

Beyond Binary Digital Embodiment

Kaitlin M. Clinnin

Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in
partial fulfillment of the requirements for the degree of

Master of Arts
In
English

Robert B. Siegle, chair
Katrina M. Powell
James H. Collier

April 24, 2012
Blacksburg, VA

Keywords: digital embodiment, cybernetics, new media art, dance, virtual

Beyond Binary Digital Enlightenment

Kaitlin M. Clinnin

Abstract

The late 20th and early 21st centuries have seen the creation of new forms of subjectivities that represent the integration of digital and information technologies into construction of the self and bodies. I argue that to this point there has not been a satisfactory theoretical framework for the experience of bodies in virtual environments that does not default to problematic binaries of physical and virtual, real and unreal, and meaningful and meaningless. These dualistic constructions render experiences of bodies within virtual settings meaningless. In order to examine how this power differential between physical and virtual came to be, I engage with Katherine Hayles' evaluation of information as a disembodied entity. I argue that Hayles' humanist principles prevents her from fully understanding the experience of bodies within virtual spaces as meaningful and important. I then deconstruct the materialist basis of representation in order to demonstrate how information can be reconceived as an embodied force. I further analyze digital media art installations, specifically dance performances, to examine how digital bodies are currently experienced in relationship to corporeal forms. I finally offer two new theories of <reality> and the networked body in order to dismantle the binary between physical and virtual and to make a space for all embodied experiences to be valued.

Table of Contents

ABSTRACT	II
CHAPTER 1: THE HUMANIST AND THE POSTHUMAN.....	1
THE MACHINE AND ME	1
CHAPTER 2: REEMBODIING INFORMATION (CHECK 0 OR 1).....	13
APPROACHING INFORMATION	13
HAYLES AND THE DISEMBODIED INFORMATION.....	15
THE MATERIALITY AND PHYSICALITY OF INFORMATION	25
EMBODIMENT OF INFORMATION AND THE VIRTUAL.....	35
NEW ASSEMBLAGES AND METHODOLOGIES	41
CHAPTER 3: ART AS EMBODIMENT	44
ART AS EMBODIMENT	44
THEORIZING EMBODIMENT IN DIGITAL ART	52
DANCE AND DIGITAL EMBODIMENT.....	58
BODIES ARE NOT LOST: DIGITAL DANCE PRODUCTIONS AND EMBODIMENT.....	62
IMPLICATIONS AND CLOSING THOUGHTS	68
CHAPTER 4: <CONCLUSION> NETWORKED <REALITY> </CONCLUSION>	70
RUPTURING THE CIRCLE	70
A RAPE IN CYBERSPACE	75
<CONCLUSION> <.....	79
WORKS CITED	82

Chapter 1: The Humanist and the Posthuman

The Machine and Me

“The machine is us” has been the consistent refrain of the post-industrialization era, simultaneously undulated as a paean to the cyborg future and whispered as a fear of that which challenges current conceptions of humanity. Every day in mass media outlets and subversive underground presses alike a new article makes headlines and details the most recent way that technologies are changing our increasingly diminished humanity. Articles that contrast the so-called digital natives, those who were born with a keyboard in one hand while texting with the other, with digital immigrants, or those who continue to type with one finger, contribute to a growing sentiment that something has been irrevocably changed in conceptions of humanity, bodies, and selfhood. It is widely regarded that this change, like other paradigm shifts in the past, is not necessarily positive. In contrast to the utopian vision that hoped for a symbiotic relationship that could prove mutually beneficial to both humans and machines, technological backlash has found a captive audience with perceptible reticence towards the increasing interdependence with technologies. Jaron Lanier’s *You Are Not a Gadget* casts an ominous outlook that perhaps the distinction between man and machine is no longer as clear as humanists would hope. *The Shallows* by Nicholas Carr laments the restructuring (or perhaps more aptly, the recoding) of the brain in ways that reflect technology’s growing presence in daily life.

The very existence of these bestselling books speaks to the fact that the fears of Lanier and Carr are not portentous predictions of a technological apocalypse, but these fears are already in the process of becoming. Technology has become so imbricated in the understanding of self for both digital natives and digital immigrants that it seems unlikely to retreat to pre-information lifestyles, let alone pre-industrialization. Such nostalgia for a simpler time is unproductive and

seems to long for a supposedly pure humanity that has never existed. Carr and Lanier's texts may very well be viewed in the next fifty years as the last holdouts from an analog era, as those who held fast to the vestigial organs of Enlightenment and post-Enlightenment humanity and bodies.

As has been discussed over the past century in great detail, the Enlightenment conceptions of bodies and the self are no longer capable of accounting for the complexity of individuals that social revolutions have enabled. This inability of the Cartesian model is determined even more so by digital technologies and methods of self-creation and representation, and even the post-Enlightenment moment has passed. Scholars such as Katherine Hayles and Mark Hansen contend that this is now the age of trans- or even posthumanism, a time period characterized by the realization that such boundaries between human and machine are dissipating and that perhaps this is the next evolution rather than a cause for hysteria. Although transhumanism and posthumanism both refer to the same hybridization of human and machine, the prefix "trans" suggests a more hopeful vision of a permeable boundary between carbon and silicon based entities that the posthuman does not. Yet even though these trans or posthumanists claim to have moved beyond the concept of human as a unified organic being, they still resort to the default settings of the Enlightenment mentalities by engaging in dualistic understandings of mind and body, albeit now the human mind and mechanical body.

This dualism of human and machine, organic and inorganic, mind and (mechanical) body has been explored in a variety of ways. Theorists such as Judy Wajcman have written extensively on the implications of the changing relationship between the human user and the machine as tool in light of increasing symbiosis. One area that has not been fully explored is the relationship between body, screen, and the representation of the body in the virtual setting, although this

oversight is not for lack of scholarship. New media and the bodily representations in such spaces have been addressed by writers such as Susan Kozel, Anna Munster, and Bernadette Wegenstein. Lisa Nakamura, Sherry Turkle, and Tom Boelstorff have explored the implications of life within virtual worlds as mediated by the avatar. The role of the avatar in identity creation, as well as the experiences of virtual race, gender, class, and even species have been well documented as anthropological phenomenon. But in spite of this abundance of academic texts on the material, digital embodiment and the value of the bodies within virtual settings remains unresolved. There is still no generally accepted definition of digital embodiment that accounts for the complex matrix of interactions that exists among the physical body, the avatar body, the mediating technology, and the flow of information and energy through the entire system. The contrast that exists between the organic body with its sociocultural constraints and the virtual-silicon body (informed by the legacy of the carbon-based body in addition to its own cyberspace situated knowledge) is further complicated by the mediating technology that simultaneously obscures and reveals. The inability to conceive of the variety of bodies in a non-traditional space has led to a new set of dangerous binaries: those of real or unreal, reality or virtual, meaningful or meaningless.

Coming to terms with definitions of “real” and “unreal” is unavoidable when evaluating online situations. There is a general conception that since the digital is a coded set of numbers and tags that it is less “real” than the physical world where most people spend their time and can physically engage with their surroundings. But what defines first lives, those lived in the physical world, is increasingly indistinguishable from what composes second lives online. As cyberculture scholar Rob Shields writes, “[t]he virtual troubles any simple negation because it introduces multiplicity into the otherwise fixed category of the real. As such the tangible,

actually real phenomena cease to be the sole, hegemonic examples of ‘reality’” (Shields 21). The virtual is therefore viewed as less real because of its multiplicity and transient nature. Ultimately, this binary of real and unreal is unproductive and must be dismantled not only due to its reliance on simplistic understandings of self and subjectivity, but also because it reinforces the problematic mind and body separation. Even though it can be argued that these virtual spaces reinforce the mind-body dualism because the virtual world is inhabited by minds, not bodies, this is a limited and damaging assumption that neglects to take into consideration how virtual and physical bodies are ever present in the digital. This argument once again reiterates the need for a comprehensive theory of digital embodiment that is able to value appropriately the phenomenological experience of bodies and the creation of meaning within virtual settings.

The “meaningless” of the virtual can partly be attributed to the perception that the digital is simply representation with no actual substance present. Critics perceive virtual worlds as secondary to physical spaces where the sole purpose is to recreate the corporeal, as evident even in the names of some popular virtual environments like Second Life. Virtual worlds are mistakenly believed to be limited to re-creation and representation of the physical instead of providing another space for meaning and reality creation. Science philosopher Ian Hacking identifies “manipulability” as a determining factor for the reality of a particular situation (Barad 50). It is the ability to interact, manipulate, and ultimately affect that Hacking uses to establish what is real versus what is representation. Hacking writes, “We shall count as real what we can use to intervene in the world to affect something else, or what the world can use to affect us” (146). Therefore, these virtual worlds are not simply subordinate to physical settings but rather function as an equally valuable space for interaction, manipulation, and affecting the experiences of bodies and subjectivities much like physical spaces.

New theories of subjectivity that challenge Cartesian dualism and embodiment while simultaneously accounting for the increased prevalence of technology in daily life have been in circulation for years. Rosi Braidotti's nomadic subject offers an intervention that exists outside of a particular form of embodiment. She calls for a subjectivity that "is a new form of materialism, one that develops the notion of corporeal materiality by emphasizing the embodied" (Braidotti 3). While Braidotti's nomadic subject is useful for its willingness to transgress perceived impermeable boundaries, it exists in such an abstracted arena and relies so heavily upon metaphorical states that it is not particularly pragmatic. Though the "visionary epistemology" that she seeks to create can be used to rethink paradigms of phallogocentrism that have previously constricted the radical potential for changes in subjectivity, it is ultimately limited by its containment to images and utterances without fully considering what it means to phenomenologically be a body. Braidotti's self-proclaimed fascination with the empty spaces, or the liminal moments that exist between categories, would seem to suggest that such a location as cyberspace would be an ideal place in which her nomad could roam. But Braidotti never goes quite as far as she needs to, instead remaining fixated on the language that she simultaneously deconstructs and empowers. She clarifies the positionality of her nomad, writing that "[t]he nomad does not stand for homelessness, or compulsive displacement; it is rather a figuration for the kind of subject who has relinquished all idea, desire, or nostalgia for fixity" (22). And yet, Braidotti's nomad relies heavily upon the existence of boundaries and within the confines of a physical body.

Braidotti's figuration of a nomadic consciousness presents a starting point for how to conceptualize the virtual self. Nomadic consciousness is defined as "a form of resisting assimilation or homologation into dominant ways of representing the self" (25). Since there is

currently no dominant method of representing the online self that is generally accepted or able to account for the complex layers of selfhood and identity, such a consciousness must be developed before introducing the nomadic component. Perhaps nomadic consciousness is an option for the future, but in the present tense, there does not even exist a way of representing the fragments of the self and body in cyber settings. Nomadic consciousness “aims to rethink the unity of the subject, without reference to humanistic beliefs, without dualistic oppositions, linking instead body and mind in a new set of intensive and often intransitive transitions” (31). This consciousness can be applied to digital settings and subjectivities in the post-human era to fully express the fragmentation and multiplicity of bodies and self in cyberspace.

Even Donna Haraway’s influential formulation of the cyborg does not meet the needs of current cyberspace embodiment issues. Haraway states that the cyborg is “a hybrid of machine and organism, a creature of social reality as well as a creature of fiction,” a fiction that is “a mapping [of] our social and bodily reality” (Haraway 149). Her stated purpose to deconstruct the dualisms that exist in technological culture is fulfilled through this image of the cyborg as a hybrid subject. Although the cyborg is useful for its ability to transgress boundaries and to revel in the fragmentation of identity while engaging in radical fusions, it also exists in a “post-gender world” that simultaneously detracts from its value. Haraway’s view that gender, race, and class are impositions from a patriarchal capitalist society fails to address how the cyborg is already a production of these same cultural constraints. Her declaration that “the cyborg is a creature in a post-gender world” is one of the points in which the cyborg fails to achieve the radical potential that it initially promises. Haraway’s imaginary of the cyborg as a hybrid figure that has moved beyond conception of gender cannot take into account the ways that certain identity markers can be performed within technological settings even by machines, as well as the unique ways that

identity and bodies can be accounted for within this context. As in the case of Braidotti's nomad, the Haraway cyborg can best be utilized as a springboard for a new theory of digital embodiment due to its bridge between biological and technological worlds. Her promise of monsters and cyborgs that will offer new political realities and subjectivities is the beginning of a new understanding of virtual experience.

The cyborg exists within feminist theory as the hybrid of the body with digital and mechanical information, but information itself has been critiqued for its disembodied nature. In *How We Became Posthuman*, N. Katherine Hayles details the waves of cybernetic theory that resulted in the formation of information as nonphysical although quantifiable entity separate from the medium. According to the information theory developed by physicists Claude Shannon and Norman Wiener, information could be distilled from the signal and code in which it was contained, resulting in the divorce of information from the context that produces it. This understanding of information has become the primary metaphor of the late 20th century and has indubitably influenced all disciplines, although it has been especially prominent in developments in genetics and understandings of how the human body functions. Hayles argues that the metaphor of information has caused a shift in subjectivity from the liberal humanist model to the posthuman, a subject who recognizes a fragmented self that is only transitionally unified by the fluid exchange of information throughout its parts. The avatar has often been seen as the location of self-fragmentation, self re-creation, and the prosthetic device for the body into the virtual setting.

Previous readings of the avatar have been limited to virtual embodiment of the avatar as a representation of a physical entity. The avatar is merely a stand-in for the body that remains in front of the computer screen. Lisa Nakamura's text *Cybertypes* and Sherry Turkle's earlier

works, *The Second Self* and *Life on Screen*, explore the often problematic representations of avatar bodies. As noted by Nakamura and Turkle, the digital body is not separated from the cultural perceptions of the user, and as a result, the characteristics of the avatar tend to reify problematic racial and gender stereotypes as in hegemonic society. While these accounts help to elucidate how “real world” power and cultural dynamics are present within online environments, they are also limited by this perspective. Nakamura and Turkle only examine virtual environments for ways in which they reflect the power dynamics of the physical, without taking into account how new structures of power relations in gender, race, and corporeality are exhibited in these spaces in alternative forms that do not necessarily coalesce with the traditional methods of embodiment.

Another previous limitation to studies of avatars has been the focus on text based online environments. Many examinations have been limited to MUDs¹ and MOOs² which are traditionally solely textual platforms. In these settings, users encounter lengthy descriptions of locations and other avatars, but ultimately any visual accompaniment is left to the imaginations of the users. The textual environment allows the user complete agency over the representation of the avatar and its actions; any identifying feature must be detailed by the user or it remains obscured. This open approach to representation allows for gender to be in constant flux. As Jenny Sundén notes in her study of WaterMOO, multiple gender categories are available for users to select, including male, female, neuter, either, Spivak, splat, plural, egotistical, royal, and 2nd (Sundén 28). These gender possibilities are accompanied by various pronouns that make

¹ “Multi-User Dungeons” are online multiplayer worlds that combine role-playing games, quest based narratives, and social interaction.

² A “MUD Object Oriented” is similar to a MUD but allows users to change the server for all users.

reference to the gender selection, but because of the textual nature of the environment, the gender selection remains abstracted and not marked upon a particular body.

