THE CONCEPT OF ART AND INTERACTIVE COMPUTER ART

Anhang Ning

In this digital era, computers have become an essential component of our lives: we connect with each other via social media, get real time news updates via the Internet, and share music and ideas in the cloud. In the art world, interactive computer art has emerged in response to this unique time period. This new art form raises some interesting discussions concerning interactivity, audience participation, and the very medium of the computer. In the first section of this paper, I will lay the groundwork through the aesthetic theories proposed by Morris Weitz, George Dickie, and Immanuel Kant. Art is an open concept, and, the audience is an important component of an artwork. In addition, a good work of art evokes a universal sense of delight or wonder, which is subjective in nature.

In the second section, through two major examples, "Crossings" (2009) by Nina Yankowitz and "Boundary Functions" (1998) by Scott Snibbe, I argue that interactive computer art eliminates the distance between the audience and the artwork since it demands audience participation. It outperforms traditional art forms in terms of artistic techniques, displaying effect, and the incorporation of other disciplines. In the end, by connecting the two sections, I argue that because the core concepts of interactive computer art (i.e. its artistic values, the importance of the audience, and the universal delightfulness it evokes) are closely related to larger discussions of art, it fits in the category of art.

With the rapid development of technology and Internet, this era with tremendous amount of information has already surrounded us, no matter if we are ready or not. Understanding

interactive computer art is an initial step toward making sense of this technological era. Although the "interactivity" concept is radically new, we ought to treat it with careful analysis instead of careless rejection. Given that technology changes rapidly, perhaps more radical art forms are approaching us in the near future; we might be left behind without a sufficient understanding of the contemporary innovations of interactive computer art.

What is Essential for the Concept of Art?

Art, given its adventurous character, is an open concept that allows continuous modifications. Furthermore, the audience plays an essential role for the artwork, and one of the many components of a successful artwork is that it generates universal subjective judgments.

Unlike rigid scientific theories, the definition of art is subject to change. Numerous efforts have been made at an all-encompassing definition of art; however, the theorists ignore the fallacy behind its logic.[1] A good definition is composed of both necessary and sufficient conditions, meaning that a theory is true if and only if the conditions are true. However, given the "very expansive, adventurous character of art,"—or, to put it more simply, the examples of what count as art change continually in unpredictable ways—the definition of art lacks sufficient and necessary conditions; thus it is logically impossible to generate a definition of art.[2]

All existing definitions of art have limitations, for example, formalism and expressionism. Formalists believe that the essential property of an artwork is the combination of "plastic

[1] Morris Weitz, "The Role of Theory in Aesthetics." In *Aesthetics and the Philosophy of Art* ed. Peter Lamarque and Stein Haugom Olsen (Malden: Blackwell, 2004): 13.
[2] Ibid. 13, 16.

forms" (i.e. lines, colors, shapes and volumes)[3]; anything without significant forms is repudiated from the category of art.[4] The inadequacy of formalism is obvious: it leaves out other essential properties that constitute an artwork, such as its historical context, emotions that it evokes, etc. The expressionist theory developed by Leo Tolstoy, is also problematic. Emotional expression and feelings, expressionists believe, are fundamental properties of art.[5] Granted, expressionism is applicable to many abstract paintings[6], but realistic paintings focusing on historical events or portraits do not necessarily invoke emotional response. Because these paintings are considered as art, the expressionist theory is thus insufficient.[7] Similarly, other theories of art, such as organicist theory, intuitionist theory, and voluntarist theory are inadequate in that "each purports to be a complete statement about the defining features of all works of art and yet each of them leaves out something which the others take to be central."[8] Different theories resemble myriad facets of a diamond; each is merely one reflection of the whole.

