Out of Our Depth: Hyper-Extensionality and the Return of Three-Dimensional Media

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Out of Our Depth: *Hyper-Extensionality* and the Return of Three-Dimensional Media

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Liberal Arts
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Dedication

To my family, who always stood by me and supported my academic endeavors.

To my friends, who were always patient when I did not have time to spare. To Yvonne, my wife-to-be, who gives me the strength to achieve my goals. And to my amazing professors and mentors, who believed in my project from the very beginning, and selflessly dedicated so much of their time and expertise to help me along the way.

Without you, I would not be where I am today.
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Abstract

This work theorizes the contemporary attraction to three-dimensional media. In doing so, it reframes ongoing debates surrounding digital three-dimensional media in order to critique the neoliberal social relations such media engender. I argue that the contemporary interest in dimensionality, especially regarding digital media, is symptomatic of a broad cultural shift, wherein millions of lives are now essentially being lived through two-dimensional, “flat” media, which have consequently generated a lack of spatial relationships and a craving or desire for “depth.” This “desire for depth” has arisen in contemporary society because people are being “spread too thin” through a combination of the radical connectivity afforded by digital technology and the demand for limitless flexibility imposed by the market: a condition I call *hyper-extensionality*. My work examines how neoliberal capitalism necessitates the individualized, radical connectivity now experienced by millions of people, and subsequently generates our attraction to three-dimensionality in digital media. Through analyses of select, prominent forms of three-dimensional media, I show that commercial three-dimensional media largely functions to maintain the status quo by helping alleviate the feeling of “depthlessness” in the social unconscious.
Introduction

The true stereoscopic effect will add a mighty force to motion pictures. It will make them beyond any comparison the most powerful medium of expression of which anyone has dreamed.

-D. W. Griffith, 1922

If your inclination is to champion lost causes, the case of stereo photography is ready-made for you. This lost pup, with us since the very beginnings of photography, continues to occupy a third-rate position in the photographic scheme of things.

-Paul Farber, 1966

3-D is a waste of a perfectly good dimension. Hollywood’s current crazy stampede toward it is suicidal. It adds nothing essential to the moviegoing experience.

-Roger Ebert, 2010

Since the early years of cinema there has been much debate over stereoscopic films. Such discourse commonly revolves around whether the effect is a valuable, artistic endeavor, or merely a trite gimmick. The notion that 3-D is nothing more than a “gimmick” has been pervasive since the 1950s, and has successfully overshadowed the importance of stereoscopy in the history of photography and cinema. In fact, the history of stereoscopy is largely repressed in the field of film studies. The question that needs to be asked, though, is not whether 3-D has value or significance in cinema’s history. The answer to that question is “yes.” Regardless of how repressed 3-D has been in film studies discourse, stereoscopy has been an integral part of cinema’s history since before the first cinematic apparatus was even invented. 3-D is not a puerile “trick” or
“gimmick”; it is an aesthetic technique that has had a prominent place in visual arts for centuries. The discussion must instead be shifted to why 3-D aesthetics and discourse have returned to prominence in contemporary Western culture today.

To answer this question, my work reframes ongoing debates surrounding the recent explosion of three-dimensional media in order to critique the neoliberal social relations such media engender. Alongside the contemporary “renaissance” of three-dimensional cinema, more and more focus has been placed on the dimensionality of objects and media in general, including everything from televisions, video games, smartphones, and projection-mapping to children’s toys, jewelry, and even plastic-surgery advertisements. I argue that this burgeoning interest in dimensionality is symptomatic of a broader cultural shift, wherein millions of lives are now essentially being lived through a seemingly ever-expanding panorama of two-dimensional, “flat” media, which have consequently generated a lack of spatial relationships and a craving or desire for “depth.” This “desire for depth” has arisen in contemporary society because people are being “spread too thin” through a combination of the radical connectivity afforded by digital technology and the demand for limitless flexibility imposed by the market: a condition I call hyper-extensionality. As the foundational tenets of neoliberal capitalism involve expansion of the market by increasing the number and frequency of transactions, seeking private solutions for public concerns, and ultimately striving for limitless atomization in order to accomplish these goals, it is clear that this system necessitates the individualized, radical connectivity now experienced by millions of people.
At the heart of my work, is the concept of *hyper-extensionality*. What I mean by “hyper-extensionality” is the contemporary state of being shared by millions of people who are technologically over-extended in multiple ways—in sheer quantity of connections as well as in frequency and duration of said connections. “Extension” here is used in terms of Marshall McLuhan’s concept of media as “extensions of ourselves,” a claim that all media introduce a “new scales” into human affairs—that is, any new media extends people (physically and mentally), allowing them to perform in ways that are not possible without said media and fundamentally reforming the way society functions as a result.¹ While McLuhan saw great social potential in the extension of our nervous systems through electronic media, today many people are *hyper-extended* on a regular basis. They are simultaneously, or synchronously, extended in myriad ways through two-dimensional digital media—from newer portable devices such as “smartphones” and “tablets” to more traditional electronic devices such as television and computers. Such is the case because success in contemporary capitalist society requires one to be “plugged-in” at all times, always connected to the network, and infinitely flexible.

Simply put, hyper-extensionality is a condition imposed, and *required* by neoliberalism. This is largely because one thing for which contemporary technology allows, through its constant connectivity, is the overflow of work into leisure times and spaces. The problem with this overflow is the fact that with hyper-extensionality, work and leisure become conflated in exploitative ways, wherein if one is to remain economically viable, *all* time must potentially be work time. Three-dimensional media *most commonly* functions to alleviate this social crisis by creating digital spaces that
resemble what has been lost in peoples’ day-to-day lives due to hyper-extensionality—i.e., depth and substance.

3-D also requires focused attention, which heightens the illusion of the spectator being “immersed” in its “depth.” By “immersed in its depth,” I mean the sense of being deeply engaged or involved in the media upon which one’s attention is focused to the extent that one feels absorbed or “sucked into” it. In the case of three-dimensional media this sensation can be figurative, as previously described, but it is also literal, in that the three-dimensionality can make digital media appear to physically inhabit the same space as the spectator, essentially *immersing* the spectator in its imagery. I state that three-dimensional media “most commonly” functions in this way because 3-D *does* have the potential to be less socially conservative; it just rarely is. For that matter, two-dimensional digital media also holds possibilities beyond being merely driving devices of anxious hyper-extensionality. While it is my aim to show how digital media largely perpetuates neoliberalism, my hope is that this critique will ultimately point to more socially just ways of using such media.

Re-Theorizing 3-D

The primary function of this “introduction” is not to merely serve as a preview of my work that follows. Instead, the coming pages perform substantial analytical work that situates the previous discourse regarding 3-D and critically re-frames its terms in preparation for chapters one and two. Because of this, I have divided the “introduction” into several parts. First, there is a detailed illustration of neoliberal *hyper-extensionality* and how it relates to 2-D and 3-D media. Included in this section are discussions of the
history of 3-D, extra-cinematic 3-D media, and the particular objects I analyze in later chapters. This portion lays the foundation for understanding my work. Second, there is a survey of imperative rhetorics related to my discussion of 3-D, explicating key concepts, such as attention, distraction, immersion, and “realism” that my media analyses take into consideration. Finally, the introduction explains the theoretical grounds of my work, and previews the analytical process that takes place over the remaining pages.

To help illustrate my concept of hyper-extensionality, I turn to a mock-advertisement for the Palm Centro smartphone created by a marketing student in 2008 (figure 1). The ad shows life as chaotic, with a Palm smartphone contrasted as the organizing device that can bring order to the disorder of contemporary life. The outstretched hand on the “Chaos” side of the ad represents the contemporary hyper-extended individual. The hand is littered with notes of things to do or remember, with verbiage scrawled up the arm to the tip of each finger. The open hand is a hub and the fingers are vectors. Information covers the arm and hand and extends outward in various directions through the separated fingers. The individual targeted by this ad is therefore clearly one who feels perpetually extended in myriad directions. The chaotic, cluttered urban backdrop also adds to the illustration of a life overflowing with sensorial bombardment, or hyper-stimuli. This is important because the “Order” side of the ad, which depicts the smartphone, promises to organize not only the copious amount of information and extensions visible on the hand, but also the entire world within which that hand resides. The smartphone is shown hovering in a stark white frame, showing that it has the power to encapsulate the entirety of one’s hyper-extended life. This is the promise of digital media such as smartphones and tablets. Yet even though these objects
may rein in virtually all of one’s “extensions” into a neat, orderly package, the extensions are still present, and the ability to maintain more extensions than ever before is now possible through the same “organizing” media. In this way, smartphones and tablets do help create a new “order” for social life and interactions, but these devices never fully distill the “chaos.” Instead, they merely provide a neat package that attempts to contain the “chaos” of hyper-extensionality within a singular device. Rather than seeing the chaos of the “3-D” physical world, all that is seen is the sleek aesthetic of one’s portable 2-D digital device through which life is now conducted.

Fig. 1. Advertisement for a Palm Centro smartphone created by a marketing student.

While I’ve coined the term “hyper-extension” in regards to the notion of technological extension, I also draw on its dictionary definition which refers to an
extension of a part of the body beyond its normal limits, and it is used to describe both a type of exercise as well as a type of injury. The dual meaning here also figures in my new definition and exposes a crucial tension within this cultural trend. With this, I ask what it means to live in a perpetually hyper-extended state, and what is gained and lost? Are we merely exercising a new ability only recently made possible through technological advances, or are we injuring ourselves? These questions are further explored through my analyses of select examples of contemporary three-dimensional media. Along the way I show how the recent surge in such media is tethered to society’s current hyper-extensional state, and in fact serves to perpetuate the current neoliberal system by mitigating the lack of spatiality it has created. In short, neoliberal hyper-extensionality has taken us “out of our depth.”

To bear out this critique, I turn a critical eye toward the way 3-D is most commonly used: to make flat digital images appear to have depth and substance. Along these lines, I argue that the fact that 3-D functions to make digital “spaces” more closely resemble physical spaces subsequently works to try to ease contemporary society’s anxiety about their new digital lives. This attempts to make 2-D digital space feel familiar; to merely bandage the wound that is the fracturing of spatiality created by neoliberal hyper-extensionality, rather than attempt to actually fix the problem at its roots. This notion ties in with the fact that most of the contemporary rhetoric of three-dimensional media—especially industry rhetoric—clearly privileges the “receding” illusion of depth, while professing against “protruding” 3-D effects. Such is the case because “receding” 3-D creates a virtual space one can allegedly get “sucked into,” or be “immersed” in, while protruding effects call attention to the medium. My argument
regarding this debate is that both “styles” of 3-D equally call attention to the medium, and therefore neither is truly “immersive.” What is important, however, is that both industry hype and social desire are geared towards the promise of immersion in depth. My thesis therefore explores several key representations of contemporary three-dimensional media, and analyzes their particular social functions, to ultimately provide a critique of the ways such media are entangled with neoliberal capitalism.

The primary shift I propose, in order to properly understand three-dimensional media, is to stop discussing 3-D solely in terms of the cinema, where it tends to be wrongfully disregarded as being merely a “gimmick” that is periodically used to attract people to the cinema in times of economic difficulty. While 3-D has most prominently reared its head during periods in cinema’s history when the threat of new technological developments created new “competition” on the moving-pictures market—such as the spread of television in the 1950s and video in the 1980s—it is incorrect to think of it as ever having been exclusive to the cinema. An array of pre-cinematic 3-D devices existed, beginning with the Stereoscope in 1838, and 3-D has existed in the cinema in some form as early as 1903.

The “stereogram” was first patented by Sir Charles Wheatstone in 1838, only twelve years after Joseph Niépce produced the first permanent photograph. Following Wheatstone’s invention, the nineteenth century saw a slew of stereoscopic devices invented—apparatuses that took stereo photographs (such as David Brewster’s Lenticular Stereoscope in 1851), devices for viewing stereographic pictures (such as Oliver Wendell Holmes’ handheld stereoscope in 1869), and devices which simulated motion using
stereographic images (such as Alexander Becker’s Stereoview Cabinet in 1857 and D. Appleton and Co.’s handheld Motoscope in 1860).

The period between 1870 and 1920 is now referred to as the “Golden Age of Stereography” because of the extreme popularity of Holmes’ handheld, affordable stereoscope. During this time (which is of course prior to the invention of television), millions of households had a stereoscope in their sitting room. After this time, 3-D began building its notorious reputation as a frivolous “gimmick”—a reputation from which it has not yet been able to completely redeem itself. Even though stereoscopic devices were developed alongside photography, and stereoscopic motion-picture devices were developed alongside non-stereo motion-picture devices, the standard history of cinema has seemingly repressed the influence and importance of these attempts to create three-dimensional imagery. Now, with digital technology, 3-D is rearing its head once again, and it is doing so extensively. The debate over whether or not 3-D is a gimmick continues, yet it is no longer relevant. Basic principles of capitalism are supply and demand, so as digital 3-D spreads, the social question that must be posed is why? Why are 3-D products being supplied, and why are consumers demanding them?

The widespread return of extra-cinematic three-dimensional devices is now upon us with digital technology ushering new in-home and even portable 3-D devices. Even with the proliferation of extra-cinematic 3-D devices, however, the glut of recent discourse surrounding 3-D is still primarily restricted to the field of film studies, wherein discussions tend to focus on the technology or the aesthetics themselves, rather than the social stakes or implications of the aesthetic. The vast majority of the discussion of contemporary 3-D is found in the popular press, where the depth of the discussion rarely
progresses beyond whether or not 3-D is “here to stay.” My work, conversely, explicates three-dimensionality as a larger paradigm in contemporary society with 3-D film serving as a locus, drawing popular attention to the dimensionality of media via large-scale spectacles.

The primary sources I closely analyze as significant examples of three-dimensional media are James Cameron’s Avatar (2009), 3-D projection mapping, and “Augmented Reality” through the Nintendo 3DS portable gaming system. Each of these objects represents a different type of three-dimensional digital media, each performs different (yet similar) functions, and each functions within different physical spaces. Even though these objects may appear unrelated in several ways, they are all connected to the same aspect of neoliberal capitalism with which my work is concerned—the attempt to conflate digital and physical spaces in order to alleviate and thus perpetuate hyper-extensionality.

Avatar is the most fitting film for the analysis of digital 3-D cinema and its effects on society because its release was a pivotal moment in the contemporary “boom” of three-dimensional media—it also garnered the highest box-office gross in history. It is the film that greatly propelled digital 3-D forward with regards to technological capabilities and widespread exhibition. 3-D projection mapping, a method of projecting digital imagery onto physical structures, also produces a large-scale spectacle, and represents the inverse of augmented-reality applications on handheld devices. While portable augmented-reality applications provide digital “additions” to reality within the frame of the mobile device on which they appear, 3-D projection-mapping creates digital “additions” upon large, unframed physical surfaces. 3-D projection-mapping is also
widely used as an amalgam of advertising and entertainment, providing an even more direct connection between three-dimensional media and economics. The Nintendo 3DS is an important device to this discussion for two reasons. It provides my counter-example of handheld 3-D augmented reality applications to the Samsung projection-mapped advertisement, and it is also the first mobile device to provide a “glasses-free” digital 3-D experience. The “glasses-free” experience is important because it fundamentally changes the dynamic of one’s interaction with the three-dimensional screen by not requiring an extra apparatus to make the illusion function properly. Without glasses, the 3-D on the screen can more seamlessly blend with the surrounding environment.