It is no longer possible to examine online avatars as simply replacements for the physical body within a digital environment. Not only does the varied context of a virtual environment require a new sociological perspective on power dynamics and relationships, but also the digitally coded body does not exist as a mere replacement to the corporeal body. It is necessary to develop a theory of digital embodiment that privileges the experiences of the multiplicity of bodies in virtual settings in such a way that does not nostalgically recall supposedly simpler times when bodies appeared to be touchable and rigid. Such stability is merely an illusion and should no longer hinder exploration into new theories of embodiment. As an interdisciplinary topic, it is necessary that I validate the seemingly disjointed methodology that I intend to use as a frame for my study. The simple fact is that any singular discipline is woefully inadequate to understand the complexities of identity and body formation in a non-traditional space that is itself also exceedingly multifaceted. In order to conceive of such a new philosophy of digital embodiment, I intend to examine information systems that have recently been accused of contributing to the disembodiment of the virtual. This accusation is a false one because although information science and cybernetics have contributed to the abstraction of information, they have also provided the conceptual framework necessary to envision a digital embodiment that can balance on the precipice of materiality and virtuality. Finally, I will apply this new theory of digital embodiment to instances that may well be understood as acts of physicality in a virtual setting. By examining the ruptures in cyberspace, I will demonstrate the inadequacies of current models of digital embodiment and subjectivity and offer a new approach to these issues.

The discipline of information systems has been labeled as the root of disembodiment by theorists such as Hayles, but this is only a convenient scapegoat that obscures the potential that exists within the theoretical models of information. The founders of cybernetics believed that by scientifically evaluating the probability of messages, they could produce a standard value of measurement regardless of medium and context that would allow researchers to efficiently understand how information flows within a particular system. The most damaging critique by Hayles is that embodiment “has been systematically downplayed or erased in cybernetic construction of the posthuman” (4). To an extent, Hayles is right: cybernetics does not deal with embodiment, or at least the traditional form of embodiment to which she subscribes. But the mathematical conception of information as a standard value that can be measured as it flows from state to state has not been appropriately evaluated as a potential method for understanding digital embodiment. If information is akin to energy, as Hayles and cybernetic scientists both agree, then it follows it should be possible to measure the impact that changes in information flow causes. By recognizing information as a property with the ability to flow and enact change within its surroundings, a recognition that essentially gives information back its body, it is possible to develop a new form of embodiment that instills meaning in virtual settings.

The examination of contemporary digital art installations, ranging from architectural constructions to performance pieces, has provided me with more inspiration than most of the theoretical foundations that have previously engaged with the issue of technological embodiments. Technology and art have been linked since even before the beginning of the digital movement most famously as Marcel Duchamp explored the relationship between humans and the machine in pieces like *The Bride Stripped Bare by Her Bachelors, Even (The Large Glass)*. This particular work has been examined by many digital theorists for the separated erotic

encounter between the fragmented and even “cloud”-like bride figure and her mechanized bachelors as an early representation of the productive conflict between human and machine. The trend towards exploring the relationship between machine and bodies has continued throughout the century, and the past 30 years have resulted in an increased presence of the digital as a theme and a technique. Artists such as Allucquère Rosanne Stone, Laurie Anderson, and Diller + Scofidio explore the convergence of embodiment and virtuality in such a way that does not resort to the aforementioned dualistic methods. In addition to art installations, I also intend to examine dance. Dance is arguably the most physical form of art and has often been studied for its philosophical approach to embodiment. I also intend to look at dance troupes like Pilobolus who specifically confront the hybrid existence of bodies in the digital age by filming and editing their embodied movements through digital technologies. Essentially these dances then become instances of digitally and virtually mediated embodied actions, which can then be examined as productions of body within a non-corporeal setting and analyzed in respect to digital embodiment. By analyzing how modern dancers have interpreted their own bodies through virtual technologies and used such technologies to create art, it is possible to construct a theory of digital embodiment that connects sensed and virtual experience with meaning.

The current understandings of physicality online disallow any possibility for physical disruption, as in, it is assumed that the actions that occur on screen to the virtual self and its representation do not have a measurable impact on the self that sits in front of the computer screen. Yet acts of physicality, and especially violence, are endemic to online environments just as in the corporeal world and are just as impactful. There is false categorization of violence online that has only served to devalue some experiences as meaningful while others are deemed to be less real. The distinction between physical acts of rape against a corporeal body and

similarly enacted violence against an avatar demonstrates how the role of the body and the perceived “reality” of a particular context relates to the sense of meaning available to a certain situation. Not only do these particular situations call into question the distinction between virtual and real and the cultural value inherent in each setting, but it also forces scholars to evaluate understandings of how race, gender, and other markers of identity are constructed in a fluid environment such as cyberspace. By applying the new theories of digital embodiment developed from examining information systems and digital art installations, it is possible to reexamine instances of virtual violence to dismantle the problematic binary that exists between real and virtual as well as to account for the increasing complexity of the digital body.

Chapter 2: Reembodying Information (Check 0 or 1)

Approaching Information

Information has become the metaphor of the current intellectual, physical, biological, and philosophical times. Bodies are embedded with genetic material that contains information regarding the physicality of one's progeny. Information is perceived to be an indefinable entity that contains no solid boundaries and is noted simply by its absence. Although one can amass a substantial amount of information, the value of that is almost always subject to question. What does information weigh, how can it be determined if one truly has information, and how are information and meaning related?

It is critical to note the order of events that relate to information as best exemplified in the understandings of human genetic material. In their monumental article "Genetical Implications of the Structure of Deoxyribonucleic Acid," James Watson and Francis Crick establish the purpose of deoxyribonucleic acid (DNA) as an information vector, writing, "It therefore seems likely that the precise sequence of the bases is the code which carries the genetical information" (965). In this example, information is a nontangible presence that is then made physical through the code, which in this case is the specific iteration of DNA bases adenine, guanine, thymine, and cytosine. Although the nebulous information may be abstractly present, it is meaningless until it can be coded into a tangible form: the genome. It is only from this identifiable and quantifiable sequence that information can finally result in the production of amino acids and genetic characteristics to form an organism. Ultimately, information is dependent upon other objects to grant its physicality; there can be no exchange of information without the use of a physical intermediary because information itself is not physical. Or is it?

The conception of information as nonphysical in itself is not necessarily nonconductive to establishing meaning. What is harmful is the relationship that currently exists between meaning and physicality so that meaning is linked to physical presence. Karen Barad claims, “Matter and meaning are not separate elements. They are inextricably fused together, and no event, no matter how energetic, can tear them asunder. ... *Mattering* is simultaneously a matter of substance and significance...” (3, emphasis mine). The double meaning of “mattering” in this instance demonstrates that physicality, however that may be construed, and meaning cannot be extricated from each other. A more nuanced understanding of physicality and meaning is needed in order to truly appreciate the value and the “realness” of nonphysical entities, but for the sake of brevity, I will focus solely on developing theories of information as a “real” presence in spite of its nontraditional physicality. It is the conception of information as a nonphysical entity that has allowed scholars in a variety of disciplines to claim and ultimately devalue situations like virtual environments in which information is the only substance.

In this section, I will examine Katherine Hayles’ claim that information is constructed as disembodied as a result of the cybernetics movement and the turn to theoretical conceptions of information, and I will additionally evaluate alternatives that compose a new body for information. Hayles is right to an extent; information has typically been theorized as an abstract concept that has historically been understood as lacking in materiality and therefore further lacking a body. However, Hayles’ critique is limited in its scope because she does not question the basic precepts essential to the relationship between information and materiality. Interesting questions remain unanswered, such as what is at risk if information remains bodiless? But perhaps the more important question is how information can be re-embodied, and how is this work already occurring in fields outside of the humanities? Furthermore, what changes in

perceptions of virtual interactions when information exchange is understood as a physical process and therefore meaningful?

Hayles and The Disembodied Information

In order to understand how information came to be disembodied, it is necessary to provide an abridged version of the history that Katherine Hayles details in *How We Became Posthuman* and also to provide a working definition of information. Hayles pinpoints the post World War II Macy Conferences on Cybernetics, a set of interdisciplinary conferences intended to discuss how communication in its various forms could be applied to humans, animals, and machines, as the beginning of information's disembodiment. Scholars in a range of fields presented unfinished papers that related to information as it was understood in their particular discipline, so the definition of information remained conflicted and could only be understood within the context of the particular paper presentation (Hayles 51).

This difficulty in defining information presented a problem at the Macy Conferences, and it still remains unresolved. Outside of individual disciplines' understandings of information, two widely accepted definitions of information have emerged. The first defines information as meaning (Anderson and Johannesson 2). Information is data, and subsequent interpretation of the data set according to a previously established system of coding provides meaning.

Mathematicians Ralph Hartley and Claude Shannon offered a secondary definition that stated information "was the degree that uncertainty was reduced by knowing symbols" (Anderson and Johannesson 2). Norbert Wiener and Shannon understood information as a yes-or-no choice which limited the possibilities of the system based upon the result of the binary decision (yes or no, one or zero). However, Shannon and Wiener's theory is not dependent upon what the information represents (for example, a telephone number or the national debt) and only utilizes

probabilities in order to determine the meaning of the relationship. In this equation, information that is less probable is therefore more meaningful without regards to what the information actually *is*. Hayles views this decontextualized value of information as problematic because it supposes that changes in material state will not impact the meaning or value of the information (54).

Shannon's decontextualized theory of information corresponds to his larger mathematical model for communication. Shannon writes, "Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. ... The significant aspect is that the actual message is one *selected from a set* of possible messages" (Shannon 5) Information is sourced from a person or a machine that generates the message. This message may be a sequence of letters or various combinations of functions that are then encoded by the transmitter into a signal, which is then transmitted through a designated channel. The receiver reconstitutes the message from the signal and then passes it on to the destination, the person or machine for whom the message is intended (Shannon 6-7). Shannon's model once again emphasizes the decontextualized nature of information. Although the message passes through four separate transformations (from source to transmitter, transmitter to signal, signal to receiver, receiver to destination) it appears that the message remains uninfluenced by these changes in context and medium. The only possibility for change in the information message results from noise interference with the signal transmission. In this sense, Shannon's model of information privileges a quantifiable and fixed message as the ultimate goal, thereby constructing information as a disembodied and homeostatic entity.

Although the Shannon-Wiener model of information problematically focuses on the decontextualization and resulting disembodiment of information, there were other contemporary

scholars and theories which attempted to maintain a sense of context and physicality. One example is Donald MacKay's model of information theory, a model which makes a conscious effort to maintain meaning by considering form and content, although it was not popularly accepted due to the difficulties presented in quantification (Hayles 56). MacKay's theory departs from the Shannon-Wiener model, which obscured the role of the receiver in information transmission, in order to examine structural information that indicated how the message, what MacKay refers to as selective information, was to be interpreted. This understanding of information categorizes information as an action in that information is a process that is enacted. The receiver is not passive in this theory but rather complicit in the process of "doing" information. According to MacKay, information is specifically situated within a body and context resulting in an interpretation that privileges the receiver as a vital part of the construction of meaning in addition to the message. MacKay's model did not receive much support due to claims that structural information was hard to quantify because it required a subjective understanding of the receiver's context. Hayles further points out that MacKay's model situates information as an enacted process as opposed to an object, and the process "implies context and embodiment," although the presence of context and embodiment narrows the applicability and makes quantification more difficult to achieve (56). Ultimately the Shannon-Wiener model emphasizes the fidelity of information during the transmission process whereas the MacKay model focuses on the mutual constitution of meaning by particularly located message producers and receivers.

Shannon-Wiener's separation of information from context and meaning may seem counterproductive; what good is information if it is unknown what the information *means or even what the context is*? As Hayles explains, "Shannon and Wiener wanted information to have

a stable value as it moved from one context to another. If it was tied to meaning, it would potentially have to change values every time it was embedded in a new context, because context affects meaning” (53). If information was attached to the context and meaning, then information would have to have a different quantifiable value dependent upon the context even though the message would be the same. This makes sense when one considers how a statement given under one set of circumstances may then take on a new meaning in another situation. Hayles uses the example of the statement “It is raining” to demonstrate this principle (53). If the speaker mentions this to another person inside of a building, it provides information about weather conditions, whereas if the statement occurs while in the rain, it provides no information but may be construed as sarcasm. This decontextualization of information results in an abstract conception of information as an “entity that can flow unchanged between different material substrates” (Hayles 53). Accordingly, information is viewed as lacking a body of its own, but as such it provides the same meaning regardless of the context or materiality of a particular situation.

This bodiless construction of information represents Hayles’ primary concern that “the contemporary pressure toward dematerialization, understood as an epistemic shift toward pattern/randomness and away from presence/absence, affects human and textual bodies on two levels at once, as a change in the body (the material substrate) and as a change in the message (the codes of representation)” (Hayles 29). Disembodied information is not simply an abstract concept relegated to communication theory and message transmission, but it also impacts the ways in which corporeal and textual bodies are understood. Hayles views this change in epistemology as a move which fundamentally alters the relationship between signified and signifier. Although this relationship is always tenuous and situated in a specific network as in

Lacanian floating signifiers, the flickering signifier phenomenon that Hayles identifies makes meaning even harder to establish.

The flickering signifier is more of a threat to meaning because of the multiple layers of representation present: there no longer exists a signifier that corresponds to a single marker. The chain of markers that Lacan identified with respect to floating signifiers is opened to a network of signified and signifiers with arbitrary meaning and increased complexity (Hayles 31). Hayles is ultimately concerned that these flickering signifiers will result in a decreased understanding of humanity, specifically in the splicing of human and information in the form of the posthuman or cyborg subjectivity, a fear summed succinctly up in her statement “We become the codes we punch” (Hayles 46). As information becomes more integrated into metaphors of embodiment (neural pathways as electrical networks, DNA as coded blueprints of genetics) without the reverse effect of bodily metaphors in understandings of information, it appears that Hayles’ concern may not be so far fetched.

Hayles’ position can be summed up by her synchronous fears: information is rapidly becoming disembodied, and embodiment is becoming increasingly disembodied through information. Beyond the immediate threat of a context-less information and slippery meaning, technologies that employ information transmission and imaging like virtual reality are viewed as dangerous because of the impact that they have on embodiment. The experience of the human body is mediated through technology, and in order to be mediated by the technology, the body must act in ways that conform to the particularities of the technology in order to be read. For example, technologies such as magnetic resonance imaging (MRI) mediate not only how the body is viewed but also how the experience of being a body is constructed. The body is not understood as an integrated whole in MRI, but it is instead used to isolate particular areas or

systems and envisions the body as a series of disjointed organs rather than a complex whole. These technology-mediated visions of the body and the resulting changes to philosophical understandings of the body and the self present a frightening prospect for Hayles, who views this as an example of how “the computer molds the human even as the human builds the computer” (Hayles 47).

Hayles’ comment about the Escher-esque confusion regarding who is creating whom in the machine-human interaction belies an anxiety surrounding constructions of the self. Liberal subjectivity is threatened by the intangibility of information and the resultant interchangeability of humans and machines, minds and coding. The posthuman configuration, the understanding of humanity spliced with technology Hayles initially sets out to confront, is not necessarily dangerous in itself because “posthumanism need not be antihuman” (288). Hayles explains, “the posthuman does not really mean the end of humanity. It signals instead the end of a certain conception of the human... as autonomous beings exercising their will through individual action and choice” (286). It is only when the posthuman is mapped onto the preexisting liberal humanist does Hayles suggest that there is danger. Since machines, technology, and information lack an embodied reality and history, Hayles is concerned about granting such human integrated entities autonomy, agency, and control. To grant human qualities to not completely human beings degrades the conception of the human Hayles strives to protect. Like information, the posthuman has the potential to be constructed as existing outside of its context and particular embodiment; at its worst, the posthuman is a computer program running without regards to its body or context. Instead of these antihuman constructions of the posthuman, Hayles supports a posthuman interaction in which nonhuman and human actors are necessary and work together in symbiotic relationship.

