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DESIGN and the DIGITAL HUMANITIES

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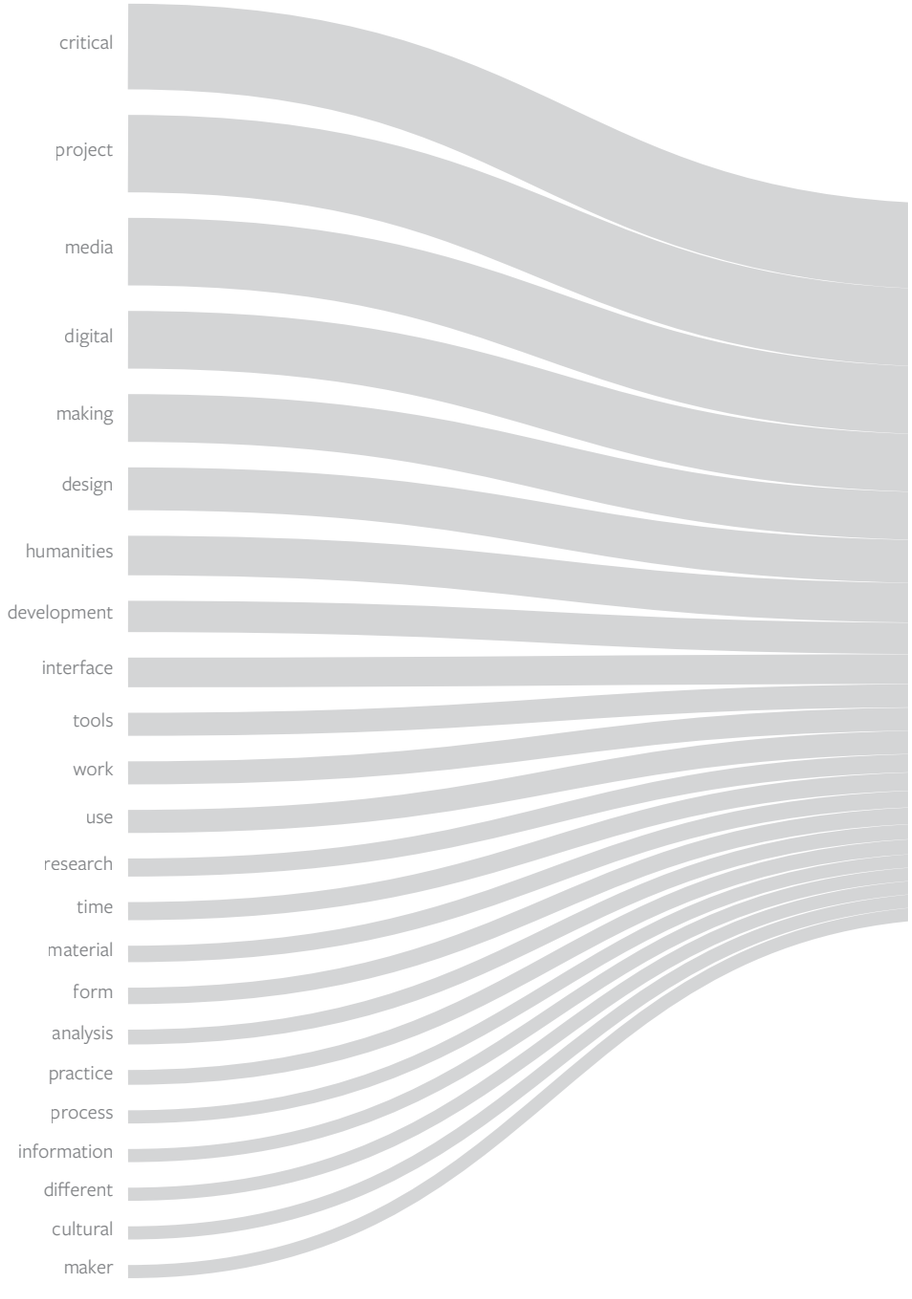


Critical Interfaces and Digital Making

Steve Anderson

Abstract

This article explores the relationship between critical making in the material world and processes of digital making that take place in the realm of software. Focusing on the evolving status of the interface in the development of three digital humanities-related platforms, the journal *Vectors*, the electronic publishing tool Scalar and the public media archive Critical Commons, the essay argues that the benefits associated with critical making may take place in the comparatively ethereal realms of software and ideation as well as physical making, and that particularly productive points of convergence may be found at the intersection of software development, user interface and information architecture.

This article has a digital component available at http://scalar.usc.edu/works/critical-interfaces

Keywords: digital humanities, electronic publishing, fair use, information architecture, interface design

Introduction

> If humanists are interested in creating in their work with digital technologies — the subjective, inflected, and annotated processes central to humanistic inquiry — they must be committed to designing the digital systems and tools for their future work.
>
> — Johanna Drucker
> *Chronicle of Higher Education* (2009)

It has been more than five years since Johanna Drucker issued this challenge to the emerging field of digital humanities, suggesting that it was incumbent upon scholars to deepen and broaden their practice to leverage not only the affordances of computation when undertaking data-driven research and publication but the design and development of digital tools as well. The argument, in some respects, seems all but self-evident. Of *course* tools matter; the basis for much that drives cultural critique and ideological analysis rests on theorizing underlying causes and systems — value systems as well as class, economic, and technological ones — that drive cultural practices and artifacts. Why *wouldn't* humanists reflexively adopt a critical and proactive stance toward the tools for their stock-in-trade, especially those that shape basic practices of research and writing? The answer lies in a technologized extension of the "two cultures" bifurcation articulated by C.P. Snow more than half a century ago. Already in 1956, Snow had identified "a gulf of mutual incomprehension" between the intellectual life of humanists and scientists in the academic cultures of Britain and the United States (Snow, 1963). For Snow, the stakes of this divide were nothing less than the intellectual vitality of the western academic establishment.

