TALKING/SPEAKING/STALKING/STREAMING: ARTIST'S BROWSERS AND TACTICAL ENGAGEMENTS WITH THE EARLY WEB

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ABSTRACT

Colin Post: Talking/Speaking/Stalking/Streaming: Artist's Browsers and Tactical Engagements
with the Early Web
(Under the direction of Cary Levine)

The thesis discusses three artist-made browsers from the late 1990s. As the Web transitioned from a niche information system to global telecommunications infrastructure, these artists created functional software that explored the socioeconomic, political, and cultural ramifications of these rapidly changing networked technologies. The thesis argues that these artworks seized upon the browser—an interface between users and information—as a tactical point of intervention. These artist's browsers presented alternative interfaces to the Web, visualizing how commercial browsers shape access to networked information while also making available new modalities of interaction. These artworks encouraged users to develop a critical awareness of how the Web functioned, and built on that awareness by offering tactics for interaction. Framing browsing as a union of reading and writing practices, these artists envisioned how the Web might be reshaped if users could fully leverage the browser as a means of both information production and consumption.

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CHAPTER 1: ARTIST'S BROWSERS AS TACTICAL MEDIA

1.1) Browsing as Writing

The World Wide Web (the Web) has always been a technology for both the production and consumption of information. Every few years, new developments exert renewed influence on practices for finding and sharing information: graphical websites interconnected via hyperlinks, search engines capable of retrieving information from these millions of pages, weblogs (or blogs) facilitating personal expression, and social media platforms fostering further interpersonal interaction. Across these practices, though, rests a core tension between producing and sharing information: practices of information consumption, like conducting queries in search engines or clicking between links, also generate data made differently legible to both humans and machines; practices of information production like creating a website or blog require literacy of the tools used to make this writing possible. As a technology enabling new ways of reading and writing, the Web has altered the relationship between producing and consuming information, along with the social, cultural, and economic valences of these information practices.

At a critical period as the Web blossomed from a niche information system to global infrastructure, several artists critically examined web browsers as interfaces to this new communications technology, creating functional software that demonstrated this core tension between the consumption and production of information inherent in interactions with the Web. As user interfaces to a complex technological infrastructure, browsers take on a performative materiality: though existing as software—as virtual objects—web browsers condition the potential interactions between individuals and information online, visualizing networked

information as webpages and translating individuals' physical actions of clicking and typing into data interpreted by system.[1] In the late '90s, popular commercial browsers like Netscape Navigator and Microsoft's Internet Explorer established an interface paradigm that persists today, representing the Web as visually-rich pages with formatted text and inline media objects. These browser interfaces were inviting and accessible, even for novice computer users, but provided little insight into how the Web functioned as a network for reading, writing, and sharing information. Users could readily browse across pages by clicking links, but this was essentially the limit of the interactive possibilities as these browsers presented the Web as a read-only media.

The artist's browsers discussed in this thesis all present alternative interfaces, visualizing the Web in ways that directly contrast the page paradigm and offering users a range of interactions with networked information obscured by mainstream browsers. *The Web Stalker* (1997) (fig. 1), created by the artist collective I/O/D, eschews the single page, instead rendering the node and link connections between pages as spindling diagnostics. As per its name, *Shredder* (1998) (fig. 2) by Mark Napier shreds through sites, reshaping the constituent images, text, and code as a collage that juxtaposes the surface and guts of webpages. Just as Google emerged as a pathbreaking tool for finding information online, Maciej Wisniewski's *netomat* (1999) (fig. 3) imagined an alternative approach to web searching that represented results as a dynamic stream of text, image, and audio culled together from disparate sites. Though each work functions in quite different ways, all critique the predominant means for interacting with the Web afforded by mainstream browsers, which offer users access to networked information but close off any insight into the browser itself. Instead advancing 'browsing' as a union of creative acts—both the

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[1] Johanna Drucker, "Performative Materiality and Theoretical Approaches to Interface," *Digital Humanities Quarterly* 7, no. 1 (2013), http://www.digitalhumanities.org/dhq/vol/7/1/000143/000143.html.

perusal and production of information, or in other words, a form of writing—these artists

fashioned the browser as a tool that users could learn to wield in any number of ways. With the

ability to both read and write the Web, users of this technology might also see themselves as

producers of the technology, driving the development of this open communications

infrastructure.

1.2) Artist's Browsers Coming Online

In the following chapters, I detail how each artist's browser operated within the extant

infrastructure of the Web in the late 1990s while demonstrating alternative configurations for

how the Web could function as a communication technology and making available tactics for

realizing these possibilities.[2] As I elaborate in the following section, the Web at this time was in a

period of transition with the communicative potential of the technology very much in flux. In all

of this, browsers act as a critical juncture point between the networked documents that make up

the Web and the individuals who create, share, and read those documents. Out of a flurry of

diverse browsers developed largely as pet projects by computer scientists or hobbyists—all of

which represented the Web in markedly divergent ways—a couple commercial browsers

emerged that cemented the paradigm for browsing we know today.[3] Responding to this

commercialization, these artists considered the socioeconomic tendencies pulling browsing

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[2] As a brief historiographical and stylistic note, I will largely be talking about how these works were created and experienced during the late 1990s. However, both *The Web Stalker* and *Shredder* remain operational in various ways, although *netomat* is obsolete for all intents and purposes. As two of these works remain functional, I will generally discuss these works in the historical present tense, except in instances where I am explicitly discussing these works in the time period of the late 1990s, in which case I use the past tense.

[3] Tim Berners-Lee and Mark Fischetti describe this heyday of browser development occurring in 1993 and 1994, with many concurrent projects developing like Lynx, Arena, and Cello alongside Berners-Lee's own eponymous WorldWideWeb browser. This early atmosphere was collegial, with browser developers discussing and sharing projects on Internet newsgroups and mailing lists. Tim Berners-Lee and Mark Fischetti, *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by Its Inventor*, (San Francisco: HarperSanFrancisco, 1999), 70-3.

toward read-only interactions, and explored the productive potential of the Web mediated by browsers as dynamic implements for understanding, configuring, and creating information online.

The first chapter focuses on *The Web Stalker*, which jostles users out of the flow of surfing across discrete webpages by providing a diagrammatic overview of the link-and-node structure of websites. Rather than browsing from page to page, the user invokes commands—stash, dismantle, crawl, map—interacting with the Web at a higher level of networked information that can be configured or processed in any number of ways. 'Map,' perhaps the most powerful of these commands, zooms up from the individual page to display how countless pages are linked together in a dense web. Through this overlooking visualization and added functionalities for interacting with sites, *The Web Stalker* introduces an alternative lexicon, 'stalking' in place of 'surfing,' recasting how to move through the information space of the Web. Unlike earlier mass communications technology like television or radio, web users control how they navigate and direct the flow of information. *The Web Stalker* illustrates that users can attain an even greater degree of agency than mainstream browsers afford.

In the second chapter, I discuss *Shredder*, which exposes the underlying code of a given webpage to induce an apparently glitchy breakdown of the Web. The interface meshes the surface and underbelly of the webpage, mashing up Hypertext Markup Language (HTML) with cut-up text and distorted images. At first this browser seems inoperable, displaying an illegible albeit striking collage that hinders reading the given page or browsing through to other links. However, this deconstruction of the webpage encourages users to adopt another kind of literacy to understand how information is structured on the Web through standards like HTML. These critical reading practices prompt writing, as users see this underlying code as a malleable

language that can be pulled apart, copied, altered, and refashioned for the users' expressive purposes.

Finally, I compare *netomat* to these two artist's browsers. While *The Web Stalker* and *Shredder* deconstruct the Web, offering alternative views into the component technologies, *netomat* represented a largely distinct information system, integrating a novel programming language created by the artist to help users search for information in new ways. As the Web grew to encompass millions of webpages, Google and other search engines replaced browsing through links as the predominant means for finding information online. *netomat* functioned as a kind of search engine, but generated dynamic streams of text, image, and audio culled together from disparate sources in response to search queries rather than ordered lists of the most 'relevant' results. Although *netomat* still depended on the web infrastructure, Wisniewski created the Netomatic Markup Language (NML) for determining how searches were conducted and how these results were represented in the dynamic stream. Through the *netomat* interface, users could readily access these system configurations, learning NML for themselves in order to shape and direct search stream. In these ways, *netomat* departed from the tactics employed by the other artist's browsers: both in contributing to the technologies driving the Web and in giving users access to this new productive tool. In line with deconstructing the Web to provide insight into how it functions, *netomat* itself was an inherently open system that encouraged users to learn how it worked and to apply this knowledge to push the technology to unexpected ends. Rather than anticipating how users might search the Web, *netomat* enabled users to adapt the technology to explore the Web with the terms and parameters that they determined.

1.3) Browsing in Transition

As noted above, the late 1990s marked a crucial point in the development of the Web as corporate interests increasingly exerted influence to maximize the commercial potential of a globally expanding communications technology. Recent popular and scholarly attention to the algorithmic processes underlying current Web systems has shed light on the pervasive extent to which personal information is mined for corporate profit[4] and governmental control,[5] raising urgent discussions about many core social and cultural norms, such as privacy.[6] Marking a growing ambiguity between producer and consumer, the so-called 'prosumer' economic model has matured with the emergence of social and mobile web applications, as proprietors of social media platforms gain direct and immediate economic value by capitalizing on users' interactions. As the Web develops to include a broader range of interactions with information, such as emotively responding to other user-generated content with 'likes,' the users of web systems and services increasingly become the producers of information driving the Web.

However, the relationship between the production and consumption of information on the Web has always been complex and intertwined, with the current situation built on existing capabilities of the Web, as well as broader socioeconomic tendencies. Daniel Bell,[7] among others,[8] foresaw the economic value of information for capitalist societies generally; for

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[4] Christian Fuchs, "Labor in Informational Capitalism and on the Internet," *The Information Society* 26, no. 3 (April 30, 2010): 179–96.

[5] Zeynep Tufekci, *Twitter and Tear Gas: The Power and Fragility of Networked Protest* (New Haven: Yale University Press, 2017).

[6] Jens-Erik Mai, "Big Data Privacy: The Datafication of Personal Information," *The Information Society* 32, no. 3 (May 26, 2016): 192–99.

[7] Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting.* (New York: Basic Books, 1973).

[8] Although Bell popularized the term 'post-industrial' to describe the changing conditions of production and consumption in capitalist societies, individuals in other contexts had previously discussed the importance of media

information technology specifically, the centrality of end-users as productive agents has long

been fundamental to discourses of human-computer interactions (HCI) and interface design.[9] In

creating these works, these artists grappled with this sociopolitical tendency in the technologies

constituting the Web. The works prompt users to recognize the capacity for browsers to implicate

individuals in productive interaction with the information systems undergirding the Web, and in

service of the entities monitoring these flows of information.

The artist's browsers all visually manifest this tension between production and

consumption at the level of the browser interface. While mainstream browsers obscure the Web's

technical mechanisms and protocols, each of these artworks foregrounds the necessarily

productive act of browsing the Web, which involves the user in countless, data-generative

interactions with various human and machinic agents in a dense media ecology. The artist's

browsers offer alternative interfaces to the Web that not only visualize these constitutive

processes, but simultaneously furnish individuals with novel productive capacities to engage

with, demarcate, and alter these underlying technological components on their own terms. Put

another way, the artworks enact both how browsers can read their users, as well as how users can

compose the browser.

The current era of Internet capitalism—in which the users of systems generate value to be

appropriated and capitalized—has been built upon the foundation established during this period

in the late '90s, when the popularity of the Web skyrocketed. In large part, this popularity was

fueled by the uptake of the first commercial browsers, Netscape Navigator and Internet Explorer.

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technologies in this regard, namely Walter Benjamin and Raymond Williams from the cultural Marxist tradition, both of whom contribute significantly to my analysis of the artworks in question.

[9] Johanna Drucker, *Graphesis: Visual Forms of Knowledge Production* (Cambridge, MA: Harvard University Press, 2014). See especially chapter 5, "Interface and Interpretation."

