ARTIFICIAL IMAGINATION

By Shane Denson

Imagination, we might say, is the very height of artifice. It is the faculty by which we are able to "make things up," which is to say actualize things that are not real or physically present, and it thus plays a central role in creating (and processing) fictions. Imagination, as a power of artifice, is therefore implicated in—perhaps responsible for—pulling human existence out of the purely mechanical causal circuits that might be imputed to insentient nature. But if imagination is the purest expression of our artificial natures, it is also the infrastructural substrate out of which artifice—the artificial, the common ground of art and technics—arises in the first place. It is by way of imagination that we are able to invent not only stories but also tools and techniques. Imagination is the power by which we envision new material processes and implements, and it is no less crucial to our ability to make use of these techniques and technologies—to think ahead towards the completion of a goal, or just to maintain that minimal openness to the future that is required to execute even the simplest technical process, whether stirring a pot or navigating a car around a tight corner.

As both expression and enabling condition of artifice, imagination encircles human existence, laying the ground for our phenomenal and material transcendence of mineral, organic, or mechanical nature. We might, as Jean-Paul Sartre did, find in the imagination the very condition of our freedom.[1] If we choose to follow that route, we see this freedom rooted in a perhaps terrifying lack of foundations: by way of imagination, we embody the absolute negation of any sort of fixed or essential actuality. At the same time, this encircling of human existence by the imagination—its function as both foundation and expression of artifice—is not untethered from the material world; it is, instead, bound up with technicity, *our technicity*, as the condition of our ecstatic way of being, our being constantly ahead or outside of ourselves. The circularity expressed here in terms of infrastructure and expression is thus closely aligned with that material-hermeneutic circle that Martin Heidegger, in his famous tool analysis, uncovered as an endless and foundationless play of reference—which is to say: perhaps nothing less than the "worldhood of the world" itself is at stake in the imagination.[2]

In drawing these admittedly broad connections between imagination and artifice, I aim to open up questions about the role of the imagination in the long history of what I have called the "anthropotechnical interface" (or what Bernard Stiegler calls "epiphylogenesis," or human-technological "transduction" in Gilbert Simondon's sense).[3] At the same time, I hope that this line of questioning will help us to think about *contemporary* anthropotechnical transformations or negotiations, specifically those emerging around artificial intelligence. What is the relation of imagination to AI? Does AI expand or endanger human imagination, or

1. Indeed, the grounds for Sartre's existentialism are laid in two books devoted to the topic: *The Imagination* (1936) and *The Imaginary* (1940). The latter book, in particular, discovers freedom in our ability to conjure images of objects that are not present or real.

2. I am referring, of course, to Heidegger's analysis of "equipment," by way of a hammer, whereby human involvement in the world is discovered in *Being and Time* (91-119).

3. On the anthropotechnical interface, see Denson, *Postnaturalism*; for epiphylogenesis, see Stiegler, *Technics and Time*, vol. 1; and for transduction, see Simondon, *On the Mode of Existence of Technical Objects*.

does it even embody its own artificial form of imagination? These are in a sense inevitable questions, I contend—at least, if one can entertain the connections between imagination and artifice that I have been making here. In the following, I attempt to provide some provisional answers, arguing that AI does indeed complicate our powers of imagination and thus calls on us to reimagine our place in the world.

"These aren't images; they're imagination"

In the course of reflecting on his own playful engagement with text-to-image generators such as DALL-E and Stable Diffusion, Ian Bogost remarks: "These aren't images; they're imagination."[4] In the context of his essay, Bogost's assertion is not so much about denying the imagistic qualities of the generated outputs as it is about redirecting the attention we pay to them; specifically, he asks us not to look at them as visual *objects* per se (e.g. potential art objects or commercial images) but instead to regard them as part of a visualization process, shared between an algorithmic system and its human user. Bogost's experiments, he writes, "have completely changed my view on what AI image creation means. It's not for making pictures to use, even if that might happen from time to time. Instead, AI images allow people to visualize a concept or an idea—any concept or idea—in a way previously unimaginable." Thus, generative AI serves, like the imagination in Kant's *Critique of Pure Reason*, as a mediator between the understanding and sensation. But in this case, the imagination is external to the mind, as (according to the essay's subhead) the "new technologies for making pictures can be prosthetics for your mind." Bogost speaks of "extending" or "amplifying" the user's imagination, and this way of regarding the new technologies allows him to navigate between two opposing views: 1) the common worry that artists (or "creatives") are in danger of being "replaced" by AI, and 2) the assertion that humans are in fact irreplaceable because they are the sole proprietors of creative imagination. Bogost's tertium quid reserves an important role for the human user, who needs to provide the ideas (or "prompts"), but imagination is now partially exteriorized and distributed between human and nonhuman agents.