Ultimately, a synthesis of these analyses works to weave a tapestry depicting the current state of hyper-extension, the resulting spatial lack that three-dimensional digital media attempts to fill, and the economics driving the development and dissemination of these types of media. Augmented reality is an example of an extra-cinematic use of 3-D that also, like 3-D cinema, essentially functions to conflate digital and physical spaces, to make the digital resemble the physical. The term itself, “augmented reality,” implies merely an “extension” or “addition” to physical reality rather than something new or radically different. Thinking of digital media in this way therefore serves to pad the transition people are making to living more digital lives and help disavow our 2-D extensionality.

Related Rhetorics: 3-D as Cultural Logic

In order to formulate a comprehensive critique of 3-D, the rhetorics that directly surround it must be taken into account. As the recent fascination with 3-D clearly
extends beyond the cinema into multiple forms of digital media—including those mentioned above as well as televisions, smartphones, tablets, et cetera—and throughout multiple spheres of discourse, it must be critiqued as a pervasive logic in contemporary society. Most important is the rhetoric commonly used to both promote and dismiss 3-D films (and other three-dimensional media), which expounds upon the success or failure of its “immersive” qualities. I argue, however, that the popular rhetoric of media “immersion” is not only inherently flawed when discussing three-dimensional media—due to technological as well as spectatorial issues such as the paradox of “losing oneself” in a medium which calls attention to its illusory nature—but it is also generally incomplete, as it fails to take the broader social issues of attention and distraction into account. As “immersion” is intrinsically related to concentration, it deals with attention, which means that the prominent discourse of distraction and the degradation of attention in contemporary Western society—especially regarding youth and pedagogy—must also be considered when analyzing 3-D media. My work therefore also investigates these connections between the concept of “immersion” in relation to three-dimensional media and the social “problems” of distraction and attention degradation. These issues are directly related to neoliberalism, as the contemporary hyper-extended subject must maintain state of hyper attention in order to manage his/her vast array of connections.

Since the contemporary surge of three-dimensional media only began roughly six years ago, and didn’t really begin to gain momentum until the release of James Cameron’s Avatar in 2009, there is a lack of published scholarship available on the topic. In recent years, however, there have been a number of academic conference presentations dealing with 3-D cinema and an abundance of coverage in the popular press.
One thing most articles in the popular press have in common is a focus on one specific medium, with a discussion of 3-D existing solely within the context of that medium. In newspapers, magazines, and blogs the qualitative debate over 3-D cinema rages on. Discussions in the commercial press are generally centered on questioning whether or not 3-D is a gimmick, if it is “here to stay,” and how well it works. Other articles commonly involve debating over which type of 3-D effects are better (protruding or receding), which types of films would be better in 3-D, and/or what big-name critics and directors have to say about the issue. Though fewer in number, articles focusing on the aforementioned topics regarding other three-dimensional media—such as 3-D televisions, video games, smartphones, etc.—can also be found in similar outlets.

These articles all fall short, however, in that they fail to acknowledge the broader socio-economic foundations of three-dimensional technology. My thesis fundamentally shifts the discussion and asserts that digital 3-D must be analyzed as multi-media. In order for any discussion of three-dimensional media to be complete, I argue, it must also take into account the current debate over attention and distraction—especially since three-dimensional media is overtly hyped as being “immersive,” a term that is intrinsically tethered to attention and concentration. To be “immersed” means to be “deeply engaged or involved; absorbed.” The term also carries the connotation of “depth” in that it can refer to being “plunged or sunk in as if in a liquid.” With these two definitions it is clear that the term not only refers to a deep or engulfing aesthetic of depth, but also to a similar attentive mode, which coincidentally, 3-D media also requires in order to succumb to its illusion of physical “depth.”
In tying all these points together, I intend to show that the desire for three-dimensional digital media is rooted in contemporary society’s hyper-extended state of being. Because people suffer from a lack of depth in their everyday lives, there is an attraction to digital 3-D spectacles which can provide an illusion of the depth they worry they’ve lost. Three-dimensional media also requires the attention of spectators to be focused on the screen, and specifically, to one place on the screen in order for the illusion of depth to be optimally visible. This required focusing of attention is also interesting because it seems counterintuitive to hyper-extensionality, wherein people are simultaneously extended in myriad ways, yet it still functions to perpetuate the system. This is because three-dimensional media merely provides a feeling of relief through the experience of depth; it can be seen as a form of catharsis in this way, allowing the spectator (or “user”) to purge their unconscious desire for depth, and then return to their anxiety-filled, hyper-extended lives, wherein the neoliberal system that generates the hyper-extension remains unchallenged.

Before any of these analytical avenues can be taken, however, the pervasive and persistent notion that 3-D is nothing more than a “gimmick” must be put to rest. I have briefly mentioned some of the history of stereoscopy earlier in this introduction, and do not wish to dwell on the topic, but the dismissal of 3-D as a silly “trick” or “novelty” is still common. Since the 1950s, most claims of 3-D being a “gimmick” focus on the “protruding” style of effects commonly used in horror films and b-movies, while contemporary filmmakers such as James Cameron proclaim that the “receding” style of 3-D adds to the effectiveness of the narrative and makes films more “immersive.” Even Ray Zone, a prominent writer on the history of stereoscopic cinema, is caught up in this
conception of certain styles of 3-D being “gimmicky.” He divides the history of 3-D into four periods, or eras, beginning with what he calls “The Novelty Period” (1838-1952), followed by the “Era of Convergence” (1952-1985), “The Immersive Era” (1986-present), and “Digital 3-D Cinema” (2005-present). The main problem with Zone’s history lies in the simple fact that first era—which begins with the pre-cinematic invention of the stereoscope and includes the early anaglyphic 3-D films of the 1920s through the early 1940s—is belittlingly-named the “Novelty Period” and therefore only perpetuates the popular conception of 3-D cinema as lowbrow and insignificant. He even describes this period as being “characterized by an emphasis on the technology of 3-D, or the ‘gimmick’ of the off-the-screen imagery.”

The problem with terms such as “novelty” and “gimmick” is that they are counter-productive to understanding 3-D as an important aesthetic trend by diminishing the technology’s significance in the history of visual art and media. In fact, to refer to anything that lasts for over one hundred years as a “novelty” is contradictory. Instead, the early years of stereoscopy (both predating and within cinema) should be conceived as contributing to the early cinematic aesthetic Tom Gunning referred to as “the cinema of attractions.” Ray Zone does acknowledge this in his work, and even cites Gunning, but he still uses terms that negate value when describing early stereoscopic cinema. Close attention to language such as this is crucial and correcting misleading or inaccurate terminology is a step in the right direction towards overcoming the misconceptions of 3-D.

The “cinema of attractions” refers to roughly the first decade of cinema, wherein narrative was virtually nonexistent, and films essentially consisted of a progression of
visual shocks. Following this period in cinema’s history, narrative became privileged over “attraction,” or “shock,” but these elements never entirely disappeared and can be found in several popular genres throughout cinema’s history—such as Hollywood musicals, horror films, and action films. The “attraction” aesthetic is especially prevalent in contemporary large-scale technological spectacles like Avatar, for example, with its blatant emphasis on envelope-pushing special effects (including new methods of performance-capture and 3-D technology). Along these lines, it is incorrect to think that the “attraction-based” nature of 3-D effects ended with the “boom” of feature-length 3-D films in the 1950’s, which the naming of Zone’s “periods” imply—as 3-D is primarily used in the above-mentioned genres, even with contemporary digital 3-D, where it augments the “visual shock” of the films.

Yet even though it functions to heighten the “spectacular” nature of films, the fact that 3-D is still promoted as making the cinematic experience more immersive can seem paradoxical. That is to say, the argument seems to be flawed in that the technology itself is being advertised as the attraction, while also promising immersion. The problem is that immersion typically requires a level of credulity in the spectator(s), whereas with 3-D media, the fact that an illusion is being generated is brought to the forefront. Simply put, truly “losing oneself” in a medium calls for a level of ignorance regarding said medium’s existence, whereas 3-D actually makes the medium more apparent by promoting its effects. This notion is touched upon by Philip Sandifer in a recent article titled “Out of the Screen and into the Theater: 3-D Film as Demo.” Sandifer also mentions this problem with the rhetoric of immersion that surrounds 3-D cinema, with 3-D being advertised similarly to early films, such as those exhibited by the Lumière
brothers—essentially as a “demo” of the fantastic technology on display. Of course, with 3-D cinema, there is also the addition of glasses that must be worn by the spectator, the increased level of focus required to avoid the “ghosting” that takes place if one looks at the screen incorrectly, and the increased ticket price that must be paid to specifically see the 3-D version of a film rather than the standard, 2-D version—all of which call the medium to the forefront of one’s attention. Along with 3-D, larger screens (such as IMAX) also fall into the paradoxical category of technology that is hyped as being more immersive, while calling attention to itself as being more spectacular—in fact, it is precisely these screens that cause Zone to name his third period “The Immersive Era.”

In actuality, however, the widely accepted film-studies dichotomies of narrative versus attraction, or shock versus immersion, seem to break down with 3-D cinema. Perhaps the fact that stereoscopic cinema renders these distinctions ambiguous is one reason 3-D is largely marginalized in film studies and film historiography. That is to say, 3-D films feature both “narrative” and “attraction” elements, and the 3-D effects are at once “shocking” and “immersive.” There are two main “types” of 3-D effects, those which appear to “recede” into the screen and those which appear to “protrude” out of the screen. The “receding” 3-D effects are often defended as not being “gimmicky” because they allegedly only add to narrative absorption. Again, these films can never be completely immersive because the 3-D effects are always foregrounded, but even so, the visual “shock” is what gives 3-D films their immersive qualities. Since the 3-D effect is always (at least part of) the attraction, the visual spectacle it provides may aid in one’s absorption, or “immersion,” in the diegesis of a film, but such will never occur without conscious attention to the 3-D itself as well.
With “protruding” 3-D effects, the spectators are given the illusion of occupying the same space as the images onscreen—they actually are “immersed” in the action as characters or objects seemingly “reach out” to them. Yet this style of 3-D is what is most often ridiculed for doing the exact opposite—the argument being that this type of effect “distracts” from the narrative. But is the “shock” of being assaulted by a murderer onscreen actually “distracting” from the narrative, or is a 3-D horror film spectator more absorbed when they feel they must physically dodge attacks from the same onscreen assailants that attack the protagonist(s) with whom they are asked to identify? In this way, 3-D adds to both the attraction aesthetic and the narrative effect. With 3-D there is always “spectacle” or “visual shock” to some degree, because that is what the effect provides.

What I am most concerned with, however, is why the rhetoric of immersion so commonly surrounds contemporary visual media, and specifically, three-dimensional digital media? What attracts both producers and consumers to the prospect of immersive media? The best example of someone attempting to tackle this subject in the context of large-scale, spectacular films is Constance Balides in her article titled “Immersion in the Virtual Ornament: Contemporary ‘Movie Ride’ Films,” but her analysis still lacks a vital component—the link to issues of attention and distraction. Balides’ term, the “virtual ornament,” mobilizes Siegfried Kracauer’s concept of the “mass ornament”—the idea that entertainment aesthetically reflects the reality of work life—and applies it to contemporary Hollywood films. Specifically, she likens Kracauer’s analysis of The Tiller Girls and their aesthetic mirroring of Fordism to “immersive” digital effects-laden films and how the neoliberal (or “post-Fordist,” as she calls it) economic system
“immerses” people in their work. While I do believe this analysis has merit, it must be significantly expanded. First, digital 3-D is now *multiple* media, not just confined to the cinema, and consequently, the rhetoric of immersion now applies to many different devices of different sizes, in different spaces. Second, immersion is intrinsically tied to concentration, which is linked to attention and conventionally opposed to distraction—all of which are excessively prevalent in contemporary cultural rhetoric (in both the popular press as well as scholarly publications). This rhetoric especially tends to focus on the degradation of attention in young generations and pedagogical discourse on how to deal with the “distracted” children in educational settings. These discussions are also commonly based on how to adapt pedagogy in ways to better service the “distracted” youth, so as to ultimately produce functionally hyper-extended beings. It is, in fact, largely because of the continuously increasing state of hyper-extensionality in the “digital age”—due to advances in digital media and, by extension, modes of communication—that the debate over attention and distraction in children has grown in prominence over the last couple decades.

The assumption that “attention” itself is a static, definite concept is one that should be avoided, and Katherine Hayles does so in her work by abstaining from the use of the term “distraction” as attention’s antithesis. Instead, she discusses two different “cognitive modes”—“hyper” and “deep” attention. “Deep attention” refers to rigorous concentration on a single object for a length of time, while “hyper attention” is the opposite; it is the mode that is required for what is commonly called “multi-tasking”—and therefore, it is also the mode that coincides with hyper-extension. It is easy to see that “deep attention” is what three-dimensional media requires of its spectator, due to the
focus required for the effect to work properly. I also believe it to be no coincidence that
the current emphasis on 3-D is to create a receding illusion of depth, rather than
privileging protruding effects, so as to create a virtual space one can get “sucked into,” or
be “immersed” in.

One of Hayles’ main arguments is that the brains of younger generations who
have grown up entirely in the “digital age” have developed differently than those of
previous generations, and therefore education needs to be reformed in order to properly
deal with hyper-attentive youth. What is important here is that Hayles’ argument relies
on the theory that our environment (and therefore our media) configures the way our
brains function through a process called synaptogenesis (which is a staple of
contemporary neuroscience). The concept that our media molds our brains factors
heavily into my argument that the cultural saturation of two-dimensional digital media,
through which much of contemporary life is conducted, has produced a lack of spatiality,
and a desire for depth. As the brains of young generations are developing more and more
for hyper attention, they are also being primed more and more for hyper-extension. Such
catering to hyper attention, and hyper-extension, only conforms future generations to the
current neoliberal system.

Theoretical Grounding

My main argument, that the contemporary return of three-dimensional media is
symptomatic of neoliberal hyper-extensionalism, is actually three-dimensional itself.
First, I explicate that 3-D is not merely a “gimmick,” as it has repeatedly reared its head
in various forms for almost two centuries now. Second, I insist that since digital
technology has allowed 3-D to proliferate in extra-cinematic forms, reminiscent of how it existed prior to the cinema, it therefore needs to be analyzed as a multi-media phenomenon and not merely within the context of film studies. And third, I show that three-dimensional media, as well as the various rhetorics surrounding it, are all rooted in neoliberal capitalism and specifically the current state of hyper-extensionality. These three points of my argument are also largely grounded in the work of three theorists: Lev Manovich, Marshall McLuhan, and Mary Ann Doane.