These first mainstream browsers encouraged particular ways of interacting with hypertext

documents that were not too far removed from consuming page-based media like newspapers or

magazines: reading discrete webpages in their fully-rendered forms; navigating by clicking back

and forth between links; and creating webpages with specialized software like Dreamweaver[10] or

specialized hosts like Geocities.[11] Rhapsodizing on Mosaic (later Netscape), the first browser to

breakthrough to widespread use, Gary Wolf praises the visually-rich interface, presenting text

and image in a familiar page format, as "the most pleasurable way" to find information online.[12]

Through this immersive interface, the "online world appears to be a vast interconnected universe

of information" that the individual can travel through "along paths of whim and intuition."[13] As

Wolf augurs that the Web has passed from cool idea to the arena of global capitalist competition,

the easy-to-use browser interface takes central stage in initiating this transition.

The artists behind the *The Web Stalker*, *Shredder*, and *netomat* likewise homed in on the

browser interface as a critically significant point—but with markedly different intentions than

corporations like Apple and Microsoft that sought to capitalize on the exploding popularity of the

Web, inaugurating the cutthroat battles of the 'browser wars.'[14] While mainstream browsers

(then and now) obscure the protocols that structure interactions with information online, these

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[10] Released by the makers of Photoshop, Adobe Dreamweaver was a 'what you see is what you get' (WYSIWYG) web editor. Much like a word processor, which allows an individual to print out a document that resembles what she was editing on the computer screen, individuals could use Dreamweaver to create a webpage as it would appear live on the Web, without having to directly edit the underlying code.

[11] A precursor to blogging platforms like Wordpress, Geocities provided individuals with free web space and preformatted webpages that could be easily customized.

[12] Gary Wolf, "The (Second Phase of the) Revolution Has Begun," *Wired*, October 1, 1994, https://www.wired.com/1994/10/mosaic/.

[13] Ibid.

[14] Eric Sink, "Memoirs From the Browser Wars," ericsink.com, April 15, 2003, http://ericsink.com/Browser_Wars.html.

artists created artworks that visualized these techniques of information production and

consumption. The artists seized on the interface as a site of tactical resistance to mainstream

browsers, proposing means for interacting with the Web that still function within the technical

protocols but exceed the typical prescriptions for producing and consuming information online.

1.4) Tactical Media

These artistic interventions into the Web are part of a longer history of artists critically

and actively considering the role of media technologies in the production and consumption of

information. Throughout the thesis, I describe this history as tactical media in an expanded sense,

broadly construed as art that infiltrates information systems to both foster critical awareness of

sociopolitical tendencies of these technologies while also suggesting tactical means for re-

appropriating these technologies to other productive ends. Rita Raley has written about a range

of artworks engaging with digital technologies under the banner of tactical media, such as the

performative interventions organized by Electronic Disturbance Theater like *FloodNet* (1998), in

which the group deployed an application to overwhelm and temporarily shut down websites

supporting anti-immigration legislation and other conservative political causes.[15] More than just

digital technologies, tactical media works engage all manner of information systems. As David

Garcia and Geert Lovink describe in their manifesto on tactical media, these artistic interventions

necessarily assume multifarious and hybrid forms, taking up whatever media individuals can

deploy at the time: "here in Amsterdam we have access to local TV, digital cities and fortresses

of new and old media. In other places they might have theater, street demonstrations,

experimental film, literature, photography."[16] In this thesis, I position these artist's browsers

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[15] Rita Raley, *Tactical Media* (Minneapolis, MN: University of Minnesota Press, 2009), 40-3.

[16] David Garcia and Geert Lovink, "The ABC of Tactical Media," 1997, http://project.waag.org/tmn/frabc.html.

within this tactical media tradition, drawing comparisons to artists working across this diverse range of materials.

Michel de Certeau's elaboration of tactics as integral to everyday practices like reading, shopping, and walking has fundamentally undergirded the artistic and scholarly discourses surrounding tactical media, influencing the texts already cited. As Roger Silverstone applies de Certeau's ideas to critically understand how individuals watch television,[17] this sense of tactics can illuminate how artist's browsers might stake out alternative approaches to interacting with the Web. While consumers of goods—including information—are typically construed as passive and removed from the active processes of production, de Certeau argues that daily use constitutes a "secondary production hidden in the process of its utilization."[18] Through innumerable minute, makeshift, and obscure actions, individuals alter objects of consumption to fit disparate and unanticipated uses, exercising a transformational creativity that is difficult, and at times impossible, to register.

While many artworks engaging with digital technologies that Raley has described as tactical media target specific political issues, such as immigration in the *Floodnet* piece mentioned above, these artist's browsers address a more general concern over how commercial web browsers impact the use and development of this nominally public communications technology. Drawing on de Certeau's theorization of tactics, these artworks can be seen as tactical media in an expanded sense. They confront the conditions for how the consumption and production of information are structured by this technological infrastructure and offer utilities for

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[17] Roger Silverstone, "Let Us Then Return to the Murmuring of Everyday Practices: A Note on Michel de Certeau, Television and Everyday Life," *Theory, Culture & Society* 6, no. 1 (February 1, 1989): 77–94.

[18] Michel de Certeau, "General Introduction," in *The Practice of Everyday Life*, trans. Steven Rendall (Berkeley, CA: University of California Press, 1984), xiii.

users to resist, subvert, and manipulate this infrastructure. With these artist's browsers, users could leverage the same web infrastructure and protocols to read and write information in ways blocked off by mainstream browsers. Throughout the thesis, I make comparisons to artworks that pose similar critical considerations for how other kinds of mass media systems, most notably television, structure the consumption and production of information. As with the artist's browsers, these works function as tactical media not in how they address a specific issue, but rather in how they prompt viewers to critically consider their engagement with these technologies.

As individuals with varying levels of computer expertise flocked to the Web in the late 1990s, they encountered new kinds of information objects and technologies. In learning to use these systems, individuals developed and deployed repertoires of tactical engagements for creating, finding, and sharing information online: small tricks like swapping background images and MIDI audio files to bedeck homepages, or linking out to other homepages as a way to build social connections. The net artist Olia Lialina has described this body of idiosyncratic uses of the Web as constituting a vernacular, now lost to an increasingly ubiquitous professionalized and corporate Web design aesthetic.[19] The role that artist's browsers have played has been to guide these tactical engagements, visualizing the workings of the Web so as to inform these tactics and offering functional tools for advancing these interactions to alternative ends—recruiting Web users as collaborators. The artist's browsers outline trajectories for how reading and writing on the Web could take shape, providing tools to actualize these trajectories, in ways that both resist and harmonize with commercial browser interfaces.

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[19] Olia Lialina, "A Vernacular Web. Indigenous and Barbarians," 2005. http://art.teleportacia.org/observation/vernacular/.

These artworks, and the alternative interactions they make possible, do not fundamentally remake the protocols undergirding the Web. The Web continues to function because of manifold software and hardware that work with Hypertext Transfer Protocol (HTTP) and HTML, among many other protocols and standards. In order to function at all, the artist's browsers too needed to interoperate as part of this broader infrastructure. Yet, the ability of these artworks to critically engage with the Web gets to the heart of de Certeau's distinction between tactics and strategy: strategy operates from a place of power and permanence, building up infrastructure that is firmly situated in a place, intended to endure; tactics insinuate into these places of power, leveraging moments of opportunity to exploit established systems toward some desired change.[20] As with the artist's browsers, tactical media necessarily operates as part of the systems that it critiques, "[eluding] discipline without being outside the field in which it is exercised."[21] In distinct ways, each artist's browser performs a style of browsing that—albeit temporarily—transforms the Web and how people make use of it.

1.5) Interrogating the Modes of Production Online

The tactical engagements made available by these artist's browsers help users to develop a deeper understanding of how the Web functions as a networked system for producing and consuming information. Illuminating different aspects of the Web, all of these artworks foster critical awareness about how this technology functions as a means of information production and consumption. However, each work seeks to build on this critical awareness, prompting users to take up tactics like stalking or shredding the Web so as to envision how the Web can be reshaped

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[20] De Certeau, *The Practice of Everyday Life*, 38-9.

[21] Ibid., 96.

as a means of production, driven by individual users rather than the corporate developers of technologies.

Walter Benjamin articulates an aesthetic philosophy that cuts across this history of tactical media in the idea of the author or artist as producer.[22] Breaking with the Romantic notion of the artist as an autonomous creator working outside social structures and apart from material economies, Benjamin describes the artist as directly involved in processes of production and consumption. In this frame, many artists and authors can be seen to create discrete works for ready consumption; the artist as a producer, though, transforms the technologies of production as part of the artistic process, like an engineer manipulating her tools to achieve different results. The object for consumption, then, is not only a discrete artwork, but technologies for production that have been altered, opened up to new kinds of production. In transforming the technology of production, this artistic engagement too transforms the relationship between consumption and production as figured by that technology, encouraging others to actively produce by taking up this reconfigured technology. This concept of the artist as producer aptly characterizes the artists behind the artist's browsers. For these artists, art is a method to critically think through material technologies, making works that redesign the technology itself.

The Web has continued to develop since this time, although to ends that further exploit users, and in ways all too presciently prefigured by these artworks. As the Web comprises a continually changing infrastructure, analysis of these artworks provides insight into the nature of this ecology at a given time, steps toward a media archaeology for how earlier technological, social, and economic developments led to the current state of the Web. The Web of the 1990s is

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[22] Walter Benjamin, "The Author as Producer," in *Selected Writings: Volume 2, part 2, 1931-1934*, eds. Howard Eiland and Michael Jennings (Cambridge, MA: The Belknap Press of Harvard University Press, [1934] 1999), 768-782.

quite different from the Web of today, but many of the same technologies, organizations, and corporate interests are at work now as then. Although technological and social particularities have changed, the critiques leveraged by these artist's browsers remain relevant. Even as the Web and people's uses of the Web have developed, current browsers continue to obscure how users produce and consume information online. The key difference is that the Web of the 1990s was an emergent technology, whereas the Web of today is firmly entrenched as essential communications infrastructure.

CHAPTER 2: FROM SURFING TO STALKING

Released in 1997, *The Web Stalker* was the fourth and final installment of *I/O/D*, a multimedia zine put together by a British artist collective also known as I/O/D.[1] The hybrid publication disseminated new artworks on floppy disks and via the Web,[2] all issues sharing an overarching concern with how software interfaces condition experiences of digital information. As Florian Cramer and Matthew Fuller describe, interfaces "conjoin asymmetries of power,"[3] referring both to the ability of software interfaces to make computational capacities available to humans, but the power also to configure human relationships as individuals interact with each other through software. While previous issues of *I/O/D* featured software for standalone computers, *The Web Stalker* functioned as a web browser, bringing both dimensions of asymmetry to the fore—web browsers connected users to massive amounts of information, and introduced the potential for global communication among a network of users.

While mainstream browsers display a single webpage at a time, *The Web Stalker* expands the interface to the Web, visualizing an overview of densely interconnected nodes and links

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[1] Matthew Fuller, Colin Green, and Simon Pope were the trio of artists principally behind I/O/D. They were also the creators of *The Web Stalker*, specifically, although earlier installments of *I/O/D* included work by other artists and writers, like the novelist Ronald Sukenick.

[2] All issues of *I/O/D*, along with supplemental materials are available on the group's website: http://bak.spc.org/iod/index.html.

[3] Florian Cramer and Matthew Fuller, "Interface," in *Software Studies: A Lexicon*, ed. Matthew Fuller (Cambridge, MA: MIT Press, 2008), 151.

alongside the underlying HTML code (see fig. 1).[1] Offering perspectives from both the top-down

and the bottom-up, *The Web Stalker* encourages users to critically reflect on the totality of the

Web, understanding this as a technology of information exchange and not just information

presentation and consumption. Using mainstream browsers, individuals have a limited range of

interactions at hand—scrolling and clicking—experiencing the Web as a series of pages to surf

across. However, the Web has always been a sophisticated ecology of technologies and

protocols, potentiating a range of practices for consuming and composing information. *The Web

Stalker* does not dramatically change the Web,[2] but does change the user's perception, this

altered awareness incited by an expanded set of interactions: stalking, stashing, and dismantling

the Web. Trying out this vocabulary, users enter *The Web Stalker* as a kind of laboratory, learning

many possible ways to articulate the Web.

     Though this artwork is limited in effect, not seeking to unseat the dominant surfing

paradigm, *The Web Stalker* fosters critical attention in order to politicize the browser,

demonstrating the potential of networked computing to configure interactions among humans

and information resources in manifold ways beyond just clicking a link and loading a page.

