

Emergent Aesthetics

Glen Carlson
Electronic Media Art + Design, University of Denver

Abstract

This paper does not attempt to redefine design or the concept of Aesthetics, nor does it attempt to study or reflect current design and anthropological practices. Rather, it is a direct attempt to create something completely new – to create a world that generates its own aesthetic, its own visual anthropology, and its own sense of understanding.

This is an investigation into the possibility of creating a situation where design (visual decision-making) can define itself. Visual agents, and their evolution in an artificial environment, can become objects of study. “Ugly” and “Beautiful” can be looked at as traits of relative fitness or non-fitness in an evolutionary model. What we consider beautiful might not be what the agents or the environment “thinks” is beautiful.

Keywords: Emergent Aesthetics, Design, Generative, Evolution, Art

Introduction

Design is not in crisis.

Design does not need to be redefined.

To that same extent, Aesthetics in design are not in crisis and do not need to be redefined. It is important to look at these things as a continuum—as an ongoing history. In this way, theories and definitions will not become redundant and degenerate but rather extend into directions, successful or unsuccessful.

This paper is not intended to rebuke, redefine, or redo anything else. It is intended to extend, to start at this point in the continuum and go in a direction.

The process of this paper is also directional. I am a product of this ongoing narrative of design and Aesthetics. Therefore, I am looking from a unique point of view, as is everyone else.

Aesthetic Narrative

The concept of Aesthetics has always been a part of our behavior; it is inextricably linked to how we see. Sensual perception is an integral part of how we understand our universe. However, from Descartes' time forward, philosophers have tried to rationalize this, and all, innate behaviors.

The first study of what we now call Aesthetics was conducted under the name of Metaphysics and not as its own discipline. The aim of Metaphysics was to rationalize sensual perception, with Aesthetics as an extension. Philosophers contended that since God was the creator of everything on Earth, and since God is also ultimately aware in terms of cognition, then beauty is a result of levels of cognition that only God can fully and completely understand. This concept of Aesthetics relied on a disdainful view of human cognition and an overall negative view of this condition. The person to build upon and change this structure of study was Baumgarten.

In 1750, Alexander Baumgarten was the first person to coin the term "Aesthetics" and establish it as a separate philosophical study. He asserted that Aesthetics was the science of sensual cognition as well as a theory for evaluating art, giving validity to this new philosophy as both science and art, with both fields of study enforcing the other.

Baumgarten proposed that the goal of Aesthetics was to end in the perfection of sensory cognition. In *Reflections on Poetry* he defines this assertion:

By **poem** we mean a perfect sensate discourse, by **poetics** the body of rules to which a poem conforms, by **philosophical poetics** the science of poetics, by **poetry** the state of composing a poem, and by **poet** the man who enjoys that state.¹

Immanuel Kant was the next major figure in Aesthetic development with his work, the *Critique of Judgment*, published in 1790. He argued that Aesthetic judgment was a completely rational exercise of the human mind. Kant proposed a basic difference between intuitive and rational presentations—the practical and the theoretical. Therefore, Kant fundamentally disagreed with Baumgarten.

Kant's main elements of Aesthetic judgments in *Critique of Judgment* are that they are disinterested, universal and necessary, act as physical objects, and that the objects are purposeful or appear purposeful:

Beauty (whether it be of nature or of art) may in general be termed the *expression* of aesthetic ideas. But the proviso must be added that with beauty of art this idea must be excited through the medium of a concept of the Object, whereas with beauty of nature the bare reflection upon a given intuition, apart from any concept of what the object is intended to be, is sufficient for awakening and communicating the idea of which that Object is regarded as the *expression*.²

¹ Alexander Baumgarten, *Reflections on Poetry*. (Berkeley: University of California Press, 1954) 39.

² Immanuel Kant, *Critique of Judgment*. (Oxford: Clarendon Press, 1952) 183-184.