A similar view is elaborated at greater length by philosopher of technology Galit Wellner under the heading of what she calls "digital imagination."[5] Invoking a portrait generated by a GAN, a recursive neural network that can complete user's drawings, and an AI-powered robot that can improvise on the marimba with its four hands, Wellner asks: "Do AI algorithms imagine? Can we classify their output as imaginative? What is their effect on human imagination?" (190). To answer these questions, she turns first to Kant, whose model of the imagination guides her further thinking; importantly, however, Wellner argues that Kant's "conceptualization of the imagination is no longer unique to humans since it is now implemented in AI systems" (190), and this has effects for human imagination. Against Kant's transcendentalism, Wellner therefore contends that the operation of the imagination is "not a-historical but rather a flexible faculty that is transformed over time as our technologies change" (191). Wellner's argument is mounted by way of a synthesis of impulses she draws from two philosophers of technology: Don Ihde and Bernard Stiegler. Through this synthesis, Wellner is able to assert that "our imagination maintains co-shaping and co-constituting relationships with our technologies" (191).

I am in broad agreement with Wellner's (and Bogost's) historicization of the imagination, which depends on a partial exteriorization of this putatively "inner" mental faculty such that it is (and, for Wellner at least, always has been) linked to the technologies that are both borne of and in turn shape it. But this does not settle the question of *how* the imagination is affected by contemporary AI technologies, and it is Wellner's picture of *this* relation that I would like to examine further.

Wellner describes two broad epochs or paradigms corresponding to two sets of (media) technologies, analog and digital. In the former epoch, "modern imagination operating in analog environments sought new points of view" (191). She associates this form of imagination with "the proliferation of optic-oriented technologies—from the magnifying glass to telescopes, from photography to cinema" (201); her assertion that "'analog' imagination was about seeking new POVs" (201) suggests that these technologies enabled optical variations that modified or displaced vision from its seat in *this* body, instead offering differently situated perspectives that enriched the range of imaginative or visualizable possibilities. In the new epoch, in contrast, "digital imagination [...] works in layers and attempts to link them in new ways" (191). The decisive term here is "layers," in contrast with the "POVs" of the modern imagination. Wellner associates both of these terms with various phases in Ihde's work, which she sees progressing from a modern to a digitally informed understanding of imagination, and she draws on them to complete her revision of Kant for the age of AI. Signifi-

4. Bogost, "A Tool to Supercharge Your Imagination."

5. Wellner, "Digital Imagination: Ihde's and Stielger's Concepts of Imagination." Further references indicated in the text.

cantly, Ihde does not use the term "layers" himself, but Wellner uses it to characterize his approach to computationally generated images in a relatively recent (2009) article titled "From da Vinci to CAD and Beyond." Importantly, in that essay Ihde is describing concrete visual phenomena, based in his own experience using CAD software to design his kitchen in the early 1990s (experimenting imagitivly, like Bogost, with various design possibilities), but Wellner generalizes well beyond this original context to assert her "layered" model of imagination operative in the digital age.

Her starting point, that is, is a familiar interface feature: "these computer programs work in layers, and each layer can be turned on or off, thereby displaying certain information like water pipes, electricity and furniture. A typical CAD software does more than showing perspectives" (194). But she ends up with a theory of "imagination that works in layers and is co-shaped by digital technologies—CAD software, augmented reality apps, or AI's neural networks. Such technologies lead us to imagine in layers while they provide contents for the layers or suggest links between them. The links they recommend are statistical and hence depend on the data on which the algorithms were trained. Our role as human users is to suggest new layers and extract meaning from the various combinations of layers" (201). This sounds very much like Bogost's description of a cooperative division of labor between the user and the text-to-image model, where the human provides concepts and the machine helps to imagine them. With respect to AI in particular, Wellner writes that "[t]he layered model of digital imagination translates the imaginative task of AI algorithms as the filling in of the layers with data. By producing endless possibilities, these technologies 'automate' the Kantian 'free play' of imagination, allowing us to examine more options and focus on the best of them. The logic of AI leaves, however, the production of meaning to humans" (201).

