaneous construction of disinformational discursivity paired with an unraveling of socioculturally shared consensus. Here, Barthes' easily-pierced tissue of quotations shows its susceptibility to disruption and manipulation.

(SLIDE FIFTY-ONE) Thesis Eight: Whereas the cube sculpture of minimalism activated the two-way interactive and theatrical space of the viewer, the black cube of invisible and inscrutable A.I. processes will change the direction of our interpersonal and aesthetic relations

How does the gaze operate when the feedback loop of subject-to-subject reciprocity is broken by one-way surveillance? In other words, and simplifying for clarity, **(SLIDE FIFTY-TWO)** Lacan's notion of the gaze, focuses on the feedback between individuals: You and I become subjectified into who we are in part because our interactions bring each other forward into ourselves. I see you seeing me even as I know you see me seeing you, and vice versa. This

relationship changes with the advent of the one-way, algorithmic gaze. The all-seeing eye and far-beyond-human aggregation capabilities of A.I.-driven firms like Palantir—look them up if you don't know what Palantir is—changes our existence as subjects when there's no feedback, only the observation and aggregation.

(SLIDE FIFTY-THREE) Thesis Nine: Portraiture will experience a renaissance

What are the possibilities for portraiture in a cultural context of real-time facial recognition systems? I predict that A.I. will generate new modes of portraiture as different from current modes as a Picasso portrait **(SLIDE FIFTY-FOUR)** is from Vermeer's *Girl with a Pearl Earring*—not only in obvious visual difference, but also in underlying material logic and pictorial goals.

Consider how modernist approaches to paint changed dramatically due to the shift of focus from *representation*, to the *material and semiotic tools of representation*. A.I. will prompt a similar shift from our present-day focus, **(SLIDE FIFTY-FIVE)** to aggregate data structures and predictive algorithmic processes. Just as the modernist portrait shifted from outer appearance to fusion of appearance and material, portraits in an age of pervasive A.I. will be portraits of social flows and hitherto unseen patterns rather than of single sitters.

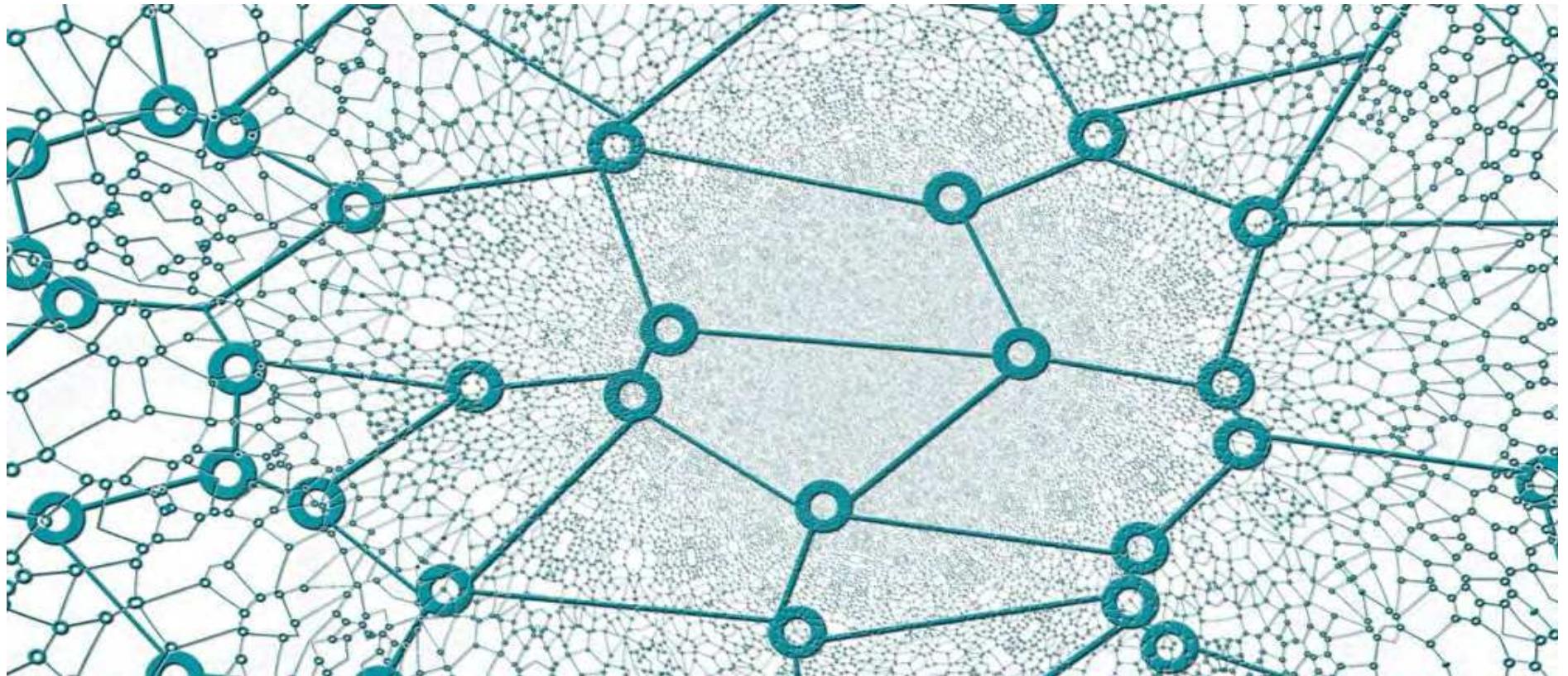
(SLIDE FIFTY-SIX) Thesis Ten: Artistic approaches to space will change beyond the perspectival, optical, and networked in weird new ways as our experience of ambient space becomes cognified

The fact that A.I. is so far not monolithic and general, but distributed, specialized and ambient, suggests interesting relations to Genevieve Bell's observations that technology is only

truly transformative when it changes our relations to space, time, and each other. (**SLIDE FIFTY-SEVEN**) As Bell, long the Director of Interaction and Experience Research at Intel and now an anthropology professor in Australia, notes, the more of those three components a new technology changes, the more transformative it is. It's now practically impossible to remember what life was like prior to the smartphone or internet, or to imagine a world without cars, trains or planes, because these technologies transformed not only our relations to each other and to time, but also to our experience of space.

Along these lines, consider the fact that A.I.—not the large technical object we imagined, but rather a field of invisible computation capabilities—changes our relation to space by *becoming spatialized*, by cognifying space itself. If, as per Sol LeWitt, the idea becomes the machine that makes the art, what happens when idea and space become indistinguishable—when the entirety of our surroundings, visible and invisible, is even more saturated with data flows and information swarms than it already is? (**SLIDE FIFTY-EIGHT**)

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SECAC Conference, Birmingham Alabama, October 2018

Thesis One

Art's operation as a difference/
différance engine will become an
increasingly crucial counterpoint to A.I.
quantification



Duchamp (left) and not-Duchamp (right)

Thesis Two

Art will become increasingly material-specific relative to A.I.



Franklin Evans (2018), Montserrat College of Art, Beverly MA



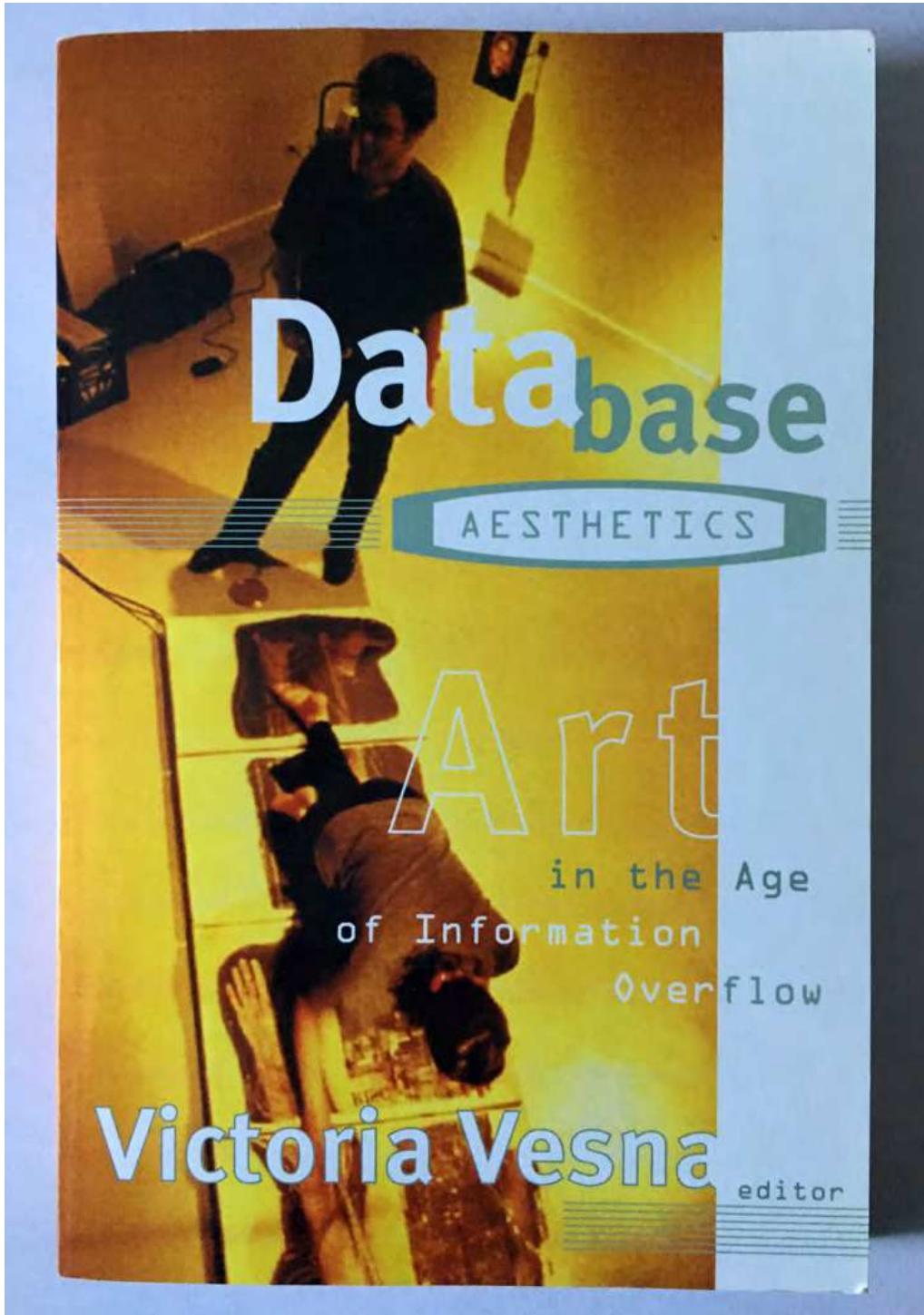
Robert Morris, 1968

Thesis Three

Art will become increasingly conceptual in new ways, as A.I. textualizes the world beyond anything Barthes or Derrida ever conceived