Today, a great many humanists remain alienated from the hardware and software upon which their work has grown increasingly dependent. Obvious exceptions exist, but the convergence of digital technology with the practices of humanism has often been an uphill struggle — one that continues to this day, with battles taking place in tenure, promotion, publication, and hiring committees as much as in the classroom. A promising antidote has emerged in movements with names such as "critical making" (Ratto, 2011), "critical design" (Dunne and Raby, 2013), "reflective design" (Sengers, 2006), "reflective HCI" (Dourish, 2004), "critical technical practice" (Agre, 1997), "value-sensitive design" (Friedman, 1996), "reflective practice" (Schön 1978) and other combinations of similar words. Each of these takes a slightly different approach to reaching its intended audience, which ranges from designers to consumers to technologists. What they all have in common is a shared interest in developing strategies for merging theory with practice, thinking with making, values with materials.

This essay explores the question of whether physical making is essential to the evolution of the digital humanities. What is it about getting one's "fingernails dirty" (Hertz 2012) that makes this activity uniquely worthwhile? Are the insights gleaned from physical making categorically different from those deriving from parallel movements on behalf of code literacy, data literacy, or software literacy? Does the impulse to defamiliarize the tools of digital scholarship — to go "under the hood" — work on a metaphorical level or only a literal one? Underlying these questions is a concern that focusing on material practice could inadvertently reify a binary long ago dismantled by historical materialism - i.e., that physical circumstances and human labor are always already foundational to the production of technology, culture, and ideology. This essay argues that the payoff of a revised conception of critical making may take place in the comparatively ethereal realms of software and ideation *as well as* physical making, and that particularly productive points of convergence may be found at the intersection of software development, user interface design, and information architecture.

Critical Making

A significant subset of critical making focuses on the extension of computation into physical spaces and material objects via practices such as fabrication, laser cutting, 3D scanning and printing, and so on. Another strand focuses on physically dismantling and recombining physical objects, especially electronic circuits, sensors, and input/output devices connected to the computer. In support of these activities, numerous institutions have responded by establishing "fab-labs," collaboratories, or hacker and maker spaces (HMS) that are available to scholars and students not just in fields of art and design but in the humanities as well. Along with these institutional infrastructures, numerous theories have articulated the benefits of thinking/tinkering with things (giving rise to awkward neologisms such as "thinkering" and "thingking") that are predicated on the direct connection between material and immaterial labor.

The historical context for the emergence of today's maker movement includes its role in efforts to redeem the (capital H) Humanities following a period of active pejoration throughout the 1960s and 70s. Edward Said linked the rise of anti-humanism in the U.S. during this period to social movements against the Vietnam War, along with "racism, imperialism generally and the dry-as-dust academic Humanities" (Said 13). Concurrent with these social movements came increasingly critical public awareness of computerization and its role in emerging systems of social regulation and control, including, notoriously, the use of computer punch cards for inducting soldiers to fight in Vietnam (Gitelman, 93). So, the turn to computing was far from a logical or necessary path to redemption for a beleaguered Humanities in the 1980s and 90s. The coincident rise of largely depoliticized modes of digital archiving and research with the flourishing of academic discourses of feminism, post-colonialism, and critical race theory has been widely critiqued as providing formalist or structuralist refuges for "traditional" (read: white, hetero, Western, male) humanities scholars (Bianco, 2013; McPherson, 2013). Critical making, in turn, has not been immune from challenges directed at both the general precept of making and its application in specific contexts — including politics of access, ethos, and funding.

In part, such criticisms undoubtedly originate in the inflated rhetoric sometimes used to proclaim the potentials and importance of making. In 2014, *Wired* magazine editor Chris Anderson declared (capital M) Making to be "The New Industrial Revolution," extolling virtues of "the industrialization of the Maker Movement" (Anderson,

2014). Mark Hatch, CEO of Techshop, a national chain of pay-to-play makerspaces, likewise elevated the benefits of tinkering to a spiritual level, declaring that, "Making is fundamental to what it means to be human… These things are like little pieces of us and seem to embody portions of our souls" (Hatch, 2013). The seamlessness with which maker culture may function in service to consumer culture is also highlighted in a report by the design firm HermanMiller. Based on analysis of a variety of maker spaces both in and out of academia, the report unequivocally states, "In today's economy, people become innovators through a hands-on approach. A growing community of makers, hackers, and coworkers are creating an emerging culture of 'learning by doing' that is shifting how future workers learn to innovate" (HermanMiller, 2015). In each of these cases, it is the *fact of making* that confers the benefits associated with revolution, spirituality, and market innovation respectively. The particularities of what is made, by whom and to what purpose, appears to be of secondary concern.