Given that the existing definitions are inevitably limited, the role of the concept of art is to describe similarities and connections of all artworks. Attention should be shifted from definitive theories to a descriptive account: "aestheticians," Weitz argues, "may lay down similarity conditions but never necessary and sufficient ones for correct application of the

---

[3] An example of formalism is James McNeil Whistler's *Nocturne in Black and Gold: the Falling Rocket* (1875), which underscores two formal elements: color and form ("Formalism in Modern Art").

[4] Ibid.

[5] Ibid., 13.

[6] Wassily Kandinsky's *Composition VI* (1913) is an expressionist painting. The artist invites his audience to sense the orchestral harmony inherent in this work. Other expressionist paintings can be found in works created by artists from *the Blue Rider* and *the Bridge*.

[7] Ibid., 13, 14.

[8] Ibid., 13.

concept."[9] Furthermore, when new circumstances arise in the art world, theorists discuss whether or not the concept could be broadened. As Weitz writes,

> "Art," itself, is an open concept. New conditions (cases) have constantly arisen and will undoubtedly constantly arise; new art forms, new movements will emerge, which will demand decisions on the part of those interested, usually professional critics, as to whether the concept should be extended or not.[10]

For example, John Cage's famous piece *4'33''* emerged as a radical new form of art. During his performance, Cage sat in front of the piano, without playing a single note. To determine whether or not this is art, theorists can look at the similarities it shares with other musical works: a three-movement composition performed in a recital. However, different from previous works, there was complete silence throughout the performance. Many audience members were angry about this because they expected to hear sound during a piano performance. Cage nevertheless believes that all sounds are equal: "not-sounds" are not inferior to sounds.[11] This piece aimed to "remind the listener that s/he can have a satisfying musical experience only by using his/her own ears and listening to the sounds and noises of the environment."[12] To decide whether or not this piece is fit for the category of art, theorists can look at its relationship with other musical works and examining both the audience's and Cage's views.

Of a profusion of attributes of art, I believe the two crucial properties are: the audience and the universality of the

[9] Ibid., 15.
[10] Ibid., 15.
[11] Marta Blažanović, "Echtzeitmusik: The social and discursive contexts of a contemporary music scene." (diss., Humboldt-Universität zu Berlin, 2012), 27.
[12] Ibid.

work. First, an artwork is seen and apprehended by viewers or auditors; thus, the audience plays a prominent part in art. George Dickie defines art as "an artifact of a kind created to be presented to an artworld public."[13] An artwork is made to be shown to members of the artworld. If Dickie were right, the artworld public is exclusively those who have enough artistic education, such that "the members…know how to fulfill a role which requires knowledge and understanding similar in many respects to that required of an artist."[14] To qualify as a member, the individual must have an artistic background similar to the artist's; the common professions of the artworld public include "critic, art teacher, director, curator, (and) conductor."[15] Although I agree with Dickie that the role of the audience is important, I think his position on "artworld public" favors elitism. I believe that this group can be broadened.

Many artworks have been created for mainstream audiences, not excluding those with minimal education on art. For example, cooperating with art museums, contemporary artists aim to present their works and values to the public. The education of these artists' work to the general public is precisely the reason that contemporary art museums exist. One important step involved in museum education is creating an explanatory label for artworks. After curators finish writing labels, museum educators make sure that the language is precise and simple, so that it is accessible to different audiences, including non-native speakers, children, advanced readers, etc. In addition, a variety of tours are often organized to ensure different groups receive suitable educational experiences, ranging from toddler tours, school tours, to adult tours and Spanish tours. During the opening of an exhibition, it is not uncommon to see the artist delivering a talk to the public in

---

[13] George Dickie, "The New Institutional Theory of Art." In *Aesthetics and the Philosophy of Art*, ed. Peter Lamarque and Stein Haugom Olsen (Malden: Blackwell, 2004): 53.
[14] Ibid., 51.
[15] Ibid., 51.

many museums. From these examples, we discern that artists and museums work hard to present the knowledge and background of the artworks to all sorts of audiences; thus Dickie's account on the artworld public is insufficiently inclusive.