While Hayles provides a valid reading of the dangers involved in disembodied information, her pessimistic view regarding constructions of information prevents her from acknowledging methods of re-embodiment. The fatalism in Hayles' account of information and embodiment suggests her investment in protecting a form of humanism that she perceives to be threatened by the integration of information into accounts of bodies. Instead of embracing the possibilities that information integration offers, specifically the new forms of subjectivity that can dismantle binaries and already disputed boundaries, Hayles reacts to this crossing as a threat to a body and a subjectivity that is always already subject to fragmentation. This humanism Hayles protects maintains the human and its body as the site of agency, autonomy, and most importantly, control. The body then exists as the center for this control; agency can be exerted from the body and also directly on the body. Therefore the body to Hayles is more than a corporeal form, but it further contains the fundamental determining factor of one's humanity. Throughout the Macy conferences, there was a commonly accepted causality that if participants were able to make a machine work similarly to the human body that the body functioned in the same way as the machine. For Hayles, this causality is emblematic of the anti-humanist path technology can cause when integrated with the body. While the processes of machine and human bodies may appear to function similarly, this does not necessarily dictate that the processes are analogous. Conflating the complex biological processes of the human body with the mechanics of the machine dismantles the body as the location of the human "essence" that Hayles is intent on preserving.

Although the capabilities of machines are rapidly increasing, there are still some boundaries that cyberneticist Norbert Wiener and Hayles still strove to maintain, namely what cannot be experienced by machines: the ability to change and to enact one's own agency.

Wiener's fear of machine domination is immediately perceptible when he warns, "The great weakness of the machine—the weakness that saves us so far from being dominated by it—is that it cannot yet take into account the vast range of probability that characterizes the human situation" (Wiener *Human Use*). Note how Wiener does not even entertain the possibility of machine and human integration, instead positing an antagonistic relationship between humans and machines in which one will inevitably dominate. Similarly to Hayles, Wiener views the danger of cybernetics as a threat to the liberal subject and its sense of autonomy. Cybernetics deconstructs the self and the body as a whole and breaks it down into smaller and smaller levels of organization. The body is then no longer a unified presence, making it impossible to enact cohesive control over itself or outside objects. If the human subject can be further dismantled into levels of organization, much like machines, what separates human from machine? Where is humanity located? It appears that the embodied self is larger than the sum of its parts, yet for Wiener and Hayles this is a dangerous affront to the image of the liberal subject.

Wiener and Hayles are invested in maintaining clear boundaries between human and machine. The cybernetic cyborg is a threat not just for the integration of information and code into the biological structure of the body, but also because it offers a new subjectivity "constituted by the crossing of the materiality of informatics with the immateriality of information" and results in the disembodiment of the body, thanks in large part to postmodern constructions of the body as discourse (Hayles 193). Hayles is invested in protecting the boundaries of the human body because the unified body is the embodiment of agency and autonomy. The biology, anatomy, and physiology of the human body is perceived as a unified entity in need of protection from the invading information-driven machine. Hayles' numerous readings of cyberpunk fictions, a genre notoriously recognized for its crossings of technologies and humans,

demonstrate an anxiety that once technology is introduced into the human body, the body will no longer belong to the person or be under one's control. Hayles' fear is clear when she writes "Human beings, who should be autonomous subjects, become encapsulated within the boundaries of the machine, and are made to serve its purposes rather than their own" (257-258). The splicing of information and cells threatens to denigrate the boundaries that separate machine from human, and therefore make it impossible to determine exactly who or what is the agent of control and subsequently holds the power.

Hayles is not only concerned about the ambiguous power shifts in regards to agency and autonomy that information integration presents to the body, but she also addresses the degradation of the body's material reality. "In the 'dematerialized materialism' of the battlefield where life struggles against entropy and noise, the body ceases to be regarded primarily as a material object and instead is seen as an informational pattern" (Hayles 104). There are a few issues worth analyzing in this selection. First of all, she notes "life struggles against entropy and noise" in a "battlefield." The rhetoric of this sentence demonstrates Hayles' belief that life and chaos (represented by entropy and noise) are continuously at war with one another, an image which further calls to mind power disparities, the possible futility of life's effort, and ultimately the destructive result of such tension. Furthermore by contrasting life with entropy and noise, Hayles is perhaps unwittingly endorsing the Shannon-Wiener model of information transmission, which desired to protect the fidelity of message communication in spite of the interference of noise and entropy. Finally, it is apparent Hayles falls into the trap that she warns others about: she establishes information as a nonphysical presence, thereby privileging physical materiality over patterns and reifying the binary of presence-absence she intends to contest. Given these failures to identify her own personal investment in particular forms of humanism and materiality,

it is necessary to develop a theory of digital embodiment to take into account Hayles' critiques but also to avoid the pitfalls of liberal humanism she continues to maintain.

To recap, there are several points Hayles raises about information which validate her concern. First, the Shannon-Wiener model constructs information as a decontextualized entity in order to maintain its ability to be quantified regardless of the context. Secondly, information is simultaneously biased towards homeostasis. In the process of message transmission, the signal must maintain a high level of fidelity in order to accurately convey the information, which represents a standard that should not be deviated from. Finally, information also poses a threat to meaning because of its intangibility; without a physical presence, the relationship between signifier and signified becomes infinitely more complex and ever changing. This ultimately results in the merging of human and code: we become the machines that we create. Overall, Hayles' fear can be summed up in her statement, "Information, like humanity, cannot exist apart from the embodiment that brings it into being as a material entity in the world; and embodiment is always instantiated, local, and specific. Embodiment can be destroyed, but it cannot be replicated" (Hayles 49).

Although Hayles provides a thorough examination of the ways in which information has been traditionally disembodied through the scientific constructions of cybernetics and the literary formations of classic cyberpunk texts, her analysis is significantly limited by her adherence to traditional humanist principles. Her representation of the human body as a tightly bounded entity that must not be defiled fails to recognize the ways in which the body is constantly responding to the environment. Hayles ultimately privileges the traditional materiality and corporeality of the human body over the patterned body of information. She ends *How We Became Posthuman* with an entreaty that "we can craft others [versions of the posthuman] that will be conducive to the

long-range survival of humans and of the other life-forms, biological and artificial, with whom we share the planet and ourselves,” yet Hayles does not offer such a version. In the next two sections of this chapter, I intend to offer a form of posthumanism that can be used to understand the complex formation of the self and bodies in virtual environments.

The Materiality and Physicality of Information

“We are suspended in language in such a way that we cannot say what is up and what is down. The word ‘reality’ is also a word, a word which we must learn to use correctly.” –Niels Bohr

As has been previously explored, Katherine Hayles contests a form of posthumanism which threatens the boundaries of the body by integrating information, a supposedly disembodied entity, into the corporeal experience. Hayles is most concerned about this due to the disembodiment of information, a construction she attributes to the cybernetics movement and specifically the Shannon-Wiener model of communication in which context and embodiment are sacrificed for objective quantification. Yet it is possible that Hayles is viewing information as a nonphysical entity because of a larger cultural phenomenon in which matter is obscured in favor of the power of language and discourse (Barad 132). It is ironic that Katherine Hayles rejects the “stupefying” postmodern construction of the body as simply a “linguistic and discursive construction” while simultaneously applying the same treatment to information (Hayles 192). Perhaps Hayles is caught in the middle of theoretical maelstrom in which we are “allowing linguistic structure to shape or determine our understanding of the world... that the subject-and-predicate structure of language reflects a prior ontological reality of substance and attribute” (Barad 133). I believe that Hayles is most concerned with exactly the wrong issue. Her focus on information’s physicality and substantiation within a corporeal encasement is emblematic of

materialist discourses which are no longer effective in the Enlightenment of the digital age. In that case, it is necessary to examine how this materialism is currently constructed and privileged, as well as evaluate other alternatives proposed by other scientific communities in order to more accurately understand the materiality of the informationally bound spaces and the “reality” of experiences in such locations.

The reality of the virtual is constantly questioned: do interactions in nonmaterial spaces matter? Most often the answer to this question is “no” due to the perception that virtual experiences are transient; they are not corporeally substantiated and are essentially a simulacra of meaning. I attribute this misperception partially to aspects of Cartesian dualism, which establish the binary system of mind and body thereby separating matter and meaning. But this lack of mattering is also representative of a larger theoretical battle regarding materiality. Bodies, meaning, and matter are caught up in a whirlwind of competing theories of materiality and discourse. Physical “reality” itself is questioned for its meaning and how it *matters* (mattering in both the physical presence and the establishment of signification), resulting in increased difficulty considering how to account for nonphysical virtual “realities.” Part of the issue results from how the presence and absence binary is valued: without a physical presence, there is absence, and in the presence of absence there can be no meaning. The issue then becomes how can meaning be attributed to that which is not physical? Or are even the assumptions used to arrive at this conclusion, specifically that information is not physical, faulty ones?

Before attempting to explore such weighted questions, it is necessary to begin with the basic principles of how I am using matter as part of a larger discourse of materialism. The most basic definition of matter taught in most elementary science courses is that it is physical substance characterized by its occupation of space and possession of mass and furthermore that

everything has matter. This understanding of matter is obviously part of a larger materialist discourse in which physical presence is an essential property of all objects; nothing exists which does not have matter. But if we accept that science itself is a discourse produced by cultural constraints which in turn constructs how our “reality” is perceived and therefore constructed, this definition of matter is not really the objective truth so much as it reveals cultural biases. Physical presence is valued over the intangible, and therefore matter *matters* in determining what has meaning or even more elementally qualifies as an object. Object-hood is denied to entities which cannot meet the necessary properties of physical presence and mass. This denial of the object is readily apparent in Hayles’ treatment of information as well as more broadly in discourses surrounding the reality of digital environments.

Given this limitation of the widely accepted definition of matter to account for even the existence of immaterial objects, let alone of their meaning, I appropriate Karen Barad’s more inclusive understanding of matter. Rather than define matter in what would be a reductionist account of a complex topic, Barad describes matter as:

neither fixed and given nor the mere end result of different processes. Matter is produced and productive, generated and generative. Matter is agentic, not a fixed essence or property of things. Mattering is differentiating, and which differences come to matter, matter in the iterative productive of different differences. (137)

These general statements enable matter to be ascribed to more than traditional physical objects, thereby allowing meaning to be attributed to entities which have previously been obfuscated, most notably the digital. Furthermore, Barad’s description identifies matter as part of a process which is constructed and also constructs differences. Barad’s statement that matter is “not a fixed essence or property of things” is most useful to the analysis I intend to undertake because of its ability to transcend the boundaries materialism has artificially placed upon meaning. Now with a

more inclusive description of matter in place, it is possible to evaluate how information and its materiality have been understood in scientific fields in order to account for the process of making meaning.

Quantum physics has long been interested in understanding the relationship between information and materiality, that which is real and the unreal, and what has meaning and that which has none. Gottfried Leibniz complicates the binary between real and unreal by observing, “although the whole of this life were said to be nothing but a dream and the physical world nothing but a phantasm, I should call this dream or phantasm real enough” (quoted in Wheeler 8). Leibniz’s quote suggests that even for this formative mathematician reality is entirely subjective and relative, but there is also reality present in this relativity. His comparative mention of both dreams and the physical world as “real enough” suggests an equal amount of reality. Although dreams are intangible, they are just as real as the physical world and its ability to be touched and manipulated. Furthermore, Leibniz’s utilization of the phrase “real enough” suggests reality cannot be measured against any fixed and quantifiable rationale; reality and meaning are therefore subjective and entirely relative, although relative to what and to whom remains unknown.

The physicality of information and reality may be subjective, but many have attempted to unify the two ideations. John Archibald Wheeler’s construction of existence posits “it from bit” (Wheeler 5). Wheeler goes on to explain that “every it— every particle, every field of force, even the spacetime continuum itself— derives its function, *its meaning*, its very existence entirely— even if in some contexts indirectly— from the apparatus-elicited answers to yes-or-no questions, *binary choices*, bits" (5 emphasis mine). Wheeler continues his examination of the universe’s beginnings by stating, “every item of the physical world has at bottom... an

immaterial source and explanation” (5). Therefore, materiality is not the most elemental state of any “it,” but follows from an analysis prompted by the answer to a binary choice question, namely that of a yes or no decision. Finally, Wheeler suggests a definition of existence as that recognizes it as primarily “an information-theoretic entity” (8). He offers the field of quantum physics as the ultimate method that can answer the question of existence, but he furthermore positions information as the ultimate answer to the question.

There are two issues in Wheeler’s statement that are particularly relevant to the issues of materiality, meaning, and ultimately the question of digital embodiment. First of all, bits are the measurement system used for information exchange (Gleick 229). Bits primarily give all matter, every “it,” its meaning. Therefore meaning is central to the understanding of information. This is unsurprising considering the various models of information previously examined in this chapter that seek to solidify the meaning of information albeit in somewhat problematic ways (specifically the decontextualization of the Shannon-Wiener model in order to further objective quantification of information). Without information, there is no meaning, and the absence of meaning corresponds to the lack of information. In digital environments, packets of information as bits are constantly exchanged between signal producer and signal receiver, which may be computers or machines, or even human participants.

Additionally, “binary choices” are foundationally present in information and its functions. The system on which information is built is literally predicated on simplistic decisions that ultimately result in increased complexity. This system is in no way obscured and is named the “binary system” in recognition of this structure. All information is broken down into a series of 0s and 1s; a simple yes or no system that is capable of transmitting complex messages. Information transmission fundamentally embodies the binary philosophy that many cultural

theories have long struggled to deconstruct, including the Cartesian dualism of mind against body.

Wheeler goes further in his analysis of information to examine the role of the observer-participant in the process of meaning determination. He writes that the observer-participant “operates an observing device and participates in the making of meaning,” a concept that he defines according to Follesdal as the “product of all the evidence that is available to those who communicate” (Wheeler 13). The role of the observer has been fraught with misunderstanding and even completely obfuscated previously, especially in the early years of the cybernetics movement. The role of the observer was difficult to understand, which is part of the reason that Shannon’s model of information communication purposefully avoided discussion of the context for message transmission. Shannon and Wiener’s equations circumvent the issue of defining information so that information will have the same value regardless of the context. It is this decontextualization Hayles argues divorces information from meaning and the body (54). Hayles further notes that Shannon “did not want to get involved in having to consider the receiver’s mindset as part of the communication system” (54). The mindset of the receiver was unknowable and entirely unpredictable, so it was vital to decontextualize information in order to maintain consistent and quantifiable meaning of the message.

The function of the observing subject and the tools used for observation have been a focus of several scientists and philosophers primarily because of the previously under-theorized roles they occupy in the process of meaning making. In his examination of the meaning making process, prominent physicist and philosopher Niels Bohr “clearly contests the Cartesian (inherent, fixed, unambiguous) subject-object distinction in a way that undermines the very foundations of classical epistemology and ontology” (Barad 125). Barad continues to build from

Bohr and expands upon his fixation with the observer and methods of measurement in ontological queries, writing “the measurement apparatus is the condition of possibility for determinate meaning for the concept in question” (127). Bohr and Barad then find that meaning is attributed to the measurement tools. Phenomena and entities in themselves do not have meaning until meaning is granted through a tool or observer via a process of “intra-action” (Barad 128). “Intra-action” constitutes a process of meaning recognition between an object and the measurement apparatus, Connecting this to the Shannon model of communication, the information-message itself has no meaning until it “intra-acts” with the receiver (the observer) through the measurement apparatus. The measurement apparatus in this case may refer to the channel, such as the telecommunication wires, or the terminal, like a computer screen. I will return to this idea of the apparatus and how it relates specifically to virtual environments and the intra-action which takes place between the apparatus and the human subject to facilitate digital actions.