Google Research Labs T-SNE linguistic vector representation project, 2017-present



Thesis Four

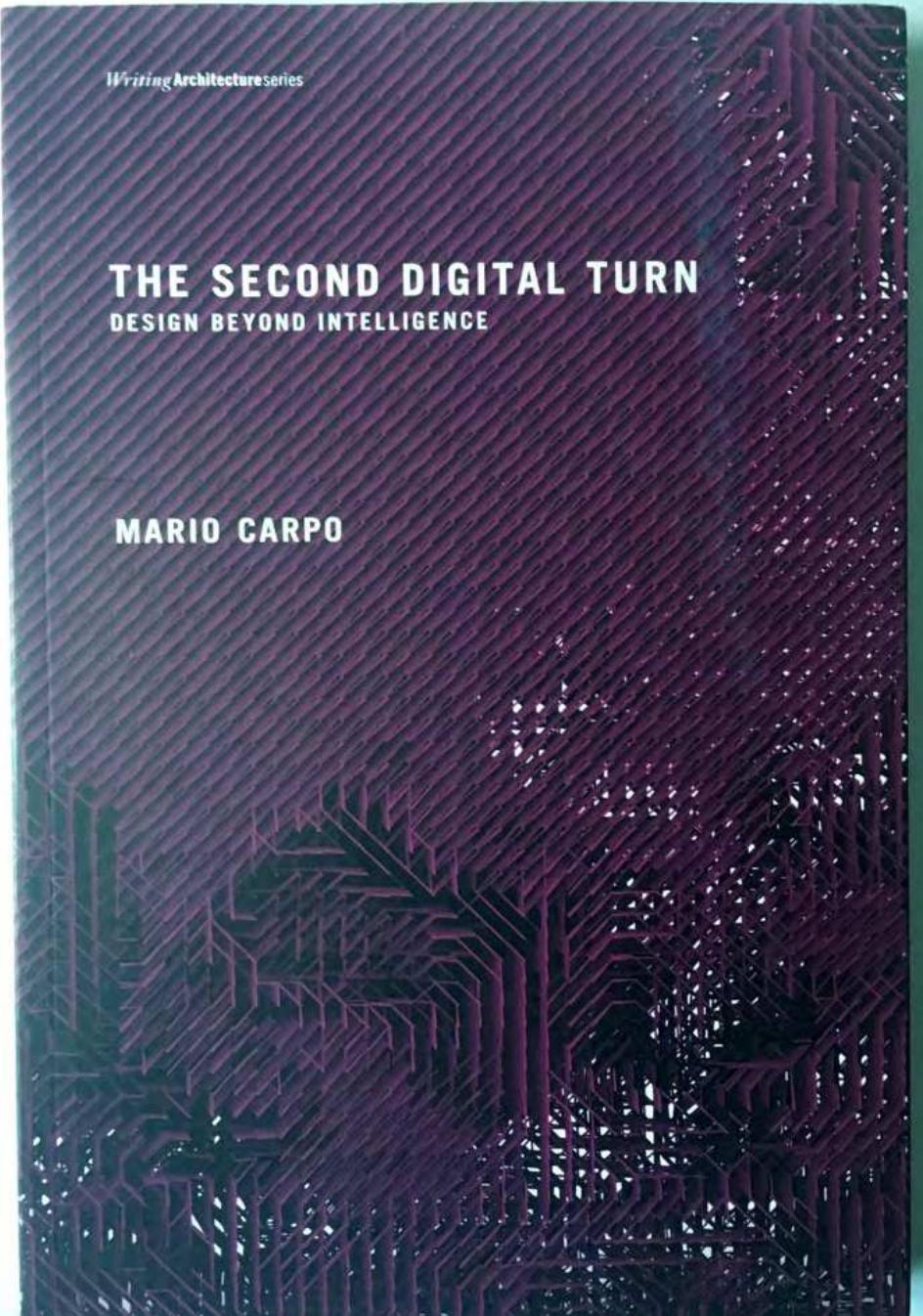
**Art's relation to (and existence as)
information will change as A.I.
transforms human modes of visual, oral,
and aesthetic communication**

Writing Architecture Series

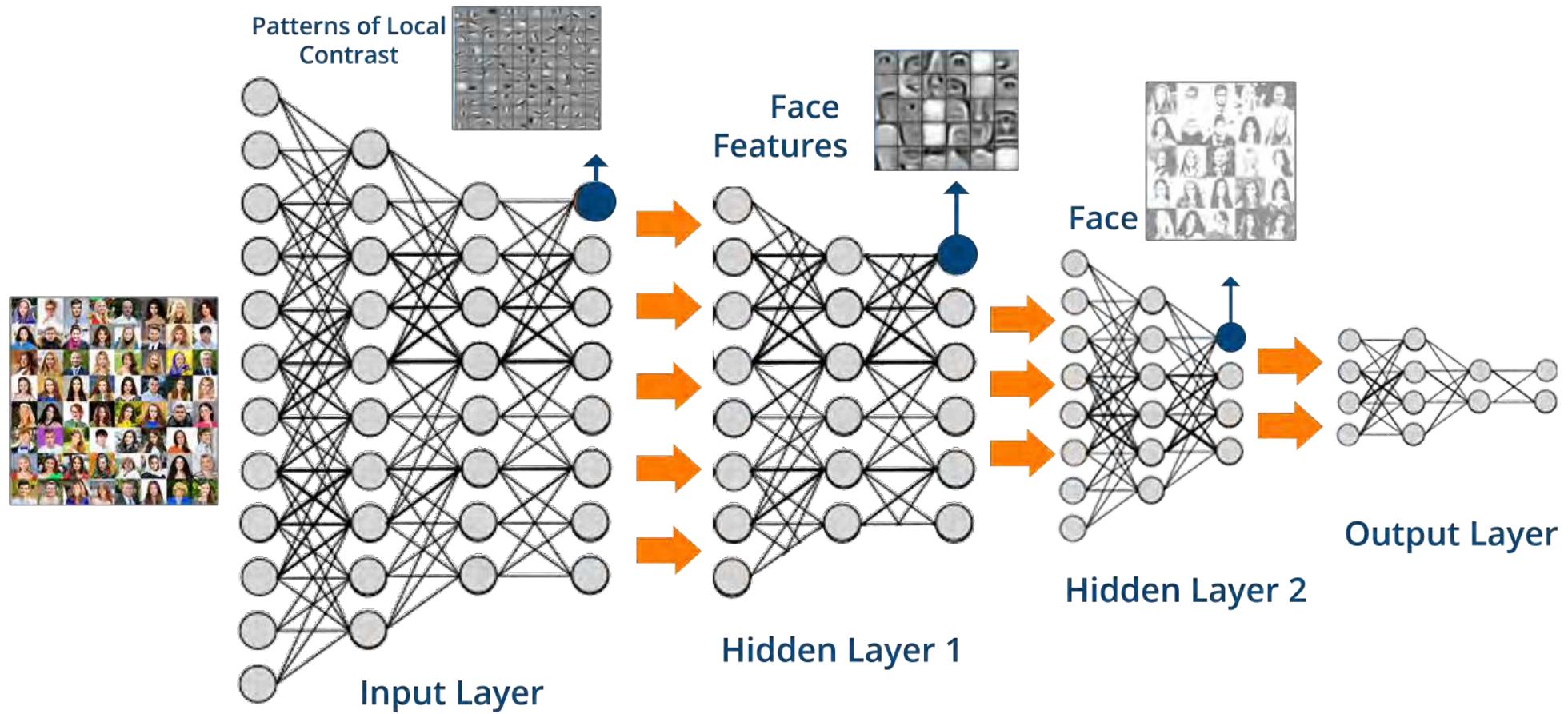
THE SECOND DIGITAL TURN

DESIGN BEYOND INTELLIGENCE

MARIO CARPO

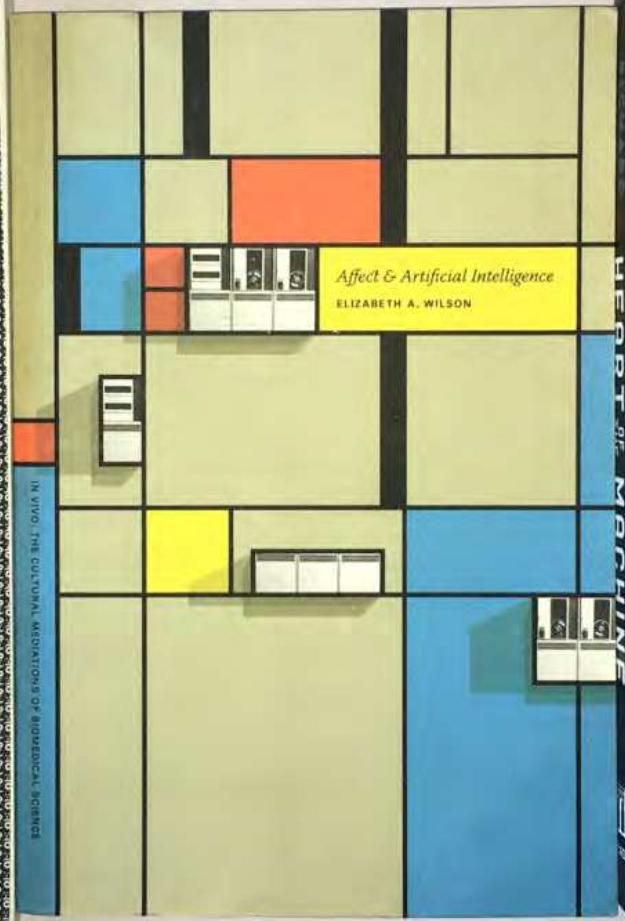






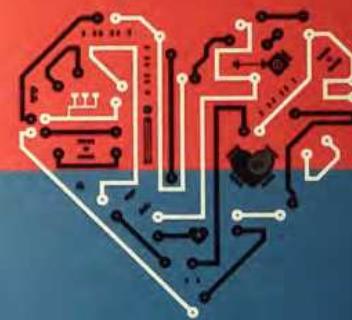
Convolutional neural network image recognition processing

AFFECTIVE COMPUTING



"Fascinating, and sometimes disturbing."
—MARTIN FORD, *New York Times* bestselling author of *Rise of the Robots*

HEART OF THE MACHINE



OUR FUTURE IN A WORLD OF
ARTIFICIAL EMOTIONAL
INTELLIGENCE

RICHARD YONCK

Thesis Five

A.I. could (or at least *should*) also stand for Artificial Imagination

**“Consciousness is what
information feels like when
processed in certain complex
ways.”**

**—Max Tegmark
Professor of Physics, MIT**



**MIT
Technology
Review**

PC: TIZIANA FABI/SHUTTERSTOCK; BRAIN IMAGE: JEFFREY M. HORNIG/SCIENCE PHOTO LIBRARY

The Artificial Intelligence Issue

The End of
the AI Boom?