Artistic masterpieces evoke subjective emotions in the mind of each audience member. In his famous theory of *sublimity*, Immanuel Kant emphasizes the aesthetic experience in our mind.[16] The *sublime* does not exist in objects; one can only find it in the mind.[17] As Steve Odin points out, Kant's perspective on *aesthetic attitude* "shift(s) from a position of realism, which understands beauty as something only inherent in the object, to an idealist (or, as it were, transcendental idealist) position that underscores the contribution of the mind in aesthetic experience."[18] In other words, far from analyzing external features of an artwork, say, in a painting, its lines, shapes, and colors, one assesses a work of art based on one's subjective judgment. As Odin writes, "human consciousness is not simply a passive recipient: to some extent it actively constitutes an object of beauty through various noetic operations of the mind."[19] Beauty arouses intellectual engagement. "The beautiful," for Kant, "is that which, apart from concepts, is represented as the Object of a UNIVERSAL delight."[20] The object evokes "similar delight" from all humans.[21] Importantly, an aesthetic judgment is subjective; therefore, it is "liberated from all constraint by concepts" and it "cannot claim the 'objective universal validity' of a logical judgment."[22] The concept of *subjective universality* may seem ambivalent at first

[16] Steve Odin, *Artistic Detachment in Japan and the West: Psychic Distance in Comparative Aesthetics* (Honolulu: University of Hawai'i Press, 2011), 38.
[17] Ibid.
[18] Ibid.
[19] Ibid.
[20] Ibid.
[21] Ibid., 39.
[22] Ibid.

glance; however, it simply means that the *beautiful*, or an exquisite work of art, can cause a similar subjective feeling for everyone. From my understanding, what Kant means by "similar delight" is not merely the feeling of pleasure—it rather lies on a broader spectrum of emotions. Standing in front of a masterful painting, for example, diverse people experience analogous emotions, such as awe, pleasure, or even melancholy.

Interactive Computer Art

Interactive computer art offers a new mode of apprehending art. By eliminating the distance from the artwork, the installation is more action-oriented. Visitors explore the work through generated display. The interaction is of a relaxing kind, since previous knowledge on the work is not required. The medium of the computer is advantageous because: 1) it creates the most precise shapes or the most realistic three dimensional models, and 2) it allows modification of the work by altering digital codes. In addition, interactive installations usually incorporate different art forms as well as knowledge from multiple disciplines.

Before we unpack the theories of interactive computer art, let us first consider some examples. Displayed in Greece and Poland in 2009, "Crossings"[23] is an interactive installation that advocates religious toleration. By incorporating sacred texts of different religions, such as the Old Testament and the Quran, the installation encourages the audience to explore connections between the scriptures[24] Inside the gallery, the floor is a projection of mosaic patterns of various churches, cathedrals, and temples around the world.[25] As participants hear religious texts in different dialects, they are invited, using the

[23] See Appendix.
[24] Project description, 2009.
[25] Ibid.

infrared wand, to drag words from religious texts appeared on an interactive wall to an adjacent text wall. The program allows participants to save their selection and review them on the program's website.

Another interactive art installation is Scott Snibbe's "Boundary Functions"[26] (1998). "Boundary Functions" examines the concept of personal space, over which we do not have autonomy because of the interrelation between us and other people.[27] The artwork requires at least two participants. An overhead projector draws lines between people: one line between two participants, three lines between three participants. More lines will be generated as more participants join, resulting in the creation of cellular areas. As people move, the lines move as well; however, a participant cannot walk outside of his/her cellular area, or his/her "personal space." The installation vividly shows the conflicted concepts of personal space and society: although there is always a line, a "boundary," between us and other individuals, the space is impossible without the presence of other people because, presented in the model, the involvement of one person is not sufficient for the creation of a "personal space." The mathematical construction *Voronoi diagram* is also used in astronomy to illustrate the relationship between gravity and stars, and, in chemistry to represent collections of atoms in crystals.[28]

Interactive computer artworks, such as "Crossings" and "Boundary Functions," differ from traditional art forms in that the participant generates different displays. Dominic Lopes writes, "a work of art is interactive to the degree that the actions of its users help generate its display (in prescribed ways)."[29] In

---

[26] See Appendix.