In many cases, as HMS are incorporated into academic contexts, the euphoric rhetoric that prevails in the commercial sector is supplanted by critical reflection on the specific affordances of making. The University of Victoria's Maker Lab in the Humanities, for example, offers a model for the convergence of humanistic inquiry and physical making. Lab director Jentery Sayers describes the lab's work as operating at the intersection of "cultural criticism and comparative media studies with computation, prototyping, electronics, and experimental methods." At a recent Digital Humanities Summer Institute, Sayers' team articulated the potential intersections of physical computing, fabrication, and the humanities in admirably diverse and specific terms, suggesting areas of research including experimental histories ("prototype the past"), labour studies focusing on materiality and manufacturing in digital culture, experimental media, installation and performance, surveillance technologies ("wearables for organizing and policing"), electronic literature that takes place "off the screen," and so on. This conception of maker space as an extension of cultural space — which is therefore infused with ideology and cultural politics — follows the model of the "collaboratory" envisioned by Anne Balsamo. In her book *Designing Culture*, Balsamo urges designers to "take culture seriously" and to mobilize the benefits of culturally embedded making through mutual respect for the contributions of humanists and technologists alike (Balsamo, 2011). Balsamo's model, in turn, follows Teresa De Lauretis, Andreas Huyssen, and Kathleen Woodward in describing the embrace of values-driven goals in humanistic inquiry as an opportunity to expand the "technological imagination" (De Lauretis, 1983). Ironically, this suggests that significant outcomes of physical making may also lie in the abstract realm of the imagination.

Humanists who are drawn to critical making have sought to work around their limits of concern or competence through strategies of collaboration, repurposing of pre-existing tools, and work-for-hire (though the last of these is too often devoted to the development of expensive, one-off *projects* that are not even extensible to subsequent work on a related topic or genre). Recent advocacy for various forms of "code literacy" (Rushkoff, 2011) suggests that this pattern is changing, along with a gradual, generational shift to scholars, like Sayers, for whom coding has been long integrated into their academic and creative lives. In the meantime, a vast ocean of non-code-writing scholars continues to populate the tenured ranks of academia across the humanities. That said, the goal of this essay is not to recapitulate calls for software literacy but to recognize the "design of digital systems and tools" (Drucker, 2009) as a particularly fertile ground for cross-pollination of the complementary skills of scholars, designers, and technologists.

Proceeding from an understanding of critical making as deeply engaged in the transformation not only of physical objects but ways of thinking, I will offer a reflection on the development of a suite of digital tools created at the University of Southern California (USC) School of Cinematic Arts. This account will highlight the evolving status of the interface in the development of three digital authoring platforms (the journal *Vectors*, the authoring platform Scalar, and the public media archive Critical Commons), each of which I have contributed to as an editor, co-principle investigator, and founder, respectively. My selection of these three platforms is not meant as self-aggrandizement so much as to take advantage of my intimate knowledge of their design and development during the past decade of extremely dynamic evolution in digital humanities scholarship. A different investigation might attend to the parallel development of research tools within the digital humanities, where nuances of interface and user experience are less consistently foregrounded. However, the focus of this article remains on electronic authoring, curating and publishing, where the role of the interface has been consistently central and contested.

Origins of *Vectors*

The late 1990s witnessed numerous developments in electronic publishing, including the founding of the Electronic Literature Organization (ELO) in 1999 and the inaugural meeting of the New London Group in 1996, giving rise to a model of semiotics-informed pedagogy focusing on recognition and support for "multiliteracies" (Cope, 2000). The electronic journal *Kairos* also launched in 1996, devoted to exploring the scholarly potentials of hypertextual writing ("webtexts") for research and pedagogy in composition and rhetoric. Related pedagogical experiments in technology-enhanced teaching and learning were taking place at USC under the auspices of the Institute for Multimedia Literacy (IML) beginning in 1998. It was within this particularly dynamic historical and institutional milieu that the journal *Vectors* was conceived and ultimately launched in 2005. The goal of the journal was to extend the IML's experiments with faculty multimedia authoring into the emerging space of peer-reviewed electronic publication. *Vectors* sought to model new modes of digital scholarship that would simultaneously prove the concept of rigorous, credentialed scholarship coupled with design-centric experiments with user experience.

The formal aspirations and workflow of *Vectors* were also inspired by Marsha Kinder's Labyrinth Project, which had been in production at USC since 1997. At the time of *Vectors'* conception, Labyrinth had recently made the transition from producing CD ROMs to DVD ROMs, which allowed creation of richly mediated, interactive

experiences using high-resolution, full motion video. Working in collaboration with artists who had not previously engaged in digital production, Labyrinth's designers experimented widely with multimedia interfaces. Early examples include Jim Tobias' gestural interface created for *Mysteries and Desire: Searching the Worlds of John Rechy* (2000), which required users to scrub the cursor kinetically across the surface of the interface, and numerous experiments with randomization and serendipity by designers Rosemary Comella and Kristy Kang. Standing in stark contrast to Pat O'Neill's fluid, motion-controlled camera movements through the halls of Los Angeles' Ambassador Hotel seen in *Tracing the Decay of Fiction* (2002), for example, a user would experience periodic "earthquakes" that rumbled through the interface, propelling visitors into random, unexplored sections of the project.