What exactly are these layers? In the case of CAD (or, say, Photoshop), it is quite clear what is meant. But how does this translate to AI? Although machine learning models are routinely described in terms of a set of "layers," including input, output, and any number of "hidden" layers of artificial neurons, these are of a very different order than the layered software interface. In particular, AI layers and their operations are not visual phenomena whatsoever; they are completely "discorrelated" from subjective perception.[6] If, as in Bogost's example, AI tools like DALL-E can be seen as automating operations of the imagination, it is not on account of the hidden layers. In her generalization from a common interface paradigm to the broad category of the "digital," it seems that Wellner has turned the idea of the "layer" into a metaphor whose purchase on AI is quite unclear. It almost seems as if "layering" comes to refer to the quasi-hierarchical division of labor between humans and algorithmic systems, according to which meaning is reserved for humans responding and interacting with an automated imagination. But then the layer metaphor would have slipped from its original domain of visual imagination to the *interrelation* between a post-visual imagination and human meaning. It is somewhat unclear whether this "meaning" should be understood, with Bogost, as conceptual (the domain of the Kantian understanding) or aesthetic; Wellner's reference to the "free play" of imagination would suggest the latter context, but since Kant refers in the *Critique of Judgement* to the "free play of the imagination *and understanding*," in characterizing the disinterested pleasure that serves as the basis for a judgement of taste, it is unclear to me how human meaning—whether conceptual or aesthetic—could remain untouched by the imagination's automation.[7] And, in fact, such a claim seems quite at odds with Wellner's overarching Stieglerian historicization of human faculties with respect to material technologies.

Although machine learning models are routinely described in terms of a set of "layers," including input, output, and any number of "hidden" layers of artificial neurons, these are of a very different order than the layered software interface. In particular, AI layers and their operations are not visual phenomena whatsoever; they are completely "discorrelated" from subjective perception.

Suffice it to say that the layer metaphor introduces more problems than it solves. Nevertheless, I see it as a significant starting point toward a model that responds to a very real transformation in contemporary visuality. That is, the layered interface is indeed part of a more general explosion of the situated "point of view" that Wellner associates with modern optical media. Computational interfaces translate—which is to say, make

6. See Denson, *Discorrelated Images*.

7. Kant, *Critique of Judgement,* 49 (emphasis added).

available for aesthetic and interactive engagement—categorically invisible operations taking place beyond the surface of the screen. These translations and transactions between the visible and the invisible—rather than the design of a particular user interface—should, I believe, be central in our interrogation of contemporary imagination. In order to understand the significance, in the context of AI, of this more general problem of contemporary images and visuality, we need to return to the Kantian framework to which Wellner is responding and look at how "point of view" arises in relation to the imagination. On this basis, I will offer an alternative to Wellner's digital imagination that will better support the view that AI-generated images represent an exteriorization of the imagination, or, in Bogost's words, that they "aren't images; they're imagination."

Kantian Schematism, Computational Images, and Artificial Imagination

I follow Wellner in taking Kant's analysis of the productive imagination (*Einbildungskraft*) in Critique of Pure Reason, and particularly his theory of "schematism," as a crucial touchstone for any attempt to come to terms with AI and its relation to contemporary imagination. As is well known, Kant's treatment of the imagination changes rather dramatically between the first and second editions of the first Critique (between the A edition of 1781 and the B edition of 1787), as he retreats from his initial theory of a "transcendental imagination" that fundamentally grounds the other two faculties, the sensibility and the understanding, demoting the imagination generally behind the understanding in the later edition. Following (and critically modifying) Heidegger's commentary on this transformation, Stiegler has argued that the shift in the role of imagination is crucial to understanding the way that Kant's three syntheses of apprehension in intuition, reproduction in imagination, and recognition in the conceptual understanding all depend on—but fail to account for—a prior transductive operation by which inner and outer senses and images co-operate and make way for subjective experience of time and space.[8] Importantly, Stiegler's argument revolves around the mental "schemata" that, according to Kant, the imagination generates from concepts and applies to sensation, thus mediating between the understanding and the intuition. According to Kant, such schemata must be distinguished from concrete images: "the *image* is a product of the empirical faculty of reproductive imagination; the *schema* of sensible concepts, such as of figures in space, is a product and, as it were, monogram, of pure *a priori* imagination, through which, and in accordance with which, images themselves first become possible."[9] Contending instead that concepts, and hence schemata, have histories and are anchored in material and cultural techniques, Stiegler argues that "[i]f the schema can be distinguished from the image, it remains the fact that there can be no manifestation of schema without image, whether mental or not" and that "there can be no *mental* image without an *objective* image" (53). Clearly, this is an important argument in the present context, as it grounds Wellner's notion of a "co-shaping" of human and machinic imagination—while also suggesting that what is special about AI imagination, as evoked by Bogost, is less the novelty of externalized or "prosthetic" imagination than the novelty of a technique that makes this transductive relation apparent and open for inspection to the subject in the very process of shaping and being shaped by the external image-engine.