Friedrich Schiller built upon Kant's work and ideas. He synthesized the Kantian idea of a separation between sense and reason, and argued that Aesthetic beauty is the harmony of these elements. The Aesthetic, was therefore the unity of matter and form. Once a person achieved this Aesthetic unity, he or she is able find Truth, which leads to freedom. Interestingly in his Aesthetic letters, he also brings up the concept of Beauty as *idea* and Beauty as *experience*, however only to reinforce human subservience to the divine:

Beauty in idea, then, is eternally only something indivisible, unique, since there can exist only one single equilibrium; Beauty in experience, on the other hand, will always be twofold, since through oscillation the balance may be destroyed in a twofold fashion, on one side or the other.³

Georg Wilhelm Friedrich Hegel followed Schiller with his work, *Aesthetics: Lectures on Fine Art*, published in 1835. It is important to note that Hegel, a professional philosopher, highly regarded the thinking of Schiller, an amateur:

For Schiller in his aesthetic writings has not merely taken good note of art and its interest, without any regard for its relation to philosophy proper, but he has also compared his interest in the beauty of art with philosophical principles, and only by starting from them and with their aid did he penetrate into the deeper nature and concept of the beautiful.⁴

Hegel's *Aesthetics: Lectures on Fine Art* dealt with Aesthetics as a product of the absolute Idea, and Idea its content. He asserted that the work of art was a sensuous combination of concept and reality. He stressed that transcendent ideas were manifested in art first through symbolic representation, then through classical representation. After the classic period falls, begins the romantic manifestation of the idea. In this romantic art-form, Idea could be purely expressed, especially through poetry, "The arts, then, which are lifted into a higher strain of ideality, abandoning as they do the symbolism of architecture and the classical Ideal of sculpture, accept their predominant type from the *romantic* art-form..."⁵

Advance

What these theories and views on Aesthetics have in common is that they establish explicit rules in the attempt to formalize and rationalize how we as humans look at things. These are all top-down structures. What these philosophers fail to validate is that the phenomenon of what we call Aesthetics is a natural innate human behavior. This phenomenon existed long before it was ever put into theory and can stand alone without the theory backing it up.

Thus, the question presents itself, "why do we need the theory?" The obvious answer is, understanding. We want to understand why we act the way we act, which, ironically, is also an innate human behavior. However, while the

³ Friedrich Schiller, *On the Aesthetic Education of Man*. (New York: F. Ungar Pub. Co, 1965) 81-82.

⁴ Georg Wilhelm Friedrich Hegel, *Philosophy of Fine Art*. (London: G. Bell and Sons, LTD., 1920) 84.

⁵ Hegel, 117

traditional view of Aesthetics has sustained our need to understand our own behavior, it has recently become stagnant. Why?

Advances in cognitive science have determined that our understanding is emergent, a complex combination of interaction, experience, and physiology, “Thought it *embodied*, that is, the structures used to put together our conceptual systems grow out of bodily experience and make sense in terms of it...”⁶ George Lakoff named this cognitive theory, experiential realism, or experientialism. Lakoff sought to extend what was correct in the traditional theory to new evidence, and new theory emerging from that evidence:

Human reason is not an instantiation of transcendental reason; it grows out of the nature of the organism and all that contributes to its individual and collective experience: its genetic inheritance, the nature of the environment it lives in, the way it functions in that environment, the nature of its social functioning, and the like.⁷

Likewise, advances in technology have granted us the ability to create other-world environments. More importantly, the digital arena has given us the mindset to make this part of our consciousness. The idea of emergent and generative art in itself modifies our sense of understanding. It propels us into the realm of un-knowledge and other-consciousness.