Vectors may therefore be understood as staking out a middle ground between the hypertextual experiments of the ELO and the design studio model of Labyrinth, which verged on fine art. Though equally invested in experiments with dynamic interfaces and database structures, *Vectors* remained oriented toward scholarly publishing and open access, online distribution. Due to the still daunting constraints of early broadband-era internet, most *Vectors* projects used Adobe Flash as their primary design and development platform. Unfortunately, the name "Flash" was not received well in many scholarly contexts of the mid-2000s, where it seemed to lend credence to suspicions among critics of digital scholarship that style or "flash" was taking precedence over substance. On a technical level, Flash posed an additional problem for scholars who wanted their work to be indexable and citable at the level of pages or paragraphs. Although it ran on the internet's most widely installed media player, Flash continued to generate files that appeared as a black box to search engines and academic indices alike. While the first generation of *Vectors* projects accepted this limitation, hosting media files in local directories, project workflow quickly shifted to incorporate external — and therefore indexable — databases for which Flash continued to provide a highly customizable user experience.

Figure 1.
Vectors logo

The production of each in-house *Vectors* project resulted from pairing a contributing scholar with a designer/programmer, who collaborated under the guidance of a journal editor to develop a project over the course of 4-6 months. Readers who are interested in a meticulous and insightful account of *Vectors'* editorial and production process should consult Founding Editor Tara McPherson's article, "Scaling *Vectors*: Thoughts on the Future of Scholarly Communication," which appeared in the *Journal of Electronic Publishing* (*JEP*) in 2010 (McPherson, 2010). The thoroughness of her account obviates the need to recapitulate the journal's history, but I will quote from McPherson's observation about the experience of *Vectors* contributors:

> They find themselves chafing against the constraints of linear text. They sense other possibilities that arise almost organically from the materials they study. They have begun to realize that they are interested in something beyond illustration. That is, it is not simply that their press would only allow 30 images in the hard copy book, and they have 75 on hand. Rather, they come to understand that the visual (or aural) communicate differently. Working more organically with these forms allows them both to present their argument differently and understand their materials differently. They can filter materials in new ways to structure multiple lines of argument or experience.

In the same issue of *JEP*, Patrick Svensson offered a point-by-point comparison of the format of *Vectors* with that of *Digital Humanities Quarterly*, highlighting the ways *Vectors* projects deliberately departed from design conventions emerging in digital scholarship during the mid-2000s (Svensson, 2010). Although the revitalization of academic publishing suggested by this issue of *JEP* did not flow automatically from such experiments, *Vectors* continues to be cited as a limit case that pushed the boundaries of scholarly electronic publishing (Fitzpatrick, 2011; Hayles, 2012). At its peak, the journal published two issues per year with at least four original projects in each issue. While individual projects were rooted in an eclectic array of disciplines and methodologies, they were united by overarching issue themes such as Evidence, Mobility, Ephemera, Perception, Difference, and Memory.

Vectors as Interface

The journal's first Creative Director, Erik Loyer, was a veteran of experimental interface design in both arts and humanities contexts. Loyer designed the online companion ("WebTake") to Katherine Hayles' *Writing Machines* for the MIT Press MediaWorks series in 2002, and his experimental sci-fi narrative *Lair of the Marrow Monkey* (1998) was among the first web-based artworks to be added to the permanent collection of a major art museum. In addition to designing numerous *Vectors* projects, Loyer produced an interactive index that allowed users to "paint" with the contents of a project in order to find resonances or create dialogues among multiple projects. From the beginning, then, user interface was conceived as a space for creating intellectual linkages and encouraging a form of discovery that eroded the boundaries between individual projects and even the concept of an "issue" of the journal.

To further enhance the interconnection among projects and authors, each *Vectors* project was initially conceptualized through a summer planning workshop that included the entire *Vectors* design and editorial team as well as scholars selected to contribute to the two themed issues being produced in a given year. In addition to individual design meetings and project demos, contributors were encouraged to participate in a physical "making" session during the residency. A typical example of this was a workshop titled "Soldering Synthesis" led by Mark Allen, founder of the Los Angeles artist collective Machine Project, in which each participant soldered together the pieces necessary to make a basic audio synthesizer. At the conclusion of the workshop, Allen and his team would lead participants in a collective "jam session." The purpose of this experience may not have been entirely obvious to the humanities

scholars who took part in the workshop, many of whom had not previously used a soldering iron or participated in any kind of physical making. For *Vectors* contributors, the benefit of this exercise lay not in the acquisition of specific "maker" skills but in the conceptual allegory of dismantling and reconstituting their basic practices of research and writing.

Digital and Social Engagement

After more than a year of project development and publishing, *Vectors* began a shift of focus from the "front end" domain of interface design toward "backend" issues and information architecture — a transition that culminated in the Scalar project several years later. In 2006 a key component of this shift was the development of a middleware tool known as the Dynamic Backend Generator (DBG). Created by *Vectors'* information design director Craig Dietrich, the DBG aimed to make it easy enough for scholars with no technical expertise to effectively structure and populate their own project databases. Typically, adding materials to a database is understood to be among the most tedious and least creative stages in the design of a multimedia project, and it is often left to others to perform. The result is that the project database remains opaque to the scholar and s/he is rendered dependent on others. However, once familiarized with the DBG, scholars were empowered to control the contents of the database rather than focusing their attention exclusively on strategies for display and interaction.