[27] Scott Snibbe, "Boundary Functions." *Scott Snibbe Website*. 1998, 1 March, 2016. <http://www.snibbe.com/projects/interactive/boundaryfunctions/>

[28] Ibid.

[29] Dominic M. Mclver Lopes, *A Philosophy of Computer Art* (New York: Routledge, 2010): 37.

"Crossings," participants help generate display by choosing words from the sacred texts, which simultaneously appear on the adjacent wall. The displays vary because different participants create different combinations of words. Furthermore, in order to better "interact" with users, interactive computer artworks include sensor systems, which records the participants' gestures and change them into data that the computer can process.[30] Then, the data is "translated back into real-world phenomena that people can perceive."[31] For example, "Boundary Functions" includes a sensor which detects people's movement and then transforms the movement into languages that the computer can process. Next the system produces data, which are then translated to perceivable phenomena, i.e. lines and cellular shapes projected on the floor.

Interactivity may appear nebulous at first glance. Because the concept plays such a pivotal role in understanding the nature of interactive computer art, it is thus important to understand the meaning of interactivity involved in this art form. First, interactivity is different from active appreciation. Traditional art forms, such as a painting, may evoke active reflections by the viewer, whereas interactive computer art allows viewers to generate the display. For instance, the Romantic painting *Monk by the Sea* (1810) by the German painter Caspar David Friedrich may elicit emotional effects of its viewers, such as loneliness, generating further intellectual engagement with the work. Although the piece leads to active thinking by the viewer, it is not considered interactive. Lopes defines this sort of engagement as "active appreciation," and he writes, "whereas art of all kinds invites active appreciation,

---

[30] Linda Candy and Ernest Edmonds, "Interaction in Art and Technology," *Crossings: Electronic Journal of Art & Technology* 2, no. 1 (2002): 5, 7. David Z. Saltz, "The Art of Interaction: Interactivity, Performativity, and Computers," *The Journal of Aesthetics and Art Criticism* 55, no. 2 (1997): 118.

[31] Saltz, "The Art of Interaction: Interactivity, Performativity, and Computers," 118.

only some art is interactive."[32] Active appreciation does not alter the display of the work, which excludes it from the concept of interactivity.

Second, another clarification regarding the concept *interactivity* regards its level. Only works that involve strong interactivity are interactive computer art. The sort of interactivity involved in interactive computer art is different from weak interactivity in that strongly interactive computer art do not have pre-determined structures. For example, computer games are strongly interactive media; the players determine how the narrative develops when they make different choices.[33] Lopes writes, when "the structure itself is shaped in part by the interactor's choices," the artwork is interactive.[34] On the contrary, the interaction involved in Michael Joyce's hypertext novel *Afternoon* is weak. The novel allows the readers to explore different versions of the narrative each time by clicking on different words.[35] The role of the reader resembles that of a tourist, without actively participating in the work; therefore, the interaction is considered weak.[36] Unlike strongly interactive media video games, the structure of *Afternoon* is pre-determined.

To participate in interactive art installations, audiences are not required to have previous knowledge. Unlike performers, who have professional knowledge on the work and devote efforts practicing the work prior to a performance, the audience of the interactive artwork does not necessarily have knowledge concerning the work prior to the interaction. For example, prior to his performance of Beethoven's No. 5 Concerto, Lang Lang has thoroughly learned and practiced the piece. On the contrary,

---

[32] Lopes, *A Philosophy of Computer Art*, 41-42.
[33] Dominic M. Mclver Lopes, "The Ontology of Interactive Art," *The Journal of Aesthetic Education* 35, no. 5 (2001): 68.
[34] Ibid.
[35] Saltz, "The Art of Interaction: Interactivity, Performativity, and Computers," 120.
[36] Ibid., 121.

a participant of "Boundary Functions" does not have to know about Voronoi diagrams and yet can still participate. The computer, functioning as an interpreter, automatically generates displays through computational processes when input is given.[37] The computer allows the user to learn and explore the work by generating displays.