While mainstream browsers in the late 1990s presented the Web as a means for users to consume

information in self-directed ways, *The Web Stalker* empowers users to organize, traverse, and

exchange information resources also according to self-directed motivations, augmented by

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[1] While Windows 95, the operating system required to run *The Web Stalker*, is now obsolete, individuals can still access the artwork in emulated form via Rhizome's *Net Art Anthology*: https://anthology.rhizome.org/the-web-stalker. My own interactions with *The Web Stalker* have been through this and other emulated versions of the software.

[2] *The Web Stalker* would render a custom tag, <shout>, not recognized by mainstream browsers, much like these browsers implemented proprietary tags such as <blink> and <marquee> discussed elsewhere in the thesis. The unique tag demonstrates the labile nature of networked information online, further born out by the entirely novel markup language interpreted by *netomat*.

greater insight into the underlying technologies. *The Web Stalker* does not transform the Web but does suggest how alternative configurations of networked computing can serve other social and economic relationships, among users of the system and between users and information.

Upon launching *The Web Stalker*, the user confronts what Fuller describes as a "reverse nihilist moment."[3] The screen is black, devoid of apparent functionality, but this darkness is marked by depth and plenitude, not emptiness. Either through experimentation or with reference to the help documentation included with the work,[4] the user learns to draw rectangles on this black screen, each invoking one of six functions. Already hinted at above, each function offers an interaction with the Web either obscured or altogether not supported by commercial browsers. 'Map' creates a diagrammatic overview of the links and pages that constitute a given website; 'dismantle' isolates particular web resources like images or audio files; 'stash' enables individuals to save webpages for later use offline. In effect, the user writes the browser interface. Each function replicates an action carried out by a mainstream browser—the 'crawl' window replaces the address bar, for instance—but the user separates these out and brings them into being, constructing the browser in the process of using it.

Reaching individuals who were just beginning to interact with the Web, *The Web Stalker* was distributed widely as a kind of viral software, available online, as freeware in magazines, and advertised with stickers and leaflets posted around the UK. As Fuller recounts, *The Web Stalker* disseminated through these myriad networks, reaching an estimated 500,000 users early on: "it was circulated on the front cover of computer magazines, and on free CDs. I thought that was a very good place to be circulating artwork, along with trashy freeware—that was exactly

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[3] Matthew Fuller, *Behind the Blip: Essays on the Culture of Software* (Brooklyn, NY: Autonomedia, 2003), 58.

[4] http://bak.spc.org/iod/Winhelp.html

where we wanted to be really."[5] *The Web Stalker* confronted the constrained mode of 'just surfing' to offer these users a more robust repertoire of productive acts online. At a time when accessing online information was both expensive and time-intensive—coming via slow connections brokered by telecommunications companies—Fuller recalls that people used *The Web Stalker* to ingeniously subvert these obstacles.[6] For instance, Fuller remembers that early adopters used the 'map' function to look ahead, finding desired information by traversing across the overview of a site, rather than clicking through links to navigate through complexly or poorly organized pages. Others used this function as a diagnostic tool, analyzing the structure of websites, or even using the tool to better organize their own websites, early examples of what we might now call 'web science.' In conjunction with 'map,' the 'stash' and 'dismantle' functions allow individuals to selectively download text, HTML, or images for offline use. Individuals might amass these in their own collections of information resources, removing these from their original context in webpages and repurposing them as digital information that can be freely shared, manipulated, and copied.

The Web Stalker does not provide means for editing existing webpages or writing new web content, like another alternative browser called Amaya,[7] created by Tim Berners-Lee, the inventor of the Web.[8] However, the alternative reading practices that *The Web Stalker* offers—

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[5] Personal interview with the artist, December 4, 2017.

[6] Ibid.

[7] https://www.w3.org/Amaya/

[8] Tim Berners-Lee and Mark Fischetti, *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by Its Inventor*, (San Francisco: HarperSanFrancisco, 1999), 170. In this account of Amaya, Berners-Lee and Fischetti also critique notions of 'interactivity' that pervade discourses regarding the Web. For Berners-Lee, interactivity is not just the ability to choose among a few options, but also the ability to create. Amaya facilitates this by enabling users to actively edit the content of webpages online, even those owned by others on remote servers.

diagnosing the structure of websites or selectively downloading web resources—are nonetheless

productive, reminiscent of de Certeau's description of reading as poaching. While reading is

typically construed as passive consumption, removed from the work of cultural creators like

those coding and designing websites, de Certeau argues that reading and writing are interwoven,

as the reader actively manipulates the written: "in fact, to read is to wander through an imposed

system (that of the text, analogous to the constructed order of a city or of a supermarket)."[9]

Although *The Web Stalker*, like commercial browsers, does not enable users to alter published

webpages, the artist's browser augments users' capacities and capabilities for wandering through

the Web. The tools made available via the browser interface—especially 'map' and 'stream'—

alter users' orientation toward the Web, shifting attention away from discrete, published

webpages and toward the intricate infrastructure constituting the Web as an information system.

Rather than providing tools for writing web content, such as editors like Adobe Dreamweaver,

The Web Stalker interface illustrates the overall production process for how webpages and

websites are coded and interconnected.

Aided by *The Web Stalker*, wandering through the Web in de Certeau's sense becomes

productive as users gain an awareness for how the Web functions as a dense media ecology of

protocols, code, and myriad interactions between humans and machines. More than just

developing an understanding of this infrastructure of information production and consumption,

though, *The Web Stalker* provides users with a laboratory for imagining how the Web might be

otherwise configured. As Benjamin describes, artists who directly engaged with apparatuses of

production—like web browsers—can seek to transform the apparatus itself, aligning technical

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[9] Michel De Certeau, *The Practice of Everyday Life*, trans. Steven Rendall (Berkeley, CA: University of California Press, 1984), 169.

progress as the foundation for political progress.[10] However, to suture political progress and technological development, the productive apparatuses generated by artists need to be opened up to users, encouraging users to also engage in production process: "the exemplary character of production is able, first, to induce other producers to produce...and this apparatus is better, the more consumers it is able to turn into producers—that is readers or spectators into collaborators."[11] Following Benjamin, a 'better' web browser is not necessarily one that makes it easier to find information online, but rather a browser that encourages users to understand how it functions and to continue to develop the technology toward their own ends—to stop surfing the Web and to start stalking it.

For Benjamin, these transformed apparatuses are recursive and reflexive: users of the technology become producers themselves, continuing to improve the apparatus through the process of use. *The Web Stalker* has not changed the Web in this way, but it does function as a kind of laboratory, much in the way that Benjamin characterizes Bertolt Brecht's Epic Theater as a "dramatic laboratory."[12] Brecht's plays employ innovative techniques that interrupt the traditional narrative plot, but in doing so recruit the audience to participate in the drama and reflect on their position in relation to processes of dramatic production—and the position of this artform within an entire socioeconomic field. Similarly, *The Web Stalker* interrupts immediate access to a fully-rendered webpage, but does so to shift attention to the overall structure of the Web. Instead of clicking links and scrolling through pages, users interact with the protocols and

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[10] Walter Benjamin, "The Author as Producer," in *Selected Writings: Volume 2, part 2, 1931-1934*, eds. Howard Eiland and Michael Jennings (Cambridge, MA: The Belknap Press of Harvard University Press, [1934] 1999), 776.

[11] Ibid., 777

[12] Ibid., 779.

the streams of information composing websites. Moving around these building blocks of the Web, users begin to see how the Web might be otherwise configured.

As the user confronts how both the Web and web browsers are constituted as they stalk, using *The Web Stalker* is necessarily recursive and reflexive. While interacting with the Web has been described with passive idioms of 'surfing' or 'browsing,' the constructive engagement encouraged by *The Web Stalker* is more consistent with the broader history of hypertext as a technology for both producing and consuming information. Theodor Nelson first proposed hypertext as a technology specifically for writers, taking advantage of computing power to augment messy authoring practices that involve working across countless notes and drafts to endlessly rearrange ideas and expressions.[13] Many of the first functioning hypertext systems, developed through the 1970s and 80s, were also designed for encouraging the active construction of knowledge. Educators at Brown University taught poetry with the File Retrieval and Editing System (FRESS), a hypertext system that enabled students to exchange and discuss annotations of poems with their peers.[14] Jay David Bolter and Michael Joyce, two of the individuals behind StorySpace, one of the first systems for literary hypertext works, describe the platform not only as a tool for writers, but as introducing a new degree of agonistic interplay between author and reader, both exercising creativity to determine the meaning of the text.[15] As Belinda Barnet argues in her history of these pre-Web systems,[16] the cultural imaginary of hypertext exceeds the

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[13] Theodor Nelson, "Complex Information Processing: A File Structure for the Complex, the Changing and the Indeterminate," in *Proceedings of the 1965 20th National Conference*, ACM '65 (Cleveland, OH: ACM, 1965), 87.

[14] James V. Catano, "Poetry and Computers: Experimenting with the Communal Text," *Computers and the Humanities* 13, no. 4 (October 1, 1979): 269–75, https://doi.org/10.1007/BF02400138.

[15] Jay David Bolter and Michael Joyce, "Hypertext and Creative Writing," in *Proceedings of the ACM Conference on Hypertext*, Hypertext '87 (Chapel Hill, NC: ACM, 1987), 49.

[16] Belinda Barnet, *Memory Machines: The Evolution of Hypertext* (London: Anthem Press, 2013).

relatively limited functionality of clicking between webpages—and inevitably running into broken links, or worse, clickbait.

The Web significantly departed from these earlier hypertext systems by privileging connections across networked computers, forgoing some of the robust reading and writing functionality possible in standalone software, but with the potential for the global exchange of information. The first graphical web browsers emerged just as the Internet infrastructure transferred into the private sphere in the early 1990s,[17] laying the foundation for the Web to become a commercial media akin to television or radio. Thinking of the Web as commercial media, browsing or surfing can be compared to Williams' conception of the experience of 'flow' in watching television. The seeming miscellany of programs, advertisements, and trailers all form part of a regimented flow that reflects a broader logic: "the flow of meanings and values of a specific culture."[18]

Jaime Davidovich's public-access television art program *The Live! Show* (1979-1984), which aired on Manhattan Cable Channel J, rendered Williams' cultural logic of flow strange with absurdity and humor, transforming the vocabulary for viewing. For example, in the 'Museum of Television Culture' (1982) sketch,[19] Davidovich's alter ego 'Dr. Videovich' acts as a curator of plastic toys variously adorned with mirrors and screens, flatly describing how viewers might use these accouterments to imagine themselves on TV while a canned laugh track and neon-tinged transition effects interrupt at irregular intervals. This sketch, and the program more generally, invited viewers to reconsider how they were watching, while calling attention to the

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[17] Paul Ceruzzi, *A History of Modern Computing*, 2nd ed. (Cambridge, MA: MIT Press, 2003), 320-322.

[18] Raymond Williams, *Television: Technology and Cultural Form* (London: Routledge, 2003), 120.

[19] https://www.youtube.com/watch?v=wDA7ZCZ2mEw

limits of television as a one-to-many broadcast technology. Another of Davidovich's public-access artworks, a proposal for QUBE in Columbus, Ohio, took advantage of a special remote control developed by the station that enabled viewers to interact with programs in real-time. Davidovich demoed a talk show, during which viewers could direct cinematography by voting on different camera positions and other options, but as Kris Paulsen argues, this and other artist's proposals for QUBE highlighted the paucity of these interactions.[20] The viewer is still just pushing buttons on a remote.

While the Web is an altogether different medium than television (though the two blur more and more), mainstream browsers encourage a similar routinized practice, links leading in and out of commercial hubs: first the "What's Hot" button on Netscape, now Netflix recommendations. Still, key differences distinguish the Web and television, particularly in the late '90s. For one, web users can choose where they click, exercising more agency than flipping through channels. Related to this, the information space of the Web is far vaster than television, including ways for individuals to readily post their own content and respond to content posted by others. The experience of surfing the Web departs from Williams' description of flow: the television viewer is subjected to a barrage of seemingly endless content, which they can do little to change or directly respond to. Although the Web overcomes some of these limitations to interactivity—program creators and viewers separated by a screen—web user interactions are still constrained to the actions made available by the interface to the system.