John Maeda was one of the first people to fully bridge computation and design, giving new media validation and opening up areas of study, “Computation allows you to create digital forms, in the finest level of detail, that react or respond to their environment.”⁸

Although Maeda approaches computation as a tool intended for mastery, like an artist’s pen or paintbrush, he also mentions the concept of emergent and generative art. In *Design by Numbers*, he specifically focuses on cellular automata and gives special attention to Joseph Conway’s program, *Game of Life*. In this program, groups of cells, called Gliders, are given sets of rules, which then generate a seemingly life-like movement, “Such an occurrence is referred to as an *emergent* characteristic of the system because of the way an unexpected concept seems to emerge from a simple set of rules.”⁹

Thus, we are far from Kant’s theory of rationalized understanding—in an emergent environment something other than our minds impose form and structure to information; the form and information build and impose themselves. We have reached a point where we can move on from Hegel’s theory of Aesthetics as well. With the ability to create digital other-worlds, we can take an unknown view of Aesthetics and see what happens.

What if we let design define itself?

⁶ George Lakoff, *Women, Fire, and Dangerous Things*. (Chicago: University of Chicago Press, 1987) xiv-xv.

⁷ Lakoff, xv

⁸ John Maeda, *Design by Numbers*. (Cambridge: MIT Press, 1999) 175.

⁹ Maeda, 233

Proposal

What I am proposing is the creation of a visual universe that produces its own bottom-up patterns—engineering instead of reverse engineering. Rather than create rules that try to explain things already present in the universe, rules will be created that generate the universe. Instead of applying or modifying rules of Aesthetics that try to explain visual communication, a universe will be created that generates its own visual communication, which in turn creates its own Aesthetic.

The process of Emergent Aesthetics uses agent-based modeling, where the agent can be anything—square, rectangle, circle, polygon (these “simple” shapes serve as a beginning step in conceptualizing the actual process). These agents are ruled by visual properties, essentially giving them aesthetic traits: color, shape, dominance, etc. These traits can then interact and react to their environment and the agents around them. Thus, competition, fitness, adaptation, breeding, mobility, and complexity become important and uncontrolled factors in the environment.

Aesthetic agents create their own form and composition based on the traits programmed into them and by competing and interacting with other agents for aesthetic dominance. This generative, emergent process is open to many variations and iterations. It does not attempt to redefine design or the concept of Aesthetics, nor does it attempt to study or reflect current design and anthropological practices. Rather, it is a direct attempt to create something completely new—to create a world that generates its own aesthetic, its own visual anthropology, and its own sense of understanding.

This is an investigation into the possibility of creating a situation where design, visual decision-making, can define itself. The visual agents, and their evolution in the artificial environment, can become objects of study. “Ugly” and “Beautiful” can be looked at as traits of relative fitness or non-fitness in an evolutionary model. What we consider beautiful might not be what the agents or the environment “thinks” is beautiful.

While this is largely a conceptual piece, the opportunities for both pragmatic use and intellectual study are many. The idea of generative, evolutionary art questions our sense of what is “beautiful” and interrogates how we look at and understand our Aesthetic universe.

What might it look like? An important aspect of this proposal is not being able to know until experiments are carried out. This is substantial because of the theoretical position of not knowing. Equally important, however, is speculation and hypothesis because of the similarity and difference that will occur based on the result of the experiments. We are trying to understand something that we have no reference for, something that we might not find Aesthetically pleasing but that the system and environment finds to be Aesthetically correct.

The implementation and future of this proposal also exists somewhat in the realm of the unknown. An initial test version of the proposal is currently being developed in a programming environment. It involves squares of three colors—black, white, and red. These squares are then placed in an

environment controlled by a genetic algorithm, with the squares themselves controlled by a polygenic structure. This structure allows for twenty-one possible heterozygous combinations. The squares then can be instructed with Aesthetic, visual traits. This is the first iteration, thus only parts of the proposal will be investigated. Other aspects, such as life and death states, multiple forms, the creation of new form, etc. will be explored as the experiment continues.

Yet, this is only the first expression of the proposal, with hopefully many more to follow. This paper is a call for different thinking in design, and, therefore, is explicitly open-ended. My hope is that this will stimulate others to bring their unique perspective to this idea.