The medium of computer has several advantages over the media of traditional art forms. First, the use of computers brings a new light on the possibility of the medium. Paul Crowther argues for the advantages of digital imagery, since digital art and interactive computer art share the same medium, and interactive computer art sometimes uses digital images. Digital images simply mean computer graphics, which are non-interactive artworks displayed on a computer. In digital artworks, the computer plays a similar role to the canvas of a painting. The computer nevertheless radicalizes the contour and mass features of traditional art.[38] Crowther explains the meaning of contour and mass:

> When creating a picture, an artist operates, *necessarily*, along an axis defined by two logical extremes…the *contours* of a three-dimensional object *or* by assembling and blending marks so as to represent its *mass*, or, of course, by combining elements of both.[39]

The French painter Jean Auguste Dominique Ingres' work *The Virgin Adoring the Host* (1852) exemplifies an extreme degree of *contours*, as it has clear and precise outline.[40] The British painter Frank Auerbach's piece *Portrait of Julia* (1960) shows *mass* to an extreme degree—its physicality is so obvious that

---

[37] Lopes, *A Philosophy of Computer Art*, 80.
[38] Paul Crowther, "Ontology and Aesthetics of Digital Art," *The Journal of Aesthetics and Art Criticism* 66, no. 2 (2008): 168.
[39] Ibid., 161.
[40] Ibid., 161, 163.

the work looks like "relief modeling."[41] Although it is according to the painter's will on where in the contour-mass axis they want to display in the work, and despite the fact that some artists are capable of extraordinarily precise outlines and realistic physicality, the computer outperforms humans.[42] The computer extends the capability of what humans can achieve in that it allows the creation of images with the maximum mass and contour features. Another difference between the computer and other media, such as a canvas or a piece of paper, is that the computer screen is flatter. Surprisingly, this does not diminish the quality of displaying and even enhances the quality of three-dimensional effect.[43]

Using its special language, the unique medium of the computer also enables modification of the artwork and the collaboration between artists. Similar to the software that generates digital image, the program of interactive computer art includes computer codes based on mathematic models.[44] The digital code can be altered through the manipulation of its mathematic operations.[45] Similar to digital images, the program of interactive computer art is not permanent, since it allows modifications from either the artist himself or other artists. This revolutionary aspect shifts our understanding of the traditional art-making process—once the work is done, it remains unchanged. The computer, in contrast, allows and encourages ongoing collaborations and exchanges between artists, disciplines, and approaches.

---

[41] Ibid.

[42] Ibid., 163.

[43] Ibid., 164.

[44] Holle Humphries, "A Philosophical Inquiry into the Nature of Computer Art." *The Journal of Aesthetic Education* 37, no.1 (2003): 22.

[45] Crowther, "Ontology and Aesthetics of Digital Art," 165.

Interactive Computer Art as a Radical New Art Form

Information and technology dominate contemporary society in myriad ways: on a daily basis, we use cell phones for communication, computers for work, and the Internet for knowledge. Interactive computer art emerges organically from this environment, and leads naturally to consideration of how interactivity fits into the larger category of "art."