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[20] Kris Paulsen, *Here/There: Telepresence, Touch, and Art at the Interface* (Cambridge, MA: MIT Press, 2017), 134-7.

As Stallabrass observes, net art has long been praised for achieving new levels of interactivity, breaking down longstanding barriers between artist and audience,[21] such as in Douglas Davis' *The World's First Collaborative Sentence* (1994-),[22] in which Davis invited users to add to a potentially never-ending sentence, always live and online.[23] However, this 'interactivity' is often more rhetoric than reality; Stallabrass details the many shortcomings of the Web as a communications platform, such as the one-directional nature of hyperlinks and the difficulties involved in coding with HTML, making it mostly a read-only media stocked with commercial content, much like TV.[24] While some net artworks play up interactivity, others dramatize the limitations, like *Weightless* (1999) by Thompson & Craighead, a work that presents viewers with a plethora of buttons and check boxes, all dynamically shifting over the course of interacting with the work, but with an obtuse—almost randomized—logic governing how particular actions lead to the delivered outcomes.[25] *Weightless* recalls Davidovich's television work, as the viewer is again at a remove from exercising any agency over the production process, separated by an interface offering a constrained set of choices.

As with the other artist's browsers discussed below, *The Web Stalker* directly confronts this issue of interactivity, advancing models for productive interactions with the Web that

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[21] Julian Stallabrass, *Internet Art: The Online Clash of Culture and Commerce* (London: Tate Publishing, 2003), 60.

[22] Douglas Davis, "The Work of Art in the Age of Digital Reproduction (An Evolving Thesis: 1991-1995)," *Leonardo* 28, no. 5 (1995): 381–6.

[23] This artwork presents an especially interesting case of conservation intersecting with the aesthetic intent of the work. In order to keep the work live, conservators at the Whitney had to fundamentally change the underlying code for the work to function on the current Web, effectively fossilizing the original piece. The price of maintaining interactivity was sealing off the original instance of the *Sentence* from further interaction. See the current website of the work for more: https://whitney.org/artport/douglas-davis

[24] Stallabrass, *Internet Art*, 64-5.

[25] http://www.thomson-craighead.net/w/

illuminate how information online is constructed, organized, and disseminated. Importantly, the new vocabulary of information practices proffered by *The Web* Stalker—mapping, stashing, and crawling—position processes of information production and consumption into a broader media ecology, of which the browser is just one element. Referencing Kurt Schwitters' notion of collage, Fuller describes media ecologies as dense and dynamic meshes of technologies and people that "set in play a process of mutual stimulation that exceeds what they are as a set. They get busy, become *merzbilder.*"[26] For the Web, these media ecologies include not only personal computers, servers, and protocols, but also people writing code, swapping software on floppies and CDs, both at computer science conferences and in popular computer magazines.

Fuller accords artworks a unique role in media ecologies, as compositional drives that can reinvent, misuse, and adapt seemingly standard objects like web protocols.[27] I/O/D sought to incite such radical change by virulently dispersing *The Web Stalker* to individuals across these media ecologies, hoping to foster an alternative "grammar of participation."[28] While commercial browsers encourage users to see the Web as a series of information sources to consume, *The Web Stalker* invites users to see the Web as a living corpus of information being continually assembled and disassembled, illuminating how sites are connected by links, how pages are coded, and how information resources are embedded. By offering tools for dissecting this media ecology, the browser incites users to take part in these active processes of construction. This altered grammar of participation—stalking rather than surfing—changes the user's perception of

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[26] Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (Cambridge, MA: MIT Press, 2005), 1.

[27] Ibid., 169.

[28] Personal interview with the artist.

the media ecology altogether, as she steps out of a Web filled with pop-up ads and slickly designed homepages and into a Web of HTML and HTTP, of nodes and links.

For Fuller, media ecologies effect particular 'dimensions of relationality,' inscribed ways that the various objects and entities relate to one another.[29] Tactical media artworks have the capacity to shift the perspective on these inscribed relations, rattling seemingly fixed structures and imagining other ways these might be composed. Similarly, Oskar Negt and Alexander Kluge argue that a political critique of television as a communications media is hampered if it only attends to individual programs.[30] Instead, attention needs to rise to the level of television overall as an industrial process of production. For Negt and Kluge, a democratic broadcast system directed by the needs of the viewers would need to exist as a "counterproduct," an apparatus operating at the level of commercial television, but running against the grain of the capitalist interests driving television as it already exists.[31] As noted above, the goal of Benjamin's artist-cum-engineer is not to create a 'better' browser or a 'better' television program, but rather to produce tools that incite users to become active participants in the production process—or, counterproducts in Negt and Kluge's terminology.

These counterproducts necessarily involve shifting the dimension of relationality for the users of the technology, away from discrete information content and up toward the processes of production for creating, sharing, and consuming that information. *The Web Stalker* effects such a shift in the dimension of relationality. The interface breaks with the rich presentation of image

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[29] Fuller, *Media Ecologies*, 131.

[30] Oskar Negt and Alexander Kluge, *Public Sphere and Experience: Toward an Analysis of the Bourgeois and Proletarian Public Sphere*, trans. Peter Labanyi, Jamie Owen Daniel, and Assenka Oksiloff (Minneapolis, MN: University of Minnesota Press, 1993), 103.

[31] Ibid., 104.

and text offered by contemporaneous and current commercial browsers, presenting users with a black screen, populated by wire-frame shapes and streaming code. However, by experimenting with the various functions and tools, users interact with the constituent components of the Web rather than individual webpages, experiencing the Web at the level of the production of information. *The Web Stalker* does not point toward any particular path for how the Web might be developed, and in this sense, the work does not take a specific political or normative stance on how the Web *should* function. Rather, the work seeks to put the tools for development in the hands of users, which serves as a necessary foundation for any political critique of technological development according to the theoretical frameworks put forth by both Benjamin and Negt and Kluge. For the Web, this means demonstrating how web browsers—and browser interfaces—function in processes of information production and consumption online. Early in the history of the Web, as many users were first coming online, *The Web Stalker* sought to illustrate not only how information could be read and written online, but how the Web itself was part of a shifting media ecology, a set of technologies open to composition and reconfiguration.

CHAPTER 3: PUTTING THE WEB THROUGH THE SHREDDER

While *The Web Stalker* surfaces technological protocols and processes impacting the

experience of browsing across a network of documents, Mark Napier's *Shredder* (1998)

deconstructs individual webpages. Programmed as a Perl script that runs within commercial

browsers,[1] *Shredder* presents users with an address bar to type in a universal resource locator

(URL), but something seems wrong when the page loads. Instead of a structured page with

formatted text and inline images, the user sees seemingly garbled code, morphed images, and a

spectrum of color swatches, all in a dense collage. Like *The Web Stalker*, *Shredder* provides an

alternative interface to the Web, transforming information transmitted with web protocols to

unexpected ends; rather than opening the Web up to new tactical interactions, though, *Shredder*

seems to shut down further engagement. Like a paper document put through a shredder, the

artist's browser deconstructs a webpage beyond the grasp of typical reading practices. At first

glance, *Shredder* produces interesting images—mashups of the surface and the underbelly of a

webpage—but impedes browsing the Web as a network of interconnected documents.

As with *The Web Stalker*, though, this unfamiliar browsing experience reveals its own

underlying logic through extended exploration of the Web using the distinctive interface. While

The Web Stalker provides users with a birds-eye view, browsing at the level of network

protocols, *Shredder* pushes users into the guts of the Web, opening up webpages to expose the

constituent code as elements and objects that can be used and repurposed in composing new web

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[1] *Shredder* is still live and can be found here: http://potatoland.org/shredder/shredder.html.

documents. Lialina posits 1998 as a crucial turning point, when an active 'vernacular web' culture characterized by amateur, early adopters experimenting with HTML and sharing code, images, and audio files to develop communities of personal pages began "to be washed away by dot.com ambitions, professional authoring tools and guidelines designed by usability experts."[1] *Shredder* shares this approach to the Web, deconstructing fully-rendered pages back into component parts that can be reconfigured by readers into new documents. Released at this turning point in web culture, *Shredder* also signals the role that browsers play as a framework for these dynamic interactions with the Web. Fueling the commercialism identified by Lialina, browser makers like Apple and Microsoft took on an increasingly pronounced role in shaping the development of HTML and other web technologies at this time. *Shredder* opens up webpages, surfacing malleable code, images, and text—all components of a potentially living language shaped by web users—but also dramatizes how browsers serve as necessary interfaces to the technical materials constituting the Web.

Given the outsize influence of companies like Google and Amazon, corporate control of web technologies currently seems to be a matter of fact, but the Web is still nominally an open infrastructure with web standards stewarded by the World Wide Web Consortium (W3C).[2] The Web is 'open' in that the protocols constituting the Web are created through transparent processes open to public comment, and that the final standards are made public, open for anyone to use or adapt. Despite the philosophy of openness, real barriers impinge upon openness in practice, namely the technical knowledge required to understand these protocols and the resources

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[1] Olia Lialina, "A Vernacular Web. Indigenous and Barbarians.," 2005, http://art.teleportacia.org/observation/vernacular/.

[2] https://www.w3.org/

required to develop technologies—like web browsers—that put these protocols to work. The openness of the Web may have been easier to maintain when the Web was still a niche technology used by a small group of computer scientists and other specialist users, but openness became less tenable when the commercial potential of the Web as a global communications infrastructure became apparent—clearly signaled in 1995, when Netscape made an initial public offering worth over four billion dollars.[3] By the late 1990s, browsing had become big business, with Netscape, Apple, and Microsoft all competing with one another for the largest share of web users.

One the one hand, this massive commercial development promised far greater access, thus augmenting how open the Web was to users with limited technical expertise. On the other hand, this development came as a result of corporations exerting control over users' access, directing use of a public information commons through privately-owned gateways. Although web protocols like HTML and HTTP have always been open to the public, the interfaces implementing these protocols increasingly came under proprietary control through the late '90s and up to the present. Even though the Web is more suited for public access than earlier mass media like television, the Web exhibits a deep contradiction running throughout the history of capitalist society: though public spheres make claims to broadly represent all social experience, in practice they are comprised of a handful of individuals, organizations, and institutions driven by private interests.[4] As Negt and Kluge elucidate, what is typically described as a 'public

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[3] Tim Berners-Lee, inventor of the Web, describes early tensions between consortium development and emerging corporate interests in the mid-90s. Tim Berners-Lee and Mark Fischetti, *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by Its Inventor*, (San Francisco: HarperSanFrancisco, 1999), 118.

[4] Oskar Negt and Alexander Kluge, *Public Sphere and Experience: Toward an Analysis of the Bourgeois and Proletarian Public Sphere*, trans. Peter Labanyi, Jamie Owen Daniel, and Assenka Oksiloff (Minneapolis, MN: University of Minnesota Press, 1993), 2.

sphere' actually consists of a heterogeneous aggregate of many "industrialized public spheres of production," with attempts to arrive at a coherent order undermined by countless fissures between disparate entities with diverging interests.[5] Even in its infancy, the Web was always the product of many groups with competing interests—the 'browser wars' only amplified the stakes of this competition.

Writing at this time of transition, Peter Flynn warns that commercial competition threatens the ongoing health of the Web, as browsers serve as users' principal interface to the Web but are developed outside of the consultative processes utilized to develop web protocols.[6] Netscape and Microsoft created browsers that parsed HTML in different ways, and introduced proprietary code that only worked on their respective browsers. Most infamously the <blink> and <marquee> tags generated playful text animations but only when viewed by the 'correct' browser.[7] As Flynn cautions, commercial browsers may introduce innovations, but this corporate competition ultimately limits the potential of the Web as a shared communications technology, pushing HTML from an open to an owned standard.[8] In the years since, this privatization has increasingly come to pass. Starting in 2004, representatives from leading browser vendors have taken charge of the ongoing development of HTML under the banner of the Web Hypertext Application Technology Working Group (WHATWG).[9] Ian Hickson, the editor of the HTML5

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[5] Ibid., 13-15.

[6] Peter Flynn, "W{h}ither the Web? The Extension or Replacement of HTML," *Journal of the American Society for Information Science* 48, no. 7 (July 1997): 614–21.

