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special issue

**critical
making**
DESIGN and
the DIGITAL
HUMANITIES

Jessica Barness
Amy Papaalias
guest editors

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critical making

DESIGN and the DIGITAL HUMANITIES

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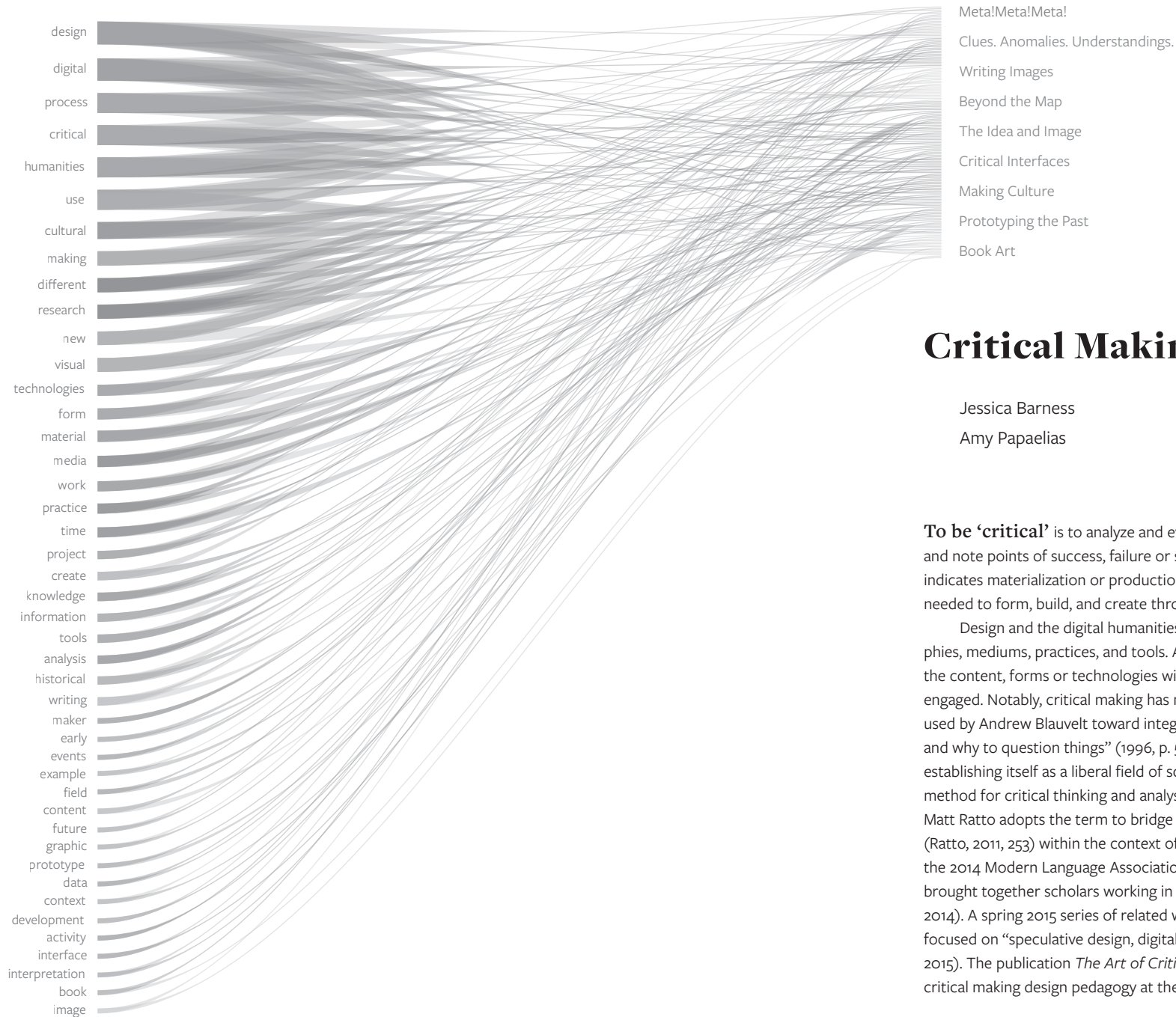
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Critical Making at the Edges

Jessica Barness

Amy Papaelias

To be ‘critical’ is to analyze and evaluate, examine the existence of something, and note points of success, failure or shifts in perspective. ‘Making’, in contrast, indicates materialization or production, a means to determine the essential things needed to form, build, and create through a process of construction.

Design and the digital humanities share common ground as disciplines, philosophies, mediums, practices, and tools. Attempts to further define these areas rely on the content, forms or technologies with which their practitioners and scholars are engaged. Notably, critical making has marked inquiry in both disciplines. The term is used by Andrew Blauvelt toward integrating design practice with “teaching when, how and why to question things” (1996, p. 57), as an essential part of the design discipline establishing itself as a liberal field of scholarship (Swanson, 1994). Defining it as a method for critical thinking and analysis through the act of collaborative building, Matt Ratto adopts the term to bridge physical and conceptual means of production (Ratto, 2011, 253) within the context of the digital humanities. A special session at the 2014 Modern Language Association, “Critical Making in the Digital Humanities”, brought together scholars working in and through critical making practice (MLA, 2014). A spring 2015 series of related webinars on critical making in the humanities focused on “speculative design, digital humanities, and media archaeology” (Whitson, 2015). The publication *The Art of Critical Making*, describes the key components of critical making design pedagogy at the Rhode Island School of Design as “hands-on

practice, the processing of enhanced seeing and perception, and contextualized understanding” (Somerson, 2013, p. 19).

Critical making situates studio-based practices as scholarship in ways that augment existing theories of design authorship, production and thinking. Designers engage with audiences through humanistic or scientific inquiry, creating systems of meaning and shaping understanding through innovative processes or collaborations. In the humanities, critical making is a means to assert the value of digital tools in constructing and building toward understanding and analyzing, within the context of well-established conventions of scholarship. Acknowledging distinctions between approaches of “design-oriented research” and “research-oriented design” (Fallman, 2007), we see that scholarly inquiry is, overall, concerned with method and process as much as the final outcome. As a developing framework to integrate activity and artifact, critical making does two things. It provides a means to understand and question the complex relationships between research, scholarship and production. It also places emphasis on the making process itself; the findings that occur within this become the crux of the endeavor and may produce as much knowledge as the polished, finished product. These activities are centered on human experience and continually fluctuate in ways that are practical and theoretical, rhetorical and physical.

The seminal publication *Digital Humanities*, collaboratively written by design scholars and digital humanists, argues for the necessity of design and design principles at the forefront of digital humanities production (Burdick et al, 2012). Design authorship practices, as a form of critical making, may also be pivoted towards ‘new’ humanities-based inquiry. The curators of the exhibition *Graphic Design: Now in Production* note they have “sought out innovative practices that are pushing the discourse of design in new directions, expanding the language of the field by creating new tools, strategies, vocabularies, and content” (Blauvelt and Lupton, 2011, p. 10). Garnet Hertz’s *The Critical Making Zine* uses physical production to publish and distribute a series of essays on technology, society and DIY culture. Intentionally using a DIY zine aesthetic (photocopied pages, stapled binding, manually folded volumes) Hertz challenges the established assumptions for how critical writing and digital humanities scholarship are disseminated. *Library of the Printed Web*, produced by Paul Soulellis, is a participatory, multi-volume book project from artists working in and around the web and interrogates the very nature of publishing through critical making. In these examples, we observe that critical making reverses emphasis on the prevailing disciplinary expectations of what scholarship is, and serves to distinguish these activities from existing research methods.

As a finding tool, this special issue locates where, how and why critical making is emerging, and the ways it exists in published form. In order to acquire a range of submissions, we reached beyond disciplinary boundaries in distributing the call for papers. From the AIGA Design Educators Community website to the H-NET.org listserve, the call for papers was posted in venues and shared on social media by

colleagues situated in design and the digital humanities. The response to the call for papers was overwhelmingly positive, with almost 50 submissions from diverse academic disciplines and geographic locations. It became evident that we were not part of a small group of designers interested in the digital humanities, but rather, we were part of a much larger community working at the edges of our disciplines.

How can critical making cultivate future crossovers between exploratory design practices and the digital humanities? How is critical making approached and evaluated in these disciplinary contexts? As evidenced in this special issue, scholars are critically impacting the ways we read, write, play, imagine and learn. Rather than advocate for each discipline to borrow and build off the other in isolation, this issue serves as a shared space to affect synergistic research, practice and education.

This issue is comprised of two sections. The first section, “Theories and Speculations”, focuses on methods and systems to facilitate critical making. New modes of inquiry and analysis are evidenced in conceptual interfaces, critical mapping and experimental frameworks. These interfaces, maps and frameworks move beyond clarifying and visualizing information to uncover critical making approaches that ask more questions than they answer.

Anne Burdick argues that modes of iterative design processes are vital to the development of new humanities tool building. The notion of interface design for criticality is put to the test within an exploratory approach involving graduate students, and concludes with the development of a speculative design brief for theorizing computational environments for humanities inquiry.

Donato Ricci, Robin de Mourat, Christophe Leclercq and Bruno Latour call into question notions of collaboration through the development of AIME, a multimodal framework that challenges preconceived ideas surrounding digital humanities projects and their impact. Interface becomes a methodology for exploring close-reading and as well as a self-reflective digital artifact.

Holly Willis employs cinematic humanities as a way of analyzing critical writing and screen typography in the history of film, video and motion design. Willis offers four modes to critical visual analysis to implicate critical making and digital humanities practices beyond cinematic studies.

Tania Allen and Sara Queen discuss the ways maps reflect more than reality, and move from the map as an object to also include the critical activity of map-making. Using a foundation of landscape and mapping theories, they connect iterative design processes with humanistic concerns.

In the second section, “Forms and Objects”, iterative processes such as prototyping and hacking play roles in critical making, as do expanded notions of publishing. Prototyping practices, whether pragmatic or speculative, are critical products in themselves, and aim to communicate through a merging of form and content. Hacking plays a significant role in building maker culture in various cultural and geographic contexts. Publishing practices are investigated through interactive and visual platforms. The forms of these arguments within this issue – from designed artifact, to a digital interface or tactile experience – draw from rich traditions and alternative forms of scholarship, publishing, and making.

Stephen Boyd Davis and Florian Kräutli investigate chronographics by designing iterative visualizations of museum collections. In dealing with aspects of curation, uncertainty, and time, they discuss their co-research effort with museum professionals.

Steve Anderson questions the role of material making as it relates to transformative scholarly practice, and how publishing platforms connect with the making itself. His born-digital article, written in Scalar and translated to print, argues that the development of technological tools play a pivotal role in critical making.

Padmini Ray Murray and Chris Hand examine differences between the Global South and the West in regard to hacking, making/DIY culture, and local circumstances. Their work specifically addresses the roles of specificity and local context in shaping digital humanities practices in India.

Jentery Sayers discusses rapid prototyping and its role in shaping media history scholarship. Through this process of making, obsolete or dead technologies are given a different life. He argues for this as an alternative means in speculating objects’ original functions and uses.

Steven McCarthy proposes a visual, collage-based format for publishing a book review, wherein the materials used to visually ‘write’ the critique are repurposed from the book being reviewed. Sample spreads from the book review are interspersed with an essay about the project itself, and readers are invited to access the book as a material object or digital download.

Collectively, these articles present critical making as a framework for understanding and analyzing practices that challenge the sometimes arbitrary boundaries of the disciplines. The contributions show that critical making may also point toward the emerging field of knowledge design. As an extension / hybrid / convergence of critical making practices, knowledge design triangulates between design, technology and “digitally-inflected scholarly practice” (Schnapp, 2011, p. 3) to engage in “post-print” inquiry. Knowledge design moves beyond the utilization of digital tools in order to consider “the more profound questions of ways media produce knowledge” that allow practitioners “to think in and through digital media” (Drucker, 2014, p. 82). Impacted by the convergences between design and the digital humanities, knowledge design benefits from the discourses surrounding critical making practices, and vice versa.

As part of the design of this issue on critical making, we performed a qualitative textual analysis of word frequencies within the nine articles. Our goal was to discover commonalities among the contributions. To do this, we utilized Voyant (Sinclair and Rockwell, 2015), a popular text-mining tool for digital texts and Raw (Caviglia et al., 2014), an open-source web application for creating custom vector data visualizations. Each article was parsed in Voyant to create a database of the 44 most frequently used words in the articles. This data was run through Voyant a second time to establish the words common across two or more articles in the issue. Imagining the issue contents as a complex network in itself, an alluvial diagram created in Raw shows the structural connections between and among the articles. The resulting data visualization is shown on pages 4–5. Extractions of this work, specific to the contents of each article, are featured on respective title spreads. Not only does this lend insight to content, it may also help to better understand the language used to communicate the concept of critical making.

Acknowledgements

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Editor Bios

Jessica Barness is an Assistant Professor in the School of Visual Communication Design at Kent State University. Her research resides at the intersection of design, humanistic inquiry, and interactive technologies, investigated through a critical, practice-based approach. Further, she is involved in collaborative projects connecting sound studies and design. She has an MFA in Design from the University of Minnesota. She has presented and exhibited research internationally, and has published in *Message*, *Visual Communication*, *SEGD Research Journal: Communication and Place*, and *Currents in Electronic Literacy*.
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References

- Blauvelt, A. (1996). *Dumb. Eye*, 22, 54-57.
- Blauvelt, A. and Lupton, E. (2011). *Graphic Design: Now in Production*. Minneapolis, MN: Walker Art Center.
- Burdick, A., Drucker, J., Lunenfeld, P., Presner, T. and Schnapp, J. (2012). *Digital_Humanities*. Cambridge, MA: MIT Press.
- Caviglia, G., Uboldi, G., Azzi, M., and Mauri, M. (2014). <http://raw.densitydesign.org/>
- Drucker, J. (2014). Knowledge Design: A Conceptual and Curricular Challenge. *Design and Culture*, 6(1), 65-84.
- Fallman, D. (2007). Why Research-Oriented Design Isn't Design-Oriented Research: On the Tensions Between Design and Research in an Implicit Design Discipline. *Knowledge, Technology and Policy*, 20, 193-200.
- Modern Language Association (MLA) (2014). *Session 708 Critical making in the Digital Humanities*. Retrieved from http://www.mla.org/conv_listings_detail?prog_id=708&year=2014
- Ratto, M. (2011). Critical Making: Conceptual and Material Studies in Technology and Social Life. *The Information Society*, 27, 252-260.
- Somerson, R. (2013). The Art of Critical Making: An Introduction. In R. Somerson and M. Hermano (Eds.). *The Art of Critical Making: Rhode Island School of Design on Creative Practice* (19-31). Hoboken, NJ: Wiley & Sons.
- Schnapp, J. (2011). *Knowledge Design v_1.0*. Retrieved from <http://jeffreyschnapp.com/wp-content/uploads/2011/09/Knowledge-Design.pdf>
- Sinclair, S. and Rockwell, G. (2015). <http://voyant-tools.org/>
- Swanson, G. (1994). Graphic Design Education as a Liberal Art: Design and Knowledge in the University and the "Real World". *Design Issues*, 10(1), 53-63.
- Whitson, R. (2015). *Critical Making Webinar Series*. Retrieved from http://www.roger-whitson.net/critical-making?page_id=2

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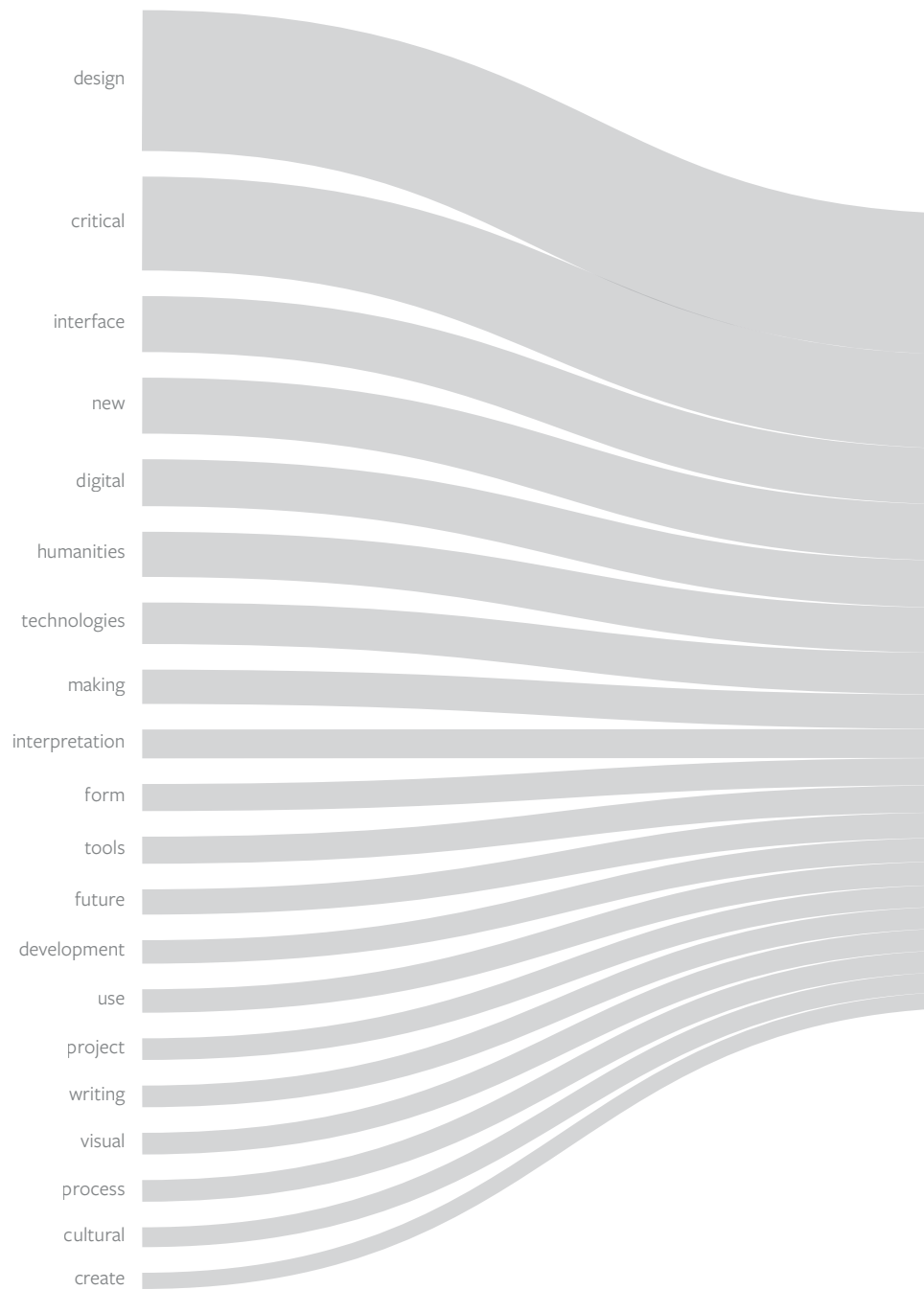
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Meta! Meta! Meta!

A Speculative Design Brief for the Digital Humanities

Anne Burdick

Abstract

Fictitious future scenarios are used in the technology industry to identify new opportunities, test high risk concepts, and rally teams toward a common goal. While such visions can play a crucial role in the technology development process, Digital Humanities futures are largely absent. Software development methods suited to the creation of tools for shoppers or workers are a poor fit for the design of tools that embody the intentional fuzziness, nuanced positionalities, and reflexive activities of critical interpretation. Therefore this paper proposes a design approach that combines core concepts from critical theory with design's speculative inventiveness and introduces the subject-computer-interface as an alternative to industry's user-centered concept. Case studies investigate how this triad of meta processes – the meta of critical interpretation, the meta of speculative reflexive design, and the meta of subject-computer-interface – might work by using critical making to engage recent concepts from digital humanities theory to invent new digital affordances. The paper concludes with a speculative design brief that challenges designers, humanists, and computer scientists to use a meta-meta-meta approach that begins with core humanities concepts and designs outward to imagine digital humanities tools that don't yet exist.

Keywords: critical making, critical theory, digital humanities, interface, speculative design

Introduction

In the technology industry, engineers and designers are working today on the computational capabilities of the next 5 to 20 years. In the process, corporations and startups sometimes use fictitious future scenarios to identify new opportunities, test high risk concepts, inspire teams toward a common goal, and generate consumer interest (Johnson, 2011). While these visions can play a crucial role in the technology development process, humanities-based future scenarios are largely absent.

Therefore, to insure that the culture, values, and practices of the humanities are not excluded from future technologies, this paper proposes a way to bring the speculative inventiveness of design together with the critical interpretation of the humanities to imagine what might be accomplished with digital tools *that don't yet exist*. In other words, the paper seeks to define a design brief for the creation of blue-sky, provocative visions that advance a humanities agenda not only to encourage technology development but also to:

- cast beyond incremental improvements to existing tools;
- investigate the impact of emerging technologies – such as artificial intelligence or the internet of things – on humanities practices;
- explore the implications of ideas too large, complex, or unconventional to be built quickly with the tools at hand;
- provoke debate about new directions in humanities research.

The humanities' agenda that concerns us here is one shared by humanists who, regardless of their home discipline, use methods founded in critical theory: reflective interpretation and social critique. Concepts that are core to this approach include subjectivity, ambiguity, the contingency of meaning, and observer-dependent variables in the construction of knowledge (Burdick, Drucker, Lunenfeld, Pressner, & Schnapp, 2012). The question is, how do we create technologies – tools, environments, affordances, and computational capacities – that can embody and enable these concepts, requirements that make for an unusual and highly specific design challenge.

Digital tools designed for rating restaurants, scheduling appointments, or piloting airplanes typically require ease of use, categorical specificity, and even fail-safe precision, requirements that industry best practices were designed to address. But this paper asserts that the workflows, use cases, and feature-function matrices of software development that make such tools effective are a poor fit for the intentional fuzziness and nuanced positionalities of critical interpretation.

Therefore this paper seeks to identify a design approach, a design space, and a design process for developing innovative affordances to be used in the creation of humanities-based future technologies. Throughout, the concerns of the Digital Humanities provide the conceptual foundation; they bring the meta to our title. Humanists themselves play a central role, both as the imagined subjects for future digital tools, and as partners in their creation and critics of the outcomes.

The paper begins by identifying a **design approach** that can integrate the critical reflection of the humanities with the propositional orientation of speculative

design by bringing together future visioning and critical theory. Next, it looks to critical theory and interface theory to define a **design space** by asking How can a future digital environment be designed to reveal its own constructedness? How do we situate the humanist within it, not as a user but as an irreducible subject? It follows with case studies whose **design process** incorporates critical making by beginning with ideas from recent Digital Humanities theory and through design and reflection ending with novel humanities-specific digital affordances.

The results of this analysis are brought together in the conclusion in the form of a speculative **design brief** for the Digital Humanities – as an unusual format for theoretical inquiry, and – to provide guidelines for designers and humanists to test new ideas, explore the implications of emerging technologies, and influence the creation of future computational capabilities.

Design Approach

To identify processes or methods specific to the challenge of designing Digital Humanities' futures, we can draw from a range of approaches that span from the generative – methods that look forward, asking “what if?” – to the reflective – methods that reveal or critique “what is.” Drawing from two seemingly divergent conceptual domains, future visioning and critical theory, our aim is to define a design approach that can do both at the same time.

In the technology industry, fictitious future scenarios are sometimes used to drive research and development. The mission statement for Microsoft Office Labs, for instance, reads: “We strive to imagine and create the seeds for new products and services that can enhance the lives of millions” (Microsoft Office Labs, p. About the Lab). One of the approaches they use to accomplish this is to create publicly-facing slice-of-life (in the future) videos. A typical example is *Microsoft Productivity Future Vision (2011)*, in which people from around the world engage in a seemingly effortless workflow facilitated by an omniscient system that anticipates their needs as they move between Asian subways to African taxis to North American homes (Microsoft Office Labs). The video's vignettes center on moments when an individual interacts with props such as a fictitious device or interface that represent the touchpoint to an imaginary technological system. Such scenarios don't necessarily demonstrate or explain how a future technology will actually work, rather they highlight what it can do or what it makes possible. Microsoft has been producing these optimistic imaginary worlds of workers and consumers for years. According to their website, the videos are used both externally to spark discussion and internally to identify directions for ongoing experimentation and development (Microsoft Office Labs, p. Future Vision).

Science Fiction Prototyping is another form of future visioning that Brian David Johnson, a futurist at Intel, explains in his book of the same name (Johnson, 2011). Working with engineers, artists, and designers, Johnson makes fictitious futures that cast forward the effects of nascent technology developments at Intel and in computer science more broadly. SF [science fiction] prototypes “endeavor to create science fiction developed specifically on science fact as a way to inspire a conversation

about the future and ultimately explore the implications of that science on the everyday lives of people. In this way, an SF prototype is a tool that can help us build better technology and sometimes practically speed up the development of hardware and software” (Johnson, 2011, p. 7). His scenarios are based on a version of strategic forecasting that he calls “futurecasting” — a combination of ethnography, trend analysis, and technology developments. Johnson’s SF Prototypes appear as comic books, films, and short stories that are collected in *The Tomorrow Project* (Intel Corporation). Unlike the upbeat and anonymously authored videos of Microsoft Office Labs, The Tomorrow Project features named authors and more complicated futures.

Similarly, the design team Dunne & Raby work with the notion of probable, plausible, possible, and preferable futures, a futuring construct brought to their attention by the futurist Stuart Candy. “Speculative design” is used to imagine alternatives to futures generated by industry insiders. As they describe in the book *Speculative Everything*, speculative designs “usually take the form of scenarios, often starting with a what-if question, and are intended to open up spaces of debate and discussion” (Dunne & Raby, *Speculative Everything*, 2013, p. 3). Importantly, they acknowledge that the notion of a preferable future depends on who is doing the imagining, hence the need for a diversity of alternatives. Equally relevant is Dunne & Raby’s earlier concept of “critical design,” “design that asks carefully crafted questions and makes us think” (Dunne & Raby, *Design Noir*, 2001, p. 58). Critical design positions the designer as an author who produces artifacts as a form of cultural critique. Its stated aim is not to create useful products, rather it is to generate dialogue and debate about the ideological dimensions of designed artifacts. To demonstrate the point, both *Design Noir* and *Speculative Everything* offer a broad sampling of works that produce such effects. Dunne & Raby’s assertion that “critical design is critical thought translated into materiality” (Dunne & Raby, *Speculative Everything*, 2013, p. 35) is an essential concept for our project and worth exploring further.

The difference between Speculative Design’s future fictions and those of Microsoft Office Labs is in the degree to which each situates itself in relation to a perceived “norm” — explicitly or otherwise. In Dunne & Raby’s terms, the Microsoft videos would likely constitute what they call “affirmative design,” a form of design that reinforces a status quo defined by dominant cultural and economic forces (Dunne & Raby, *Speculative Everything*, 2013, p. vii). By contrast, the futures that concern Dunne & Raby explore alternative values — some of which may even be dark or disturbing, an attribute they share with *The Tomorrow Project*. But *The Tomorrow Project* uses science fiction *writing* as its foundation, whereas speculative design tells its stories by bringing the everyday to life in tangible form, an expertise distinct to designers.

Dunne & Raby’s stated goal of exposing ideological bias can be found in humanistic disciplines from literature to sociology, but Dunne & Raby elide any connection with critical theory (Dunne & Raby, *Speculative Everything*, 2013, p. 35). Therefore we need to look to Jeffrey Bardzell and Shaowen Bardzell’s paper “What is ‘Critical’ About Critical Design?” in which they discuss specific strains of critical theory and

metacriticism to provide a more precisely articulated definition of critical design than that offered by Dunne & Raby (Bardzell & Bardzell, 2013, p. 3304). Bardzell & Bardzell’s summary of the qualities that are required to make a design ‘critical’ could just as easily describe the interpretative activity of any humanities scholar. [A critical design] “proposes a perspective-changing holistic account of a given phenomenon, and... this account is grounded in speculative theory, reflects a dialogical methodology, improves the public’s cultural competence, and is reflexively aware of itself as an actor — with both power and constraints — within the social world it is seeking to change.” We will unpack what these qualities mean for our design needs in the discussion that follows.

DISCUSSION

Through the practice of critical interpretation, humanists are caught up in reflexive loops of critical awareness at all levels: the cultural materials they collect and analyze, the methods and tools they use, the interpretations they construct and disseminate, and their own position in relation to their objects of study and society in general. Therefore we need to develop a way to design tools that afford such meta-activity while also incorporating self-reflexivity into the design process itself. As we have seen, the version of critical design offered by Bardzell & Bardzell is closely aligned with this critical-theory-based orientation and offers a way to take a meta approach to designing the meta activities that the fictitious scenarios are meant to represent.

But as mentioned earlier, we also need to weave in the generative, a way to look forward and ask “what if?” Corporate visioning and Science Fiction Prototyping demonstrate how stories of technology as a part of people’s everyday lives can be used in two ways: to research the potential of emerging technologies and to unite and inspire partners and publics. To expand beyond corporate visions to include a range of perspectives and worldviews, we can draw upon Speculative Design’s aim of generating alternative futures that foster skepticism, dialogue and debate, calling into question the notion of what a preferred future might be. From Dunne & Raby’s definition of Critical Design, we find concrete examples of what it means for a designed artifact to be a form of critical inquiry, research, and theoretical investigation.

When we use these ideas to modify the five qualities that Bardzell & Bardzell identify as putting the “critical” in design, we get closer to defining a design approach specific to the creation of humanities-based speculative futures:

From a “perspective-changing holistic account of a given phenomenon,” which refers to critical activity drawing together cultural materials and perspectives to suggest new understandings through critique and speculation; **to a perspective-changing holistic account of a potential phenomenon** — design activity that produces new cultural materials and perspectives to suggest new understandings through speculation.

From “grounded in speculative theory” in which theoretical propositions don’t claim to be the one true account, rather they aim to challenge new

thinking about that which exists; to **grounded in theoretical and design speculation** – *inventing futures as a form of interpretation (one among many) that challenges new thinking about that which doesn't yet exist*

From “dialogical methodology” that doesn't produce a final resolution or answer, rather an ongoing exchange of perspectives and ideas that are polyphonic, heterogeneous, and possibly even irreconcilable; to **dialogical hypotheticals** – *an ongoing exchange of perspectives and ideas between what is and what may be that is polyphonic, heterogeneous, and possibly even irreconcilable.*

From “improvement of the public's cultural competence” in which critical designs offer ways of reading skeptically beyond simple polarities; to **improvement of the public's futuring competence** – *in which designed futures and the way they are designed encourage skepticism and a critical mindset in designers, engineers, and the general public.*

From “reflexively aware of itself as an actor,” defined as recognition of the sociological and epistemological conditions that make the designer's work possible; to **generatively reflexively aware of itself as an actor** – *an awareness of the positionality of the designer and that which they create in a process that perpetually cycles between imaginative proposition and critical reflection.*

The speculative reflexive design approach outlined here could also be thought of as a meta approach to a meta activity. What is needed next is a design space whose constraints and conceptualization will allow us to focus this meta-meta approach on the creation of imaginary technologies specific to our project.

Design Space

Designing fictitious futures can be a daunting task, even if one's topic is not “the future,” as it is for foresight analysts and futurists. Where do we begin? How do we define a space within which to operate? If we are not concerned with how a future technology will actually work, how do we define the edges of our exploration? If we are interested in how future imaginings might provoke new research questions or suggest new challenges for technology development, how far into the future should we cast? To guide speculation toward useful outcomes, futurist Stuart Candy uses a 4-tiered structure that goes from macro to micro: *setting > scenario > situation > stuff* (Candy, 2015). *Setting* defines the large-scale systemic factors that shape possible, probable, and plausible futures across ever-increasing time horizons. Defining *setting* is beyond the scope of this paper. But there are numerous foresight tools that can be used to help define a time horizon and a set of future conditions, including Candy's own card set, *The Thing from the Future*. Foresight reports are produced by both for-profit and non-profit organizations such as the Institute for the Future, Arup Foresight, Knowledgeworks, or the New Media Consortium, to name a few.

