

# PAINTING AS PROGRAMMING: CASEY REAS AND THE AESTHETICS OF GENERATIVE CODE

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This paper considers the work of Casey Reas, an artist whose output hovers between painting and computing. It proposes that the seemingly insurmountable division between the conceptual and the aesthetic is not absolute, and argues that Reas's practice, one that is fundamentally painterly but also tied to the specific functions made possible by a digital computer, offers an alternative to this artificial distinction.

In 1999, Jerusalem-born, New York based artist Daniel Rozin constructed a wooden mirror. In it, a heavy, octagonal wooden frame encases a grid of 830 square wooden lozenges, each of which is mounted on a small servomechanism. When a viewer approaches the mirror, each servomotor receives information relayed through a computer program from a hidden video camera, and mechanically angles the square toward or away from the overhead gallery lights. The degree to which each square is illuminated by or shaded from the external light source determines that square's visible gradation from light to dark. As each servomotor receives its real-time information about the figure standing before it, a grossly pixelated impression of the viewer's body coheres into visibility, accompanied by the faint clicking sounds of hundreds of scrabble pieces spilling over and against each other in a continuous loop.

*Wooden Mirror* is the first in a series of interactive installations fabricated from a variety of opaque, usually non-reflective materials, including wooden pegs, circles of laminated paper, woven fabric, and trash collected from the streets of New York city. In this series, Rozin announces that his aim is to explore the relationship between the analog and the digital, to "inflict digital order on a material that is as organic as it gets." But, this opens the question: in what features does the digital reveal itself? Why should we think of this piece as digital? Does it use digital technology to create an analog aesthetic experience? Or, does it employ analog technology to leave us with an aesthetic impression of the digital?

What we would expect to see in approaching a mirror, even a "fun-house" mirror, is a detailed if insubstantial image of ourselves generated by the refraction of light, no matter how distorted the results. When confronting *Wooden Mirror*, however, we cannot say the pixelated impression hovering before us is a "reflection," in the same manner as the reflections that appear in the silvered, glass mirrors to which we are so accustomed. Glass mirrors create a sense of continuity between the reflected world and the physical world in which the viewer stands.

Rozin's *Wooden Mirror*, on the other hand, compels us to gaze *at* instead of attempting to look *through* the wooden pixels as they sweep towards and away from the light. The opaque, and non-reflective lozenges render a granular likeness of the viewer, but in such a way that calls attention to the modular composition of the interface—the grid of wooden pixels—instead of effacing them in favor of an illusion of transparency. The particulate discreteness of the "mirror image" renders an indistinct, discontinuous impression, dismantling the possibility of a perfect virtualization by foregrounding the digital elements that give rise to the overall pattern.

Most often, it will be presumed that digital systems and electronic computers are equivalent because technologically speaking, electronic computers process information digitally. The digital is a term that

has become largely transparent—digital imaging, digital technology, digital sensors, all denote a technological milieu rather than an aesthetic one. However, instead of thinking of the digital as a technological category, in which an object is “digital” if it is a product of electronic computational processing, I am defining the digital as an aesthetic category, where “aesthetic” is deployed etymologically, to refer to the apprehension of features of an artifact that are available to sense perception. The digital then becomes a configurative and aesthetic modality rather than a technological one. Consequently, just because a picture is created using an electronic computer, whose underlying processes are computed digitally, it might not necessarily exhibit perceptibly digital features. And, contrastingly, an artifact that is made without computational processing might have digital features.

To more concretely illustrate what I’m saying, think, here, of each wooden square in *Wooden Mirror* as a “digit”—a discrete unit that, when combined into a schematic array, constitutes a digital screen. While this schema is comprised of physical, tactile materials, instead of electronic impulses, it is similar to a bit- or pixmapped computer screen, in which the pixels are spatially mapped, arranged in a regular pattern. The surface of Rozin’s so-called mirror is configured digitally, then, insofar as it is constructed of discrete, interchangeable, and articulate modules.