To begin, the recent expansion of 3-D to extra-cinematic devices is reminiscent of the pre-cinematic period that was populated by a vast array of stereoscopic devices. This branch of my argument aligns with Manovich’s assertion that digital cinema recalls pre-cinematic aesthetics, except here I am broadening the observation to include digital devices outside of the cinema. The return to past aesthetics, specifically from the years leading up to and through the early years of the cinema, is especially important when analyzing three-dimensional media. 3-D is not just a “novelty” that pops up from time to time throughout cinema’s history. Instead, 3-D is an embodiment of a previously dominant aesthetic, the “aesthetic of astonishment,” as Gunning puts it. Of course, the “aesthetic of astonishment”—i.e., the emphasis on visual spectacles, especially (but not always) those that utilize cutting-edge technology, in order to pique both curiosity and shock in the spectators—has never entirely disappeared in cinema. It has merely been subordinated to narrative in the majority of the films that come after the “cinema of attractions.” Every time 3-D reappears it helps reinvigorate this “shock” aesthetic, even if many 3-D film directors and proponents want to bury this notion under the pretense of using the effect to serve narrative absorption.
Next, my term “hyper-extension” comes into play. Building upon McLuhan’s notion of media as extensions of our nerves and senses, I’ve combined the concept of “extension” through media with the prefix “hyper” because of the sheer number and frequency of connections so many people have in contemporary neoliberal society.20 Neoliberal economics are hinged upon people being perpetually “plugged in”—and the level of connectivity afforded by digital technology allows for millions of people to be simultaneously extended in a multitude of directions at all times. Work and leisure time can almost completely merge, and average Americans can now live as though they are always “on call”—and they do so through various two-dimensional interfaces. This state of always being “on call,” or having to be infinitely flexible in order to remain economically viable, has generated a new social anxiety over the increased difficulty of obtaining and maintaining employment. Moreover, I show how rhetorics of attention, distraction, and immersion are also all entangled in this concept of hyper-extensionality. To be immersed means to devote attention to one object, a notion that is opposed to hyper-extensionality, which itself involves myriad extensions being maintained simultaneously. Hyper-extensionality is in this way more akin to the “problem” of distraction, because it requires minimal focus on many things at once.

Finally, the foundation of my argument about hyper-extension—i.e., the creation of a general lack of spatiality in contemporary life due to an excessive amount of interaction with two-dimensional digital media—is reminiscent of Doane’s argument regarding time in modernity. In her book, The Emergence of Cinematic Time, she claims that the nineteenth century suffered from a “precise historical trauma,” wherein “the subject [was] no longer immersed in time, no longer experience[d] it as an enveloping
medium” because, among other things, it had been abstracted and externalized.\textsuperscript{21} My claim is that in the contemporary culture of hyper-extensionality, the subject is no longer immersed in \textit{three-dimensional space}. The “precise historical trauma” of the digital age is that the subject now experiences the vast majority of his/her relationships and communication through flat, two-dimensional media—life has been digitized, and it is managed through a flat interface; space has been abstracted and externalized. Contemporary neoliberal capitalism requires people to be plugged into and extended though these flat surfaces at all times in order to be as flexible and connected as possible, a fact that has led to millions of lives being structured, and managed through their interaction with two-dimensional interfaces.

\textbf{Analytical Process}

My first chapter focuses on three-dimensional cinema. Primarily I focus on Cameron’s \textit{Avatar}. Essentially I conduct a two-pronged analysis of the film, performing a close reading of the film itself, as well as examining its place within contemporary culture. In doing so, I explore the problems of “immersion,” the need for deep attention regarding 3-D cinema, and how such media function to perpetuate the current neoliberal economic system by attempting to allay our two-dimensionally hyper-extended state of being. The chapter then goes on to discuss other cinematic technologies, such as motion-capture, which also feed into the desire to produce simulacra of the physical world, in order to explore how cinema attempts to cope with the lack caused by hyper-extensionality. I then take on industry rhetoric, including advertising for 3-D films as well as popular 3-D advocates such as Pixar Animation Studios and Cameron’s own
comments regarding 3-D. Ultimately, I show that blockbuster 3-D films such as *Avatar* promote the most aesthetically and socially conservative use of 3-D and associated technologies by attempting to forge digital “worlds” that resemble the physical space we no longer inhabit, including its physics, as closely as possible. In doing so, these films only function to perpetuate the current system that causes the “desire for depth.”

In Chapter Two I focus on 3-D projection mapping and “augmented reality” (AR) applications, and explore three-dimensional media as it is used in advertising and related forms. Specifically, I look at a 3-D projection-mapped advertisement for a Samsung 3-D television and the AR cards used with the Nintendo 3DS portable video game console. These two media work together to exemplify opposing forms of AR that mirror the two primary forms of 3-D effects used in cinema, “receding” and “protruding.” 3-D projection mapping is correlated to the “protruding” effects used in cinema because it augments real spaces by projecting three-dimensional images upon them. AR apps on mobile devices are more similar to the “receding” effects in 3-D cinema because they portray their augmentation within the confines of their screens, as if looking through a window into a digitally-altered world. While both types of 3-D (and consequently both types of AR) essentially have the same function, the “receding” effects tend to be favored by contemporary producers as being more “immersive” because “protruding” effects are inherently more self-reflexive.

I then directly explore the economics of dimensionality, tying together my previous analyses. I explicate the fact that commercial “augmented reality” exemplifies the desire for digital spaces and physical spaces to merge as one, or for digital spaces to actually take over physical spaces. This type of media works as a *coping mechanism* for
the fact that life seems to be shifting over to digital spaces and leaving physical spaces behind instead of trying to reimagine aesthetic and social relations. I also examine the tenets of neoliberalism and its relationship to contemporary neuroscience. Specifically I explore how the contemporary model of the brain relates to the current socio-economic system, and how the current issue of attention “disorders” is interrelated as well. Ultimately I show the correlation between brain function and the media we use, and how this connection is exploited by the neoliberal system.

Finally, my conclusion connects my specific analyses into a cohesive portrait of contemporary hyper-extended society and its cultural byproducts. I then offer closing remarks that include my stance on the aesthetic and social potential of three-dimensional media and hypotheses for its future. Here I restate the conclusions of my previous critiques and briefly explore how artistic works might use 3-D in self-reflexive or less aesthetically and socially conservative ways. Specifically, I examine Werner Herzog’s recent 3-D documentary, Cave of Forgotten Dreams (2010) to this end. In this film Herzog uses 3-D in a manner unlike most (if not all) other directors; he uses it primarily to show surfaces rather than depth. His editing and cinematography also differs from others in that it functions in a very hyper-attentive and self-reflexive manner. Coupling this aesthetic with Herzog’s introspective epilogue, it is clear that he is asking his audience to think about the contemporary condition and particularly humanity’s relationship to nature and time vis-à-vis our current highly technological society. These are the questions that are most often perverted or misdirected in mainstream media such as Cameron’s Avatar. Through his subject matter, highly self-reflexive filmmaking, and probing dialogue, Herzog does not attempt to depict technology as damaging to nature.
Instead, he shows how technology is intrinsic to the human condition, and asks his viewers to think about how current technology has reconfigured society. I conclude with this discussion of Herzog’s film, and how 3-D in general can be implemented in a more socially just manner, to help bring to light those issues it currently attempts to patch up or to question the system it currently helps perpetuate.

Notes


4 Examples from the popular press for further information:
   - Kehr, Dave. "3-D or not 3-D." *Film Comment* Jan-Feb 2010: 60-67.


8 Ibid, 1.


11 Sandifer, Philip. "Out of the Screen and into the Theater: 3-D Film as Demo." Cinema Journal (University of Texas Press) 50, no. 3 (Spring 2011), 64.

12 Zone, Stereoscopic Cinema & the Origins of 3-D Film, 1838-1952, 3.


14 Examples from the popular press for further information:


17 Catherine Malabou also discusses synaptogenesis in her book, What Should We Do with Our Brain?, wherein she cites numerous contemporary neuroscientists in her discussion of brain plasticity.


20 McLuhan, Understanding Media: The Extensions of Man, 5.

Chapter One:

It Looks So “Real”: 3-D Cinema and the Promise of Spectacular Immersion

The division of perception into two realities causes a blurring comparable to intoxication: we are seeing double...To live in one reality and then, from time to time, enter another, through a night of drinking or hallucinogens, is one thing. But to live all the time through telecommunication and the electronic highway is another. I don't think we can even imagine what it may provoke in people's minds and in society to live constantly with this "stereo-reality." It is absolutely without precedent.

-Paul Virilio

A New World, Part One: Digitizing Life

In December of 2009, James Cameron’s Avatar debuted in the theaters of more than sixty countries in virtually every commercial screening format available. While it was most widely distributed in standard 2-D format, it was also released in every prominent three-dimensional format, including: RealD 3D, Dolby 3D, XpanD 3D, and IMAX 3D. The film was even shown in "4-D" in South Korea—the term “4-D” being commonly applied to 3-D film exhibitions that also cater to at least one sense beyond vision, such as smell or touch, through techniques such as “Smell-O-Vision” or motion seats.¹ In anticipation of Avatar’s arrival—and especially in its wake—a veritable tidal wave of digital projectors capable of exhibiting 3-D films rushed into theaters.² Avatar proceeded to garner the highest box office gross in history, and the renaissance of 3-D cinema was officially in full swing. Cameron’s work was by no means the first
commercial 3-D film of the current “boom,” but it was certainly the most prolific, making it the most apt “representative” of the medium for a cultural analysis. Aside from Avatar’s specific importance in the contemporary discussion of three-dimensional cinema, Cameron himself is also a developer, and one of the most outspoken proponents of digital 3-D technology.

In short, three-dimensional media has made a big comeback in recent years, and Avatar was a powerful catalyst in its dissemination. A close reading of the film, coupled with an examination of its production and impact on popular culture will therefore prove fruitful in illustrating not only contemporary society’s fascination with three-dimensional media, but also the socioeconomic system that creates and strengthens consumer desire for such media. Since Avatar is such an economically valuable cultural product of contemporary society—being the highest-grossing film of all time—it is important to look at why it was so popular, including what it provided to the market it served and helped create. To answer this question, one must critically explore its narrative and themes, which deal with issues of nature and technology and particularly technological extension. So, in addition to an analysis of Avatar’s own 3-D technologies, an evaluation of these matters will provide insight into how contemporary society perceives technology and specifically humanity’s relationship to technology.

As the amount of digital effects in blockbuster films continues to increase, so too does the digitization of the actual world we inhabit. The society that produces and consumes these largely digital blockbuster films itself becomes increasingly more and more digitized. In this way, digital cinema is largely mimetic of contemporary reality. Millions of people already “live” much of their social lives through avatars in “virtual
worlds” online, and millions more organize their physical lives through digital devices on a daily basis. And, as the quantity and frequency of interaction with two-dimensional digital media continues to increase, there is a feeling of loss developing in the social unconscious.

That which we now lack is a sense of depth, substance, materiality, and even gravity in much of our daily lives. Telecommunications and digital technology have largely eliminated any sense of space or distance by allowing instant connectivity to virtually anywhere on Earth at any time. Coupling this notion with the fact that the current neoliberal system requires such connections to continuously grow in quantity and frequency through ever-increasing market atomization, it is no surprise that the contemporary worker is perpetually “spread too thin.” The term I have given this state of being is hyper-extensionality, and three-dimensional media tries to alleviate the strain of being hyper-extended. In other words, three-dimensional digital media can be seen as putty that attempts to fill this newly created void and smooth over the fact that contemporary life lacks spatiality or depth.

Additionally, the drive towards “realism” in digital effects—especially in the movements and textures of computer-generated imagery (CGI)—also feeds the same desire to create simulacra of the physical world with which we are losing touch and is almost always present in three-dimensional media. Even in less “realistic,” or more “cartoony,” films, such as those made by Pixar or Dreamworks, there is still serious attention to detail regarding physics, textures, and movement to make the diegetic world resemble the physical world in other ways.³ Avatar ups the ante on all of these trends by employing highly detailed CGI, state-of-the-art performance-capture technology, and the
latest digital 3-D technology in attempt to forge the most intricate digital simulacra possible.

In a nutshell, Avatar’s plot deals with a (human-run) corporation, allied with military forces, that wants to mine an extremely valuable mineral from an exotic planet called Pandora. Pandora is a lush jungle planet (entirely constructed of CGI) populated by a harmonious race of natives called the Na’vi which are depicted as living “primitively”—i.e. without advanced technology. The fact that the Na’vi are intended as “untechnological” or “primitive” is highly problematic, as I will explain shortly. The film also deals with humans transmitting their consciousnesses into “avatar” bodies, which look and function exactly like the native Na’vi. Through these avatars, the humans can communicate with and study the natives. The main narrative conflict in the film is between the humans who want to exploit the Na’vi’s planet for resources, which involves destroying their “natural” habitat, and the Na’vi who are not willing to sacrifice their way of life. The protagonist of the story, Jake Sully, is a wheelchair-bound marine who initially infiltrates the Na’vi in his avatar body with the intention of learning their weaknesses to help the humans gain the ground they need to mine. Jake ends up falling in love with the Na’vi princess, however, and decides to help the Na’vi fight the humans off, ultimately choosing to remain in his avatar body forever at the end. The primary dichotomy of the film, then, is between nature and technology, wherein technology is wielded by corrupt forces who want to use it to destroy nature. The human military-industrial complex is villified in opposition to the harmonious, “natural” Na’vi.

Paradoxically, however, Cameron’s film actually idealizes the digitization of life more so than its blatant allegory of nature versus technology seems to let on. On the
surface, the film’s narrative merely consists of a plethora of Hollywood clichés: a love story that binds two opposing groups together, victorious “underdogs,” evil corporations, military injustice, and an overarching environmental message about humanity’s destruction of nature via mechanical technology. It is very easy to cry hypocrisy regarding Avatar’s seemingly anti-technological, pro-nature politics—considering the film itself is a massive technological spectacle. Yet its relationship to technology is far more complicated than its narrative suggests. Even though it would not be incorrect to state that Avatar is an über-technological film that essentially demonizes technology, or humanity’s relationship to technology, for destroying nature, there is more to the picture than such a basic reading. One of the film’s most apparent narrative tensions is the way it attempts to simultaneously figure “nature” as technological and technology as “other.” What is more, the “nature” that is portrayed is also highly technological in both diegetic and non-diegetic ways. Layers of tensions such as these can be found between the methods and techniques of the film’s production and the ways technology and nature are figured within the film. In fact, with some careful analysis, the film can actually read much differently from its popular surface message about environmental destruction, and in such a way that is actually not hypocritical. The “non-hypocritical” reading of Avatar is important because it actually showcases the positive potential of digital media; the potential for such media to be freeing, unifying, and equalizing rather than isolating, atomizing, and multiplying our extensions and anxieties.