But we are concerned here with a design space that sits at the bottom of the ladder – to use Candy's metaphor – and moves upward and outward. By focusing on a scholar's interactions with their digital tools (*situation* and *stuff* designed in tandem), we can rely upon design's expertise in creating tangible or experiential artifacts and scenarios that can suggest new understandings. From this 1:1 human scale we can then infer the kinds of systems and technological developments that would be required at the level of settings to make the situation and scenario possible. As the Microsoft video shows, it is that moment of exchange between a computational system and the people who use it when the promise of the system is brought to life. Therefore the locus of this exchange – the interface – will be our design space.

There are many kinds of interface that mediate and translate between layers in the computer, but the interface that concerns us here is the topmost layer, also called human-computer (or user) interface. It is this version of interface that has been theorized as a medium (Manovich); a textual field (McGann, 2014); an environment, event-space or enunciative system (Drucker, *Graphesis: Visual Forms of Knowledge Production*, 2014) (Drucker, *Humanities Approaches to Interface Theory*, 2011); a regime (Bratton, forthcoming); a threshold or effect (Galloway, 2012); or my favorite: a *fertile nexus*, as described by Dragognet, translated and quoted by Alex Galloway (Galloway, 2012). Each of these notions draws upon different disciplinary perspectives within the humanities, yet they all share the understanding that the interface as a concept has more to do with relationships and interactions than it does with objects or things. Those relationships and interactions construct a world that privileges certain ways of being and knowing over others. This conception of the interface provides a useful design space for addressing two core concepts from the humanities: the constructedness of worldviews and observer-dependent variables in the construction of knowledge. It also means that the interface is more than a designed artifact, more than mere “stuff” at the bottom of Candy's ladder.

In *The Language of New Media*, Lev Manovich describes digital media as having a cultural layer and a computational layer. While the computer is a product of human culture, what Manovich outlines is how its base mechanisms, which are primarily mathematical, have distinct affordances that contribute to how it can be manipulated and reworked. “The ways in which the computer models the world, represents data, and allows us to operate on it; the key operations behind all computer programs (such as search, match, sort, and filter); the conventions of HCI – in short, what can be called the computer's ontology, epistemology, and pragmatics – influence the cultural layer of new media, its organization, its emerging genres, its contents” (Manovich).

Within software development, the cultural layer is increasingly manifest in the concept of the user. The centrality of the user to the technology industry can be seen in the emergence of job titles and expertise dedicated to designing around this figure: user interface (UI) and user experience (UX). In spite of a history with roots as radically different as Taylorism and Scandinavian participatory design, the user concept continues to skew toward the former (Tuomi, 2005). The top ten Google search results for “best practices user interface design” describe a user thus: *A user*

is enabled by speed, responsiveness, usefulness, and efficiency. A user performs, jumps, makes, and manages. A user exists in a world of mistakes and tasks.

The user has become a key figure in designing for everything from products to computer systems. User-centeredness as a concept has been useful in pushing the design of services and systems beyond the needs imagined by engineers (Tuomi, 2005). In fact, “it is a user-figure that becomes a tool through which particular design decisions are made” (Kelly & Matthews, 2014, p. 357). As the idea of the user has matured since its introduction in computer science in the early 1970s, (Kling, 1973) it has grown in complexity, taking into account social dimensions, contexts beyond the workplace, and cultures defined by more than job title. Recently, researchers have become interested in users as producers of multiple interpretations (Senger, Gaver) or creators of alternative framings of artifacts and networks of relations (Kelly & Matthews, 2014).

Nonetheless, user-centered design remains dominated by a focus on creating tools for use that make daily life productive and pleasurable, an orientation that many of us benefit from on a daily basis (consider, for instance, the ease with which one can shop online or navigate the city). “User-friendliness” and terms such as “intuitive” and “efficient” describe a kind of seamless interaction with a computer in which one is no longer aware of the interface that shapes one’s relationship with a larger system. A user-friendly interface “disappears” and action happens, as if “by magic” at which point a dominant worldview has effectively been naturalized, a condition that critical theory is poised to dismantle (Emerson, 2014). User-friendliness is thus a poor fit for our project.

That said, to develop new products, corporations must imagine users, and with them an entire strata of society, a fictional world that aligns with a corporate mission. The well-to-do families and workers of *Microsoft Productivity Futures (2011)* live in a land of seamless functionality, easy abundance, and the promise of success. As Tuomi has observed, “the phenomenon of use needs to be conceptualised as a relation between the user and the artefact, where the user and the functionality of the artefact mutually construct each other” (Tuomi). In future fictions, carefully cast “users” need to be designed to the same extent as the products themselves.

Critical theory has given us the idea of an observing subject and with it the construction of subject positions across media — elaborated in art, photography, film, and literary theory. These notions provide a way to conceptualize how a digital environment or tool also imagines its user-subject. If, as Pelle Ehn asserts, “users only come into being once there is something to be used,” then a humanities-based computational world brings the interpreting subject — rather than the user — into existence (Ehn, 2008).

In “Humanities Approaches to Interface Theory”, Johanna Drucker demonstrates how the various notions of the subject from critical theory provide a way to conceive of human experience in relation to computational environments beyond notions of use (Drucker, *Humanities Approaches to Interface Theory*, 2011). As she points out, we have learned from strains of psychoanalytic and feminist theory,

among others, that subjectivity is in flux, can be multiple, and is seldom reducible to a single set of concerns. It is neither autonomous nor possessed of free will; it is a position within a system of relations. An imagined individual who is able to occupy multiple, heterogeneous, and even contradictory subjectivities, is incompatible with the task-focused user central to industry best practices. Rather than recuperate or complicate the user-figure, this paper proposes a better fit for the humanities: the interpreting subject.

DISCUSSION

Our topic is not “the future” *per se*, rather it is how the creation of alternative worlds founded on the concerns of the humanities might inform the development of new technologies. The idea of “the future” is used to nudge the imagination beyond what is possible with the tools at hand, which can make for a wide-open design space. To provide constraints and to keep the concerns of humanist scholars at the center our activities, this paper proposes limiting our future visions to the fertile nexus of the user-interface recast as a “subject-computer-interface” (SCI). Core concepts from critical theory help to define the SCI as a design space that is meta — but at a human scale. Our meta-meta design approach to a SCI suggests that we start with theory (rather than users or technical capabilities) and work outward to the design of fictitious subjects, imagined actions, and tangible future worlds.

As a design space, SCI’s theoretical dimensions frame how we imagine what happens in those crucial moments when a subject and a computer meet. As Drucker and others have pointed out, this shift from user to subject allows us to consider the interface as a site of construction, an action or event space co-constituted in an exchange between subject and computer (Bratton, forthcoming) (Drucker, *Humanities Approaches to Interface Theory*, 2011) (Emerson, 2014). In Candy’s terms, this means that the design of our future vision must address both *stuff* and *situation* in the same gesture.

The complex nature of subjectivity can give the design of a SCI a complex and sometimes contradictory set of requirements that may resist being reduced to a set of functions. The requirements are further complicated by the need for a computer interface whose design embodies criticality, meaning it does not rely on a default, natural, or preferred model or worldview. Such heterogeneous and possibly irreconcilable attributes make the SCI a dialogic design space rife with the potential to generate provocative futures.

Design Process

What does a subject-computer-interface make possible? How will it *enable* criticality? Or to put it another way — how will the subject engage in acts of critical interpretation beyond those made possible by today’s digital affordances? This section offers a set of case studies that investigate how this triple-meta process (the meta of critical interpretation, the meta of speculative reflexive design, and the meta of subject-

computer-interface) might work by using critical making to engage recent concepts from digital humanities theory to invent new digital affordances.

Critical making is Matt Ratto’s model of experiential learning-through-making as a way to elaborate and explore theoretical concepts. Critical making involves three phases: identifying concepts and theories from a discipline’s literature; exploring those concepts through “making” experiments and the creation of technical prototypes; extending the concepts through reflection, further exploration, and critique (Ratto, 2011). Critical making is focused on process and experiential learning but not on the products that participants create.

Working with a small team of graduate student designers, we began by applying critical making to recent Digital Humanities theory. Specifically, we worked with Lori Emerson’s notion of *readingwriting*, Jerome McGann’s ideas about *texts-in-n-dimensions*, and Johanna Drucker’s concept of *visual epistemology*. Each idea was selected because its mode of interpretation is inseparable from its form, an exciting provocation for the project at hand. We wanted to use critical making not only to better understand each concept but also to research novel ideas for graphical displays and digital affordances.

We began by creating sketches and diagrams, working to generate new interpretations of each concept in the context of the larger project. Very quickly it became clear that sketches alone were not enough to allow us to understand the implications of each concept as a model for humanities-derived modes of interaction. We needed to test the relevance of the concepts in the context of an intended future application: as tools for critical interpretation. In other words, we needed to see if we could start with a concept and design outward toward digital affordances that could be used to research, to explore, and to construct an argument.

In the experiments that follow, you will see how each concept was tested through its application to ideas from interface theory. This was happening concurrently with the paper’s development which allowed the author to move back and forth between designing and reflecting on the potential for each critical concept to become a digital tool to be used in the construction of a new argument. Further reflection allowed us to identify interaction principles that could be extrapolated out to become affordances for a future humanities-based digital tool.

ReadingWriting

THE CONCEPT

In *Reading Writing Interfaces*, Lori Emerson discusses the “Googlization” of literature and a strategy that she calls “readingwriting” as a form of resistance to, or critique of, the unquestioned ubiquity of the Google search algorithm. “Readingwriting — the practice of writing through the network... [that] is itself constantly reading your writing, and writing your reading,” adds the computer algorithm to the list of readers and writers who bring a text into being, as Emerson demonstrates in her discussion of

works such as Bill Kennedy and Darren Wershler’s *apostrophe* and Tan Lin’s *HEATH* (Emerson, 2014, p. 163).

The value of such works is that they counter the black box approach to the design of computational devices by using the act of searching and writing to reveal the inner workings that are otherwise hidden from view. For Emerson, readingwriting’s critical innovation is that it “not only frames the how and the why of works that depend upon the algorithm underlying any given search engine but also foregrounds its own constructedness as a way of making visible the invisible, taken-for-granted media that delimit what information we can and cannot access” (Emerson, 2014, p. 177).

MAKING EXPERIMENTS

We performed a variety of experiments, including designing algorithms and systems to enable readingwriting as well as engaging in readingwriting ourselves using black-boxed technologies to see what we might learn. One such test included using Apple products which proudly proclaim that they perform as if by “magic.” QuickType, a predictive text editor that comes with the Apple OS, is an everyday example of digital tool that “writes through a network that reads your writing and writes your reading.” When texting on my Apple iPhone 6, I can opt to see a set of three words at the bottom of the text window that are provided for me to select as my next word choice as I craft my message. Apple’s predictive algorithm “learns” over time and the vocabulary evolves based on the texting habits of its user. However, QuickType’s algorithm is trapped inside the black box which leaves one to guess how or why words are offered up.

I	only	interface	is	very	to	use.
The	user	to	and	a	to use	get
I’m	best	interface is	with	easy	and	play

Figure 1. A sequence of texts, shown in table format, that were offered by Apple’s predictive text tool, QuickType as Anne Burdick attempts to investigate Lori Emerson’s concept of “readingwriting.”

I engaged in an act of readingwriting as a way to expose the inner workings of Apple QuickType. Exploring the user concept, I performed numerous texting tests in which I followed the choice of three words given to me after hitting the space bar. Figure 1 shows one such string. I had never used the QuickType feature before but given that its inner workings are unavailable to me, I can only assume that I was starting with the “factory settings.”

After composing numerous text strings, all of which began with the sequence “a-user-friendly-interface” or “the-user-interface,” I never encountered a word choice that included dark or negative connotations. The user interface — according to the system — was generally an upbeat and positive thing. It was not “filled with contradiction,” nor did it “offer me multiple perspectives” — to imagine two possible statements I might want to compose. My interaction with QuickType became a game in which

Figure 2. Sentences composed by Anne Burdick trying to get Apple QuickType to suggest words that complicate the notion of “the user interface”

A user friendly interface is easy to use.

The user interface is great and the best thing about it is the most beautiful girl in the world.

The user interface is a very long day ahead with its own right and wrong way to get to know what you are.

I had to find workarounds to get it to say what I wanted to say about a user interface. A few of the results are shown in Figure 2.

REFLECTION

Shifting away from the idea of *readingwriting* as a form of cultural critique, what can we learn about its potential as a feature of an interface for critical interpretation? The experience of writing against Apple QuickType in order to interrogate its inner workings led me to imagine an interface in which a writer makes a conscious choice to write “with” or “against” a set of texts in a dynamic call and response between a writer, an algorithm, and a corpus. But without the ability to alter the parameters that define the corpus, the algorithm, or the form of the search results, my options were limited. Ideally such a feature would heed Emerson’s call: “The more visible we can make the operations of the machine, the more control we can give to the expressive user, and then we can foster the development of the expressive technique” (Emerson, 2014). Here we see that what Emerson describes in works of algorithmic writing align with our need for affordances that enable acts of critical interpretation.

Visual Epistemology

THE CONCEPT

In *Graphesis*, Johanna Drucker calls for an interface that is a “knowledge generator,” meaning it “produces the knowledge it draws” through visual displays – diagrammatic, spatial, textual – that are generative and dynamic. For Drucker, this kind of visual configuration is distinct from an information visualization that is designed to provide a representation of “what is”, whether in the form of a network diagram or a wordle. With information visualizations, data is gathered, analyzed, and presented as a kind of conclusion or evidence; its methods can be recapitulated. By contrast, a display that presents a set of elements, relationships, and rules of engagement, such as a Wunderkammer or a timetable of train departures and arrivals, requires a user/viewer/reader to derive meaning by “computing” – by combining and constructing relationships between the parts – in order to produce their own distinct meaning (Drucker, *Graphesis: Visual Forms of Knowledge Production*, 2014, p. 88).

Visual displays rooted in the subjective and the generative – rather than the empirical and the objective – hold promise as a feature of an interface that enables the interpretative capacities that rely on criticality. As Drucker notes, “most, if not all, of the visualizations adopted by humanists, such as GIS mapping, graphs, and charts, were developed in other disciplines... taken wholesale from empirical sciences that conceals their epistemological bias...” (Drucker, *Graphesis: Visual Forms of Knowledge Production*, 2014, p. 125).

MAKING EXPERIMENTS

As mentioned earlier, the critical making experiments began with sketching numerous diagrammatic structures that varied greatly in their spatial strategies. Our initial question was were some configurations more “generative” than others? While forms that allowed reading to be multi-directional could produce more than one interpretation, any pre-established diagrammatic form brought with it a pre-existing set of assumptions about the relationships between its parts. This experience allowed us to recognize a potential shortcoming of seemingly open-ended generative tools such as mind maps: they can be useful to “think with” but the shapes and relationships built into the software delimit what is possible to imagine.

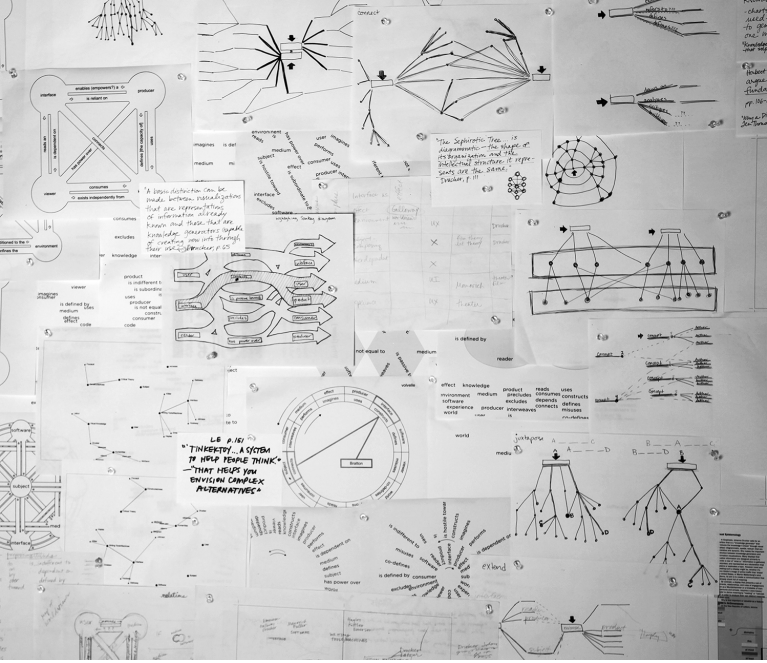
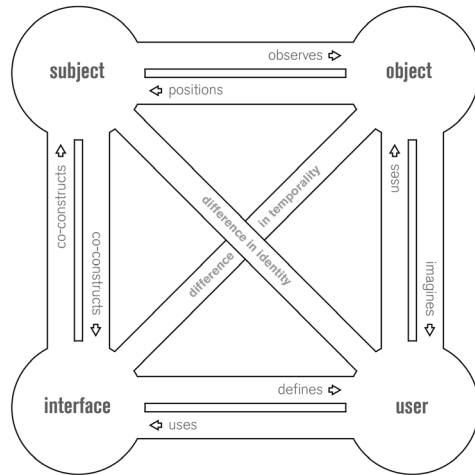


Figure 3. Diagrammatic design exercises created by Margo Dunlap as a form of critical making to investigate Johanna Drucker’s notion of “visual epistemology.”

What became clear in our process was that in order to evaluate the generative aspect of any diagram we composed, we had to imagine a reader in the act of reading. This led us to move away from the design of formal configurations toward

Figure 4.
A spatial writing
exercise created by
Margo Dunlap and
Anne Burdick to think
through ideas
about interface.



the design of “ways of reading” or the design of “meaning-producing spaces.” For our test content, we used our own literature review around theories of users, subjects, products, and interfaces — concepts that are defined by their relationality. Having an idea or argument to construct allowed us to move from designing “visual diagrams” to designing “spatialized writing” — an important conceptual shift. One such result is shown in Figure 4.

REFLECTION

In interface or software design terms, our critical making challenge became to design a generator whose “...shape of its organization and the intellectual structure it represents are the same” (Drucker, *Graphesis: Visual Forms of Knowledge Production*, 2014, p. 111). By definition, a visual knowledge generator can be conceived of as tool for reading and writing, which has implications for an interface for critical interpretation. What we learned was that if spatialized writing is to be generative of new ideas, its shape-making capacity needs to be as flexible as language — and by definition, both must develop in tandem with one another.

Texts in N-Dimensions

THE CONCEPT

In *The New Republic of Letters*, Jerome McGann writes about print textuality and the role of graphic design in the creation of complex, non-linear, spatialized argumentation found in books. His argument is that the social, historical, situated textual interpretations that we have inherited from philology have yet to be fully developed as a form of computational textuality. This is due in part to the mechanisms for text mark-up that rely upon nested hierarchies and ontologies that disallow multi-directional movement within a text. McGann therefore calls for a digital spatial textuality

that is autopoietic, a concept taken from evolutionary biology that means — in the simplest of terms — a self-generating system. The catch is that its realization requires the development of new computational operations (McGann, 2014).

With speculative design, we cannot create those paradigms but we can imagine what they might make possible, how they would look and feel, what impact they might have on scholarly interpretation. To properly investigate the implications of all that McGann proposes is a much larger project than this modest set of critical making exercises could undertake.

For the purposes of this paper and its aim of prototyping experiences of digitally-based scholarly interpretation that don’t yet exist, we focused on a specific condition that is part of McGann’s ambitious and complex proposition. We wanted to understand what it might be to read what he calls “texts in n-dimensions” (meaning, in its simplest terms, an infinite number of interpretative perspectives) in a field of relations from a clearly identified position *inside of the field itself*.

MAKING EXPERIMENTS

Generating our own interpretation of *texts in n-dimensions* began with sketches in which a reader is literally positioned within a three-dimensional spatialized array of texts. We created an interactive digital prototype, a simple realization of the concept, so that we could begin to get a feel for the environment and its performance and to determine where the material and the metaphor might begin and end.

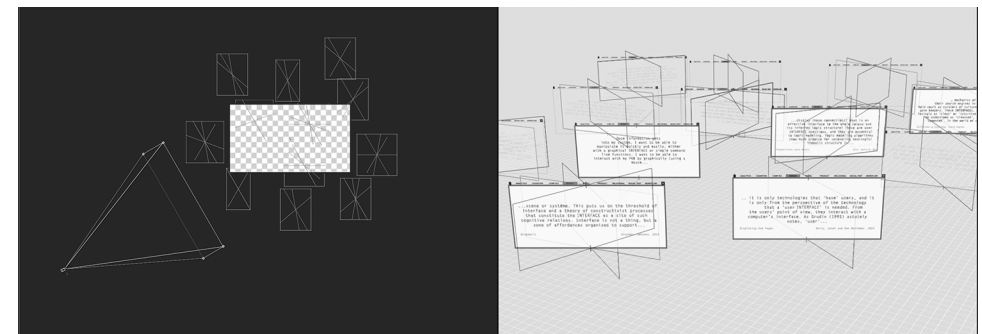
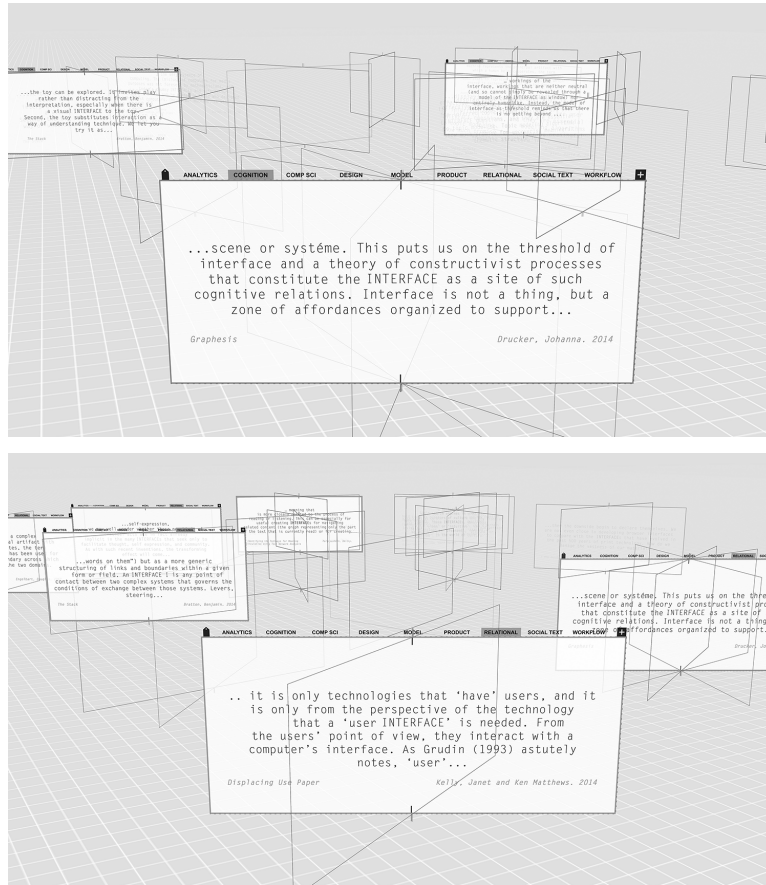


Figure 5.
A work-in-progress
view showing plan and
elevation as Xiangjun
(Shixie) Shi Trofimov
creates a 3-D digital
environment as
a form of critical
making to investigate
Jerome McGann's
concept of “texts
in n-dimensions.”

To build our environment of texts, we used an array of quotations, the result of a keyword search on the word “INTERFACE” within a small corpus, displayed in a words-in-context format. Each search result was tagged according to a variety of conceptual categories, such as “cognition” or “relational.” Each text could theoretically be tagged n-times, with each tag representing the idea of adding another interpretive dimension to a text.

In the three-dimensional model shown in Figure 6, each text occupies a flat white “card.” With each new tag, the card is replicated on the same central horizontal axis but pivoted to a slightly different angle, creating another “face.” The more tags a quotation has, the more faces it has. Each tag-face is allocated its own angle, meaning that when multiple texts have the same tag, they will each have a face oriented in the

Figure 6.
Two views from
within the interface
created by Xiangjun
(Shixie) Shi Trofimov
shown from the
point-of-view of the
tags “relational” and
“cognition”.



same direction. When a subject-observer is added to the 3-D world, he can move to positions that allow him to see the faces of all texts that share the same tag. So, for instance, if he moves to the “relational” tag position, he will see the faces of all texts tagged “relational.” As the subject-observer moves through the environment, texts appear and disappear accordingly.

REFLECTION

While the movement in this particular experiment is not as fluid or nuanced as we had hoped, the 3-D display was enough to demonstrate that texts that configure according to the position of a subject provide not only a qualitatively different reading and searching experience, they also provide a glimpse at what might be possible in a digital environment comprised of observer-dependent displays. The possibilities multiply when the algorithmic inquiry of reading/writing and the generative spatiality of visual epistemology are added to the mix.

DISCUSSION

Ratto’s version of critical making is focused on the experiential qualities and epistemological implications of hands-on making. However, our experiments demonstrate how critical making can also be used in the creation of new digital affordances for critical interpretation. As the case studies suggest, working with a speculative reflective design approach that begins with theory and uses design to work outward can lead to the creation of novel digital affordances that may have wider applications, particularly for the subject-computer-interface.

Conclusion

This paper began with the proposition that creating humanities-based future scenarios might help to insure that the concerns of the humanities are included in the development of new technologies. We conclude with a set of propositions that offer much more: *suggesting new understandings through speculation, challenging new thinking about that which doesn’t yet exist, generating an ongoing exchange of perspectives and ideas, encouraging skepticism and a critical mindset, and creating an awareness of the positionality of designers and that which they create.*

We got here by applying a rigor of starting and ending with core concepts from the humanities to develop a design approach, a design space, and a design process. We conclude with a number of novel propositions derived from these specific demands with the hope that others will pick up the project and take it forward. Therefore the paper concludes with a design brief, which, like a manifesto, sets new terms for future action that a community can rally behind. In design practice, a design brief typically outlines the aims, objectives, issues, audience, and other considerations (such as budget, site, resources, or constraints) that a new design (or movement) must take into account. It can serve as a point of reference and can be used to develop trust and understanding amongst project participants which can include clients, partners, collaborators, consultants, vendors, and other designers. It is also an agreement about the outcome of a process, defining that which constitutes success.

A design brief can also be seen as way to interpret the research that preceded it – the analysis, theorizing, and making – by synthesizing it into an agenda for action. It is in this spirit that this paper concludes by casting forward with a design brief that challenges designers and humanists to test new ideas, explore the implications of emerging technologies, and influence the creation of future computational capabilities founded in core concepts from the humanities.

*The following pages contain
A Speculative Design Brief for the Digital Humanities*

A Speculative Design Brief for the Digital Humanities

Anne Burdick

Overview

Digital Humanists seek designs for humanities-based future scenarios to test new ideas, explore the implications of emerging technologies, and influence the creation of future computational capabilities founded in core concepts from the humanities. Core concepts include subjectivity, ambiguity, contingency, and observer-dependent variables in the production of knowledge.

A speculative reflexive design approach should be used to generate fictitious narratives that bring a complex system into being quickly so that its effects and implications can be considered by humanists, designers, and computer scientists alike.

Deliverables should include vignettes, narratives, prototypes, or snapshots in any medium designed to suggest new understandings, introduce new research questions, or inspire the development of new computational tools and systems for the Digital Humanities.

Vignettes or scenarios should center on a subject-computer-interface (SCI), a site of exchange and co-construction between a complex subject and a computational system. “Computational system” can be interpreted as any kind of hardware, operating system, programming language, or software, though the concern should not be with how a specific technology or system works but with what it makes possible.

The 3 Metas

To root the scenarios in the concerns of the humanities, it is suggested that project teams work within the following conceptual frameworks:

META 1

A speculative reflexive design approach should be used that: provides a perspective-changing holistic account of a potential phenomenon, is grounded in theoretical and design speculation, produces dialogical hypotheticals, leads to improvement of the public’s futuring competence, and is generatively reflexively aware of itself as an actor.

META 2

The design space is the subject-computer-interface (SCI), understood as a complex site of co-construction informed by ideas about interfaces and subjectivity from critical theory. The SCI should embody criticality — meaning computational components should be designed reflexively to reveal their own constructedness (see design challenges).

META 3

The SCI should enable criticality — meaning it should provide the capacity to perform acts of critical interpretation. At the meta level, that means it should provide a critical orientation (see design challenges). At the level of digital affordances, subjects should be able to perform research, compose arguments, and engage with peers, cultural records, and discourse networks.

Audience and Context

While this project is rooted in a North American context, the audience includes Anglophone designers, humanist scholars, library and information scientists, computer scientists and engineers but also those interested in the future of critical thinking and the cultural record.

Project teams must identify the setting and scenario for their future vision. The context for the scenarios should be cast at least five years into the future. Specificity about the imagined individuals and activities will help a scenario to be incisive. One suggestion is to start with a current situation in which a humanist scholar wishes to perform a specific kind of research, but the tools don’t yet exist to do so.

Design Process

Innovative designs can be produced by using critical making that begins with humanities-based theoretical concepts and works outward to the design of digital affordances, fictitious subjects, imagined actions, and tangible future worlds.

Design Space

The design space should be the subject-computer-interface (SCI) which is not an artifact but a site of exchange co-constructed by an interpreting subject and computational technologies and systems; all three — subject, computer, interface — should be designed in tandem.

Challenge

What follows is a description of design attributes and qualities that should be considered when creating SCIs in humanities-based future scenarios.

NO BLACK BOX. At any time, algorithms and scripts should be available to be accessed, edited, and created. In other words, the inner workings of a computational tool should be readily available to the reader-writer to be interrogated, manipulated, and reconfigured as needed. The design question is how this would be displayed and accessed.

NO DEFAULT WORLDVIEW. A subject-computer-interface (SCI) that embodies the criticality of the humanities should be designed to reveal its own constructedness. Therefore the subject-interface should allow for multiple worldviews, making explicit that the one on view is a choice the subject actively needs to make. Thus one can imagine a system in which interface views could be reconfigurable according to different ontologies with a navigational interface that structures situations, conditions, positions, and relationships.

OBSERVER-DEPENDENT PERSPECTIVES. Interface views should be context-specific, observer-dependent, partial, and situated. An observer-dependent interface would be one in which an interpreting subject brings a world or worlds to life through their own actions — as seen and experienced from a situated perspective. Providing views through a variety of orientations: spatial, temporal, singular, multiple, shared, sequential, morphed, or juxtaposed would require that interface components and content always be situated in context. Providing a way of determining how much and what kind of context is visible at any given moment could allow the interpreting subject to explicitly orient themselves and their work in larger groupings. This same subject may simultaneously occupy multiple positions, requiring the juxtaposition of multiple points of view. Their own world — or worlds — may collide and intersect with the worlds of others. From a design standpoint, the question is how to visualize and give form to this shifting space of subjectivity.

N-DIMENSIONALITY. An interface design that represents discourse units and subject positions “n-dimensionally” — meaning they can be seen, interpreted, and manipulated in an infinite number of ways — allows core humanities concepts such as ambiguity and observer-dependent variables to be manifest in design terms.

CONVERGENT SPACES. Writing space is also reading space is also archive space is also social space. Spaces that were previously kept distinct due to material differences converge in digital space. What would an interface look like in which the metaphors of opening and closing were replaced with switching, flickering, blurring, and flowing?

CODE SWITCHING. Allow a subject to “code switch” between a dynamic array of modes and media as she moves back and forth between reading, writing, viewing, composing, and coding. Manipulating components freely can allow for a greater range of interpretive reading and writing strategies that could be described as spatial, algorithmic, visual, time-based, networked, linear, fragmentary, and more. We can see the beginnings of such affordances in tools like Scalar and CommentPress that begin to redefine the form that critical discourse might take. These new modes of knowledge production can begin to produce new epistemologies and textualities beyond those of print. The design challenge is how to give form to dynamic materials and practices.