As important as this line of thinking is, my argument here will not rely on it or depend in any way on Kant's revision of the imagination between the two editions of the *Critique*. Instead, I would like to focus on the operation of the schematism, which survives Kant's revision, and its relation to perspective or point of view. According to Kant, a "schema is in itself always a product of the imagination" (182). More specifically, it is the "representation of a universal procedure of imagination in providing an image for a concept" (182). Kant illustrates with a geometric figure: "No image could ever be adequate to the concept of a triangle in general. It would never attain that universality of the concept which renders it valid of all triangles, whether right-angled, obtuse-angled, or acute-angled; it would always be limited to a part only of this sphere. The schema of the triangle can exist nowhere but in thought. It is a rule of synthesis of the imagination, in respect to pure figures in space" (182). Accordingly, the schema of such a figure has to be indeterminate but determinable—a kind of "latent space" such as is discussed in machine learning contexts, where it refers to an abstract, lower-dimensional representation of more complex, higher-dimensional data (e.g. the multitude of determinate images or text used as training data), capturing the underlying structure of that data and enabling the generation of novel but similarly detailed specimens. Like the latent space of an image-generating AI model, the schema of a triangle cannot be directly observed as it is not yet determined in its concrete imagistic manifestation. As if writing about the "hidden layers" of a cognitive latent space, Kant writes: "This schematism

8. See Heidegger, *Kant and the Problem of Metaphyics*; Stiegler, T*echnics and Time*, vol. 3. Further references indicated in the text.

9. Kant, *Critique of Pure Reason*, 183. Further references indicated in the text.

of our understanding, in its application to appearances and their mere form, is an art concealed in the depths of the human soul, whose real modes of activity nature is hardly likely ever to allow us to discover, and to have open to our gaze" (183). We are dealing here with the relation of visibility to invisibility itself.

The stakes and relevance of Kant's schematism become even more apparent when he turns from the "pure figures" of geometry to those of empirical experience: "Still less is an object of experience or its image ever adequate to the empirical concept; for this latter always stands in immediate relation to the schema of imagination, as a rule for the determination of our intuition, in accordance with some specific universal concept. The concept 'dog' signifies a rule according to which my imagination can delineate the figure of a four-footed animal in a general manner, without limitation to any single determinate figure such as experience, or any possible image that I can represent *in concreto*, actually presents" (182-183). Significantly, the generality of the figure described here implies that it is indeterminate with respect to perspective or point of view, but it makes possible perception of concrete instances from virtually any point of view. Thus, whereas Kant writes that "*Imagination* is the faculty of representing in intuition an object that is *not itself present*" (165), it also serves an indispensable role in determining the experience of an object when it is present. In particular, it is responsible for our ability to process the experience of sensing (or intuiting) an object, as an experience of that determinate (conceptually "labeled") object, and doing so *from a particular point of view*. As the mediator between concepts, by way of perspectiveless schemata, and concrete images or experiences of objects, the imagination is the faculty by which perspective is given to subjective experience.