A good starting point is to note the similarities between Avatar and popular nature documentaries such as BBC’s Planet Earth series. Specifically, Avatar and Planet Earth have a very similar aesthetic and highly technological process in depicting their
landscapes. With both programs, viewers are regularly treated to extreme long shots, with extreme depth-of-field, showing richly detailed, vast expanses of “nature” via high-tech instruments. Both works are large-scale spectacles wherein much of the spectacle is the vision of “nature” itself. Of course, one key difference between these products is that Avatar’s “nature” was also entirely constructed using high-tech instruments. In fact, if one is to use the popular and traditional understanding of “nature”—the material world that exists independently of human civilization/culture—it can be said that Avatar’s actual setting is about as far removed from “nature” as possible. What I mean is that the film was almost entirely “shot” with a “virtual camera” (which is really more of a handheld computer screen with sensors for location tracking) within a concrete room called “the volume” (which is essentially a large sound stage rigged with numerous sensors and cameras). So by the traditional conception of the term, there is absolutely no “nature” to be found anywhere in Avatar’s production.

How “nature” is portrayed within Avatar’s diegesis is also problematic. The fictional planet depicted is called Pandora, and the way the planet functions resembles an electrical network. There is nothing remotely subtle about the “nature” being portrayed as electrical. Virtually everything on the planet is “bioluminescent,” so in the night scenes, the whole forest is essentially lit up. Also, the natives literally plug their bodies into their environment. The Na’vi have white strands that resemble fiber-optic cables coming out of their hair, which they can plug into animals, each other, and the planet itself. Specifically the “Tree of Souls” (which appears to be a tree with a bunch of thick illuminated fiber-optic cords dangling from its branches) functions as a hub to which the Na’vi can connect and communicate with the planet and all the beings that have once
lived on it. It seems to function as a hard-drive that stores the “souls” of beings who have died on *Pandora*, as well as a CPU that communicates to all “nature” on the planet. The fact that this location seems to function as a sort of CPU also conflicts with the decentered network-like functionality of the planet—an issue upon which the overall theme of the film hinges, and I will further explain shortly.

![Fig. 2. Jake Sully, currently “plugged into” his avatar body, connects to the Tree of Souls.](image)

The concept of “plugging in” is itself multi-layered in *Avatar*. Still within the film’s diegesis, human characters (including the main protagonist, Jake Sully) plug into high-tech machinery that extends their consciousness into an “avatar” body—a bioengineered body that resembles the native *Na’vi*. So here, within the narrative, there are multiple levels of electrical extension of the human nervous system, which resonate with Marshall McLuhan’s claims about the electric medium and its social implications. Humans extend their consciousness into avatar bodies, and the *Na’vi* (as well as the humans within their avatar bodies) extend their consciousness into their environment. Then, there is yet another level of extension outside of the film’s diegesis, wherein live
actors are digitally extended through performance-capture technology—they even ironically refer to the process on set as “digital prosthesis” or “CG make-up.”

Such conscious references to extension are logically inconsistent, however, because while all of these extensions are happening in the film’s production, as well as in its narrative, Avatar still somehow attempts to depict technology as an amputated, destructive “other.” Amputation occurs, McLuhan argues, when technology is conceived as being “severed,” distinctly cut off from or not integrated with “nature” or humanity. In Avatar, if the unnatural creation and technological function of “nature” is ignored, the film plays as a utopian vision of beings living in harmony with nature, who are being threatened by technology. And this initial reading is precisely how Cameron himself describes the film. He has stated that Avatar is an allegory of humanity’s “relation to nature and how our technological civilization has taken us several removes away from a truly natural existence…and the consequences of that to us.” Technology and capitalist interests are clearly aligned and clearly demonized in this reading—which is why it is easy to say the film is hypocritical.

On a closer analysis, however, it is really only mechanical technology that is depicted as destructive, and if “nature” is read as digital/electrical technology instead of merely a representation of some fantastic natural setting, then the entire meaning of the film changes drastically. Such a reading changes the film’s “message” to one that shows digital media can not only do more than enable neoliberal hyper-extensionality, it can also actually be freeing. The neoliberal system causes the contemporary worker to feel he/she must be hyper-extended in order to remain economically viable, but the digital media through which this hyper-extension takes place does have possibilities beyond
merely serving the current socio-economic order. For example, instead of seeing *Avatar* as a tale of technology destroying nature, it can be read as demonizing *mechanical* technology for its amputating, disintegrating qualities and advocating a full embrace of the integrative possibilities of digital/electrical technology à la McLuhan.

By representing nature through digital technology, *Avatar* can be seen as exalting such technology; that is, putting it on par with nature, or aligning it with natural powers, rather than opposing them as binaries. After all, at the end of the narrative, Jake Sully ultimately decides to remain in his avatar body; he *becomes* his “avatar.” He chooses to forever remain in the digital world instead of going back to his comparatively limited physical reality. Through digital extension he can be freer than he could in his physical body, and he can experience a more unified, connected, and egalitarian existence. This unified existence is aesthetically manifested in images such as Jake Sully’s initiation into the Na’vi clan and the collectivized ritual the Na’vi perform in an attempt to save one character’s life. In both of these images the Na’vi are all physically joined together as a unified group.

This ability to connect and unify seemingly works against neoliberalism’s aspirations toward atomization and its aims to create what Pierre Bourdieu has called a “pure and perfect market” that is completely deregulated and “calls into question any and all
collective structures that could serve as an obstacle” to its logic. Indeed, a completely equal and unified collective of people is more a Communist dream than a Neoliberal utopia.

In this reading, the film is essentially an allegory of humanity’s evolution to a new state of being. Specifically, that state is achieved through the digital extension of human consciousness. That said, utilizing a similar aesthetic to Planet Earth can therefore be seen in Avatar not so much as an attempt to showcase the immense majesty of nature (even though that is what Cameron seems to think he is doing), but to showcase the incredible potential of digital technology. Such a reading is difficult to acknowledge, however, because it is in opposition to the very thing three-dimensional media functions to bandage: the social anxiety over the digitization of life. What I mean by the “digitization of life” is the general move towards organizing one’s work, leisure, social relations, and overall daily functioning through almost constant interaction with digital media. Rather than believe in a digital utopia, the current overload of interfacing with two-dimensional media has caused a temporal and spatial lack in society. People no longer experience time or space as they did prior to their lives being digitized.

Assessing whether Avatar’s image of digital life is a Communist dream or Neoliberal utopia will require determining precisely what type of technology Pandora represents. The way in which Pandora (and all of its life) is portrayed is clearly technological, however its depiction of technology is as problematic as its depiction of “nature.” The planet seems to obviously function like digital, electric technology, but there are still remnants of what McLuhan would call “mechanical” thinking in its structure. McLuhan describes “mechanical” media (and, by extension, mechanical
thinking) as linear, fragmented, sequential, and centralized, while “electric” media is “pervasive and decentralized,” eliminating “time and space factors in human association.” In *Avatar*, then, is *Pandora* truly a decentered electric network, or a centrally-controlled machine?

For the most part, *Pandora* seems to be intentionally portrayed as a decentered network, wherein all life can “plug in” and be connected. Yet there are also hierarchical structures that go unacknowledged. For example, while the “tree of souls” functions as a central hard drive or a communication hub, the tribal order of the Na’vi, though “harmonious,” is portrayed as a monarchy. The tension here is aligned with popular culture’s persistent inability to recognize the difference between mechanical and digital technologies or to see technology in general as being natural rather than “other.”

It would seem then that McLuhan’s concept of the medium as “the message” and electricity as an extension of the human nervous system are becoming quite apparent in contemporary society with films such as *Avatar*. However, *Avatar*’s diegetic depiction of the electric medium is embedded within layers of contradiction that work to invalidate it. The fact that such “content” is displayed within an electric medium (digital film) may seem to double its visibility, but the film’s actual narrative and the filmmaker’s conscious intentions completely undermine “the message” and instead show that people still cannot function outside of mechanical terms. McLuhan claimed that “electric light escapes attention as a communication medium just because it has no ‘content.’ And this makes it an invaluable instance of how people fail to study media at all.” *Avatar* is a glaring example of this accusation. Not only is digital cinema an electric medium full of “content” that “blinds us to the character of the medium,” but also the actual content of
*Avatar* is a utopian vision of the electric medium. The title of the film is *Avatar*, and it is about people who electrically extend their nervous systems into digital bodies (avatars) in a harmonious, connected, digital world. But even with “content” that points directly towards considering the functionality of the electric medium itself, there are still other factors that prevent this message from being easily received or accepted.

The world still thinks largely in mechanical terms, and Cameron’s intentions point toward a goal that not only differs from explicating the electric medium as an extension of human consciousness, but in fact, ignores such a notion altogether. Again this can be attributed to the social anxiety over the steady shifting of life into the realm of the digital. Simply put, the thought of abandoning the physical world (even if only metaphorically), or essentially losing grip on materiality as more and more of life becomes digitized, is difficult. Humans are physical beings, so the loss of a sense of spatiality in many everyday interactions has taken a toll on their psyches, which the replication of materiality in digital media attempts to ease. Even though Cameron himself may actually believe in a digital utopia, he does not publicly display such sentiment, and *Avatar*’s explicit theme of environmental conservation works against such a notion. *Avatar*’s narrative is largely aligned with contemporary anti-technological rhetoric regarding nature and environmentalism. Primarily it involves the concerns of environmental conservation and sustainability of natural resources, wherein technology is largely considered to be separate from, and destructive towards, nature. This fact adds to why several of Cameron’s own statements regarding the film are so paradoxical.

He has said, for instance, that *Avatar* is “the most high-tech film dealing with essentially a very low-tech subject”—the “low-tech subject” being “nature” and
humanity’s relation to it. There is a crucial tension within this statement. Certainly to call “nature” a “very low-tech subject” seems to be an acknowledgment that nature is technological, or that technology is natural. The film’s narrative, however, denies this connection. Even though Pandora is entirely digital, knowledge of this fact is supposed to be suspended upon viewing the film, for the narrative does not involve a digital world at all. Avatar’s narrative deals with an advanced, but still mechanized, human military destroying a natural, un-mechanized planet for its mineral resources—a mineral that is undoubtedly supposed to be used as an energy source for the still-mechanical existence back on Earth. So, even with characters that electrically extend their consciousness within the film, the focus of the narrative is actually placed on a false “natural,” non-technological existence versus a mechanical-industrial existence. Nature (including humanity) and electricity are still conceived as separate. Even with Avatar’s complex relationship to technology, it is still portrayed by Cameron as “amputated” from nature.

Avatar’s production also clearly shows that a desire for “realism” in its digital effects was a top priority. As three-dimensional digital simulacra attempt to fill the “lack of depth” in the social unconscious by recreating that which is digital in the image of that which is physical, they are generally coupled with a serious attention to detail in aspects of digital imagery such as “realism” in textures, depth, and weight. Intricately detailed digital imagery that aims to (re)produce believably “real” textures, and performance-capture technology that maps the movements and expressions of actors onto their digital counterparts are replacing the mechanical production of human-like beings in film, but they do so in a manner intent on serving the same objective—i. e., replicating “nature” and the laws of physics as “realistically” as possible. Cameron’s work is a prime
example of the desire to create digital simulacra of the physical world. In his essay titled “Gollum and Golem: Special Effects and the Technology of Artificial Bodies,” Tom Gunning theorizes that motion-capture technology is the contemporary version of a historical human endeavor. Gunning relates the technology to attempts at creating autonomous beings that date back centuries and stem from ancient religious myths—from the Jewish myth of the Golem to Thomas Edison’s automatons. Gunning proposes that cinema has enabled “a new way of fulfilling the dream of a moving human simulacrum.” Though these simulacra are exhibited only as projected images, the goal of filmmakers is typically to make them seem as “real” as possible. In interviews, Cameron has specifically stressed the importance of “realism” regarding his digital creations, stating that in making Avatar, the ability to “take” the actors’ performances and “preserve them in their computer-generated characters” was his “biggest goal,” to “reproduce full human emotion in a CG character.” Computer animation and motion-capture technology have given filmmakers the power to actualize artificial beings that have little or no basis in the physical world. Filmmakers can use these tools to effectively forge simulacra of the material world. Their digital creations attempt to comfortably resemble the world we increasingly cease to inhabit directly and consequently help bandage the spatial and temporal lack caused by two-dimensional hyper-extensionality.

In addition to the sense of “realism” sought through texture detail and motion-capture technology, Cameron’s usage of 3-D in Avatar—as well as other similar usages of 3-D in cinema—goes further by attempting to heighten the “presence” of these “realistic” digital beings. Since the new digital beings are only exhibited through
natively two-dimensional media (film), spectators have no way of experiencing them as they would a physical object. If there is a connection between the historic desire to create a physical, autonomous human simulacrum and the usage of motion-capture to create a similar being in the “digital realm,” then shooting such a film in 3-D appears to be a logical progression. Doing such creates an illusion of depth in the film that attempts to mimic human depth perception (via binocular vision), allowing the digital simulacra to appear more “whole” or “solid.”

Turning to one of the original terms used for three-dimensional images, the word “stereograph,” it can be seen that the representation of solidity or materiality has always been intrinsic to the 3-D media. The etymology of the term “stereograph,” coined by Oliver Wendell Holmes in 1859, comes from the Greek stereos, meaning “solid,” and graphein, meaning “to write.” So the term “stereograph” literally means “to write with solids.” The term was attributed to “double-eyed or twin pictures,” most commonly referred to as “3-D” imagery today, because they create the illusion of occupying three-dimensional space as if they are actually material, rather than mere flat, weightless images. It is precisely this drive towards making flat, weightless imagery appear to embody the depth, substance, and weight of the material world that is at the heart of contemporary society’s reinvigoration of three-dimensional media. This transformation of abstract two-dimensional imagery into something that mimes attributes of the physical world disavows the contemporary state of two-dimensional, digitally hyper-extended life. It attempts to suture the wound caused by our unconscious “loss” of spatial communication and relationships, ultimately helping perpetuate neoliberal hyper-extensionality. With more and more people regularly “living” through two-dimensional
interfaces—whether they be televisions, computer monitors, tables, or smartphones—the perspective of space and time of the physical world is being lost. Hyper-extensionality has generated new lacks in the contemporary social consciousness; lacks of time, space, and even gravity due to its abstraction and instantaneity.

