Critique of Digital Reason

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My coming of age, academically speaking, occurred at the time of two cultural events that (at least initially) appeared to have little or nothing to do with one another. As a student of philosophy in the early 1990's—and pursuing a particular brand of philosophical thinking that is called "continental philosophy"—I studied and worked with the innovations of poststructuralism. Although poststructuralist thinkers, like Jacques Derrida, were often marginalized by the philosophical elite (the best evidence of which was a 1992 letter of complaint, signed by a veritable who's who list of academic philosophers, issued in opposition to Cambridge University extending Derrida an honorary degree), those of us studying continental philosophy were busy deconstructing anything and everything. At the same time that I was working my way through the complexities of Derrida's Of Grammatology, Donna Haraway's Simians, Cyborgs and Women, and Jean Baudrillard's Simulacra and Simulation something else was also going on. A CERN physicist named Tim Berners-Lee released to the nascent Internet a hypertextual documentation system that he called the World Wide Web. Being an unrepentant geek from the time I initially wrote a "hello world" application for the Apple II, I immediately began hacking HTML code and developing applications for this new digital media.

During this time, when I was writing code by day and reading poststructuralist philosophy at night, the connections between heady theory and the practical challenges of web programming seemed either non-existent or forced. There had been some efforts to connect the dots: George Landow's *Hypertext*, which sought to show how the "de-centering of the text" in the work of Roland Barthes and Derrida shared important affinities with the non-linear hypertextual documents circulating on the Internet; Jay

David Bolter's *Writing Space*, which sought to extend the critique of logocentrism to post-print, digital writing systems; and *The Electronic Labyrinth*, a site that used the technology of the web to present and investigate the work of notable poststructuralist thinkers, bringing the content of their writings in-line with the form and function of this new reading/writing technology. But these mainly literary explanations were far too literal and, for that reason, ultimately unsatisfying. In my estimations, they were only concerned with and remained distracted by the end-user experience and interface. And this distraction seems to persist in current studies of web 2.0 applications and mobile tech, which are, more often than not, concerned with interface design, usability, and other superficial matters. I, however, was more interested in what I perceived to be a profound and fundamental convergence between the rhetorical formations targeted and deconstructed by poststructuralism and the underlying binary logic of the digital computer.

```
var theory = poststructuralism;
var web = "world wide web";

if theory + web = literary_hypertext
    {
      status != interesting;
      document.write("This is far too literal");
      return false;
    }
}
```

Digital Reason

Digital computers are designed to operate with two discrete variables, commonly represented by the binary digits, or bits, 0 and 1. In electronic digital computers (and there can be other implementations that are not electronic) these bits are expressed in terms of machine electrical states. 0 is a switch or circuit that is in the *off* position; 1 is a switch or a circuit that is *on*. No matter what happens inside the machine or comes to be displayed on the screen of the device, the underlying operations are encoded, processed, and stored as bits of digital data. In other words, all information in digital form, whether the alpha-numeric characters that are written here, the images that are captured by the cameras built-into our mobile devices, or the immersive experiences that are produced in popular role playing games consist of nothing more than a complex

sequence 0's and 1's. Here, for example, is how the digital computer represents, processes, and stores the title to this section using ASCII, the standard binary code for alpha-numeric characters:

What I find interesting is that this binary procedure not only defines the technical aspects of digital information but also characterizes much of the technology's critical reception. Already in the mid-1990s (the time of the first Internet bubble), Michael Heim (1998, p. 42) argued that contemporary debates about the social impact of digital technology were themselves digital in form. More often than not, Heim demonstrates, arguments about the technology were organized around and motivated by two different and opposed ideas: "network idealism" and "naïve realism." For the "network idealist," the computer constitutes a virtual techno-utopia—a new world of uninhibited freedom, boundless opportunity, and friction-free exchange. The "naïve realist," by contrast, opposes this overly optimistic assessment and warns of increased surveillance, compromised security, loss of a sense of reality, and the erosion of human connection and face-to-face interaction. Consequently, where the network idealist sees utopian possibilities and virtual opportunity, the naïve realist perceives a threat to real human relations, real communities, and reality in general. Characterized in this way then, network idealism and naïve realism are positioned and function as conceptual opposites. They are, as Heim (1998, p. 42) describes it "binary brothers."