Barad suggests the tensions present in discussions of nonphysical entities and the meaning that is assigned to them is a result of competing schools of representationalism and realism. This friction has been present in various scientific endeavors over the years, including the first examinations of organisms and atoms through the microscope (Barad 51). The atom was initially thought of as simply representative rather than a physical bit of matter that could be isolated and manipulated (Barad 50). Ian Hacking and Barad both take issue with the methods that are used in order to “prove” physicality and presence. They identify the practice of “seeing” not as a natural practice, but as a practice that is culturally situated and requires a particular focus or lens of hermeneutical interpretation in order to make sense of the field.

This emphasis on the act of interpretation involved in the process of seeing is not unique to science scholars but is also addressed in literary studies, perhaps most notably in J. Hillis Miller's treatise "Optic and Semiotic in *Middlemarch*." Miller writes, "Seeing... is not a neutral, objective, dispassionate, or passive act. ... This projected radiance orders the field of vision according to the presuppositions of the seer. The act of seeing is the spontaneous affirmation of a will to power over what is seen" (Miller 138). Miller recognizes that the self is at the heart of all acts of seeing and interpretation that results in visualization. Like Hacking, he establishes the presence of a culturally situated process in the act of visualizing, a process that is learned as opposed to natural. Biological processes of sensory perception such as sight are then doubted for their ability to relay consistent and accurate messages, and instead these supposedly natural actions are recognized as part of a larger hermeneutical process of information selection and meaning making. Given the complicity of the biological body in interpretation, alternate forms of visualization that offer more avenues for representation in an expanded hermeneutic system must be considered.

Barad continues the examination of sight by offering a new approach to the visualization methods currently used in physics to "see" atoms beyond their contained boundaries. The process of visualization enabled by a scanning tunneling microscope utilizes "tunneling" as opposed to photo-like images used for representation (Barad 52). The process of tunneling traces the traversal of particles across energy barriers and the ensuing electrical current to map out the shape of an object by its impact on the surrounding environment. The pattern of the electrical current then results in a cartographic map that is able to visualize, much like the fable of the blind men grasping different parts of an elephant in order to understand what the whole animal looks like.

The alternative processes of visualization and representation proposed in scientific communities have real relevance to the experience of online embodiment. Whereas traditional forms of representation were limited by the adherence to physically determined boundaries and ascribed meaning based upon these tangible limits, visualization by means of the scanning tunneling microscope suggest the possibility of representational practices that are not inextricably reliant upon notions of materiality. When applied to online environments, it becomes possible to reconceive visual virtual communities as part of this alternative representation. These digital spaces then allow for a representation of a different state that was previously obscured by traditional visualizations, but a state that is still meaningful and “real” due to the transference of information and meaning.

If representation is subject to revision, it becomes necessary to determine what constitutes materiality and meaning within these new environments. The scanning tunneling microscope and Hacking’s theories of manipulability offer a new way to understand generally the physicality of information and specifically the interactions that occur in online visual virtual environments. Information according to traditional cybernetic definitions lacks physicality, as demonstrated earlier in this chapter, but perhaps this is simply because of the social constructions that have situated information as disembodied in an attempt to maintain regularity in value. Barad writes, “representationalism marks a failure to take account of the practices through which representations are produced” (53). According to this statement, representationalism is unable to identify and address the processes that bring representation into existence, and therefore the social values that support methods of representation remain insidiously invisible. Representation relies upon fixity and tangible materialism, and it not until a new form of visualization and mattering is offered that virtual spaces can be recognized as meaningful.

Barad offers a posthumanist performative in order to move away from the humanist representationalism and individualism that have only contributed to the formulation of the individual human as apart from the rest of matter (Barad 135). This agential realism “allows matter its due as an active participant in the world’s becoming, in its ongoing intra-activity” (Barad 136). Barad’s posthuman configuration is not the anti-human entity Hayles fears but is intended to decenter the anthropocentric separation between man and nature, while also deconstructing the body as a natural and fixed medium that reifies interior and exterior binaries (Barad 136).

Meaning has typically been understood almost as an essential quality; meaning resides almost naturally within an object, and it is difficult to pinpoint exactly what makes it meaningful. As previously explored, meaning has also been limited to material and physical presence. In contrast to this understanding, Barad suggests expanding so that “Meaning is not a property of individual words or groups of words but an ongoing performance of the world in its differential dance of intelligibility and unintelligibility” (Barad 149). This conception of meaning allows for a continual process of meaning creation within specific cultural spaces where it is constantly renegotiated and reconstructed. Furthermore, Barad’s theory of meaning appeals to me because of its applicability to embodiment. What happens to meaning and embodiment in online situations if her statement is recoded to be “*Embodied meaning* is not a property of individual *bodies* or groups of *bodies* but an ongoing performance of the worlds in its differential dance of intelligibility and unintelligibility?”

Embodiment of Information and the Virtual

If information has lost its body, as Katherine Hayles suggests, then it is necessary to identify how bodies and embodiment are currently conceived in the cybernetics movement as well as to construct a new model of embodiment that allows for embodied meaning within these nontraditional digital forms. Current theories of embodiment are focused detrimentally on physical presence, thereby privileging a corporeal body without considering how alternative forms of physicality can contribute to embodied experiences.

In order to begin this exploration of informational and virtual embodiment it is necessary to delve into a brief overview of how embodiment has been negotiated by recent feminist scientists and scholars. First of all, Hayles clearly differentiates the body from embodiment, writing “the body is always normative relative to some set of criteria” (Hayles 196). The body is then a socially constructed and comparative entity which is culturally located and normalized according to a generally accepted standard. Embodiment is focused on enactment, the process of being within a body according to “the specifics of place, time, physiology, and culture” (Hayles, 196). The body is a generalized image drawn from a large set of data points whereas embodiment corresponds to a specific instance of bodily experience and is performative. As Hayles writes, “the body can disappear into information with scarcely a murmur of protest, embodiment cannot, for it is tied to the circumstances of the occasion and the person” (Hayles 197). Embodiment can never be erased because it is linked to a particular entity in a given context; to “disappear” embodiment is to disappear an individual. In a visual virtual environment, the general avatar form may then be considered the body whereas the individual experience of existing as an avatar accounts for the embodied aspect.

The body exists in contrast to the individual process of being a body that is embodiment. Elizabeth Grosz explores the different understandings of the body stemming from Cartesian philosophy. Although she details three lines of bodies in contemporary thought, I want to focus on her third line in which “the body is commonly considered a signifying medium” (Grosz 9). Grosz writes the body “is a circuit for the transmission of information from outside of the organism, conveyed through sensory apparatus,” a construction of the body as a passive medium through which information can flow with little or at least predictable distortion (9). Comparing this construction of the body to the Shannon-Wiener model of communication, the body is understood as a channel for message transmission, but it is also possibly the largest contributor to noise and entropy, which can subsequently degrade information. The body is then devalued in respect to information; the high fidelity transfer of information is the ultimate goal of communication, and the body presents an obstacle to this process.

Hayles argues for a need to reintegrate the body and embodiment practices but in such a way that does not cause embodiment to be absorbed into the body. Absorption of embodiment into the body would result in the erasure of individual experiences and only contribute to an idealized amalgam of bodily experiences. She offers a binary of inscription and incorporation as a method of reintegrating the body and embodiment without the detrimental effects of erasure. In practices of inscription, it appears that the system of signs operates independently of physical manifestation much like the body, so messages show no sign of having been translated from various forms of media. Incorporation privileges the manifestation of the message within a particular medium just as much as the message; without the specific instantiation of the particular communication method, the transmission ultimately loses parts of its meaning.

Hayles' model of inscription and incorporation is appropriate for applications to cyborg interactions, specifically in traditionally physical manifestations. The role of bodies, embodiment, and consciousness for the robots and virtual reality which are her focus lend themselves to easy applicability. Yet this model is ultimately lacking for the new virtual visual environments users are increasingly using today. How does an embodied individual then perform a body and embodiment in online spaces? Can the inscription and incorporation model be adapted to an environment that Hayles overlooks, or must a new model be created?

Given Hayles' definition that the body is a normative ideal of collective physicality, it is necessary to address what constitutes a body when traditional physicality is thwarted by the context of a virtual space. Digital embodiment is complicated because there is a multiplicity of bodies present. There is the primary body of the user, but there is also the avatar body, which has popularly been configured as a prosthetic appendage of the physical body into the digital space. I believe this understanding of the avatar as a prosthetic is damaging and must be reconsidered. A prosthetic device typically denotes a lack of some sort, a void that must be filled, a limitation that must be compensated for. The prosthesis may represent a way to compensate for the lack a body may experience, but it also relies on the body for its meaning; without the physical body, the prosthesis has no function or purpose, it is solely a mechanical tool. In the comparison of an avatar body to a prosthesis, the avatar body is merely an extension of the physical body, which is posited as the primary meaningful body. The avatar body is then simply an appendage of the physical body and relays experience back to the controlling corporeal body.

Hayles' greatest problem in her incorporation schema is that it does not allow for bodies to exist outside of traditional corporeality. Bodily practices of action and movement are often considered to be so habitual as to be entirely subconscious: the normative body performs

movement without even having to engage the mind. It is from these experiences of embodiment that incorporated knowledge is developed. But the digital body confronts this apparently natural ease of bodies because nothing happens online that is not intentional. Hayles also assumes that the context in which bodies find themselves will always remain the same. Although the context may change, it will still exert pressure on the body that aids in how the body is constructed and configured.

In spite of the extensive theorizing on embodiment practices and constructions of the body, these theories are ultimately limited because they focus only on the physical presence of the body. Grosz writes “there are always only specific types of body, *concrete* in their determinations, with a particular sex, race, and physiognomy” (19 emphasis mine). Her emphasis on the concreteness of bodies, the illusion of wholeness in regards to identity characteristics, is not applicable to online environments and the bodies that inhabit them. Together, the supposedly fixed nature of the body and its construction as a passive medium compose the primary understanding of bodies in virtual environments. In virtual spaces, information exchange is once again the primary objective, and the avatar body is only understood as a conduit for such exchanges. Ultimately this results in the perception of the avatar as meaningless because it is not traditionally physical but is instead a pattern of information.

There is no question that digital environments and the bodies inhabiting within them are not tangible in the sense that is currently understood and therefore privileged in a materialist culture, but that does not necessary mean that there is a complete dearth of physicality, matter, and meaning. If manipulability, as Hacking suggests, is a criterion for determining the reality of a particular object, then it follows that virtual interactions are real due to the ability to manipulate and be manipulated, to effect and to be affected that occur in such coded environments.

Cyberspace is “about negotiating the tensions between individual subjects, virtual collectivities, and the physical bodies in which they may or may not be grounded” (Stone 35). This understanding of cyberspace recognizes that there is not a simple one to one correspondence between a self and a body, signifier and signified, but instead a complex system of relations that are constantly being negotiated with the self, others, and the digital space. Stone additionally notes that technology produces a “socially apprehensible citizen,” defined as a “collection of both physical and discursive elements” (41). This collection of elements results in a legible body that is social and conforms to the cultural codes and values of the digitized space. It is important to note that the physical elements Stone references do not necessarily refer only to material and tangible items, but instead physicality is open to reinterpretation in the virtual environment especially as an indicator of presence. Stone notes that one of the most important aspects to reconsider in cyberstudies is presence. Presence is more than simply the physicality of being; according to Stone, it is also related to the sense of agency, or “the proximity to intentionality” (16). Cyberspace confounds basic readings of presence, and also forces theorists to identify the importance of presence in the first place. Is presence necessary for agency and intentionality? If so, how is presence defined in an inclusive way to account for the lack of a typical presence in virtual settings? Is a body necessary for presence, and if so, what constitutes a body?

As Niels van Doorn notes, the virtual is often constructed as a “state of unreality or absence” largely determined by “the opposite or a lack of ‘reality’” (van Doorn 533). Following Deleuze and Bergson, van Doorn offers a resolution to this conundrum by casting the virtual as a form of memory. Although virtual experiences may not be tangible, they can become materially actualized so as to function much like memory. Memories are similarly nontangible, and yet they are commonly recognized for the ways in which they transform and can be transformative in

lived experience. Furthermore, memories are not subject to the mind and body dualism because they are manifested in both mind and body often in integrated ways.

This understanding of the virtual as compared to memory is useful to the extent that it demonstrates a nontangible phenomenon has been widely accepted as “real” and “meaningful,” but the virtual as memory cannot be the only way to understand the reality of virtual experiences. The “virtual as memory” construction is limited because it is only through a transformative process of encoding an experience into memory through a corporeal channel of the brain and body does the memory become materially actualized. For virtual experiences, this means the meaning of an online interaction only occurs after the experience is physically processed by a corporeal body. While the memory actualization model proposed by van Doorn is a beginning towards understanding the reality of virtual experiences, there is still a need for a theory of the virtual’s reality that can account for the meaning of an experience as it is occurring.

Instead of van Doorn’s formulation of the virtual as memory, I prefer to utilize Karen Barad’s construction of an apparatus (as influenced by Niels Bohr) in order to offer the beginning of a mechanism for representing and actualizing the virtual. Barad defines apparatuses as “specific material reconfigurings of the world that do not merely emerge in time but iteratively reconfigure spacetime as part of the ongoing dynamism of becoming” (Barad, 142). These apparatuses are active in the production of the phenomena they simultaneously observe, and the situated location allows the process of observation to be transparent (Barad, 142). There is no binary of inside or outside, present or absent from the system for the apparatus to become trapped within. Furthermore, the emphasis on the ongoing process of becoming suggests a non-fixed and constantly negotiated practice that corresponds to the similar becoming that is the construction of space, bodies, and identities within digital spaces.

Barad offers an agential realist apparatus. I argue the computer terminal and digital programs act as the apparatus in virtual digital environments. They are produced by and subsequently produce particular cultural ideologies regarding bodies and experience. Since an apparatus is partially determined by its ability to measure, the technological interface is particularly well suited to this function because it measures a sense of reality. This construction of the apparatus emblematically resists boundaries; it is impossible to tell where the apparatus begins and where its limits exist. For a digital space, this agential realism provides the beginning methodology for stepping outside of traditional practices of representation and mattering in order to account for the complex and ever-changing relations of bodies and information.

New Assemblages and Methodologies

The exploration of this chapter has occurred in multiple modes, and the assemblages will be further explained in the next chapters of this thesis. Up until this point, I have focused primarily on academic disciplinary understandings of embodiment and bodies of various sorts, including information, communicative messages, texts, and accumulated knowledge. Yet none of the addressed works in isolation are able to fully account for the multifaceted experience of digital embodiment and existence. I am further convinced that a singular methodological approach to studying digital embodiment, specifically the methods of critical analysis I have utilized in this chapter, is limited in its ability to fully address the complexities of nontangible reality without needing to conform to confining pre-established theories or resorting to reductionist statements which compromise the applicability and effectiveness of a given theory. For example, I recognize my own complicity with assigning value to physicality as a method of determining the meaning of a particular experience; I feel the need to justify information's embodiment by demonstrating how it can alternatively be classified as a physical entity, thereby

reifying the problematic structure in which materiality is necessary to construct meaning. I believe that by expanding the available methodologies, as an interdisciplinary subject like digital embodiment warrants, it becomes possible to transcend the need to respond to an already problematic argument and look instead to new productive ideas.