Even if it is a technological possibility that the pixel-like “modules” in Rozin’s mirrors could be further and further refined, to the point at which they could no longer be perceived by the human eye as individual units, and even if it is feasible that the materials deployed in these mirrors could mimic the color and texture of the person or object facing it, the more interesting question to me is why artists like Rozin choose *not* to pursue that technological teleology, and instead choose to foreground digital discreteness. Digital technology may be capable, notionally, of virtualizations that appear perfectly coextensive with the physical world. The number of calculations and speed at which they can be carried out by computers is potentially infinite, the upper limit determined only by the limitations of existing, and as we know, always dynamically changing memory storage and processing speeds. Nevertheless, it is important to ask what is achieved by making the digital sensorially apprehensible, by keeping it open as an aesthetic and analytic category worthy of conceptual and perceptual consideration.

I contend that giving aesthetic priority to the digital, instead of masking digital configuration, provokes viewers to consider how a variety of pictorial techniques and technologies involve digital or proto-digital processes at various stages from conception to realization, even if the final product obscures most indices of the technology used in the process of structuring the depiction. I argue that the phenomenon of digitality has been a mechanism undergirding representational technologies for far longer than electronic computers have existed. As such, the digital is not simply an art historical problem applicable to the study of contemporary art, but can be extended to a much broader consideration of how modules, matrices, and other digital techniques have shaped the norms and trajectories within various depictive modalities, from pictorialization to musical notation to cartography.

Rozin’s work is palpably discrete, programmatic, and digital, foregrounding the digital at the level of interface. But I will now turn to the “programmed paintings” of Casey Reas. As opposed to Rozin, Reas treats the digital as a primarily technological category, rather than an aesthetic one. As such, his work only occasionally and tentatively reveals the digital architectonics underlying his graphic schemas; most often his work is suffused with the analog properties of continuity, smoothness, and gestuality. I see Reas as a liminal figure, who operates in an indeterminate range of picture-making, one that is fundamentally tied to the specific functions made possible by a digital computer, but whose morphological structures are often dense, continuous, and remarkably and markedly painterly. Despite his thorough

investment in software-driven, computational art, Reas's work often obscures the discreteness of its underlying structure. The final output, in other words, is not heavily articulated in the manner of Rozin—Reas does not overtly embrace the pixel as a fundamental expressive unit. Rather, his works experiment with the aesthetic possibilities of algorithmic variation within a given visual system, a process that explores the limits of computation, but without necessarily offering up a digital aesthetic.

Let me briefly explain what I mean by analog aesthetic properties. Within the history of aesthetics it has been presumed that pictures would be a product of analog processes, and would therefore exhibit aesthetic features, which include continuity, smoothness, and perceptual ambiguity. The analog picture is irreducible, both on the level of form and content, to a distinct quantitatively assessed set of values.

The digital, on the other hand, emerges from a very different structural logic; digital composition is inherently discrete, schematic, metric, and modular. The classic example given by philosopher Nelson Goodman in 1976 to differentiate analog from digital inscriptions are the morphologically similar but semantically distinct illustrations of an EKG and a painting by the 19th century Japanese "floating world" artist Hokusai. [1] In the Hokusai painting, exemplary of analog values, every linear modulation, every increase in pressure or thickness of ink potentially affords a new layer of meaning. The EKG, by contrast, exemplifies a digital system, in which only the abscissas and ordinates bear meaning but the lines connecting them are insignificant. So, despite the morphological similarity between the two depictions, they function very differently.

Information is, of course, processed digitally in today's electronic computers, but the digital as an analytic and perceptual category can be disaggregated from the technical specificities of today's hardware and software. Rather, the digital refers to a particular configurative schema—to a state in which materials or signals operate and are operated upon as discrete states, as distinct from the continuous variation of the analog. Digital symbol systems may appear in the form of pixels, but may also manifest in a variety of other mark-making practices, such as points on a graph, in which a unit of measure has been assigned and outside of which no indeterminate state can be registered.