The effect of the immediacy that telecommunications have afforded society has been theorized by Paul Virilio. In his work, he claims that “the old line of the horizon curls itself inside the frame of the screen.”¹⁴ He goes on to say that there is:

No more delay, no more relief; volume is no longer the reality of things. This is now concealed in the flatness of figures. Right here and now, life-size is no longer the yardstick of the real. The real is hidden in the reduction of images on the screen.¹⁵

What Virilio means here is that in the current age of telecommunication, physical space(s) and distance(s) can no longer be conceived as “the real.” In other words, much of contemporary interpersonal connection and communication is achieved through digital technology, which erases any sense of physical space or distance between connected parties by allowing instant access to virtually anywhere on the globe.

*Avatar*, along with most other contemporary 3-D films, functions to mitigate the social unconscious feelings of loss regarding at least two of these dimensions, space and gravity. The perceived “loss” of these aspects of the physical world has been brought on by the constant interaction with two-dimensional interfaces that must be maintained in order to be competitive in the current economy. Narratively, *Avatar* actually does portray digital extension in a positive and relatable way. In the film, Jake Sully extends himself into a digital avatar, and his character ultimately chooses to remain in the digital world, where he is freer in his digital avatar than he was in his physical body. Similarly, in
contemporary society millions of people extend themselves digitally every day and communicate via avatars in “cyberspace” through the internet. The quantity and frequency of interaction with two-dimensional screens seems to be ever increasing with people utilizing them on a daily basis to organize their work, leisure, social circles, etc. Millions of people already go even further by spending their leisure time literally “living” through avatars in MMORPG’s (“Massive Multiplayer Online Role-Playing Games”) and “virtual worlds” like Second Life. Unfortunately this reading of the film goes unseen or unaccepted by the general public because it is camouflaged by the more overt narrative of technology as destructive and unnatural.

Formally, Avatar’s extreme long shots of Pandora show off not only the extremely detailed CGI, but they also specifically show off depth itself when viewed in 3-D. They do so by filling almost all the negative space in Pandora’s lush CGI landscapes with “floating” particles—either dust, ash, or small jellyfish-like creatures that populate the planet and “swim” through the air. These function to show off the “space,” or “depth,” of the scenes on Pandora by populating the entire range of depth with some form of visual marker to accent the “receding” effect. They, also give the planet’s entire atmosphere a sense of viscosity, substance, or weight. Depth and weight of the digital world are essentially what is on display in Avatar. The meticulous work that goes into the production of “realistic” CGI, performance-capture, and 3-D effects is done in the service of crafting a digital world that resembles the space and physics of the material world as they used to be experienced.

It is clear in closely reading Avatar that the social unconscious finds the notion of a digital world being equal to (or possibly even better than) the “natural,” non-
technological world difficult to accept. Even with Avatar’s nearly-explicit portrayal of a
digital existence as utopian, the film is most popularly read (and intended to be read) as
an allegory of technology as destructive and separate from a “nature” that should be
preserved. Now, in acknowledging Avatar’s complicated relationship to technology and
its massive popularity, it is important to step back and examine contemporary 3-D cinema
more generally, as well as the way it is promoted to the public.

Selling It

There is a debate over how 3-D effects are best used in cinema that has existed
since the early years of stereoscopic motion pictures and continues today. This debate is
centered on the two basic types of effects 3-D technology can add to a film with one style
typically shunned as “gimmicky” and the other praised as “immersive.” Fundamentally,
3-D can either make a two-dimensional image appear to recede into the surface upon
which it is printed or projected, or it can make figures/objects appear to protrude out of
that surface. The former creates a perception of depth within the frame of the image
while the latter makes a portion of the image appear to jut out and occupy the same space
as the spectator. Avatar employs the “receding” effect, and Cameron publicly condemns
“protruding” 3-D effects.

The protruding effects make images appear to have depth and substance, just as
the receding effects do, however they tend to be more self-reflexive and/or intentionally
jarring in some way (most often they are either laughter- or fright-inducing). This
inherent difference in the two styles of 3-D has created polarized opinions regarding
which type of 3-D is “better.” Since mainstream filmmakers typically strive for narrative
“immersion” or “absorption,” the self-reflexivity of protruding 3-D effects generally causes that style to be frowned upon, while receding effects are often championed as adding to the narratives’ “immersive” qualities. Cameron has been a vocal supporter of receding 3-D effects for this reason.

Cameron’s penchant for a specific style of 3-D effects ties in with one of the most prominent thematic links that can be seen throughout his oeuvre. A common message embedded in virtually all of Cameron’s films is his warning against the misuse of technology. In recent years this topic has bled out of Cameron’s films and into his reality regarding the use of 3-D. When he was questioned about Piranha 3-D (2010), a contemporary 3-D film which employs “protruding” 3-D effects, Cameron said: “That is exactly an example of what we should not be doing in 3-D. Because it just cheapens the medium and reminds you of the bad 3-D horror films from the 70s and 80s.” He also publicly opposes studios hastily converting films to 3-D in post-production, saying:

They ignore the fact that we natively authored [Avatar] in 3-D, and decide that what we accomplished in several years of production could be done in an eight-week (post-production 3-D) conversion with Clash of the Titans. If people put bad 3-D in the marketplace they're going to hold back or even threaten the emerging of 3-D.

Such opposition to styles and methods of using 3-D technology that differ from his own likely extends beyond Cameron’s inflated ego. If his quest is to create “believable” virtual beings (and worlds), it seems natural that he would oppose any usage of the technology that inherently sheds light on its artifice. In this respect, shoddy post-production 3-D is no different than poorly rendered or animated CG effects; their falsity is immediately apparent and “realism” is consequently sacrificed.
Similarly, the “protrusion” effects, which have always been the primary attraction of 3-D cinema, tend to be self-reflexive. These effects literally “break the fourth wall” by appearing to jut out of the screen. They are also commonly excessive and direct in their playfulness. For example, one of the most famous of such scenes is the “paddle-ball man” in *House of Wax* (1953). A crowd gathers around a man who stands outside of the wax museum and shows off his paddle-ball skills. The man looks towards the screen as he repeatedly hits the ball “out of” the screen and makes remarks that are clearly meant to doubly apply to his diegetic audience as well as the actual audience in the theater—e.g., one of his comments is about almost hitting someone’s popcorn.

![Image](https://example.com/figure4.png)

Fig. 4. “Paddle-ball man” in action, *House of Wax* (1953).

A survey of the advertisements historically used for 3-D films confirms the fact that this form of 3-D—i.e., the “protruding,” self-reflexive type—has clearly been the dominant style of the medium throughout its various periods of popularity in the history of cinema. Almost any poster for a 3-D film, prior to the contemporary “wave,” brazenly emphasizes the 3-D effects over the content of the film. However, a contemporary trend in digital 3-D, led by prominent technophile filmmakers such as Cameron and animation studios like Dreamworks and Pixar, wants to repress the “shock” or “attraction” nature of
traditional 3-D. Horror films, being already a largely self-reflexive genre, have embraced the traditional “protrusion” 3-D technique the most, and contemporary 3-D horror films, such as My Bloody Valentine 3-D (2009) and Piranha 3-D, remain loyal to the original style. Avatar, and most other “blockbuster” films that are released in 3-D formats, do not. Most of the contemporary 3-D films not only avoid exaggerating the 3-D effects in their advertisements, but many times it is not even mentioned outside of the “fine print” in contemporary movie posters. The repression of more self-reflexive, “shocking” 3-D effects in much contemporary blockbuster 3-D films aligns with the contemporary desire for “immersion in depth” that “receding” 3-D effects strive to provide.

Fig. 5A and 5B. House of Wax (1953). My Bloody Valentine 3-D (2009). Promotional posters for 3-D horror films exaggerate the “protruding” 3-D effects.
Allegations of people “misusing” technology such as those found in the narratives of Cameron’s films, as well as his actual comments in interviews, exemplify what McLuhan has called “the voice of the current somnambulism.”18 Of course, the term “current” for McLuhan referred to contemporary times when he wrote “The Medium is the Message” in 1964. Though much has changed since the 1960s, and McLuhan’s commentary on the world becoming a “global village” has become quite apparent due to inventions such as the internet, nature and technology are still portrayed and discussed as isolated phenomena. Regardless of our obvious connectivity to electrical devices and means of communication, the medium remains envisioned as “amputated” and threatening to nature, instead of being realized as an extension of natural existence. The “current somnambulism” regarding the contemporary resurgence of 3-D media can be seen in the fact that 3-D’s place within and effect upon society as a medium is still neglected. We are still caught up with asking how 3-D should be used, rather than trying
to understand how it functions within the social structure that produces and consumes it. Aside from this, our failure to understand the meaning and impact of three-dimensional media within the current social order also detracts from our ability to understand how two-dimensional media function as well. The two-dimensionally hyper-extended subject must first acknowledge how digital media has reordered society in order to be able to perpetrate change.

*Avatar* is perhaps the most fitting portrait of precisely how difficult it is to “see” the electric medium as McLuhan expounded. Cutting-edge digital effects and 3-D are primarily used against themselves. Though these effects clearly add to the technological spectacle of films, their intended function is typically to blend with the live action and appear to be as “realistic” as possible. Cameron rejects “protruding” 3-D precisely because it calls attention to itself. In films that utilize that style of 3-D, the medium is accentuated rather than obscured. Typically, narratives conceal artifice while spectacles reveal it. Filmmakers like Cameron, however, attempt to transform spectacle into a narrative device; a device to embellish the diegetic worlds of their films, but to do so without “distracting” from the narratives. In a perfect scenario (from Cameron’s point of view) special effects would *only* add to narrative absorption. And the narrative, or “content,” of films tends to be so powerful in its ability to distract from the central “message” that even when the “message” of the medium is glaringly built *into* the narrative, it can still go unnoticed. The spirit of the “cinema of attractions” may seem to be reinvigorated in contemporary special effects-laden films such as *Avatar*, but these films are still narratively-driven, and narrative almost always overshadows the spectacles in importance (or at least attempts to). The director who digitally extends his actors,
camera, and entire stage to compose his electric magnum opus, describes his film as a rendition of how technology separates humans from nature. Cameron has built his career as a pioneer of technological advancements in film, continually writing technology-based narratives, yet he seems to not recognize that technology is his nature.

To get at the heart of this issue, it must be acknowledged that the protruding 3-D effects, though condemned by many mainstream filmmakers, essentially serve the same function as the receding effects. While protruding effects may be more closely linked to the “cinema of attractions” due to their punctuated-shock and direct-address format, fundamentally both types of 3-D create the illusion of depth and solidity in flat images. The fact that protruding 3-D has the tendency to be more self-reflexive than receding 3-D seems to be the cause of its ostracization, yet receding 3-D is still more “distracting” from a film’s narrative than filmmakers seem to want to accept. Any form of 3-D effect added to a film becomes a point of interest or attraction when one goes to the movies. Neither effect goes unnoticed by spectators, as filmmakers such as Cameron want to believe, and in the case of Avatar, the attraction is largely the depth, or the 3-D effect itself. Both styles of 3-D require deep attention, as the spectator must don a pair of 3-D specs and rivet his/her eyes to the screen in order to perceive the illusion. In this way, both styles of 3-D cinema are more “immersive” than standard 2-D cinema, because the audience must dedicate deeper attention to experience the illusion, but both styles of 3-D also call attention to the medium and render absolute “immersion” or narrative “absorption” impossible.

The debate still rages, however, over which type of 3-D effects are “more immersive” or “less gimmicky”—the “gimmicky” term being given most often to the
protruding effects. Instead, there needs to be an acknowledgment of the fact that both
types of 3-D are simultaneously more immersive and more “shocking.” Since both styles
of 3-D function very similarly at their core, again it becomes apparent that rather than
asking what type of 3-D effects should be used, the real question that needs to be asked,
and which I am attempting to answer, is why exactly do we produce and consume 3-D
media? The answer is that both styles of 3-D essentially function to help society cope
with the lack of depth in contemporary life by providing the illusion of depth and
substance in digital imagery. “Digital worlds” are forged into simulacra of the material
world, which may help alleviate society’s anxiety over shifting into a new digital life,
because acknowledging that technology is our nature is too difficult. Technology is still
seen as amputated, or “other” in relation to “nature,” instead of as augmentation or
transformation. Refusal to see that protruding and receding 3-D effects function
similarly, and ultimately serve the same purpose, is not unlike the refusal to recognize the
falsity of the rift humanity still puts between nature and technology. It is precisely this
rift that causes the lack of depth in contemporary life to weigh on the unconscious,
because digital “spaces” are not attributed the same importance as their physical
counterparts, and so the “move” to a digital world is met with hidden anxiety.

Epilogue: From 3-D Cinema to Cultural Logic

It was important to begin discussing three-dimensional media with cinema
because 3-D films are one of the largest and most publicized instantiations of the
technology. My examination of Cameron’s Avatar has shown that the film has a
complicated relationship to its own technology, just as contemporary society does, but
ultimately *Avatar* (and most other prominent examples of contemporary 3-D cinema) promotes an aesthetically and socially conservative use of 3-D. That is to say, the way 3-D is most commonly used in cinema is to create an illusion of depth and materiality in two-dimensional digital images. By doing so, 3-D films only attempt to ease the lack of spatiality neoliberal hyper-extension has caused and subsequently help perpetuate the current system.

Now that a prime example of contemporary 3-D cinema has been critiqued and its complications and entanglements with the current socio-economic system have been explored, it is time to move beyond the cinema. As my introduction explained, the contemporary return of three-dimensional media exists in objects and discourses outside of and even unrelated to cinema. So, in order to fully understand our relationship to three-dimensional media and the social system that creates and consumes it, 3-D needs to be examined as a pervasive cultural logic, rather than simply within the confines of one example. To further illustrate this point, the following chapter begins with an examination of “Augmented Reality,” which is another widely popular form of three-dimensional digital media. My critique of Augmented Reality provides further examples of how other three-dimensional media functions similarly to 3-D cinema, in that it also helps deny society’s two-dimensionally hyper-extended state by merging physical and digital spaces. That chapter then goes on to explicate key elements of neoliberalism and discusses issues of attention and distraction as they relate to neoliberal economics, hyper-extensionality, and three-dimensional media.
Notes


3 For example, see the Toy Story films, Up, Wall-e, Monsters vs. Aliens, etc.


5 Cameron, James. Capturing Avatar 2010.


7 McLuhan, Understanding Media: The Extensions of Man, 21.

8 Ibid, 21.

9 Cameron, James. Capturing Avatar.


11 Ibid, 330.

12 Cameron, James. Capturing Avatar.


18 McLuhan, Understanding Media: The Extensions of Man, 23.
Chapter Two:

Deep Pictures, Deep Pockets: Augmented Reality and the Economics of Three-Dimensional Media

It took 25 years to progress from drawing stick figures on a screen to the photorealistic dinosaurs in “Jurassic Park.” Within another 25 years, we should be able to wear a pair of AR glasses outdoors to see and interact with photorealistic dinosaurs eating a tree in our backyard.