Part of this new methodology must be to include a heightened awareness of the observer's own subject location and the possibilities of situated knowledge production as a potential benefit rather than a relativist liability. Academics are committing Shannon's crime as predicted by Miller and Barad: we are obscuring our role as the observer and attempting to remain objective by separating ourselves and our bodies from the phenomenon we intend to study. Furthermore, it can be argued digital humanists, including Katherine Hayles, are in fact contributing to the disembodiment of digital experience by completely neglecting the phenomenological experience of having and being a body in a virtual setting. Essentially, scholars have managed to form a gap as focus has been limited to theorizing around the digital body without ever occupying the position of a digital body and then theorizing through this subject position. For this reason, the traditional methodology of literary analysis that privileges textual accumulation, close readings, and synthesis must be supplemented, not supplanted, by alternative epistemological methods influenced by performance studies and phenomenology.

Instead of defaulting to a methodology that has become forged into the circuits of my own neural pathways and thinking processes, I suggest a theoretical shift that is more illuminating of the observer's role in digital epistemology and thereby privileges specifically located knowledge. Beginning first with the body in digital and virtual environments and experiencing such embodiment and (non)corpo(reality is the first step towards understanding (and subsequently theorizing) the experience of the body within such spaces. In order to

accomplish this, it is necessary to examine how new media artists in a multitude of media have embraced the mediation of bodies within digital and virtual environments.

Chapter 3: Art as Embodiment

Art as Embodiment

It may be a surprising transition to move from theoretical realms of quantum physics, computer science, cybernetics, and resultant modes of embodiment to a discipline as radically different and historically disenfranchised as new media art. In spite of this abruptness, the disjuncture offers a productive transition for it provides an alternative perspective and allows a new assemblage to develop thereby preventing stagnation in understandings of embodiment and allowing flights of fantasy that may be more able to account for the fantastical nature of the digital-corporeal interface.

In respect to practicality, I must address the question “why art?” in all seriousness. Art, in all of its far reaching extensions, is often simultaneously establishing and contesting established issues of representation, experience, and performance. These key phrases taken alone are central conflicts found in feminist studies, cybernetics, and various strains of science, although science tends to obscure these issues in an attempt to veil subjectivity in objectivity. The meeting of these various fields represents an interstice where I choose to position my research; therefore, it seems obvious to include art in the discussion to further nuance and complicate already complex issues of embodiment. Art has a rich history of theorizing issues of representation, experience, and performance in a variety of media that are productive to facilitating a new conception of digital life and bodies.

Art has long explored the possible expressions of representation ranging from modes of realism to surrealism and beyond abstraction. Since representation is an ever present issue in terms of embodiment, as in what bodies come to matter and how they are subsequently represented, there are productive overlaps with art that can be useful for developing a more

nuanced and phenomenological approach to digital embodiment specifically. The not necessarily correlated exchange between reality, perception, and representation is then a concept inherently present in discussions of art and theoretical approaches to art. Art complicates simplistic understandings of this dynamic; perception is constantly questioned in regards to how accurately even supposedly objective sight can portray reality, and then issues of representation further dismantle any lingering adherences to the idea that representation is accurate and objective.

The relationship between art and performance is undeniable, especially as many theatre and art departments are transitioning to a “performance studies” based model to incorporate interdisciplinary approaches and sidestep traditional relationships of art in favor of a more postmodern representation of bodily experience. Performance itself has a twinned meaning. Performance has traditionally been understood as an art form and most significantly as a dialectic experience between an artist or her work and a spectator (Allegranti 4). But performance has also developed into performativity, an action of political construction and deconstruction, an act of doing and undoing one’s subjectivity (Pollock 83).

It may be argued that feminist theory has adequately provided a significant compilation of texts regarding the relationship between embodiment and performance³, but I have found these texts have not permeated as far as one would imagine or hope. Although artistic studies have theorized embodiment and performance in artistic productions, and feminist texts have similarly attempted to account for issues of embodied experience and performance, these

³ Judith Butler argues gender as an iterative performance rather than a naturalized embodiment, Sandy Stone offers performance as a method to explore the multiplicity of bodily and discursive identities, and Bernadette Weggenstein examines how the female body literally becomes a canvas for 21st century artistic performances contesting gender, sexuality, reality, and representation.

rhizomes have not been effectively brought into synthesis regarding issues of digital embodiment.

Following these discussions of the theoretical potential available through art, I am specifically interested in narrowing my focus to digital art productions for two main reasons. First of all, art is inextricably linked to the body, whether it is the body of the producing artist, the body of the text being produced, or the body of the spectator in relation to the former, although often there exists synergistic combination of these elements. In digital artistic pieces, the body cannot be taken for granted because of its readily apparent constructed nature. Secondly, the previously mentioned relationships between bodies of artists, texts, and spectators are a central issue in artistic studies. In digital art, the typical boundaries that separate and make distinct these separate roles are often intentionally obscured. If new methods of visualization and representation are necessary to fully account for digital experience as I suggest in the previous chapter, then these contested relationships explored in new media art provide an entry point for such a new examination. Given these fluid contestations, digital art allows for a more nuanced examination of the complicated issue of digital embodiment.

Perhaps surprisingly, art has often played with themes of technology, exploring the overlapping boundaries of the body and the machine, and also introducing new technologies into the production of art. Jennifer Parker-Starbuck writes, “thought of as a tool [technology], we build, control, develop, push forward, and have always done so; the body (human being) develops the technology” (10). But in the case of digital media installations, the technology is building a body, or at least rebuilding.

As always, it is necessary to begin with a limitation and a definition. The purpose of this project is not to define art; there are bookshelves on the topic and still no definitive conclusion

seems to have been satisfactorily reached. I will limit my focus to digital art, which in itself does require at least some characteristics. The work of art in the age of digital reproduction is ever more contested as boundaries between old and new media shift and overlap in interesting ways. For example, should an oil-work painting captured by a digital camera be categorized as digital art? Can digital art be created using traditional artistic methods? At what point does art become digital?

Although this study is limited to an examination of digital media productions, I find it necessary to delineate the impetus that compels me to define and discuss new media art. I do not believe that there is anything essentially “new” about new media except that it perhaps makes more apparent issues of representation and construction than supposedly “traditional” forms of artistic expression. In fact, there is a danger in creating a new binary of new media and old media, a dualistic mode of thought I am resistant to reifying in this exploration. If anything is new, it is simply that digital and new media methods offer a disruption to ways of reading and responding to artistic productions to which viewers of traditional art have become acclimated and acculturated. For example, when in a gallery viewing a painting, a medium that would be considered “traditional”, the artist, the artistic production, and the spectator are involved in a dialogic experience. The spectator and the piece inhabit a bounded space in which cultural expectations and social relations are constantly regulating what sorts of behaviors and interactions are allowable between viewer and painting and among the spectators themselves. The established distance between viewer and artistic production, often marked by the presence of a physical barrier such as a rope or a guard, limits the types of interaction available although there is still a dialectic present. Even the bodies of spectators as they move throughout the gallery space are regulated so that embodiment is experienced in accordance to the spatial social

norms. Even when participating in the viewing of traditional medium, interaction between the viewer and production and the possibilities of embodiment are constantly susceptible to social and relational expectations. There are always issues of bodily representation and the co-constructed nature of art at play in supposedly “traditional” art forms, but digital media brings these issues out of obscurity by making these themes the subject and method of art pieces.

Digital art as a genre has been renamed and redefined on multiple occasions as the media utilized and the assumptions about the genre have been in flux. What was once called computer art and then multimedia art has now been branded as new media art (Paul 7). While this nomenclature recognizes the hybridity of techniques used to produce artistic texts, the “new media” is also juxtaposed against “old media” without any clear distinction regarding what exactly is new. It is clear from the wide variety of production methods that there is not an overarching set of new media aesthetics. Christine Paul offers two distinct types of digital art: art objects that are produced using digital technologies as a tool, and art objects that use digital technologies as the medium (8). I intend to focus on art that uses digital technologies as a medium because most current methods of artistic production require the use of digital technologies in some part of the process, whether it is the use of Photoshop or editing software. I am most interested in digital art that utilizes digital technologies as a method of expression and representation.

The particular relationship digital art has to expressionism and representation is not an isolated one. Digital art is influenced by the same historical artistic trends present in pre-digital productions, but it has developed special connections to Dada, Fluxus, and conceptual art (Paul, 11). Paul writes the importance of these movements resides in their focus on “concept, event, and audience participation, as opposed to unified material objects” (11). These movements have

typically questioned the relationship between meaning and representation, and so it is highly appropriate that methods of digital art creation have integrated this skepticism regarding the possibility of ever creating an accurate representation.

Digital art has a few characteristics that make it particularly well suited to developing a new theory of embodiment. Although not all productions may display all of these traits, these are still predominant features that separate artistic creations which use digital technologies as tools from those that use the digital as a medium. One primary characteristic is digital art's interactive and participatory nature. Digital art has borrowed much of its structure from computer and technical systems, specifically the need for constant input and information in order to produce output. Although viewer perceptions of and interactions with pre-digital art forms (theatre, painting) have generally contributed to the illusion of the fourth wall, an invisible barrier that separates the audience from the artwork and maintains the piece as isolated from its context, digital art has openly flouted this convention by typically developing an open structure. Often digital art requires the active participation of the viewer in order to (re)compose the project, thereby removing the artist as the sole creator and instead introducing a collaborative authorship. Although it can be argued that viewers or readers of artistic productions have *always* interacted with a piece through reception theory and the process of interpretation, digital interactivity has made the user's participation in the artistic production overtly present as the user "corporeally influences the body of a digital text itself... in real time" (Morse 18). This interaction further promotes a sense of immediacy, one of the qualities of new media which encourages the viewer to become intimately involved with the image and its production while simultaneously distancing the creator from the piece (Bolter and Grusin 28)

Interaction further breaks down the perceived boundaries separating audience and artist, the digital from the physical. The viewer's participation in the creation and performance of a digital piece transcends the physical world instead offering a collaborative connection between the two spaces. Feedback from the digital piece itself, whether it is through the presence or absence of an expected stimulus, conditions an appropriate response from the user to continue an input of data. In this sense, the role of the digital technology is not a passive medium through which data passes, but rather an active participant involved in a responsive exchange of information (Morse 20). Bolton and Grusin note that this immediacy and interaction allows the user to experience immersion and projection of the self into the digital environment, which contributes to the sense of "reality of the image" (31). Although Bolton and Grusin's work references earlier forms of virtual reality and gaming systems, their evaluation of the self-projected immersion into a digital reality is perhaps even more applicable to the newer forms of visual virtual spaces wherein the avatar body is increasingly realistic and therefore more open to such self-projection and identification.

There are obvious limitations to the interaction between human-user and machine. This interactive nature of digital projects presents somewhat of a paradox. On the one hand, one of the overarching desires of technology is to become an immediate presence that exists at a subconscious level, yet simultaneously the digital project requires constant input from the observer, thereby challenging the possibility of immediacy. Furthermore, the ability to interact outside of the program is nonexistent. The user is only able to interact with the art-machine in ways that have been built into the program (and therefore validated) by the artist. This limitation further augments the illusion of immediacy; the ruptures become readily apparent and can present a source of frustration. In spite of the limitations to interaction, there still exists a wealth

of productive possibilities between human and machine as exemplified by other characteristics of digital media and the specific productions I intend to analyze later in this section.

A second characteristic which overlaps digital art and virtual embodiment is the difficulty in preservation and recreation. Since many digital art pieces are performance based or installations requiring interaction, preservation by traditional methods are insufficient to account for the complexity of experience. “Any time-based art piece, such as a performance, is essentially ephemeral and often continues to exist after the event only in its documentation” (Paul, 25). Such difficulty in preservation and transmission results in a piece that is constantly in flux and never stasis; whereas a sculpture (barring destruction) will remain physically intact for a viewer, the digital piece may exist only in active performance and can only be recreated through memory. This transience is also a common charge levied against virtual experience; it is somehow less “real” for its intangibility, and therefore it is considered only a fleeting experience rather than continued and meaningful.

Even within artistic ventures there is the preoccupation with physicality. Paul notes that computer generated art has been associated with the lack of relationship between the artist and the “mark,” or that there is “a significant lack of personality in the mark one produces on a computer screen as opposed to one on paper with canvas” (60). This statement recalls the conception of other digital spaces as unreal or somehow disembodied. Yet even though the method of artistic production is changed by the introduction of digital technologies, there is still the presence of the artist’s own aesthetic as well as the bodily action required in production. Paul further writes “ultimately, every object—even the virtual one—is about its own materiality, which informs the ways in which it creates meaning” (70). Once again, materiality is linked to

meaning, as the form of an artistic production is directly related to the meaning available. This problematically suggests that art is tied to physicality and tangibility, but I believe an exploration of bodies within digital art will demonstrate new methods of embodiment and meaning unrelated to physical presence.

Theorizing Embodiment in Digital Art

Digital artists have been theorizing the role of the body in its various forms of representation in digital productions for quite some time. Yet these theories have not been applied widely in cyberstudies to further complicate the rather simplistic binary conceptions of the body in a digital space. By examining some of the theoretical groundings of digital art embodiment, I hope to make connections back to the information studies and sociocultural experiences of digital bodies and identity in order to offer a more nuanced performative embodiment theory.

Often when the body has been theorized and represented in digital installations it has been configured as the cyborg body. In contrast to Katherine Hayles' posthuman and Donna Haraway's metaphorical cyborg, the cyborg as represented in art and popular culture productions has typically featured the integration of technologies into the corporeal fleshiness of a human body revealing the anxiety produced by the thought of the merger of flesh and silicon.⁴ Although the cyborg body has become a fragment of popular imagination, it is limited in its utility in terms of understanding digital embodiment. The cyborg still exists as an abject Other. It does not help

⁴ See Mary Shelley's *Frankenstein, R.U.R.* by Karel Capek, Sophie Treadwell's *Machinal*, Eugene O'Neill's *Dynamo*, Philip K. Dick's "Do Androids Dream of Electric Sheep" and the subsequent movie adaptation *Blade Runner* directed by Ridley Scott, William Gibson's *Neuromancer* series, Joe Davis' science meets art productions, among the other uncountable artists in a variety of media who have addressed the topic.

the millions of people who would prefer to be a Goddess rather than a cyborg and who resist the new identity imposed by the integration of mechanical, digital, and technological into the body.

The cyborg is typically understood through the process of technology being integrated into the physical body. This is partially due to the sociocultural ways in which materiality and physicality are privileged over the seemingly disembodied and therefore meaningless and subsequently subhuman technological form. However, this one way relationship between the body and technology also stems from historical context; when the developing cyborg held particular fascination for theorists and creative minds alike, there was no alternative technologically bound space for the body to exist within and through. This limitation of the cyborg then contributes to the fears posthumanism presents for theorists such as Katherine Hayles, who are concerned about the blurring boundaries between machine and man as it will negatively affect definitions and constructions of humanity. Unless the conception of the cyborg expands, it is ultimately too limited in order to account for the new subjectivity and embodiment promised by incorporating the body into the digital. But the expansion of the cyborg to include embodied experience integrated into the technological and digital can alleviate some of the fears by allowing for new subjectivities to develop that sufficiently merge pixels with cells.