A similar characterization was provided by Derek Stanovsky in his critical evaluation of virtual reality (VR) technology. Although Stanovsky (2004, p. 168) does not use Heim's rather specific terminology, he identifies a similar digital structure. "Virtual reality is equally prone to portrayals as either the bearer of bright utopian possibilities or dark dystopian nightmares." And we can see this at work in, for example, press coverage of Pokemon Go, an augmented reality game that has been positioned as either a remarkable new experience for gamers or a threat to user privacy and security (Abel, 2016). While Heim and Stanovsky both identify a general binary structure in the

rhetoric of digital technology, it is perhaps Andrew Calcutt who has provided the most comprehensive inventory of the specific binary terms associated with the technology. His *White Noise: An A-Z of the Contradictions in Cyberculture* (1998) consists of an alphabetical listing of 26 oppositional pairs that are evident in the debates and discussions about digital technology and culture, i.e. Anarchy/Authority, Community/Alienation, Play/Work, Subject/Object, Universal/Particular. Whatever the exact terms, the rhetorical structure that is evident in discourses about digital technology seems to be digital in form.

Structuralism

So this was a kind of an epiphany—a turning point—in the development of my own research program and career: The rhetoric of digital technology is itself digital. This insight, however, is not really new. Something like it was already formulated and theorized in *structuralism*, poststructuralism's precursor and a twentieth-century intellectual innovation that accompanies the development of information theory and the electronic digital computer. "Structuralism," which Wikipedia (2016) will tell you is "the methodology that elements of human culture must be understood in terms of their relationship to a larger, overarching system or structure," does not name a formal discipline, a particular school of thought, or even a singular and unified method of investigation. Instead, it indicates an interdisciplinary practice that found application in fields as diverse as linguistics, anthropology, and literary criticism. Its development is widely recognized as the product of innovations in early twentieth-century semiology in general and the "structural linguistics" of Ferdinand de Saussure in particular. In the posthumously published Course in General Linguistics (1959), Saussure argued for a fundamental shift in the way that language is understood and analyzed. "The common view," as Jonathan Culler (1982, pp. 98-99) describes it, "is doubtless that a language consists of words, positive entities, which are put together to form a system and thus acquire relations with one another." Saussure turns this common-sense view on its head. For Saussure, the fundamental element of language is the sign and "the constitutive structure of signs is," as Mark Taylor (1999, p. 102) points out "binary opposition."

"In language," Saussure (1959, p. 120) explains, "there are only differences. Even more important: a difference generally implies positive terms between which the difference is set up; but in language there are only differences without positive terms." For Saussure, language is not composed of linguistic units that have some intrinsic value or positive meaning and that subsequently comprise a system of language through their interrelationships. Instead, a sign, any sign in any language, is only defined by the differences that distinguish it from other signs within the linguistic system to which it belongs. According to this way of thinking, the sign is not a "positive term" but an effect of difference, and language itself consists in a system of differences. This characterization of language, although never explicitly described in this fashion by Saussure, mirrors the binary logic of the digital computer, where the binary digits 0 and 1 have no intrinsic or positive meaning but are simply indicators and an effect of difference—a switch that is either on or off.

Perhaps the best example of this within the discussions and debates about digital technology is the problem of the digital divide. "Digital divide" is a concept that begins to gain traction during the latter half of the 1990's with the US Department of Commerce's multi-year studies (1995, 1998, 1999, 2000) of socio-economic-geographic disparities in access to and use of computers, the Internet, and broadband technology. Although initially focused on demographic data gathered within the United States, the digital divide has become a persistent global issue that seeks to identify and distinguish the world's "information haves" from the "information have-nots" (Gunkel, 2007, p. 64-81). Formulated in this way, however, the digital divide is itself digital in form: The "information have nots" are characterized, quite literally, as the negative and opposite of the other term—the "information haves." Organizing the world into one of two diametrically opposed types is clearly expedient for identifying a problem, dramatizing its effects, and advocating for solutions. In other words, it is rhetorically expedient. But this binary structures has at least two difficulties. First, access to and use of technology is never a zero-sum game. Global studies of the digital divide have found that the world's people are not so easily and neatly separated into "haves" and "have nots." There is, in fact, a broad spectrum of diverse possibilities that are not able to be captured by just one or the other (Gunkel, 2007, p. 70). Second, the two terms that

characterize the divide—"information haves" and "information have nots"—are not on equal footing. One of the two is already situated as the positive condition while its other is defined through its negation. In other words, one of the two terms is already elevated above the other and invested with positive value. As Derrida (1981, p. 41) describes it, "we are not dealing with the peaceful co-existence of a *vis-á-vis*, but rather with a violent hierarchy. One of the two terms governs the other, or has the upper hand." This is not just a problem for the digital divide, where the "information haves" are already positioned in such a way as to have "the upper hand." It is a persistent difficulty with structuralism in general and the critical target of poststructuralist efforts.