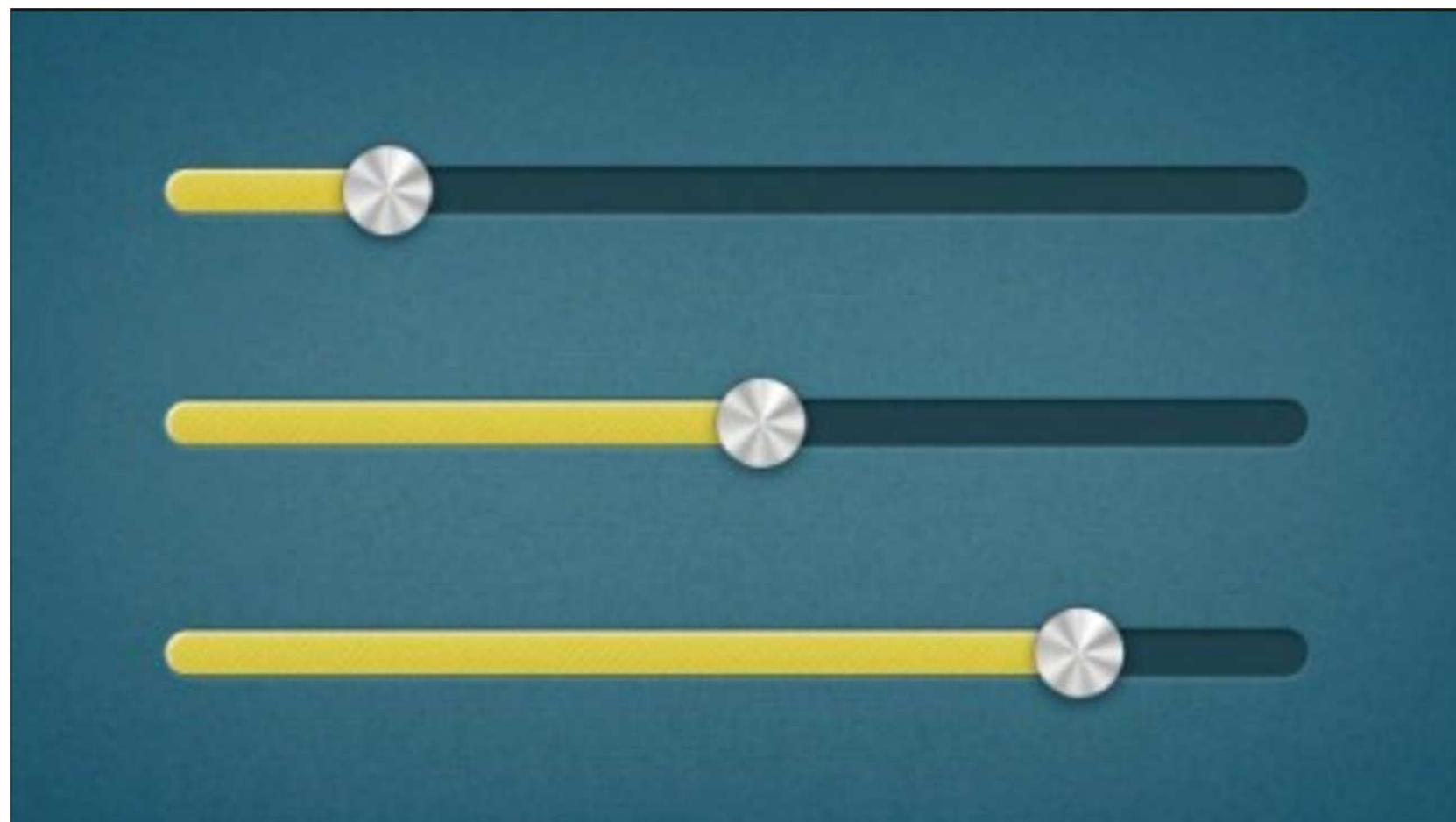
The Billion-Dollar
Quest to Have AI
Keep You Healthy

What Everyone
Gets Wrong
When Making AI
Predictions

Will Your Home
Robot Have
Feelings for You?

Thesis Six

**Imaginative A.I. will evolve into
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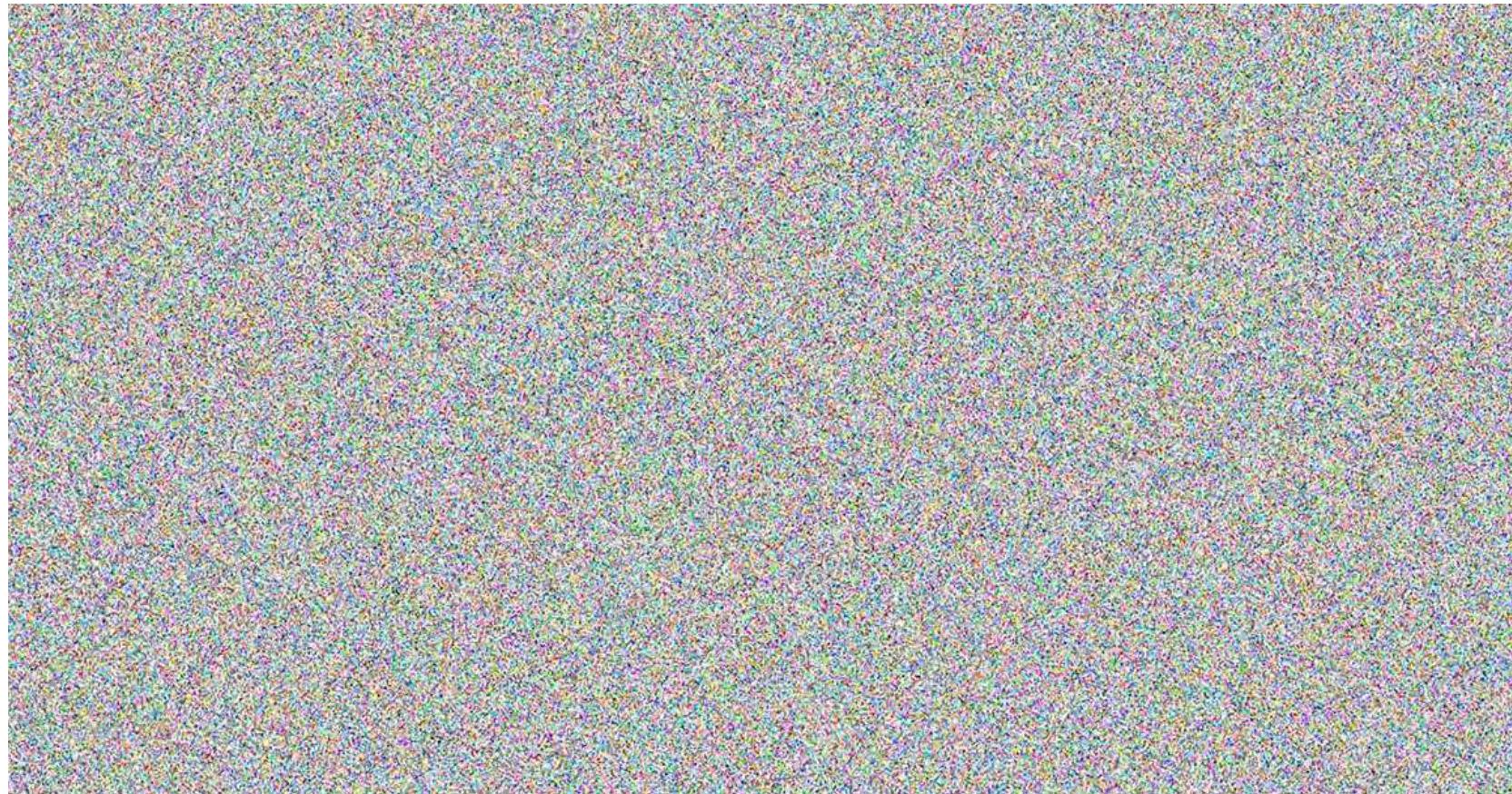


