

INDIVIDUATION IN GENETIC ARTWORKS AND CAUCASIAN CARPETS

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This paper compares contemporary genetic artworks and 17th-century carpets from the Caucasus. Both are algorithmic works that respond to new information to reach results not prefigured in the algorithm's initial state. Caucasian carpets exemplify internal differentiation, individuation. In light of Grosz's argument that art's genetic impulse arises from sexual selection, they offer criteria for meaningful individuation in genetic art.



*Carpet, Caucasus, 17th C. Pergamonmuseum, Berlin; burned in 1945, parts survive. From Kurt Erdmann, *Oriental Carpets: An Essay on Their History*, trans. Charles Grant Ellis (New York: Universe Books, 1960).*

How can algorithms produce something that looks like life — acts like life — is, “for all practical purposes,” life? This talk pursues a comparison in the last chapter of my book *Enfoldment and Infinity: An Islamic Genealogy of New Media Art*, between two bodies of algorithmic art: contemporary generative artworks and 17th-century carpets from the Caucasus. This comparison may seem *recherché*, but I think it is pertinent because these carpets are perhaps the strongest examples of analog algorithmic artworks whose patterns arise not from top-down instructions but from internal differentiation, individuation. Both genetic artworks and Caucasian carpets respond to new information and come up with results that could not be prefigured in the algorithm's initial state. A problem I find with contemporary algorithmic artworks is that their developments lack strong, interesting motivations. Thinking about carpets, with help from some Deleuzian ideas, should give us a set of criteria for how meaningful individuation occurs in genetic art.

I assume this audience has some familiarity with genetic artworks, and not much familiarity with Caucasian carpets, so I'll begin by defining both. Generative artworks are algorithmic artworks whose algorithms respond to new information, such as inputs from the environment or from users. This allows them to come up with results that could not be prefigured in the algorithm's initial state. Caucasian car-

pets hail from the Caucasus, the ethnically and religiously mixed area that, historically, intersects northern Iran, Russia, Armenia, Azerbaijan, and Georgia. In the period I'm looking at, 17th and 18th centuries, when the Caucasus was politically controlled by Iran. Based on their shared genetic structure, this talk's task is to suggest some manners of individuation that Caucasian carpets offer for, and prefigure in, genetic art.

Genetic Artworks

Contemporary artworks made with genetic algorithms introduce software behaviors into environments produced by human interaction. Laurent Mignonneau and Christa Sommerer have been working with genetic algorithms since 1992, producing works that grow and change according to users' interactions with them. The works make their connection to biological evolution evident, in that they are plant-like or insect-like: the plant forms grow and branch, and the insect-like forms grow and reproduce, according to visitors' input. Sometimes this input is as simple as the amount of time a visitor spends in front of a screen (as in *Wissengewächs*, 2007, an interactive façade for the City of Science in Braunschweig, Germany).

Life Writer (2006) uses a manual typewriter input. The characters users type are translated into forms by assigning a standard ASCII value to each character; the resulting forms "eat" the input text, growing and reproducing. Users can't know what kind of forms their typing will reproduce; however, if they interact with the work for long enough they learn that the more they type, the more growth and individuation occur. This visually pleasing work answers the question, *What causes evolution?* by suggesting that evolution results from sustained engagement. Still, it leaves open the question, *What motivates evolution?* I am not making the argument here that interfaces should be more transparent, so that users can know intellectually what results their work produces. Maybe the slight mimetic relationship between users' gestures and the creatures' changes is enough to make the work satisfying. But in this, as in many other genetic artworks, the motivation seems slim. This is why I will look first to carpets, then to philosophy, for models of strongly motivated individuation.

Carpets as Algorithmic Artworks

Here's a detail of a Caucasian carpet. See how its motifs are figurative, but don't represent any figures we've seen before: they are a little like flowers, a little like animals, a little like crystals. Commentators on Caucasian carpets often refer to their forms as hybrid, "foetus-like," [1] anthropomorphic flowers and floral animals, and populations of "archaic, headless, two-headed beasts." [2] You can see these odd creatures for yourself.

Carpets, of course, are algorithmic media, in that a weaver follows a set of instructions in order to arrive at a predictable result. All carpets have some degree of automatization: the imposed structure of loom, thread count, knot style, and design. Nomad and village carpets allow for a lot of spontaneity on the part of the weaver. The carpets I'll show, however, were made for high-level courtly and religious clients. At the beginning of the 17th century, Shah 'Abbas of Iran supported economic development throughout his realm, and this stimulus may have established commercial rug weaving in the Caucasus. The size of the Caucasian carpets shows they were woven on large looms, suggesting commercial production. [3] They were woven from detailed cartoons that specified form, so weavers did not have much room for maneuver. However, the cartoons did not specify knots per form, giving weavers a bit of leeway.