Aftermath

My main goal with this paper is to create a shift in the way that we think about design and Aesthetics—to take design in a direction.

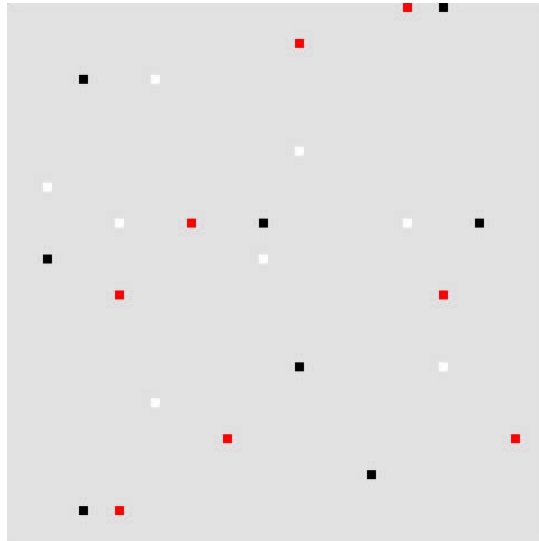
With this shift in thinking comes an almost overwhelming newness. The most beneficial contribution will come in the development of new language to better express and articulate where this direction in design is headed. One of the main limitations to discussion is ineffective language to describe both the process and unknown results of Emergent Aesthetics.

Another development that is evolving from this shift is a new process of making art and design. The change from a rationalized view of Aesthetics to an emergent one will take many forms and variations of expression. Coinciding with a change in thinking comes a change in making, both changes amplifying each other and furthering this direction in design. However, process is unique to the person enacting the process and, therefore, I can only propose a general direction and framework, of which this paper is one example.

New technology may need to be developed to suit Emergent Aesthetics. Currently it is being carried out using existing technology, yet the experiment has only begun to be expressed. In the very near future, a program using an existing programming language or combinations of languages will be developed to further articulate Emergent Aesthetics. Eventually, to handle a complex system of interacting visual agents, new genetic environmental technology—whether it is software or hardware—will have to emerge or evolve.

One of the largest elements of this paper is the fact that *we do not know what will happen*. This is the guiding principle.

Experiments



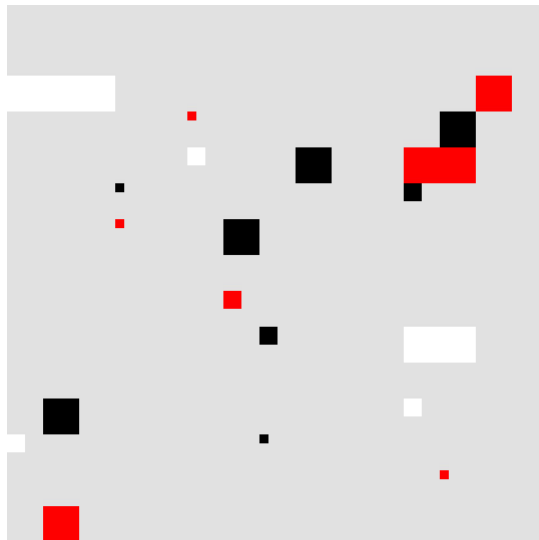
Starting Stage

Elements:

Three sizes in each color,
8x8, 16x16, and 32x32

Attributes:

- Red attracted to Black
- Black attracted to Red
- White attracted to itself
- Black repulsed from White
- Attraction and repulsion only occurs in 32x32 (large) size elements
- Movement is otherwise random.



Running Stage

This particular iteration of the Emergent Aesthetic experiment, named *Aesthetic Interaction (A.I.)*, is meant as a base, or starting point—a place where conceptual thinking is put into something real and visible. Thus, it is rule-based and transparent. The program and experiment is by no means in a finished state.