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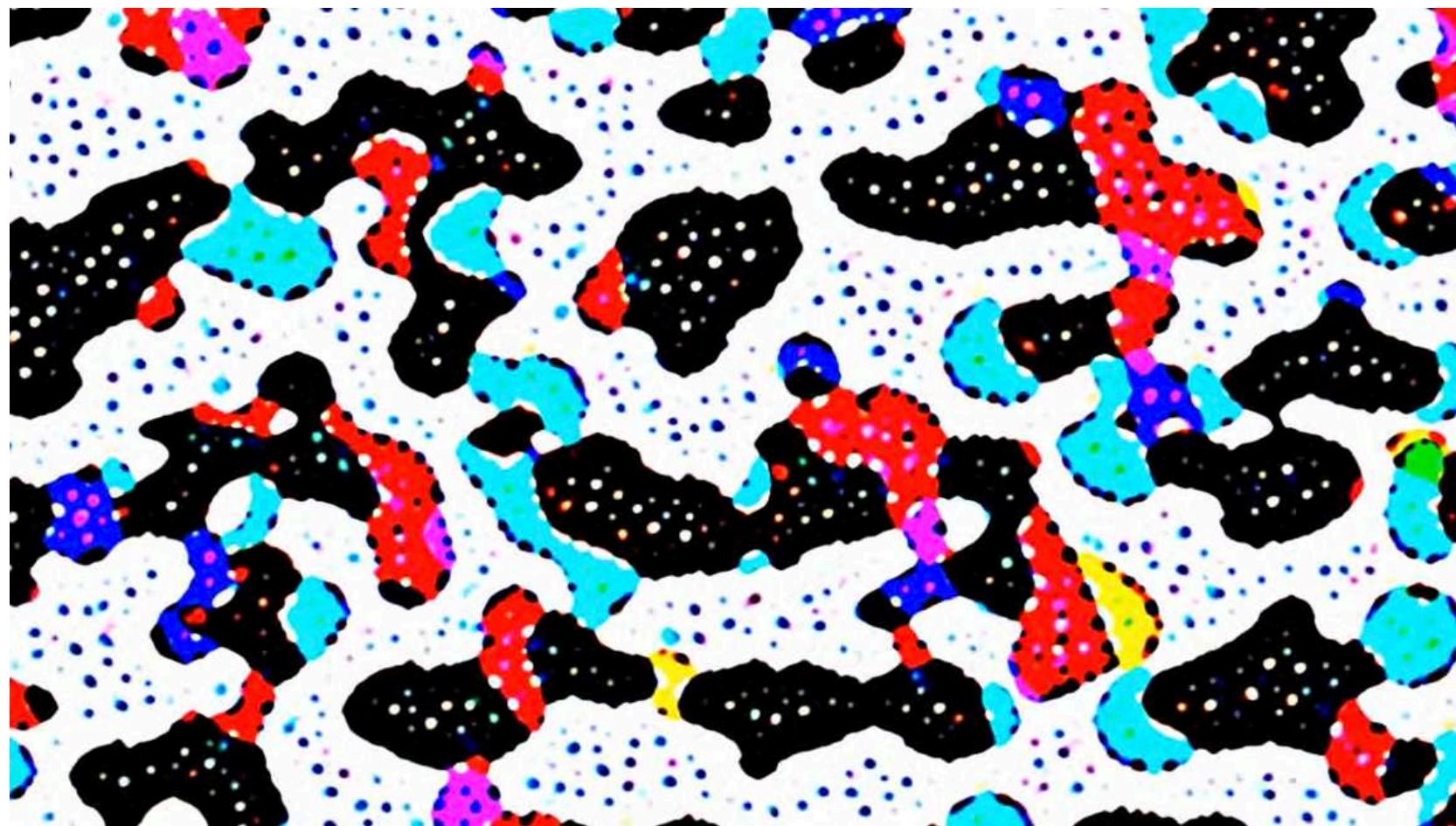
Nature's Algorithms for Learning and
Prospering in a Complex World

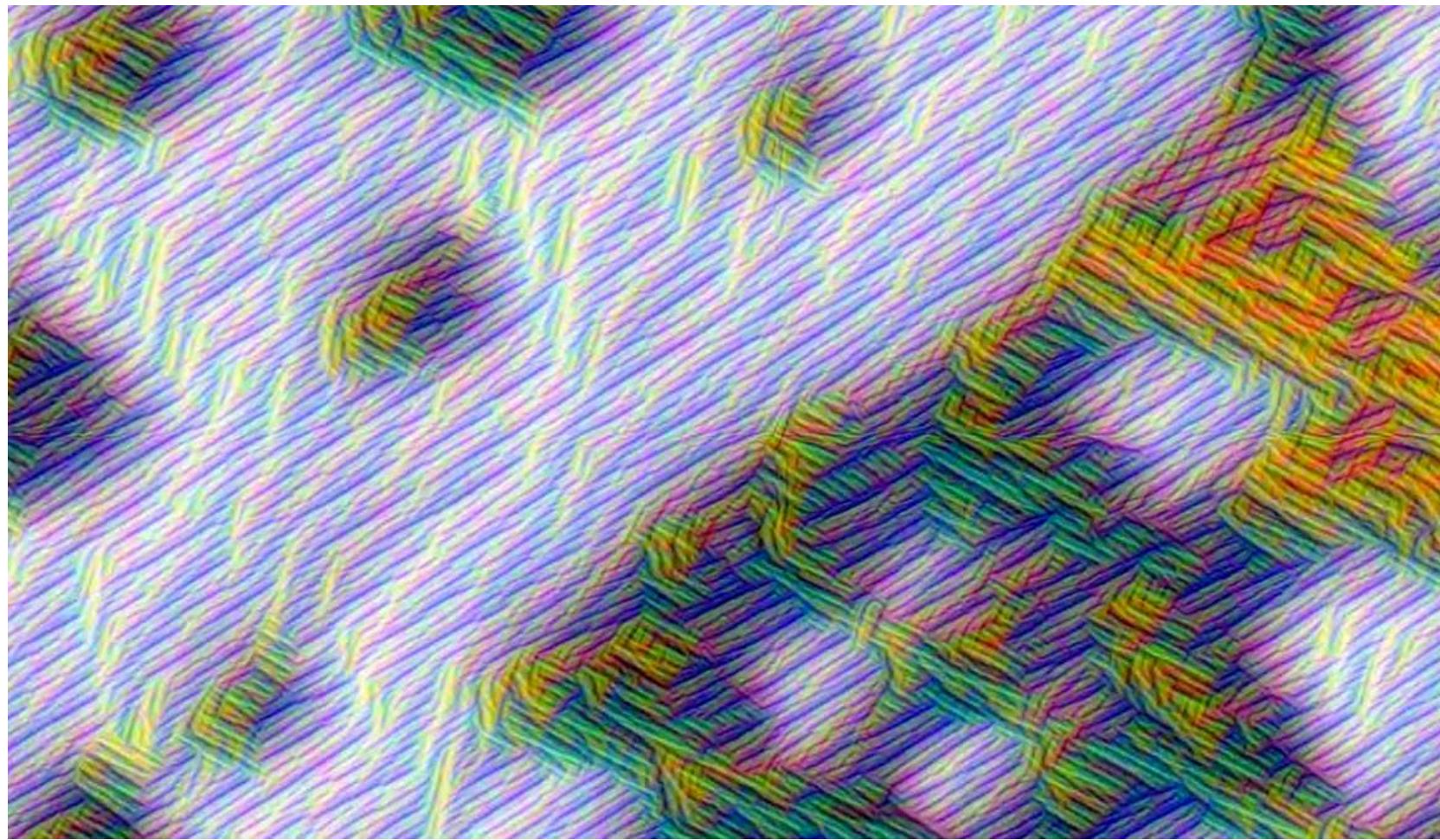
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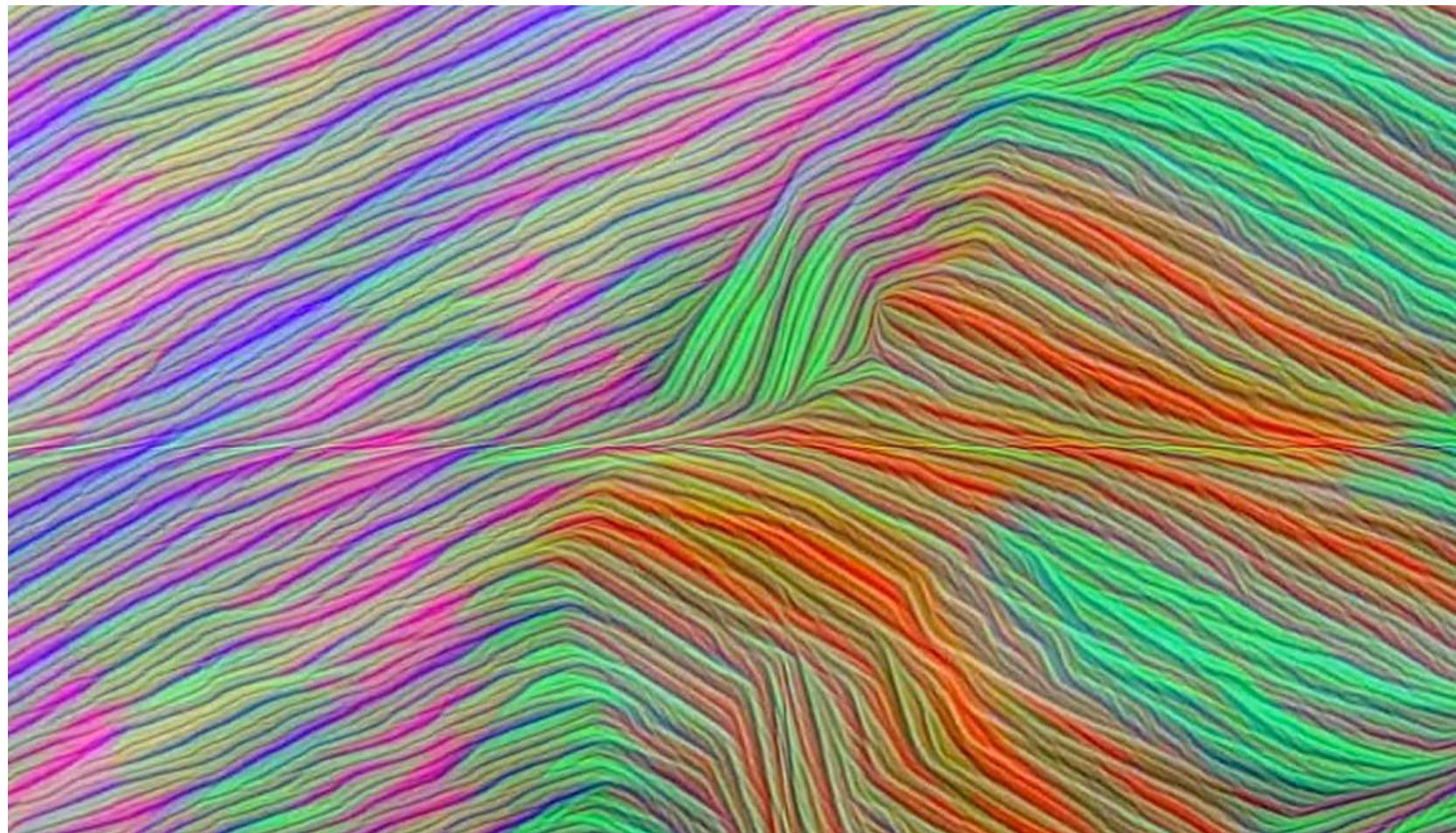
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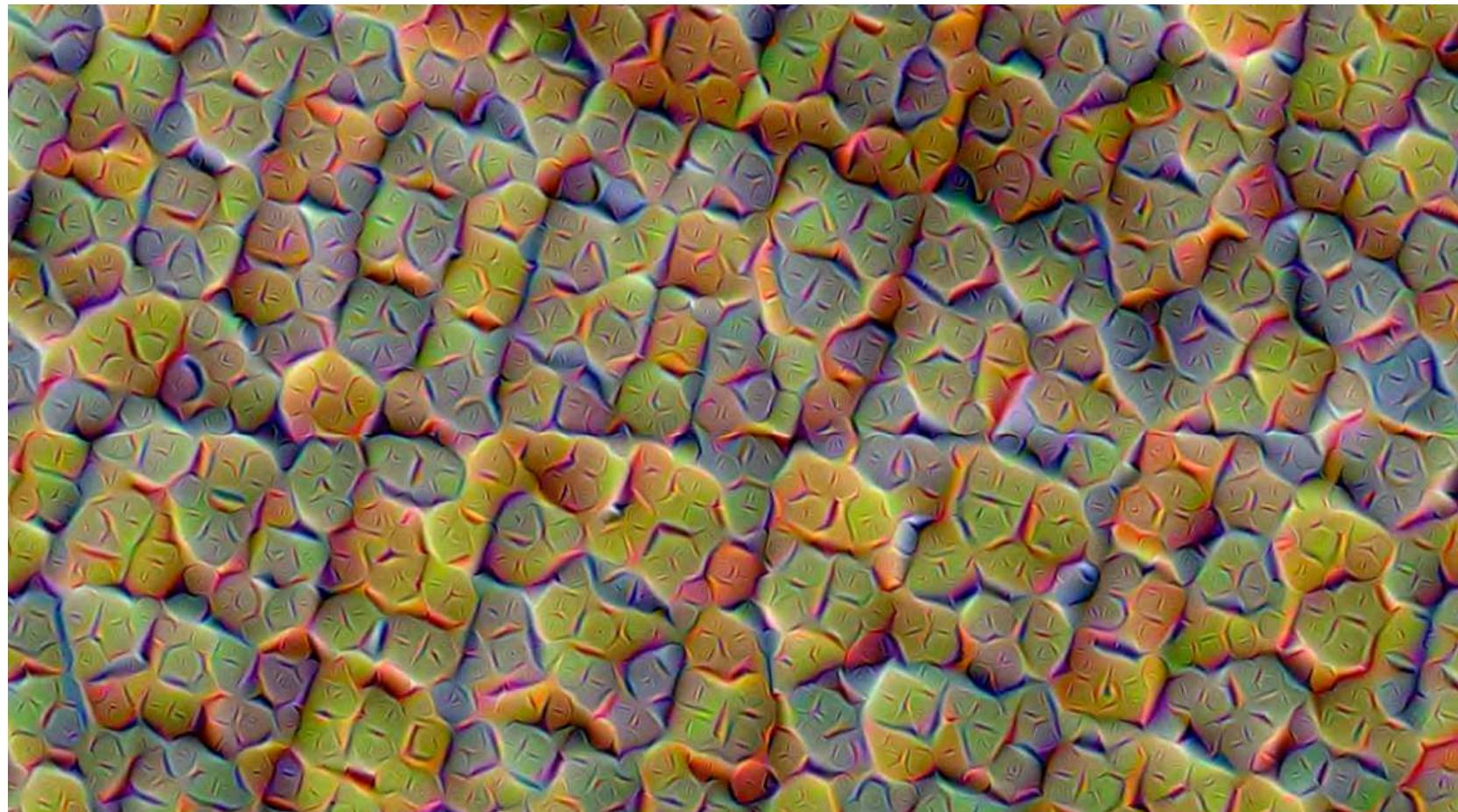