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References

- Bardzell, J., & Bardzell, S. (2013). What is “Critical” about Critical Design? *CHI 2013: Changing Perspectives, April 27-May2, 2013, Paris, France* (pp. 3297-3306). ACM.
- Bratton, B. (forthcoming). *The Stack*. Cambridge, MA: MIT Press.
- Burdick, A., Drucker, J., Lunenfeld, P., Pressner, T., & Schnapp, J. (2012). *Digital_Humanities*. Cambridge, MA: MIT Press.
- Candy, S. (2015, 09 18). Private conversation.
- Drucker, J. (2014). *Graphesis: Visual Forms of Knowledge Production*. Cambridge, Massachusetts, USA: Harvard University Press.
- Drucker, J. (2011). Humanities Approaches to Interface Theory. *Culture Machine*, 12, 1-20.
- Dunne, A., & Raby, F. (2001). *Design Noir*. August/Birkhäuser.
- Dunne, A., & Raby, F. (2013). *Speculative Everything*. Cambridge, Massachusetts, USA: MIT Press.
- Emerson, L. (2014). *Reading Writing Interfaces*. Minneapolis, MN, USA: University of Minnesota Press.
- Galloway, A. R. (2012). *The Interface Effect*. Cambridge, UK: Polity Press.
- Intel Corporation. (n.d.). Retrieved 09 15, 2015, from The Tomorrow Project: <http://tomorrow-projects.com/>
- Johnson, B. D. (2011). *Science Fiction Prototyping*. San Rafael, CA, USA: Morgan & Claypool Publishers.
- Kelly, J., & Matthews, B. (2014). Displacing use: Exploring alternative relationships in a human-centred design process. *Design Studies* (35), pp. 353-373.
- Kling, R. (1973). Towards a person-centered computer technology. *Proceedings of the ACM annual conference* (pp. 387-391). Atlanta, Georgia, USA: ACM.
- Manovich, L. (2001). *The Language of New Media*. Cambridge, Massachusetts, USA: MIT Press.
- McGann, J. (2014). *A New Republic of Letters*. Cambridge, Massachusetts, USA: Harvard University Press.
- Microsoft Office Labs. (n.d.). *Microsoft Office Labs*. Retrieved 09 13, 2015, from Microsoft Office Labs: <http://www.microsoft.com/office/labs/index.html>
- Microsoft Office Labs. (n.d.). *Microsoft Productivity Future Vision (2011)*. Retrieved 09 15, 2015, from You Tube: <https://www.youtube.com/watch?v=5jzAAPccBaU>
- Ratto, M. (2011). Critical Making: Conceptual and Material Studies in Technology and Social Life. *The Information Society*, 27, 252-260.
- Tuomi, I. (2005). Beyond user-centric models of product creation. In *Everyday Innovators* (pp. 21-38). Springer.

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the DIGITAL
HUMANITIES

Jessica Barness
Amy Papaalias
guest editors

December 2015

critical making

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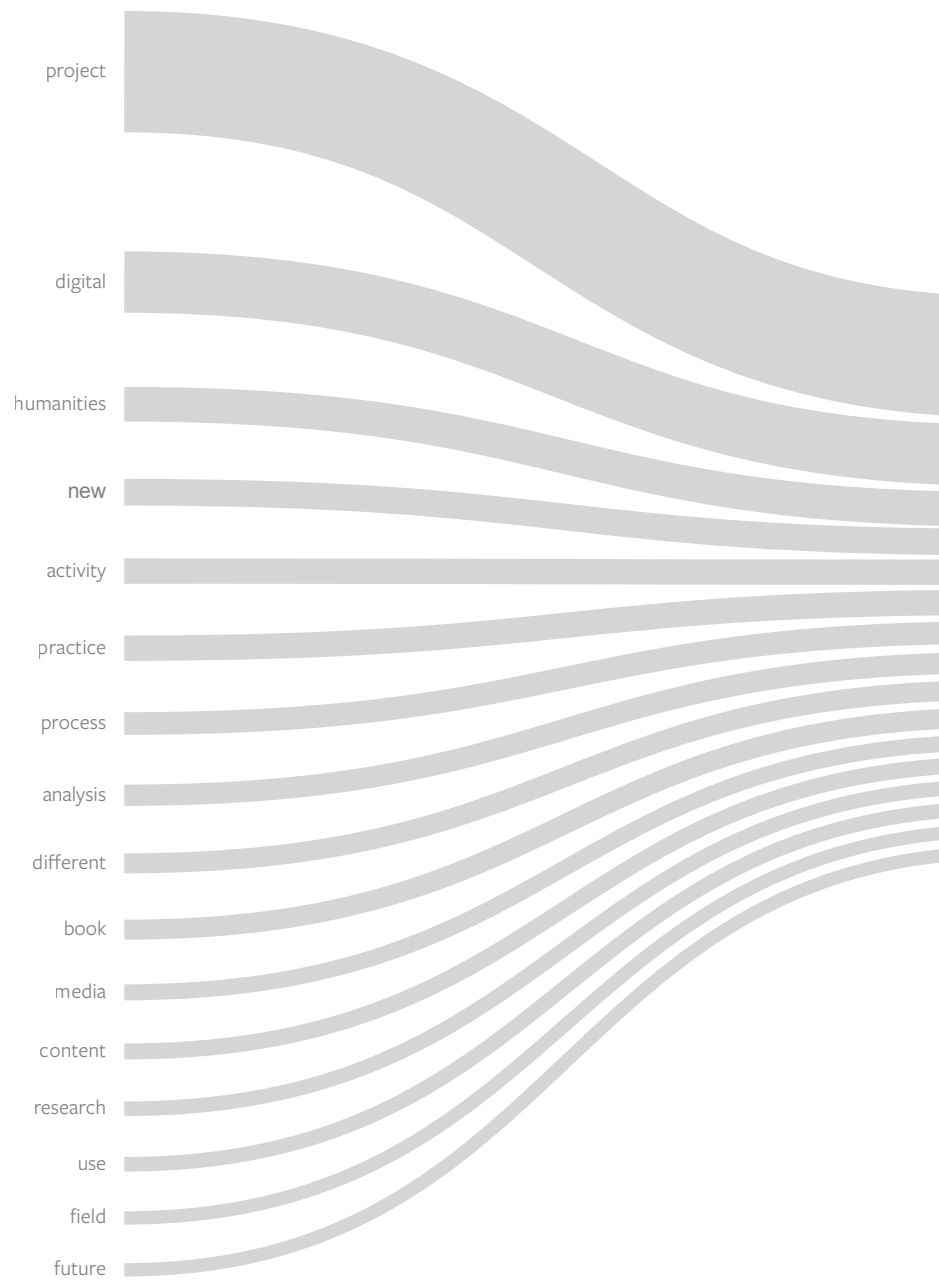
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Clues. Anomalies. Understanding.

Detecting underlying assumptions and expected practices in the Digital Humanities through the AIME project

Donato Ricci
Robin de Mourat
Christophe Leclercq
Bruno Latour

Abstract

Imagine a collective inquiry presenting its results before the collaboration has even started; an academic book without footnotes and references; an open, on-and-off-line platform to collaborate with peers where all must subscribe to a strict protocol to express their ideas. This is the AIME (An Inquiry into Modes of Existence) project. It is an experimental intertwining of analog and digital practices often contradicting the norms and formats they belonged to, thus creating expectations and protestations from different communities of users. Adopting a critical position toward the project, we multiplied the listening devices to collect these accusations. We propose, here, to reframe them as **clues** to detect the different practices and assumptions at work in collaboration-based projects, design, and Digital Humanities communities. This paper details the methodical activity of collecting clues, grouping them in specific **anomalies**, then explicating the choices that generated them. In a situation where Digital Humanities are still delineating their position and role in the wider academic environment, our way to study the AIME project will help reframe the role of experiments in the Digital Humanities. This study about AIME enables an **understanding** of some underlying assumptions and expectations in Digital Humanities.

This article has a digital component available at <http://bit.ly/dhanomalies>

Keywords: anomalies, close reading, collaborative frameworks, critical and speculative design, digital humanities

Introduction

An Inquiry into Modes of Existence (AIME) project tried to explore the many discrepancies between the description that the Moderns are offering of their values and the ways they are defended in practice. For instance, there is a huge gap between Science capital S and the scientific institutions. There is almost no relationship between Technology as it is hyped and the ways technical artifacts are actually produced. This gap also exists in law, politics, religion, etc. Such discrepancies raise the question of deciding which version of their values the Moderns are ready to defend: the official one or the more practical ones? In order to pursue such a vast inquiry, we needed to transform the inquiry of a lone ethnographer into a collective undertaking of a community of co-inquirers. In order to achieve this transformation, in addition to the publication of a book, we produced a series of workshops and meetings and the design of a digital platform with the intention of testing and expanding the preliminary results of the inquiry.

Figures 1a–1b. The first instance of the project: the “report”. It features neither footnotes or glossary, nor any critical apparatus, while it presents a report-like index that provides the reader with a very precise overview of the contents. The graphic layout has been kept consistent between the French and the English version since some typographic elements, the expression in small caps or in square bracket, are signalling a link towards the digital platform. The first ones are “links” to vocabulary entries, the latter to mode or crossing descriptions.

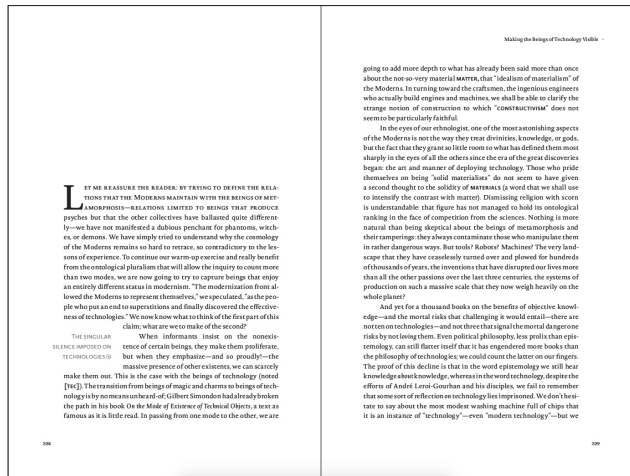
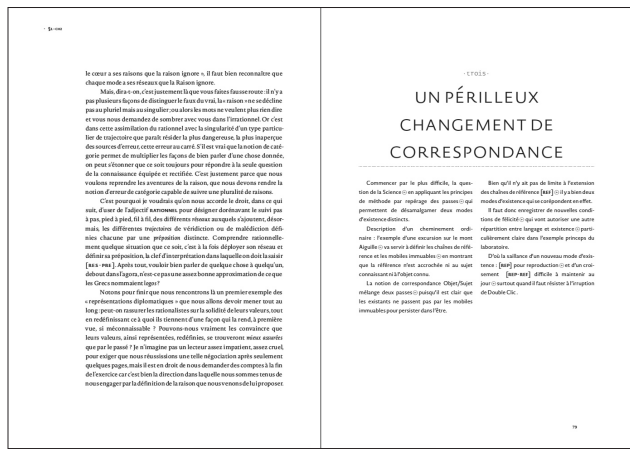


Figure 1c–1e. The second instance of the project: the digital platform. It is composed of two different interfaces, the first one named “book entry”, features all the items of the project in a layout composed of four columns. The reader is left free to navigate through a non-linear logic by clicking through the links bounding the diverse elements of the inquiry. The second interface, called “crossings entry”, displays the elements of the inquiry as sorted through the theoretical framework of the project, that is modes and their crossings.

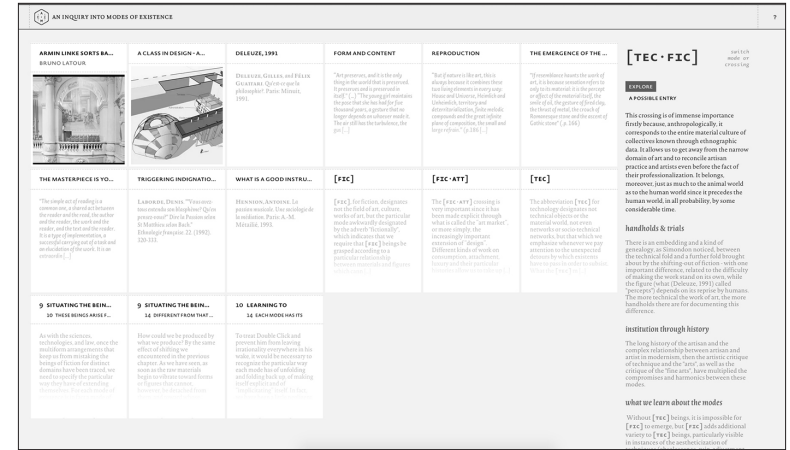
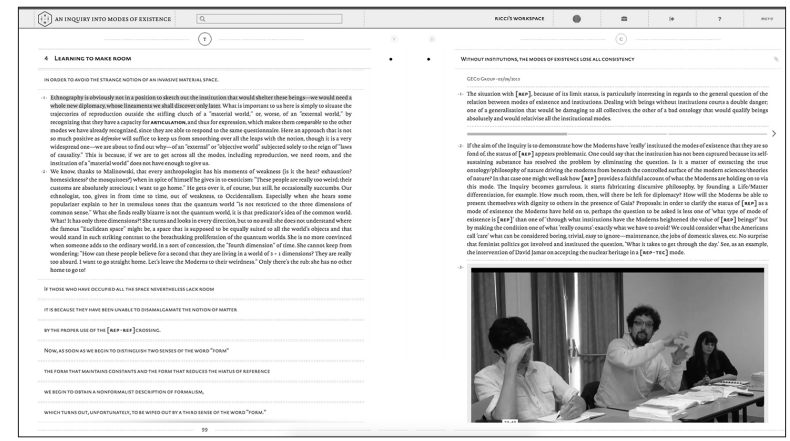
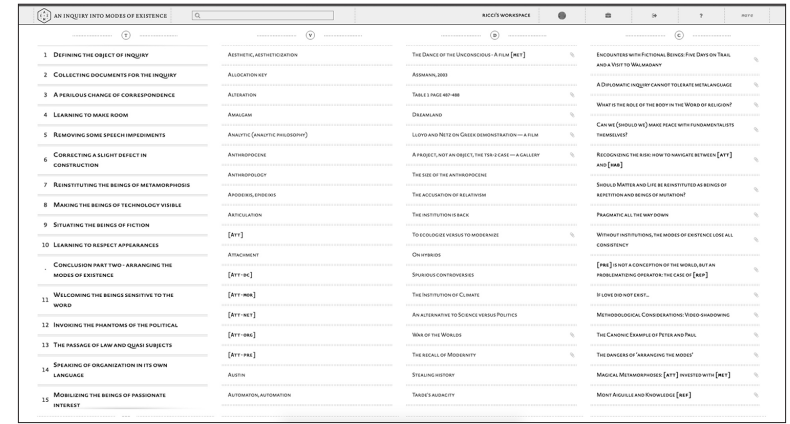


Figure 01f. The third instance of the project: the face-to-face meetings. During the course of the project 24 workshops have been organized to act as a trigger to contribute to the project. During these meetings various and different visual and multimodal formats have been deployed to foster the discussions and validate the philosophical argument produced.



This is where AIME project overlaps with innovative practices in Digital Humanities (DH). This meant we had to build, technologically speaking, an on-the-fly experiment that depended as much on the scholarly practices of philosophy and anthropology as on the many new skills and habits of the emerging DH field. Over a four-year timespan, a vast and diversified *set-up* of technologies¹ has been designed, developed, tested, and modified. Some of them clearly achieved the foreseen objectives, whereas others did not. For most of them, we struggled to design their features and to understand their agency. Although challenging from a management and scholarly point of view, this was not completely unexpected. AIME has provided the rare opportunity to craft all at once a new method of inquiry in philosophy, its own content, its format, and a way to disseminate its results, all the while striving to build an innovative relationship with a diversified spectrum of readers. In a more than chaotic trajectory, design practices played a major role, acting as critical and speculative agents². To understand the role of AIME in the field of DH, as well as what has to be retained as good practices and what should be avoided in similar future projects, we offer here a thoroughgoing analysis. It is an empirical observation – to this extent we will try to adopt the same research posture as the AIME inquiry itself – based on the gathering of different feedback collected with heterogeneous strategies: from digital methods of research to web analytics; from qualitative interviews to an online questionnaire.

Figure 2. (opposite) AIME schematic table. In this poster the main features of the different instances of the project are shown to highlight their connection and interactions.

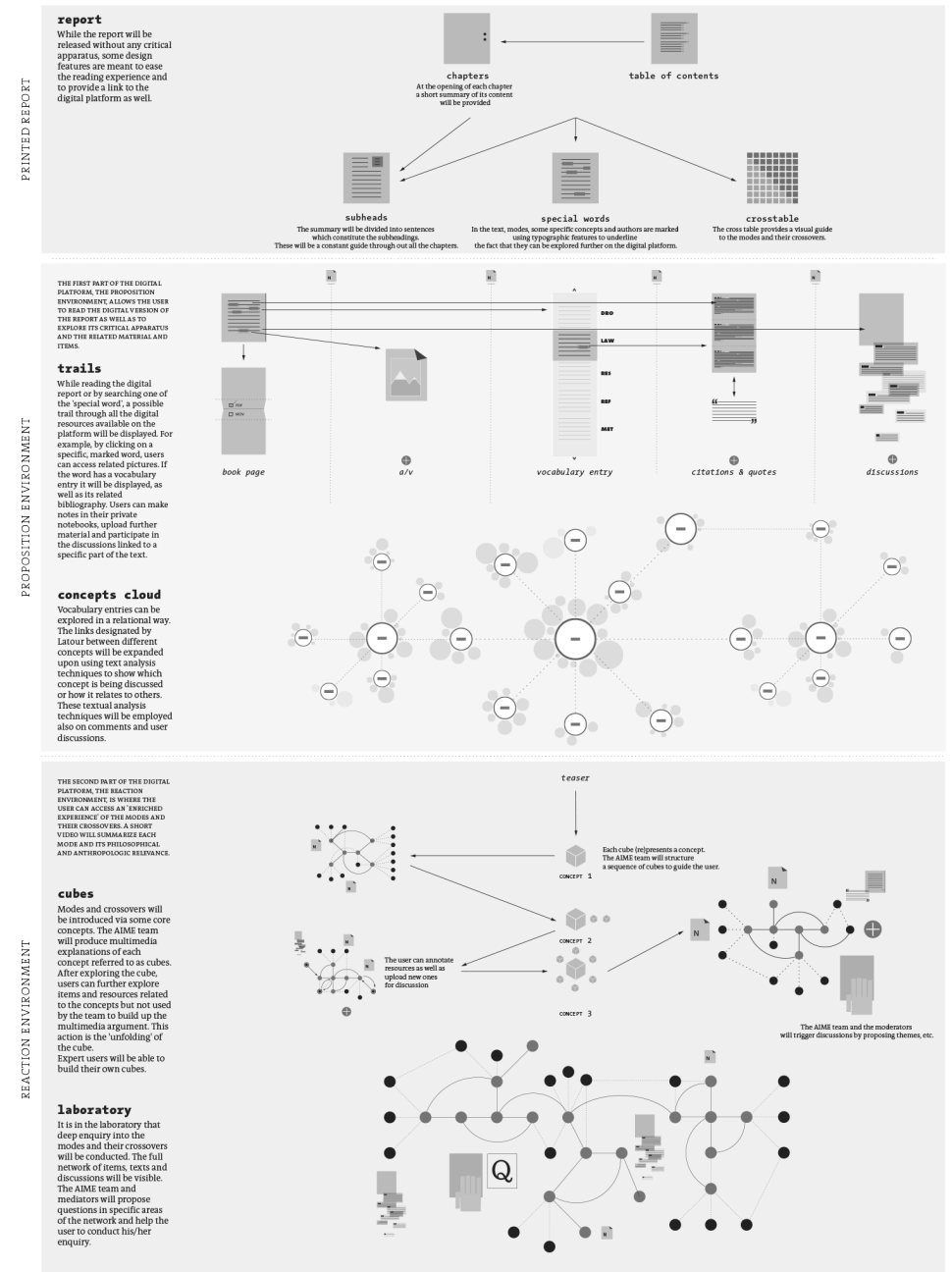
AIME and its Digital Humanities set-up

Johanna Drucker (2013) stated that finding a vocabulary – and we would also add finding the meaning (*what it is*) and the sense (*what it does*) – of a new technology (and here the new technology is the entire AIME set-up) takes time. During the initial

- 1 Here the term set-up refers to the network of complementary instances of the project: interconnected material artifacts (i.e. print, web interfaces, meeting rooms) as well as people with their skills supporting an ecosystem of distributed practices.
- 2 Lukens' (2011) definition perfectly describes our design attitude in engaging with the project: "Speculative design is an approach to design that emphasizes inquiry, experimentation, and expression, over usability, usefulness, or desirability. A particular characteristic of speculative design is that it tends to be future-oriented."

Enquête sur les Modes d'Existence

schematic table



development of AIME set-up, only a few components were presupposed and could be identified via a specific nomenclature. One of these is the principal investigator (PI): Bruno Latour. In one of the first public presentations of AIME, delivered in late 2011, he defined AIME as a collective procedure triggered by a series of troublesome anthropological and philosophical questions. AIME's ambition was to invent a specific medium for an empirical³ inquiry. The inquiry had started 25 years earlier as a personal endeavor⁴. Given the huge scope and topic, it now had to be opened to other researchers willing to use the AIME protocol and method (borrowed from William James) in order to validate and expand the results. In this presentation, the moments of hesitation about the medium are clear, and the names for designating technologies and procedure are shaky, signaling something still to invent. Leaving the philosophical community to judge the relevance and quality of the AIME arguments, in this paper we dedicate ourselves, instead, to describing the evolution of these hesitations. They evolved into a chimera whose body parts do not have a clear identity, becoming one of the "strange beasts" described by Ludovico (2012). Thus, here was

a collaborative inquiry presenting some results before the collaboration was even started; an academic book without footnotes and references; an open, on-and off-line platform to collaborate with peers where subscribing to a strict protocol was required. It is a set-up that was composed

before it was able to be described⁵. Eventually, we identified some BUILT-IN EXPECTATIONS where the produced artifacts did not present all of the features required from the general type of media they belonged to.

Observing how people described AIME is enlightening. By analyzing 39 web pages retrieved by employing five different search-engine queries, selected according to their relevance and pertinence (Rogers, 2009), almost all the pages mentioned the book⁶, but only a few of them called it a report. While it is easy to label a printed aca-

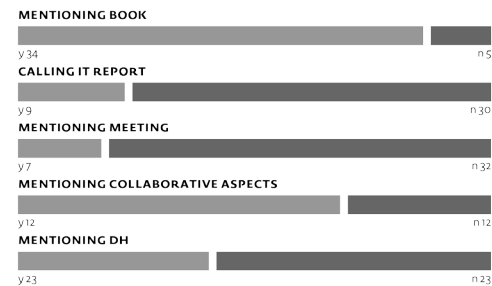
3 It is empirical in the sense that the demonstration and discussion of the philosophical arguments are grounded on anthropological experiences fostered by diverse types of documents (iconic, audio visual, textual...).

4 For an historical account of the project see (Latour, 2013).

5 Obviously this does not mean that we had no plan or strategy. It is simply that these were anticipated as achievements of the philosophy itself. Figure 2 is among the very first comprehensive depictions of the project.

6 The first community-oriented instance of the project is a printed artifact called "preliminary report". However, designating it as a philosophical book may be dangerously misleading. It does not present the expected conventional cognitive and cultural features expected from a philosophical book. It features neither footnotes or glossary, nor any critical apparatus. It presents

Figure 3 .
Count of the pages mentioning the different components and naming of the AIME projects.



demic artifact as a book, "the very best 'interface' ever designed" (Ludovico, 2012) to convey arguments, it has been fairly impossible to reinforce its unstable nature by associating it with the word "report". It is a kind of MISMATCHING OF LEXICAL REFERENCES where the labels used for an established artifact didn't fit with "new" experimentation. Another interesting element of reflection emerged from the relatively small number of pages mentioning AIME as an experiment in DH, even though, looking at Twitter activity during the DH2014 meeting, Latour's keynote speech received a great deal of attention. These initially high expectations were quickly frustrated by the clumsiness of the first version of the online platform and by the type of DH activities conducted on it. Aren't these clues of a kind of MISALIGNED SET-UP PRACTICES for DH, where data visualization and large datasets are supposed to be the "new" norm, whereas the close reading of large numbers of documents is not?

Almost all the pages retrieved above mentioned the AIME collaborative aspects of the digital platform,⁷ but only a few cited the face-to-face meetings⁸ that had been widely communicated. This lack of citation is in marked contrast to the other digital methods analysis (Rogers, 2013) that we conducted using Twitter. Having a look at the graph produced by connecting hashtags and users certainly gives the impression of a complete contrast.

Evident at first glance is a polarization between AIME and its PI. It is probably the clue of a PERSONALITY AND STATUS REFRACTION where the reputation of a specific project actor multiplies engagements with the project itself. If we remove the two main nodes, a clearer view of the discussion around AIME arises. Some discussions are shown to be revolving around DH memes (eg. #digitalhumanities) and are clustered around the various AIME workshops and side events (eg. #thatcamplyon). As would

additional characteristics atypical of philosophical book templates, such as expanded margins and a report-like index that provides the reader with a very precise overview of the contents. This first printed instance is, therefore, an incomplete or defective version of a philosophical book. This incompleteness is intentional; it is a call for reworking the project along with the other instantiations of the inquiry, and especially the digital interfaces of the project.

7 The digital interfaces of the project find their unity in a shared URL: modesofexistence.org. This accesses a blog-like home page and two interfaces for the inquiry contents.

The first interface (modesofexistence.org/inquiry), named "book entry," features the elements of the project in a layout composed of four columns: the first presents the preliminary report (txt), then comes a vocabulary discussion and definition column (voc), then contextual documents along with bibliographical references (doc), and, last but not least, collective contributions pointing at elements from the three previous columns (cont). The reader is then left free to navigate through a non-linear logic by clicking through the links bounding the diverse elements of the inquiry, reassembled through specific visual agencies depending on the main element read by the visitor. The second interface (modesofexistence.org/crossings), called "crossings entry," displays the elements of the investigation as sorted through the theoretical framework of the enquiry, that is modes and their crossings. It allows for the building of alternative and non-exclusive pathways, called scenarios, into the network of contents (book paragraphs, vocabulary entry, documents), each scenario intended to shed new light on the meaning of modes and their crossings.

8 Another instantiation of the project consisted of physical meetings gathering various people interested in specific modes and responding to a call for contributions on the digital version of the inquiry.

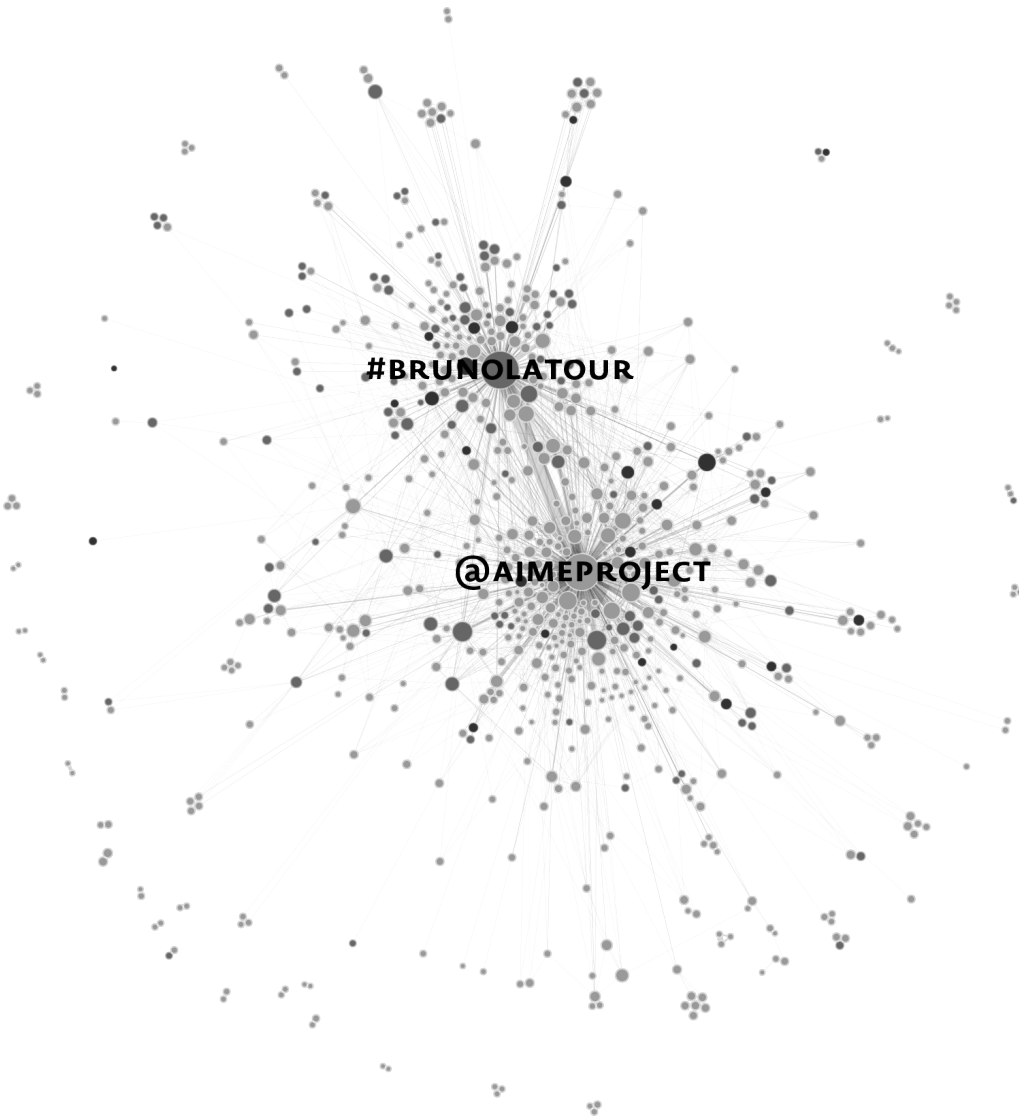


Figure 4.
Graph depicting the link between users (@) and hashtags (#) for the AIME project.



Figure 5.
Graph depicting the link between users (@) and hashtags (#) for the AIME project. The nodes @aimeproject and #brunolatour have been removed to show how the network is organized around the events #.

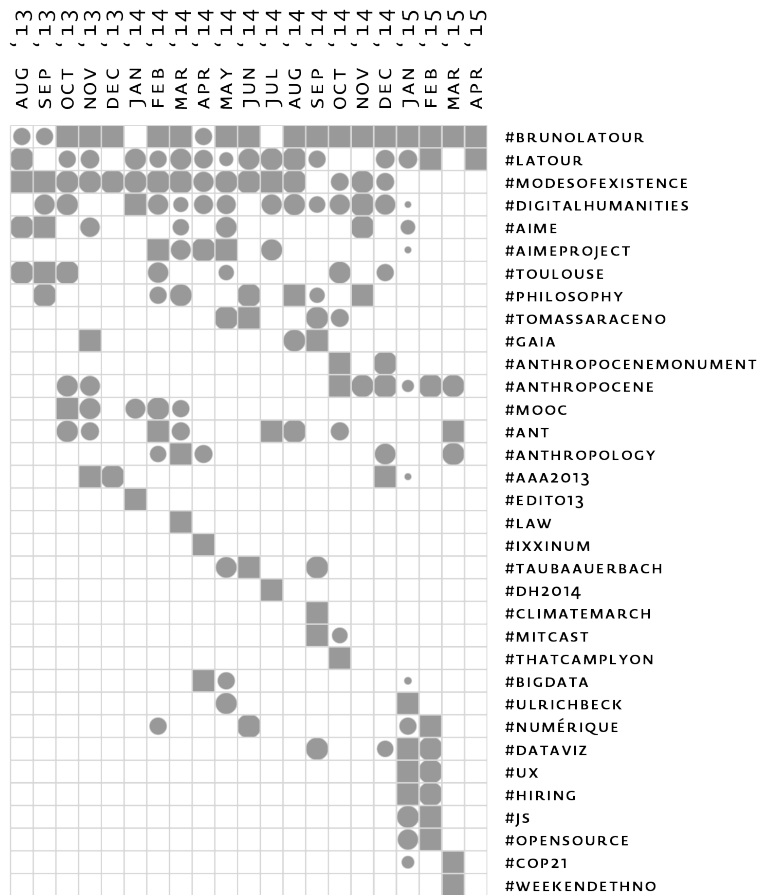


Figure 6. Heatgraph depicting the relevance of the different # during the time of the project. The first five are present during all the time of the observation; all the others are clustered in specific moments.

be expected, discussions appear around the usual fields of study with which the PI is associated (#sociology, #ANT⁹, #STS) as well as other projects conducted by him (#mooc, #cop21). Here we can see a sort of AMALGAMATION OF HETEROGENEOUS PUBLIC, where the composition and scale of the communities being formed do not fit with what had been expected. The projected audience did not conform to a single discipline/community, which engendered some confusion, thereby leading to misunderstandings.