Poststructuralism

If structuralism's characterization of language is accurate, then "digital" does not just describe the technical operations of the computer but defines a fundamental structure in human cognition and communication. Daniel Chandler (2002, p. 102), for instance, argues that "people have believed in the fundamental character of binary oppositions since at least classical times" and that it would be difficult, if not impossible, to operate otherwise. Case in point: deciding to think in binary terms or not is itself just another instance of binary opposition. The issue, therefore, is not whether to think in binary terms or not, but how to dispense with and manage this digital rhetoric. Or as Peter Elbow (1993, p. 3) explains it, "the question, then, is not whether to deal with dichotomies but how to deal with them." Although different theorists have proposed somewhat different solutions to this challenge, many of these efforts have been collected and organized under the general category "poststructuralism." "While poststructuralism does not constitute," as Taylor (1997, p. 269) points out, "a unified movement, writers as different as Jacques Derrida, Jacques Lacan, and Michel

Foucault on the one hand, and on the other Hélèn Cixous, Julia Kristeva, and Michel de Certeau¹ devise alternative tactics to subvert the grid of binary oppositions with which structuralists believe they can capture reality." Since poststructuralism does not constitute a unified movement or singular method, what makes its different forms cohere is not an underlying similarity but a difference, specifically different modes of thinking difference differently.

There are, however, important consequences or complications to this way of thnking. In particular, poststructuralists often find themselves in a difficult situation with regards to language and communication. This is something that is already evident in the somewhat convoluted description offered above: "different modes of thinking difference differently." If structuralism is right and language, any language, is a system of differences, then any alternative that is determined to escape binary opposition (that would, in fact, be different) can only be described in and by using a vocabulary that is necessarily composed of binary oppositions. In such a situation, therefore, language must be twisted and contorted in such a way as to make that which is fundamentally digital in its structure articulate something that no longer can be and never was able to be comprehended by such structural arrangements. The manner by which this is accomplished, although obviously different for different poststructuralist thinkers, usually entails the use of two related rhetorical strategies, both of which seek to formulate "a non-dialectical third term"² that is able to escape from the limitations and controlling influence of a particular binary opposition. This third term is not necessarily situated in between the two different terms that separate, for example, "the information haves" from "the information have nots," but consists in an exorbitant third alternative that distorts or "deconstructs" (Derrida's word) what can be captured and or represented by this binary arrangement.

Poststructuralist Strategies

On the one hand, poststructuralists employ *neologism*, inventing a brand-new word to name a new possibility or object. Examples abound. There are, for instance, the well-known and often difficult Derridian neologisms: deconstruction, différance, and arche-trace. But this is by no means something that is limited to Derrida. This is also the rhetorical strategy employed by Donna Haraway in her classic techo-feminist text "A Cyborg Manifesto" (1991). Though she did not invent the word "cyborg," she did resurrect and redefine this all but forgotten neologism in order to name something that exceeds the usual conceptual oppositions and the limited set of available names that have been used to describe the differences dividing the human being from its others, i.e. animals and machines. On the other hand, we can deploy what Derrida (1981, p. 71) calls paleonomy, the use of an "old name in order to launch a new concept." These "old names" can be archaic words that have almost fallen off the linguistic radar, like Derrida's use of the ancient Greek terms χώρα [chora] and φάρμακον [pharmakon] or the French tympan and hymen. Or they can be common words that are stuck with a significant difference that makes them slide away from their usual meaning and usage, like writing, spacing, trace, supplement, etc. Although Derrida's work supplies ample illustrations of the paleonomic strategy, this rhetorical maneuver, like the strategy of neologism, is not something that is limited to the Derridian text. Gilles Delueze, for example, is rather economical in his use of neologism. Instead of inventing new words, Deleuze "often draws upon existing words to create a terminology for concepts of his own making" (Patton, 1994, p. xii). Likewise, Emmanuel Levinas takes a common,

everyday word like *other* and makes it function in a way that is entirely different than what one might expect.