Philosopher Alan Thomas argues along these lines in an article titled "Perceptual Presence and the Productive Imagination."[10] The larger context is what Thomas calls the problem of perceptual presence, namely: the problem "of explaining how our perceptual experience of the world gives us a sense of the presence of objects in perception over and above the perceived sensory properties of that object. Objects possess other properties that are phenomenologically present, but sensorily absent" (154). Thomas follows Wilfrid Sellars in offering the example of a red apple, which I can perceive as having a white interior despite only the red exterior being given to sensation. Arguing that this is not a theoretical judgement that is added to perception, but immediately present to perception itself—I *see it as* having a white inside—Thomas argues that only Kant's productive imagination (as further elaborated by Sellars) is able to explain such perceptual presence, and that competing accounts tend not even to recognize the problem in the first place. Importantly, Thomas admits that "[t]his sense of presence undoubtedly depends on prior background knowledge that one might, in an extended sense, call 'theoretical'" (156); without prior experience with apples, I could not perceive it as having a white interior hidden beneath its peel. And it is here, I suggest, that Stiegler's reminder about the role played by material artifacts and cultural techniques in the formation of concepts and schemata comes into play; but assuming that the perceiver has had the relevant (always technically mediated) experience, then the productive imagination fills out sensation to produce the robust perception I have, which exceeds intuition but does not involve any conceptual deliberation by the understanding. Though Thomas does not discuss this dimension, we can begin to see here how Kant's view of the imagination can be historicized, even in Stiegler's strong epiphylogenetic sense, and still remain operative in any given cognitive and cultural-material situation. Writing specifically about the role of schematism, Thomas argues that "[b]ackground theoretical knowledge primes the content of the model [i.e. the schema] that is applied in perception. But there remains a difference between the prompts that cue the operation of the model and that which the model places in perception if its operation succeeds" (160).

It is in this context that Thomas argues for the link between the productive imagination and perceptual perspective, drawing on a provocative claim made by Sartre, writing in his early book *The Imaginary*, about the way that imaginary objects (as opposed to perceived objects) are present to intuition from multiple points of view at once: "Imagined objects are seen from several sides at the same time: or better—for this multiplication of points of view, of sides, does not give an exact account of the imaginative intention—they are 'presentable' under an all inclusive aspect" (qtd. in Thomas 162). Sartre further specifies that such imaginary objects—images conjured in the mind of objects absent or unreal—are "not sensible, but rather quasi-sensible things" (125). In the domain of perceptual sensing, in contrast, seeing is always from a determinate point of view. Thomas thus suggests that Sartre's reflections illuminate the role of schematization in determining perspective in perception: "the idea of that object as being from no particular view *in particular* figures in the explanation of how it appears from the particular point of

10. Thomas, "Perceptual Presence and the Productive Imagination." Further references indicated in the text.

view that it does in any particular instance" (162). Thus, "Kant seems to take the perspectival feature of perception, the presentation of objects *as from* a point of view, as a feature contributed by the productive imagination" (162). And this explanation is made plausible by the fact that it helps explain how we have perceptual experiences that exceed sensory intuition without resorting to theoretical deliberation: "While the relevant sensorily identified features are present in visual experience, their being taken *as* perspectival, as being from a point of view, is not present in visual experience. Perspectivalness enters into how the features are taken when they are conceptualized and a sensory model applied to them" (162). Accordingly, the productive imagination is essential not only to our perception of things as having unseen insides, but also depth and backsides—for why we see *things* at all rather than a flat, two-dimensional plenum of sense-data.

Wellner seems to make the connection between perspective and productive imagination when she writes: "The reproductive imagination is guided by the productive imagination, which is more fundamental and synthesizes sensory content into a meaningful whole. Put differently, the preference of certain perceptions functions as a filter or point of view from which reality can be perceived" (191). Without explicitly emphasizing the connection between imagination and perspective, Wellner immediately turns to the operation of the schematism and asserts that "this recipe for the imagination is now deployed in AI algorithms" (192). She elaborates: "this type of AI capabilities [*sic*] transforms human imagination so that the human does not need to focus on 'schematization,' but rather can concentrate on the invention of new schemes or concepts" (192). But what does it mean to "focus" on schematization? In what sense was this a necessity before that can now be offloaded onto machines? As we have seen, the schematism is, according to Kant, a transcendental condition of experience itself, which in linking sensations with concepts, automatically imposes spatiotemporal determination and point of view. In an important sense, schematism determines subjectivity itself by "placing" the subject with respect to a schematized (one might say "stereotyped") object. Already automatic, this stereotyping and subjectivizing operation hardly seems like something we would want to (even if we could) relegate to machines, but the connection between schematism and AI does help make sense of "algorithmic bias." In fact, if we get rid of the idea that the exteriorization or simulation of schematism in any way "frees us up" from anything, I think that we see here the basis for a much more productive idea of artificial imagination, as mediating the conditions of visibility in an age of invisible algorithms, than Wellner's more limited "layered" model. Importantly, this alternative model will not support a utopian optimism, since the schematism, whether human or artificial, has to be seen not only as an enabling but also a disabling condition: a repository of limiting conceptual biases (or statistical correlations) that determine subjective experience itself.