9 ANT stands for Actor-Network Theory, while STS stands for Science and Technology Studies

Methodology: multiplying listening devices

This is a shallow *understanding* of what the AIME project did, trying to recombine inventive and classic intellectual technologies. With different timing in each case, the project created different expectations from various communities,¹⁰ philosophers, designers, and DH researchers, as well as created a wide range of frustrations and protestations.

We are proposing to reframe these different elements as *clues* allowing us to detect different *analogous*¹¹ practices and assumptions at work in philosophy, collaboration-based projects, design, and DH communities. In order to do so, this paper will:

- detail the methodical activity of collecting different criticisms and analyzing the data produced by the project;
- interpret them as *clues* signaling *anomalies* (expressed in SMALL CAPS) grouped into main 3 families;¹²
- look for an understanding by eliciting, using an insider point of view, the choices which eventually generated them;
- evaluate each AIME project anomaly as: a) a future norm (innovation), b) a useful mistake for similar experiments in the future, or c) an uncertain anomaly, which reveals nonetheless underlying assumptions in the audience and participants.

What is at stake here is the evaluation of the process of building set-ups central to the DH hermeneutics (Ramsay, 2011). In a situation where the DH is still delineating its position, shape, and role (Svensson, 2010), our way of studying the AIME project — focusing on what has been done and said more than on what it is — will help to produce a wider understanding of some assumptions and expectations about DH itself.

The DH field is increasingly heading to a certain stabilization of formats, methods, and goals,¹³ supported by the development of shared standards and infrastruc-

10 For a thorough, qualitative analysis of AIME project's outsiders diverging expectations, see Nyrup and Thomsen (2015).

11 Here the word *analogous* is in contraposition to the word *anomalous* as for the linguistic quarrel of ancient started in ancient Greece and then developed in Rome. While the doctrine of the analogy fostered the idea of a rational language stemming from regular fixed grammatical rules, the doctrine of the anomaly saw language as a spontaneous phenomenon crafted by its living use, evolving and modifying itself, thus admitting divergences and irregularity. The meaning of the term should not be taken in contraposition to digital.

12 A further family has been identified as well. We have temporarily dubbed it DEVELOPING THROUGH PUBLISHING, which refers to the peculiar process of developing a project while having already constituted an audience around its first instance, and to the role of different team members in such an endeavor. Since it is still under elaboration, we prefer not to publish it here and develop it in future contributions.

13 Although not in a strictly rigid normative sense, it could be cited as a clue toward this need of standardization noted in a passage from the book *Digital Humanities* (Burdick et al., 2012): "Curation, collection, and data management are cohering around shared standards, while concrete rationales for the production and deployment of Digital Humanities methodologies have emerged in the academy."

reactions were aligned in their understanding of this *multimodal*¹⁶ strategy. However, others revealed that this distributed media organization ended up with some MISSING CONNECTIONS between the components of the project. Some descriptions simply did not take into account one or several of the project instances, pointing out, in their critique, a lack of consistency or solidity, while other ones found fault in one instance, not to propose the functionalities that were aimed at being fulfilled by another one. Hence, the printed instance was blamed for not providing contextual references — they were available in the ‘book entry’ of the digital platform; the ‘book entry’ of the platform was accused of not allowing enough discussion and debate, which were designed to be held during physical events, and so on. What had been conceived of as a distributed environment of complementary workplaces, was received in these cases as a hegemonic and constraining factory for digital intellectual labor¹⁷.

Another source of displacement in the understanding of the project came from BUILT-IN EXPECTATIONS and the deceptive, although natural, comparisons they made explicitly or implicitly between AIME specific artifacts and more widespread new media formats¹⁸ with which they shared some features or methodological resonances. Indeed, while the printed artifact has been criticized for being flawed as a defective version of a “philosophical book” due to its lack of critical apparatus, more subtle analogies were made regarding the digital instances.

The principle of a collective endeavor supported by digital means and framed through systematic guidelines often caused the project to be likened to an encyclopedia.¹⁹ This has been reinforced by some AIME platform features, such as its extended glossary (voc column of the ‘book entry’), its systematic organization through modes of existence, and as a network of linked entries. Therefore, these latter similarities caused multiple, related protestations about the absence of some topics judged as mandatory in the AIME database (e.g. feminist history, petro-chemicals, etc.) or more

16 As McPherson (2009) stated, a multimodal scholar should make profit of a variegated array of literacy forms. She goes further in posing a question that was at the very core of AIME: “How do you ‘experience’ or ‘feel’ an argument in a more immersive and sensory-rich space?”

17 This latter feeling could also have been favored by the technical problems faced by the site, which made it slow and irritating, due to its experimental and evolutionary history. The lack of seamlessness may have engendered some doubts about the relevance of such an ecosystem of instances: “In any case, it is faster and easier to negotiate the book via a PDF file than through the web interface, or certainly it is better to keep ready to hand the PDF or the paper copy when waiting for the website to slowly grind back into life.” (Berry, 2014)

18 Namely social media platforms, blogging platforms, wiki websites, academic documents, online repositories, and digital archives.

19 This distinction has been underlined several times and in different writing; for further discussion see (Ricci and De Mourat, Forthcoming; Ricci, 2013) and (De Mourat, Donato Ricci and Boulanger, 2014).

broadly a supposedly exhaustive and, thus, hegemonic approach to AIME’s philosophical project, namely the description of the Moderns, contradictory to the scope of the project.

We also noticed that the project has been recurrently compared to the archetype of Wikipedia and its corresponding principles of organization. Wikipedia’s approaches to *crowdsourcing*, *source citing*, or *content mutability* were projected on AIME’s own principles, and seem to have produced misaligned requirements about its content management policy and collective organization²⁰.

Another recurrent comparison was with blogs, from the PI’s argument about blogs being the opposite of the project’s principles of collaboration, to external critiques emphasizing the similarities between the two forms, and thus the lack of “originality” of the set-up, contradicting its claims of exceptionality. Comparison with blogs provoked the evaluation of the project in terms of innovation, and its distance from the *conventional* point of reference of blogs. It also imported false expectations regarding a presumed easiness to comment upon and discuss user contributions.

We could try to explain the MISSED CONNECTIONS provoked by the project as a clash between the tradition of the humanities to use (one) text as the main (and only) medium for intellectual argument, and AIME multimodal shifts through several complementary instances. But if we then try to understand them in the specific context of DH experiments, some MEDIA-RELATED EXPECTATIONS may also have been caused by the heterogeneity of the AIME set-up in terms of templates’ compliance or divergence: on the one hand various generic media and tools used for the project life (Twitter, AIME blog, mailing list, shared on-line meeting materials), and on the other hand the parts that were specifically designed for the inquiry. The latter presented a strong visual and organizational homogeneity (for instance, book and interfaces were presented with the same typesetting and colors, dialoguing with similar visual codes). It could be stated, firstly, that their peculiarity asked for some linking with existing templates, provoking the displacements that we have described. Secondly, the specifically new artifacts were perceived as designed to fulfill every cognitive and intellectual expectation of such a project, while some of them, like project discussion and scholarly debate, could and have also been fulfilled by more generic media such as twitter or blogs.

20 See also anomaly family #3.

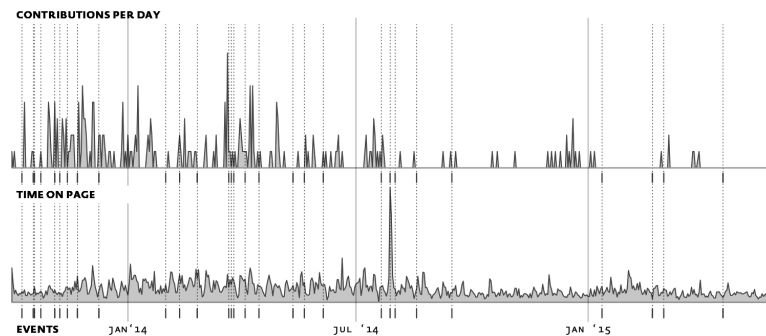
Anomaly family #2: interface-driven methodology and its encounters with scholarly publics

The practices proposed to the co-inquirers in order to fulfill the project methodology did not fit with the large spectrum of skills demanded.

The peculiarity of the intellectual and practical requirements to contribute provoked a certain intimidation to potential contributors.

Methods	Clues	Anomalies	Understanding - explanation
Database of users' visual analysis Website analytics visualization Questionnaire visual analysis Twitter activity analysis	A small number of the participants contributed to the project. A small number of the participants presented both "traditional" and "digital" literacy skills needed to fully participate to the project. People practicing the whole set-up were more likely to contribute successfully to the project.	EVOLVING SET OF SKILLS UNUSUAL BLEND OF PRACTICES MISMATCHING OF LEXICAL REFERENCES MISALIGNED SET-UP PRACTICES	There is a tension between interface-driven methodologies and the DH users' various literacies. Supporting collective inquiries through the design of new digital tools demands long learning curves. Relying on complementary and non-digital instances helped to engage participants in a complex scenario of use.

Figure 8. Timelines depicting the number of contributions created per day (top chart), and the cumulative time spent by readers on the website (middle chart), in relation to the AIME events agenda preceding or following a peak in activity.



Once the different reactions provoked by AIME were observed and analyzed, we could focus on the very activity of people engaged with it. The possibility of contributing to the inquiry was meant to be open to diverse practitioners and scholars able to witness the clashes between the "modes of existence". This process required an **EVOLVING SET OF SKILLS**: the co-inquirers should have known the main inquiry narrative by having read the report (traditional humanities literacy skills), then to have navigated through the extended contextual contents on the "book entry" ("digital literacy" skills). There, they could bookmark some excerpts through a specific functionality. Eventually, they were encouraged to propose a "contribution" to the inquiry by attaching to one part of existing content a production of their own

Figure 9. Timelines depicting, per day, the number of consultations of each of the four columns of the "book entry". Namely: text column — featuring content of the printed instance, vocabulary column — acting as a glossary, documents column — featuring bibliographical references and media documents, and contributions column — featuring co-inquirers productions. These are compared with the project agenda of events. It can be seen a proportional rise in consultation of "contributions" as compared to "text" that correlates with AIME events.

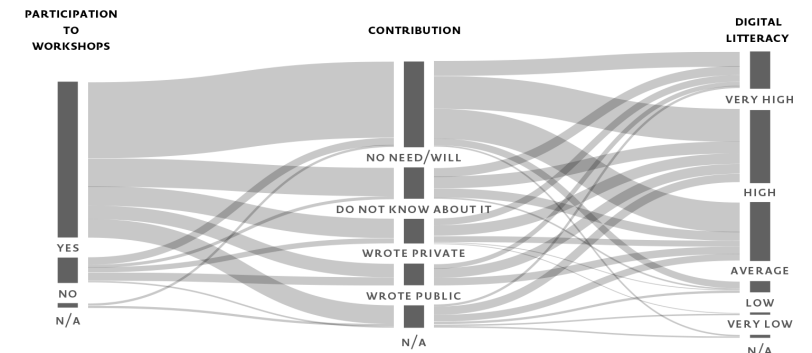
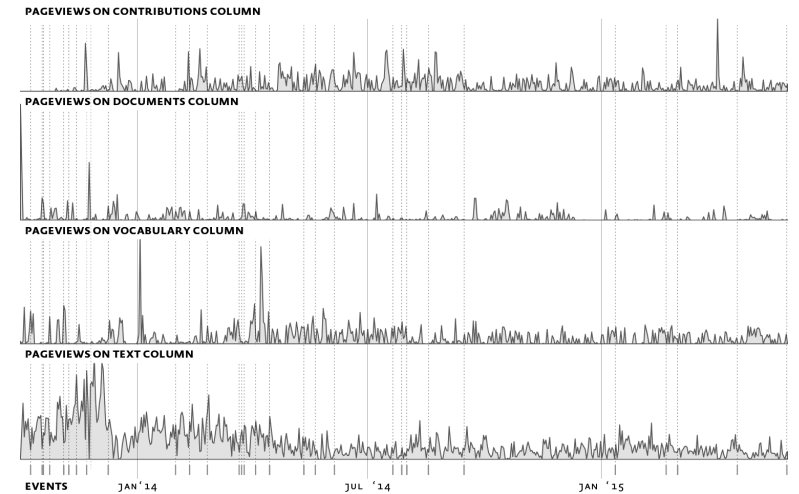
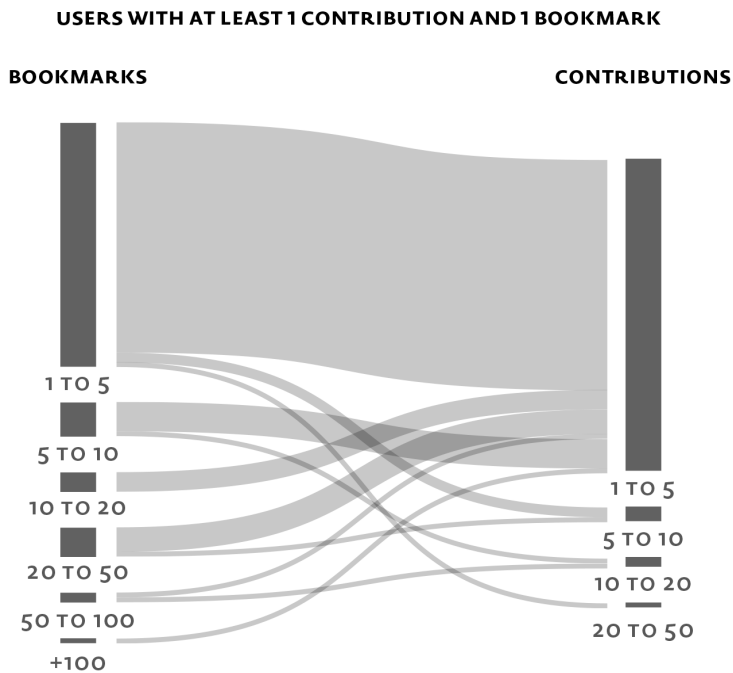


Figure 10. Alluvial diagram depicting the co-inquirers' answers to an online questionnaire involving 249 respondents, and showing the correlations existing between their participation in workshops, their attitude and practice towards the contribution activity, and their digital literacy. The majority of contributors were involved in workshops, and declared to have a high or very high level of digital literacy.

in order to amend/expand the original PI work (philosophy and anthropology-related skills). In this process, a huge role was also played by the face-to-face meetings, mainly aimed at discussing, accompanying, and encouraging contributions on the platform. Comparing reading and contribution activity of the platform overall and the project events agenda, it seems that the digital platform activity was correlated with the AIME workshops and events agenda.

Looking, then, at project reading metrics in more detail, it can be seen that the "contributions column" was proportionally more and more consulted as workshops were deployed. These correlations show that the co-inquirers subscribed rather well to the proposed sequence of activities. Accordingly, when looking at the questionnaire sent to platform subscribers, it can be seen that people participating to workshops were more likely to write contributions and to get published. Furthermore,

Figure 11. Alluvial diagram, based on AIME web platform database of users, depicting the correlation between contribution activity and bookmarking activity among the subset of co-inquirers that have used both of these functionalities. An important correlation between high bookmarking profiles and prolific contributors can be highlighted.



most of those who declared having actually read the report happened to own or use a hardcopy of the inquiry and also to have read the documentation of the project (voc and doc columns). These findings are a good indication of some success in the AIME multimodal plan of action. However, they also reveal that this multimodal awareness was the main condition for having people successfully engaged in the project methodology, whereas “single-medium” participants were left behind.

The UNUSUAL BLEND OF PRACTICES required by the project online contribution scenario asked the participants to pass through a series of particular steps designed to make their work become an empirical contribution fitting into the AIME methodology. To do so, following the suggestion to react to specific parts of the text rather than addressing general remarks, they were first supposed to select an anchor point, being a report or vocabulary word or paragraph, and then attach to it a “contribution”.²¹ It is clear that a first condition for being able to contribute was to know how to navigate and get acquainted with the contents available on the web. Users declaring to have the highest digital literacy level were also the ones who declared to have profited from the writing and bookmarking functionalities. But if we look

21 In order to emphasize the role of empiricism, the “contribution” was a composite and constrained format composed of a short abstract and a series of slides presenting commented documents.

more deeply into the platform database of co-inquirer activity,²² it can be noticed that the diverse, demanding practices were deployed by a rather small part of the community composed of participants who used most of the platform’s functionalities together: people who had discovered/used one of the website features were more likely to enter the complete scenario of use that was proposed to them.

Digital literacy (Gilster, 1998) proved as well to be an important factor for subscribing to the methodological affordances of the project interface. An insightful clue to the digital literacy required by the project is the observation that almost none of the few questionnaire respondents declaring to have a low or very low level in this skill wrote a contribution. It seems that the overall project set-up was well-fitted for a very specific category of users, those who presented both content and research-related skills and familiarity with digital environments²³. Having a look at the qualitative feedback from the person in charge of managing contributors,²⁴ some explanations can be found. In addition to the difficulty of finding, understanding, and using such features,²⁵ a strong intellectual compliance to the contribution format (an abstract followed by a series of commented documents) was required: it has been as much a practical as an intellectual obstacle to some of the people willing to participate to the project.

Another explanation may lie in the ways of presenting the project features to the reader. While the website was designed to focus attention and to help navigate inside a dense network of neatly packed content, it produced at the same time a certain intimidation for the potential contributors; such a feeling has been recurrently reported to the team. The design of *rhetorical expression* (Buchanan, 1985) developed in the AIME platform granted access to a huge amount of very sophisticated content, and simultaneously asked for contributing to and expanding that content.

While multimodal inquiry and composition seem to be one of the most discussed and experimented topics of DH field (Eyman & Ball 2015), we have experienced how such an endeavor needed to take into account various DH public literacies, and how it sometimes collided with them: encouraging a specific mindset through very specific interfaces requires a long learning curve and inevitably excludes some users. However, mixing digital activities with other types of undertaking helps to strengthen on-screen practices, commitment, and the valorization of online contributions.

22 Collecting personal anonymized information declared at sign-up, and information related to bookmarking and annotation/contribution activity.

23 We are also aware that some scholars presenting a low or very low level of digital literacy were enabled to contribute thanks to team’s help.

24 Pierre-Laurent Boulanger, acting as “meta-mediator,” was in charge of coordinating the activities of reviewing the contributions submitted to the web platform and helping contributors to get acquainted with the process and rules of contributions.

25 It has to be said that the UI/UX elements for performing these actions are pretty similar to the ones present in the vast majority of reading/annotation software and annotations.

Anomaly family #3: the shock of collaboration's ethos

<p>People expected the web platform to present a transparent and open process of participation</p> <p>People did not know what recognition to ask/expect by giving of their time to such a project</p>			
Methods	Clues	Anomalies	Understanding - explanation
<p>Team's interview analysis</p> <p>Web pages reviews</p>	<p>People protested about the principle of contribution, both in its goal (helping Latour's work) and modalities (a closed process)</p>	<p>ETHICAL DISJUNCTION</p> <p>AMBIVALENT STATUS IDENTIFICATION</p> <p>MIDDLE-STATE PUBLISHING</p> <p>PERSONALITY AND STATUS REFRACTION</p>	<p>The specificity of DH inquiries inside the Academia collided with the notions of academic contribution and authorship.</p> <p>There are various distances and dissonances between the requirements of scholarly collaborative undertakings and web culture openness ethos.</p>

During a French Digital Humanities event,²⁶ the collective and collaborative nature of the AIME project was challenged as presenting a certain non-reciprocity between the main author and contributors: co-inquirers were asked to dedicate a huge amount of time while not being acknowledged clearly enough as genuine contributors to the inquiry. During the latter meeting, the very principle of contribution was under discussion as a matter of intellectual work reward.

If we compare the project idea of a contribution to that of the *analogical* academic publishing habitus, the AIME contribution activity is indeed somehow perturbing: it could be framed, on the one hand, as an open reviewing process where co-inquirers propose modifications and improvements, and, on the other hand, as a journal call for contributions through which accepted submitters get to the status of author. This hybrid, peculiar finality of the contribution activity, that fit with none of the established ways of recognizing and acknowledging scholarly work, has caused various aural and written protestations that we could frame as the sign of an *AMBIVALENT STATUS IDENTIFICATION* anomaly. Besides the very format of the contributions, a sort of *MIDDLE-STATE PUBLISHING*²⁷ between traditional academic contribution and academic blog argumentation²⁸ may have fed and complicated this latter anomaly.

26 THATCamp Saint-Malo. Held in Saint-Malo (France) from 17th to 20th October 2013. See books.openedition.org/editionsmslh/2203

27 This expression is borrowed from "The New Everyday" experiment in academic publishing. See mediacommons.futureofthebook.org/tne/about

28 See, for instance, the scientific blogging platform hypotheses.org

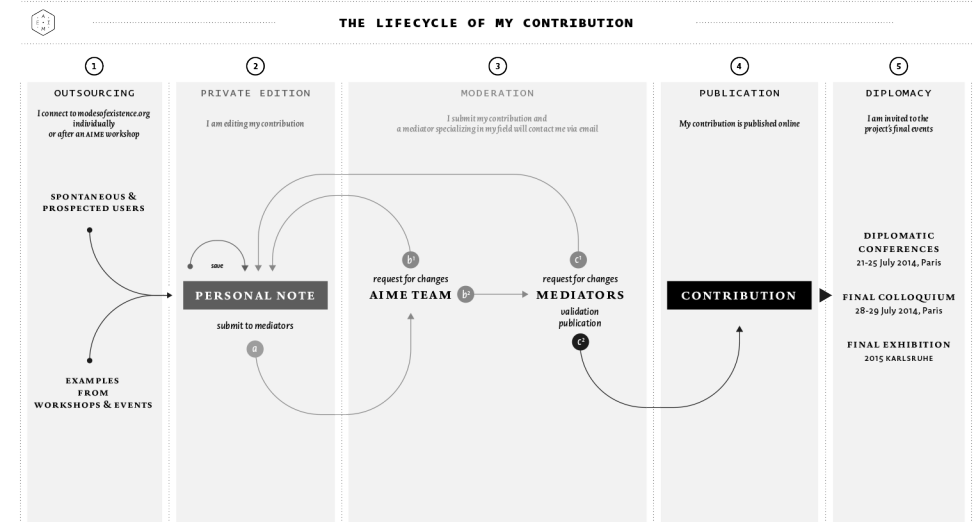


Figure 12. The life cycle of a contribution showing the mediation and review process. From a private edition, progressively and with the help of the AIME team, the submitted contribution reaches the “status” of being public and part of the AIME official documents.

It has to be said that the PI considered contributors to have specific and autonomous interests in the project and a shared, though limited, status of author. Even if limited, this acknowledgement of the co-inquirers' authorship has been emphasized by featuring them on platform credits. The contribution validation process itself has been under discussion as well. The contributions followed a definite process of mediation and review as a result of their compliance with a specific research methodology, strategy, and empirical protocol. They were evaluated and followed by a small collective of scholars acquainted with certain intellectual regions of the inquiry: these particular reviewers were labeled as *mediators*. This distribution provoked some concern. Some co-inquirers criticized the lack of transparency of the process²⁹ and questioned the “testability” of AIME methodology as a closed process. Here we face an intellectual critique highlighting an *ETHICAL DISJUNCTION* between design project choices and an intellectual debate about philosophical inquiry.

Another similar *ETHICAL DISJUNCTION* can be detected regarding the very discourse supporting the DH dimension of AIME, thanks to the reactions responding to some public presentations of the project to DH audiences that repeatedly framed *closeness* as one of the core values of the project. Closeness was presented as *distance*: a close arguments analysis also required a *close reading* activity rather than a *distant* one (Moretti, 2013). This first claim provoked reactions³⁰ about the relevance

29 The AIME team published 2 ‘AIME leaks’ to inform users about the revision process. For instance, see modesofexistence.org/answer-to-a-reader-reponse-a-un-lecteur/ the disclosure of a non-published contribution and its justification, and at modesofexistence.org/contribution-recognizing-the-risk-how-to-navigate-between-att-and-hab a successful contribution of email exchanges.

30 In his book Berry (2015) states, “The use of the ‘digital’ in such a desiccated form points to the limitations of Latour’s ability to engage with the research program of investigating the digi-

of such an undertaking in the context of “post-digital” research, implicitly assuming that because the set-up of AIME was making use of digital instances, it should have specifically addressed the question of digitality in its very contents and intellectual scope, and thus used distant reading activities, most appropriate methodology for activities such as “unpacking and ‘reading’ computational media and software structures” (Berry, 2015)³¹.

Closeness was also presented as *focus*: producing philosophical argument required a non-distracting environment.³² This declaration provoked strong reactions inside DH communities since openness³³ is one of the key values allowing humanities to address contemporary issues and reframe their role inside society (Spiro, 2012). Although this gap between web ethos of collaboration and closeness claims could be minimized by the fact that the whole inquiry content is freely available to anyone, and that its generated contents (not being formerly copyrighted) are published under Creative Commons license,³⁴ the question of controlling the process of collaboration remains under question. While the team members interviewed unanimously valued the opening of access as mandatory, others also argued for the need of a protection to maintain homogeneity and coherence within inquiry. Underneath the value statements discussion lay, also, a practical tension between the need for methodological quality and the broader political expectations about the formation of scholarly community in the digital age.

From an ethical point of view, we have seen that the complex process of constituting a collective body of inquiry provoked important reactions among its publics, responses motivated by several cultural references and agendas (advocates of an alternative academy, of open access, of open software...). We see through this anomaly how DH projects may gather under the same roof a broad variety of ethical guidelines and value systems. While openness is a shared value of digital humanists, it seems to us that the expression of such a notion would need somehow to be precisely cast regarding the several underlying meanings it is given (Tkacz, 2015) and modeled according to the specific needs and methodological goals of one’s project.

tal, but also the way in which a theologically derived close-reading method derived from bookish practice may not be entirely appropriate for unpacking and ‘reading’ computational media and software structures.”

31 The amalgamation of the PI’s discourse about AIME projects peculiar choices, and its broader positions about the philosophy of digital and software in general, while legitimate, could also be the sign of a *PERSONALITY AND STATUS REFRACTION*. See Berry (2015).

32 This concern has been expressed through design choices such as not pointing to external websites inside the digital instances of the project while allowing the embedding inside this protected workplace of a variety of media and contents coming from external sources.

33 “The digital is the realm of the open source, open resources. Anything that attempts to close this space should be recognized for what it is: the enemy.” The Digital Humanities Manifesto 2.0, manifesto.humanities.ucla.edu/2009/05/29/the-digital-humanities-manifesto-20/

34 The websites were nevertheless password protected because of legal reasons concerning quoted documents such as texts and videos, and the source code of digital interfaces was not published at first because it was not reusable as is. At the moment of this writing, interfaces are in the process of being open sourced.

Qualifying anomalies for a better (understanding of) Digital Humanities projects

By collecting clues and spotting anomalies, our AIME critical review helped us to get a better understanding of the feedback coming from different communities of users. In this last part, we will focus on operationalizing these anomalies to debrief and assess the AIME project itself, hopefully transforming the anomalies into recommendations, warnings, or observational remarks, and then reframing our approach within the broader Digital Humanities field.

To perform this anomaly-detection activity, we draw our methodological framework from an ancient dispute about the nature and evolution of language (Douay and Pinto, 1991). This opposed, during the 2nd century B.C., the stoics of Pergamon (the *anomalist* school) and the philologists of Alexandria (the *analogist* school). While *analogists* were looking for proportional repetitions to be instituted into grammatical rules, *anomalists* were looking for exceptions that would bring these rules into question. The situation ended up with a very fruitful debate where the description of language was as much at stake as the ethical rules for its further development. In other words, the question was whether to assess language in terms of conventional rules or relevance inside a specific context. Here, some anomalies we detected could be seen as *future analogies* and *future conventions*, becoming a base for *future norms* if they reached a certain level of dissemination.³⁵ Anomalies like *MISSED CONNECTIONS* could be attenuated by the proliferation of multimodal and distributed projects, and the *BUILT-IN EXPECTATIONS* that the project faced could be eluded and eventually replaced by its own medial peculiarities after a longer period of use.

It is inevitable to consider some AIME anomalies as mistakes or evitable transgressions of justified emerging conventions. These are not able (and for our case, not wished) to come back into any normative status. Such anomalies as *AMBIVALENT STATUS IDENTIFICATIONS* could have been handled in a clearer way.³⁶ The understanding of their genesis will inform other projects that would want to follow similar paths.

Some other anomalies could be qualified as specific, undecidable features. These cannot be cast into the former categories or linked to any guidelines or recommendations, either because they are caused by the encounter of irreconcilable viewpoints or are completely idiosyncratic to the project. For example, the *ETHICAL DISJUNCTIONS* provoked by the project remain still to be discussed, as the *UNUSUAL BLEND OF PRACTICES* issue remains attached to a peculiar methodological wager of the project. These are therefore anomalies of epistemological interest, informing “the ways” Digital Humanities publics expect and preconceive the artifacts they are dealing with.

35 We would here follow Canguilhem’s (1991) definition of anomaly regarding biologic life, as a successful mutation that “spreads into space rather than time” and is sometimes eventually recast as a normativity producer.

36 We could have for instance tried to feature inquiry’s contents through a wider range of points of view, acknowledging the work of particular contributors. We could as well have put a priority on providing co-inquirers with a way to reference their work and embed it on other places on the web.

Our reflective study helped to provide some feedbacks for a certain approach to Digital Humanities focusing more on the methodological renewal of Humanities through experimentation and design practices, than on the new intellectual and methodological challenges arising from the encounter between the digital and humanities topics and methods. In the introduction of his book David M. Berry (2012) framed DH latest developments as anomaly-producing agents that allow us to question and challenge the traditional values, expectations and methodologies of the humanities³⁷. Although this assertion is probably crucial for framing DH inside the broader humanities, we could also admit that DH are themselves in a process of normalization or “conventionalization,” following necessarily the installation of shared standards and infrastructures, but also values and practices grounded in the feedbacks given from the first experiments in the field.

In that sense, DH could be addressed as an anomaly themselves, as the temporary and preliminary sign of an imminent shift within the humanities. However, we argue that this conception is a perilous move, because it would wipe out the privileged capacity of DH to continuously interrogate, through an experimentation dealing with technical, social, and experiential *means*, the very *ends* toward which research is conducted. As Lunenfeld & al. (2012) stated:

“When new norms establish themselves, when new procedures and techniques become naturalized, assumptions can become invisible. [...] the new routines that structure this world of practice have the potential to become just as sedimented and automatic as those of the print era, and when they do, they sound the death knell for Digital Humanities as a practice that is both critical and experimental.”

The anomaly-tracking endeavor performed in this paper seems to be a good way to prevent this risk. Anomalous dimensions of DH experiments are essential features for their critical approach to the contemporary condition of humanistic knowledge. We advocate that they should not be left out of the future developments of the field, but rather deliberately produced and then observed for their reflective qualities. The interest of DH lies less in essential regulating principles than in a corpus of irregularities, tropes, or spontaneous moves that give its reflective and transgressive value to Digital Humanities practice.