[7] Bob Whipple, "The Evil Tags <blink> and <marquee>: Two Icons of Early HTML and Why Some People Love to Hate Them" in *From A to <A>: Keywords of Markup*, ed. Bradley Dilger and Jeff Rice (Minneapolis: University of Minnesota Press, 2010), 98-110.

[8] Flynn, "W{h}ither the Web?" 620.

[9] https://whatwg.org/

specification and an employee at Google, summarizes the profound influence maintained by these corporations: "the reality is that the browser vendors have the ultimate veto on everything in the spec, since if they don't implement it, the spec is nothing but a work of fiction."[10]

As evidenced by Flynn and Lialina, though, the effects of this corporate influence over web technologies and web design aesthetics could already be felt in the late '90s. In part, Napier created *Shredder* in response to the precarity of the Web engendered by this ramping up of corporate competition: "the browsers agree on how to present this text called HTML, this standard…That is also a consensual hallucination in a sense: all these browsers—this industry— has agreed to represent HTML one way."[11] As Napier warns, the apparent stability of how browsers interpret the underlying code of web documents is only founded upon agreements among a few corporations—a foundation showing its cracks in the late '90s. *Shredder* dramatizes this precarious position, demonstrating how simple it was to radically alter this shared interpretation of web documents. Describing the process of creating *Shredder*, Napier states that "by just injecting a few hundred lines of Perl into the pipeline of loading and rendering a page, I can completely alter your entire experience of surfing the Web and alter the reality of what this thing is and how it appears…introducing a hallucinogen into the pipeline, and saying, 'this is what the Web looks like when you're on the *Shredder*.'"[12]

Shredder's interpretation of the underlying code dramatically departs from any of the commercial browsers at the time—an intervention more profound than the differences between

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[10] Bruce Lawson and Ian Hickson, "Interview with Ian Hickson, Editor of the HTML 5 Specification.," *The Web Standards Project* (blog), May 13, 2009, https://www.webstandards.org/2009/05/13/interview-with-ian-hickson-editor-of-the-html-5-specification/index.html.

[11] Personal interview with the artist, December 26, 2017.

[12] Ibid.

the <blink> and <marquee> tags—but the work nonetheless illuminates the 'asymmetries of power' conjoined by interfaces.[13] Web users necessarily (and often unwittingly) follow how browser developers have chosen to implement otherwise open web standards like HTML, which in part is motivated by corporate interests like locking in users to the given browser or directing web traffic through sites owned by the corporation. When driven by corporate interests, browsers optimize the Web for corporate needs, making it easier to consume information on the Web albeit opaquer as to how that information is structured or composed. *Shredder* steps between the user and the commercial browser, breaking through the programmed opacity of the interface and wresting together the underlying code with the rendered colors, images, and text. The user partakes in this, pressing the button to 'shred' rather than to surf. In the process of shredding through the surface of the webpage, the user uncovers these constituent components of online information—code that can be copied, re-written, and rendered anew. Rather than render, *Shredder* decompiles webpages back into elements of raw material.

Recalling Stallabrass' comments about the limits of interactivity online, *Shredder* does not function well as a browser: this first interaction with the interface is also effectively the last. Instead of a structured document, the shredded page collages text with code, images are warped, and spelled-out links are replaced with URLs. The user can still click around, but unsure of where the next click will lead—and even this will be to another shredded page. To this end, *Shredder* stages a breakdown of the Web, interrupting the fluidity with which commercial browsers facilitate the reading and writing of information online. Michele White describes this 'aesthetics of failure' as a characteristic common to net art, employing "misquotation,

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[13] Florian Cramer and Matthew Fuller, "Interface," in *Software Studies: A Lexicon*, ed. Matthew Fuller (Cambridge, MA: MIT Press, 2008), 151.

misdirection, and interface breakdown [to] offer a distance from the Internet's effects and a critical commentary on its vernacular."[14] White points to another artist's browser, JODI's *WRONG Browser* (2001), which performs a deconstruction like *Shredder* (fig. 4). With the *WRONG Browser*, the user sees squares of color resembling windows open on a desktop, interspersed with shards of code. The semblance of windows invites users to click around or enter URLs, but any attempt at navigation is thwarted by an inexplicable interface. As with other works by JODI, the user can slowly—and frustratingly—learn the idiosyncratic rules governing the artwork, but never feels totally comfortable.

With *Shredder*, this aesthetics of failure—a browser that fails to browse the Web—fosters a critical literacy of the components that make up a webpage and how this information is structured by the browser. *Shredder* confronts users with apparently illegible representations of webpages in order to elucidate the logic by which commercial browsers compose pages. As Alexander Galloway compares workable and unworkable interfaces, the interface that 'just works' maintains a coherent logic, centralizing focus on the content presented by the interface, while inoperative interfaces remain incoherent, pushing attention outward from the edges of the interface.[15] *Shredder* inhibits users from reading any particular webpage but instructs users in how to read the browser itself, as a technology that pulls together many components into a structured document. The seeming garble of HTML, Cascading Style Sheets (CSS), scripts, and other component elements a user encounters when first launching *Shredder* can be clearly read in productive terms—that is, as information that web users can take up to produce webpages.

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[14] Michele White, "The Aesthetic of Failure: Net Art Gone Wrong," *Angelaki* 7, no. 1 (April 1, 2002): 173.

[15] Alexander Galloway, *The Interface Effect* (Cambridge, UK: Polity Press, 2012), 39.

Unworkable interfaces encourage the user to look beyond the content presented because this in and of itself is illegible, instead pointing outward to how this particular system is embedded in broader technological infrastructures and social contexts. As Galloway suggests, "the edges of the work are the politics of the work."[16] As a script running within commercial browsers, *Shredder* not only surfaces the code constituting websites, but presents this as a visually-rich collage butting up against the edges of the browser interface. As discussed in the previous chapter, Fuller describes media ecologies as collage: a work like Kurt Schwitters' *Der Harz* (1921) exercises a logic of parataxis, bringing together beer labels, ticket stubs, leaflets, and bits of cloth, demonstrating how these seemingly disparate objects actually cohere as part of a shared information economy.[17] Likewise, *Shredder* articulates the relationships between disjunct components of the information economy of the Web—HTML, CSS, .jpegs, .gifs, and snatches of text—which elsewhere appear fluid and naturalized.

Shredder's act of parataxis brings surface and code into contact, creating a new interface that compresses the many layers constituting a webpage into one inoperable document. The beer label and ticket stub are two different objects, but they also intersect, both economically, as the holder of the ticket may have also purchased the beer, but also materially, both objects fabricated using the same print technologies. *Shredder* similarly illuminates points of confluence in the media ecology of the Web: not only do surface and code interrelate, but these layers are coordinated by browsers. These browsers have a materiality, as software embodying countless decisions made by corporate developers, all impacting how the Web is visually represented and

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[16] Ibid., 41.

[17] Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (Cambridge, MA: MIT Press, 2005), 1.

experienced by end-users. As Schwitters' collage contorts the material products of a paper-based economy, *Shredder* irrupts through layers of digital material immanent to a webpage to force otherwise unseen connections that determine how the Web functions as an information economy. The code, files, and links that *Shredder* brings to the fore are no longer unseen elements functioning behind the browser interface but are highlighted as the elements productive of online information.

Users of *Shredder* engage in this productive activity in multiple ways. From their first interactions with the work, users undertake productive destructions, as clicking on a link or entering a URL into the browser creates a novel deconstruction. Users might actively seek out particular pages to shred, curious to see the results of destroying a favorite (or maligned) site and exposing the digital material beneath the surface. Reviewing *Shredder* for *The New York Times*' "arts@large" column at the time of its initial release, Matthew Mirapaul observes that shredding commercial sites, those replete with high-res images and bloated code like microsoft.com or Madonna's homepage, produces some of the most "eye-popping results."[18] Mirapaul suggests *Shredder* might serve as useful tool for deconstructing the visual language of the Web, transforming "graphic design disasters" into visually-striking works.[19] This intervention, pressing 'shred' on a webpage designed by a crack team of web designers and information architects, constitutes a small act of tactical resistance, recalling de Certeau's notion of reading as poaching discussed in the previous chapter.

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[18] Matthew Mirapaul, "When Artists Build Their Own Browsers," *The New York Times*, December 3, 1998, https://partners.nytimes.com/library/tech/98/12/cyber/artsatlarge/03artsatlarge.html.

[19] Ibid.

Sustained engagement with this unworkable interface, though, prompts another kind of productive activity, taking up the code from shredded pages as raw material that can be used to produce new sites. Although browsers of the late '90s increasingly moved toward obscuring these underlying elements to encourage consumption of fully-rendered pages, *Shredder* reopens HTML as a language that web users can both read and write. Lialina reminisces that the earlier period of initial popular uptake of the Web was marked by a wealth of such information practices.[20] Playing with HTML code (including <blink> and <marquee> tags), sharing libraries of MIDI audio files and twinkling star background images, these individuals took advantage of free hosting services like Geocities to create webpages that broke with professional web design aesthetics.[21] Following de Certeau, these information practices involve more than just using the Web, but rather 'making use of' the Web: picking up HTML, CSS, and other web technologies developed with corporate interests in mind, and refashioning these technologically encoded systems to generate a living language, shared in common by a community of users.[22]

Coming up against the growing corporate influence over the Web—as professionally-designed virtual storefronts overshadowed communities of personal homepages—*Shredder* demonstrates the continued openness of HTML and other web technologies, and the possibilities that this openness affords. *Shredder* viscerally opens up a given webpage, presenting viewers with the code that constitutes it. This code can be grabbed, altered, and repurposed to compose another page. Despite corporate vying, these underlying protocols are not owned, and so are

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[20] Olia Lialina, "A Vernacular Web. Indigenous and Barbarians."

[21] Lialina and her partner Dragan Espenschied maintain an archive of many of these Geocities sites and study this period of web culture at http://blog.geocities.institute/.

[22] Michel De Certeau, *The Practice of Everyday Life*, trans. Steven Rendall (Berkeley, CA: University of California Press, 1984), 31.

open to being interpreted in many imagined and still-to-be imagined ways. HTML and these

related technologies are open in more than just this sense; they are also open to be used by

individuals. Williams urges that all manner of engagement with technologies of writing, from

reproduction or copying to new articulation and formation, all drive forward the development of

these inherently social forms of expression.[23] Through vernacular information practices,

individuals participate in the development of the living languages constituting the Web, with and

against the overarching corporate control of technologies themselves.

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[23] Raymond Williams, *Marxism and Literature* (Oxford: Oxford University Press, 1977), 210-212.

CHAPTER 4: FORDING THE STREAM

In different ways, both *The Web Stalker* and *Shredder* intervene into standardized ways of consuming and producing information online, presenting interfaces that visualize the extant network protocols and code typically obscured by commercial browsers. These artworks deconstruct the Web, making components of this information system differently available to users in order to demonstrate alternative uses for the Web as it currently functions. *netomat* (1999) also depended on existing web infrastructure, protocols like HTTP, and code like HTML, but this artist's browser did not deconstruct these technologies; rather, the artist Maciej Wisniewski constructed *netomat* as a distinct information system with its own custom markup language, structuring information online according to an altogether unique paradigm.[1] *netomat* opened with a black screen, with a slim search bar in the lower-left corner of the window. Entering a search term into the bar brought the program to life, as the software retrieved text, images, and audio from across the Internet, juxtaposing these into a dynamic stream of content flowing across the screen. In a similar fashion to search engines like Google, which were emerging at this time as a novel way to find information online, the *netomat* interface did not render any particular website, but instead created a wholly unique meta-document in response to each search.

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[1] Unlike *The Web Stalker* and *Shredder*, there is currently no functioning version of *netomat*, either in emulation or running on current hardware. My experience with *netomat* has been limited to conversations with the artist and documentation of the work (https://www.digitalartarchive.at/database/general/work/netomat.html). While I have discussed the previous browsers in the present tense, as individuals can still interact with them, I discuss *netomat* throughout this chapter in the past tense, as further interactions are effectively closed off—barring a significant restoration of the work.