This was the core of the *Vectors* experiment: to empower humanists to dig below the surface of the interface to engage deeper levels of digital authoring and to thereby invite them to ask different kinds of questions of their discipline and objects of study. The *Vectors* interactive editorial statement, designed and programmed by Raegan Kelly, expands upon this sentiment of defamiliarization, while modeling an insistence on interactive engagement through the collaboration of authors, designers, readers, and computational processes. The brief texts ("lexia") that comprised the editorial statement were co-authored by the editors in an attempt to model the journal's commitment to a triangulated process of writing, reading, and computation. Visitors to the "statement" are first required to type in a keyword in order to call forth relevant lexia, along with related keyword arrays. Concurrently, a code window reveals the Actionscript used to generate the text and its linkages. A sample of the text generated in response to the keyword "labor" is as follows:

> *Input via index: "labor" transmitted to host*
> *key= process*
> *secondary_key_array= author,labor,play,collaboration*
> *associative_array= labor,play,tool,open source,translation,time*
>
> *lexia= Like the media products that preceded them, digital forms tend to conceal the labor that was necessary to produce them. The slickness of the digital can make it hard to remember the varied acts of labor that underwrite the ubiquitous technologies of the Western world, rendering invisible code workers and chip makers alike.* Vectors *insists that labor matters and that a careful investigation of networked society can reveal and perhaps forestall our seamless incorporation into the uneven workings of post-fordist digital capitalism.*

Admittedly, these texts and associated keywords were composed before *Vectors* had published its first issue. They are therefore reflective more of the hopes that were invested in the journal, the ethical stakes and commitments that motivated the form of the projects, and the processes of collaboration that sought to place design considerations on an equal footing with more traditional "content."

The *Vectors* selection process was disposed to favor work that engaged social issues, especially related to feminism, critical race theory, and cultural or ethnic studies. In part, this represented an effort to remediate the discourse of disembodiment and dematerialization of early net culture and the apolitical turn in humanities computing of the preceding decades. It was also an extension of McPherson's work as a co-founder of the *Race in Digital Space* conferences that took place at MIT (2001) and USC (2002), which were explicitly devoted to foregrounding issues of race and ethnicity in digital culture. It was an explicit commitment of the *Vectors* editorial project — and later in the development of Scalar — that these platforms represented an opportunity to promote digital publishing as a space of inclusivity toward historically underrepresented groups. Citing Sharon Daniel's *Vectors* project, "Public Secrets," Patrick Svensson notes, "There is a strong sense of intervention here that resonates with the "active" humanities… Daniel's "Public Secrets" brings together artistic installation and academic expression in a single frame that serves both as cultural critique and activist call for change" (Svensson, 2010). A review of the *Vectors* archive reveals the extent to which these goals were evident in the selection of projects; however, a more challenging question is the extent to which the design function of the journal itself succeeds in challenging the "uneven workings of post-fordist digital capitalism."

Case Studies: *Stolen Time Archive* and *Totality for Kids*

To better ground these observations, I will offer two case studies of projects created by the *Vectors* team at the very beginning and very end of the journal's active period of development. The first project to be created by *Vectors* was Alice Gambrell's *Stolen Time Archive*, a collaboration with designer Raegan Kelly published in 2005. Gambrell's project was based on an archive of ephemera created by and for female office workers during the 1940s and 1950s. The concept of "stolen time" refers to activities performed by low-wage workers such as secretaries who use some of their time "on the clock" as an opportunity for creative but non-sanctioned labor, a metaphor that infuses the design sensibility of the project.

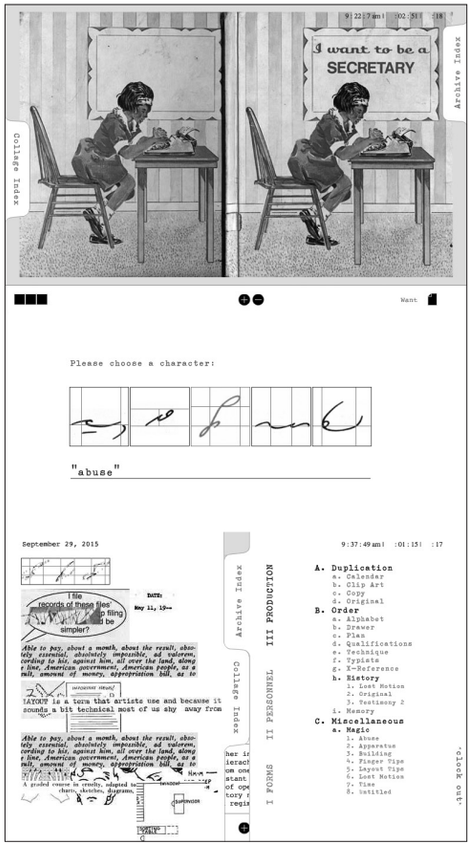


Figure 2.
Screen shots from Alice Gambrell's Vectors project "Stolen Time Archive" designed by Raegan Kelly