As Weitz suggests, the development of art resembles an ongoing adventure. The nature of the concept of art is open and allows modification. As new art forms emerge, theorists decide whether or not they share similarities with existing ones. It is thus unwise to exclude new art forms, even radical ones, from the category of art without thorough consideration. It is true that interactive computer art exploits a new medium, the computer, but a judicious theorist should not deny its status on that basis. Similarities between interactive computer art and traditional art forms are obvious; for example, interactive installations include visual art, sound, and etc, and they are usually shown in a museum. Not only does interactive computer art share similarities with traditional art, as discussed in the second section, it even perfects certain aspects of existing art forms. Interactive computer art works outperform human artists in what they can achieve in the mass-contour axis and create more realistic three dimensional effects. Furthermore, computers make possible combination of different art forms, such that sounds, texts, and images could all be present in one setting. Given that interactive computer art possesses a plentitude of artistic values, it belongs to the open concept of art.

The core concept of interactive computer art, interactivity, also aligns with Dickie's views on the important role of the audience. Without an interactor, the work is incomplete. However, unlike Dickie's "artworld" concept that inherently inclines to elitism, interactive installations welcome each visitor, who often doesn't have prior knowledge, to engage in interaction. In this respect, interactive installations are approachable to a wide range of people as they require minimal

artistic education. Since interactive computer art demands audience participation, it highlights the audience, who play an indispensable part of an artwork.

Furthermore, the interaction is advantageous to generating subjective universality as proposed by Kant. When an audience member apprehends a painting, a sculpture, or other traditional forms of art, there is always a distance between them. Interactive installations eliminate such distance through active participation. Whereas people are inclined to find formal features of a painting, subjective feelings and emotions are created when they interact with interactive works. Therefore, instead of a passive mode of appreciation, interactive installations elicit active engagement. Interactive computer art exemplifies the concept of subjective universality.

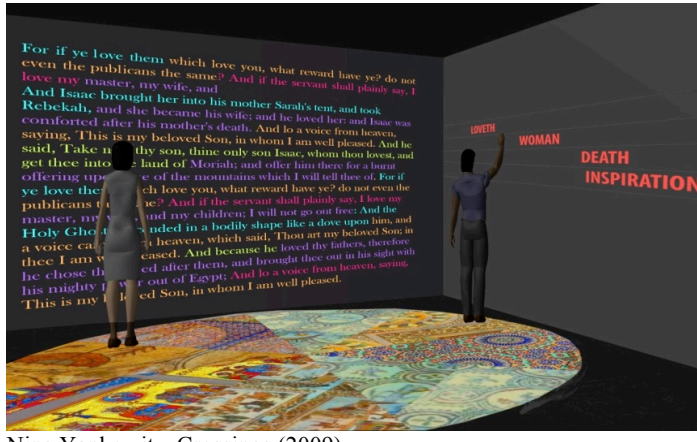
What changes would maximize the development of interactive computer art? First, to give the artist more flexibility, more computer software that "[allows] the artist access to deeper levels of the computer's programming system" should be developed.[46] Whereas many software programs that target "specific tasks such as image manipulation" limit the artist's use of the computer to achieve their goals, programs that integrate deep features of computing system allow more control and creativity.[47] Second, the computer artist could be equipped with more technological knowledge of programming. Lacking such knowledge, as observed by Linda Candy and Ernest Edmonds, the artist usually rely on technology experts, and they are less certain about how much power they have during the art-making process.[48]

Interactive computer art, which involves active audience engagement, represents a remarkable moment in the development of art. The new art form alters the traditional mode of encountering art by allowing the audience to generate the