-Ronald T. Azuma, 1997

A New World, Part Two: Digitizing Space(s)

While we aren’t yet interacting with dinosaurs in our yards (perhaps thankfully), Augmented Reality (AR) continues to develop and spread. Recently, within the overall reinvigoration of three-dimensional media, there have been growing commercial developments in AR, especially in the spheres of advertising and entertainment. In “A Survey of Augmented Reality,” Ronal Azuma explains that “Augmented Reality” is essentially a variation of “Virtual Reality,” except Virtual Reality “completely immerse[s] the user inside a synthetic environment,” whereas AR only “supplements reality, rather than completely replacing it.”¹ In other words, AR is a blending of the “real” and the “virtual.” It generates a composite vision of the physical world that is in some way altered by digital imagery, with the ideal goal being to make it “appear to the user that the virtual and real objects [coexist] in the same space.”²

AR can therefore (at least theoretically) reach beyond cinema’s capability in making digital images resemble the physical world. Not only does AR integrate three-dimensional digital imagery into physical spaces, but most of it is also interactive,
allowing the user to traverse or manipulate the images he/she sees as though they are physically present in his/her field of vision. So with functions such as these, AR—like 3-D cinema—can also be seen as a medium which attempts to mitigate social anxieties regarding the rapid digitization of daily life and the seemingly ever-increasing level of connections through 2-D interfaces one feels pressure to maintain under the current socio-economic system. In fact, AR can achieve that to which 3-D cinema can only aspire, because AR is by definition an integration of the physical and the digital, functioning to visually “bridge the gap” between realms and consequently make that which is digital feel less amputated or more integrated with the material world.

As with three-dimensionality in general, my work is not attempting to make value judgments regarding any form of AR. Instead, my aim is to show that the particular form commercial AR tends to take, or aspires to become, is tethered to a contemporary desire for depth that has given birth to a whole market for three-dimensional media, including (but not limited to) cinema, television, smartphones, tablets, video games, and even children’s toys. What I am concerned with critiquing, regarding commercial forms of AR, is that same aspiration towards “realism” in digital effects that can be seen in the cinema and in video games, as well as the prevalent desire to create three-dimensional digital constructs that appear to have substance and weight in this medium. Azuma states that “after the basic problems with AR are solved, the ultimate goal will be to generate virtual objects that are so realistic that they are virtually indistinguishable from the real environment.”3 It is this end goal of producing digital simulacra of the physical world that is entangled with the same social issues that have resurrected interest in three-dimensional media.
Specifically, one of the largest forms of contemporary AR (both physically and in popularity) is “Spatial Augmented Reality” (SAR), also called “3-D projection mapping.” 3-D projection mapping, which is often used to create grand-scale spectacles for the purpose of advertising, has become quite popular via internet “buzz” in recent years. One reason these entertaining visual spectacles are problematic is because most of them are simply commercials for various products; commercials that are projected massively on the sides of architectural structures outdoors, typically in urban environments throughout the world. In this way, it can be said that just as AR is conceived as a blending or “middle ground” between the virtual and the material, 3-D projection mapping can be seen as a seamless blending of entertainment and advertising.

Another problem with this style of advertising is that it uses digital effects to sell material goods that are almost always digital devices themselves. Essentially, these three-dimensional digital spectacles entice us by appealing to the unconscious lack of depth in our daily, two-dimensionally hyper-extended lives, and they do so only to sell us more digital devices which either provide the same bandage for our loss of depth or further enable our hyper-extensionality. It is a perverse loop, a Möbius strip-like scenario, wherein we are genuinely attracted to and entertained by a 3-D projection-mapped advertisement that is meant to sell us a product that either helps generate or perpetuate the lack which caused us to be attracted to the advertisement in the first place. Such a loop turns entertainment into a tool that works to disavow the exploitative hyper-extensionality imposed by neoliberalism and consequently preserves the status quo.

The particular example of SAR I analyze in this chapter is a Samsung advertisement for 3-D televisions that was projected upon the façade of the Beurs van
Berlage in central Amsterdam on three consecutive evenings in May of 2010. The Samsung ad not only exemplifies my main arguments regarding three-dimensional media as an alleviator of social anxieties correlated with “living digitally,” but it also has thematic similarities to Avatar regarding its highly-technological portrayal of “nature.” Along with this example of large-scale SAR, I also look at portable AR, specifically the AR cards that are included with the Nintendo 3DS portable gaming device. These two examples represent two popular consumer-directed forms of Augmented Reality that, while seemingly working as “inverses” of each other, similarly answer the same socio-technological problem.

Fig. 6. SAR Samsung advertisement for 3-D television projected onto the façade of the Beurs van Berlage in Amsterdam (May 2010).

Fig. 7. Advertisement for Nintendo 3DS AR Cards.
Just as there are two distinct types of three-dimensional effects in cinema—those that appear to protrude from the screen and those that appear to recede into the screen—these two forms of AR share a similarly inverse relationship. What I mean is that SAR, on the one hand, can be correlated with protruding 3-D effects, as it involves digital imagery being projected upon physical structures. On the other hand, portable AR applications such as those on the Nintendo 3DS correlate with receding 3-D effects in that they are seen in “depth” within the frame of the portable device’s screen. Of course, these associations are not without fault. For instance, SAR can appear to protrude from and/or recede into the surface upon which it is projected. Additionally, digital effects seen through the Nintendo 3DS screen can also appear to protrude and/or recede into the physical space within which they are displayed. But for all intents and purposes, it can be said that SAR “builds upon” physical structures—i. e., it “protrudes” from façades—while portable-device AR is seen in depth as though the screen is a window one must peer through to see the digital augmentation—i. e., it “recedes” into the screen.

Interestingly, the complications with protruding versus receding effects in Augmented Reality are not as apparent as they are in 3-D cinema. This is perhaps because AR is not inherently tied to narrative in the same way as contemporary mainstream cinema, so there is not a public debate over which type is “better” or more “gimmicky.” Put differently, the question of which type of AR is most “immersive” is not a popular concern as it is with 3-D cinema, because the concern with “immersion” in the popular discourse on cinema deals heavily with narrative absorption. That said, SAR, which I liken to “protruding” 3-D, is arguably more “shocking” or “spectacular” than portable AR, which I compare to “receding” 3-D, and which is arguably more subtle or
“immersive.” These observations correlate to the way the two opposing types of 3-D are often seen as functioning in cinema, and are therefore also problematic, just as they are in cinema. That is, the particular concepts of “immersion” and “shock” or “attraction” are complicated by the introduction of 3-D, as explained in my introduction. Three-dimensionality increases both the “shocking” and the “immersive” qualities of media, making it difficult to describe one style of 3-D as more immersive in contrast to another. The second part of this chapter will return to this point, where the issue of attention in relation to three-dimensional media will be explored. Before that, however, it is important to take a closer look at the Samsung 3-D projection-mapped advertisement as an example of SAR and the Nintendo 3DS AR cards as examples of portable AR, in order to have a more complete picture of the way contemporary three-dimensional media functions.

The Samsung ad begins when it is activated by someone placing his/her hand in a cut-out control panel of sorts. This action projects large fingerprints upon the façade of the building. This initialization method of the advertisement is important in itself because fingerprints are *indices*—i.e., tethered to their specific referent. This initial projection caused by direct human interaction with the apparatus therefore inherently links the projected digital imagery to a “reality” even beyond the building surface upon which it is projected. Next, the handprint darkens to look as though bricks have been removed from the building to create a hand-shaped hole in the center. The importance of this initial image cannot be overlooked. The fingerprints are transformed into a hole in the building, complete with some digital dust and a few falling bricks to make it look as though the hole has just been made. So, essentially what happens here is that the user
extends an index of him/herself into the digital projection, which then has the power to break through the solid surface of the building. The indexicality of this initial digital extension engenders the power and connectivity such interactive digital media can potentially offer. Essentially, the opening moments of this Samsung advertisement show that digital media has the ability to supersede the limits of the physical world, while still remaining tethered to the user’s physical being. The user is in a sense transformed into a new, digitally enhanced, or augmented being, which is able to perform new tasks beyond the limits of one’s physical body. This brief showcase of the power and capability of digital media happens in just a few seconds and then fades, along with its accompanying background music, so that the rest of the “show” can begin.

It starts with a crack in the façade, forming at the base of the building and moving towards the top, shattering windows and making a large portion of bricks and glass appear to fall out of the center of the building as it progresses upwards. Again, this is demonstrating the power of digital projections to break through physical spaces and “alter” our environment. The crack then transforms into a tree trunk and branches with digital leaves and flowers growing out from it. Next, butterflies appear to fly around in and out of the large “hole” that has seemingly formed in the building’s façade. This transformation into “natural” images is entangled with the same complications as the digital “nature” in Avatar. Ironically “nature”—in this instance a tree and butterflies—appears to “grow” out of the brick building. The “nature” here is actually composed of ethereal digital effects, while the brick building is physical, but “man-made.” So which is more “natural”? Again, as with Avatar, the digital effects in this Samsung ad do not
merely mimic “nature” in appearance, with “realistic” colors and textures, but also in weight, and three-dimensionality.

After the butterflies, the building then fills with water and become a larger-than-life fish tank. A giant cat walks by peering in from behind the tank as fish appear to swim around in and out of the holes in the building. The fluttering of butterflies initially showcases the “gravity” of the digital imagery, but cannot do so as well as water. The apparent viscosity of water makes the entire illusion seem to have a weight and solidity. The water then “drains” out of the windows onto the steps in front of the building in what is probably the most remarkable effect of the show. Here the water really seems to have weight as it floods out of the windows three-dimensionally and runs down the steps in front of the building.

Fig. 8A. (left) Hand imprint in building; Fig. 8B. (center) Crack in façade beginning at base and moving upward; Fig. 8C. (right) Bricks crumbling and falling out of front of building from crack.

Fig. 8D. (left) Crack in façade becoming trunk of tree with leaves and flowers growing out from “branches”; Fig. 8E. (right) After filling with water and fish, water drains out of the windows onto the steps in front of the building.
Finally, a few more butterflies flutter out of the hole and a giant Samsung 3-D television appears, hovering in the darkened center of the building. The television then “floats” out prominently in front of the building, and “sucks” the rest of the digital imagery off of the building into its frame, which then illuminates and portrays a tropical forest scene of its own. Of course all of this is part of the same projection, but it is made to look like the television comes out and literally “steals the show” by pulling the surrounding digital effects off of the wall and into its own frame. Another butterfly then flies out of the screen of the television to imply that the device being advertised is capable of the same effects employed by the advertisement itself. Not only is the television shown to be capable of 3-D effects that are as impressive as the projection on display, but it is also shown to mimic nature as effectively. The obsession with making digital simulacra of the physical world is apparent at all times. The television set is the only “unnatural” image shown in the show, and the screen of the television shows a “natural” scene. This is reminiscent René Magritte’s “window” paintings that consist of a painting on an easel propped in front of a window, with the painting on the canvas exactly matching the natural scenery behind it, except now the digital screen has replaced the canvas.
Magritte’s “window” paintings deal with the framing of spaces, and particularly the relationship between two-dimensional representations and three-dimensional physical spaces. Along these lines, there is also a play of inside and outside in these works. Regarding this, Magritte has stated that the landscape portrayed on the painting within the painting in *The Human Condition I* is “simultaneously inside the room; in the picture, and outside, in the real landscape, in thought.” In other words, this painting can be seen as critiquing an early form of what contemporary digital 3-D media now attempts to accomplish. It represents a perfect mimesis of three-dimensional “nature” within the confines of a two-dimensional plane wherein the spectator can (almost seamlessly) envision materiality through the two-dimensional representation. It is important to note that there is a “seam” in this work, however, as canvas within the canvas has a visible edge which points out the fact that there is a difference between the representation and its referent, even if this difference may appear to be negligible. Contemporary AR, conversely, attempts to eliminate the seams. Returning to the Samsung advertisement, its
mimesis of nature can be seen as working to “naturalize” digital media. Rather than call attention to the seams, SAR demonstrations such as the Samsung ad discussed above strive to erase the boundaries between two-dimensional abstractions and the physical world. In doing so, these works subsequently function to naturalize the specific forms/uses of digital media that help perpetuate neoliberal hyper-extensionality.

Magritte’s “painting within a painting” is actually the perfect image to tie 3-D projection mapping to portable AR, because it represents precisely how the digital screen attempts to function when using an AR application. AR on a handheld device such as the Nintendo 3DS uses a rear-facing camera to generate an onscreen image of what is “behind” the screen in the user’s physical space. The 3DS actually uses dual rear-facing cameras to create a stereoscopic image, creating the illusion of looking right through the screen as though it is a window. This effect is then strengthened by the fact that the 3DS creates three-dimensional imagery without the need for glasses or a separate apparatus. By turning on the rear cameras, the screen of the device looks effectively transparent. The way the augmented reality on the device works is primarily through the use of the “AR cards” that come packaged with the system. When an AR card is placed on a surface, and the cameras of the 3DS are positioned a certain distance from the card, the device registers the card’s presence and initializes a particular program.

Most of the AR cards cause a three-dimensional figure to appear on them, making it seem like there is a character standing on the surface of the card, within the physical space. These figures can be rotated and looked at from different angles, but do little else. They are essentially a demo of the AR cards’ capabilities to make digital images appear to occupy the same space as the user. The user is encouraged to take photographs of the
character of their choice in different locations. For example, below is a photograph I took of Mario “standing” on my laptop.

![Mario AR Card](image)

**Fig. 10.** Nintendo 3DS AR card; Mario standing on my laptop.

The main AR card is one that has a question mark on it. When this AR card is initialized, a three-dimensional menu, consisting of six yellow cubes, appears to rise out of the surface the card is on. There are various games that can be played here, as well as different characters the user can photograph, all of which are made to appear as though they are grounded in the physical location of the AR card. To add to this, there are effects that are intended to make the surface upon which the AR card is placed appear to open up, sink down, or build up at times with digital game elements either perched upon or coming out of the surface.

Aside from having a glasses-free 3-D experience, the system also uses motion controls. That is to say, when using the AR cards, the view on the screen is manipulated by moving the whole device, further strengthening the illusion that one is merely peering through a window. All of this attention is put towards creating the illusion of digital images that reside within the physical world, appear to be solid, and adhere to the same physics as material objects. Effects such as these work to disavow contemporary
society’s two-dimensionally hyper-extended state, a state that is made possible through digital devices such as laptops, netbooks, tablets, and smartphones.

In recent years, smartphones have arguably become the most pervasive outlet of hyper-extensionality. The rise of smartphones has drastically refigured the way people communicate. These devices have altered the way people send and receive information, the amount of information that can be sent and received, and the rate at which said information can be accessed. At any time, anywhere, a smartphone user is plugged into the network, part of a constant feedback loop. Paradoxically, however, the one area from which many smartphone users seem to be disconnected much of the time is the very space their bodies physically occupy. Spatial relationships between physical beings seem almost secondary in power and importance to the radical connectivity afforded by smartphones.