Sartre's imaginary object, which is "'presentable' under an all inclusive aspect" beyond any given point of view, provides a useful basis for this alternative model. Sartre's non-perspectival imagination corresponds closely to Alexander R. Galloway's description of a new "visual contract" implicit in computational imagery. In his book *Uncomputable*, Galloway distinguishes between photographic and computational "contracts" of visuality, which align with Wellner's historical epochs of "modern" and "digital imagination" while pointing beyond (but encompassing) the more limited framework of the "layered" interface.[11] Essentially, the contracts theorized by Galloway describe the correlative or intentional potentials of different image types, framed in terms of the geometric configurations that they suggest for perceiving subjects and perceived images. "The photographic version of the contract, if it were drawn as a diagram, would resemble a cone splayed outward from an origin point, like a horn. Something of great importance occupies the spot at the tip of the horn, something important like a lens or an aperture or an eyeball or a subject. Starting at the focal point, photographic vision fans out into the world, locating objects in proximal relation to the origin" (52). According to Galloway, the photographic contract is thus a subject-centric or ocularcentric—and clearly perspectival—correlation, which is significantly challenged by computational media and its very different geometry. As he puts it, "computational media has finally impoverished the eye [...]. Indeed, computational vision is also conical, but inverted, more like a funnel with the tip facing away. Here the perceiving subject is not focused into a dense, rich point at the center but diffuses itself outward toward the edge of the space [...]. The object, by contrast, lies at the point of the funnel, receiving all the many inputs issued to it from the perimeter. Thus, if the photographic eye is, as it were, *convex*, then the computational eye is *concave*, flanking and encompassing the world from the fringe" (53). At the heart of this topological inversion from the photographic to the computational lies not an optical but an architectural perspective (with echoes of Ihde's experiences with CAD), one that emphasizes a volumetric rather than planar conception of the im-

11. Galloway, *Uncomputable*. Further references indicated in the text.

age: "The condition is simple: assume that objects and worlds will be viewable and manipulable from all sides in multiple dimensions" (53).

What is crucial here is not the layers that can be turned on and off, though this minimal interactivity and modifiability of the visual object is not unimportant. More important, however, is the way that it is subject to global transformations, transpositions, and translations—and the way that these changes relate to an invisible infrastructure upon which they depend but are also capable of modifying. CAD is a good example. Design may be done from any number of perspectives—frontal, side, top-down—but the computer is storing a model from all sides, which it can display in a "fly-through" animation. Somewhat more radically, a self-driving car scans the environment with its many cameras and sensors, building and updating just such a model—a model of the streets, buildings, crosswalks, and other relevant objects as seen from all possible angles. But this model is only liminally visual in the first place, as the input from video cameras and LIDAR sensors is translated immediately into mathematical form and operated on by AI. The artificial intelligence is responsible for stitching together the various views into a dynamic photogrammetric model, similar to the multidimensional objects and environments that can be navigated in a virtual environment such as a videogame or VR scenario. But the car's supraperspectival model of the environment is never even seen by human eyes, save when an engineer tinkers with it or a visualization is made for testing or marketing purposes. And this brings us to generative AI, such as the text-to-image models that Bogost writes about. For their human users, such tools are all about visualization, about generating images from a particular perspective, but at root they are built on multidimensional models that exceed visual regard at all.