37 “Indeed, we could say that third-wave digital humanities points the way in which digital technology highlights the anomalies generated in a humanities research project and that leads to a questioning of the assumptions implicit in such research, e.g. close reading, canon formation, periodization, liberal humanism, etc”. (Berry, 2012).

About the Authors

Donato Ricci is design lead and Post-Doc researcher at médialab | SciencesPo. He conducts research concerning the role of design practices in human and social sciences. He followed all the design aspects of the AIME project. Furthermore, he is involved in projects using visual models, tools, and approaches for observing social phenomena through digital traces. Since 2005, he has been part of the development of the DensityDesign Lab where he deepened his interest in exploring the role of visual languages to foster public engagement in complex social issues. He is Assistant Professor of Representação e Conhecimento at Universidade de Aveiro and teaches Data & Information Visualization at Parsons Paris.

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Christophe Leclercq is an art historian, teacher, and project manager working at Sciences Po and The Ecole du Louvre, Paris. His research is based on the relationship between art and technology, and on digital archives in art history (the E.A.T. Datascape). He has collaborated with many engineers, artists and designers toward the development of experimental projects in art, and the promotion and diffusion of their research via exhibitions, workshops, lectures, and conferences. He has acted as project manager of the ‘médialab’ and AIME Project (‘An Inquiry into Modes of Existence’), led by Bruno Latour.

Bruno Latour is Professor at Sciences Po Paris and head of its médialab, specializing in digital methods and digital humanities, and has recently published *An inquiry Into Modes of Existence* (Harvard UP 2013) whose content is replicated in a digital platform accessible on modesofexistence.org. All the references to his work and most of his papers are accessible on bruno-latour.fr

References

- Berry, David M. (2012). *Understanding Digital Humanities*. Palgrave Macmillan.
- Berry, David M. (2014). "On Latour's notion of the digital." Retrieved July 24, 2015. (stunlaw.blogspot.fr/2014/08/on-latours-notion-of-digital.html).
- Buchanan, Richard. 1985. Declaration by design: Rhetoric, argument, and demonstration in design practice." *Design Issues* 2(1).
- Canguilhem, Georges, and Michel Foucault. (1991). *The Normal and the Pathological*. New York: Zone Books.
- Douay, Françoise, and Jean-Jacques Pinto. (1991). Analogie/anomalie. Reflet de nos querelles dans un miroir antique. *Communications* 53(1).
- Drucker, Johanna. (2013). *What Is? Nine Epistemological Essays*. Victoria: Cuneiform Press.
- Eyman, D., & Ball, C. (2015). Digital humanities scholarship and electronic publication. *Rhetoric and the Digital Humanities*, 65.
- Gibbs, Fred, and Trevor Owens. (2012). Building Better Digital Humanities Tools: Toward Broader Audiences and User-Centered Designs. 6(2).
- Gilster, Paul. 1998. *Digital Literacy*. New Ed. New York, ny: John Wiley & Sons.
- Kemman, Max, and Martjin Kleppe. (2014.) Too many varied user requirements for digital humanities projects. Presentation at *The 3rd CLARIN ERIC Annual Conference*, 24&25 October 2014, Soesterberg, the Netherlands.
- Latour, Bruno. (2013). Biography of an inquiry: On a book about modes of existence. *Social Studies of Science* 43(2).
- Ludovico, Alessandro. (2012). *Post-Digital Print The Mutation of Publishing since 1894*. Onomatopée.
- Lukens, Jonathan, and Carl DiSalvo. (2011). "Speculative Design and Technological Fluency." *International Journal of Learning and Media* 3(4).
- Lunenfeld, Peter, Anne Burdick, Johanna Drucker, Todd Presner, and Jeffrey Schnapp. (2012). *Digital Humanities*. Cambridge Mass.: MIT Press.
- Manzini, Ezio. (2015). *Design, When Everybody Designs - An Introduction to Design for Social Innovation*. Cambridge, Massachusetts: MIT Press.
- Marres, Noortje, and Esther Weltevrede. (2013). Scraping the social? *Journal of Cultural Economy* 6(3).
- McPherson, Tara. (2008). "Introduction: Media studies and the digital humanities." *Cinema Journal* 48(2).
- Moretti, Franco. (2013). *Distant Reading*. Verso Books.
- Nyrup, Thomas, and Joachim Thomsen (2015). *AIME - perceptions and experiences*. IT University of Copenhagen.
- Presner, Todd, Jeffrey Schnapp, and Peter Lunenfeld. (2009). *The Digital Humanities Manifesto 2.0*. (humanitiesblast.com/manifesto/Manifesto_V2. pdf).
- Ramsay, Stephen. (2011). On building. (stephenramsay.us/text/2011/01/11/on-building/).
- Ramsay, Stephen, and Geoffrey Rockwell. (2012). Developing things: Notes toward an epistemology of building in the digital humanities. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press.
- Renear, Allen H. (2008). Text encoding. in *A companion to digital humanities, Blackwell Companions to Literature and Culture*, 218–39. Wiley-Blackwell.
- Ricci, Donato. (2013). Documenti di scena. *Progetto Grafico* (23).
- Ricci, Donato, and Robin De Mourat. (2015). An account of digital humanities from the AIME Project. *échappées* (2).
- Ricci, Donato, Robin De Mourat, and Pierre-Laurent Boulanger. (2014). AIME: Opening the context of a humanities inquiry. in *Digital Intelligence Conference Proceedings*. Nantes.
- Rogers, Richard. (2009). The Googlization question, and the inculpable engine. in *Deep Search: The Politics of Search Engines Beyond Google*, edited by Konrad Becker and Felix Stalder. Innsbruck: Studien Verlag.
- Rogers, Richard. (2013). *Digital Methods*. MIT Press.
- Spiro, Lisa. (2012). "This is why we fight': Defining the values of the digital humanities. *Debates in the Digital Humanities* 16.
- Svensson, Patrik. (2010). The landscape of digital humanities. *Digital Humanities Quarterly* 4(1).
- Tkacz, Nathaniel. (2015). *Wikipedia and the Politics of Openness*. The University of Chicago Press.

Additional Sources

- Adema, Janneke. (2012) On Open Books and Fluid Humanities. *Scholarly and Research Communication* (3)3.
- Andersen, Christian Ulrik, and Soren Bro Pold, eds. (2011) *Interface Criticism: Aesthetics Beyond the Buttons*. Aarhus Denmark: Aarhus University Press.
- Fallen, Camille. (2012) *L'anomalie créatrice*. Paris: Kimé.

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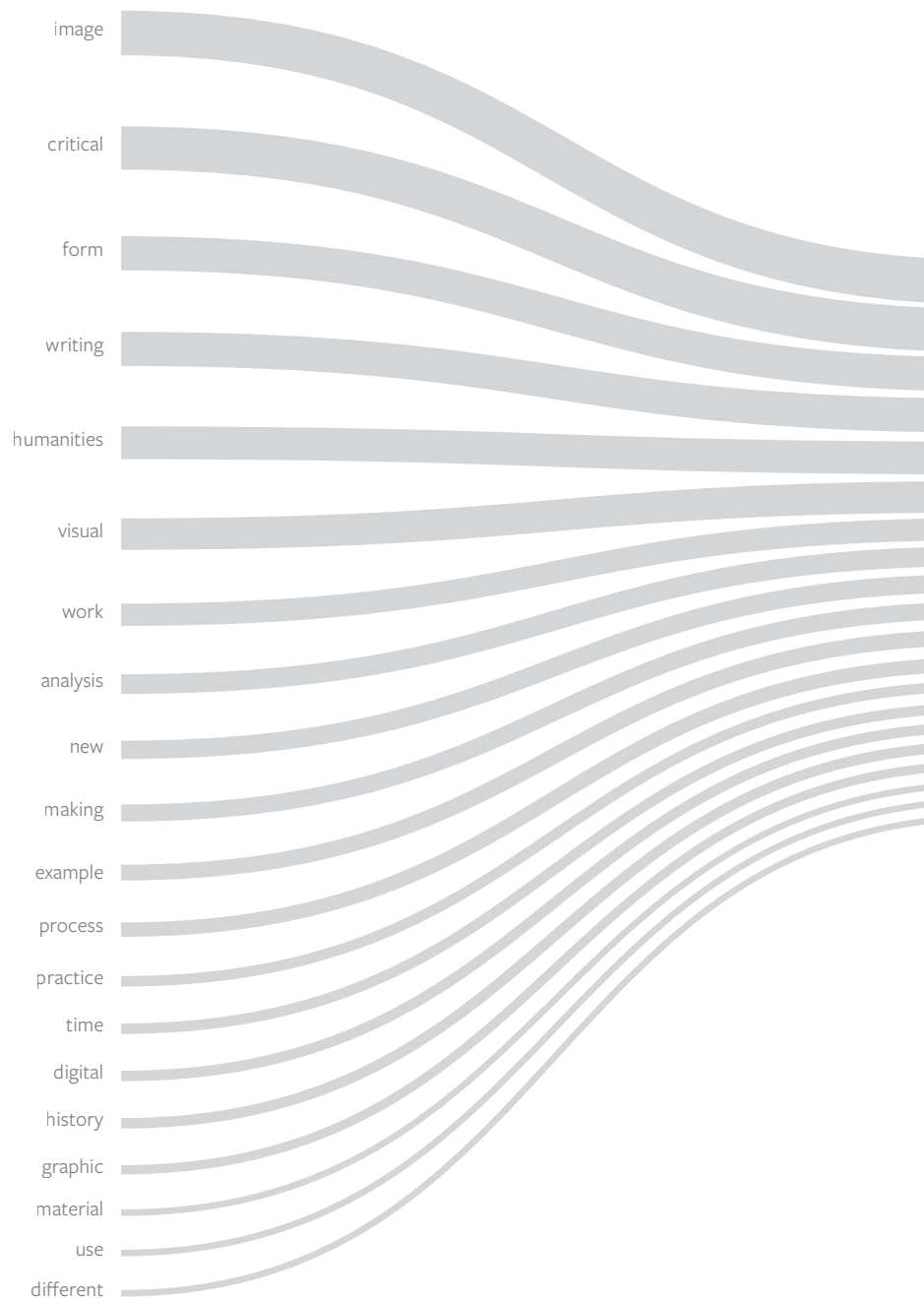
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Writing Images and the Cinematic Humanities

Holly Willis

Abstract

The histories of film and video contain a sub-history of media-based critical analysis undertaken through visual analysis, the integration of text and image, and the deployment of the artist's own body as a means of underscoring a critical stance. This essay explores four modes within this critical practice and makes a case for the cinematic humanities, or humanistic inquiry enhanced through the practices and modes of cinema, even as cinema continues to expand into what has been dubbed "the post-cinematic." The cinematic humanities include examples of critical visual work that integrate space, time, and the methods of design to produce new ways of knowing. The works created in this arena constitute a form of critical making that reframes the fundamental acts of the humanities through cinematic tools and allows us to reconsider our ability to re-search, re-frame, re-edit, re-contextualize, and re-write.

This article has a digital component available at <http://scalar.usc.edu/works/writing-images/users/3330>

Keywords: analysis, cinema, humanities, typography, visual

Introduction

In 1948, French film theorist Alexander Astruc published an article arguing that cinema had entered a new age, one in which the camera was freed from “the tyranny of what is visual” to become instead “a means of writing” (1948, p. 13). He dubbed this new age that of the “camera-stylo” or camera-pen. He went on to note that this metaphor of the *camera-stylo* is very precise. The term designates the ability of cinema to move beyond the “immediate and concrete demands of narrative” to become instead a form of writing that is “just as flexible and subtle as written language” (Astruc, 1948, p. 13). He looked forward with great anticipation to a body of cinematic work that would integrate the technics of writing and image-making.

Astruc’s essay, which has been cited repeatedly since its publication, struck a nerve: the desire to use images as a form of writing, and in turn to use writing to produce an image, runs through the history of cinema; indeed, other theorists and filmmakers have proposed similar terms that attempt to describe both the alliances and gaps between cinema and writing. French experimental filmmaker Agnes Varda, for example, proposed “cinécriture,” which has been defined as “filmic writing,” a form cinematic style analogous to style in writing (Smith, 1998, p.14). Marie-Claire Ropars-Wuilleumier also uses the word “cinécriture,” as well as “hieroglyphic editing,” in her analysis of filmmaking techniques that attempt to move away from mimetic representation to figural writing (Ropars-Wuilleumier, 1982); this form was perhaps best explored by Sergei Eisenstein in his interest in creating ideograms through dynamic editing techniques not dedicated to continuity but to the creation of ideas. In describing the collaging of images and words in the work of Jean-Luc Godard, Jon Conomos uses the term *vidéo-stylo*, with direct reference to Astruc’s earlier term (Conomos, 2001). In his book *Visionary Film*, P. Adams Sitney describes what he calls a “graphic cinema,” using the work of filmmakers Robert Breer and Peter Kubelka to suggest a form of cinema organized around graphic principles. And in *Reading the Figural, or, Philosophy After New Media*, D. N. Rodowick uses the term “figural” to capture the melding of differing semiotic forms, writing, “In a larger sense, the figural defines a semiotic regime where the ontological distinction between linguistic and plastic representations breaks down” (Rodowick, 2001, p. 2). He continues, “This opposition, which has been the philosophical foundation of aesthetics since the eighteenth century, is explicitly challenged by the new electronic, televisual and digital media” (2001, p. 2). Finally, there is a growing body of work dedicated to intermediality, represented by scholars such as Joachim Paech and Ágnes Pethő, who investigate “the intricate interactions of different media manifest in the cinema,” as Pethő explains (Pethő, 2011, p. 1). In each of these instances, scholars are seeking a form of cinematic expression that exceeds both narrative and documentary, creating a form that is intermediate, figural – a meshing of the visible and legible.

While the era Astruc imagined never materialized in the way that he describes, there does exist within the history of cinema and video art a little-known sub-history of attempts to reimagine critical writing through a form of on-screen typography that troubles the generally strict boundary between the visual and legible; this imagin-

ing is also evident through explicit renderings of image manipulation in which we see the filmmaker – his or her body, shadow, or hands – in association with his or her materials; and it is apparent in films and videos in which the filmmaker’s voice is laid over the images, and the critique is heard rather than seen. In each of these gestures, cinema aligns with the impulse of both critical writing and design, and critical makers seek a form of inquiry and analysis that hovers in the space between word and image. They also seek a mode of expression that is similarly hybrid and, indeed, that blurs the boundaries between inquiry and expression, between thinking and making. The process proposes new forms of humanistic inquiry enabled through design and the cinematic, and contributes to the evolution of the digital humanities, dedicated to exploring a world in which “print is no longer the exclusive or the normative medium in which knowledge is produced,” and one in which “print finds itself absorbed into new, multimedia configurations, as the writers of *Digital Humanities Manifesto 2.0* proclaim (Presner, 2009, p.2). They also contribute to the “maker” culture developing within the digital humanities, an evolution exemplified by THATCamp, The Humanities and Technology Camp, as well as HASTAC (Humanities, Arts, Sciences and Technology Alliance and Collaboratory), both of which embody a strong commitment to new forms of teaching, learning, and scholarly expression through practice-based uses of media.

The relatively small body of work surveyed here, although varied and dispersed across the entire histories of film and video, is significant now for numerous reasons: it asks designers to rethink the traditional hierarchy legislating the visible and the legible; it helps to reimagine the act of critical interpretation through the visual; and it suggests possible directions for uniting design practice and the digital humanities to imagine new forms of knowledge production. These are forms of critical analysis made visual. The integration of typography disrupts the seamlessness of narrative viewing, opening up a space for other kinds of vision perhaps best understood in the field of graphic design. Those works that overtly demonstrate the practice of image critique and recontextualization by showing the filmmaker’s hands or body within the frame call attention to the process of making and the haptics of embodiment. Rather than hiding the process, they reveal it, and in so doing, assert the significance of making and praxis. To cite the *Digital Humanities Manifesto 2.0* again, making is central to the digital humanities. The authors explain that they understand *making* “in the poetic sense of poesis, but also in the sense of design carried out in action” (Presner, 2009, p.8). In this way, critical video analysis models a form of practice for the digital humanities.

However, this practice is specifically cinematic. Through the diverse examples of critical video work, I will advocate for the exploration of the *cinematic humanities* – humanistic inquiry enhanced through the practices and modes of cinema – and even as cinema continues to expand into what has been dubbed “the post-cinematic.” it is advocated here. Understood in this context, the cinematic humanities includes examples of critical visual work that integrate space, time, and the methods of design not simply to conjure interesting experiences but, instead, to produce new ways of knowing. The works created in this arena constitute a form of critical making that

reframes the fundamental acts of the humanities through cinematic tools and allows us to reconsider our ability to re-search, re-frame, re-edit, re-contextualize and re-write.

Through an analysis of several iconic examples of critical visual analysis within film and video selected specifically for their embodiment of criticality, this essay identifies four specific modes of analysis:

- visual remix and audio commentary, in which artists integrate images and voice-over commentary to create multimedia experiences that destabilize the power of the visual;
- graphic writing refers to the use of text onscreen;
- the hand-made mode references the desire of critical makers to demonstrate their critical analysis by depicting their own hands and bodies within the frame of the moving image;
- and materiality and the reflective viewer is a mode that centers on explorations of the material forms of moving image production, and the ways in which a project can embody its own argument.

Background

The background for this emerging genre of critical making within the context of cinema includes several diverse practices. One of these is film title design, which was re-imagined in the 1950s as designers brought new ideas to a previously moribund form. The earlier title designs that graced Hollywood feature films tended to merely announce a film's title and list its cast and crew with static title cards that did not contribute significantly to the film's story or visual style. Their design was inconsequential. However, a generation of designers that includes Saul Bass and Pablo Ferro understood that the integration of motion graphics, typography, and visual style could extend and enhance a film's overall meaning, and the design of these titles was not insignificant but could be extraordinarily powerful.

Bass, who moved from New York to Los Angeles in the 1940s, shifted with seeming ease from traditional, print-based graphic design to what is now called motion graphics (Kirkham 2011). Early in his career, Bass collaborated with filmmaker Otto Preminger, and they co-designed 13 title sequences between 1954 and 1979. Perhaps the most famous of these was for *The Man With the Golden Arm* (1955), which featured a groundbreaking ad campaign centered on a graphic symbol of an arm, which gestures obliquely to drug addiction. The film's title sequence is akin to the graphic cinema of the 1920s; a series of white rectangles are juxtaposed with the credits, concluding with the abstracted image of an arm, which is underscored by a dramatic brass soundtrack. Bass was delighted with the reductive image, its metaphorical quality, and its sense of nuance; and the sequence as a whole, with its rhythms, pacing and music, deftly introduced the film's central conceit as well as its general sensibility.

Bass went on to create dozens of other title sequences. He worked with John Whitney on the groundbreaking graphic sequence for Alfred Hitchcock's *Vertigo*

(1958). With the title sequence for a film titled *Something Wild* (1961), he demonstrated the graphic patterns of everyday urban life. The title sequence for John Frankenheimer's 1966 film *Seconds* used disturbingly distorted facial imagery. While Bass is generally known for his transformative work in logo design, his invariably provocative and sophisticated motion work set the bar high for all title design to follow and offered an invitation to critical makers to consider the interplay of words, graphics, imagery, and motion.

Pablo Ferro was another contributor to the transformation of motion graphics, beginning with his work on commercials in the 1960s where he experimented with the quick cutting and kinetic camerawork that would become his trademark. His first title sequence was for Stanley Kubrick's *Dr. Strangelove* in 1963; it boasts the designer's now recognizable, skinny, hand-drawn lettering, as well as his deft use of visual metaphor. Ferro's hand-drawn lettering was typography designed to be looked at, to have effect, and to produce meaning in multiple registers.

Ferro is also significant to contemporary critical media in that he understood the possibilities of multi-frame visual communication. The designer employed the pacing and rhythms of music in his editing and shot design, which is perhaps most evident in his work on Norman Jewison's 1968 film *The Thomas Crown Affair*. Here, Ferro notoriously shattered the full-screen images showing a fast-paced polo game, breaking the single image into dozens of smaller frames to juxtapose close-ups, wide shots, and movement. The sequence is dazzling, and while Ferro says that he was inspired by magazines and their use of multiple images on a single page, the sequence references the then nascent visual language of the database. Rather than merely selecting a series of shots and showing them in linear order, Ferro's polo sequence maps all of the image possibilities across the screen, showing an array of options and telling the story by crafting a visual pathway through them. For our purposes, though, Ferro's technique suggests a form of visual analysis; through juxtaposition and association, we can make comparisons, view similarities, note differences, and assess the images before us.¹

While Bass and Ferro were ensconced in the Hollywood film industry, husband-and-wife team Charles and Ray Eames, icons in the history of American design, made a tremendous contribution to the understanding of graphics-oriented film design in a collection of experimental design shorts starting in the 1960s. Linking the tools of graphic design to moving image communication, the pair deftly revolutionized information graphics in ways that continue to reverberate. The celebrated *Powers of Ten*, for example, made first in 1968 and subsequently revised in 1977, begins with a medium shot of a grassy picnic scene in Chicago. The camera then zooms backwards, moving away from the earth to show the contours of the city, then the planet, then

¹ It is precisely this image array and its potential for critical inquiry that inspired the creation of the Difference Analyzer by Steve Anderson; the tool, still a work-in-progress, is designed specifically to allow multi-frame analysis within a single frame. Users simply position a series of clips within a larger frame, designate start- and end-points, and run the sequences, allowing side-by-side clip analysis.

the Milky Way, until we are one million light years away. The camera next zooms speedily back to its starting point, continuing forward to delve into the interior of a man's body and the molecular world. While the film is riveting as the viewers sense the rush of weightless travel while trying to comprehend the vast immensity of space and time, it is also very instructive in demonstrating measurement. Indeed, the film-making team worked hard on the visual interface that documents the changing powers of ten, prototyping several different modes and studying how much information could be absorbed by viewers who were both watching the photographic imagery as well as the designed counting systems. *Powers of Ten* is the best-known film by Charles and Ray Eames, but in all of their work, the duo was dedicated to understanding the potentials of visual expression, not only in single channel forms, but in multi-screen installations and exhibitions that were groundbreaking.

If film title design offers one vector of investigation useful in contextualizing critical visual analysis, so too does video art and installation, which over the last two decades has often taken the history of cinema as its subject matter. Project after project borrows from existing films and genre conventions to create experiences of cinematic recontextualization. Perhaps the ur-text for this mode is Douglas Gordon's *24-Hour Psycho* (1993), which slows Alfred Hitchcock's famous film down, allowing an entirely different experience of it as a result. Other examples include the video art projects by media artist Jim Campbell that analyze existing films, and Kevin and Jennifer McCoy's *Horror Chase* (2003), a media installation that crafts an unending chase sequence using material taken from Sam Raimi's *Evil Dead 2: Dead by Dawn*. As Ursula Frohne has remarked, "For artists of the post-cinematic era, cinema and film are not interesting primarily as examples of genres, but as a repository of visual raw material that floods the pictorial worlds of ordinary culture" (Frohne, p. 5). Similarly, Raymond Bellour has acknowledged the profusion of installation works that take cinema as their topic, writing, "By duplicating cinema and differentiating itself from it, the installations thus also make cinema enter into a history that exceeds it" (Bellour, 2008, p. 407).

As with the title design works noted above, this direction suggests strategies for visual analysis that can be extended in critical works that take design seriously as an element in the formation of the argument. In other words, rather than remaining explanatory, critical visual analysis can employ design principles to embody an argument.

Finally, the history of music videos has also offered myriad examples of typographic experimentation, as has the electronic poetry movement. The work of Young-Hae Chang Heavy Industries, for example, consists simply of words on-screen to create time-based reading experiences that blur the lines among film, animation, motion graphics, and digital poetry. Similarly, in both electronic poetry and music videos, artists and designers set words in motion, using movement, scale, font, time, and other design elements to craft reading experiences that unfold based on the temporality established by the artist; the result is a very compelling form of reading that, again, can inform the work of critical visual analysis.

Four Modes of Critical Visual Analysis

Critical visual analysis within the context of the cinematic can take many forms. Below are gathered examples of four specific forms from the histories of avant-garde film and video to suggest models for critical forms of moving image writing moving forward.

A. VISUAL REMIX AND THE AUDIO COMMENTARY

In the first form, artists integrate images and voice-over commentary to create multimedia experiences that destabilize the power of the visual, helping call attention to the ways in which they are always part of a larger representational context. Sometimes the images are original to the project. Trinh T. Minh-ha's *Reassemblage* (1982), for example, is a 40-minute exploration of rural Senegal narrated by the filmmaker. In the film, Trinh actively queries her own role and employs a variety of techniques, including the repetition of key sentences in the voice-over, to ensure that viewers are aware of her presence. Her objective is overtly politically and centers on disrupting the authority of representation by calling attention to what we see and how we see it. This gesture is not unique but contributes to a larger genre of essayistic film and video dedicated to investigating the nature of subjectivity, power and authority.

In a different vein, filmmaker Thom Andersen's 2003 film *Los Angeles Plays Itself* brings together clips from classic Hollywood features such as *Blade Runner* (1982) and *LA Confidential* (1997), as well as less well-known clips — snippets from gay porn, for example — with Andersen's wry, idiosyncratic narration spoken in voice-over by Encke King. The voice-over ponders the city's history, musing on architecture, geography, and storytelling obsessions, and occasionally rants about particular irritants — the lack of geographic continuity in most Hollywood car chases, for example. Andersen has continued to make visual essays — his latest film is *The Thoughts We Once Had* (2014) — and their power is in the careful combination of image and voice. To be sure, the texts for both of Andersen's essay films would be compelling on paper; combined with the images, though, they become something altogether different as we attend to the performance of the voice over itself; the sound, texture, and personality of the voice; the incredible array of images culled from the history of cinema and the erudition they suggest; and the combination of voice and image, which produces new meanings.

While voice-over exerts tremendous control over the resulting project and can perhaps have the effect of closing down meaning, humanities scholars have tended to eschew voice, outside of the written voice, as a critical mode. These examples demonstrate the power of voice to inflect meaning and to bring forward the persona of the critical scholar.

B. GRAPHIC WRITING

While it has been possible to integrate typography and moving images since the advent of cinema, the impulse to use text onscreen remains relatively rare, outside of the use of intertitles in the era of silent cinema and in the practice of title design deployed to introduce and close traditional narrative and documentary films. As noted earlier, there does exist a tradition of onscreen text within electronic literature, and the history of music video and avant-garde film and video is punctuated by often stunning examples of text onscreen. However, both the use of typography onscreen, and the critical writing about this practice, has remained fairly limited until recently, when a confluence of factors has contributed to an increase. In the context of critical making, James Benning's extraordinary film, *American Dreams (Lost and Found)* (1984), offers a masterful example of multi-register discourse and invites a form of combined reading and viewing that blurs the boundaries between the two that is highly instructive for the digital humanities.

American Dreams brings together images of baseball cards related to the history of baseball player Hank Aaron, including images of the player and statistics related to his career, from its beginning in 1954 through its conclusion in 1976. The cards are presented one-by-one in chronological sequence, front and back; at the same time, we see and read hand-written scrolling text that slips from right to left along the bottom of the screen. This text draws on diary entries written by a man named Arthur Bremer from 1972. Bremer hoped to assassinate then president Richard Nixon. When he couldn't, he decided to target presidential candidate George Wallace that same year, instead, and the diary entries recount his thoughts during this time. Benning rewrote Bremer's diary entries by hand, mimicking Bremer's handwriting; Benning then created a long, scrolling text, which he photographed using an animation stand, advancing the text 1/8 inch for each click of the shutter. These two forms of imagery are accompanied by an audio track that features pop songs from the same time period as well as audio recordings of speeches made in that same 22-year span. Overall, the project represents a stellar example of hand-made filmmaking: Benning's precise work on the film, which pre-dates the digital tools, represents the exacting attention to process that not only characterizes the filmmaker's entire body of work, but underscores a history of making that extends well beyond the critical making movement coming of age currently.

The result of the combination of images, voice, music, and text in *American Dreams* is riveting. The hand-written text slides along quickly, making it nearly impossible to look away, even for a moment. It is almost as if we are being read as we read the film. At the same time, though, the baseball cards and statistics are intriguing. As participants in the meaning-making process, we become very aware of the skills necessary to attend to the four different semiotic registers. But we also come to recognize that meaning coalesces in the interstices as written word, image, song lyric, and spoken word align here and there to spark insights. And these insights seem to be our own, rather than being generated by the filmmaker. We experience meaning through the possibilities that are generated in the mix of information, and it is the

individual viewer/reader's own decisions and attention that will determine what insights are made.

This second mode has tremendous potential in the context of 21st century critical visual analysis, and designers have much to share regarding the significance of typography and its impact on meaning. Similarly, filmmakers have much to share about the creation of a temporal work that is more an event than a thing. As Johanna Drucker writes in an essay exploring concepts of materiality, "The aesthetic object offers its possibilities, not as a thing or entity, but as a provocation to interpretation" (Drucker, 2009, p. 13). She rejects the stasis connoted by "thing" and "entity," underscoring the ways in which they instead function to produce something else. She continues, acknowledging that the "provocation to interpretation" is certainly not unique to time-based forms, but occurs on the printed page as well. She writes

With such concepts in mind, we see the page, book, print, or screen space of text and image quite differently from the usual static presentation of thing, and see it instead as an active, dynamic field of forces and energies in dynamic suspension, acting on each other and within a frame of constraint, to produce the conditions a reader is provoked by in the constitutive act of reading that makes the text. (Drucker, 2009, p.14)

Benning's *American Dreams* presents us with this "dynamic field of forces and energies in dynamic suspension," and offers yet another vector to consider in constituting a critical visual practice within the cinematic humanities.

C. THE HAND-MADE

The reflexive manipulation of cinematic materials onscreen constitutes a particular and relatively rare filmmaking trope associated perhaps most specifically with structural filmmaking in which the specific materiality of film is made the subject of a work. However, several filmmakers employ this trope not so much in order to investigate the material conditions of film or video, but to layer differing temporal and semiotic registers. Ágnes Pethő has described this layering of registers as "metalepsis," borrowing the rhetorical trope that indicates the melding of different story worlds within a single work (2010). While Pethő is interested in the combination of narrative and documentary worlds in the work of Agnes Varda, "metalepsis" references the ways in which filmmakers such as Jean-Luc Godard, Harun Farocki, and Su Friedrich call attention to their own voice, body, and critical stance by layering images of themselves or their forms of inscription with the images being investigated.

Perhaps the most evident form of this layering is seen in Godard's *Histoire(s) du Cinema* that contains many images in which we see the filmmaker in conjunction with the cinematic imagery he is investigating in his 264-minute critical essay film. The film explores the history of cinema through the very specific attributes of the medium: through juxtaposition, montage, fast-motion, dissolves, superimposition, and other techniques. In addition to layering his own image into those he is investigating, Godard also uses typography and wordplay, adding an additional element of critique

(and often humor). With its incredible range of citations, as well as Godard's own knowledge of cinema, viewers experience not only Godard's critique, but the vastness of the subject at hand. We come to understand the significance of cinema in a profound way, but we also see it situated within a larger context. As James S. Williams writes, "By placing cinema in this expanded context Godard is not only trying to establish new links across different art forms, but also, in the very process to formalize the fundamental nature of cinema and what it 'alone' can achieve" (Williams, 2008, pp, 11-12). In this way, Godard's goal is very specific to cinema: He is expanding beyond its discursive traditions to comment on its vitality and role within contemporary Western culture. However, we can again imagine ways to borrow his method and critical gesture to further build a palette of tools for critical visual analysis.

Harun Farocki has also used his own visual, embodied presence in conjunction with his images as a means of calling attention to his critical stance. Farocki, in his insistent focus on the mechanisms of contemporary power as they are instantiated through technologies of vision, repeatedly shows us that cinema is ever-present. However, he also, almost as insistently, makes us aware of his own presence as the critical voice producing the work we see and hear. This is perhaps most notable in the iconic images of his hands as they frame the image of a body of a woman before she is led to her death in *Images of the World and the Inscription of War (Wie man sieht, Bilder Welt und Inschrift des Krieges)* (1988).