In *Stolen Time Archive*, Gambrell's historical and critical analysis is buried beneath a routinized interface, providing access to a layer of archival materials. Before being allowed to explore the archive, each visitor is required to engage in a brief exercise in shorthand "practice." The shorthand tracings are automatically "graded" for precision and any departures from the correct character shape are noted as mistakes. In contrast with the celebration of plenitude and simultaneity often associated with new media interfaces (Manovich 2001), Gambrell and Kelly's interface insists on highly disciplined input from users. Gambrell's Author's statement provides a further sense of this project's formal difference from contemporary works of electronic scholarship:

> The files are sorted by subject under three main headings — "forms," "personnel," and "production" — and you may examine them in whatever order and to whatever duration and extent you choose. Your own research process, in turn, will be tracked and recorded in the form of an evolving, cut-and-mixed collage through which idiosyncratic sets of meanings and alternative modes of access to the archive will emerge. Then, when you are done rifling through the files, you will be asked to activate a series of copying functions that will leave you with a ghostly remapping of your own interaction with *Stolen Time*. These screen-based 'photocopies' will gradually disclose abstracted layers of information: about the archival objects that you have examined, about their rapidly receding histories, and (finally) about the recent movements of your own hand on the mouse or the touch-pad (Gambrell, 2005).

As Gambrell notes, at the conclusion of the project, it is revealed to visitors that the software has been tracking their every move — both in the creation of a sub-curated collection of archival materials presented in the form of a scrapbook or 'zine (again, referencing unpaid and easily overlooked "women's work"), and also with a screen that reveals that the Flash application has been tracking and logging each movement of the cursor. This final revelation of an ongoing system of surveillance extends the discussion of tracked movement in the workplace to the experience of the project reader. It was this type of affordance — the explicit, critical, affective linkage of project form and content — that inspired much subsequent *Vectors* work.

Completed nearly a decade later, McKenzie Wark's "Totality for Kids" may be considered the last project to be created by *Vectors'* in-house production team. Designed by Erik Loyer, the project bears certain structural similarities to Gambrell's project. Although it was originally conceived as an archive of materials by and about the Situationist International (SI), "Totality for Kids" evolved during production to take the form of an interactive comic book based on the history and writings of the SI. The images and quotations presented in the comic panels are annotated by Wark and these annotations, in turn, reveal yet another level of primary sources published by the Situationists themselves. The project's layers thus invert the sequence of Gambrell's, but both invite potentially varied tiers of engagement from reader-users. Just as a visitor to *Stolen Time Archive* might be content to explore a collection of archival materials without choosing to dig into the author's analytical level, readers of Wark's project could choose to read only the "surface" of the comic book without engaging the underlying annotations or primary sources.

Figure 3.
Screen shots from McKenzie Wark's Vectors project "Totality for Kids" designed by Erik Loyer; original art by Kevin C. Pyle

In his author's statement, Wark describes a transformation from his expected mode of authorship to one that took advantage of *Vectors*' design orientation. He writes, "'Totality for Kids' turned out completely differently to what I actually proposed. I had just done the *Gamer Theory* site

with the Institute for the Future of the Book, and the *Vectors* people were interested in the participatory side of that. But things evolved. The *Vectors* team had a really nice way of creating a visual interface to an underlying database, so that seemed the place to start" (Wark, 2013). Wark worked with a team that included designer Erik Loyer, comic artist Kevin C. Pyle, and the musical group The Love Technology, who were commissioned to record new versions of French folk songs to be released into the public domain. In addition to its departure from academic vernaculars, the comic book form and refusal of copyright reflected the Situationists' radical rejection of "intellectual property." In the conclusion to his author's statement, Wark notes that, "One aspect of the Digital Humanities that I think tends to get neglected is the aesthetics of presenting research material, and what attracted me to *Vectors* is their exploratory attitude to this" (Wark 2013). Although Wark's project does not take advantage of many of the affordances of a database-driven interface — access to content is not varied or withheld based on user actions or sequence, for example — the compositional form of layered and nested annotations emerges directly from the logic of the database as a critical and metaphorical Z-axis to the flat surface of the comic panels on screen.