This ratio between pre-given form and slight improvisation may account for the genetic development of the forms on Caucasian carpets. Pre-given, top-down forms individuate in unforeseen ways, producing genetic mutations that shock and delight.

Caucasian Carpets (and a Turkish one): A Model for Genetic Artworks

A couple of times in *The Movement-Image* Deleuze describes how the smallest elements of “flowing-matter” are perceiving, acting; alive. We do not need to see things, for things themselves already see: “The eye is in things,” he writes, referring to Bergson, who imagined that every point has a point of view that can be, as it were, photographed: “taken in the interior of things and for all the points of space.” [4] Deleuze describes the earliest life forms as tiny machines that perceive and react: “Biologists speak of ‘primeval soup, which made living beings possible, and where forms of matter known as dextrogyres and levogyres play an essential role’”: they produced micro-intervals, perceiving at one end, acting at the other. [5] Each point, then, to the degree that it resists top-down organization, is a living micro-interval that responds to its environment in unpredictable ways.

Even the most strictly ordered, hierarchical carpets produce singularities where idea meets matter. Here I show, not a Caucasian, but a Turkish carpet, that’s right here in Istanbul. This carpet follows a kind of cosmological organization, remarked by carpet scholars, whereby the central medallion suggests the beauty and divine order of heaven. See how the further we move from the center, the more unruly the forms get: they seem to possess an internal life force. I love this carpet because of the way the wacky flowers and cloud bands compete with the “transcendental” medallion. As though they’ve heard of heaven and they want none of it! This begins to raise the question, is there something in material that resists idealism, that has its own ideas of how to develop? And if so, what pushes it to develop?

Individuation

Let us define life as the capacity for individuation. While information, in-formation, is the creation of form from without, individuation comes from within. Gilbert Simondon writes that individuation occurs in a system that is metastable or out of step with itself. [6] I suggest we think of a sea or a lake as such a system. The individual form is not a final result so much as something like the peak of a wave: just a phase in process of individuation. [7] There are more potentials in pre-individual state than this individual. Becoming, then, is a mode of resolving an initial incompatibility that was rife with potentials: lots of other potential resolutions might have arisen. [8] In this awareness of the multiplicity of potentials, only one of which is actualized, we hear the resonance with theories of evolution, specifically Henri Bergson’s *Creative Evolution*. Individuation is the realization of a life force from within; the actualization of the virtual; a becoming.

Deleuze goes to great lengths in *The Fold* to uphold a free life force internal to matter that shapes it from within, each according to its capacities. He uses the concept of the univocity of being to argue that the Being of the universe is a field of unlimited potential that individuates freely, without any debt to Platonic and Aristotelian concepts of form. I want to emphasize that in fact this concept arises first in the thought of Abu ‘Ali al-Hussein Ibn Sina (980-1037), the Muslim philosopher from Bukhara whose innovative thought so immensely informed philosophy in both the Muslim world and the West. Deleuze indirectly acknowledges Ibn Sina’s concept of the univocity of being in some of his works, but the connection needs to be better acknowledged. [9]

Back to information vs. individuation. Algorithmic artworks obviously privilege information: they are formed by a pre-given set of instructions. Where does individuation occur in an algorithmic artwork? One locus of individuation is the machinic phylum of a given artwork, its particular nexus of material and immaterial production. Another is experimentation for the sake of seduction: the desire to give rise to beauty and pleasure may be the strongest provocation for individuation. Let me elaborate on these.

1. Machinic Phylum

I struggled a lot to find a source of individuation in algorithmic artworks, which would seem to be entirely pre-determined by their algorithms, until one day I saw it starting me in the face. Algorithmic artworks are not just numerically generated; they arise from nexes of idea and material that are completely particular. Given particular material, historical circumstances, drawing on existing programs that other people wrote in particular circumstances, the genetic artwork executes in a time and place that are, of course, different every time. So we can easily say that any algorithmic artwork arises from a *machinic* “assemblage” in Deleuze and Guattari’s sense of a singular nexus of ideas and materials. For example, each iteration of Sommerer and Mignoneau’s Life Writing assembles the analog typewriter interface, a text-to-form editor, the artists’ time, thought, practice, and conversation, funding from the University of Art and Design, Linz, Austria, and the actions and interest of users—in this documentation, at the Centro Cultural España in Mexico City.

Carpet making too is a machinic phylum specific to a culture, subject to its organizing principles. Caucasian carpets too arise from machinic assemblages. They required industrial-level design and production. Individuation occurred at the level of design, where it fascinates to try to reconstruct what was going on in the mind of a designer who drew an animal with eight legs and no head, for example. Individuation also occurs at the level of production, the decisions about knots per form that I think produced their genetically mutating forms. And individuation continues to occur in use.