This is precisely how I have pursued and operationalized digital rhetoric in my own work. I employ these two strategic maneuvers in order to critically engage with digital media and technology in all its forms and manifestations. In Hacking Cyberspace (Westview, 2001), for instance, I appropriate and redeploy Jean Baudrillard's concept of simulation—an old word that has been in circulation for several thousand years—in order to deconstruct the rhetorical configurations of virtual reality (VR) as it has been formulated in the popular, scientific, and critical literature. The prevailing understanding of VR situates these 3D immersive visualization technologies as a kind of iconographic representation turned up to eleven. And recent talk concerning commercialized VR equipment like Facebook's Oculus Rift, Samsung's Gear VR, and Google Cardboard continue to mobilize these discursive configurations. Simulation, which in Baudrillard's work provides a good illustration of the rhetorical strategy of paleonomy, has the general effect of inverting and displacing the standard conceptual hierarchy that has, since at least the time of Plato, situated the image as a derived and deficient copy of the real thing. "Simulation," as Baudrillard (1994, p. 1) describes it, "is no longer that of a territory, a referential being, or a substance. It is the generation by models of a real without origin or reality." Understood in this way, both the concept and technology of VR are opened to some alternative capabilities that do not simply reproduce Platonism but challenge its controlling influence.

A similar operation is deployed by following the rhetorical opportunities of the neologism "cyborg"—a term that was initially introduced by Manfred Clynes and Nathan Kline in a 1962 paper on the future of manned space flight. Following Haraway's appropriation of the term in her "A Cyborg Manifesto," I used this rather monstrous concept to challenge and reconfigure the subject of communication—not just the subject matter of the discipline but also the human subject that is the organizing principle of the discipline. For Haraway, *cyborg* is not merely an organism with cybernetic implants or prostheses. Instead, it names a double boundary breakdown between humans and animals, on the one hand, and animals and machines, on the other, that effectively challenges the human subject and the traditions of human exceptionalism. In doing so,

the analysis challenges the humanist limitations of the subject of communication and proposes a much broader formulation of communication studies that is able to accommodate others and other forms of otherness, like animals and machines.

This effort to address alternative configuration of otherness (or what is also called "alterity") has been further pursued and developed in subsequent publications, Thinking Otherwise: Philosophy, Communication, Technology (Purdue University Press, 2007) and The Machine Question: Critical Perspectives on AI, Robots and Ethics (MIT Press 2012). These two books, along with a number of journal articles, book chapters, and opeds for popular venues, draw on the ethics of otherness, as it has been developed in the work of Levinas, Derrida, and others, as a way to question and critically challenge traditional forms of moral exclusion, which not surprisingly have been formulated in terms of a conceptual (or binary) oppositions. One of the enduring concerns of ethics, as Derrida (2005, p. 80) has pointed out, is deciding between "who" is a legitimate moral subject and "what" remains a mere object. Although who counts as morally significant was something that had been initially limited to "other men," moral thinking has evolved in such a way that it continually and necessarily questions its own restrictions and comes to encompass what had been previously excluded others—women, foreigners, animals, even the environment. Currently, we find ourselves standing before another fundamental challenge to this way of dividing up the world. This guestion—"the machine question"—concerns the autonomous, intelligent machines of our own making, and it challenges many of the deep-seated assumptions about who or what constitutes a legitimate subject.

Interminable Analysis

For my purposes, poststructuralism has provided an effective and potentially innovative way of "thinking outside the box." It has allowed me to critically engage the rhetoric of digital technology in a way that does not simply endorse one side or the other in an existing debate, but open up the current debate to some new and previously uncharted possibilities. This effort, for all its advantages, however, still has one crucial problem or challenge: It is never able to be completed or finished. This is because the innovations introduced by poststructuralist criticism always and necessarily risk