Digital embodiment is not simply an issue of which bodies mean what, but it also presents an affront to theories of humanist subjectivities which have constructed the body as inviolable. In the face of the human-digital integration, the question then becomes which bodies mean what to which self at what point in time. Poststructuralist and deconstructivist theories of the 20th century have questioned the very foundation of selfhood, undoing the image of an generative and unified self and instead offering the subject who is multiple, fragmented, and

fluid. When the digital is integrated with poststructuralist forms of subjectivity, the posthuman is produced, a formation that Katherine Hayles argues as a problematically disembodied subject that is “anti-human” (286). Furthermore, the poststructuralist subjectivity tends to address solely the psychical topography of the subject as multiple and fragmented; there is not understanding of ways in which the body can be extended, splintered, or even exist outside of discursive situations. Perhaps the best example of the absent-present formation of the body are Deleuze and Guattari’s bodies without organs (BwO). Deleuze and Guattari call for the reader to “find movements of deterritorialization, possible lines of flight, experience produce flow conjunctions here and there, try out continuums of intensities” in order to become a BwO (161). While the BwO is useful because it emphasizes the constant process of becoming involved in subject creation and denaturalizes the body as a stable form, it is still necessary to integrate sensory experiences of embodied being into the posthuman construction in order to fully understand digital embodiment.

The experience of bodies in digital environments also requires a phenomenological approach in order to properly value the sense of “being” that abstracted theoretical approaches tend to negate. Paul Sermon’s *Telematic Dreaming* (1992) consciously addressed human interaction mediated through digital technologies, specifically focusing on the states of “touch, trust, vulnerability” (Kozel 93). The installation utilized two separate rooms each containing a bed and video equipment. A performer lay on a bed in a room apart from the audience installation interface, and the image of the performer and her movements was then projected onto the bed in the other room open to the public. The audience was invited to join the projection of the performer in the bed, and the audience member’s image and movements in the bed were then beamed back to the performer, who could watch and interact with the audience member by

watching monitors placed around the bed. Participants in Sermon's installation often began by using hesitant movements as they explored the intimacy and physicality of the bed space also inhabited by the digital projected image of a stranger. Typically the movements became progressively freer and increasingly resembled forms of dance contact improvisation as the audience member and performer inter- and re-acted to the absent yet present other body in the bed (Kozel 93)

Phenomenologically, *Telematic Dreaming* represents perhaps the best case study to provide insight into the complexity of digital embodiment as not only a corporeal phenomenon but also a psychological and emotional experience in which distinctions between real and unreal, virtual and actual are contested, obscured, and ultimately found lacking. Susan Kozel, one of the performers in the installation and a trained dancer, writes, "When the movement moved through us in this way, based on openness and trust, the distinction between which bodies were real and which were virtual became irrelevant" (94). For Kozel, there was no longer a conscious recognition of which body was which; there were simply bodies, bodies that mattered not based upon perceived physical boundaries but the social interactions capable of exchange. She also noted the physical pain and the heightened awareness of her bodies the installation caused her. While performing in the installation, she was unaware of any discomfort, but after the performance she became hyperconscious of body aches, pain, and her physical body's typically invisible processes of breathing and digestion (95). She uses the term "disintegrating" to describe her changing relationship to her bodies, although with her description of the events, I would argue it was more of a process of boundary disintegration and bodily reintegration in unexpected ways.

Even though all of the interactions Kozel experienced as part of the installation were mediated through a doubled process of digital projection, she still felt these experiences bodily. Erotic moments opened Kozel up to intimate connections of trust as a participant touched the image of her inner thigh and jarring moments of sexual violence when a man exposed a knife in the bed (96-99). Ultimately Kozel's participation in *Telematic Dreaming* provides a more nuanced and complicated understanding of bodies as they exist and feel in digital embodiment than abstract theories suggested by Hayles, Grosz, and others are able. It is for this reason an inclusive theory of digital embodiment must utilize the experience of bodily relations in virtual environments, specifically by engaging with the most embodied, experiential, and performative art forms as a method of developing a practical approach to being a digital body.

Kozel's reflections upon her involvement in *Telematic Dreaming* require a new theory of embodiment that can better account for the sensate experience of both the physical and the digital. In her narrative, the distinction between digital and physical becomes increasingly blurred, and essentially the distinction *no longer matters*. As such, any theoretical development that continues to separate these two spheres with clear cut boundaries is bound to fail by its insistence on rigidity. It is for this reason I wish to examine the Deleuzian baroque and process of folding as reenvisioned by art embodiment theorist Anna Munster to account for virtuality, physicality, and bodies.

Anna Munster offers the Deleuzian theory of the "baroque" event as a way to resolve the conflicting expectations and theories associated with bodies, the virtual, and art aesthetics. Harkening back to an early artistic movement, the baroque is intended to rethink the nature of time as not historically locked but rather able to flow, converge, and diverge into new artistic productions (Munster 5). Munster further offers the Deleuzian fold as a way of understanding

the “curious contiguities and collaborations” existent among the body, materialities, and the machine (31). The metaphor of the fold is particularly apt here because it demonstrates unity as two separate spaces are joined together, but the fold also emphasizes the difference (31). The two folds meeting in Munster’s understanding are “the production of contemporary embodiment — the corporeal experiences of living in and through information culture— and the relation of this to its aesthetic, epistemological and ontological genealogies” (31). Munster further avoids the somewhat ubiquitous question of the digital’s ontological status, specifically the reality or “un”reality of the space, by asking instead what experiences can be expected under such conditions (34). The combination of the baroque and the fold shifts the question of *what* forms of embodiment and digital experiences are occurring to *how* are they unfolding and how are they further expanding the possibilities for convergences and divergences in terms of materiality and embodiment (41).

Munster’s joint theory of the baroque and the folding provides a more complicated perspective on the digital as an aesthetic and functional space than current conceptions of the digital as virtual and empty allow. Instead of perpetuating a simplistic and reductive binary of real and unreal, digital and physical, the baroque offers a way to negotiate the tensions and similarities. The act of folding brings together disparate locations in order to facilitate the appearance of a unified experience. If the experience of existing in a digitally created body located within a virtual space can be understood via the fold, an experience that is then brought to meet the different and yet same corporeal and physical existence of bodies and being, there is no longer a need to privilege one instantiation of the body over the other. Real and unreal, corporeal and digital, flesh and pixels then do not matter in how they express various

experiences; they become simply different ways of examining the ultimate experience of holistic digi-real embodiment.

Dance and Digital Embodiment

I am particularly interested in examining how dance has embraced digital technologies as a medium of expression and what this means for digital embodiment. The use of the mechanical or the digital does not erase the body, but instead opens a new dimension for explorations of the body's boundaries. As choreographer Linda Austin writes, "as a choreographer, the fascination with the 'mechanical' is part of my insistence of the ineluctable materiality of the body—our interface with the physical world it inhabits" (Austin 427). Although Austin's work is focused on evaluating the production of bodily movements as aided by mechanical props, her emphasis on the "ineluctable materiality of the body" is applicable to digital performances in spite of the importance of materiality, a notion previously troubled by Karen Barad. Her use of the term "interface" in terms of the body as a meeting space for exterior physical objects and surrounding space is also reminiscent of the Deleuzian fold concept in addition to technological associations of the term. The body's function as an interface suggests that dance can open up new forms of spatial embodiment outside of the limits currently offered by the virtual and real divided experience.

Dance is the most embodied of the artistic productions because the body is literally molded to conform to the expression of the choreographer and the actual performer. Any and all expressive meaning is mediated by the body. No performance is ever stable; the nature of dance is that variations will always exist no matter how many performances occur. It is this fluidity of expression that makes it a particularly appropriate artistic production in order to examine how virtual bodies may be reconceived. Leventhal writes "dance helps us to both uncover and own

the enlarging pattern, and the ‘movement’ helps to identify the primary exploration of self discovery and awareness” (qtd. in Allegranti 37). According to Leventhal’s understanding, dance is not simply about the artistic study of bodily movement, but it is also a method of exploring the self that is not typically embodied. The “enlarging pattern” suggests that dance can go beyond the corporeal instantiation of the body to also include exterior and nontangible forces that influence the self in order to provide a more complex understanding of the multiply embodied self. This exploration of relations between the body and space, the body and exterior objects, and even the body and the self, suggests that dance is a valuable method for complicating notions of embodiment in new forms and positions.

The incorporation of dance into this study is also a result of experimental approaches to Dance Movement Psychotherapy (DMP) and the focus on embodied experience. Dance posits a new approach to embodiment that focuses on the body’s active role in subjectivity creation. Rather than positioning the body as the passive medium through which the psyche and cultural values move through, DMP practitioner Allegranti establishes the body as part of the “process of *becoming* as a way towards embodiment, a *coming into* the body” (33). DMP’s founding philosophy in which the body’s sensory experience presents a method for examining constructions of the body in relation to itself, others, and the surrounding space. The body is then not a sedimentary and whole form, but it is always part of a productive network of negotiation and tensions. Allegranti writes, “movement provides the interstitial space between intersubjective bodies where it is possible to focus on the details of how the body is ‘layered’ or made and the ways in which it may need to be ‘undone’ and ‘re-made’” (34). She develops this idea of “un/doing” writing, “the moving body can deconstruct and re-constitute meanings or personal texts with an awareness of the embodied political aspects of sexual and gendered

performativities” (43). Within the interstitial space created by moving bodies, performers (or even more generally participants) reverse the Cartesian mind-body split by simultaneously experiencing outward biological corporeality and inward emotional responses to performative movement. Dance ultimately allows the participant to experience new forms of subjectivity by integrating aspects of the self typically separated in a productive process of actively undoing and recreating. Dance’s confrontation of fixity is especially useful for reconsidering digital embodiment, specifically the experiential and situated knowledge produced by a digitized form. Accepting the premises proposed by Allegranti that the moving body allows for explorations of the self and its relation to external and internal forces in a process of un/doing, it is then possible to further evaluate how digitized dance can similarly produce new bodily experiences.

One of the peculiarities of dance that makes it so applicable studies of digital embodiment is the body and space dichotomy in performance and theoretical criticisms of dance. Dance has been said to produce an interface, or a meeting of body and space, through which “material bodies being in contact with space” and influences how “we perceive the world around us and relations to that world” (Briginshaw 1). Instead, I view the interface as one of Munster’s folds, or a moment in which bodies and space, apparently disparate instantiations of the same, meet to form a relational moment. This interface deals directly with the absence and presence binary typically associated with digital settings. However, instead of reifying such a problematic binary, dance is able to confront and resist simplicity by offering an infinite relationality rather than a limitation. Space is no longer coded as an emptiness or an absence of presence, rather it is itself a relation that can contact the body and helps to produce the constantly redefined and fluid boundaries of the body. In this sense, absence does not represent a lack and instead is just as vital as materiality to the construction of the body and its subjectivity. Space is not an extension of the

body or the marked absence of a body, but it is a relation of the same to the body that contains always a potential for action, not an absence but simply a moment of “not yet.” Valerie Briginshaw writes, “In a very fundamental and immediate way dance presents representations of bodies in spaces, their relations to the spaces and to other bodies” (5-6). Space then between bodies is once again not an absence but similarly plays an important role in the relationship between other bodies; the space functions to separate and distinguish bodies from each other, contributing to the constitution of individual embodied subjectivity. When these defining roles of space are then applied to cyber-space specifically, Allucquere Rosanne Stone calls it a networked collective structure where technology meets the social (Stone 38). It is specifically for this reason that I choose to evaluate dance as a methodology for understanding the complexity of bodies engaged in digital interaction.

It may appear counterintuitive to evaluate how digital environments such as cyberspace are constructed as actual spaces due to their supposed immateriality. Yet the spatiality of cyberspace is noted even in the term itself, suggesting that the space is an integral part to the understanding of digital environments and the behavior of bodies within it. Elizabeth Grosz writes that subjectivity is partially determined by its ability “to be situated in the space occupied by its body” (47). As previously mentioned, space functions to create shifting boundaries of the body that construct individual or collective subjectivity, and as a result space is an integral component of self-creation. As space changes, so does the subjectivity available in it. Jaishree Odin offers a more applicable definition of space for digital studies as “an intensive space characterized by forces rather than forms, directions rather than dimensions” (Odin 453). Here space is recognized as containing forces, non-material shifts of power that are able to cause effect in spite of this lack of traditional materiality, and this symbolizes a move towards

relational rather than object-oriented analysis. Although Odin is specifically referring to hypertextual narratives, her point is still relevant to an exploration of digital spaces like this that seek to move away from traditionally materially bound understandings of space and bodies.

In addition to the representations of bodies possible in cyberspace, the digital also allows the expansion and even the obliteration of the boundaries that typically contain and restrain embodied experience. I wish to focus on the digital intersections with dance because the body is afforded extensions through digital technologies, not limitations as digital embodiment has most often been understood. With the development of cameras with the ability to manipulate film speeds to a greater extent, the body's movement has also been open to extreme manipulation resulting in extreme movements freed from the constraints of embodiment when it reproduced through film. This results in the extension of "the physical capacity of the dancing body" for the performer, and "the spectator is able to see facets of the performer that could not be seen with the naked eye" (Dodds 219). Here the digital technologies are used to augment the possibilities of dance. Whereas "traditional" dance may be limited in its expression by the distance between the audience member and the performer, often a space of multiple feet, the ability to perceive the performer close-up invites the audience member to a closer experience. The presence of digital technologies in this sense actually expands the movement available to a performer, essentially creating a body that is simultaneously part of and outside of the physical, an extension that can be examined through the artistic productions resultant from the meeting of popular music and web technologies.

Bodies are Not Lost: Digital Dance Productions and Embodiment

As previously mentioned, dance is perhaps the most embodied of the arts because of its relationship to the corporeality and spatiality of the performer. While these are vital

characteristics that separate dance from other similarly performance based arts, these characteristics have also been subject to play. Several artists have taken advantage of the affordances allowed by technologies and the bodily representations and extensions possible to contest the body and its existence in these digital spaces.

In July 2011, pop music group OK Go, modern dance troupe Pilobolus, music video director and choreographer Trish Sie, and a team of coders from Google Japan collaborated on a music video project entitled “All Is Not Lost,” which was intended as an outreach message to Japan after catastrophic natural disasters (OkGo "A Message"). OK Go was already renowned for their viral music videos that combined catchy tunes with choreographed feats performed by the band members themselves, including the motions of a highly orchestrated Rube Goldberg machine. In past videos, specifically the Grammy award winning “Here It Goes Again” treadmill dance routine, the group has played with the frame of the music video and the spatial relationships possible within the confines of the screen. The collaboration with Pilobolus, an acclaimed dance company devoted to pushing boundaries of dance through athleticism and playing with structure and form, resulted in the digital project “All Is Not Lost.”

Unlike most music videos, “All Is Not Lost” was designed specifically for an Internet interface in order to incorporate new HTML 5 technologies. HTML 5 is the newest version of Hypertext Marking Language (HTML), the stuff that websites are made of. It combines preexisting coding languages such as past versions of HTML, Cascading Style Sheets (CSS), and JavaScript in order to create an inclusive web experience without the need for additional browser plugins. This allows for an integration of images, video, and sound into all parts of the browser screen without the typical segregation of each element experienced in past surfing experiences. HTML 5 allows for an integrated interactive multimedia and multimodal experience that has

been explored by other musical collaborative projects, such as the joint Arcade Fire and Chris Milk film for “The Wilderness Downtown.”