For Godard and Farocki, it is not enough to speak over the images under consideration; they feel compelled to enter the visual registers themselves, to figure the body of the maker onscreen and to thereby undermine the illusory power of the cinematic, which tends to hide its mode of production.

D. MATERIALITY AND THE REFLECTIVE VIEWER

The final form of critical visual analysis centers on explorations of the material forms of moving image production and the ways in which a project can embody its own argument. Gary Beydler's deceptively simple six-minute film, *Pasadena Freeway Stills* (1974), exemplifies a form of this critical making dedicated to investigating the fundamental aspects of film as a medium. The film's first images show what appears to be an empty chair in a room. A man wearing a white t-shirt (it is Beydler himself) enters the frame, sits down in the chair, and raises a still photograph up to be viewed by the camera. He presses it against a piece of glass that until this moment has been invisible to the viewer. He continues this process, methodically repeating the action of raising a photograph, placing it within the taped frame on the glass, lowering it, and raising another photograph. Each photograph is a still from a filmed sequence shot on the Pasadena Freeway in Southern California; we see the dotted lane divider, cars in the near distance, and the trees that line the freeway. Eventually, in Beydler's recreation of that footage, moving from still photograph to moving images, we will travel through the freeway's well-known tunnels. And so, as the film progresses, the movement of the man's hands, raising and lowering the images, is cut out and the pace of the images within the box increases, such that the still images become the film; at the same

time, the man's body and hands appear to remain still. Having created the film within the film, the process reverses; the images slow and we once again see the hands doing their work, placing each image on the screen.

Pasadena Freeway Stills deftly demonstrates one of the fundamental conundrums of film: motion emerges from stasis, or rather, the appearance of motion emerges from the appearance of stasis. Further, our ability to perceive motion onscreen requires an occlusion. When we think we see motion, we are in fact only seeing stills, and the creation of the experience of motion requires ignoring how it is actually produced. We can witness this paradox in the pairing of the two "times" in the frame, namely that of the man in the chair, and that of the freeway captured in the still images. The images of the man initially appear to be in real time; however, as the focus of the film shifts from the man and his actions to the movement of cars within the secondary film, the real time imagery of the man is displaced. That section of the film becomes a series of stills, too, as the motion — the human action of placing each image up to be viewed — is now hidden, and what was motion becomes stasis, but a stasis that is only an appearance of stasis. The result is a film that is delightfully complex in its playful investigation of time, stasis, and motion and deftly enacts its thesis.²

A similar interrogation of film as a medium occurs in Austrian filmmaker Peter Tscherkassky's 14-minute film *Outer Space* (1999). To create the film, Tscherkassky appropriated imagery from a horror film titled *The Entity* (1981) by Sidney J. Furie. He uses the images to interrogate cinema at the turn of the century, at the moment when digital video threatened to annihilate film. The short film becomes not so much a horror film about the violence enacted on the body of a woman but the violence done to cinema. As some unseen power attacks the woman in the original, Tscherkassky turns that power toward the images themselves, which are embattled; the film's frames become visible, as do the film's sprocket holes and optical soundtrack. They are ripped, scratched, and destroyed in a pulsing frenzy of chaos and mayhem. We experience the destruction of cinema through an enactment of its destruction. Once again, the filmmaker creates a form of analysis using the tools of cinema to reflect back on the medium.

Pasadena Freeway Stills and *Outer Space* make their arguments by calling attention to the material qualities and technological workings of the cinematic, and in so doing, open up another avenue of critical visual analysis.

2 The topic is also timely. Interest in the space between stillness and motion has expanded over the last decade as digital video has gradually replaced celluloid film, sparking renewed inquiries about the material specificity of each form. This is evident in the publication of several books on the topic, including Laura Mulvey's *Death 24 X a Second: Stillness and the Moving Image*, as well as the essay collections *Still Moving: Between Cinema and Photography* co-edited by Karen Beckman and Jean Ma, and *Between Stillness and Motion: Film, Photography, Algorithms*, edited by Eivind Røssaak.

Conclusion

Each of these four gestures is dedicated to enacting new forms of visual critical analysis at the intersection of design, the cinematic arts, and critical making. There is still much to explore, however. For example, we might investigate new methodologies. Film scholars are now easily able to capture stills and video sequences and array them for analysis or make video essays. This practice alone points to new possibilities for workflow, and by extension, new ways for framing an argument and producing knowledge. As game designer Eric Zimmerman has explained, a common design methodology entails prototyping, testing, analyzing, and refining a work (Zimmerman 2003). This process sounds familiar within the humanities. In traditional, scholarly research and writing, we formulate an argument, test it against our evidence, compare our argument with other arguments, and continue on to hone and refine our thesis. However, what is key to the design process is that it often does not follow a linear order. Indeed, design often starts with a process of making; what is made is then tested, and perhaps then it is theorized. Then it is tested again, theorized some more, and so on. So the process is iterative, but more importantly, ideas emerge from the process of making.

This practice is of particular value in our current moment, one in which traditional academic disciplines are being rethought and revitalized through interdisciplinary cross-fertilization. This is also a moment when the critical methods of design are increasingly welcomed into the humanities. And it is a time when, as Kathleen Fitzpatrick has argued, the lines between the creative and critical are blurring (Fitzpatrick, 2012).

Looking to the future, the cinematic humanities invites us to imagine critical practices that are immersive, embodied, gestural, and virtual, and to engage in acts that integrate thinking, writing, coding, and designing, and to step into the making of moving images that continue to function as the dominant feature of the global condition. The move toward video-based scholarly work is but one step in a larger context of critical making; the models suggested by filmmakers and video artists engendered by the cinematic humanities, however, offer an instructive toolbox for others interested in this practice.

Within film scholarship, the video essay has emerged recently as a new critical form and, along with it, reflections on new forms of knowing. Catherine Grant has been one of the scholars in the forefront of creating these videos; she made *Unsentimental Education*, her first critical essay video, in 2009, and the process convinced her of the powerful process of working with the material itself. Writing about her experience in an essay titled “The Shudder of a Cinephiliac Idea? Videographic Film Studies Practice as Material Thinking,” Grant reflects, “It was the practical experience of having to work through, construct, and then convey or perform a meaningful analysis by re-editing the film for its making that completely convinced me of the merits of videographic approaches as analytical, pedagogical, and creative research process” (Grant, 2014, p. 53).

Grant, along with Christian Keathley, Drew Morton, Christine Becker and Jason Mittell, launched a journal designed specifically to showcase scholar videos titled *[in] Transition* in 2015, in collaboration with *MediaCommons* and *Cinema Journal*. The online journal brings peer review to the video essay and establishes a new set of terms for evaluating critical visual scholarship work. In an essay about this emerging form titled “La Camera-Stylo: Notes on Video Criticism and Cinephilia,” Keathley brings us back to Astruc and to the questions that opened this essay. Considering the future of video-based scholarly writing, he notes, “What that critical ‘writing’ — still in the process of being invented — looks and sounds like marks a dramatic broadening of our understanding of what constitutes the meaning of such terms as criticism and scholarship, supplementing them with features that resemble art production” (Keathley, 2011, p. 179). The cinematic humanities is core to this new form of critical making and production that Keathley is referring to with the melding of critical and creative, of thinking and making. Indeed, as what we consider the cinematic expands into the virtual and three-dimensional, we are invited to imagine future forms of criticism beyond the videographic, forms that might be gestural and immersive, that might take advantage of augmented and virtual realities, that might integrate the art and practice of crafting meaningful experiences of story, information, and knowledge into a new attunement with contemporary culture. This is the role for writing images and the cinematic humanities.

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References

- Astruc, Alexandre. (1948). The birth of a new avant-garde: The caméra-stylo.” Originally published as “Naissance d’une nouvelle avant-garde: La caméra-stylo.” *L’Écran Français*, No. 144. Translated and published subsequently in Peter Graham, ed. 1968. *The new wave: Critical landmarks*. London: Secker & Warburg in association with the British Film Institute.
- Beckman, Karen and Jean Ma. (2008). *Still moving: Between cinema and photography*. Durham: Duke University Press.

- Bellour, Raymond. (1990). Video writing. *Illuminating video: An essential guide to video art*. Doug Hall and Sally Jo Fifer, eds. New York: Aperture, in association with Bay Area Video Coalition.
- Bellour, Raymond. ed. (1992). *Jean-Luc Godard: Son + Image 1974-1991*. New York: Museum of Modern Art.
- Bellour, Raymond. (2008). Of an other cinema. In *Art and the moving image: A critical reader*, Tanya Leighton, ed. London: Tate/Afterall, 406-429.
- Conomos, John. (2001, September 15). Only the cinema. *Senses of cinema*. Issue 14. http://sensesofcinema.com/2001/jean-luc-godard-pt-1/godard_conomos/.
- Dienderen, An Van. (2010). Indirect flow through passages: Trinh T. Minh-ha's art practice. *Afterall: A Journal of Art, Context and Enquiry*. Issue 23 (Spring 2010), pp. 90-97. <http://www.jstor.org.libproxy1.usc.edu/stable/20711784>
- Drucker, Johanna. (2009). Entity to event: From literal, mechanistic materiality to probabilistic materiality." *Parallax*, 15: 4, 7-17, 2009.
- Fitzpatrick, Kathleen. (2012). The humanities, done digitally. *Debates in the Digital Humanities*, Matthew Gold, ed. Minneapolis: University of Minnesota Press.
- Frohne, Ursula.(n.d.) That's the only now I get: Immersion und participation in video-installations by Dan Graham, Steve McQueen, Douglas Gordon, Doug Aitken, Eija-Liisa Ahtila, Sam Taylor-Wood. http://www.medienkunstnetz.de/themes/art_and_cinematography/immersion_participation/
- Grant, Catherine. (2014). The shudder of a cinephiliac idea? Videographic film studies practice as material thinking. *ANIKI: Portuguese Journal of the Moving Image*, 1 (1), 49-62.
- Jackson, Emma. (2010). The eyes of Agnès Varda: Portraiture, cinécriture and the filmic ethnographic eye. *Feminist Review*, No. 96, urban spaces, 122-126. <http://www.jstor.org/stable/40928100>
- Keathley, Christian. (2011). La camera-stylo: Notes on video criticism and cinephilia, in Clayton, Alex and Klevan, Andrew (eds.), *The language and style of film criticism*. London: Routledge.
- Kirkham, Pat. (2011). *Saul Bass: A life in film and design*. New York: Lawrence King Publishing.
- Knowles, Kim. (2015). Performing language, animating poetry: Kinetic text in experimental cinema. *Journal of Film and Video*, Vol. 67, No. 1 (Spring), 46-59.
- Mulvey, Laura. (2006). *Death 24 X a second: Stillness and the moving image*. London: Reaktion Books.
- Pethő, Ágnes. (2010). Intermediality as metalepsis in the 'cinécriture' of Agnes Varda." *Acta Univ. Sapientiae, Film and Media Studies*, 3, 69-94.

- Pethő, Ágnes. (2011). *Cinema and intermediality: The passion for theSpace-in-between*. Cambridge Scholars Publishing.
- Presner, Todd, Jeffrey Schnapp and Peter Lunenfeld. (2009). *The digital humanities manifesto 2.0*. Retrieved online: <http://www.toddpresner.com/?p=7>
- Rodowick, D. N. (1985). Review: The figure and the text. *Diacritics*, Vol. 15, No. 1, Spring pp. 32-50. <http://www.jstor.org.libproxy1.usc.edu/stable/464629>
- Rodowick, D. N. (2001). *Reading the figural, or, philosophy after the new media*. Durham: Duke University Press.
- Ropars-Wuilleumier, Marie-Claire. (1982). The graphic in filmic writing: *A bout de souffle*, or The erratic alphabet. *Enclitic*, 5-6,.
- Røssaak, Eivind, ed. (2011). *Between stillness and motion: Film, photography, algorithms*. Amsterdam University Press.
- Sitney, P. Adams. (1979, October 11). Image and title in avant-garde cinema, 97-112.
- Sitney, P. Adams. (1979). *Visionary film: The american avant-garde 1943-1978*. Oxford: Oxford UP.
- Smith, Alison. (1998). *Agnes Varda*. Manchester: Manchester University Press.
- Williams, James S. (2008). "Histoire(s) du cinéma." *Film Quarterly*. Vol. 61, No. 3, Spring, 10-16.
- Zimmerman, Eric. (2003). Play as research: The iterative design process. *Design research: Methods and perspectives*, Brenda Laurel, ed. Cambridge, MA: The MIT Press, 176-184.

Media Works

- Andersen, Thom. *Los Angeles Plays Itself*. 2:49. 2003.
- Andersen, Thom. *The Thoughts We Once Had*. 1:48. 2014.
- Beydler, Gary. *Pasadena Freeway Stills*. 6:00. 1974.
- Eames, Charles and Ray. *Powers of Ten*. 9:00. 1977.
- Farocki, Harun. *Images of the World and the Inscription of War*. 1:15. 1988.
- Frankenheimer, John. *Seconds*. 1:47. 1966.
- Garfein, Jack. *Something Wild*. 1:52. 1961.
- Gordon, Douglas. *24-Hour Psycho*. 24 hours. 1993.
- Hitchcock, Alfred. *Vertigo*. 2:09. 1958.
- Jewison, Norman. *The Thomas Crown Affair*. 1:42. 1968.
- Kubrick, Stanley. *Dr. Strangelove*. 1:43. 1963
- McCoy, Kevin and Jennifer McCoy. *Horror Chase*. 2003.
- Petho Preminger, Otto. *The Man With the Golden Arm*. 1:59. 1955.
- Trinh, T. Minh-ha's *Reassemblage*. 40:00. 1982.
- Tscherkassky, Peter. *Outer Space*. 14:00. 1999.

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**critical
making**
DESIGN and
the DIGITAL
HUMANITIES

Jessica Barness
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guest editors

December 2015

critical making

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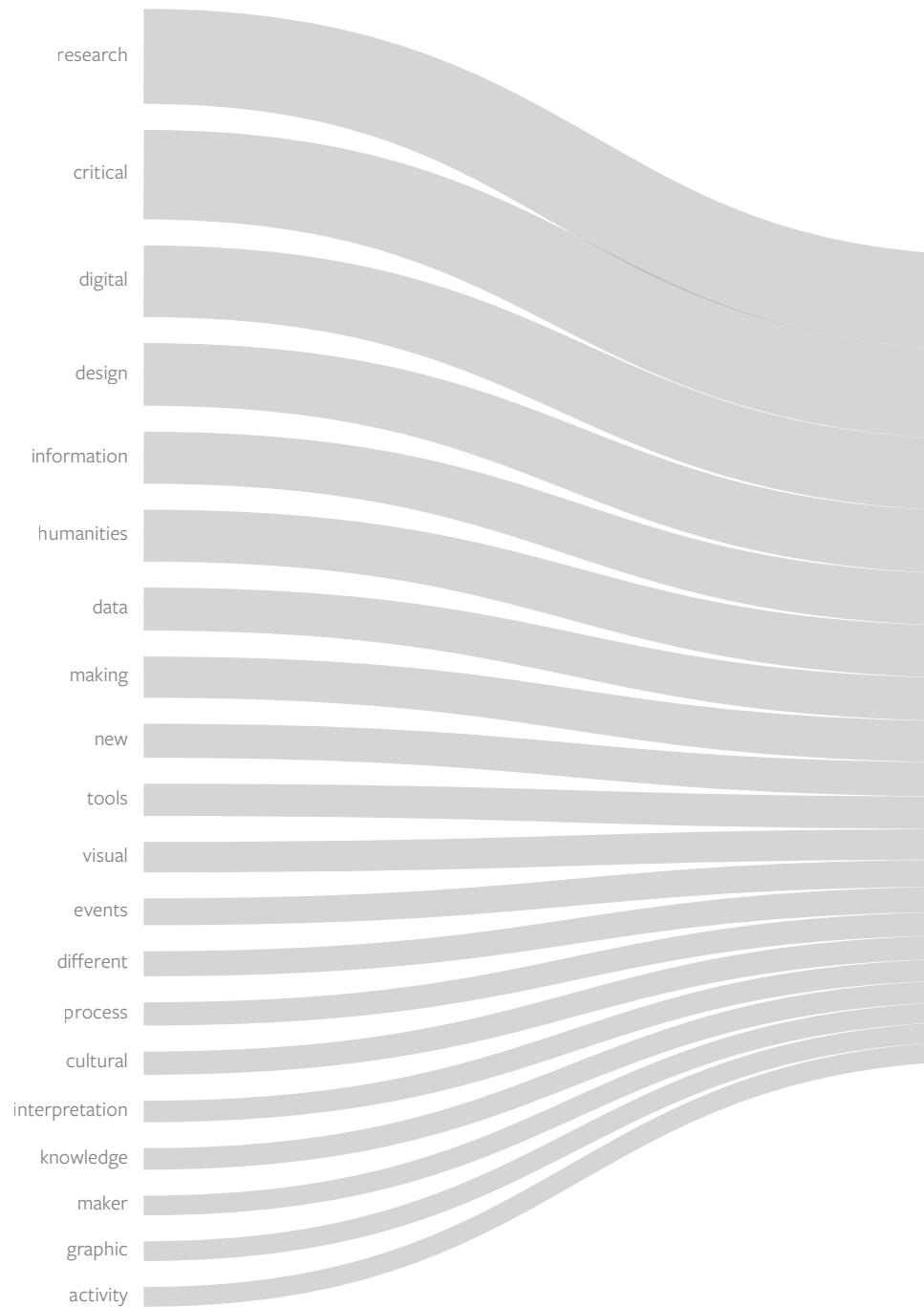
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Beyond the Map:

Unpacking Critical Cartography in the Digital Humanities

Tania Allen
Sara Queen

Abstract

The importance of visualization as a formative and evaluative tool in the digital humanities begs for a deeper examination of the methods and literacy that accompany the making process. Current design and humanistic pedagogy and best-practice are heavily focused on understanding context – of place, culture, situation, or artifact. The iterative construction of visualizations which diversely examine these contexts of interpretation can illuminate both what is and what might be. Building on landscape and mapping theory which argues the map does more than reflect reality, it actively shapes our understanding of the physical, political and social world, this paper suggests the development of a theoretical perspective that goes beyond the examination of the artifact (i.e. the map) to include the critical evaluation of the activity of map making (i.e. the conditions that inform the activity of mapping and visualization and how to go about it) and its impact on the propositional nature of exploratory research (i.e. how the activity of mapping affects the decisions that researchers make about where, how and to what extent to intervene).

Keywords: cartographic tools, critical cartography, critical making, design research, design thinking, theoretical perspective on mapping

Introduction

We begin with the three-part assumption that theoretical perspectives and methods evident in design research are relevant to current discourse in the digital humanities (1) because of their parallel origins intersecting science and art, (2) because the activity of visualization through mapping is fundamental to generative research due to the overlapping nature of theory and practice, (3) and because mapping as a critical and reflective activity is essential to the interpretive nature of both fields. These assumptions are supported by the exponential growth of mapping as a research tool in design and humanities-based education and practice over the past 30 years: from concept maps and their capacity to assist in understanding complexity (Novak and Gowan, 1984) to critical cartography and its contribution to understanding landscape as a cultural and social phenomenon (Corner, 1999a), to geographic information systems (GIS) as a tool for providing a bird's eye view to environments and their demographics, and to the most recent data visualizations and their ability to highlight previously invisible relationships from vast amounts of data (Lima, 2013). As Denis Cosgrove attests, "The map is perhaps the most sophisticated form yet devised for recording, generating and transmitting knowledge" (1999, p. 12).

We base our definition of critical cartography on Jeremy Crampton and John Krygier's explanation as "new mapping practices and theoretical critique" (2006, p. 11). Our definition acknowledges the emergences of critical cartography in the 1990s — led by James Corner, JB Harley, Denis Cosgrove, and others — but expands this critique beyond the artifact to the methods and bias that culminate in its production. We further define critical cartography as an active practice — engaged by the cartographer during the generative, analytical, synthetic, and formative phases of research and inquiry. Because of what we see as similarities of process, we expand the usage of cartography to include new modes of data visualization in addition to traditional geo-spatial forms. There are a plethora of existing projects in the digital humanities that use cartographic strategies to investigate, navigate, and compare data and digital archives. In this paper, we are primarily concerned with how the digital humanities might leverage these methods to also confront the bias of the process and results. To explore the potential for expanded functions of mapping in the digital humanities, we have outlined a number of theoretical projects or issues a digital humanist might pursue. Many of these examples are based on existing projects; however, rather than critique those projects, each with their own motivations and accomplishments, we are using similar digital data sets or content to explore the potential of critical cartography to further shape the environments, tools, and methods native to the humanities.

Well illustrated by Stephen Ramsay's (2011b) proclamation that the growth of the digital humanities inherently "involves moving from reading and critiquing to building and making" (para. 4), we argue that the iterative and generative methods explored through critical cartography offer valuable insight to help explore and define the future of the digital humanities. However, this argument is not without tension. Johanna Drucker (2011) addresses the conflicts that arise when utilizing data

visualization tools that are taken directly — and without conceptual modification — from the scientific paradigm from which they originate. Drucker argues that this most profoundly affects the interpretation of meaning at the core of humanistic research when it collides with (or is subsumed by) the rational and scientific framework on which most data visualization and mapping relies. Drucker suggests a significant paradigm shift that begins by redefining data (what is given) as *capta* (what is taken). We extend Drucker's propositions by offering a theoretical perspective on mapping that balances the benefits of visualization strategies as cognitive tools to render a quantitative absolute with the ability of maps to explore truth as subjective, constructed, and incomplete.

As a cognitive tool, the benefits of mapping are well documented. In *Design for Information*, Isabella Meirelles builds on the historical and contemporary research of Donald Norman, Jacques Bertin, and others in arguing that "[v]isualizations of information can be considered cognitive artifacts, in that they can complement and strengthen mental abilities" (2014, p. 12). By making the tacit explicit, mapping provides a critical tool in the construction of knowledge (Novak and Gowan, 1984). Through the use of observation and pattern-finding, mapping has been utilized as a tool for inductive or deductive reasoning. However, because of its potential to "make sense of chaos" (Kolko, 2010, 15) by abstracting, manipulating, isolating, and visualizing, mapping also utilizes design thinking processes such as abductive reasoning and the "logic of conjecture" in its creation (Cross, 1990; Martin, 2009). Abductive reasoning is particularly powerful in the creation of hypothesis (or proposals) based on inherently incomplete information. As the scope of the digital humanities moves into uncharted territory, thinking that is both interpretive *and* propositional is pivotal to develop a vision of what *might be*. Theories of design thinking also provide parallels with the cognitive tools of mapping which move iteratively between processes of **analysis** (dissection), **synthesis** (assemblage), and finally **formation and action** (generation) (Bloom, 1956; Cross, 1990; Dubberly, Evenson & Robinson, 2008). Within each of these processes, **evaluation** of the activity and artifact provokes greater insight into the research findings.

These strategies for design thinking align with important behaviors in critical cartography through an active and reciprocal process of generation and selection. By encouraging a fluctuation of scales, behaviors of critical cartography also provoke pattern-seeking that is less recognizable in non-visual forms. The very activity of mapping the members of a literary group like the Black Mountain Poets (Figure 1) illuminates connections previously unrecognized. If the map maker also engages in an iterative process that includes isolating, comparing, assuming, and judging, they might further reveal additional patterns. These patterns might highlight (1) commonalities of origins, circumstances, and experiences that drove a similar trajectory and philosophy within the group; (2) how philosophies "born" from the group travelled and evolved over space and time; (3) and how individual influences grew and matured both inside and outside of the immediate group.

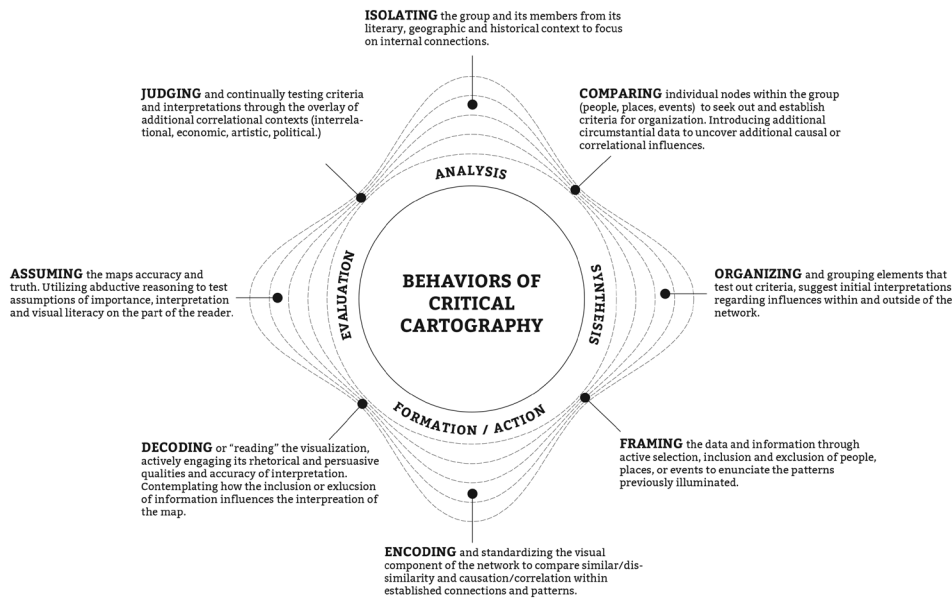


Figure 1. At its foundation, mapping complements the design thinking process by encouraging adaptive and integrative thinking through fluctuating scales of observation and evaluation.

If the argument for mapping within design and humanistic research is based on its contribution to making more informed decisions and constructing interfaces or interventions within the subject matter, then deliberation on the activity of mapping is equally necessary. The critical literature extracted from geography and cartography has focused primarily on the cultural, political, and social impacts of the map that result from the bias, power, and values embedded within it but less so on an evaluation and methodology for the activity of mapping to address this imbalance. Cartographer Jeremy Crampton recognizes this lack of discourse coming from geography and GIS when he argues, "If you open any of today's prominent textbooks on cultural, social or political geography it is more than likely that you will find no discussion of mapping..." (Crampton, 2010, p. 1). As in design research, incorporating mapping within digital humanities necessitates a literacy of mapping that exposes the persuasive quality of the map (Harley, 2002) and applies the critique of the artifact to evaluate the non-neutral process of its construction. Like other generative practices, critical cartography must include a component of "reflection in action" (Schon, 1984) that reads the map as a social and cultural construct and engages in a critical dialogue that ventures beyond the object.

Mapping in the Digital Age

The relevance of mapping as a critical and generative design research tool is of particular importance within the digital humanities at its current point of development. Matthew Gold, editor of *Debates in the Digital Humanities*, has described this current context as "...a significant moment of growth and opportunity for the field" but warns

"at stake in the rise of the digital humanities is not only the viability of new research methods (such as algorithmic approaches to large humanities data sets) or new pedagogical activities (such as the incorporation of geospatial data into classroom projects) but also key elements of the larger academic ecosystem that supports such work" (p. ix). As suggested through Gold's statement, mapping has much to contribute to the digital humanities by providing important tools to organize, synthesize, and interpret the vast amounts of primary and secondary source information that is increasingly accessible within the digital humanities. An example that we increasingly see is visualization of library collections. Through sorting and categorizing, these maps help aggregate topics so viewers can see the totality of library holdings. Pushing this further, maps can also reach outside of the library's collection to include events, non-traditional media, photo collections, and much more. In this way, the map becomes a tool for situating library collections in contemporary events and dialogs. As the digital humanities move into a sphere that is participatory, co-creative, networked, and increasingly focused on making, the consideration of the user experience becomes pre-dominant. Academics, students, and professionals must find new modes to understand a multiplicity of scales which measure the diverse contexts and platforms that their work occupies. These needs provide real and complex challenges that mapping has the ability to engage – challenges that necessitate a fluctuation in scale, orientation, and media to gain insight into how best to confront them.

In today's networked world, access to both data and technologies provides an important context for developing a critical literacy of mapping and cartographic tools. The unique ability of mapping to make the complex accessible and knowable is appealing to a wide array of disciplines outside of geography, and consequently we see an increasing interest in these tools in different contexts. These conditions suggest an opportunity to develop a theoretical perspective focused on critical engagement in the mapping process. This development first requires establishing a middle ground between the positivist perspective of mapping as truth-seeking and an interpretivist paradigm that sees the map solely as construct. This starts by looking specifically at the dimension added to research and practice through the **cartographic tools** mapping utilizes. Successful integration of **critical making** into the mapping and research process necessitates reframing the emphasis of mapping from product to process. And finally, the assumptions and judgments visualized and developed through mapping require a focused **critical analysis** to encourage debate, questioning, and awareness of how mapping affects findings.

Cartographic Tools

Tools borrowed from geography are critical assets to advance mapping beyond the analysis of isolated project components and into the synthesis of both process and outcomes for generative research – research that is beyond a verbal activity in both design and the digital humanities. The map is a widely accepted way for researchers to understand complex issues through cartographic strategies for orienting a phe-

nomena within its larger context, uncovering the dimensions appropriate to examine its extents and impact, highlighting organizational patterns and relationships otherwise invisible, and translating observations into visual models that help identify novel intervention opportunities. The effective use of these cartographic features requires both an understanding of how they contribute to the creative activity of mapping as well as critical reflection on how they manipulate the findings.

Of the a priori features borrowed from cartography, including scale, organization, orientation, and framing (Figure 2), “scale is fundamental” (Cosgrove, 1999, p. 9). **Scale** describes relative or absolute size in terms of spatial dimensions, temporal units, or thematic attributes. Scale also has three types: cartographic, analytic, and phenomenal. Cartographic scale, with which we are most familiar, refers to the depicted size of a feature on a map relative to its actual dimensions. Analytic scale refers to the size of the unit at which a problem is studied. Phenomenal scale refers to the size in which the object or process exists, regardless of how it is represented in the map (Smelser and Baltes, 2001). Within design research, each of these types of scale are interrelated; the cartographic scale of the visualization and the analytic scale of the research question should consider the phenomenal scale of its subject to properly capture the extents of the issue at hand. The same subject matter examined at different scales can reveal different, sometimes contradictory, patterns. Often design research requires an isolation of scales — from a component scale out to a system scale — to study the relevant aspects of complex scenarios. “Scale selection and manipulation is thus a powerfully imaginative and generative act which at once records and sets in train chains of meaning and association in an active process of knowing” (Cosgrove, 1999, p. 9). Critical cartographers must remain cognizant of how scale skews the map’s reading through the extents of what is observed and proposed.

Contributing to the map’s scale are the dimensions that quantify space, time and theme through absolute or relative increments. In geographic maps, space is generally the primary measure defined in absolutes such as feet, meters, or miles. In a timeline, the scale of the map can be measured by absolute temporal units (minutes, hours, days, years, etc.) or relatively by proportional spacing events along an axis. Often maps have more than one scale overlaid to illuminate patterns between dissimilar attributes. Iteratively testing the effects of different measures across diverse scales encourages insight toward the non-neutral imprint these attributes have on the analytic, synthetic, formative, and evaluative processes of research.

Critical cartography in humanistic research can challenge traditional dimensions of scale to accommodate variable measures of experience and perception. For example, when mapping the 1963 March on Washington, the map maker must decide on the extents of the geographic measures of the map (i.e. showing the origin points of bused protesters from across the country, including only the marchers who walked from the surrounding east coast region, or limiting the frame of the map to the National Mall and Lincoln Memorial site). Additionally, considerations on the temporal dimension of the map might include events precipitating the march (i.e. showing significant events beginning with slavery during the colonial era, key events

in the civil rights movements, important events in Dr. Martin Luther King, Jr’s life, or the organization of the march itself) as well as the causal relationships for events that followed (i.e. national civil rights legislation, global civil rights events, or contemporary challenges to equality). Each of these scalar decisions define the extents of the map in space and time, in turn limiting what is understood as important factors to the overall interpretation of the event. For instance, shifting the scalar attributes of personal accounts to create a sortable, mutable, and layered visualization might illuminate shared experiences versus individual testimonies. By challenging how to visualize different experiences of space and time simultaneously, the goal of the research shifts from the discovery of a singular history to an interpretation of multiple histories.