If Reas's use of digital technology is haunted by the spectre of analog painting practices, by a desire for the spontaneity and gestural contact that is traditionally associated with painting, this tension that arises in his work makes him an ideal springboard from which to see how the analytic category of the "digital" can, and should be disaggregated from electronic-computational machines. His work demonstrates how artists can utilize computational technology in a multitude of ways—to highlight the properties of digital graphic composition by foregrounding pixels or other structural building blocks, or to occlude the picture's digital infrastructure, leaving only indirect clues, or none at all, to its digital ontology.

It is within the architecture configured by the strict causal chain of computational logic that the oscillatory movement between digital and analog becomes evident in Reas's work. For example, Reas's series *Tissue*, beginning in 2002, layers fragile, transparent webs of spindly lines, creating dense, continuous and replete painterly surfaces, which would seem to position his work at odds with the constitutive features of digital aesthetics as demonstrated in *Wooden Mirror*. The lines themselves are generated by the movements across the screen of small bots or vehicles that leave trails of line and color behind them. The point I want to emphasize here is that while the technical, procedural and programmatic constraints of computers make them unable to process or deal in ambiguity, *Tissue* mobilizes the programmatic logic of computation towards an ambiguous end.

The characteristics visible in *Tissue* do not appear to be digital in the sense I am using it. However, the elements that produce the analog, painterly, ambiguous surfaces in these works turn out *not* index the gestural immediacy implied in the act of drawing, as we may have thought. Even though the surface appears to be aesthetically analog, it is in fact a set of digital elements drive the graphic output of the piece. As I have indicated, the lines extending across the screen or the print are created by digital “vehicles.” These vehicles mimic mechanical sensors in neuroanatomist Valentino Braitenburg’s studies of nervous systems in the 1980’s. In a different version of *Tissue*, an interactive, CD-ROM version of the piece involving touch and motion sensitive technology allows users to move the “dots” with their fingers, changing their trajectory and thus the visible structure of the composition. As such, the two versions—print and interactive installation—reveal the digital to differing degrees, the print concealing it, the interactive installation making it accessible to perception and interaction.

In an electrocardiogram, only the ordinates and abscissas are informationally relevant—the lines connecting them are insignificant. *Tissue*, on the other hand, privileges the connecting lines: what would be, in a notational system like the EKG, secondary “information.” What the viewer observes, instead of the digital units themselves, as in the case of *Wooden Mirror*, are the tracelines extending behind the elements, similar to the line of frozen vapor trailing an airplane in the sky. In a time-based version of the piece, after a period of scrutinizing the lines as they loop and intersect in seemingly random patterns across the screen, the intently watchful viewer might glean relationships between elements, and even potentially their position on the screen. We might think, then, of this moment of revelation as an instance of the digital furtively showing itself, coming into a partial visibility, but remaining camouflaged by the analog. Rather than directly seeing the simulated mechanisms, as in the see-sawing movement of Rozin’s wooden pixels, we gather their information second-hand. We can guess at their level of activity and the length of their simulated lifespan as drawing agents from the complex curvatures of the lines and the density of their entanglement. These knotted skeins become the sensorially apprehensible effect of the setting-into-motion of a digital system. What we have before us is a painterly, seemingly analog visual world that is actually a visualization of the byproducts of a digital system in the act of calculation and computation, but it is not itself aesthetically digital. This is an area in which a potential divide between “computational” aesthetics and “digital” aesthetics becomes visible. The system operates computationally, and perhaps we could classify the continuously unfolding loops of multi-colored lines as exhibiting a computational aesthetic insofar as we are watching the graphic output of computational processing proliferate before our eyes. But the “digital” stubbornly conceals itself within the tangle of lines.