In the case of the “All Is Not Lost” video, a total of twelve web browser windows are used throughout. Upon opening the website, the user is prompted to enter a message using Roman or Katakana characters, thereby allowing for a multilingual experience. The video begins with one blank centrally situated window, and then the members of OK Go appear from the bottom right corner of the frame. The window at this point appears to be a traditional screen interface that often exists between user and image in film and television. The lead singer, Damian Kulash, is then hoisted into the air by two other band members, his body pressed against an apparently invisible wall, most likely intended to be the interface screen itself. Kulash then proceeds to stand up so that the screen now becomes the floor and utilizes a camera angle from directly beneath the lead singer, who is now joined by members of Pilobolus in a dance routine pressed against the barrier. The initial screen fragments into four smaller, separate yet connected screens. Latex clad bodies continue to press against the barrier of the screen, showing the presence of pressure and the compression of the corporeal bodies against this invisible barrier. The four screens then triple to a total of twelve screens arranged in a structure of three rows by four columns. Bodies begin in the top row and roll down through the columns vertically, still pressed against the barrier but appearing to be in a cascading freefall. The dancers then begin to form the words “all is not lost” with their feet pressed against the screen throughout the various windows. A kaleidoscope pattern of arms and legs bending across and through the windows then demonstrates the interconnectedness of each of the windows to each other. The individual windows once again are divided so that each of the twelve windows contains quadrants. The dancers and band members continue to walk across the now forty-eight sections to form with

their feet the individual message input by the user upon accessing the website. The video ends as each of the twelve divided windows closes only to leave an eventual black screen. The interactive experience of the video does not end there, but viewers are encouraged to explore the Global Gallery option, where the most recent messages can be viewed based on their geographical location and relative popularity.

Although the “All Is Not Lost” music video may have been intended primarily as a morale booster for disaster-struck Japan, the spatial presence of bodies throughout the multiple screens of the video provide a more nuanced interpretation of digital embodiment than might be expected from a Top 40 musical group. The first image of the blank browser screen can best be understood as what Gabriella Giannachi refers to as the hyperspace, the space “where the real and the virtual meet each other. It is materiality and textuality, real and representation” (Giannachi 95). The space of the hypersurface exists as both virtual and real. Giannachi is most interested in the role of the viewer in this liminal space; the viewer is able to maintain a presence both in corporeal “reality” while also experiencing a “world of simulation” (95). Allucquere Rosanne Stone also addresses the digital space, calling cyber-space a networked collective structure where technology meets the social (Stone 38). Utilizing Giannachi and Stone’s understandings of hyper- and cyber-space, it is evident that digital space functions to integrate e-body experiences, representation and actuality, social and binary codes in ways that contest simplistic understandings of embodiment or even subjectivity.

The construction of the hypersurface is similar to the rhizomatic lines of flight proposed by Gilles Deleuze and Felix Guattari as alternatives to stagnation and fixity. Deleuze and Guattari offer the rhizome as map as opposed to a tracing, where the map is “entirely oriented toward an experimentation in contact with the real” (Deleuze and Guattari 13). The rhizomatic

map is an open system, allowing for multiple dimensions and connections, a space yet nonspace “always in the middle, between things, interbeing, *intermezzo*” (25). This hyperspace rhizome is therefore beyond any such binaries as “real” or “unreal,” but instead embraces the dialectical opposition in order to become the site for virtual performance and allows for a hybrid transformative experience.

The hyperspace in “All Is Not Lost” is first introduced as the blank browser screen, a glimpse that initially appears to be positioned solely within graphical cyberspace like most browser windows. The sudden appearance of the band members confronts this perceived virtuality with real bodies, accounting for Giannachi’s meeting of “materiality and textuality” (95). The introduction of apparently physical bodies within a space that is typically understood to be graphically designed requires a more open appreciation of the space contained within browser windows not simply as lengthy code of HTML and CSS, but as a space where bodies can exist between and amongst the code. While it may appear the video is only conforming to cinematic genre conventions that typically position bodies within limited frames, the numerous moments when the windows are resized, multiplied, or boundaries between screens are transgressed suggests that the video producers are intentionally playing with the affordances of the browser screen as a hyperspace in order to confront perceptions of real and unreal as well as the possible positionality of bodies within the space.

The presentation of spatial relationships are also unique to the “All Is Not Lost” video for the combination of simultaneous fragmentation and collective fluidity. The beginning of the music video features the band members captured straight on in the frame; there is nothing particularly strange about the relationship of their bodies to the space around them. The immediate shift of the screen to a new spatial arrangement that allows for Kulash’s body to be

pressed against the browser window suggests a fluid spatiality that is not stable within the browser. There is no stable sense of gravity or point of anchor throughout the video; instead every location of apparent fixity instead becomes a pivot point for a change in the arrangements of bodies in space, which results in the continual feeling of shifting and dislocation. This spatial relationship demonstrates the moment of the fold that I examine in the previous section as a moment of disparate yet similar meeting. Although the bodies of Ok GO and Pilobolus members appear to be fixed corporeal forms that typically appear in music videos, the constantly changing relations between the bodies to themselves, bodies of the other, and the interface functions to subvert expectations of fixity and stability of bodies and space itself. The dancers' bodies and the space are not stable and fixed boundaries, but rather a momentary relation captured within the video.

The experience of watching the “All is Not Lost” video is a disjointed yet collective experience. As the previous description of the movement throughout the video demonstrates, there is an overwhelming amount of movement occurring both in terms of the performing bodies and the presence of multiplying browser windows as bodies and windows constantly occupy new positions across the computer screen. The presence of several windows in which performing bodies are located would suggest fragmentation and lack of connection; the boundaries of the windows serve to disconnect bodies from one another, and even in a few instances partition one body into several. Although the video can be read as a series of acts of fragmentations, there is a sense of collectivity and fluidity that is produced. The separated bodies are not confined to the boundaries imposed by the limits of the browser windows, but they instead traverse these demarcated territories and cross in and out of windows at will. The performers also play with the limits of the computer screen itself, as there are moments when a body leaves the laptop screen

on the left to emerge again on the right, or a conga line of feet continues across the screen.

This regenerative movement demonstrates that the computer screen itself, often perceived as a bounded space with beginning and end, may actually function as a browser window itself that is a limited view into a much larger space of continuous relations where bodies may play.

Ultimately, OK Go's video for "All Is Not Lost" reflects the shifting experience of bodies in digital settings. The bodies of the Pilobolus dancers and the band members are not in any way lessened by the digital setting, as alarmist anti-posthumanist theorists like Katherine Hayles may fear, but instead the boundaries of the body are expanded and new assemblages of the body protrude.

Implications and Closing Thoughts

I have explored in this chapter an alternative to the abstracted theoretical approaches to digital embodiment which have inadvertently created a gap in scholarship in terms of the actual experience of *being* a virtual body. Instead of analyzing the discourses that surround and act upon the body, I propose a new model for digital embodiment that incorporates Anna Munster's revision of the Deleuzian fold in order to demonstrate the relational possibilities of the digital body and subjectivity with a multidisciplinary influenced methodology. In spite of the fact I call for a phenomenological approach to virtual embodiment studies (as the phenomenological aspect of digital has been devalued) the scope of this project prevents me from engaging further with the topic by practicing this methodology. Future work must be done in order to experience and document first-hand (or perhaps more aptly mediated-hand) the process of being a digital body and the epistemological revelations such a new bodily and psychic subjectivity may provide.

Due to the current limitations of methodologies for digital feminist studies to address comprehensively the experience of online interaction, I intend to offer a few characteristics of a

new methodology for future embodiment explorations. First of all, a singular disciplinary methodology will prove unable to address the complexity of digital embodiment. Literary analysis has been demonstrated to be limited in its ability to account for the phenomenological experience of having and being a body. Yet phenomenology or sociological tactics are similarly so each other individual methodology will prove to be inadequate. Instead it becomes necessary to draw from computer sciences in order to understand the construction of space and the architecture of programming, sociology for ethnographic research principles to elucidate the personal experience of digital being, and even literary analysis to demarcate the intersections of discourses.

Chapter 4: <Conclusion> Networked <reality> </conclusion>

Rupturing the Circle

After examining the claims levied against the disembodiment of information and the digital information-constituted environments in conjunction with the evaluation of new media art installations, it has become obvious that the binary understandings of reality and virtual reality, physical and digital, real and unreal oversimplify a complex experience of being in nontraditional spaces. In fact, there is not even a way of conceiving these spaces. These generalizations reduce what is irreducible, purport to know what is unknowable, and misunderstand what is not understandable. Throughout these explorations of science and art, I have complicated even the most basic concepts of what meaning means in an effort to demonstrate how the virtual cannot and should not be incorporated into current epistemological schemas, but rather the virtual offers a disruption to these schemas and instigates a new flight of fantasy. This flight has brought me to the conclusion that while it may be possible to construct an epistemology that does address both spaces, such a construction is not possible nor useful as the best epistemology is also a living and evolving entity that accommodates the changing role of the body in the noncorporeal but ever “real” space of cyberspace.

Due to the relational and constantly changing nature of the digital, a supposedly comprehensive theoretical approach to digital embodiment that does not account for the shifting environment will be rendered ineffectual by its constraining theoretical scaffold. However, I do argue that there are better ways to negotiate digital embodiment than have currently been utilized. In this final chapter, I intend to provide the living framework of a digital embodiment methodology that does not ascribe to the various binaries circulating through discourses on virtual spaces and digital identity production. I will also examine the infamous “Rape in

Cyberspace” case in order to apply my theory of digital embodiment to an occurrence which exemplifies the complex intersection of bodies, materialism, meaning, violence, and cultural codes of gender performance.

One of the basic premises of a new digital framework requires the revision of digital embodiment terminology. While this may be perceived as a splitting of hairs or pixels, as linguists have argued for several decades language is a method of constructing reality and meaning. No new epistemology can be created without using language and without satisfactorily critiquing such language. The virtual is foundationally linguistic; the various coding languages of HTML, XML, CSS, Python, Java, and others utilize a vocabulary and grammar to create a physical space where bodies and beings inhabit. This fundamental reliance on language makes language not only an appropriate turn to the linguistic but also a necessary place to begin a new framework. It is no longer productive to continue separating digital from “real” embodiment as it has reduced the digital to a space that is somehow less meaningful or more transient than a corporeally constituted embodiment. Such distinctions limit the spaces available for experience and expression, and a true digital epistemology must emphasize the openness of space. In stark contrast to the typical coding language of closure that emphasizes <beginning> </end>, this is a methodology of the open tag <begin > <continue>. In recognition of this absence of closure that is not lack, I then offer the term <reality> as an alternative to the detrimentally closed terms of “reality” or “virtual reality.”

<reality> represents a new space characterized by openness and hybridity, and consequently is a more productive term to begin the creation of a new digital embodiment framework that privileges precisely these two characteristics. As has been previously mentioned, the qualifier “virtual” denigrates the experiences of digital spaces so that they become marked by

the absence of traditional physicality and subsequently are no longer thought to matter based upon this lack of matter. “Reality” has also become totally reliant upon materialism in order to provide meaning or value to experiences, which reduces complex issues negatively. <reality> is not bound to these constraints materialism presents. The open tag signifies the continual process of being and becoming in this space; there is no closed tag </reality>, just as there is no end to the framework I propose. <reality> is furthermore an open space not limited to the two spaces I have discussed to this point, physical and virtual spaces, but remains open to the exploration of alternative spaces that have not been anticipated at this point.

Building upon this idea of open tags and the resultant <reality>, the body within this hybrid space becomes a focal point for its own hybridity, openness, and nonfixity. Hesford and Kozol write that the emphasis on the “real” is “a historically formulated epistemology that responds to localized needs and expectations. Much attention is therefore paid to the material body, which is one of the most privileged sites for the production of reality claims because of the presumption that *one is one’s body*, that identity is expressed through the body” (Hesford and Kozol 7). As postmodernism recognizes the multiplicity and fluidity of the subject, so it is necessary to do the same for the body. Bodies are never whole and are constantly inscribed. The corporeal body composed of flesh and bones is always subject to outside forces, as Elizabeth Grosz writes, the body “is the condition and context through which I am able to have a relation to objects. It is both immanent and transcendent” (Grosz 86). Phenomenologically the body has been understood as more than a complex system of interrelated parts but as a specifically located position in relation to other objects. This phenomenological approach to the body is especially relevant to digital spaces, specifically visual virtual communities, where users embodied in avatars are not simply suspended in space, but as part of a complex interrelated network.

Previous studies have attempted to account for and complicate the role of the body in online interactions⁵. Anne Balsamo notes, “The virtual body is neither simply a surface upon which are written the dominant narratives of Western culture, nor a *representation* of cultural ideas of beauty or of sexual desire. It has been transformed into the very medium of cultural expression itself, manipulated, digitalized, and technologically constructed in virtual environments” (131). Once again, the body is not simply an object but is instead an interface through which one relates to others. One of the more sustained explorations of the body in virtual settings has been Jenny Sundén’s work on textual embodiment in WaterMOO. In her reading of this text based world, Sundén examines the possible representations and performances of “ambiguously gendered and/or textually disembodied characters” afforded by the textual setting (63). Balsamo and Sundén’s texts both demonstrate the illusion of the body as a fixed and controllable object. Balsamo writes, “what these VR encounters really provide is an illusion of control over reality, nature, and especially over the unruly, gender-and-race-marked, essentially mortal body” (127). The avatar body is obviously open to playing with issues of gender and race, as the avatar can be customized and rendered radically different in its visage with a few keyboard commands, but this sense of control is illusory to Sundén and Balsamo because of the limiting cultural discourses surrounding these identity markers. What these studies fail to address are the new digital spaces available for experimenting with bodies. Tom Boelstorff’s *Coming of Age in Second Life* has been the only text focusing on visual virtual communities such as Second Life, but his project is an ethnographic survey, not a critical approach to issues of embodiment or epistemology that such a visual environment requires. With a new understanding of the space

⁵ Lisa Nakamura’s *Cybertypes* explores LambdaMoo and Club Connect, *Coming of Age in Second Life* by Tom Boelstorff is an ethnographic study of Second Life, and T.L. Taylor examines EverQuest in *Play Between Worlds*, among many other articles and books.

afforded by visual communities in <reality>, the body then becomes a site that must also undergo a radical transformation.

In their respective works, Sundén, Balsamo, and Nakamura problematize the ways in which corporeally marked identities like race and gender are inscribed onto the avatar form. While these are important critiques to make as they challenge the utopian visions of technology as a post-racial and post-gender online society, these critiques also fundamentally misunderstand the role of the avatar body and its potentiality. The critiques of the avatar as related to issues of gender, race, and sexuality are detrimentally grounded in reality, and as such limit the analysis of how these complicated identities are actually being formed, regulated, and resisted in online visual environments. Introducing <reality> to the body creates a space that is not simply limited to physical identities that are then replayed in a new digital environment.

To address the oversights of previous scholarship on virtual communities and specifically bodies within these spaces, I propose the networked body as a new form of embodiment for <reality>. Like <reality>, the networked body is most importantly an open system without closure. The networked body is related to Deleuze and Guattari's body without organs as it is similarly an "opening [of] the body to connections that presuppose an entire assemblage, circuits, conjunctions, levels and thresholds, passages and distributions of intensity, and territories and deterritorializations" (160). The networked body is not simply a deterritorialized form that is then reterritorialized to become newly stagnant, but an experience of being that is constantly in process. Unlike the body without organs which exists as a state, the networked body is grounded in <reality> and similarly emphasizes the phenomenological experiences of being in multiple bodies simultaneously and how these experiences relate to each other. Therefore the networked body is not only an interface that exists as a location of meeting relations to exterior others, but it

is also an interface to the multiple and infinite bodies in <reality> that compose the body-self. This interface of the networked body is then not a disembodied entity as Katherine Hayles would fear, but a multiply embodied, disembodied, and then re-embodied form constantly in process.