If, following Thomas, we can see Sartre's imaginary object as an approximation of a Kantian schema, then we are in a position to see computational images—including not only layered interfaces but also the invisible (for humans) operational images that are produced by self-driving cars or the latent spaces of AI models—as embodying an exteriorized form of imagination. These are schemata that enable and constrain the production of concrete images today, and they therefore exercise an inestimable power in determining what, today, there is to be seen. I therefore concur with Wellner that the conditions of the imagination have changed, and the perspectival qualities of optical technologies have been superseded, with the advent of digital imaging systems, but I do not think that "layering" gets at the essence of these changes. And while I have argued independently of Stiegler, I believe this view of a new epoch of artificial imagination supports his claims about the transductive relations between imagination and technicity, or between schemata and concrete images. Whether we rely on generative AI to imagine things or not, we live in a world conditioned by these artificial schemata, where not only the images we see on screens are likely to have been "imagined" by artificial agents, but also the very environments that we navigate by car or on foot are being automatically mapped and modeled, turned into schemata for machines that will likely never reveal how they see the world. This has important consequences for the points of view that I can (virtually *and* physically) occupy, what I can see or what I can imagine.

Importantly, as we have seen, automaticity has always been a part of the imagination, but now our visual stereotyping of the world is problematically shared with artificial agents. To impute imagination to them is not to pay them a compliment, and it does not imply that AI models have subjectivity. Sartre's theory of imagination is written explicitly from the point of view of ego-less experience; Kant's theory, too, can be seen in terms of a mechanical, certainly nonconscious operation. Imagination is a necessary condition for perception and subjectivity, but it is hardly sufficient, and perhaps we have simply expected too much from it in romanticizing it as a condition of humanity. Maybe it is such a condition, but not by means of being within our conscious control as a power of creative autonomy. Sellars has foregrounded the algorithmic nature of the imagination as "a unique blend of a capacity to form images in accordance with a recipe, and a capacity to conceive of objects in a way which supplies the relevant recipes" (qtd. in Thomas 163). As Thomas elaborates, "a schema is [...] both *produced by,* and is *a rule for,* the imagination" (163). The imagination, in other words, has always been a kind of latent space that both expresses and grounds our technically conditioned positioning within the world. Now that we have begun constructing systems that exteriorize these processes, that process visual data to produce imagistically indeterminate schemata that in turn serve as recipes or rules for the production of novel constraints of perspective and vision, we will have to take responsibility for—which is to say: recognize the deeply political and contestable nature of—our artificial imaginations.

Works Cited

Bogost, Ian. "A Tool to Supercharge Your Imagination." *The Atlantic*, October 31, 2023: https://www.theatlantic.com/technology/archive/2023/10/ai-image-generation-human-creativity-imagination/675840/

Denson, Shane. *Discorrelated Images*. Durham: Duke University Press, 2020.

Denson, Shane. *Postnaturalism: Frankenstein, Film, and the Anthropotechnical Interface.* Bielefeld: Transcript Verlag, 2014.

Galloway, Alexander R. *Uncomputable: Play and Politics in the Long Digital Age*. New York: Verso, 2021.

Heidegger, Martin. *Being and Time.* Translated by John Macquarrie and Edward Robinson. New York: Harper and Row, 1962.

Heidegger, Martin. *Kant and the Problem of Metaphysics.* Translated by Richard Taft. Bloomington: Indiana University Press, 1991.

Ihde, Don. "From da Vinci to CAD and Beyond." *Synthese* 168 (2009): 453-467.

Kant, Immanuel. *Critique of Judgement.* Translated by James Creed Meredith. New York: Oxford University Press, 2007.

Kant, Immanuel. *Critique of Pure Reason.* Translated by Norman Kemp Smith. New York: St. Martin's Press, 1965.

Sartre, Jean-Paul. *The Imaginary.* New York: Routledge, 2010.

Sartre, Jean-Paul. *The Imagination.* New York: Routledge, 2012.

Simondon, Gilbert. *On the Mode of Existence of Technical Objects.* Translated by Cécile Malaspina and John Rogove. Minneapolis: Univocal Publishing, 2017.

Stiegler, Bernard. *Technics and Time,* vol. 1. Translated by Richard Beardsworth. Stanford: Stanford University Press, 1998.

Stiegler, Bernard. *Technics and Time,* vol. 3. Translated by Stephen Barker. Stanford: Stanford University Press, 2011.

Thomas, Alan. "Perceptual Presence and the Productive Imagination." *Philosophical Topics* 37.1 (2009): 153-174.

Wellner, Galit. "Digital Imagination: Ihde's and Stiegler's Concepts of Imagination." *Foundations of Science* 27 (2022): 189-204.