When sharing the space of an elevator with a group of people, for instance, one might notice that everyone on the elevator has their attention directed solely at their smartphones, many times also with headphones in their ears so as to be both visually and aurally disintegrated from the physical space they inhabit. Such a sight would not be considered odd in contemporary society and is especially prevalent in locations occupied primarily by Generation-M’ers—i.e., members of the “media generation,” those who have grown up in the current digital era and have never lived in a world that was not connected via the internet. Users are therefore largely living their lives extended through virtual rather than physical spaces. A two-dimensional handheld device now encapsulates everything; the “world” is accessible through the screen of a smartphone—and much more conveniently so than in the physical world.
Work and play, professional and social relationships, can all be managed in one portable package. Regardless of what one wants or needs to do, there is most likely an ‘app’ that is designed for just that—in fact, for most tasks it is more likely that one would have to wade through many such apps in search of one that functions best rather than not being able to find one. And, the fact that smartphones are portable, always connected, and extremely versatile also allows for the possibility of work and leisure time to flow into each other more than ever before. In other words, constant connectivity has the potential to make everyone essentially “on call” at all times, collapsing any leisure time into time that is available for work-based communication and/or activities. Conversely, leisure time can also leak into work time with the ability to play games, listen to music, watch videos, or enjoy a vast array of other entertainment-based activities via one’s smartphone.

This “smartphone culture” has also generated a reconfiguration of public and private spaces. Returning to the elevator scenario and analyzing the activity one step further, these people who are engrossed in the screens of their smartphones are all having private conversations in a small, enclosed public space, and yet they are doing so without threat of eavesdropping. On top of that, if they are communicating on social networking sites, they are quite possibly having private conversations in the most public of all spaces—the internet. Also, the inverse of this situation is that group communication can happen with all participants isolated from one another, in their own private spaces.

The traditional notions of public and private are therefore much more complicated with contemporary digital communication technology. For example, social networking is one of the primary arenas in which the boundaries between public and private
communication have been virtually shattered. Specifically, I would like to analyze a group of friends having a conversation on someone’s Facebook “wall.” Participants in this scenario are isolated from one another in different spaces (they could be at work, home, shopping, etc.). Such a conversation would typically only be between this particular group of friends, and they would traditionally have to simultaneously occupy the same physical space in order to partake in such communication. Via traditional spoken conversation, if the group was meeting in a public space, it is true that perhaps some other people, who are not involved in the private conversation, could eavesdrop. In the current scenario on Facebook, however, the “wall” upon which the conversation takes place belongs to one of the participants who happens to have hundreds of other “friends.” Now, even if his/her privacy settings are relatively strict, there is at least several hundred people who cannot only eavesdrop (figuratively), but can also legitimately enter the conversation. I say “legitimately” because in this realm it is socially acceptable for anyone who is “friends” to enter any posted conversation. And of course, in the event that his/her privacy settings are not strict (which the default setting is not), the private conversation can then technically be found and viewed by anyone who is connected to the internet.

Along these lines, the general ability to send and receive text messages needs to be examined as well—and with smartphones, of course, social networking is also included as a portable, text-based form of communication. “Texting” is now extremely popular, and the process of doing so, instead of actually speaking to someone (either over the phone or in person), completely changes the act of interpersonal communication. No longer does a conversation necessarily imply a direct encounter wherein it is known that
all parties are involved simultaneously. The act of texting is inherently different from speaking to someone on a temporal level because text messaging, as well as social networking, lacks the necessity of a direct encounter. That is to say, the initial text message, or social network post, that attempts to open conversation, is entirely one-sided. The sender of such a message cannot know when they will receive a reply, because they cannot know when the message they sent will be received, if they will even receive a reply at all, or if their message even went through to the intended recipient. Also, with social networking, one cannot even know who (if anyone) will reply to posts. This reconstruction of communication forces every participant to accept potentially being “on hold” for an indefinite period of time.

In a nutshell, smartphones have radically altered the way people work, play, obtain information, and communicate on a global scale. The smartphone user has the information and connectivity of the internet at his/her fingertips at all times. Whole social lives are mapped online for everyone to potentially see. Communication with virtually everyone we know, simultaneously, regardless of where we are, and regardless of where they are is now possible. We are radically connected, and our lives are conducted through two-dimensional interfaces flooded with abstract imagery. Life now consists of interacting with a vast assortment of two-dimensional abstract “icons” that are made to signify some concrete reality to which their function relates—for instance, the icon for a “folder” commonly resembles a traditional manila folder. The problem here is that while the functions of these two items may be related, they are not the same. One is a physical object made of paper, and the other is a method of digital data organization within a computer system. The addition of aspects such as touchscreen technology,
motion controls, photorealism, and three-dimensionality to these abstractions then attempts to further obscure the difference, or “erase the seams” between digital and physical objects, spaces, or “realities.”

This erasure or disavowal of the difference between digital abstractions and physical realities is precisely what allows neoliberal hyper-extension to continue unchallenged. It is not merely the digitization of everyday activities, but the ever-increasing amount of connections one must maintain in the current socio-economic system that has left the average worker feeling “flattened” or spread too thin. This feeling is at least somewhat alleviated by molding digital images into substantial simulacra of the physical world, but making digital imagery mimetic of the material reality we now lack merely softens the loss and lessens the resistance to hyper-extension.

To avoid merely maintaining the status quo, digital media must maintain a level of abstraction or self-reflexivity. It must show its seams.

The demand for hyper-extension has spread so that virtually every digital device now does well beyond its core purpose. Is it not paradoxical that even our digital devices now seem hyper-extended? For instance, the Nintendo 3DS is, at its core, a portable gaming system. It does not simply play games, though. It, too, is device that allows for extensionality far beyond its core function. The 3DS has cameras capable of photo and video, a web browser, a music player, a video player, Netflix, and a plethora of downloadable applications such as calendars, notepads, et cetera. The device is capable of so much more than gaming that it almost seems wrong or limiting to categorize it as a gaming platform. But this issue is one that has arisen in most portable electronics in recent years. It seems as though each of our digital devices must be capable of doing
what every other device can do. Returning specifically to the issue of three-dimensionality, more and more devices are becoming capable of 3-D as well. Just as every device that connects to the internet has the capability to enable hyper-extensionality, every device that creates three-dimensional imagery at least minimally eases the stress of said hyper-extension.

To further understand this connection between three-dimensional media and neoliberal economics it is important to analyze exactly how neoliberalism affects contemporary society. In doing so, it will become clear that the lack generated by the neoliberal system has reinvigorated an attraction to a particular aesthetic style, known as photorealism, which three-dimensionality is most commonly used to enhance.

Neoliberalism, Photorealism, and the Return of Three-Dimensional Media

Over the last few decades there has been a penchant for photorealism in visual effects, and it is important to note that this has not always been so. “Photorealism” is an art-historical term referring to paintings that became popular in the 1970s, which depict meticulously detailed scenes and strive for little or no evidence of brushstrokes so as to create the illusion of being a photograph. When applied to cinema, the term refers to computer-generated imagery and other digital effects (such as digitally erasing wiring harnesses) that are similarly detailed so that they appear to actually take place or be present in the mise-en-scène of the film.

In the late 1970s, there were three coinciding cultural developments—two aesthetic, and one socio-economic. The primary aesthetic development in cinema was what is often referred to as the “ILM aesthetic,” named after Industrial Light and Magic.
the visual effects company founded by George Lucas in 1975. The “ILM aesthetic” strives for photorealism in special effects, and has dominated the style of cinematic special effects from the late 1970s to present day. Julie Turnock states that the “ILM aesthetic” is in fact a style, “with stylistic components that can be identified, analyzed, and most importantly, denaturalized.”

Also in the late 1970s, beneath the aesthetic turn towards photorealism in painting and cinema, a new socio-economic configuration called “neoliberalism” was being put into place in countries around the globe. David Harvey defines “neoliberalism” as:

A theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade.

Basically what this “liberation” involves is massive deregulation and privatization of industry, along with a reduction of state involvement in “many areas of social provision.” So essentially “neoliberalism” is a theory that promotes economic deregulation and atomization of the market as being in the best interest of humanity’s “well-being.” The thought is that the most free and targeted market will provide what is most wanted to the most people.

The primary problem with this system is that it actually puts an incredible amount of stress on workers, because excessive atomization has generated a new level of expectancy for (potential) employees. Philosophers and critics of neoliberalism, such as Pierre Bourdieu and Catherine Malabou, have expanded upon the problem of financial deregulation (a key trait of neoliberal policy) and the amplified, excessive demand for flexibility in the contemporary workforce. Heading his article titled “Utopia of Endless
Exploitation: The Essence of Neoliberalism,” Bourdieu states that neoliberalism is, “a programme [sic] for destroying collective structures which may impede the pure market logic.” The “collective structures” that are called into question range from overarching systems such as government, to labor unions, all the way down to families. Every collective within this system is broken down, and/or atomized. Aside from reduction of any collective’s ability to regulate the market, the reason for such atomization is, according to Paul Treanor, “the desire to intensify and expand the market, by increasing the number, frequency, repeatability, and formalization of transactions.” Treanor then states that the ultimate goal of neoliberalism is:

A universe where every action of every being is a market transaction, conducted in competition with every other being and influencing every other transaction, with transactions occurring in an infinitely short time, and repeated at an infinitely fast rate.

It is this emphasis on atomization that generates the need for absolute flexibility. What is meant by “flexibility” here is the “over-involvement in work” that is imposed on everyone from increased competition that is extended down through the ranks to individual workers.

One must be able to maintain seemingly ever-increasing quantities of connections and have virtually limitless availability in order to compete and remain viable. Bourdieu claims that out of the destruction of collectives “a Darwinian world emerges [wherein] it is the struggle of all against all at all levels of the hierarchy, which finds support through everyone clinging to their job and organization under conditions of insecurity, suffering, and stress.” This process is kept alive by “the permanent threat of unemployment” and that fact that a “reserve army [of employees] exists at all levels of the hierarchy.”
“permanent threat of unemployment” is then what drives the motivation for excessive flexibility. Job security is highly reduced (or non-existent in many cases) so employees (or potential employees) must constantly be competitive, always proving their value and commitment to their employer(s) though flexibility. The ideal employee in this system would be able to handle any task, at any time, at maximum efficiency. The idea is that the elimination of “all temporal guarantees of employment” generates an extreme fidelity to one’s employer at all times.16 Work starts to spill out of the workplace and into leisure time, becoming more and more immersive. And, of course, much of this “spill” is aided by the ability of employees to always be “plugged in” through contemporary technology—namely laptops, tablets, smartphones, et cetera.

Aside from the rise of neoliberal economics and the new aspiration for photorealism in special effects, there was also a brief but notable increase in 3-D films in the late 1970s and early 1980s. Most of the 3-D films of this period such as Comin’ at Ya! (1981), Friday the 13th Part 3 (1982), Jaws 3-D (1983), and Amityville 3-D (1983) relentlessly relied on “protruding” 3-D effects to “shock” their audiences, in contrast to the contemporary digital 3-D films that primarily employ “receding” 3-D effects.
This 3-D film “boom” was relatively brief and less widespread than the contemporary return of three-dimensional media, but is important to note that it did occur around the same time as the rise of neoliberalism and the “ILM aesthetic.” This is likely because the desire to create simulacra was rising at the time, but the social level of hyper-extensionality could not severely increase to where it is today until at least the spread of internet availability in the 1990s and the countless digital/computing innovations since that further enabled connectivity. The “protruding” effects of the 1980s 3-D films are more self-reflexive than the “receding” effects of contemporary films and therefore show that, even though an interest in 3-D cinema seemed to be returning at that time, the social need for feeling “immersion in depth” was not yet present. I have argued that there are complications with these styles of 3-D because both protruding and receding 3-D effects have immersive and non-immersive qualities, but the receding effects are the style that is consistently promoted as being more immersive. The desire for immersion is shown in the promotion for the media today, while the need was not fully present before digital hyper-extensionality.

The quantity of portable digital devices that function to keep us “connected” everywhere we go and the level of connectivity of which these devices are capable is continuously growing. While these technologies do not necessarily have to serve neoliberal interests such as market atomization and increased work overflow, they are generally used to these ends. This is where the contemporary return of three-dimensional media comes into play. Three-dimensional digital imagery functions to both disavow our two-dimensional hyper-extended state and make our new digital reality feel familiar, like the physical world we seem to inhabit less and less every year. It is in the best interest of
“the market” that people remain hyper-extended, and continue to extend further and further, in more and more directions. The more connections a person has, the more profitable they potentially are. The allure of three-dimensional media, therefore, lies in the fact that it at least somewhat mitigates the social anxiety over neoliberal hyper-extensionality and the loss of “depth” in everyday life. The problem with this is that it only helps perpetuate the status quo. So what can be done about the current state of hyper-extensionality? Can three-dimensional media be used in a more socially just manner, one which helps show the problems of hyper-extensionality rather than bandage the lack it causes? To answer these questions, it is important to understand how entrenched the neoliberal system has become in contemporary society.

Neoliberal economics even have a correlation to contemporary neuroscience, specifically the way scientists understand and explain brain function. Malabou states that the “dominant concept of the neurosciences” is plasticity, and she explores this notion of a plastic brain in relation to the flexibility demanded by the neoliberal economics of contemporary society. Malabou’s primary argument deals with the recognition that, although they typically pass as being relatively synonymous, there are actually significant differences between the terms “plasticity” and “flexibility.” While flexibility only connotes malleability, plasticity connotes the ability to receive form, the ability to give form, and even the ability to annihilate form. The essential differences are, therefore, plasticity’s resilience and its “explosive” property—“explosive” meaning the ability to revolt, fight back, or destroy the current form. This resilience, and particularly the “explosive” property of the brain, is important in understanding how resistance to a system that has become naturalized like neoliberalism is actually possible. Malabou’s
argument develops out of these qualities and she ultimately proclaims, in a manifesto-like conclusion, that we should:

Refuse to be flexible individuals who combine a permanent control of the self with a capacity to self-modify at the whim of fluxes, transfers, and exchanges, for fear of explosion. To cancel the fluxes, to lower our self-controlling guard, to accept exploding from time to time . . . To visualize the possibility of saying no to an afflicting economic, political, and mediatic culture that celebrates only the triumph of flexibility, blessing obedient individuals who have no greater merit than that of knowing how to bow their heads with a smile. 

Such resistance is more easily said than done, however, because people are not conscious of their brains’ plasticity. This is the case because the contemporary model for our brain is so familiar that it goes unseen.