Likewise, this instance is governed by the limitations of the technology used to produce it. *Stagecast Creator™* was employed as a creation tool, initially because, (a) I was comfortable using it, (b) it's graphical interface responds well to a project dealing with Aesthetics, and (c) it is rule-based, which makes my process accessible, and logically understandable. However, the experiment is not a completely emergent system; the rules and elements are ultimately established by human design. This experiment is in its infancy, and it is important for the process to be well documented and evolutionary.

The goal of an experiment like this is to provide a visualization of the concept, and to give a reference for what is possible with the concept. The goal I am aiming for is to create an environment where Aesthetic Agents can fluidly create their own form and composition, by expressing their own Aesthetic evolution. However, this is only my personal goal, and the idea is open to all for study. I have heard suggestions for implications ranging from education to music and, of course, design. I encourage anyone to create their own iteration and application of the idea of Emergent Aesthetics.

Reactions

I have received varied reactions to this version of the Emergent Aesthetics experiment. It is interesting to note the differences in reaction when viewers know what they're looking at and when they do not.

When people know what they are viewing, the connection between concept and visualization is made, and the visual realization enhances the concept of Emergent Aesthetics. One viewer, who had followed the concept to visualization process had this comment:

The use of *Stagecast* worked much more effectively than I could ever imagine. However, perhaps you could add another layer of interactivity into the piece through revealing the "rules" you set for this particular emergence and letting the participant change the rules to see how the results change. Otherwise, I think you've somewhat accomplished a successful simulation of an isolated system of aesthetics.*

However, when people view the experiment without knowing the conceptual base, the results vary and are quite interesting and revealing.

Comment 1:

For starters, the control panel is highly effective, a sometimes difficult thing to do in an interactive piece without explicit instructions. I think it would be even more impressive, though, to in some way explain *how* the images are being generated, destroyed, and moved around the field. This is a strong project, and what has gone into it should be made clear in order to assure optimal viewer/audience benefit.*

Comment 2:

This piece draws several questions. What purpose does this idea serve? I find it to be interesting and could potentially be a harmonious piece. It would be interesting to see this piece collaborated with audio, perhaps the squares generate to the beat of the music.*

This difference in response highlights the fact that this experiment is in the beginning stage of its evolution, and hints at other possible experiments, implications, and applications of the Emergent Aesthetics idea.

References

- Baumgarten, Alexander. *Reflections on Poetry*. Trans. Karl Aschenbrenner and William B. Holther. Berkeley: University of California Press, 1954.
- Hegel, Georg Wilhelm Friedrich. *Philosophy of Fine Art*. Trans. F. P. B. Osmaston. London: G. Bell and Sons, LTD., 1920.
- Kant, Immanuel. *Critique of Judgement*. Trans. James Creed Meredith. Oxford: Clarendon Press, 1952.
- Lakoff, George. *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind*. Chicago: University of Chicago Press, 1987.
- Maeda, John. *Design by Numbers*. Cambridge: MIT Press, 1999.
- Schiller, Friedrich. *On the Aesthetic Education of Man*. Trans. Reginald Snell. New York: F. Ungar Pub. Co, 1965.
- *Experimental research presented for critique at the University of Denver, November 18, 2004.

Biographical Note

Glen Carlson

T: +01.650.533.4627

E: gcarlso@du.edu

www.glencarlson.com (information + portfolio)

www.glencarlson.com/emergent/ (the Emergent Aesthetics project)

University of Denver
The School of Art & Art History
2121 E. Asbury Ave.
Denver, CO 80208
T: +01.303.871.2846
F: +01.303.871.4112

Glen Carlson is an undergraduate in his final year as a BFA of Electronic Media Art + Design at the University of Denver. The program aims to produce self-motivated artists with strengths in creative vision, design, concept development, critical thinking and a commitment to communicating visual messages capable of reshaping the world through innovative design.