Hence the fascination of Caucasian carpets, whose laws seems arbitrary, despite the industrial circumstances of their production. To me this suggests a lively competition between information and individuation.

Simondon offers a useful criterion for how technical production can create the unforeseen:

There is nothing essential about the made-to-measure aspect of the artisan's hand-craft. This derives from another, though essential, aspect of the abstract technical object: its being based on an analytical organization which always leaves the way clear for new possibilities, possibilities which are the exterior manifestation of an interior contingency. [10]

Similarly, in generative artwork, we may seek individuation at the level of programming and of material execution.

Seductive Novelty

We can certainly see a playful, experimental practice of pleasure in the way carpet patterns evolve. What about contemporary genetic artworks? The pursuit of beauty and pleasure seems such a retrograde motivation for contemporary art. It seems rather that genetic artworks, to the extent that the

artists aim to meet criteria for contemporary art, follow models of participatory and relational art. The artwork is supposed to change in response to some wish or need of the participant; this, in more radical versions, should be an ethical need. [11] I've interacted with any number of algorithmic artworks, genetic and otherwise, that practically begged me to invest them with meaning. But as with relational artwork, throwing the creative agency back onto the beholder or participant, demanding that we the visitors give the work its meaning, often results in random or lackluster outcomes. Such genetic works seem to follow the survival model of evolution: changes come about if enough participants select for them.

I think we need a stronger argument for what motivates individuation. What about this one: individuation arises from experimentation for the sake of beauty and pleasure! Moreover, the genetic impulse of art arises from sexual difference! This is the shocking thesis of Elizabeth Grosz in *Chaos, Territory, Art*. [12] In a brilliant feminist intervention, the Deleuzian philosopher adds sexual difference to individuation. Grosz picks up Bergson's point in *Creative Evolution* that we humans inherit all the creative solutions of other creatures from whom we differentiated at some point in evolution. [13] Bergson wrote:

The line of evolution that ends in man is not the only one. On other paths, divergent from it, other forms of consciousness have been developed," which are not as free from constraint as the human "but which, none the less, also express something that is immanent and essential to the evolutionary movement.

Clearly inspired by Bergson, Grosz rereads Darwin to argue that "survival" be construed in the broadest sense possible. Sexual selection highlights morphological differences that enhance the body's sexual appeal. Sexual display involves intensification—both of the one creating a spectacle of itself and the one perceiving. The wish to attract potential mates gives rise to all kinds of genetic inventiveness and experimentation, producing useless beauty. [14] Darwin writes that the mature male stickleback becomes "beautiful beyond description," colorful, translucent, and iridescent, during mating season. [15] To attract pollinators, flowers color their petals yellow and red and emit lovely scents. The bowerbird gathers colorful objects to decorate a stage for its courtship dance.

If we take the idea that evolution arises not from natural selection but from sexual selection, a universe of meaningful evolutionary beauty, seduction, and pleasure unfolds for us. The carpets I've shown are beautiful — and provocative, showing off their evolved embellishments much as the male stickleback shows off his colorful, iridescent skin. These observations about seductive evolution, in both carpets and nature, offer new criteria to artworks produced with generative software. In fact there are many digital and specifically genetic artworks that evolve in ways designed to keep our attention, to attract and delight us, much as the male bowerbird decorates his courtship stage. Critics often dismiss these works as decorative, not serious. But it is their ever-evolving beauty that makes them succeed. Beauty is an agent of evolution!

To conclude, I suggest that genetic and other artworks that rely on input from the user might try refining the random openness that so often motivates interaction. Further, they might try jettisoning the dreary, survivalist motives that incite "relational" interactions. Instead, retrograde though it may sound at first, cultivating beauty and experimenting with pleasure, may be the most generative of motives for individuation.

References and Notes:

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6. G. Simondon, "The Genesis of the Individual," in *Incorporations*, ed. J. Crary and S. Kwinter, 302 (New York: Zone, 1992), 302.
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10. G. Simondon, *On the Mode of Existence of Technical Objects*, trans. N. Mellamphy (London: University of Western Ontario, 1980), 22.
11. See C. Bishop, "Antagonism and Relational Aesthetics," in *October* 110 (2004): 51-79.
12. E. Grosz, *Chaos, Territory, Art: Deleuze and the Framing of the Earth* (New York: Columbia University Press, 2008).
13. H. Bergson, *Creative Evolution*, trans. A. Mitchell (Mineola, NY: Dover, 1998), xii.
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