That is to say, plasticity is invisible because the model of the human brain “has become the form of our world,” meaning that “neuronal functioning and social functioning interdetermine each other and mutually give each other form … to the point where it is no longer possible to distinguish them.” In other words, the contemporary model for the human brain mirrors contemporary capitalism in form and functionality (a malleable, decentered network of connections). Malabou quotes Luc Boltanski and Eve Chiapello’s book, *The New Spirit of Capitalism*, to this end, referring to the contemporary form of capitalism as “the neuronal form of political and social functioning,” and she calls flexibility “the ideological avatar of plasticity—at once its mask, its diversion, and its confiscation.” In this system, the resilient, form-giving, and form-annihilating aspects of plasticity are intentionally hidden or ignored in favor of a demand solely for flexibility in the workforce. Economic viability relies upon absolute mobility and adaptability—only the ability to bend and receive form. Without acknowledging the
other elements of plasticity, the current political and social organization is essentially “naturalized,” justified as being intrinsically linked to human biology. Adaptability is perhaps the most important aspect of the “plastic brain” model. The concept is that the plastic brain adapts, or evolves, based on its environment and experiences. Regarding this adaptability, Katherine Hayles has discussed “Generation M,” a term that refers to the multitasking or media generation—also referred to in contemporary discourse as “Generation Z,” or the “Internet Generation.” She explains that “human beings are born with their nervous systems ready to be reconfigured in response to the environment,” and that the brain essentially goes through a “pruning process” (called synaptogenesis) in which particular neurons strengthen and grow while others decay and disappear, based on the environment and experiences of the child. The idea is that if the brain truly evolves in this way (based on its environment), then children who grew up in the contemporary, media-saturated environment, may “literally have brains wired differently” from previous generations of people who grew up without such media interaction. This is a crucial concept in understanding the contemporary issues of attention and distraction, to which 3-D, AR, and SAR are intrinsically linked.

There are two primary modes of attention, deep and hyper, which, according to Hayles, can be used to explain the divide created by Generation M’s media-saturated environment and consequent difference in brain function, and the developmental environment experienced by older generations. Deep attention is characterized by “concentrating on a single object for long periods, ignoring outside stimuli while so engaged, preferring a single information stream, and having a high tolerance for long focus times.” Hyper attention, conversely, consists of “switching focus rapidly among
different tasks, preferring multiple information streams, seeking a high level of stimulation, and having a low tolerance for boredom.” What is interesting is that hyper attention is simultaneously associated with multitasking (or what I have referred to as hyper-extensionality) as well as distraction. Yet these two terms tend to connote opposing opinions of the same behavior—that is, the ability to multitask is considered to be a positive tool for efficiency and success in contemporary society, while distraction is typically considered to be negative, and wasteful.

Each type of attention has its own advantages and disadvantages, though. On the one hand, deep attention works for “solving complex problems represented in a single medium” but lacks an overall awareness and alertness of one’s environment as well as “flexibility of response.” On the other hand, hyper attention “excels at negotiating rapidly changing environments” that contain multiple focal points but lacks the ability to maintain focus on any single “non-interactive object.” In education especially, hyper attention has been branded as “defective behavior” because much of the curriculum still relies on deep attention. The label this “defective behavior” has taken on is widely known in contemporary society as it has seemingly become an epidemic. The label, of course, is “ADHD” (Attention Deficit Hyperactivity Disorder), a disorder that first appeared in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (or DSM-III) in 1980. The CDC (Centers for Disease Control and Prevention) states that recent survey data indicates “approximately 9.5%, or 5.4 million children 4-17 years of age have been diagnosed with ADHD, as of 2007,” and “the percentage of children with a parent-reported ADHD diagnosis increased by 22% between 2003 and 2007.” However, if brain plasticity is causing this shift towards hyper attention on a
generational level due to media saturation and contemporary hyper-extensionality, what is the most socially just way to deal with this issue?

In a way, three-dimensional media may have a similar function to medication for forcing deep-attention from someone who may generally be more hyper-attentive. Three-dimensional media is commonly hyped as being immersive, something that strives for deep attention. As noted in my introduction, this concept has been compared to one of Siegfried Kracauer’s theories, the “mass ornament,” wherein Kracauer analyzes the Tiller Girls, a synchronized dancing troupe in Berlin during the 1920s.\textsuperscript{29} Again, the gist of his argument in this article is that the “mass ornament” (the Tiller Girls) is the “aesthetic reflex of the rationality to which the prevailing economic system aspires.” Its structure “reflects that of the entire contemporary situation.”\textsuperscript{30} One way it does so is through its synched, mechanical movements, which mimic those of the assembly line. In this way, workers are basically shown their social reality through their aesthetic entertainment.

Also, as I previously mentioned, Kracauer’s notion of the “mass ornament” has been applied to current, neoliberal conditions by Constance Balides in order to analyze blockbuster films as the contemporary counterpart to the Tiller Girls. Balides’ argument is built upon the goal of these films to provide an immersive experience for the audience. Just as the Tiller Girls aesthetically encompassed aspects of Fordism, such as the assembly line, blockbuster films reveal aspects of neoliberalism. Particularly the fact that, as Balides notes:

\begin{quote}
Work in the post-Fordist era fills all time and previously non-work spaces. It is bounded neither by the factory gate with its clear spatial boundaries between factory and home nor by the factory whistle and its sharp temporal distinction between work and leisure.\textsuperscript{31}
\end{quote}
In this way, there clearly seems to be a link between the aesthetic of or desire for immersion in contemporary films and neoliberalism which “involves an incorporative mode of subjectivity.”32 In other words, the contemporary social reality of being “immersed” in one’s work is therefore reflected in the aesthetics of one’s entertainment. Three-dimensionality only helps satiate this desire for immersion, in that it creates the illusion of depth and substance in flat digital imagery, and requires a level of deep attention to perceive the illusion. Of course, whether or not deep attention is actually more “immersive” than hyper attention is also arguable. Deep attention does not necessarily provide a more “immersive” experience, it just involves focusing on only one object or task. In this way, hyper attention can be said to be more “immersive,” because a hyper-attentive state involves dealing with a collection of tasks, focusing on many things at once.

It is here that I would like to put forth the suggestion that beyond merely reflecting the current economic situation, the concept of immersion in films or any media, which is seemingly strengthened by the addition of three-dimensionality, may serve another purpose. For instance, if the brain is understood as being “plastic”—meaning it adapts or evolves based on its environment—then the brains of younger generations are adapting to be wired for hyper attention rather than deep attention, because they are developing in a hyper-extended, media-saturated environment. If this is the case, the notion of deep attention may slowly be phased out entirely. Now, it seems that hyper attention is already preferred in the current socio-economic system, as neoliberalism requires people to be hyper-extended. So the question then becomes, what is at stake if deep attention continues to wither and eventually disappears?
Studies have actually indicated that “efficiency declines so significantly with multitasking that it is more time-efficient to do several tasks sequentially than attempt to do them simultaneously.”\(^3\) Therein lies the potential economic attraction to deep attention and a seemingly counterintuitive necessity for it in neoliberal society. If the boosted efficiency of multitasking is a fallacy, then some amount of deep attention must remain in order to achieve a desired level of productivity. So perhaps the bandage that three-dimensional media provides not only alleviates social anxieties stemming from two-dimensional hyper-extensionality, but also helps maintain a level of capability for deep attention. But should we be attempting to maintain an attentive mode that is becoming obsolete? Would it not be more ethical to step back and analyze how the contemporary technological capacity for hyper-extension has been used to exploit the general public?

Current technology does not have to serve the goals of neoliberalism, but unfortunately, it largely does so in multiple ways. As digital devices are now commonly used for both work and entertainment, they are capable of enabling hyper-extensionality while simultaneously disavowing it. While current technologies extensively function in this neoliberal, hyper-extending way, we need to embrace the social possibilities of both two-dimensional and three-dimensional abstraction, rather than incessantly seek to recreate a lost “depth” which only helps perpetuates our imposed hyper-extensionality.

Notes

2 Ibid, 2.
Ibid, 35.

4 For examples see:


10 Ibid, 3.


13 Ibid.

14 Bourdieu, "Utopia of Endless Exploitation: The Essence of Neoliberalism."

15 Ibid.

16 Ibid.


18 Ibid, 5.

19 Ibid, 78-79.

20 Ibid, 9.

21 Ibid, 10, 12.

22 Ibid, 9.

23 The term “Generation M” is taken from the title of the Kaiser Family Foundation’s survey entitled “Generation M: Media in the Lives of 8-18 Year-olds.”


25 Ibid, 192.

26 Ibid, 187.
27 Ibid, 188.


29 This comparison has been made by Constance Balides, in her work: "Virtual Spaces and Incorporative Logics: Contemporary Films As ‘Mass Ornaments’".


31 Balides, "Virtual Spaces and Incorporative Logics: Contemporary Films As ‘Mass Ornaments’"

32 Ibid.

33 Hayles, Hyper and Deep Attention: The Generational Divide in Cognitive Modes, 189.
Conclusion

If we choose, we can live in a world of comforting illusion.

-Noam Chomsky

We comprehend... that nuclear power is a real danger for mankind, that over-crowding of the planet is the greatest danger of all. We have understood that the destruction of the environment is another enormous danger. But I truly believe that the lack of adequate imagery is a danger of the same magnitude. It is as serious a defect as being without memory. What have we done to our images?

-Werner Herzog

“Comforting illusion” is an apt descriptor for what popular three-dimensional media provides the contemporary public. My work has shown that the current desire to produce and consume digital three-dimensional media stems directly from neoliberalism and the demands for flexibility it imposes on the workforce. Commercial forms of three-dimensional digital media, such as cinema and augmented reality, function largely to create the illusion of depth and substance in digital imagery. This fact alone is not necessarily problematic. However, this form of three-dimensional media is most often coupled with a drive towards photorealism in digital effects and subsequently ends up functioning as a coping mechanism for the unconscious lack of depth caused by neoliberal hyper-extensionality. To understand the social implications of three-dimensional media, the fact that multi-dimensionality has become a pervasive logic in contemporary culture must be acknowledged.
Through my examples I have analyzed contemporary 3-D cinema and commercial forms of augmented reality, some of the most prevalent forms of three-dimensional digital media today. Not only do these examples focus largely on photorealistic aesthetics, illusions of depth, and illusions of substance or weight, but they also show a complex, and often confused understanding of the relationship between nature and technology. Rather than attempting to embrace the abstraction of two-dimensional digital interfaces and the social possibilities such media engender, these objects merely attempt to naturalize digital imagery by making it appear to be mimetic of or seamlessly integrated with the physical world. In doing so, the status quo is maintained, and the true potential for such media is not fully realized.

Werner Herzog’s 2011 documentary, *Cave of Forgotten Dreams*, offers an aesthetically and socially promising vision of 3-D technology. One of the most striking differences between this film and its contemporary 3-D counterparts is that even though it is a film about caves, it primarily depicts *surfaces* rather than *depth*. Specifically, Herzog’s film is about *Chauvet Cave* in France and the paintings within it.

The cinematography of *Cave of Forgotten Dreams* differs drastically from most contemporary mainstream 3-D films, which tend to be aesthetically similar to *Avatar*. For instance, rather than showcasing depth, substance, weight, or viscosity through extreme long shots and a mise-en-scène that lacks negative space, Herzog’s film is shot in a hyper-attentive, self-reflexive manner that primarily uses close-ups or medium shots. What I mean by a hyper-attentive aesthetic is twofold in Herzog’s film. First, the camera is handheld and very mobile throughout, never truly static or lingering in one place. Second, the film crew are all wearing helmets with lights on them. This creates a
constant mobility within the film even when the full frame is focused on a particular wall painting because focused lights are always randomly roving around the frame. Also, where there is depth in this film, there is blackness. Shots in the cave show a void that is not populated by floating dust particles or flora and fauna, as the air is in Avatar, but is instead simply black, or negative, space. Due to this, there is in fact a conspicuous lack of depth in this 3-D film. Showing this negative space, or lack of depth, is one way of problematizing and creatively exploring the possibilities of 3-D (and 2-D) media, rather than participating in the neoliberal aesthetics of illusory depth. Harkening back to Malabou’s discussion of plasticity, Herzog’s film can be seen as emphasizing resilience or explosion through its subversive use of 3-D to show hard surfaces and visually depthless negative spaces.

In addition to the focus on surfaces, a hyper-attentive aesthetic, and a visible lack of depth, Herzog’s film also ends with an epilogue in which Herzog asks the viewer(s) to contemplate humanity’s current relationship to nature and technology. Leading up to this epilogue, there are comparisons made between the 30,000-year-old cave paintings and contemporary technology. It is pointed out by Herzog and the experts he interviews that many of these paintings utilized the three-dimensional surfaces upon which they were painted to create depth in their depictions. Several also seem to intentionally convey movement and even sound through various lines and techniques. The intention in pointing these factors out is not, however, to provide grounds for the argument that artistic representation has always been progressing towards photorealistic 3-D motion pictures with sound. What is really being shown here is that humans have been technological beings since long before contemporary times. That technology is part of
us; it makes us who we are. It also shows that the play of 2-D and 3-D has been a technological issue since the origins of our representations. This then further implies that we should not take our media, their representations, and their interfaces for granted. For instance, through tools such as augmented reality, digital media have the power to break through the boundaries set by physical reality and accomplish tasks that cannot be conceived without it, so why should it be used merely to mimic the very aspects of physicality it has the capability of transcending?

Finally, the film’s epilogue relocates to a nuclear power plant twenty miles from Chauvet Cave and explains that the warmed water from the power plant is used in a tropical biosphere nearby. At this point, the director shows “mutant albino crocodiles” that live in the biosphere, thriving in waters warmed by the power plant, and ultimately asks, “Are we, today, possibly the crocodiles who look back into an abyss of time when we see the paintings at Chauvet Cave?” This final line of dialogue asks viewers to ponder humanity’s relationship to the past, as we now see it from our current, technologically mutated state. Our technology fundamentally changes how we function; through synaptogenesis, our media helps mold our brains. In other words, as our technology changes, so do we. Herzog’s aesthetics, as well as his self-aware dialogue, rub against the common ways in which three-dimensional media is used. Instead of alleviating our unconscious loss of depth, Herzog’s film shows a lack of depth and concludes by asking viewers to think about humanity’s relationship to technology throughout time.

Cave of Forgotten Dreams is just one example of a more self-aware and socially just usage of three-dimensional technology. As long as 3-D is used to bandage the wounds of neoliberal hyper-extensionality by re-creating our lost depth, the current
system of exploitation has the ability to remain unchallenged. Instead of disavowing our
two-dimensional hyper-extensionality, we need to understand it. Instead of trying to
retain a level of deep attention, we need to accept hyper attention as a new cognitive
mode and consider new possibilities for social organization. Instead of making digital
images mimetic of the physical world, we need to embrace the potentials of abstraction.
As Catherine Malabou suggests, we need to say “no” to a system that demands limitless
flexibility, and “accept exploding from time to time.”¹ Change can only begin once
hyper-extensionality is no longer accepted as a way of being, and if three-dimensionality
is used in more socially and aesthetically just ways, it can help show the depths of this
issue, rather than alleviate the symptoms of it.

Notes

¹ Malabou, Catherine. What Should We Do with Our Brain?, 78.
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