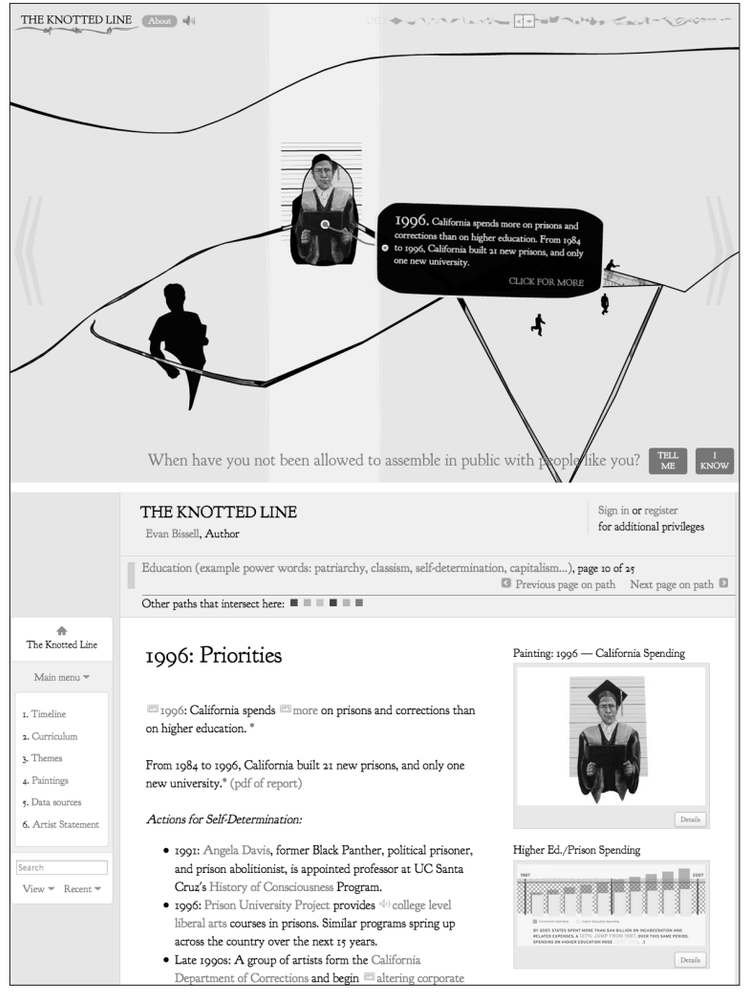
Scalar

The next phase of software development by the *Vectors* team shifted focus from richly designed user interfaces to information architecture, seen most clearly in the electronic authoring platform Scalar. The goal was to take what was most productive about *Vectors'* intervention in electronic publishing and make it more widely available — that is, to *scale* the impact of *Vectors*. With funding from the Mellon Foundation and support from the National Endowment for the Humanities (NEH) and USC's Institute for Multimedia Literacy, Scalar was conceived under the guidance of the Alliance for Networking Visual Culture (ANVC), led by Tara McPherson and an inter-institutional group of scholars including Wendy Chun, Brian Goldfarb, Nicholas Mirzoeff, and Joan Saab. Design and development of the platform was undertaken by the core *Vectors* team, consisting of McPherson, Loyer, Dietrich, and Anderson, who were joined by historian Phil Ethington.

Figure 4.
Scalar logo

As with *Vectors*, development of Scalar was shaped in direct dialogue with scholars who participated in a series of NEH workshops devoted to "Broadening the Digital Humanities" held between 2009 and 2011. During these workshops, Scalar designers and programmers worked directly with scholars to implement strategies to address immediate research goals, marking a sharp distinction with the development process for many tools that are created with abstract digital humanities applications in mind. Because of its connection to *Vectors*, many scholars come to Scalar expecting an authoring environment that approximates the richly designed user experience of a *Vectors* project. While Scalar allows significant "look-and-feel" customization via CSS (cascading style sheets) and its database

Figure 5.
Screen shots from two versions of Evan Bissell's Scalar project "The Knotted Line" (top: Flash interface; bottom: Scalar interface) designed by Erik Loyer



structure supports externally authored user interfaces — see, for example, Loyer's Flash-based interface for Evan Bissell's civil rights history project "The Knotted Line" — the emphasis within the platform's native affordances remains on information architecture, rather than highly interactive or richly mediated user interfaces.

Scalar supports a variety of web-compatible digital files — images, audio, video, text — as well as the linear and non-linear organizational conventions of paths and tags, respectively. The database driving Scalar treats these components as equivalent and capable of existing in any designated relationship to any other element. In other words, the database does not rely on traditional hierarchies; each element in a project can be defined as having any kind of relationship to any other element. For example,

authors may be familiar with the basic practice of annotating a video file with text or using tags to identify and retrieve elements of content. In Scalar, it's possible to annotate a video with another video or create a tag that is a critical pathway unto itself. The creative potentials enabled by this type of flexibility in information architecture are best recognized in the reverse engineering of the critical processes it enables. That is, the affordances of Scalar's flat database ontologies include the ability to ask different kinds of questions and respond with different kinds of answers. The real potential of Scalar is thus realized when it is used to rethink the potential structures of scholarly argumentation.

Historically there has been a divide between "close" and "distant" reading within humanities scholarship; with close textual analysis sometimes perceived as a casualty of the movement to computational analysis of large collections of media. Scalar was deliberately architected to support both types of analysis, inviting authors to consider not just one or the other but the relationship of part to whole. The platform offers built-in visualization tools for mapping the broad contours of an archive as well as tools for doing granular analysis at the level of commentaries attached to individual video frames or pixels in an image. Although Scalar downplays the importance of interface design in favor of a modest palette of design templates, I would argue that the potential for a rich user experience via the information architecture — that is, the defined relationships among elements in the database and potentially complex navigational structures — is no less compelling or intellectually generative.

Critical Commons

Scalar's decoupling of the *Vectors* model of deep collaboration between author and designer intensified the need for scholars to be able to work directly with media artifacts as evidence. While Scalar aimed to lower technical and design barriers for electronic publishing, scholars working with copyrighted media continued to face significant legal barriers in the form of "copyright confusion" (Hobbs, 2006) and lack of institutional support for fair use. In order to set the stage for understanding the motivation behind Critical Commons, imagine that literary scholars were compelled to seek permission every time they quoted from a work of literature and that the largest internet service providers deployed filters that search for — and automatically delete — any web page that includes an unlicensed quotation from a published source. It is not difficult to envision the impact such restrictions would have on the field of literary studies; the analyses that would never be undertaken, the self-censorship and doubt that would haunt the field. Until very recently, this was the prevailing state of affairs for those who study media and popular culture. Even short excerpts from commercial sources, used to make a point or illustrate an example, are still routinely expunged from media sharing sites, sometimes accompanied by threats of litigation. At the very moment when electronic publishing emerged as a transformative presence in media-related scholarship, reactionary challenges arose with equal vehemence.