becoming reappropriated into the existing structures they work to undermine and exceed. The peculiarity of a neologism, for example, comes to be domesticated, through the actions of both advocates and critics, by making it conform to existing conceptual structures, often in the face of explicit statements to the contrary. This has, for example, been the fate of Derrida's deconstruction. The word "deconstruction" does not mean to take apart, to un-construct, or to disassemble. It is neither a form of destructive analysis, a kind of reverse engineering, nor a synonym for what had been called criticism. As Derrida (1993, p. 147) has described it, "the de- of deconstruction signifies not the demolition of what is constructing itself, but rather what remains to be thought beyond the constructionist or destructionist schema." Despite this very clear qualification, "deconstruction" has been routinely reabsorbed by and understood according to a construction/destruction schema. For example, the practice of "deconstructive criticism," as the name implies, appropriated the term "deconstruction" to the task and project of literary criticism, turning it into a method of textual decomposition and explication. Similarly the word has been (mis)understood and employed as a synonym for analysis—the process of taking something apart in order to investigate its component elements. Physicist Brian Greene (2005), for instance, examines the original components of the physical universe under the title "Deconstructing the Bang." Stephen P. Stich (1998) reevaluates recent developments in cognitive science by *Deconstructing the Mind*. And Lynda Weinman (1996) investigate the components of effective graphic design in *Deconstructing Web Graphics*. In all these cases, the neologism is domesticated through a misappropriation that makes "deconstruction" just another name for criticism, a synonym for analysis, or the mere opposite of assembly and construction.

Paleonomy is exposed to a similar difficulty and is often easier to domesticate, because it does not take much interpretive work to make an "old name" function in the old way. *Writing*, for example, which for Derrida comes to be used to name something beyond and prior to the speech/writing opposition that is operative in and definitive of Western metaphysics, has often been simply re-situated within the context of that particular conceptual pair. Consequently, critics like Walter Ong (1995) and John Ellis (1990) have taken Derrida to task for simply inverting the speech/writing hierarchy and,

in the face of what appears to be overwhelming empirical evidence to the contrary, situating writing in the position of priority. All of this is perpetrated in direct opposition to or in complete ignorance of carefully worded explanations that have been specifically designed to preempt and protect against such misunderstandings. Consequently, poststructuralism, whether employing the strategy of neologism, paleonomy, or a mixture of the two, always runs the risk of having its innovations reappropriated by the discursive systems in which and on which it supposedly works. This exposure to reappropriation and misunderstanding, however, is not the result of an individual critic who has it out for poststructuralism, even if critics have often exploited this situation for their own purposes. Instead it is a systemic necessity and unavoidable by-product of logic and language. It is caused by the fact that poststructuralism cannot conceptualize or articulate its innovations without employing a terminology that is already and inescapably organized in terms of a digital structure.

Finally, due to the fact that these poststructuralist innovations are always at risk of falling back into or becoming reappropriated by existing structures, there neither is nor can be finality. "Leading poststructuralists," as Mark Taylor (1997, p. 269) explains, "realize that, since they remain unavoidably entangled in the systems and structures they resist, the task of criticism is endless." For this reason, a poststructuralist intervention is not, strictly speaking, ever able to finish its work or complete its project. The task is always something of "an interminable analysis" (Derrida, 1981, p. 41), a never-ending engagement that must continually submit its own innovations, movements, and conclusions to further scrutiny. Let's return to the example of the digital divide. Every effort to articulate an alternative to the two defining terms—"information haves" and "information have nots"—can be and has been eventually reabsorbed into this binary structure. This is the case whether we deploy new terms like "information wantnots" (those individuals who have willfully decided not to use the technology) or "internet drop-outs" (individuals who once tried the technology but, for various reasons, decide not to continue with it). They are all, in one way or another, able to be recaptured by the binary arrangement that divides the world in two one of two types—those with access to advanced information technology and those lacking access. A similar complication occurs with "virtual reality" and can be seen, most readily, in *The Matrix*. In the first

episode of this cinematic trilogy (*The Matrix*, 1999), the protagonist Neo is offered a choice between a blue and a red pill. The blue pill leads to a virtual fantasy situated inside a computer generated simulation; the red pill leads to "real reality." The second film, however, shows us how this very choice between the two pills is already an integral component of the computer simulation and therefore a mechanism that *reloads* (and the name of the second film is *Reloaded*) the very binary opposition that we and the protagonist thought was resolved.