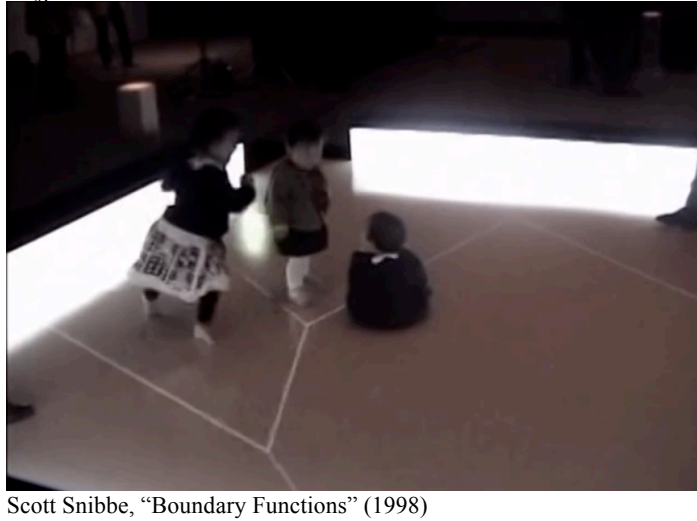
[46] Candy and Edmonds, "Interaction in Art and Technology," 9.
[47] Ibid.
[48] Ibid.

artistic display itself, and the medium enables great improvement in terms of artistic techniques and audience experience. In this digital era, everything changes rapidly—we will undoubtedly encounter many radical changes, not only in the art world, but in society more broadly. Although we should cherish traditions, an open mind is essential in the contemporary world. If we always live within our predetermined meanings and values, we will soon be overwhelmed by the multitude of changes. Therefore, it is crucial to embrace valuable new changes such as interactive art in order to function within our rapidly developing society.

Appendix



Nina Yankowitz, Crossings (2009)
http://www2.media.uoa.gr/~charitos/emobilart/exhibition_gr/img/crosings_2.jp


Scott Snibbe, “Boundary Functions” (1998)
https://www.youtube.com/watch?v=_Ax4pgtHQDg

Works Cited

Blažanović, Marta. "Echtzeitmusik. The social and discursive contexts of a contemporary music scene." Diss., Humboldt-Universität zu Berlin, 2012.

Candy, Linda & Edmonds, Ernest. "Interaction in Art and Technology." *Crossings: Electronic Journal of Art & Technology* 2, no.1 (2002): 1-12.

Crowther, Paul. "Ontology and Aesthetics of Digital Art." *The Journal of Aesthetics and Art Criticism* 66, no. 2 (2008): 161-170.

Dickie, George. "The New Institutional Theory of Art." In *Aesthetics and the Philosophy of Art* edited by Peter Lamarque and Stein Haugom Olsen, 47-54. Malden: Blackwell, 2004.

"Formalism in Modern Art." *The Art Story Website*. The Art Story Foundation, 2016. 28 April 2016. <http://www.theartstory.org/definition-formalism-artworks.htm#pnt_1>

Humphries, Holle. "A Philosophical Inquiry into the Nature of Computer Art." *The Journal of Aesthetic Education* 37, no. 1 (2003): 13-31.

Lopes, Dominic Mclver. *A Philosophy of Computer Art*. New York: Routledge, 2010.

____ "The Ontology of Interactive Art." *The Journal of Aesthetic Education* 35, no. 5 (2001): 65-81.

Odin, Steve. *Artistic Detachment in Japan and the West: Psychic Distance in Comparative Aesthetics*. Honolulu: University of Hawai'i Press, 2011.

Rokeby, David. "Transforming Mirrors: Subjectivity and Control in Interactive Media." In *Critical Issues in Electronic Media*, edited by Simon Penny, 133-158. New York: State University of New York, 1995.

Saltz, David Z. "The Art of Interaction: Interactivity, Performativity, and Computers." *The Journal of Aesthetics and Art Criticism* 55, no. 2 (1997): 117-127.

Snibbe, Scott. "Boundary Functions." *Scott Snibbe Web-site*. 1998. 1 March, 2016. <http://www.snibbe.com/projects/interactive/boundaryfunctions/>

Weitz, Morris. "The Role of Theory in Aesthetics." In *Aesthetics and the Philosophy of Art* edited by Peter Lamarque and Stein Haugom Olsen, 12-18. Malden: Blackwell, 2004.

Yankowitz, Nina. "Crossings." *Crossings Project*. 1 March 2016. <http://www.nyartprojects.com/crossings/>