While *Shredder* and *The Web Stalker* deconstruct existing webpages, reconstituting the code from those pages into alternative visual forms, *netomat* created a bespoke web document composed in NML. More than a novel browser interface, *netomat* introduced an altogether new language for reading and writing information online and provided users easy access to customizing this language (by right-clicking on search bar). Reviewing the work for *Computing Canada*, Greg Meckbach refers to *netomat* as a 'meta-browser,' not only because the software utilized a custom markup language to cull information from across the Web, but also because users could learn to read and write this language to effectively "create their own browsers."[1] Although still working within the media ecology of Internet-connected servers and personal computers, Wisniewski forged a novel virtual space—a technology for networking information that provided users direct access and insight into how the system retrieved and represented information. Though the work did not aim to supplant the Web outright, *netomat* still served a largely tactical function, as a counterproduct standing in relief of an increasingly commercialized Web.

In part, Wisniewski created *netomat* in response to dramatically shifting practices for finding information online. As the Web exponentially expanded through the late '90s, web users became far more likely to find information using newly developed search engines like Google or Alta Vista rather than surfing across links.[2] Reviewing several contemporaneous studies, Michael Bergman reported that 85% of web users turned to search engines to find information— though the rate of search failures and user frustrations with these engines were rising just as

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[1] Greg Meckbach, "Alternative Browser Adds Twist to Web Searching," *Computing Canada*, August 27, 1999.

[2] https://digital.com/about/altavista/

rapidly.[3] Web search engines were still at a nascent state: these early systems drew on a rich

tradition of information retrieval research dating back to the 1950s, but required new approaches

given the massive breadth and depth of information online.[4] Out of the many competitors active

in the late '90s, Google eventually established a monopoly over the search engine market,

sparked by an innovative approach to determining the relevance by analyzing the links pointing

to a given website.[5] This PageRank algorithm seized upon the productive activity of individuals

and organizations forging links to and from various pages, appropriating this *en masse* via

automated web crawlers to fuel the Google search engine.

     As Elizabeth van Couvering argues, the rise of this search engine paradigm marked a

shift in the economics of the Web, with web traffic rather than web content as the fundamental

unit of exchange.[6] Presaging the contemporary landscape of dominant social media

corporations—which generate profit by gleaning, analyzing, and selling users' data—Google and

the PageRank algorithm has become an archetype of an online information system principally

driven by the productive interactions of web users. Neal Thomas describes these social

computing systems as a Marxian 'general intellect,' amassing clicks, links, and other data-

generating interactions as so many signals that lay a foundation for the future automation of

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[3] Michael K. Bergman, "White Paper: The Deep Web: Surfacing Hidden Value," *Journal of Electronic Publishing* 7, no. 1 (August 2001).

[4] Mark Sanderson and W. Bruce Croft, "The History of Information Retrieval Research," *Proceedings of the IEEE* 100, Special Centennial Issue (May 2012): 1448

[5] Sergey Brin and Lawrence Page, "The Anatomy of a Large-Scale Hypertextual Web Search Engine," *Computer Networks and ISDN Systems*, Proceedings of the Seventh International World Wide Web Conference, 30, no. 1 (April 1, 1998): 107–7.

[6] Elizabeth Van Couvering, "The History of the Internet Search Engine: Navigational Media and the Traffic Commodity," in *Web Search: Multidisciplinary Perspectives*, ed. Amanda Spink and Michael Zimmer, Information Science and Knowledge Management (Berlin, Heidelberg: Springer Berlin Heidelberg, 2008), 177–206.

intellectual labor.[7] As with the myriad current systems employing this model, Google mined this wealth of productive information—how website creators linked between pages—while obscuring the inner workings of the PageRank algorithm from end-users. Then as now, a user of Google sees only the simplest of interfaces to the engine: a blank page, a logo, and an empty search bar promising to return the most relevant results to any query.

The interface and underlying logic of the search engine were novel in the late 1990s, but these means for finding information online have since become naturalized: the user types in a query and the most 'relevant' information rises to the top of an ordered list. This interface simultaneously perpetuates the page metaphor for web documents, presenting a list of discrete information sources to seek out, and transcends it, providing a masterful overview that surmises all the constituent pages. The list of search results advances that most ancient form of organizing information—the table or grid—long used for administrative purposes to enforce categorical distinctions, translating a particular empirical orientation into material reality.[8] At this point in time, the Web was already rich with information, written, read, and linked by millions of people. Search engines approach this wealth of information as a problem to be solved, and in doing so, impose value criteria to which end-users have no recourse to contest. The interface to these engines precludes any further efforts by the user to interrogate or understand how these criteria have been applied.

Wisniewski saw this emergent paradigm as a serious threat to the potential for a Web actively constructed by a diversity of participants: "the network—with all of our thoughts and

[7] Neal Thomas, *Becoming-Social in a Networked Age* (New York: Routledge, 2018), 21.

[8] Johanna Drucker, *Graphesis: Visual Forms of Knowledge Production* (Cambridge, MA: Harvard University Press, 2014), 87-92.

work going into it—was presented in this flattened way."[9] Representing search results in a discrete list not only privileges certain information sources but also inhibits forming connections between and across disparate pieces of information. This flattened Web limits possibilities for compositional reading—for the reader to take on an active role in constructing the text—that Bolter and other new media scholars have long ascribed as a unique contribution of hypertext technologies.[10] *netomat* generated an overview of many information sources but as a dynamic stream, juxtaposing bits of information from disparate sources, with criteria for selecting this information neither absolute nor obscured.

As discussed in the chapter on *The Web Stalker*, *netomat* operated as a counterproduct to commercial search engines as interfaces to online information. Crawling the Web and pulling together disparate information in response to search queries, *netomat* functioned in a way akin to Google but to alternative ends that afforded users agency in understanding and directing the system. As Negt and Kluge argue, effective critique of industrial information systems has to encompass the totality of these systems. For Google, this would include not only the engine interface and search results but also the algorithms deployed to generate these results.[11] Negt and Kluge urge that "the only antidotes to the production of the illusory public sphere are the counterproducts of a proletarian public sphere: idea against idea**,** product against product, production sector against production sector."[12] Counterproducts achieve this critique by

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[9] Personal interview with the artist, November 27, 2017.

[10] Jay David Bolter, *Writing Space: Computers, Hypertext, and the Remediation of Print*, 2nd ed. (Mahwah, NJ: Lawrence Erlbaum Associates, 2001), 168-173.

[11] Oskar Negt and Alexander Kluge, *Public Sphere and Experience: Toward an Analysis of the Bourgeois and Proletarian Public Sphere*, trans. Peter Labanyi, Jamie Owen Daniel, and Assenka Oksiloff (Minneapolis, MN: University of Minnesota Press, 1993), 126.

[12] Ibid., 80.

advancing modes of production at the same level of industrial information systems—but

integrating users into the production process rather than extracting value from their participation.

netomat staged its tactical critique of the emergent search paradigm by developing a fully

functional search system driven by a novel information protocol designed by Wisniewski to give

users greater control over how the system functioned.

  While *netomat* resembled these search engines—filtering users' access to information

through the prism of a seemingly self-contained piece of software—the interface revealed its

underlying principles and instructed its users in how to consciously produce and consume

information using this system as a tool. Even before a user gained familiarity with how NML

structured information on the system, she would learn how to read the stream as fundamentally

composed through juxtaposition. Following a logic of parataxis similar to *Shredder*, *netomat*

differed from this work in pulling information together from disparate sources rather than

smashing together layers from within the same document. This strange stream asked viewers to

compose connections between the otherwise disjunct pieces of information: how do these all

relate to the search query? In this way, *netomat* functioned as an artwork in a manner outlined by

Viktor Shlovsky: as a device capable of inducing change through impediment and distortion. [13]

netomat's dynamic stream defamiliarized the ordered lists presented by popular search engines,

encouraging users to critically reflect on how these systems functioned and to provide the tools

to transform how they searched for information online.

  Through ongoing use, an individual might gain greater familiarity with *netomat*'s logic of

parataxis, developing both competency for searching via stream, as well as a literacy for how

mainstream search engines organized and valorized information. Comparing searches in *netomat*

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[13] Viktor Shklovsky, *Theory of Prose* (Champaign, IL: Dalkey Archive, 2015 [1929]), 13.

and Google (or Alta Vista), the individual could identify some of the underlying biases in how these search engines were indexing information. For example, Wisniewksi describes how someone might search for information about Bill Gates: "[*netomat*] would go get information from Microsoft's site, but it would also search on the fringes of the web, things commenting on him, caricatures of Bill Gates, songs about Bill Gates—actually that happened."[14] Much like how Rob Kitchin suggests reverse engineering contemporary search engines in order to empirically assess algorithmic drivers, *netomat* exposed these biases by presenting a functional alternative operating according to a radically different logic.[15] Departing from the ordered list provided by a commercial search engine, *netomat* set search results into a dynamic and fluid relationships that encouraged ongoing inquiry from the users to tease out interconnections.

Users could in turn interrogate *netomat* itself, dissecting the logic it was applying to retrieve and compose search results. In addition to this deeper understanding of commercial search systems, the user would have learned to better wield *netomat* itself as an information discovery tool. Unlike Google, which hides the countless factors used to determine relevance, *netomat* made NML open to tweak and customize. With command of NML, individuals could have directed the stream, pulling information from particular domains or periods of time, and determining how that information was to be visualized on screen. Consuming information was enhanced by the ability of *netomat* users to produce information, to both read and write NML, encouraging the kind of functional transformation described by Benjamin.[16] With *netomat*,

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[14] Personal interview with the artist.

[15] Rob Kitchin, "Thinking Critically about and Researching Algorithms," *Information, Communication & Society* 20, no. 1 (January 2, 2017): 14–29.

[16] Walter Benjamin, "The Author as Producer," in *Selected Writings: Volume 2, part 2, 1931-1934*, eds. Howard Eiland and Michael Jennings (Cambridge, MA: The Belknap Press of Harvard University Press, [1934] 1999), 774.

Wisniewski not only created a productive apparatus that transformed search engine technologies involved in crawling and indexing information online but also gave users the requisite tools to undertake their own transformations of *netomat* itself. Wisniewski left the artwork open to ongoing functional transformation, making *netomat* an information system for both reading and writing the Web.

netomat operated as tactical media by both critiquing the information economy intrinsic to the Web and by itself functioning immanently within that particular media ecology. Through the 1960s and 1970s, guerrilla television collectives like the Videofreex pursued similar tactics, using relatively inexpensive consumer video recording equipment to insinuate experimental production practices into the mainstream television ecology.[17] The Videofreex tactically critiqued how television networks disseminated information and sought to establish an alternative information system that encouraged more democratic means for producing and consuming information—but from within the extant broadcast infrastructure. Following an initial foray with CBS that resulted in an exuberant albeit ultimately disastrous pilot program *Subject to Change* (1969), the Videofreex became disillusioned with the possibilities presented by commercial broadcasting.[18] The collective retreated to upstate New York, eventually transforming a house in the Catskills into a pirate TV studio, which they used to broadcast alternative programming produced by the collective and others from the local community.[19]

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[17] 'Guerrilla Television' is a term first popularized by Michael Shamberg, derived in response to a variety of artistic and political engagements with consumer video equipment in the late 1960s and early 1970s. Michael Shamberg, *Guerrilla Television* (Holt, Rinehart and Winston, 1971).

[18] Deirdre Boyle, *Subject to Change: Guerrilla Television Revisited* (Oxford: Oxford University Press, 1997), 14-25.

[19] These activities of the Videofreex are documented in the memoirs of a central member, Parry Teasdale. Parry Teasdale, *Videofreex: America's First Pirate TV Station & the Catskills Collective That Turned It On* (Hensonville, NY: Black Dome Press, 1999).

Guerilla television responded to a broadcast information system distinct in significant ways from the networked computing environment of the Web. Although the Videofreex enlisted the participation of community members, helping them to produce programming that was then aired on the pirate station, this broadcast logic precludes the ability of individuals to forge their own connections between diffuse pieces of information, and a single television station pales in comparison to the amount of information available to users on the expanses of the Web.[20] However, as a gateway to producing and consuming televised videos, the Videofreex pirate station functioned as a counterproduct much in the same way that *netomat* operated in relation to commercial search interfaces for finding information online. The Videofreex achieved an industrial scale of production, successfully broadcasting their own videos, while collectively integrating viewers into the production process. Negt and Kluge cite the television screen as a major blockage impeding the viewer: "while mobilizing the viewer, it simultaneously makes him experience the fact that, sitting in front of the television, he can do nothing to change the situation."[21] The Videofreex were able to overcome this by involving their community of viewers directly in the production process, moving behind the screen by moving behind the camera. For *netomat*, the community of web users transcended any particular geographical area, and moving behind the interface meant delving into the underlying information protocols.