Reas’s works after 2004, which he calls “Processes,” begin to allow the digital literally to parallel the analog aesthetic exhibited in *Tissue*. They exhibit a tri-partite structure, in which natural language “instructions,” in homage to LeWitt, are accompanied by a divided screen. In *Process 18*, the right screen displays a simplified digital schema of the underlying processes of the generative software. Here, a skeletal array of short white lines against a black screen reveals the “mechanism” determining the behavior of individual parts as they touch, collide, and rebound. In *Process 18* the right screen gives up the “trick” or the “game” or the “conceptual undergirding” of the work precisely by showcasing the schematic, digital structure that underlies the painterly swaths on the left screen.

On the left screen the mechanistic structural elements—the skeletal backbones—are erased, as the orthogonals and transversals disappear from a perspective painting, leaving the surface effects—here, curved, layered lines, of varying degrees of transparency and various degrees of saturation on a grayscale—available to sensory apprehension. In contrast to the austere structuralism of the right hand screen, then, its neighbor on the left reveals the more “painterly” aspect of Reas’s multi-layered process

compendium, offering up an abstract, gestural surface that, minus the textures, is more reminiscent of Jackson Pollock's Action Painting than Rozin's heavily digitized *Wooden Mirror*. However, these works are more "digital" than the others I have discussed with you today because the digital and analog surfaces are placed in parallel. In *Process 18* the side-by-side placement of the screens does *not* erect a hierarchy in which the analog is granted final pride of place.

In *Tissue*, digital mechanisms, such as a line of a specific number of pixels, become drawing "agents," but in the act of drawing, they obscure their digitality, rendering the digital, in Reas's practice, a technological rather than an aesthetic category. In this sense, Reas *reverses* the schema of Rozin's *Wooden Mirror*. There, the motion of the servomotors is perceptually analog—their movements and adjustments register as continuously correlated to the position of the viewer, just as a needle in a pressure gauge rises and falls smoothly, as a direct effect of the modulations in the physical quantity of pressure in the gauge. It is only the outermost layer of the interface—the array of discrete, modular wooden lozenges—that defines Rozin's mirror as *aesthetically* digital. In *Tissue*, on the other hand, the computationally simulated bots mimicking Braitenberg's neural motors are digital—they are registered by the system in terms of their position at any given moment. But whereas the bot's *position* is digital—it can only occupy one encoded position at a time, the visible output of the system is continuous, fluid, and aesthetically analog. In the end, Reas's work does not evidence two entirely separate strains. Instead, these two impulses swirl playfully around one another in a noisy feedback loop. They are each practices built on digital platforms, but shot through with the spectre of the analog.

To return to my opening example, Daniel Rozin in *Wooden Mirror* formulates a visual (graphical) proposition in which the "digital" becomes a sensed and experiential, instead of a technological category. Here I am placing the digital in an expanded field, so that it is a mechanism, a process, and a constructive method that operates well beyond the boundaries of computational technology. Once digitality is disgregated from contemporary electronic computers, it becomes a category that can be used to address works of art, techniques and technologies that may speak in a different language than and thus require a different interpretive framework than pictures and artifacts configured through analog processes.

What I call the digital is a mode of visual understanding that has appeared at other times under other names. It speaks to the replicability of the pointillist dot, and to the simulated matrix of perspective. Here, the digital ceases to be a highly technical term relevant only in contemporary discourse, but becomes an art historical project about making connections. This is not to enforce *congruence* between all digital, proto-digital, and quasi-digital systems—I do not claim that perspective, pointillism, op-art, and contemporary computational artworks are reducible to historical, cultural, and formal equivalence. Instead, I bring out features of these works that interface with my notion of the digital in complex and potentially idiosyncratic ways. My question of whether the "look and feel" of digital media is correlated to the appearance of individuated "digits" within pictorial structure is ultimately not merely a formal, but also a social, philosophical, and art historical problem, which seeks to discover how an evaluation of digital composition might add a new narrative layer to the long art-historical discussion about how and why pictures "mean," and what they say about a given culture in a given historical moment.

### **References and Notes:**

1. Nelson Goodman, *Languages of Art* (Indianapolis: Hackett Publishing Co., 1976), 229.