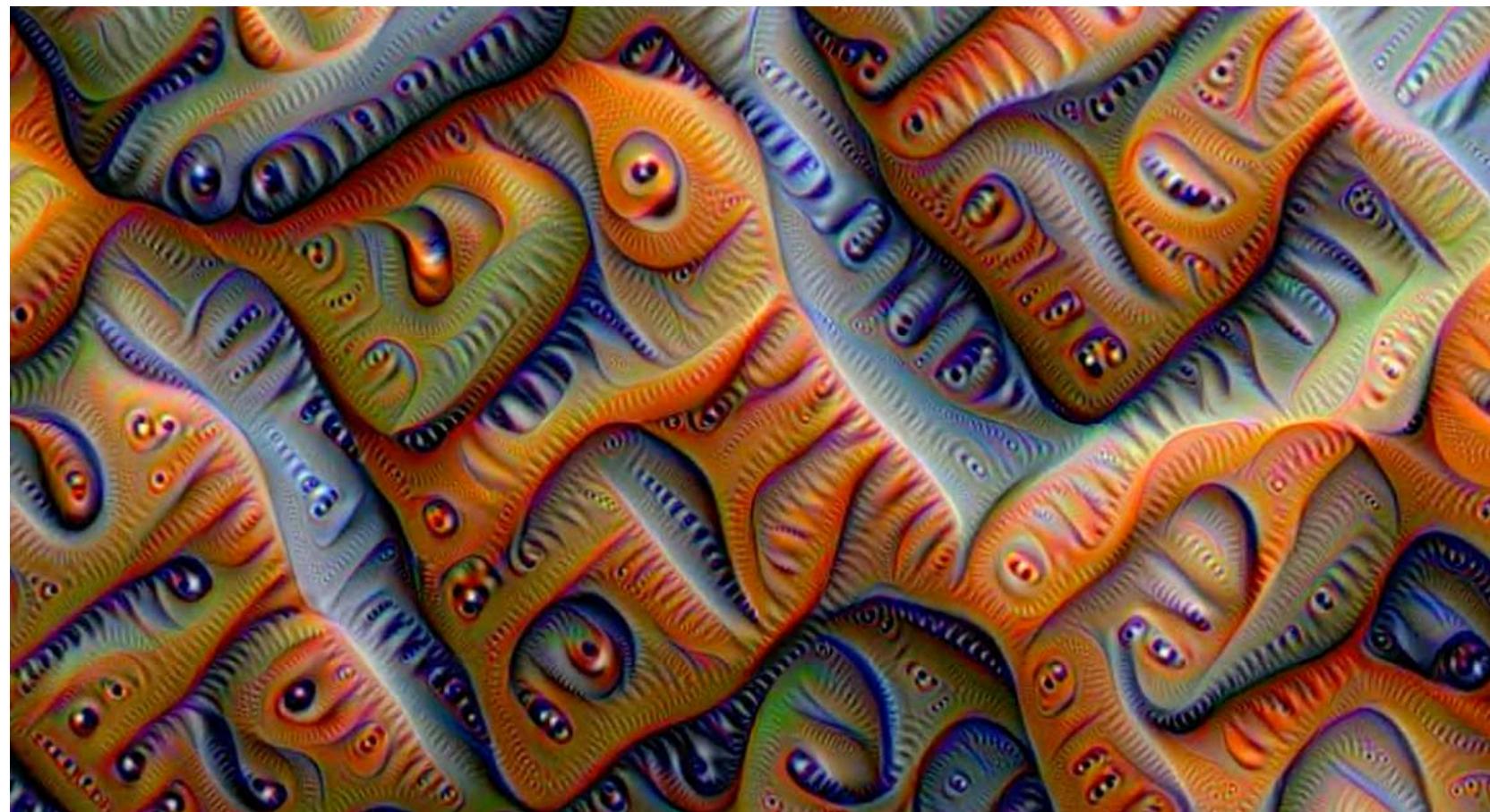




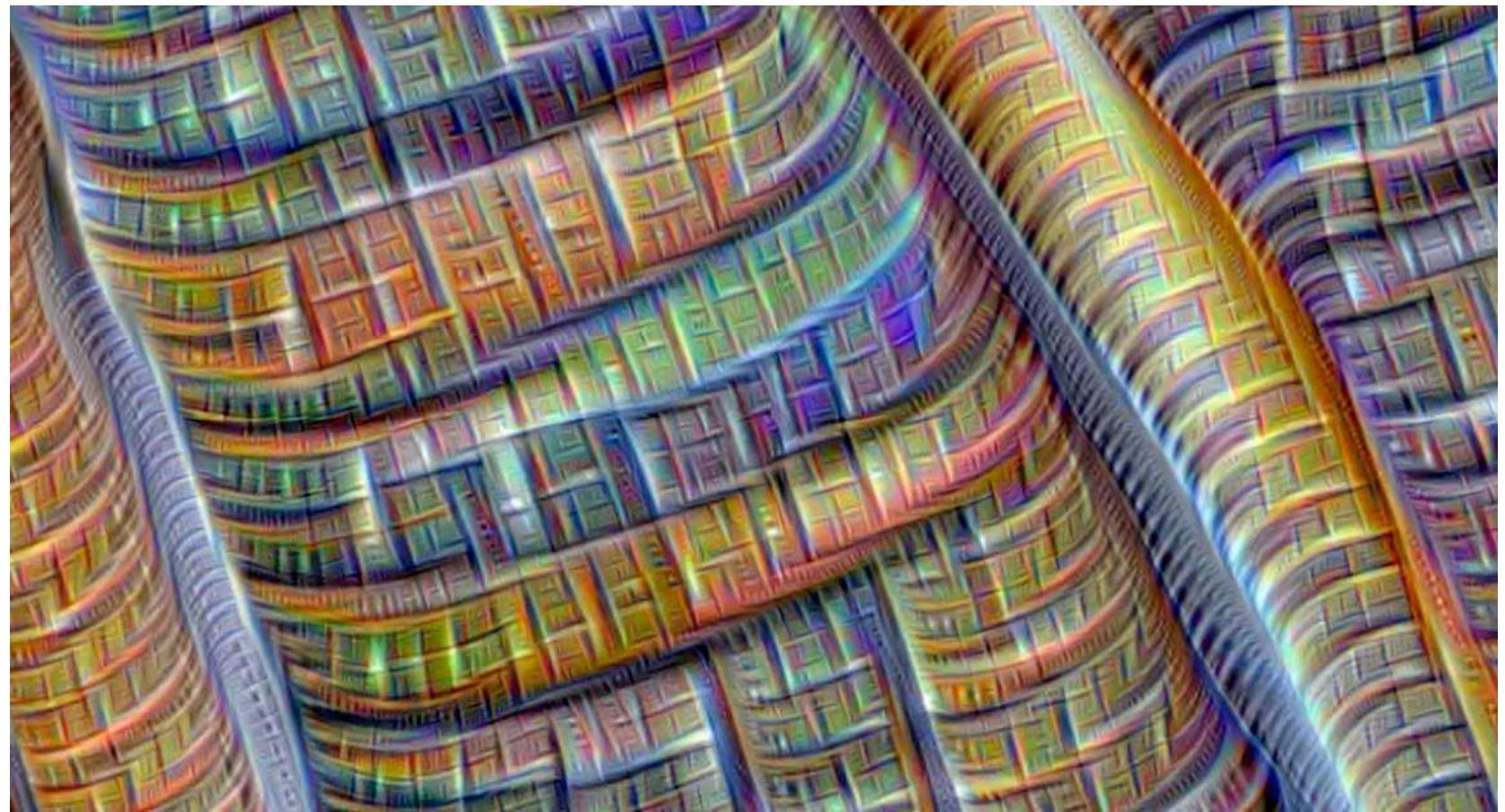


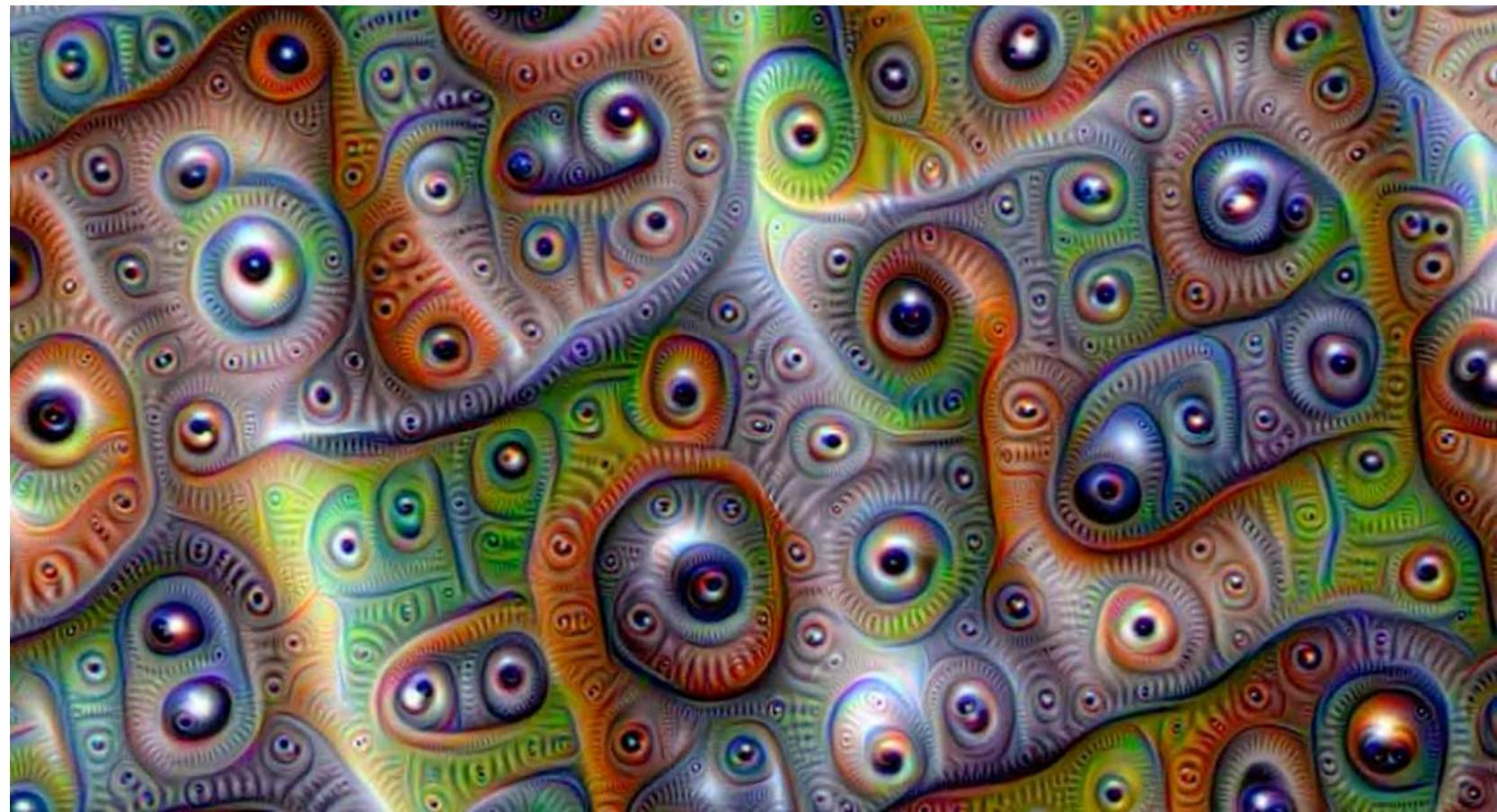










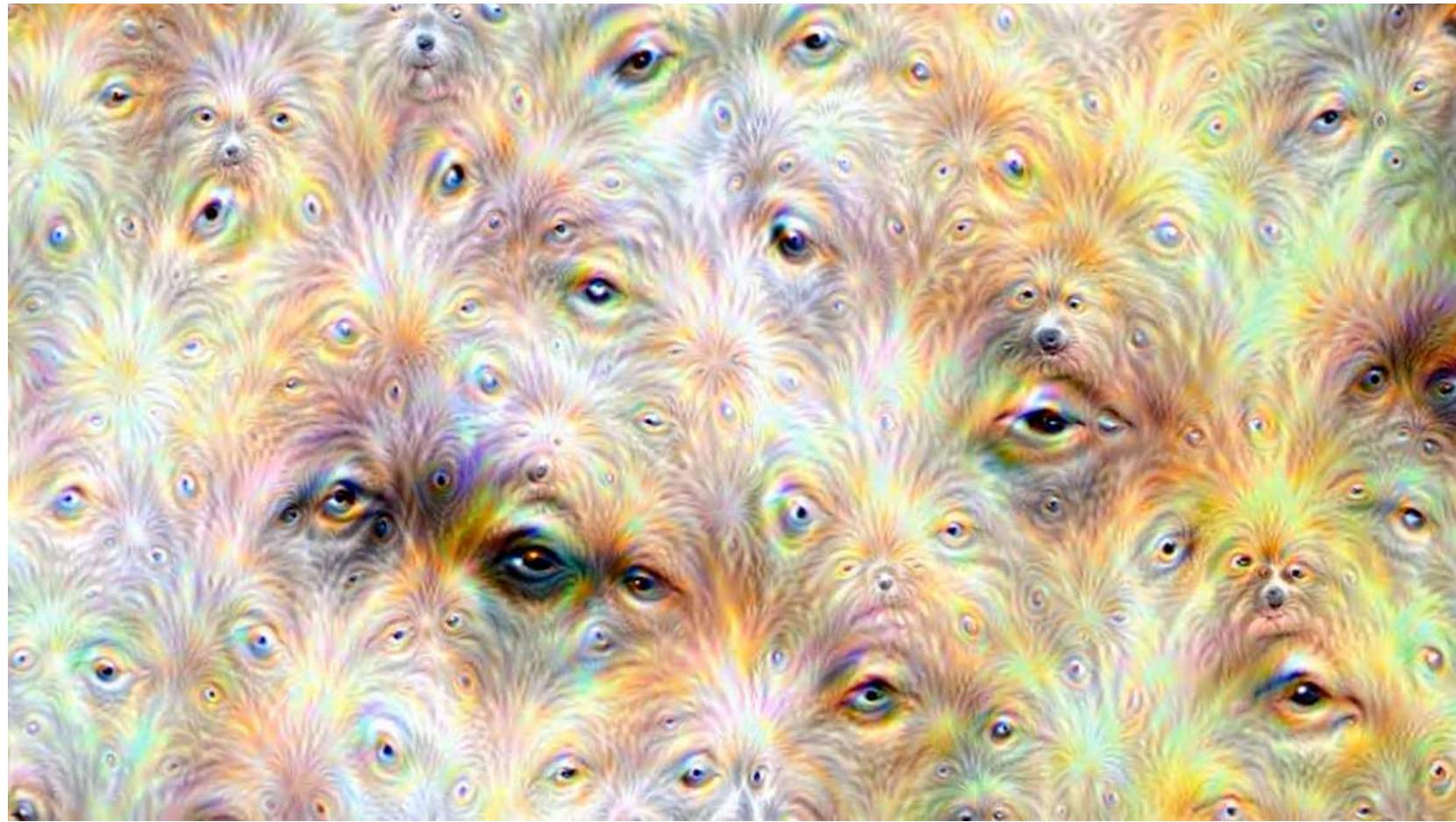


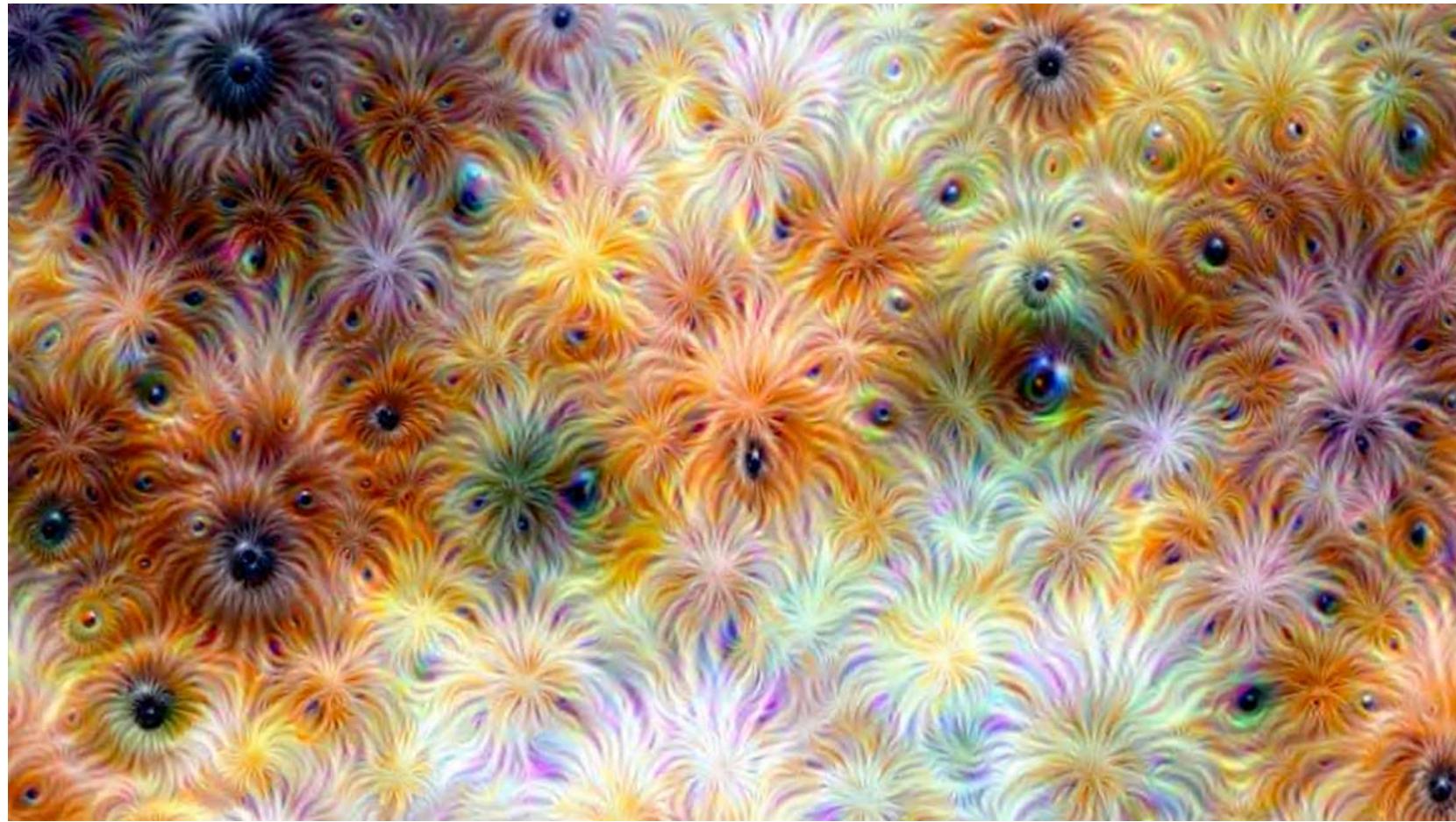






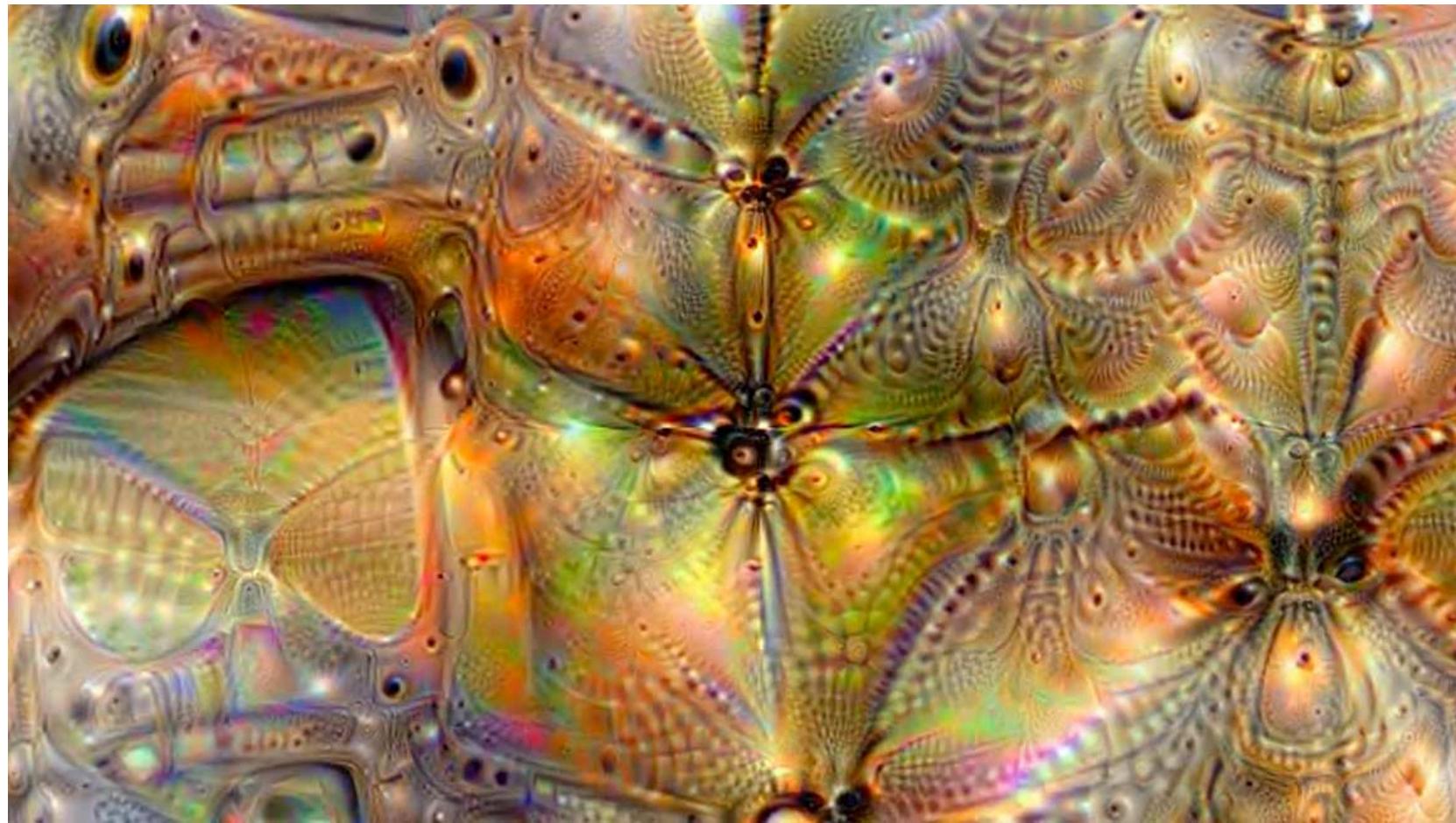








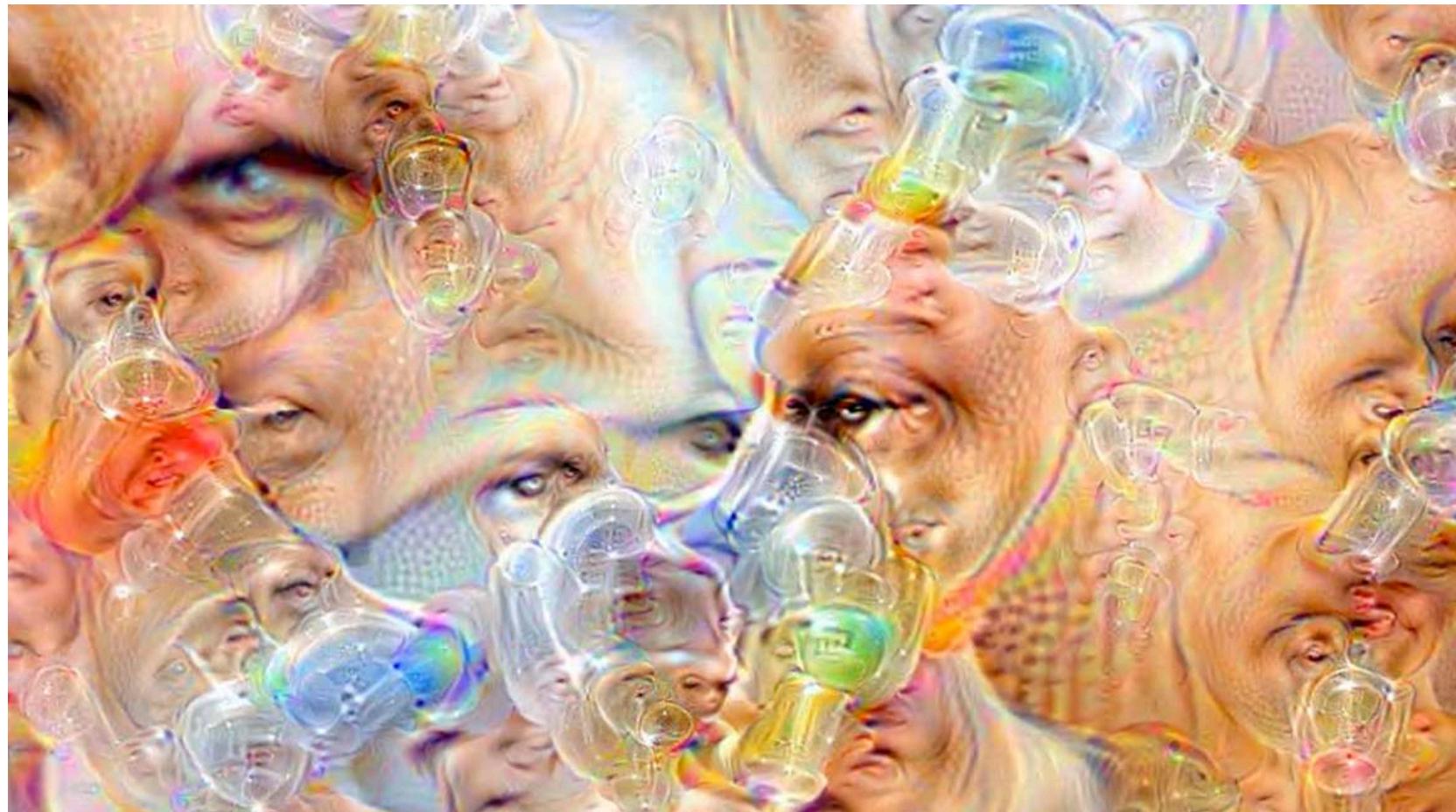
