Despite these differences, both the Videofreex station and *netomat* adopted pirate approaches: each worked within existing infrastructure but added new tools in order to transform users' relationships to these existing means of information production. The Videofreex

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[20] An archive of over 1,5000 tapes produced by the Videofreex is hosted as part of the Video Data Bank. http://www.32gw52y.vdb.org/collection/Videofreex%2520Archive

[21] Negt and Kluge, *Public Sphere and Experience*, 128.

commandeered camcorders and advanced novel video production techniques, while Wisniewski

adapted extant markup languages to craft a new framework for structuring online searches. Fuller

stresses that media ecologies are fungible, open to manipulation and rearrangement, comparing

the work of transmission to metallurgic alchemy, which marshals pragmatic, technical, and

sensual skills to combine elements and achieve broadcast.[22] This medial alchemy is fueled by

regimes of regulation, evolving new technological manipulations in response to protocols and

controls.[23] The artistry of Wisniewski or the Videofreex can be seen in how these artists

appropriated technologies and protocols to establish alternative information systems immanent

within existing infrastructures.

Although *netomat* no longer functions, the work still holds tactical value as an example

of a functional counterproduct. As de Certeau describes, "'fabulous' stories offer their audience a

repertory of tactics for future use…[continuing as] living museums of these tactics."[24] In

particular, the repertoire of tactics that *netomat* crystallized hinge upon directing the social and

material evolution of reading and writing practices. *netomat* introduced a new language for

structuring networked information and embedded this within a system for the social production

of information, as Wisniewski further expanded *netomat* and NML into a collaborative,

multimedia messaging and composition platform.[25] Williams contends that writing is necessarily

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[22] Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (Cambridge, MA: MIT Press, 2005), 17.

[23] Ibid., 23.

[24] Michel De Certeau, *The Practice of Everyday Life*, trans. Steven Rendall (Berkeley, CA: University of California Press, 1984), 23.

[25] My knowledge of this is based upon an unpublished *netomat* platform specification (2006) provided by the artist. As with the *netomat* browser, this social platform no longer functions, but Wisniewksi's intentions for how this platform would function, both technically and conceptually, are documented in these specifications.

social, bound up in the language and forms of expression shared by a society.[26] The languages

and forms in which social reality is authored increasingly stem from digital networks. To

guarantee that everyone in today's networked society has the ability to read and write in this

multiplicity of ways, these languages and forms need to be open to collective access. *netomat*

demonstrated how such collective access might be built right into the user interface, by right-

clicking on the search bar. As a fable, *netomat* continues to exercise real effects, even as the

software itself is obsolete.

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[26] Raymond Williams, *Marxism and Literature* (Oxford: Oxford University Press, 1977), 193.

CHAPTER 5: BELIEVING IN USERS AND BELIEVING IN THE WEB

Elaborating the concept of 'digital folklore,' Lialina and Espenschied place users of the Web at the center of both its technological and cultural development.[1] Users became increasingly prominent in discussions around 'Web 2.0' in the mid-2000s, a term which characterized the greater degree of user interaction afforded by web services like blogs, wikis, and emergent social media sites. As web guru Tim O'Reilly assessed at the time, successful web companies would need harness collective intelligence, adopting peer-production methods in which the users of a system simultaneously constructed the system.[2] 'You' were named the 2006 *Time* Person of the Year, after all.[3]

Although users play this critical role, technology companies and developers continue to drive the conversation. When Facebook was recently embroiled in a series of scandals, including data breaches and influencing the 2016 US Presidential election, Mark Zuckerberg took center stage in the political theater of congressional hearings.[4] Despite much finger wagging, Congress expects Facebook to course correct to avoid such calamity in the future—rather than seeking

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[1] Olia Lialina and Dragan Espenschied, "Do You Believe in Users?/Turing Complete User" in *Mass Effect: Art and the Internet in the Twenty-first Century*, eds. Luaren Cornell and Ed Halter (Cambridge, MA: MIT Press, 2015), 1-14.

[2] Tim O'Reilly, "What Is Web 2.0," O'Reilly, 2005, http://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html.

[3] Lev Grossman, "You—Yes, You—Are TIME's Person of the Year," *Time*, December 25, 2006, http://content.time.com/time/magazine/article/0,9171,1570810,00.html.

[4] Issie Lapowsky, "Mark Zuckerberg Answers to Congress For Facebook's Troubles," *Wired*, April 10, 2018, https://www.wired.com/story/mark-zuckerberg-congress-facebook-troubles/.

legislative or regulatory action that might vest more agency in the users of these systems. For Lialina and Espenschied, users must act: "it won't be technology that will stand up for values like free speech and free thought. And the technological mastery of a few bright minds will not protect the Internet from being blocked, split up, throttled, or censored by repressive or well-meaning governments, powerful industries, or religious zealots."[1]

The artist's browsers described in this thesis were all created before YouTube and Twitter, but the roots of digital folklore reach back to this earlier period of the Web, when millions of individuals dialed up for the first time—most likely launching Netscape or Explorer. As Michael Stevenson points out in his history of HotWired, a late '90s web forum for *Wired* magazine, "concepts, debates, and design aims surrounding the participatory web were very much a part of web production early on."[2] Even more, this ambiguity between users and producers colors the entire history of the Internet. Janet Abbate emphasizes that users of digital networks have often been key drivers, with critical applications like email and the Web itself arising not from major firms or governmental initiatives but from individuals tinkering around.[3]

Alongside and in step with major developments like the Web, users of digital technologies are also active creators, shaping digital technologies and culture through everyday uses. As users came online in the late '90s, they created email accounts and homepages, and posted in chat rooms and message boards. Using commercial tools like Adobe Dreamweaver and web standards like HTML, these individuals participated in dynamic social and material

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[1] Lialina and Espenschied, "Do You Believe in Users?/Turing Complete User," 4.

[2] Michael Stevenson, "Rethinking the Participatory Web: A History of HotWired's 'New Publishing Paradigm,' 1994–1997," *New Media & Society* 18, no. 7 (2016): 1332.

[3] Janet Abbate, *Inventing the Internet* (Cambridge, MA: MIT Press, 1999), 6.

practices, all of which Williams ascribes to reading and writing broadly conceived. As with

learning to read and write in any language, early web users took up established forms and models

to register their own lives and communicate with others. For Williams, this whole range of

expressive and communicative practices constitutes a creative "self-making," producing (among

cultural objects like webpages or email messages) a "practical consciousness."[4] According to this

theoretical ideal, individuals come to see themselves as part of a society, recognizing the role that

they play in reproducing the material and social bases of that society.

Web technologies have made possible new expressive and communicative practices—

new forms of writing and reading—but these systems participate in many production processes,

among these playing a critical role in the valorization of capital. From the '90s to the present,

corporations have not only used the Web as a new marketplace to promote and sell products but

have also leveraged the Web as a site of value production. Negt and Kluge describe public

spheres of production as complex aggregates of many heterogeneous public spheres,[5] and the

Web can be similarly characterized: the Web is not (and never was) a homogeneous public space;

rather, the Web consists of countless corporate, academic, governmental, and personal domains,

all utilizing a combination of open and proprietary technologies. The individual user of the Web

enters into a dense sociotechnical infrastructure; many aspects of her experience have already

been decided and prearranged, much of which remains obscured by the browser interface. These

interactions are still productive of a consciousness but one in which the individual has little

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[4] Raymond Williams, *Marxism and Literature* (Oxford: Oxford University Press, 1977), 210.

[5] Oskar Negt and Alexander Kluge, *Public Sphere and Experience: Toward an Analysis of the Bourgeois and Proletarian Public Sphere*, trans. Peter Labanyi, Jamie Owen Daniel, and Assenka Oksiloff (Minneapolis, MN: University of Minnesota Press, [1972] 1993), 13.

say—not something the individual creatively produces, but instead "the raw material and the site where these public spheres realize themselves."[6]

This could be construed as another way of saying that the technology corporations are in total control of how the Web gets used today and developed for tomorrow. However, the artist's browsers described in this thesis demonstrate that this is not necessarily the case. At the level of the interface—the point of connection between individuals and underlying technological systems—these artworks open up spaces for critical reflection on how web browsers shape users' reading and writing practices online. While mainstream browsers obscure the mechanics of these systems, communicating a comprehensive and easily traversed information space, these artist's browsers surface the complexity of technologies and protocols constituting the Web, fostering this awareness to enable users to develop tactics for interacting with the Web on their own terms. *The Web Stalker* represents the Web as a network of nodes, in turn shifting how individuals might navigate through links and pages, digging up information buried deep in a website's structure. *Shredder* deconstructs webpages, ripping up the polished page to expose the code underneath. *netomat* introduced a novel information protocol to structure search results in fluid arrangements. In all of these cases, the artworks dislodge information from being read or written in just one way and provide users with the tools to reconstruct this information for themselves.

While the artworks all stage varied critiques of the Web, they also evince a belief in the possibilities of these technologies to foster the kind of creative self-making described by Williams. *Shredder* dramatizes the precarious position of HTML, a nominally open standard whose fate is dominated by corporate browser developers but also opens up HTML as a language that can be visualized, taken up, and in turn utilized by individuals, fueling a web vernacular. *The*

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[6] Ibid., 18.

Web Stalker highlights how the Web structures and constrains access to information but empowers individuals to navigate websites in ways that bypass the limited linking model on the Web. Wisniewski created *netomat* in response to the propensity for search engines to bias search results but established a new language for crafting searches as a result. These works can be placed in a rich and diverse 'hypertext imaginary,' a term posited by Barnet to elucidate the many possible ways in which reading and writing over networked computers has been (or might still be) realized.[7] Networked computing is a core part of the social and materials means through which society is reproduced, but these technologies do not necessarily need to be arranged, designed, or organized in any one way.

As pieces of software that function within existing web technologies and protocols, all of the artworks demonstrate this plasticity of networked computing broadly, and of the Web specifically. Williams describes reading and writing as dynamic practices; while these developments may play out over years or even millennia, each of these artworks manipulates information technologies and shifts information practices in a far more compressed time scale. The Web, of course, has never been a static technology, and these artworks directly intervene, prompting particular developmental trajectories. This is typical of tactical media artworks more broadly. Though motivated by a range of social, political, and economic issues, tactical media artworks often target information technologies—whether the newspaper or television—advancing alternative communication practices by redirecting or subverting existing languages, models, and protocols.

De Certeau explicates this function of tactics with a comparison to the relationship between speech and language. Languages exist as complex systems with many material

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[7] Belinda Barnet, *Memory Machines: The Evolution of Hypertext* (London: Anthem Press, 2013), xxi.

manifestations; speech appropriates these linguistic systems, embodying and realizing them in the moment of enunciation. Speech both uses language but also operates on it, the continual enunciation of language exerting slow yet sustained influence on the overarching linguistic systems over time.[8] In a similar fashion, using the Web—conducting Google searches, writing blog posts, shopping on Amazon—enunciates the underlying technologies, bringing them into practice for some directed end. Everyday use of the Web performs this enunciation and induces this dynamic development. These artist's browsers, though, seek to add a critical dimension to this everyday use of the Web, both expanding users' awareness of the elements of Web that are legible and configurable and focusing users' attention on how those elements can be read and written. Despite creeping privatization, the Web remains an open technology in many senses: the Web still largely consists of open standards and protocols; but it is also open to change. As always, users of the Web will be the drivers of that change.

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[8] Michel De Certeau, *The Practice of Everyday Life*, trans. Steven Rendall (Berkeley, CA: University of California Press, 1984), 33.