For this reason, the project of poststructuralism is never able to be completed or done. It is always needing to work and rework its own innovations in order to escape the gravitational pull of the binary structures it struggles against and cannot help but utilize. This increasingly self-involved/self-reflective aspect of the effort is, as one might imagine, something that does not sit well with critics. As Taylor explains (1997, p. 325), "the growing self-reflexitivity of theory seems to entail an aestheticizing of politics that makes cultural analysis and criticism increasingly irrelevant." In other words, "what's the matter with poststructuralism" is that it, for all its promise, appears to be increasingly irrelevant and unsatisfying. "Instead of engaging the 'real,' theory seems caught in a hall of mirrors from which 'reality' is 'systematically' excluded" (Taylor, 1997, p. 325). Critics of poststructuralism, therefore, find the insistence on an "interminable analysis" to be solipsistic (or self-involved) at best and a potentially dangerous kind of intellectual narcissism at worst. At the same time, however, poststructuralism already has a response to this criticism, which, it rightfully points out, necessarily mobilizes and relies on one of the classic conceptual oppositions—the real vs. the unreal—that poststructuralism would have put in question in the first place.

```
function InterminableAnalysis()
{
   var = positiveTerm;
   var = negativeTerm;
   var = thirdAlternative;

   if(thirdAlternative != positiveTerm OR negativeTerm)
      {
        do
        {
        thirdAlternative = negativeTerm;
      }
}
```

```
negativeTerm < positiveTerm;
    document.write("Try again");
}
while(thirdAlternative != null);
}</pre>
```

Notes

¹ Although this might look like "name dropping," and in one sense it is, the individuals Mark Taylor refers to in this quotation are the widely-recognizable "thought leaders" in poststructuralism. Jacques Derrida (1930-2004), Jacques Lacan (1901-1981) and Michel Foucault (1926-1984) are listed here as representatives of what might be called the "philosophical wing" of the movement, while Hélèn Cixous (1937), Julia Kristeva (1941), and Michel de Certeau (1925-1986) represent the "social sciences" side, coming from the disciplines of literary theory, semiology, and sociology.

² A little "history of philosophy" might help at this point. "Dialectic" is a term that is commonly associated with the philosophy of G. W. F. Hegel, a German philosopher who was active during the late 18th and early 19th centuries. As its name indicates, "dialectic" consists of two opposed terms, commonly called "thesis" and "antithesis." The latter, as you may have already guessed, is characterized as the mere negation of the former. Hegel's Science of Logic (originally published in 1812), for example, begins with the thesis being which is immediately challenged by its antithesis, nothing. But what motivates and drives Hegel's philosophical system is not the opposition per se but its resolution in a third, mediating term, which is commonly called the "synthesis." Between being and nothing, the third term is becoming. In Hegel's philosophy, however, this third term already constitutes a new thesis, which then has its proper antithesis and this opposition is once again resolved in a subsequent synthesis. And on and on it goes ad infinitum. The phrase "non-dialectical third term" refers to another kind of alternative that is not synthetic, in the Hegelian sense. It is a kind of monstrous "undecidable" that, as Derrida (1981, p. 43) explains, "can no longer be included within philosophical (binary) opposition, but which, however, inhabit philosophical opposition, resisting and disorganizing it, without ever constituting a third term, without ever leaving room for a solution in the form of speculative dialectics." In other words, the "non-dialectical third

term" is something that is designed to exceed the grasp and comprehension of Hegelian dialectics. For more on the relationship between Hegelian philosophy and structuralism and poststructuralism, see Gunkel (2007).

References

- Abel, Robert (12 July 2016). "UPDATE: Prepare for Trouble: Pokemon Go Sparks
 Privacy Issues, Malware and Muggings." *SC Magazine*.

 http://www.scmagazine.com/pokemon-goes-wrong-with-malware-and-armed-muggings/article/508755/
- Baudrillard, Jean (1994). Simulacra and Simulation. Translated by Sheila Faria Glaser.