BEYOND ZERO *and* ONE

Machines, Psychedelics,
and Consciousness

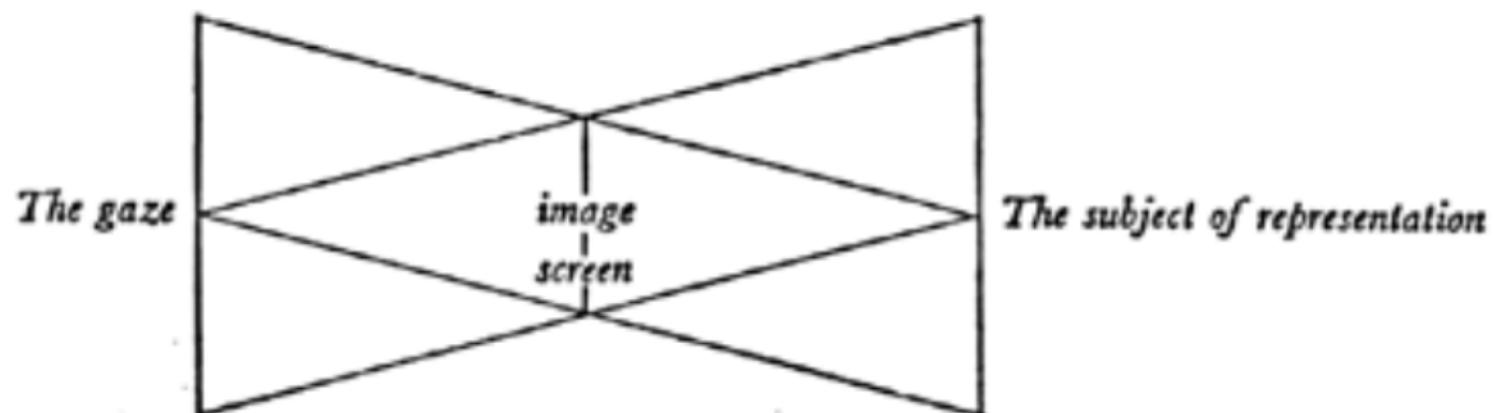
ANDREW
SMART

Thesis Seven

Art's role as a reality-enhancer will shift to reality-stabilizer, as discursive flux is amplified within so-called post-truth contexts iteratively interwoven and unraveled by self-improving disinformation bot swarms