Another essential aspect of maps is that they **organize and prioritize** vast amounts of information through visualizing an overarching system of relationships. Proximity, hierarchy, categorization, isolation, and overlay are the primary ways by which traditional maps compare diverse sets of information to uncover patterns and connections that might otherwise be overlooked. This synthetic view of a scenario moves beyond “a mirror of nature” to “redescribe the world... in terms of relations of power and of cultural practices, preferences, and priorities” (Harley, 2002, p. 35). As Manual Lima (2011) argues in his book *Visual Complexity*, “any system can be depicted and interpreted in multiple ways, and a specific map delivers only one of many possible views... In some cases, the maps of these hidden structures are the only visual reference we have, constituting its own alternative territory” (p. 80).

In the digital humanities, the power of maps to visually organize, compile and relate different sources and media into a synthetic whole is particularly powerful. The plethora of primary accounts and secondary reports of 9/11 (i.e. maps of the different flight paths, timelines of the events, news reports, graphic novels, text messages, and personal photos) offer a unique perspective of what took place on that date. As distinct sources — each mediated by its hosting platform’s format and rhetoric framework — these reports provide piecemeal vision of the unfolding events from singular viewpoints. But once assembled onto a level plane, the disparate accounts are connected through visualizing an order of events in space that illuminates simultaneity of actions and people in addition to connecting historical precedents leading up to those events. Through this engagement, the pieces become part of a larger, collective narrative that provides the digital humanist with evidence to construct new insights previously unconsidered.

Within the process of organizing and translating data into a graphic format, editing occurs whereby “mapping differentiates itself from the territory precisely through acts of selection... all maps are thematic: selecting and highlighting specific phenomena, consciously removing others... such choices and the presences and absences they create are profoundly significant both in the making and meaning of maps” (Cosgrove, 1999, p. 11). Therefore as map makers and map users, “we must search for what it de-emphasizes; not so much what the map shows, as what it omits” (Harley, 2002, p. 45). Like scale, the organizational structure of the map biases the user’s judgments of the information displayed. Through the extraction of more and less important

components of a system, mapping encourages the emphasis of certain elements over others. Imposing this hierarchy facilitates the ability to test various orientations and speculate more fluidly on the relationship between intervention and impact but also actively influences the researcher's belief in the findings. This is especially relevant within the digital humanities as the discipline expands beyond leveraging digital tools to sort and organize vast amounts of archival metadata towards building tools that contribute new knowledge and generative methods to the domain (Ramsay, 2011a).

Through mapping, the activity of inclusion and exclusion forces a confrontation with the values and assumptions that drive who or what is rendered and why. A simple Google search on any research topic will return a variety of results, ranging from the highest academic expert to the casual observer and blogger. In translating these results into a cartographic form, assessments are made regarding criteria for sorting, grouping, and framing that in turn determine which sources are included or excluded. The cartographic form illuminates the established criteria for who and what are legitimate contributors, authors, or forms of media. By exposing the choices made in alignment with that criteria, the map maker is forced to reflect on the judgements of credibility and validity that determine why certain voices are included while others are excluded, reinforcing the need for active, iterative, and conscious editing processes.

Supporting the organization and modeling of a scenario, maps **orient** the viewer and maker within an abstract construction by conveying the location of one's self, or a component, in relationship to other elements. Orientation allows for wayfinding by providing a point of origin for the viewer to enter and navigate within the map as well as to project a new understanding over the real territory it describes. Orientation is a product of hierarchy and centrality which privileges what is at the center of the image as well as its relationship with other elements in the map. Orientation provides a critical vantage point that must be studied in relationship to the effect it has on the map's purpose and persuasion. A basic application of orientation within the digital humanities field is a cartographic bibliography which connects the influence of cited authors. Depending on the criteria for shared connections (academic training, age, collaboration, theoretical perspectives, research methods, etc.), different authors appear more or less influential, and different connections to other authors become visible. Each change in criteria shifts the visual display and meaning of the map through changing the origin point, the relative importance of each author, and their evident connections to one another.

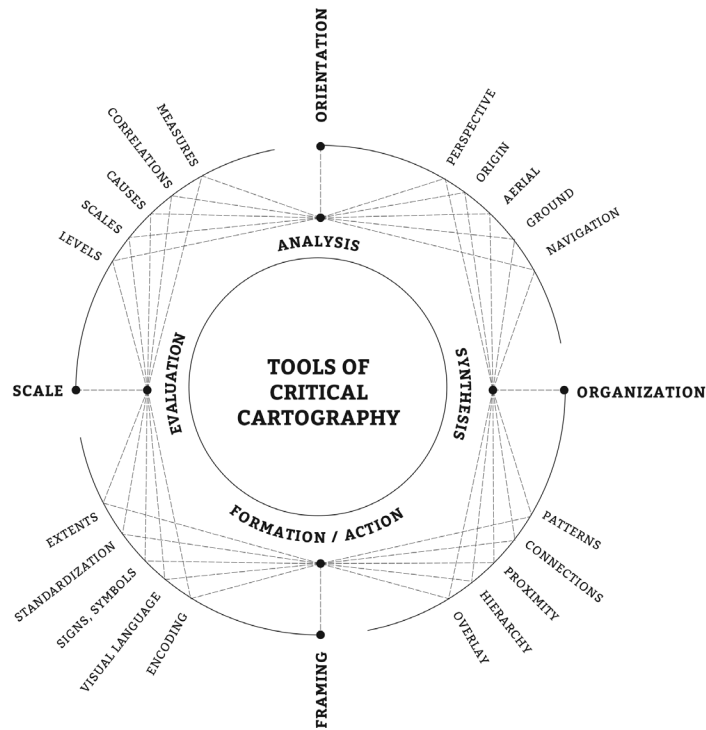
Framing, like scale and organization, is a process where the map-maker (and later viewer) intentionally defines the territory and agenda of the map. Framing sets the physical boundary of the map, restricting the extents of the subject described, but it can also conceptually position the map through the inclusion and exclusion of certain information. Through such elements as the language, iconography, and symbolism chosen for denotation, cultural framing filters the perceptions, interpretations, and understandings of the subject in ways consistent with shared cultural beliefs and experiences. Framing not only affects how we filter a given scenario in the creation of the map but also affects how we interpret meaning as a user. As Christian Jacob

(1999) describes, "any map is an interface — pragmatic, cognitive, metaphysical — between its users and the world that surrounds them... As an optical, as well as an intellectual prosthesis, maps allow human senses and the human mind to achieve a new level of reality... more accessible to study than the reality itself" (p. 25). Framing is linked to perspective as a literal and figurative vantage point that includes socio-political, economic, and cultural worldviews and experiences. Commonly, geographic maps view their subject from a distant or removed aerial perspective and orient the territory facing north up. These culturally agreed upon semiological keys, which we often take for granted, are rules that allow us to understand abstract constructions of the world and project those insights back on the real world. Other than the bird's eye view from an airplane or high overlook, aerial perspective is not our typical experience of a landscape and configures a description of territory in terms other than those we experience daily. Through this abstraction, cartographers highlight attributes of the territory that are unperceivable from the human perspective and de-emphasizes or omits sets of information that interfere with their agenda.

Cartographic framing in the digital humanities situates a place, event, text, or cultural artifact in its larger context. If the goal of a project is to "reconstruct" a historical piece of destroyed architecture through written accounts of patrons and users, design drawings, and photographs, there are multiple strategies for framing the display of that data. At one end of the spectrum might be a rendered simulation of the space which assembles (and edits) the diverse perspectives in order to construct a unified virtual world where the sources of information and their nuanced contradictions are no longer unidentifiable or accessible by the user (Drucker, 2012). At the other end of the spectrum, the resulting cartographic construction might be an interactive floor plan overlaid with historic photos and written accounts which acknowledges the different sources and their bias, thereby illuminating different motivations for the design, construction, use of the space, and its varied cultural significance. These two scenarios utilize the same data set, but through choices in the visual and conceptual framing, they provide very different user interfaces to experience the subject of the map.

The primary cartographic assets of scale, organization, orientation, and framing are deployed through a wide range of tactics (Figure 2), and each contributes to the map's larger role as an analytic, synthetic, and formative research tool. As a powerful **analytic** tool, the map breaks complex issues or systems into smaller pieces to allow the researcher to extract and study a single component or relationship in depth. Design and humanistic research often begins by collecting data and observing phenomena from a variety of sources before assembling those diverse information sets into tangible and comparable ideas. Generally this process proceeds or is simultaneous to the problem definition and therefore highly informs the question seeking phase of a research project. As a **synthetic** research tool, mapping allows researchers to take the diverse observations and data they have gathered surrounding a question and its contextual relationships to render new insights and relationships previously unseen. The patterns that the map uncovers provide a clear entry point for the researcher

Figure 2. The addition of cartographic tools into the digital humanities provides increased opportunities for humanistic interpretation through the primary functions of orientation, framing, organization and scale.



to make critical judgments that support or deconstruct preconceived ideas as well as incite new alternatives previously unconsidered to seed future opportunities. The landscape architect and theorist James Corner argues that “the function of mapping is less to mirror reality than to engender the re-shaping of the worlds in which people live” (Corner, 1999a, p. 213). As a **formative** research tool, the power of mapping has two main assets. Primarily, by providing a bird’s eye view of a system with its complexity of nodes and connections, mapping encourages a critical consideration of the impact of discrete research interventions on alternate parts of the system. Secondly, mapping in the formative stage of the generative process encourages iterative speculation through the use of overlay to test a variety of constraints and opportunities for the intervention itself.

A Theoretical Perspective for Critical Cartography

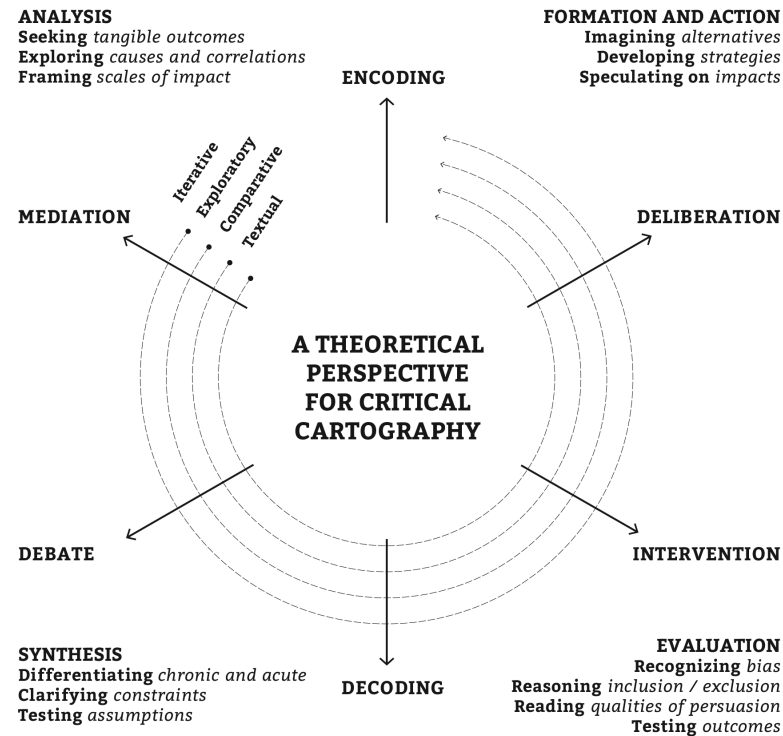
In each of these three functions (analysis, synthesis, and formation), mapping encourages an iterative and non-linear process, similar to that in design. Shifts in scale and perspective actively contribute to the bridge between analysis, synthesis, formation, and action by forcing a constant re-orientation and re-configuration (Figure 3). This fluctuation in perspective encourages debate around new ideas and insights through lateral thinking (DeBono, 1970). Additionally the mapping process exposes the over-

arching systems of relationships through the visual connections that it creates, while simultaneously allowing for a depth of investigation by isolating and highlighting particular intersections supporting focused deliberation. Here the map’s role in mediating the existing environment inaugurates opportunities for later intervention and positions the designer and digital humanist’s approach towards action. Building on Stephen Ramsay’s (2011b) position that a defining component to the digital humanities is the process of building and making, we recognize digital humanities projects as interventions because they force a confrontation with assumptions, challenge knowledge bases, and have the potential to transform disciplinary landscapes through the construction of new research methods, digital tools, and user interfaces. In advancing Geoffrey Rockwell’s acknowledgement of the importance of “thing knowledge – the tacit knowledge of fabrication and its cultures” (Rockwell, 2011, para. 5), much can be applied from the design process towards methods of generative and exploratory research.

The translation of the non-visual to the visual through **encoding** (in the creation of the map, converting and abstracting information into a graphic language) and **decoding** (through the dissection of the graphic image, evaluating alignment with or building meaning around its concept) performs important functions by encouraging a consistent evaluation of form, content, and communication that is essential to research, the construction of knowledge, and the identification of opportunities for alternative futures. Translation and abstraction facilitate encoding and decoding as the map maker moves back and forth between concrete observations and conceptual ideas or models. Here “abstraction is the key word in the process that leads from the empirical vision to the mental schematization” (Jacob, 1999, p. 40) whereby visual language is standardized and seemingly irrelevant differentiators are removed to allow the researcher to more easily see relevant patterns and phenomena. Aided by computational power of digital tools, the iterative and divergent testing of approaches to encoding, modeled on design processes, can transform how visualizations are utilized in the digital humanities. This critical approach to the rhetorical nature of encoding/decoding processes that construct the map’s meaning must consider the rules and visual vocabulary by which information is coded. The rules of most graphic vocabulary was developed in the sciences and preferences quantitative research (Drucker, 2012). Therefore, like any designer who must iteratively test material translations to best serve an intended function, the digital humanist must actively interrogate the tools that input and manipulate data as well as the visual language that displays it.

In order to fully engage the strength of mapping in translating, clarifying, and constructing knowledge, researchers must also consider how maps (and the codes or softwares that construct them) distort the truth (and even lie) by employing their position as a reflection of reality (Harley, 1989) that persuades and manipulates. Within this critical view the map maker knowingly or unknowingly inserts bias into the map which persuades its viewer (and maker) of a certain, inherent truth. Much of the critical literature on and surrounding mapping has focused predominantly on the artifact (i.e. the map itself) as a symbol of values, biases, and assumptions on the part of

Figure 3. Using cartographic tools for encoding/decoding, debate/deliberation and mediation/intervention in the digital humanities includes a focus on the iterative, exploratory, comparative and textual components of map making to support critical analysis and design thinking that move the map away from an artifact of proof and towards one of critical understanding and insight.



the mapmaker. JB Harley (1989) has argued that the map is a “social construct” and a product of the “rules of society” and the “rules of measurement” (p. 6) – rules that might seem fixed but are actually in continuous negotiation. As the activity and process of mapping is utilized more frequently to aid us in deciphering the vast amounts of data at hand, so the literacy surrounding the methods employed to create them must be utilized. Movement towards this maturity starts with a focused critical reflection on the methods employed and questions asked during the map-making process.

Critical Making

Essential to the intentional use of cartographic tools in design research and the digital humanities is an active consciousness of the persuasive qualities of translation and abstraction as well as the exploratory potential of mapping to define numerous possible measures of an issue. To aid in the critical making process, we have identified four fundamental characteristics to the development of a theoretical perspective for mapping in design research: map making should include aspects that are iterative (vs. linear), exploratory (vs. proving), comparative (vs. singular), and textual (vs. aesthetic). Here we argue that these distinctions are important for developing mapping as a methodology rather than a passive tactic.

Like design, map making is enhanced greatly when seen as an iterative process whereby the map is not just a finished product, but an ongoing generative and reflective process for advancing critical and creative thinking (Dubberly, 2010). Because an essential component to mapping processes is interpreting and encoding observations from diverse perspectives, iteratively testing appropriate orientations, scales, and translations for those observations facilitates the working back and forth between concrete observations and the abstract concepts they illuminate. These map-supported processes are also integral to iterative problem seeking and idea generation. As Donald Schon (1984) proposed, design is a “reflective dialog” between the designer and situation more so than a linear problem solving process, and the map is a powerful device to lend insight to that reflective dialog by providing the measures necessary to assess a proposal’s usefulness and impact. In addition to facilitating investigation on a design problem or issue at hand, critical cartography can also serve as an internally reflective tool for designers and researchers as they consider their process and consciously reflect on their assumptions and bias throughout. Returning to the cartographic bibliography exemplified earlier, each change in criteria provides an opportunity for the map maker to reflect on the decisions made and knowledge built as a result of its construction. It also provides an opportunity to introduce new data and content, such as non-academic authors, to see how those perspectives integrate into academic dialogs or to explore public awareness and relevance.

Map making should also be exploratory and used as a tool for designers and scholars to think “aloud.” Design research requires integrative thinking which combines analytic thinking process with the ability to work through sometimes contradictory information (Martin, 2007). Maps require a similar conceptual leap, as cartographers must often work with incomplete information and tolerate uncertainty as they construct relationships previously unseen. This requires the cartographer to ask deeper, more focused questions and often return to gathering additional data or to step back and visualize the given information from an alternative orientation or scale to explore the various potentials. Here the intention is not to resolve the observations into a single truth in order to elicit a specific design approach or conclusion but instead explore “what if” for a number of possible truths. As a cognitive tool, map making supports open-ended exploration of the complexities of design problems and research questions by complementing and even strengthening our mental abilities through increasing our working memory, facilitating our ability to search or navigate large information sets, supporting perceptual inference and discovery, and providing testable models of actual and theoretical worlds (Meirelles, 2013, p. 12). Mapping’s greatest benefit comes when seen less as a tool to prove a point and more to illuminate, uncover, and provoke insights and new connections. This can only be done when the goal of the activity is the process rather than the product. The interactive nature of digital tools provide a strong environment in which to re-frame the map in this way. For example, a project that uses crowd-sourcing to map literary influences on rap songs over 20 years is inherently dynamic in the way that meaning is constructed in real-time. As more information is introduced and mapped onto the

system, the patterns of influence similarly shift. This same approach could also be explored within a contained data set by changing criteria to highlight different types of literary influences – when and where literary influences were most prevalent, whether or not similar influences appear in other musical genres, or if a reciprocal effect occurred where lyrics from rap songs found their way into popular literature. In critical cartography, these maps then become exploratory research tools, helping the digital humanist visualize a larger landscape in order to carve out a smaller territory to investigate more deeply.

Related to its iterative and exploratory attributes, as a comparative process, mapping also works best when used to encourage parity – combining various data sets to highlight alternative relationships and ultimately stimulate systems thinking. Comparative processes support iterative experimentation by testing how components relate to form a synthetic interpretation of the issue at hand. They also help predict how an intervention in one discrete area might affect the system as a whole. Naturally, designers and researchers approach a research question with pre-conceived assumptions as to how components relate to one another. Therefore, it is important that the mapping process be understood as a tool for uncovering juxtapositional relationships and how new information and interventions might affect those connections.

The final element contributing to this theoretical perspective for mapping in design research and the digital humanities is that map making involves a literacy focused on the effectiveness and impact of its agreed upon (or obvious) meaning as well as its contested (or nuanced) connotations. Fundamental to this aspect is the idea that “maps are text in the same senses that other nonverbal sign systems – paintings, prints, theater, films, television, music – are text” (Harley, 2002, p. 36). Cosgrove (1999), along with JB Harley (2002) and other geographers, points out that the visual systems which maps use to connect represented space with “ideas of the real” are historically and culturally determined and that “within the frame of one map there may be several texts – an intertextuality” (Harley, 2002, p. 38). As Johanna Drucker’s statements cited earlier in the paper underscore, the digital humanities focus on interpretation means that the process of translation and encoding becomes infinitely more complex and inter-relational (2011, 2012). The potential complexity in the authorship and reading of the map’s content begs that the map maker be not only aware of, but in command of, how abstraction and translation processes inform the map’s rhetorical nature. This includes an understanding and consciousness of Harley’s “systems of meaning” (2002) borrowed from art history which identify physical, psychological, and rhetorical interpretations that are dictated by an agreement as to what signs, symbols, and language mean within the map’s construction. The strength of the map as encoded text is that it highlights aspects and opportunities invisible without the abstraction, translation, and isolation of the complex design problem or research question. Critical reflection and dialogue on these cultural constructs – both as assets to clarify meaning as well as obstacles to interpretation – promotes a better understanding of the connection between process and outcomes.

Critical Analysis

Equally important to critical insight on map making is the reflective analysis of the procedure and its influence on the map artifact. “Representing multidimensional information structures in a two dimensional visual display is not trivial” (Meirelles, 2013, p. 9). The rhetorical nature of the map and the influence that the tools and conventions of mapping have on the message should be critically questioned in the decoding or use of the artifact. Harley points out that “the fascination of maps as humanly centered documents is found not merely in the extent to which they are objective or accurate. It also lies in their inherent ambivalence and in our ability to tease out new meanings, hidden agendas and contrasting worldviews from between the lines on the image” (Harley, 2002, p. 36).

Critical analysis requires map makers to be aware of how the perspective of the map and its translation of information conditions the viewer’s (or their own) understanding of the information displayed. The iterative and exploratory nature of map making, which requires cartographers to test many different alternatives to visualize and translate observations, plays an equally important role when interacting with and decoding the map. Critical cartographers must actively consider diverse lenses and alternative interpretations to challenge the assumptions and bias they bring to their research. The graphic language of “maps as unique systems of signs whose codes may be at once iconic, linguistic, numerical and temporal” (Harley, 2002, p. 79) requires us to question how we make meaning from the signs and whether that meaning is singular or multiple, implicit or explicit. This involves exposing what informs or influences our interpretation, including cultural and experience-based knowledge that preface certain understandings of visual images, as well as recognizing what is included versus excluded. In mapping the March on Washington, the interpretation of the map is directly influenced by the people, events, and narratives that are included as well as the visual representation they take. The inclusion of information such as who didn’t participate (and why) or simultaneous and reactionary demonstrations changes the conversation from one of celebration to one of contention – an important alternative interpretation. Attention must also be paid to the orientation, scale, and extents of the map as it influences the scope and definition of the project. Critical consideration of alternative measures, impacts, and patterns should be developed as a way to reflect on the judgements formed from the display of the map. If the temporal timeline in the March on Washington map ended with the introduction of civil rights legislation, the map showcases an interpretation of current America as being “post-civil rights” – inferring that issues inherent in the Civil Rights Movement are no longer in existence. If, however, the timeline continues into the current day and includes current events surrounding the #blacklivesmatter movement, the interpretation is expanded to include civil rights as an ongoing and relevant issue. This critical eye should also be applied to the instruments, code, or software that aid in the construct of the map, acknowledging where and how the tool distorts or preferences certain information or organizational structures. Visualizing the March on Washington as a

series of bar charts or as a dynamic timeline with sliders that allow the reader to see where participants in the march are living and working today changes how the viewer understands the context of the event and those involved. In critical cartography, the map becomes a visual tool for analyzing the construction and deconstruction of knowledge and interpretation.

Critical Impact

One of the most overlooked aspects of mapping as design research is the impact that mapping has in determining the approach and goals of a research proposal. This agency which the map lends to the design process is equally influential in the digital humanities whereby the visualization of and navigation through a large data set inherently positions the researcher and user of the research as active participants in the making of meaning. The power of the map's mediation, as a non-neutral synthesis of a research problem, inherently influences and transforms the generative process and demands the responsibility of the map maker in shaping it. "The graphic is no longer only the 'representation' of a final simplification, it is a point of departure for the discovery of these simplifications and the means for their justification" (Bertin, 2010, p. 4). The ability to abstractly organize a scenario is extremely useful to designers or researchers who are searching for acute issues within larger chronic problems. In this role, the theoretical model of the research problem constructed through the map has the potential to highlight opportunities for intervention and even suggest the assessment outcomes which might be used for measuring its impact on the overarching chronic problem. In this way map making dissects very complex, seemingly unsolvable problems into potential opportunities to effect change through a graphic language which emphasizes (or highlights) existing gaps within the greater context. Therefore the map has the potential to serve as a generator precisely because it offers a conjecture or starting point for reconsidering a place or situation of knowledge. Here mapping is a "collective enabling enterprise" that "reveals and realizes hidden potential" (Corner, 1999a, p. 213).

The potential for impact on the final design or research proposal begins very early in the map making process; the selection of scale and orientation contributes to how the scope of the problem is defined from the outset and often aligns with or drives the goals of a later proposal. As Denis Cosgrove articulated, "Another form of mapping is the creative probing, the tactical reworking, the imaginative projection of a surface. Here, mapping becomes the two-dimensional 'staging' of actuality or desire. 'Perspective' has a temporal as well as spatial meaning – looking forward, the sense of prospect. Thus the map excites imagination and graphs desire, its projection is the foundation for and stimulus to projects" (Cosgrove, 1999, p. 15).

A few designers, including James Corner, Alan Berger, Anuradha Mathur, and Dilip Da Cunha, take this impact of the map one step further to claim that critical cartography can be the design intervention in and of itself. Through their seminal research publications and exhibitions of maps, they incite alternative beliefs about a

DEBATE AND DELIBERATION IN CRITICAL CARTOGRAPHY

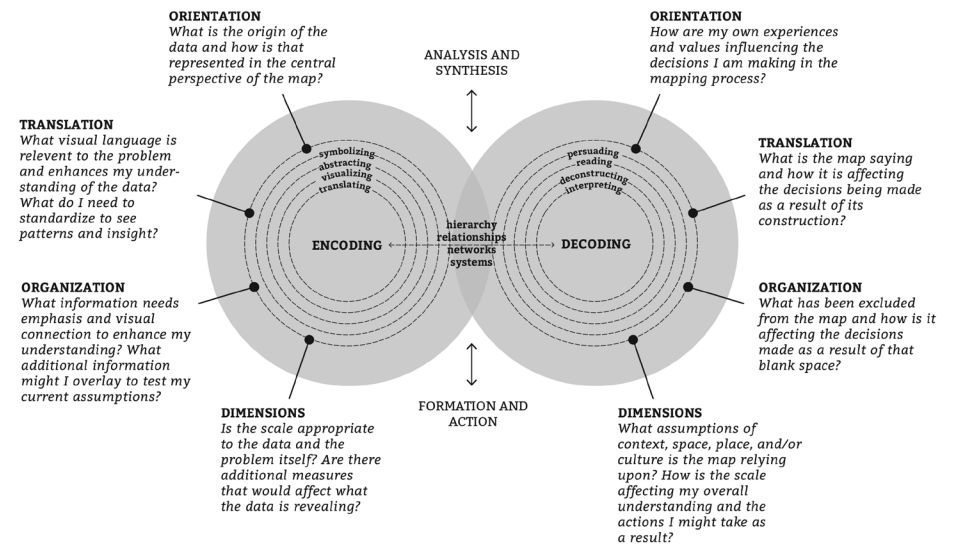


Figure 4. Central to critical cartography is provoking debate and deliberation throughout the encoding and decoding process. These questions acknowledge the major attributes that mapping provides for design research, while challenging the assumptions it can illuminate.

landscape's geographic, cultural, and economic measures influencing both the public's interpretations of its histories and possible futures. Their work as design-cartographers transforms the landscape, not by physically altering it, but by influencing one's perception and future use of it.

Conclusion

The growing popularity of mapping in the digital humanities and design research begs for a greater literacy of the non-neutral processes of map making as preparation for deeper reflection on its use. As a cognitive and reflective process, mapping has the ability to support design thinking through experiential learning and development because it incorporates concrete experience (feeling), reflective observation (reviewing), abstract conceptualization (thinking/generalizing) and active experimentation (doing/testing) (Kolb, 1984). In facilitating experiential learning, mapping moves in a non-linear sequence between observing and gathering information, encoding information through graphic systems of abstraction to make the invisible visible, translating the abstract relationships through decoding to identify novel opportunities for intervention, and extracting judgments of the work produced based on measures determined through the initial framing of the question. Here mapping is an act of making precisely because it supports "the ability to imagine that-which-does-not-yet-exist, to make it appear in concrete form as a new, purposeful addition to the real world" (Nelson and Stolterman, 2014, p. 12).

With the integration of mapping into research and generative processes, designers and digital humanists need to be intentional in developing tactics for the rigorous

use of cartography. To achieve this goal, evaluating and outlining a theoretical perspective for mapping as a part of the generative research process needs to include explicitly critical and reflective components. Debate and dialogue in the activities of making, evaluating, and utilizing the outcomes inherent in critical cartographies starts with specific questions regarding the purpose of the map and the bias of the data upon which we are relying: *What purpose does the map serve in the context of this project and its potential impact? How is the process of gathering and recording the information influencing its visual translation? How is our process of making influencing what we are learning and the proposals we generate as a result?*

Strategies for synthesizing and communicating design research need to include critical questions regarding how the researcher might bias the findings: *What assumptions do we bring to how we abstract and translate the gathered information? What are the culturally determined rules of measurement and graphic conventions being used or broken? What is included versus excluded? What hierarchical, causal, or correlative relationships are implied? What is the agenda of the map?*

Lastly we must be critical of how the mediation of the map affects formation and action, including the definition of project goals and outcomes: *How has the map identified new opportunities for intervention? What are the opportunities for measurable impact? What are the goals of the project and how do we assess those through measurable outcomes?*

Through the asking of explicit and targeting questions, we can move mapping beyond an organizational and visual strategy towards an actively critical and reflective tool that helps designers and researchers conceive large systems, individual components, and discrete moments for intervention.

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Tania and Sara lead the faculty lead initiative *Co/lab* at North Carolina State University which facilitates cross-disciplinary design research through mapping methodologies and visualization strategies with the goal of facilitating deeper, more diverse understandings of physical place, cultural space and social territory through innovative courses and projects that map urban territory, history and social relationships. Through *Co/lab* they have developed a number of public participatory mapping projects on such topics as public transportation, memory and placemaking. Tania received a Bachelor in History from Washington University, a Certificate in Visual Communication from the School of the Art Institute of Chicago, and a Master of Graphic Design from NC State University. Sara received a Bachelor of Environmental Design in Architecture from NC State University and a Masters in Architecture from the Graduate School of Design at Harvard University.

References

- Abrams, J., & Hall, P. (Eds.). (2006). *Else/Where: Mapping, New Cartographies of Networks and Territories*. Minneapolis, MN: University of Minnesota Press.
- Bertin, J. (2010). *Semiology of Graphics*. Redlands, CA: Esri Press.
- Corner, J. (1999a). The Agency of Mapping: Speculation, Critique and Invention. In D. Cosgrove (Ed.), *Mappings* (pp. 213-252). London: Reaktion Books Ltd.
- Corner, J. (1999b). Eidetic Operations and New Landscapes. In J. Corner (Ed.), *Recovering Landscape* (pp. 153-170). New York, NY: Princeton Architectural Press.
- Cosgrove, D. (1999). Introduction: Mapping Meaning. In D. Cosgrove (Ed.), *Mappings* (pp. 1-23). London: Reaktion Books Ltd.
- Crampton, J.W., & Krygier, J. (2006). An Introduction to Critical Cartography. *ACME: An International E-Journal for Critical Geographies*, 4, 11-33.
- Crampton, J. (2010). *Mapping: A Critical Introduction to Cartography and GIS*. West Sussex: Wiley-Blackwell.
- Cross, N. (1990). The Nature and Nurture of Design Ability. *Design Studies*, 11(3), 127-140.
- DeBono, E. (1970). *Lateral Thinking: Creativity Step by Step*. New York, NY: Harper & Collins.
- Dubberly, H., Evenson, S., & Robinson, R. (2008). "The Analysis-Synthesis Bridge Model." *Interactions*, 15(2), 1-4.
- Dubberly, H. (2010). Creating Concept Maps. Retrieved from <http://www.dubberly.com/concept-maps/creating-concept-maps.html>
- Drucker, J. (2011). Humanities Approaches to Graphical Display. *Digital Humanities Quarterly*, 5 (1). Retrieved from <http://www.digitalhumanities.org/dhq/vol/5/1/000091/000091.html#p26>
- Drucker, J. (2012). Humanistic Theory and Digital Scholarship. In M.K. Gold (Ed.), *Debates in the Digital Humanities*. (pp. 85-95). Minneapolis, MN: University of Minnesota Press.
- Gold, M.K. (Ed.). (2012). *Debates in the Digital Humanities*. Minneapolis, MN: University of Minnesota Press.
- Harley, J.B. (1989). Deconstructing the Map. *Cartographica*, 26(2), 1-20.
- Harley, J.B. (2002). *The New Nature of Maps: Essays on the History of Cartography*. Baltimore, MD: Johns Hopkins University Press.
- Hassett, M., & Kostelnick, C. (2003). *Shaping Information: The Rhetoric of Visual Conventions*. Carbondale, IL: University of Illinois Press.