Roughly concurrent with the formation of the ANVC, the media archive Critical Commons was conceived and designed by Anderson and Loyer and in 2008 it received support from the MacArthur Foundation's Digital Media and Learning initiative. Critical Commons is a non-traditional "archive" that is uniquely committed to access, preservation, and dissemination of copyrighted media under the protections of fair use. Virtually all of the media hosted and distributed by Critical Commons is contributed by an international community of scholars, educators, and media makers, many of whom have experienced media takedowns or legal threats when using commercial media sharing services. After six years online, with over 5000 media files in circulation, Critical Commons has never taken down a single piece of media in response to a copyright challenge. The ability to exercise fair use in the quotation of media sources is crucial to contemporary media and cultural studies, and Critical Commons may well be the only public archive dedicated specifically to supporting this type of fair use.

Critical Commons
For Fair & Critical Participation in Media Culture

Figure 6. Critical Commons logo

Like Scalar, the basic architecture and functionality of Critical Commons represents an instance of critical making through software development. The principle of transformation, which has been central to recent interpretations of fair use, is hard-coded into the workflow of users who upload media to the site. Unlike commercial media sharing venues, the basic "service" offered by Critical Commons is predicated on users possessing a working knowledge of the core principles of fair use and contextual transformation. Once a media file is uploaded, it does not become available for viewing or embedding until it has been linked to a text commentary. For some users, this requirement doubtless constitutes a source of frustration or a workflow bottleneck, but it is essential to the site's most basic reason for existence. By integrating critical transformation into the workflow of the site, Critical Commons aims to elevate media uploading to an essential part of the curatorial and critical process.

Critical Commons + Scalar

Although Critical Commons was originally conceived as a destination site, greater utility was quickly recognized in the site's ability to serve as a host for media that is uploaded for the purpose of embedding in external publications. Like most blogging platforms, Scalar has a limited capacity for accepting uploads, which effectively prevents storing video files on the Scalar servers. Users who require larger files (especially video, audio, or high resolution images) are encouraged to upload these files to Critical Commons along with a commentary that substantively transforms the media in accordance with best practices in fair use. As soon as a piece of media is publicly viewable within Critical Commons, Scalar users may search for the clip using Scalar's media importer, which captures the embed code and associated metadata via Critical Commons' RSS feed. Both files and metadata from Critical Commons are then

integrated into Scalar's layout and visualization tools. Storing the uploaded media files on a different server from the Scalar publication introduces an additional layer of protection for authors and publishers in the event of a copyright challenge. Scalar authors are encouraged to make assertive and responsible use of media quotation and to extend the scholarly practice of electronic publishing to the realm of curation. Scalar's "structured media view" was created specifically to support the gallery-like presentation of media collections, creating a compelling visualization of the media included in a given project and providing alternative points of entry to a project.

The conjunction of Critical Commons and Scalar is beneficial in several ways that are relevant to the present argument. First, scholars who are freed from anxiety about potential legal challenges may undertake different sorts of critical projects, perhaps motivated by the ability to quote extensively from original media sources. Second, the basic architecture of Critical Commons presumes that media that has been used in one critical context should be available for others to use in subsequent projects, creating possibilities for competing analysis or alternative, critical recontextualizations. In other words, the price of the fair use infrastructure provided by Critical Commons is willingness to freely share the basic components of one's research with a broader community. Finally, the software-based process of ripping (de-encrypting), selecting, excerpting, and transforming scenes from commercial media may be properly regarded as a form of critical making. Media that is wrenched out of its safe narrative container is thereby defamiliarized and transformed, not only for the legal purposes of fair use but in terms of its potential as an object of critical analysis.

This article has argued for an expansion of the domain of "critical making" to include a range of software-based practices including the development and use of authoring tools, archives, and data-driven electronic publications. Consistent with conventional practices of critical making, which draw attention to the systems, materials, and technologies that enable emerging modes of scholarship, I have attempted to demonstrate some of the resonances between development of these digital platforms and the underlying motivations of critical making. Each of the case studies cited here — the electronic journal *Vectors*, the public media archive Critical Commons, and the electronic authoring platform Scalar — engage issues of both making and criticality from varying but related angles. My goal has not been to undermine what I take to be a beneficial and continuing dialogue surrounding critical making in the humanities but to suggest ways that this conversation might productively extend to include the activities outlined above.

About the Author

Steve Anderson is an Associate Professor at USC's School of Cinematic Arts with appointments in the divisions of Interactive Media & Games and Media Arts + Practice. He is a scholar-practitioner working at the intersections of media, history, technology and culture. He is the author of *Technologies of History: Visual Media and the Eccentricity of the Past* (2011) and founder of the MacArthur funded public media archive Critical Commons. He is Co-Editor of the interdisciplinary electronic journal *Vectors* and Co-Principal Investigator of the electronic publishing platform Scalar. For his research project, *Technologies of Cinema*, Anderson was awarded a 2015 Digital Innovation Fellowship from the American Council of Learned Societies.

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