Thesis Eight

Whereas the cube sculpture of minimalism activated the two-way interactive and theatrical space of the viewer, the black cube of invisible and inscrutable A.I. processes will change the direction of our interpersonal and aesthetic relations

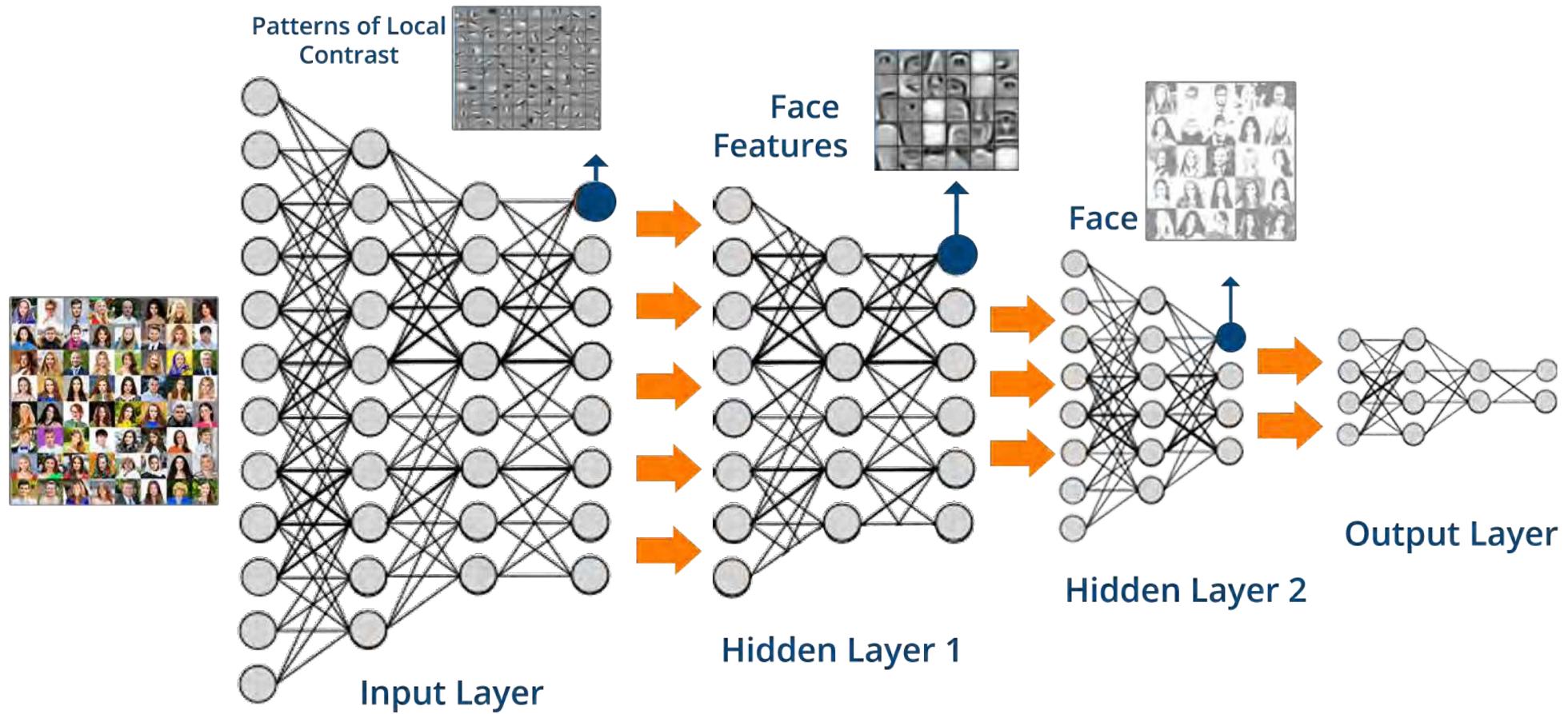