FIGURES
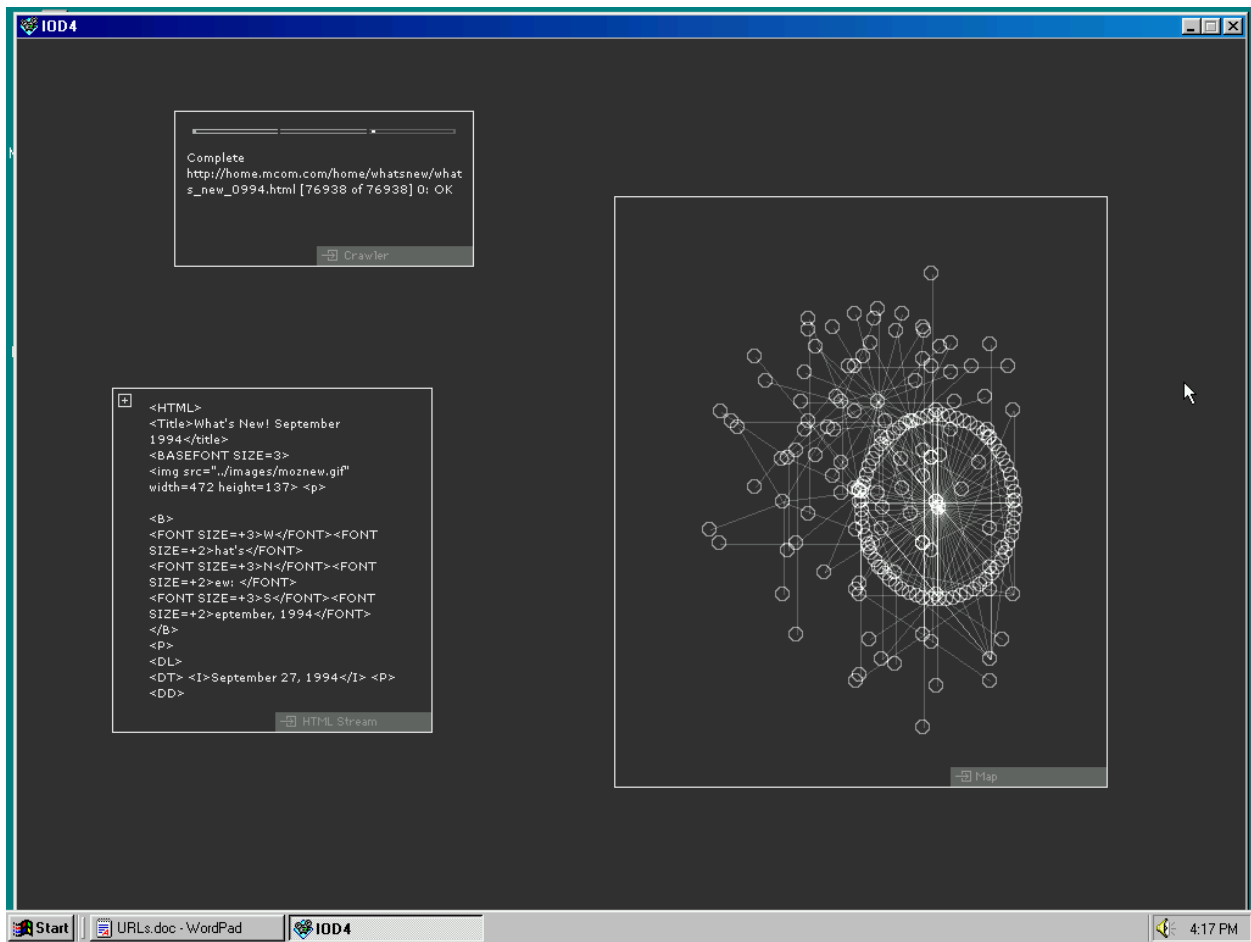

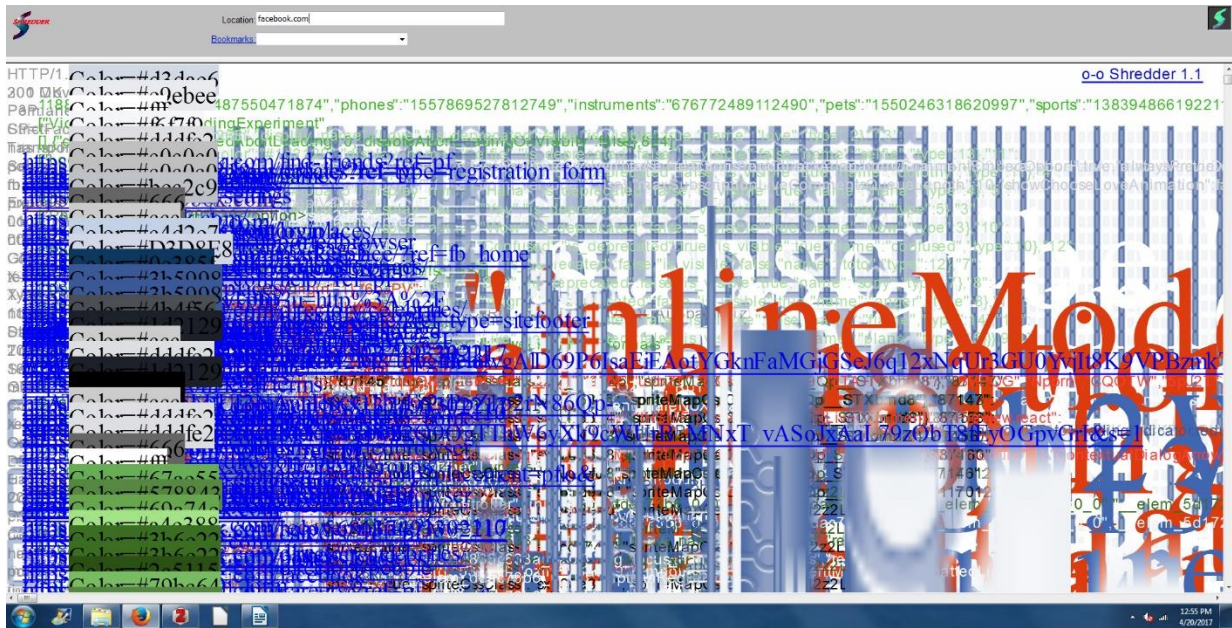Figure 1: I/O/D (Matthew Fuller, Colin Green, and Simon Pope), *The Web Stalker*. 1997, web browser, dimensions variable. Available from: http://bak.spc.org/iod/.

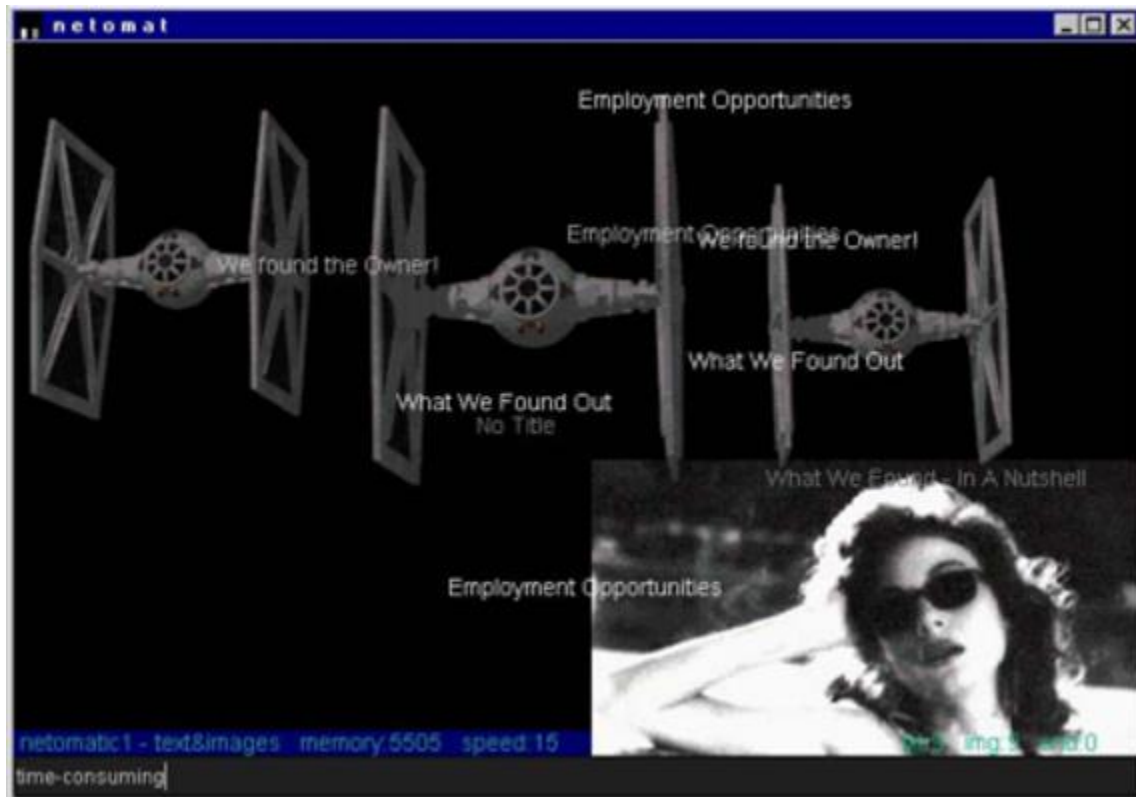Figure 2: Mark Napier, *Shredder*. 1998, web browser, dimensions variable. Available from: http://potatoland.org/shredder/shredder.html

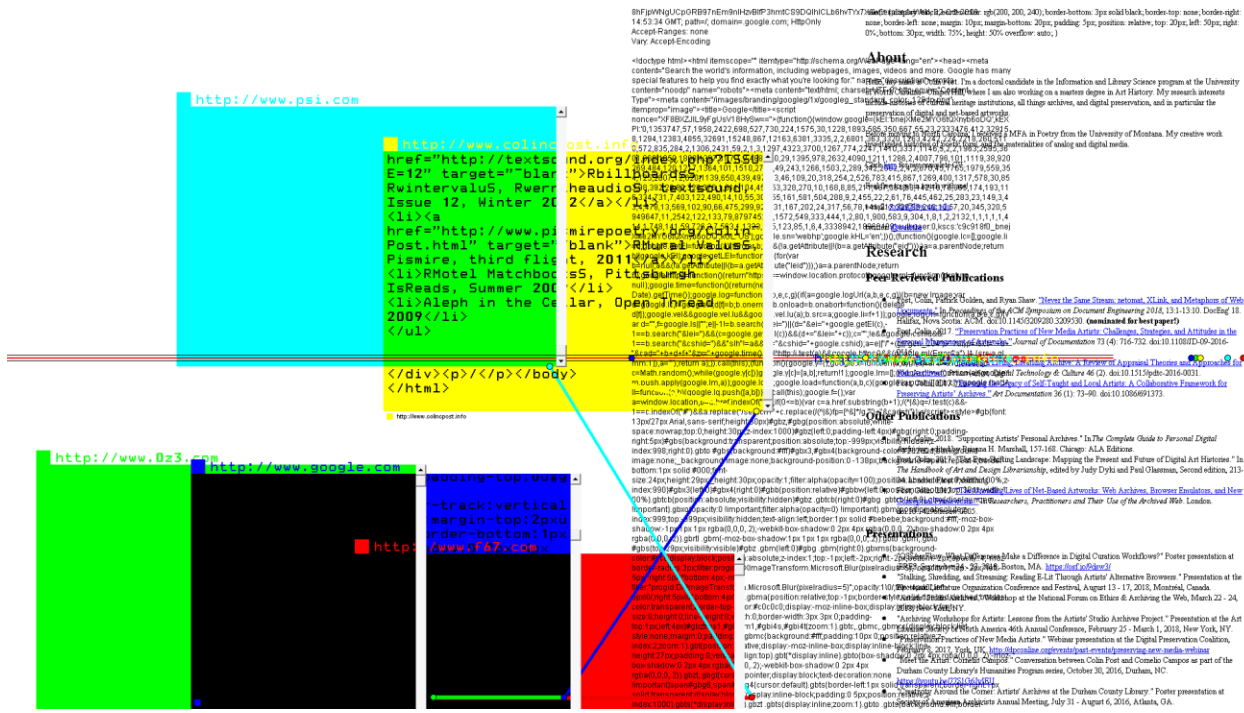Figure 3: Maciej Wisniewski, *netomat*. 1999, web browser, dimensions variable. Available from: *Archive of Digital Art*, https://www.digitalartarchive.at/database/general/work/netomat.html.

Figure 4: JODI, *WRONG Browser*. 2001, web browser, dimensions variable. Available from: http://wrongbrowser.jodi.org/.

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