When utilized in conjunction, <reality> and the networked body allow for a greater understanding of the multiple types and spaces of bodily experience that are already part of the hybrid digital lifestyle. Having presented the concept of <reality> and the networked body, I now wish to examine Julian Dibbell's "A Rape in Cyberspace" as a case study to apply these two characteristics of a new digital embodiment framework.

A Rape in Cyberspace

In December 1993, Julian Dibbell published in *The Village Voice* what has now become arguably the most famous case study of an act of violence in a digital environment. Dibbell recounts the story of legba,⁶ an ambiguously gendered user of LambdaMOO, who was the victim of a voodoo doll hacking in the text based massive object oriented MUD (multiuser dungeon). Another user, a deranged clown called Mr. Bungle, used the voodoo doll hack on legba and other users to force them to perform degrading sexual actions. The voodoo doll was a popular entertainment device on the MOO because it allowed the initiator to mimic another user, making it appear to the rest of the chatroom's inhabitants that the victim was performing in a certain way when in actuality it was the voodoo doll holder who was in complete control. Therefore the voodoo doll victim was not actually forced to behave in a certain way but merely appeared to be performing the degrading actions.

⁶ "legba" is the name of the victim in the original 1993 version of Dibbell's stories, but subsequent publications in Dibbell's book and his website use the name "exu."

In spite of the popularity of the voodoo doll code, the “rape in cyberspace” (as the incident came to be called) resulted in community wide turmoil. legba posted a notice to a community social issues forum and called for the virtual castration and banishment of the offending Mr. Bungle as punishment for his actions. LambdaMOO users were then confronted with complex issues of identity, authenticity, and embodiment. Had a crime been committed, and did this crime have any meaning since it was against a virtually constructed body, especially considering the text based setting? What were the community behavioral standards, and how should they be policed if at all? Amidst all of the turmoil regarding one of the administrators took it upon himself to quietly silence Mr. Bungle and ban him from LambdaMOO, although the ghost of Mr. Bungle and the violence continued to haunt the forum.

Although the LambdaMOO rape case occurred within a textual based platform, it still provides the best case study for reexamining digital embodiment utilizing the beginnings of the relational digital embodiment. Several of the issues raised during the Mr. Bungle rape case are directly related to issues in rape cases in the physical world. The victim’s legibility and authenticity as victim are almost always questioned in cases of sexual assault. Was the victim somehow inviting sexual contact whether knowingly or not? Was the victim known for sexual promiscuity? Is there irrefutable evidence that points to violent and forcible trauma? These questions are all commonly used to discredit the stories of survivors and the reality of their situation, and while they are destabilizing enough in the physical world, in digital environments these questions take on an even more insidious attempt to undermine bodily experiences. In an environment where identities and bodies are constructed, authenticity is always in question⁷. The

⁷ There have been numerous cases in which a user in an online environment has been revealed to be falsely portraying himself. The blogger behind “A Gay Girl in Damascus,” who was purportedly a lesbian woman covering the violence in Syria, was revealed to be a heterosexual

lack of physical evidence is similarly used to discredit the entire violent experience. Victims are asked why they did not just turn the computer off rather than suffer through an act of aggression; a call to blame that victim that sounds eerily like asking a physical rape victim why she did not scream or fight her attacker. Yet although the digital experience of rape may be scrutinized for its ultimate “real”-ness, for the victim it was traumatically real. In the LambdaMOO example, legba later tells Dibbell that as “she wrote those words she was surprised to find herself in tears,” a statement Dibbell argues is “a real-life fact that should suffice to prove that the words emotional content was no mere fiction” (15).

Revisiting the “Rape in Cyberspace” case with the digital embodiment framework of networked <reality> allows for new conclusions to be drawn and new meaning to be created and attributed to experiences previously designated as virtual and therefore unreal. While I am not suggesting that the experience of physical rape and digital rape are analogous, I do believe the <reality> and networked body together offer a method of understanding both sets of bodily trauma not in an effort to conflate the two but as a way to hold the multiplicity of bodies and their varied experiences in a related network.

Examining the <reality> of the LambdaMOO rape leads to an analysis of the multiple spaces impacting all aspects of the case. The primary space is LambdaMOO, the text-based world where the violence took place, a world described as a large mansion with many rooms. There is then the location of the physical body of the users distributed across the globe and partially unknown. The user known as legba was physically located in Seattle, but the other participants and their corporeal bodies were diffused and unknown. Ultimately these individuals

British man. Although this ability to create a new identity is one of the draws to digital environments, there is also an expectation of authenticity that accompanies these identities and subsequent feelings of betrayal when “real” and “digital” selves do not correspond as expected.

spaces do not matter when examining <reality> because much like the Deleuzian fold <reality> is the meeting point of what appears to be different but is really the same. The material physicality of the user in Seattle or the particular room inhabited in the LambdaMOO mansion does not affect the situation because all of these spaces are moments of relations meeting. There is no difference in the meaning available in LambdaMOO or Seattle, there are no regulations for what passes for a violent act in these spaces because these spaces and bodies are ultimately the same. Therefore, the fact that a rape occurred in cyberspace is no different than if a rape occurred in a physical setting; it is the cultural attachments to material presence that keeps meaning from being recognized in digital settings. The examination of <reality> in the LambdaMOO rape case then allows legitimacy and authenticity to be given to legba's experience of violent disruption, while still granting the same value to a similar experience in a corporeal space. Neither violent crime is valued or devalued in relation to the physical or <reality> setting, but instead all spaces are accorded meaning as different relations in time.

There are also a multiplicity of bodies and relations at play. The most obvious relationship appears to be between legba as victim and Mr. Bungle the evil clown as perpetrator of violence. Yet Mr. Bungle never actually acts upon legba, instead favoring the use of the code that forces her to perform sexually degrading acts to herself. Although legba appears to be and would have considered herself prior to this incident to be in control of her body in LambdaMOO, the violence of turning against herself removes legba to a position exterior to herself. Her dislocation from herself and the inability to stop the violence renders legba helpless as a sexual trauma is perpetrated not/by her against a body that is/not hers. A relation is also existent between legba and her creator-user situated in Seattle. The user recognizes legba as a part of herself that she has created, yet it is a part of her self that is simultaneously in and out of her

control. Importantly, the networked body does not require any of these relations to be privileged over the other or for these relations to justify the meaning of their particularly situated experience.

By examining the rape in cyberspace as a case study for <reality> and the networked body, it becomes possible to negotiate the tensions that currently exist in understanding of digital experiences. In the past, ascribing meaning to digital spaces and interactions has been structured in opposition to corporeal experiences in physical spaces, and the virtual's nontraditional materiality was then understood to be lacking in meaning. But when binaries of real and unreal, physical and digital, meaningful and meaningless are dismantled in favor of a relational approach to all spaces and bodies, it becomes possible to understand how all experiences of bodies and space are equally valuable for they are all relations of the same but different within a particular moment.

<Conclusion> <

Throughout this project, I have worked specifically to dismantle the binary constructions of real and unreal, physical and digital, meaningful and meaningless in order to examine how a more nuanced theory of digital embodiment could be developed. I was dissatisfied with the current conceptions of digital embodiment that were problematically discursive or corporeal, and relied too heavily on Cartesian dualism or outdated digital spaces to be relevant to the increased integration of the digital into the body and subjectivity. There was no understanding of digital bodies without reverting to constructions of embodiment in physical spaces or the opposing problem of obscuring the phenomenological experience of bodies.

From this dissatisfaction with theories of digital embodiment, I examined Katherine Hayles' posthuman subject, a model she deemed disembodied and anti-human. By demonstrating

Hayles' adherence to traditional humanist values of unity and physical presence, I suggested it was necessary to move beyond Hayles and her binary understandings of technology. Drawing from the founding documents of cybernetics and Karen Barad's recent work on quantum physics, I questioned the very basis of materialism that has privileged physical matter as a precondition for granting meaning. I further demonstrated that the virtual did not simply exist in opposition to the physical world, but that the nontraditional exploration of presence, bodies, and relations required a more complex digital embodiment than binaries could provide.

I found in digital art installation the complex experience and play of digital bodies that a singular approach in the sciences was unable to provide. Since art generally addresses issues of representation, construction, and experience, an examination of new media art was particularly useful for addressing these same issues as they arise in discussions of the digital. I utilized Anna Munster's reinterpretation of the Deleuzian fold in order to examine the momentary relationships formed from apparently disparate entities that are really of the same. I then applied this fold to dance as a relational process of bodies and space in order to demonstrate an alternative experience of digital embodiment in which boundaries are extended to allow for a more complex play of being. Ultimately this examination allowed for binaries of body and space, virtual and physical to be reconceived as not oppositional entities but a series of related moments.

As part of the beginning of a complex digital embodiment, I offered <reality> and the networked body as two characteristics of an embodied digital methodology. <reality> is a relational space that does not require the binaries of reality and virtual reality by instead eliminating the necessity of material presence in understandings of space. <reality> is then like the meeting point of the Deleuzian fold, a place where difference and the same meet, and where one space is not valued over another. The networked body is then part of this system of <reality>

and similarly emphasizes relations and instantiations over material sedimentations. When <reality> and the networked body are then utilized to examine the LambdaMOO rape, it becomes possible to without resorting to binaries based upon material spaces, and instead the experiences of online or offline environments, jacked-in or unplugged bodies are able to be understood as meaningful without caveats.

It seems to be disingenuous to write a conclusion for this project as a conclusion is typically constructed as the closing tags of code, the signal of a finished product. A conclusion is part of a binary relationship with the introduction (what is understood as the opening tag) and together the introduction and conclusion function as origin and closure. But this writing project and the larger project of understanding digital embodiment is fundamentally opposed to origins and endings and to the closing of tags. In the spirit of open tags and the constantly shifting nature of the digital, I want to pause the conversation and issue a call. A call to my relational selves in their various manifestations of bodies and spaces, a call to crowdsource, a call to revise and challenge my own conclusions. This work is never done, this conversation is never over, this body and this space is never complete, but it is simply the framed screen of a moment, a node on an infinite network. And it is from here we must continue.

Works Cited

- Allegranti, Beatrice. *Embodied Performances : Sexuality, Gender, Bodies*. New York: Palgrave Macmillan, 2011. Print.
- Anderson, John B., and Rolf Johannesson. *Understanding Information Transmission*. Hoboken, NJ: IEEE Press, 2005. Print.
- Austin, Linda and Leslie Ross. "Pigs, Barrels, and Obstinate Thrummers." *Women, Art, & Technology*. Ed. Malloy, Judy. Cambridge, MA: The MIT Press, 2003. 426-39. Print.
- Barad, Karen Michelle. *Meeting the Universe Halfway : Quantum Physics and the Entanglement of Matter and Meaning*. Durham: Duke University Press, 2007. Print.
- Bolter, J. David, and Richard A. Grusin. *Remediation : Understanding New Media*. Cambridge, MA: MIT Press, 1999. Print.
- Braidotti, Rosi. *Nomadic Subjects : Embodiment and Sexual Difference in Contemporary Feminist Theory*. New York: Columbia University Press, 1994. Print.
- Briginshaw, Valerie A. *Dance, Space, and Subjectivity*. New York: Palgrave, 2001. Print.
- Carr, Nicholas G. *The Shallows : What the Internet Is Doing to Our Brains*. 1st ed. Vol. New York: W.W. Norton, 2010. Print.
- Deleuze, Gilles, and Félix Guattari. *A Thousand Plateaus : Capitalism and Schizophrenia*. London: Athlone Press, 1988. Print.
- Dibbell, Julian. *My Tiny Life : Crime and Passion in a Virtual World*. 1st ed. Vol. New York: Holt, 1998. Print.
- Dodds, Sherril. "Revolution in Video Dance: The Construction of a Fluid Body." *Indeterminate Bodies*. Eds. Segal, Naomi, Lib Taylor and Roger Cook. Houndmills, Basingstoke, Hampshire ; New York: Palgrave Macmillan, 2003. 219-33. Print.
- Giannachi, Gabriella. *Virtual Theatres : An Introduction*. New York: Routledge, 2004. Print.
- Gleick, James. *The Information : A History, a Theory, a Flood*. New York: Pantheon Books, 2011. Print.
- Grosz, E. A. *Volatile Bodies : Toward a Corporeal Feminism*. St. Leonards, NSW: Allen & Unwin, 1994. Print.
- Haraway, Donna Jeanne. *Simians, Cyborgs, and Women : The Reinvention of Nature*. New York: Routledge, 1991. Print.
- . "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14.3 (1988): 575-99. Print.

- Hayles, N. Katherine. *How We Became Posthuman : Virtual Bodies in Cybernetics, Literature, and Informatics*. Chicago: University of Chicago Press, 1999. Print.
- Kozel, Susan. *Closer : Performance, Technologies, Phenomenology*. Cambridge, MA: MIT Press, 2007. Print.
- Lanier, Jaron. *You Are Not a Gadget : A Manifesto*. New York: Alfred A. Knopf, 2010. Print.
- Miller, J. Hillis. "Optic and Semiotic in Middlemarch." *The Worlds of Victorian Fiction*. Ed. Buckley, Jerome Hamilton. Cambridge, MA: Harvard University Press, 1975. 125-45. Print.
- Morse, Margaret. "The Poetics of Interactivity." *Women, Art, and Technology*. Ed. Malloy, Judy. Cambridge, MA: MIT Press, 2003. 16-33. Print.
- Munster, Anna. *Materializing New Media : Embodiment in Information Aesthetics*. Hanover, N.H.: Dartmouth College Press : Published by University Press of New England, 2006. Print.
- Odin, Jaishree K. "Embodiment and Narrative Performance." *Women, Art, & Technology*. Ed. Malloy, Judy. Cambridge, MA: The MIT Press, 2003. 452-65. Print.
- OkGo. "A Message for Japan." YouTube, 2011. Print.
- Paul, Christiane. *Digital Art*. New York: Thames & Hudson, 2003. Print.
- Pollock, Della. "Performing Writing." *The End of Performance*. Ed. Lane, Peggy Phelan and Jill. New York: New York University Press, 1998. 73-103. Print.
- Shannon, Claude Elwood. "A Mathematical Theory of Communication." *Claude Elwood Shannon Collected Papers*. Ed. Sloane, N. J. A and Aaron D. Wyner. New York: IEEE Press, 1948. 5-83. Print.
- Shields, Rob. *The Virtual*. New York: Routledge, 2003. Print.
- Stone, Allucquère Rosanne. *The War of Desire and Technology at the Close of the Mechanical Age*. Cambridge, MA: MIT Press, 1995. Print.
- Sundén, Jenny. *Material Virtualities : Approaching Online Textual Embodiment*. New York: P. Lang, 2003. Print.
- van Doorn, Niels. "Digital Spaces, Material Traces: How Matter Comes to Matter in Online Performances of Gender, Sexuality and Embodiment." *Media, Culture, & Society* 33.4 (2011): 531-47. Print.
- Wheeler, John Archibald. "Information, Physics, Quantum: The Search for Links." *Complexity, Entropy, and the Physics of Information : The Proceedings of the 1988 Workshop on Complexity, Entropy, and the Physics of Information Held May-June, 1989, in Santa Fe,*

New Mexico. Ed. Zurek, Wojciech Hubert. Redwood City, Calif.: Addison-Wesley
Pub. Co., 1990. xiii, 530 p. Print.