Jacques Lacan, *Four Fundamental Concepts of Psychoanalysis*

Thesis Nine

Portraiture will experience a renaissance

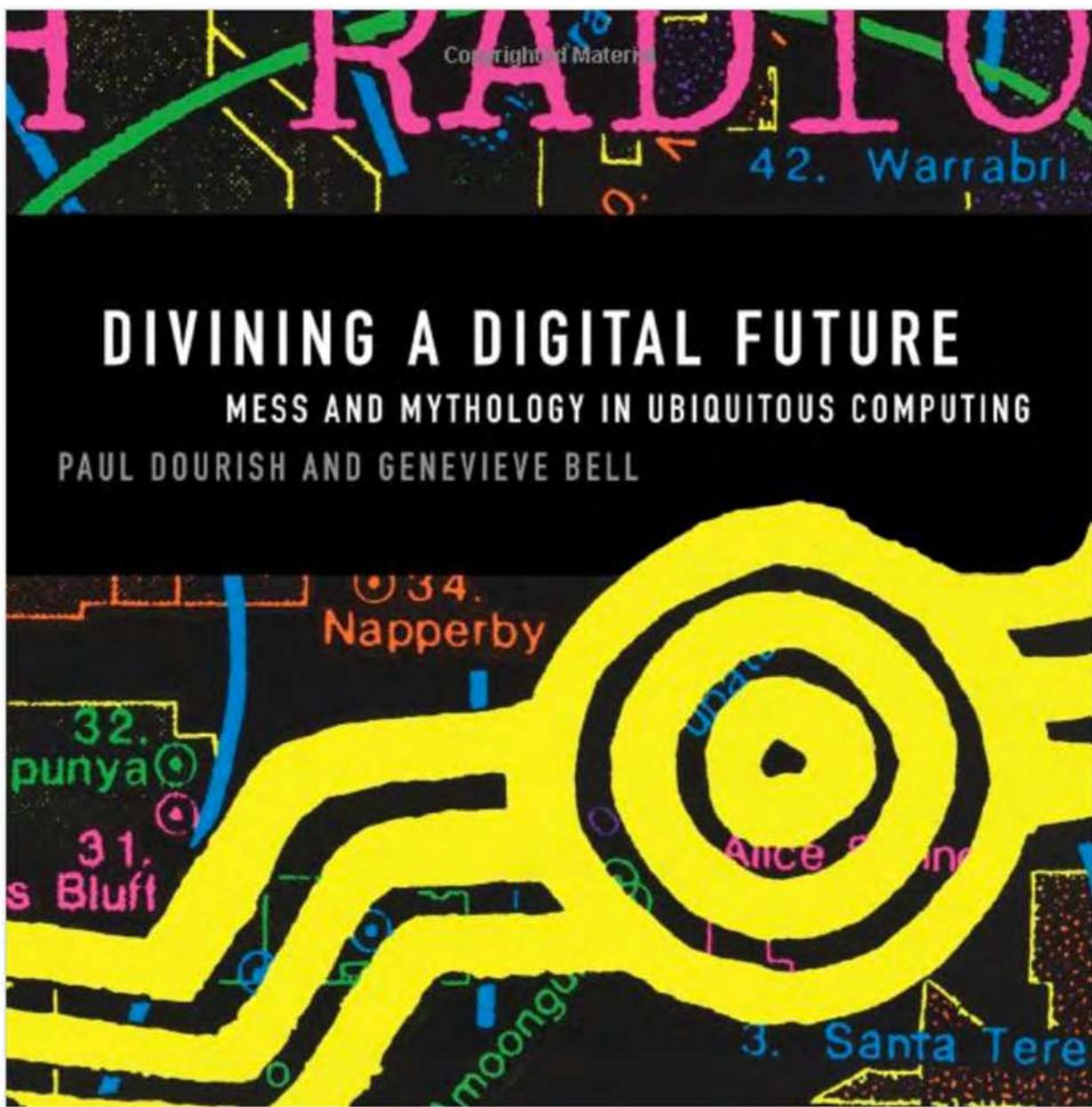




Convolutional neural network image recognition processing

Thesis Ten

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Thank you

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