 Ann Arbor, MI: University of Michigan Press.
- Bolter, Jay David (2001). Writing Space: Computers, Hypertext, and the Remediation of Print. Mahwah, NJ: Lawrence Erlbaum Associates.
- Calcutt, Andrew (1998). White Noise: An A-Z of the Contradictions in Cyberculture. New York: Palgrave Macmillan.
- Chandler, Daniel (2002). Semiotics: The Basics. New York: Routledge.
- Culler, Jonathan (1982). *On Deconstruction: Theory and Criticism After Structuralism*. Ithaca, NY: Cornell University Press.
- Deleuze, Gilles (1994). *Difference and Repetition*. Translated by Paul Patton. New York: Columbia University Press.
- Derrida, Jacques (1981). *Positions*. Translated and annotated by Alan Bass. Chicago: University of Chicago Press.
- Derrida, Jacques (1993). *Limited Inc.* Translated by Samuel Weber. Evanston: Northwestern University Press.
- Derrida, Jacques (2005). *Paper Machine*. Trans. by Rachel Bowlby. Stanford, CA: Stanford University Press.
- The Electronic Labyrinth (1993-2001). http://www2.iath.virginia.edu/elab/elab.html
- Elbow, Peter (1993). "The Uses of Binary Thinking." *JAC* 13(1): 51-78. http://www.jaconlinejournal.com/archives/vol13.1/elbow-uses.pdf
- Ellis, John M. (1990). *Against Deconstruction*. Princeton, NJ: Princeton University Press.

- Greene, Brian (2004). *The Fabric of the Cosmos: Space, Time, and the Texture of Reality.* New York: Vintage Books.
- Gunkel, David J. (2001). Hacking Cyberspace. Boulder, CO: Westview Press.
- Gunkel, David J. (2007). *Thinking Otherwise: Philosophy, Communication, Technology*. West Lafayette, IN: Purdue University Press.
- Gunkel, David J. (2012). *The Machine Question: Critical Perspectives on AI, Robots and Ethics*. Cambridge, MA: MIT Press.
- Haraway, Donna J. (1991). *Simians, Cyborgs, Women: The Reinvention of Nature*. New York: Routledge.
- Hegel, G. W. F. (1989). *Hegel's Science of Logic*. Trans. by A. V. Miller. Atlantic Highlands, NJ: Humanities Press International.
- Heim, Michael (1998). Virtual Realism. New York: Oxford University Press.
- Landow, George P. (1992). *Hypertext: The Convergence of Contemporary Critical Theory and Technology*. Baltimore, MD: The Johns Hopkins University Press.
- Levinas, Emmanuel (1987). *Collected Philosophical Papers*. Trans. Alphonso Lingis. Dordrecht: Martin Nijhoff Publishers.
- Lurie, Peter (2004). "The Rush to Judgment: Binary Thinking in a Digital Age." *ctheory.net*. http://www.ctheory.net/articles.aspx?id=416
- Ong, Walter (1995). *Orality and Literacy: The Technologizing of the Word*. New York: Routledge.
- Patton, Paul (1994). "Translator's Preface" to *Difference and Repetition* by Gilles Deleuze. New York: Columbia University Press.
- de Saussure, Ferdinand (1959). *Course in General Linguistics*. Translated by Wade Baskin. London: Peter Owen.
- Stanovsky, Derek (2004). "Virtual Reality." In *The Blackwell Guide to the Philosophy of Computing and Information*, ed. Luciano Floridi, 167-177. Oxford: Blackwell.
- Stich, Stephen P. (1998). Deconstructing the Mind. Oxford: Oxford University Press.
- Taylor, Mark (1999). *About Religion: Economies of Faith in Virtual Culture*. Chicago: University of Chicago Press.
- Taylor, Mark (1997). *Hiding*. Chicago: University of Chicago Press.
- U.S. Department of Commerce. (1995). National Telecommunications and Information

- Administration (NTIA). Falling Through the Net: A Survey of the 'Have Nots' in Rural and Urban America. Washington, DC: U.S. Department of Commerce.
- U.S. Department of Commerce. (1998). National Telecommunications and Information Administration (NTIA). *Falling Through the Net II: New Data on the Digital Divide*. Washington, DC: U.S. Department of Commerce.
- U.S. Department of Commerce. (1999). National Telecommunications and Information Administration (NTIA). Falling Through the Net: Defining the Digital Divide.Washington, DC: U.S. Department of Commerce.
- U.S. Department of Commerce. (2000). National Telecommunications and Information Administration (NTIA). *Falling Through the Net: Toward Digital Inclusion*. Washington, DC: U.S. Department of Commerce.

Weinman, Lynda (1996). *Deconstructing Web Graphics*. Berkeley, CA: New Riders. Wikipedia (2016). Structuralism. https://en.wikipedia.org/wiki/Structuralism