- Jacob, C. (1999). Mapping in the Mind. In D. Cosgrove (Ed.), *Mappings* (pp. 24-49). London: Reaktion Books Ltd.
- Kolb, D.A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.
- Kolko, J. (2010). Abductive Thinking and Sensemaking: The Drivers of Design Synthesis. *Design Issues*, 26 (1), 15-28.
- Lima, M. (2011). *Visual Complexity: Mapping Patterns of Information*. New York, NY: Princeton Architectural Press.
- Martin, R. (2007). *The Opposable Mind*. Cambridge, MA: Harvard Business Review Press.
- Martin, R. (2009). *The Design of Business: Why Design Thinking is the Next Competitive Advantage*. Cambridge, MA: Harvard Business Review Press.
- Meirelles, I. (2013). *Design for Information: An Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations*. Beverly, MA: Rockport Publishers.
- Nelson, H., & Stolterman, E. (2012). *The Design Way: Intentional Change in an Unpredictable World*. Cambridge, MA: MIT Press.
- Novak, J.D. & Gowin, D.B. (1984). *Learning How to Learn*. Cambridge, UK: Cambridge University Press.
- Ramsay, S. (2011a). Who's In and Who's Out. Retrieved from <http://stephenramsay.us/text/2011/01/08/whos-in-and-whos-out/>
- Ramsay, S. (2011b). On Building. Retrieved from <http://stephenramsay.us/text/2011/01/11/on-building/>
- Rockwell, G. (2011). Inclusion in the Digital Humanities. Retrieved from <http://www.philosophi.ca/pmwiki.php/Main/InclusionInTheDigitalHumanities>
- Schon, D.A. (1984). *The Reflective Practitioner*. New York, NY: Basic Books Inc.
- Smelser, N.J., & Baltes, P. B. (Eds.). (2001). *International Encyclopedia of the Social & Behavioral Sciences*. Oxford, UK: Pergamon Press, 13501-13504.

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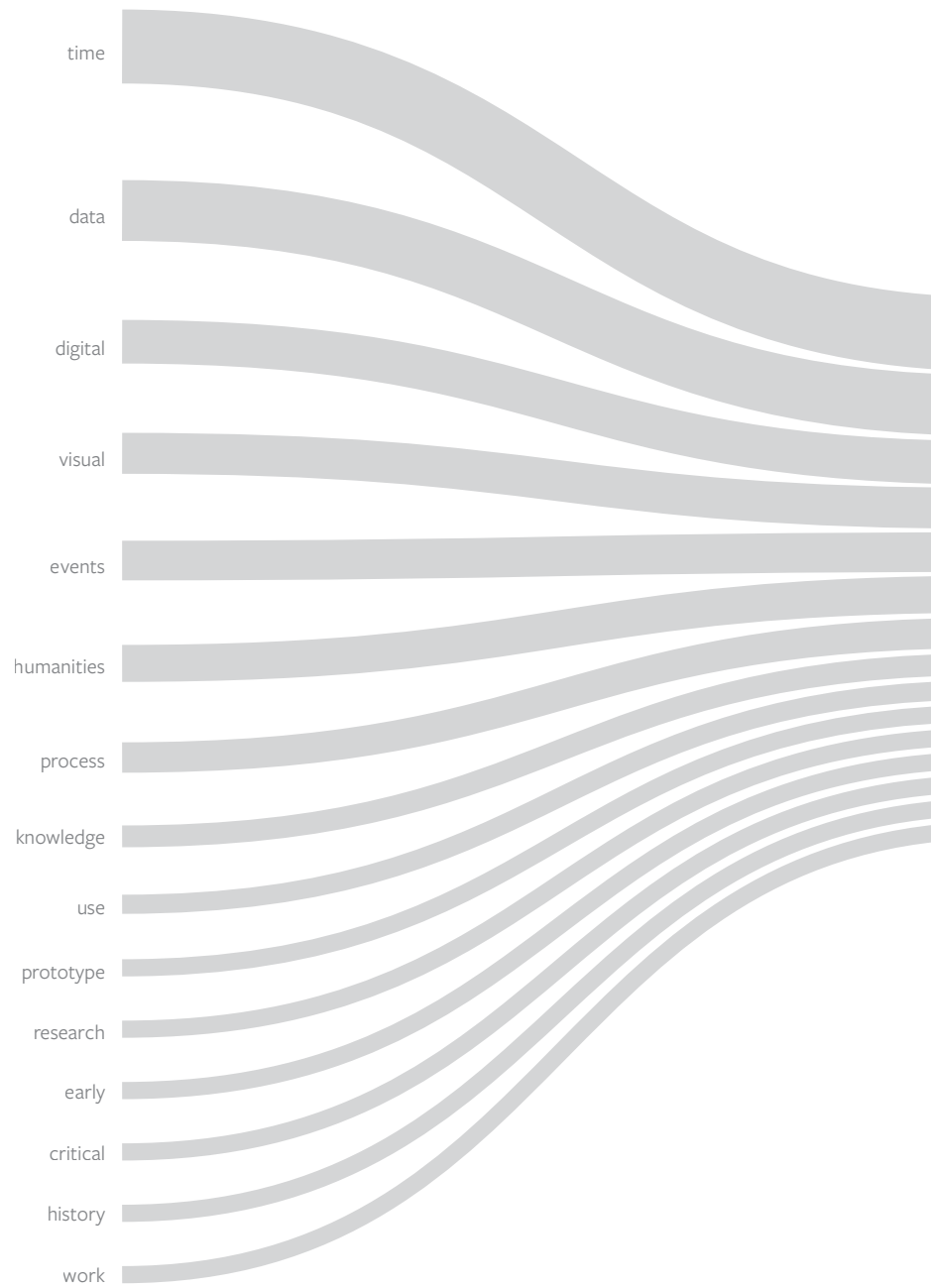
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The Idea and Image of Historical Time:

Interactions between Design and Digital Humanities

Stephen Boyd Davis
Florian Kräutli

Abstract

The paper addresses the relationship between design and the digital humanities, asking what each can learn from the other and how they may make progress together. The focus is *critical making* in chronographics – the time-wise visualisation of history – based on the authors’ historic research and current practice in visualising collections of cultural objects and events. This is situated in historic and contemporary contexts, arguing that the eighteenth century origins of the modern timeline have useful insights to offer in terms of objectives and rationale. The authors advocate a critical approach to visualisation that requires both design and digital humanities to face up to the problems of uncertainty, imprecision, and curatorial process, including in relation to time itself.

Keywords: chronographics, curating, design, dates, digital humanities, timeline, uncertainty

Introduction

In this paper, we explore the interaction between designers and humanists in the context of our work on time-wise visualisations for research in digital cultural collections. The digital humanities have introduced humanities researchers to ‘making’ as a method for knowledge production, as well as to the idea of visualisations as research outputs, which is leading to increasing collaboration and cross-fertilisation between the fields of design and humanities.

We suggest that, in the context of time-wise visualisation, scholars were already adopting ‘design methods’ in the eighteenth century by creating new data visualisations of temporal data in order to understand and communicate. They combined graphic invention, advanced technologies (such as copper plate engraving and techniques borrowed from cartography), and new approaches to humanistic knowledge, particularly in terms of mathematisation and mechanisation. We show that then, as well as now, there are important insights to be gained through the act of making, as well as through interacting with the created digital artefacts, and that those insights benefit both design and the (digital) humanities.

Our work has led us to grapple with a number of issues. Our commitment to making timelines into serious tools that match the needs of historiography requires us to address head-on the problematics of time as a metrical framework, seeking benefit in time-wise visualisation despite its apparently mechanistic character. We deal with data that is messy, partial (often in both senses – incomplete and skewed), and flawed. These failings extend to the very numbers we depend on for dating objects, events, and records.

The digital humanities face criticism for relying on mechanical methods for what should be substantially an interpretative form of scholarship (Anderson, 2007; Borgman, 2009; Drucker, 2011; Swierenga, 1974). However, the humanities have long been intertwined with mechanical methods and mathematical concepts. While we may take most of them for granted and as essential, it is worth considering that even by a trivial act such as positioning historical documents by date, we make use of a mechanical, arithmetic model: Newtonian time, named after its most prominent proponent. Newton considered time to be an absolute, uniform frame of reference where events could be ‘located’ independent of other events or external perceivers. Time, according to Newton, is “absolute, true, and mathematical” (Newton, 1687), a fundamental quantity like length or mass, which can be measured and expressed in a manner that may be universally agreed upon. In the eighteenth century, such thinking led to geography and cartography being treated as models for representing historical time (Boyd Davis, 2015b).

Without this fundamental shift in thinking about time as a number, and Descartes’ proposition that anything that can be expressed in number can be represented graphically (Descartes, 1996), true timelines that map durations to graphical space would not be conceivable. This transition, from studying historical data based on lists and tables of time to Cartesian graphical timelines, can be seen as representing a change in the ontology of historic time itself, from an earlier

conceptualisation where history is simply the accretion of events to one in which it is a quasi-spatial dimension or terrain where events are situated.

To model history on such a basis is to make an emphatic decision. Such numeric and apparently objective models of time have famously been contested. Bergson (1950) discusses time in relation to consciousness. He distances experienced (concrete duration) from mathematical time (abstract time), the latter seen by Bachelard (1963) as a sequence of discontinuous, countable instants. Bachelard, as a philosopher of science, favored a quantified model of time, for only what can be expressed in numbers would, in his view, count as scientific. By contrast, Bergsonian duration is “a qualitative multiplicity, with no likeness to number” (Bergson, 1950, p. 226). His duration is unique and extends continuously from past to present. Of course ‘scientific’ time is no longer the simple uniform progression from past, to present, to future that non-scientists sometimes like to suggest. Einstein introduced a kind of subjectivity with the theory of relativity, and time’s very existence is repeatedly questioned, including in the ‘hard sciences’ such as physics (Barbour, 1999). For Gödel, too, (Weinert, 2013) time is unreal, a conclusion that has been reached by thinkers such as Spinoza, Kant, and Hegel (McTaggart, 1993), and many others throughout history.

In the field of information technology, a number of innovations are introducing interpretive and subjective (Drucker & Nowviskie, 2003), complex and uncertain (Kräutli & Boyd Davis, 2013; Meeks & Grossner, 2014), and social (Martin, 2010) models of time. Nevertheless, Newtonian time is still the prevalent underpinning model in computing; and, if we keep in mind that it is just one of many, it has considerable merits for analysing data through visualisation by providing a unified frame of reference that can be easily mapped on to the numerical space of a digital screen. Arguably, there are also few alternatives when it comes to working with existing datasets. While the limitations of available software tools for humanities research have been identified since the 1980s (Winchester, 1980), early efforts in developing database tools specifically for humanities computing (Thaller, 1987) found little acceptance. Most cultural datasets have therefore, whether thoughtlessly or out of necessity, been created with simple models of linear time, and without many of the qualifiers – relative dates, levels of precision, identification of authorship, etc – that would be necessary to sustain other approaches.

We present first some historic examples of visual chronologies such as timelines – a class of visualisation we will refer to as chronographics – and discuss the arguments put forward by their creators. We see these pioneering works as a form of research through design, as their makers not only had to design new graphical formats, they had to develop a new visual rhetoric and, most importantly, explain and reflect on their ideas, processes, and rationales. Today, it is rare for designers to have to defend and justify their decisions in relation to visual representation of time. Until recently, chronographics have largely escaped serious study. This lack of theorisation in the visual mapping of time contrasts strongly with that in cartography, the visual mapping of space. There, argument rages over the respective merits of the Mercator, Gall-Peters, and other projections, with a clear understanding that each presents

a different world view and that these differences matter (Wood & Krygier, 2009). Feminist geography exemplifies the extent to which maps are rightly seen as contingent, contentious, and loaded with embedded meanings (Kwan, 2010; Rose, 1993), while the awareness that maps represent particular ideologies, parties, and claims has even made its way into populist academic literature through the works of Monmonier (1996; 2008). Chronography, however, unlike cartography, is generally seen as simple, even as “a bit of banal tedium” (Behrendt, 2011), and as a merely technical design problem. We argue that chronographics both require and enable critical thinking.

Our research method

Our methods are based on iterative design of functional visualisation prototypes for digital cultural collections. A core element of this process is a constant evaluation of the created artefacts in the form of critical reflection and ongoing dialogues with museum curators and archivists, who are both experts and the future users of our visualisation tools. This is a form of *critical making* (Ratto, 2011) in which we emphasise iterative and collaborative methods and use the collaborative working process itself as the locus of evaluation, rather than employing a separately designed user-testing process.

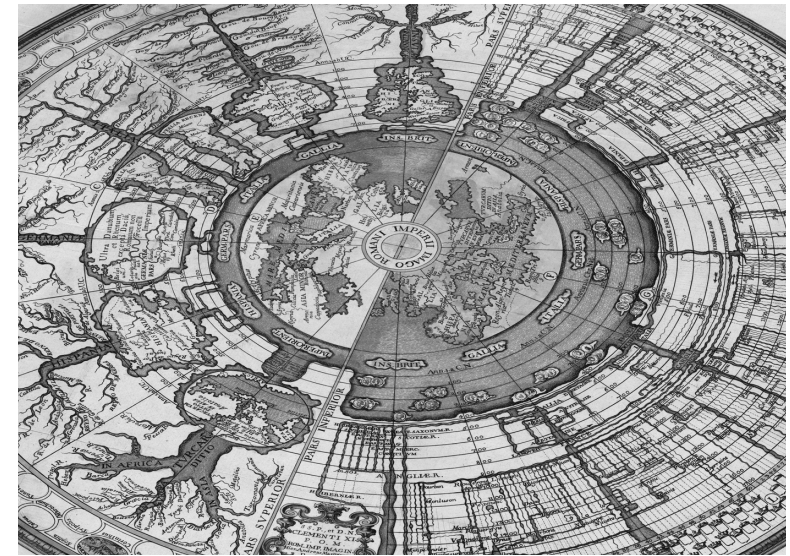
We also assume, as was recognised early in the years of Design Research as a discipline, that the questions, issues and problems to be interrogated and presented are reformulated during the design and development process (Archer, 1968). The creation of a prototype and the subsequent interaction with it constitute the enquiry by raising new research questions that emerge during development and evaluation of the prototype and by supplying evidence for addressing the original research questions. Prototyping acts as a way to instantiate ideas and hypotheses and as a method to generate knowledge by reflecting on the creation process and interacting with the created prototype.

Our prototypes are based on existing cultural datasets and thus reflect the challenges of time-wise visualisation in real-world applications. We work with publicly available datasets as well as data we have obtained directly from the institutions we collaborate with. In terms of our technical methods for realising our prototypes, we rely on standard web technology such as HTML and JavaScript together with the open source visualisation library d3.js (Bostock, Ogievetsky, & Heer, 2011).

Early Chronographics

In 1718, Girolamo Andrea Martignoni (died c.1743) published a large, engraved chart of history inspired by geographic maps and centered on the Roman Empire, together with a substantial *Explication de la Carte Historique de la France et de l'Angleterre* (Martignoni, 1721) and a similar volume on Italy and Germany. He presents his chart as a visual summary of history, “par une nouvelle invention, de faire voir en abrégé dans une Carte, toute l'Histoire principale de l'Empire Romain” (Martignoni, 1721§1). He also identifies multiple forms of access, in that there are three different ways of

Figure 1.
Martignoni, 1718.
Chart of the
Roman Empire.
Turin: Tasnere.
56cm x 57cm.
Collection / photo:
Cartographic Insti-
tute of Catalonia
(Creative Commons
BY-NC-ND 3.0).



interrogating his chart: tracing events and successions, following centuries, and tracing the histories of major families. These are facilitated by the representation being diagrammatic rather than textual. Martignoni also claims that the use of his chart is enjoyable and that it is more memorable than text: “an easy means of learning History, in a manner that pleases the Mind and relieves the Memory” (“un moyen facile pour apprendre l’Histoire; d’une manière qui puisse faire plaisir à l’esprit, & soulager la mémoire”) (Martignoni, 1721§1). The notion of visual presentation providing a more enjoyable encounter with history recurs in many later authors and can be regarded as a primary motivation for chronographic invention.

The Abbé Nicolas Lenglet du Fresnoy (1674-1755) similarly states that his more conventional chart, a series of roughly synchronized columns, “pleases considerably more than it tires” (“elle plaît beaucoup plus qu’elle ne fatigue”) (Fresnoy, 1729). He introduces the implication that his chart bypasses some of the cognitive processes associated with reading: “This is a method that I present as much to the eyes as to the intellect” (“c’est une méthode que je présente autant aux yeux qu’à l’esprit”) (p. 108). This notion of more direct access to knowledge through vision will also become a regular claim. More unusual is the Abbé’s interest in representing uncertainty. Rather than using his diagram to simplify chronology, he uses it to draw attention to its notorious difficulties. Rather than forcing his dates into a single chronology, he uses the chart to display in parallel columns the key points of difference, such as those between Usher, de Tournemine and Serrarius (Fresnoy, 1729). Few chronographers since have troubled themselves with uncertainty of any kind, succumbing to the temptation to make clean, uncluttered, unequivocal charts, which perhaps explains why timelines are not generally regarded as a serious tool for the historian.

While Martignoni favoured a design based rather literally on metaphors of topographic features and cartography, Joseph Priestley (1733-1804) and Jacques Barbeau-Dubourg (1709-1779) both produced ‘mappings’ of a more abstract kind, timelines that graphically map events on a mathematical diagrammatic timescale, an ‘ocular demonstration’ of Newtonian time (Priestley, 1764). Priestley is one of the earliest to graphically address the problem of uncertainty, as described below, which is so often swept aside by subsequent chronographic designers.

Barbeau-Dubourg’s chart (Barbeau-Dubourg, 1753) is 16.5 metres long and depicts all of time from the Creation to his own days on a uniform scale. His rationale for this uniformity is that the viewer need not refer to any external guidance and can assume at any point that the scale is the same. Surprisingly, he does not make any claims for the significance of empty space, perhaps because the early sheets of his chart have an embarrassing degree of emptiness. The point is made, however, by Priestley in relation to his much smaller – but equally uniform – Chart of Biography (Priestley, 1765): “The thin and void places in the chart are, in fact, not less instructive than the most crowded, in giving us an idea of the great interruptions of science, and the intervals at which it has flourished” (Priestley, 1764, p. 24). This is an argument for the power of visual pattern to reveal clusters, voids, and outliers – though Priestley, in an untypical lapse of acuity, fails to make any distinction between lack of events and lack of data for his ‘empty’ periods. As we have discussed elsewhere (Boyd Davis, Bevan, & Kudikov, 2013), there continue to be good arguments for and against uniform timescales. Speaking of a pirated English version of La Bruyère’s *Mappemonde* (1750), Priestley attacks the lack of a uniform scale in terms of the capacity of visualisation to mislead. He is one of the few theorist-practitioners to acknowledge the dangers of a badly designed diagram, arguing that once a wrong impression (such as of timescale) has been seized through vision, no amount of ratiocination will undo the damage (Priestley, 1764, p. 8). He seems to recognise that this is the downside of the benefits of rapid visual apprehension in which a few minutes’ inspection “will give a person a clearer idea of the rise, progress, extent, revolutions, and duration of empires than he could possibly acquire by reading” (Priestley, 1764, p. 7). Key characteristics that La Bruyère sought in his own diagram were “order and precision” (“ordre et précision”) (Barbeau de la Bruyère, 1750), surely indicators of a then new mechanical-mathematical approach to time (Boyd Davis, 2015a).

Despite his reservations, Priestley makes a persuasive case for visualisation. He uses the example of trying to figure out the relationship between the lives of five historical figures: He allows his reader to experience the difficulty of answering questions about their relative dates before directing them to look at his chart: “As soon as you have found the names, you see at one glance, without the help of Arithmetic, or even of words, and in the most clear and perfect manner possible, the relation of these lives to one another” (Priestley, 1764, p. 10). Dealing as he does in his 1765 chart with biography rather than general history (he made a chart of the latter in 1769), Priestley is unique in discussing the issue of individual context: “a view as this chart exhibits, of a great man, such as Sir Isaac Newton, seated, as it were, in the circle of his

friends and illustrious cotemporaries [sic]. We see at once with whom he was capable of holding conversation, and in a manner (from the distinct view of their respective ages) upon what terms they might converse” (Priestley, p. 24). Again, “We likewise see, in some measure, by the names which precede any person, what advantages he enjoyed from the labours and discoveries of others, and, by those which follow him, of what use his labours were to his successors” (p. 24).

Like Lenglet Du Fresnoy, Priestley is concerned to be honest about uncertainty. Where the Abbé wants to show difference of opinion, Priestley is concerned to show doubt. His Chart of Biography is the first to use a drawn line to represent the duration of each individual life and also to show, using one, two or three dots, the level of uncertainty of any individual’s birth or death dates (Priestley, p.11). Within the limits of the technologies available to him, Priestley also tackles the question of justification: to say what his sources are, what principles were used to choose the two thousand names he represented, and how he grouped them into categories (which he admits was partly pragmatic under the dictates of available space).

Process

In his Description, Priestley stressed his view that he was merely an “assistant to great Historians, Chronologers, and Biographers” (Priestley, 1764, p. 4) in the sense that he claimed not to have made any major discoveries himself. All he professes to have done is to represent the data that scholars had gathered before him and communicate their findings to a wider public. In contrast to Priestley, we are in the privileged position to have been able to work closely together with these ‘data-gatherers’, the curators and archivists who sometimes were the very scholars who had produced the digital datasets we visualised and, in all cases, were very knowledgeable about the contents and origins of the data. Collaborative efforts between humanities scholars and designers have proven to be challenging at times, but nevertheless insightful and beneficial for both (Caviglia, 2013; Pellegrini, Caviglia, & Ciuccarelli, 2013; Uboldi et al., 2013).

The prototypes we discuss in this paper offer snapshots of our iterative design process. They are indicators of the numerous paths we explored, focusing principally on the works of Benjamin Britten as represented by the digital records of the Britten-Pears Foundation in Aldeburgh, UK. Seeking an institution willing to share not only their datasets but also their expertise, we were lucky to work with Dr. Lucy Walker, Director of Learning at the Britten-Pears foundation, who was not only eager to help us but had already experimented with simple visualisations herself. Once we had prototype visualisations to offer, it became easier to encourage other scholars and museum professionals to collaborate, even where they had no prior experience in visualisation. In the following account, the remarks by these various curators are distinguished by their initials.

We encouraged curators to come up with questions that they would like to have answered through visual interfaces – assignments or design briefs in a sense – before

we let them see and interact with our prototypes and, in some cases, even before we had visualised any of their data. Typically, their questions related to ongoing discourses among the experts in their particular field, perhaps related to common beliefs and assumptions about the items in the collection or their creators, for which a visualisation might provide evidence, or maybe disproof. Sometimes the questions would require additional data to be gathered or digitised and generally revolved around the contents of the collection as well as notable individuals associated with it.

Before we could get to the content, we had to concern ourselves with the form, the structure of the digital catalogues. As our own interest was in the visual representation of temporal events, we paid particular attention to the way dates are specified and stored in the database. The Britten-Pears dataset proved to be an exceptionally complete collection in terms of dating: every single item contained a date of composition. However, curatorial staff warned us that the composer sometimes retrospectively wrote dates onto undated items from his earlier history, a reminder that dates — as much as any other historical data — must be considered with caution. Dates were specified in a wide range of granularities: Almost half of the dates were set by the exact day, some contained a month and a year, while just a third of the dates were defined by year only.

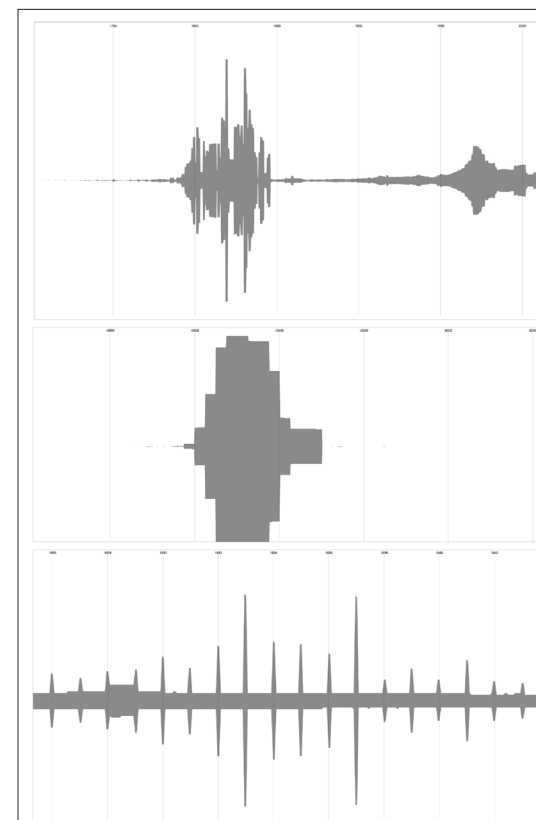
Most digital collections we worked with stored dates as a pair of values denoting an earliest and latest date, typically bracketing the date of production of an artefact. Additionally, the date is generally stored as free text: it is this representation that the curators work with and is exposed on a website when the collection is accessible online.

Often, there is a significant discrepancy between the free text that the curator enters manually and the numeric date pairs that lie ‘behind’ them and are sometimes generated automatically. The numeric values for the pairs of dates are typically stored as years, even in cases where more precise information would be available in the written date. In other cases, where the precision of the known date is less than a year, the numeric dates are set as a precisely defined range of years. In the Cooper Hewitt objects database, for example, ‘mid-20th century’ becomes 1940-1958; ‘possibly ca. 1960’ is stored as 1955-1965; and ‘1946 or later’ is quantised to 1946-1989. Thus data-formatting and processing protocols produce their own, sometimes unhelpful, effects on the quality of the data, typically implying greater precision than was originally available—clearly a process that should be of concern in any critical approach to using time as the basis for knowledge production.

Dates, history and curatorial practice

In day-to-day use, a curator may only be concerned with the textual dates, but in order to map records computationally on a visual timeline, we have to rely on their numeric representations. Having spotted some of these problems in the datasets, we were prepared to see these discontinuities reappear in prototype visualisations that we made in order to get an impression of the size, composition, and temporal scope of the collection.

Figure 2.
Kräutli, 2014-2015.
Institutions use different strategies when dating their items, as we discovered through these visualisations. Tate (top) specifies exact years, while the dates in Oxford’s Beazley Archive fall in regular intervals of 50 years (middle). Cooper Hewitt (bottom) predominantly dates either by year or decades, which is visible through the regularity of the spikes and planes.



The extent of the irregularities that the visualisations exposed nevertheless came as a surprise to us and caused some embarrassment among the curators: Modern paintings appeared in Roman periods, photographs depicting contemporary street scenes were placed at the beginning of last century, compositions seemingly were performed before they were written, and works that must have taken years to produce all happened to have been conceived on the exact same day.

We explored the sources of these irregularities in the visualisations in dialogue with the curators. Some errors we could quickly identify as caused by the collections management system, where the software misinterpreted the data that a user meant to enter: a specification like ‘17th century design, produced 1920’ might have been translated to 1600-1920 in numeric terms.

But what would be the ‘correct’ date of such, or any historical record? By having to ask this question for practical reasons in order to position visual marks on a timeline, we addressed a delicate issue in historiography around the recording and certainty of events in general. “In the history of technology at least, historians have only been interested in innovation, the moment of genesis” (DR), a curator responds, which is why objects in museums often only carry a single date, concealing the events

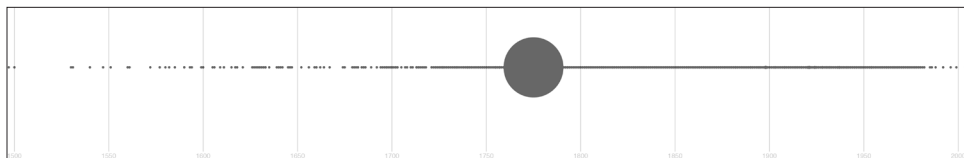


Figure 3. Krätli, 2013. A sketch visualisation of the Tate dataset. Each artist is represented as a bubble, arranged horizontally by birth year and sized by their number of works in the Tate collection. The large bubble stands for J.M.W Turner, who dwarfs the other artists by being disproportionately present in the Tate collection.

that lead to their creation as well as their history up until the present. We can assume that events did not just happen without any background process, that objects or works of art may have taken a considerable amount of time to be conceived and manufactured, and that we cannot be sure of when the various creative processes began or ended. Still, by pinpointing an event to a precise date, we generally choose to suppress this uncertainty. At the same time, institutions may be forced into a position, as the preservers and authorities of a collection, where they need to demonstrate a level of expertise and certainty that is not really attainable. “Twenty years as a curator, I was always forced to be certain about things I wasn’t certain about,” (DR). Furthermore, historic knowledge needs to be expressed in a format that is compatible with cataloguing structures. While these have been in place also prior to their digitisation, in cases such as dates, digital databases often allow for even less flexibility than their analogue predecessors.

Had our brief been to design a visual timeline to appear in an exhibition, we might have been keen to tidy up the display, correct supposed errors and, if necessary, omit data in order to get a clear picture that communicates a coherent history to the public. However, our own view is that such tidiness, even for public consumption, risks presenting a deceptive view of historical events, and of the nature of historical knowledge itself.

Led by our conversations on the uncertainties around dates, we decided to instead explore and emphasise these inconsistencies through prototype visualisations. Our first iterations focused on the representation of uncertain events. We developed a format that allowed us to model uncertainties both mathematically on the data level as well as graphically in timeline visualisations (see Krätli & Boyd Davis, 2013). However, we found that a visual rendering of imprecisions might itself convey a greater level of confidence in the uncertainty of events than is supported by the data.

We therefore decided to try a more playful approach that utilises rather than models uncertainties around dates. In a later prototype (Figure 5), each record is represented as a dot, which is pulled towards its designated position on a horizontal time axis with a simulated gravitational force that is proportional in strength to the certainty of the date. The technique, which is borrowed from a force-directed graph visualisation method (Fruchterman & Reingold, 1991), causes the dots to align themselves in a fluid motion – a visual effect that curators found very appealing. There were, nevertheless, two downsides to this method, which we sought to tackle in our latest prototype iteration. On a technical level, the approach did not scale well to datasets larger than a few hundred items due to the complexity of the physics simulation. On the side of the users, unsurprisingly, the curators found it difficult to interrogate records that were moving around constantly. We realised that we had to

Figure 4. Krätli, 2012. An early prototype iteration which maps events as disks, distorted according to their level of uncertainty. The data for this visualisation is generated randomly and does not correspond to a real-world dataset.

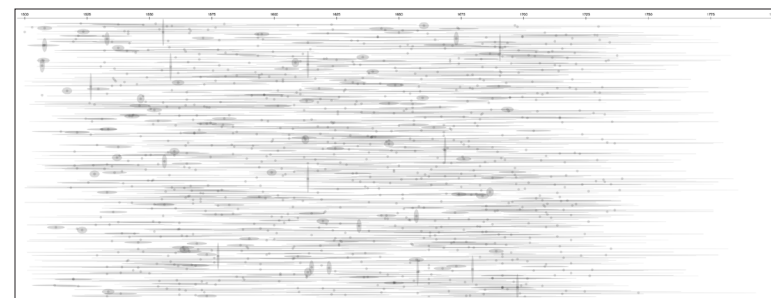
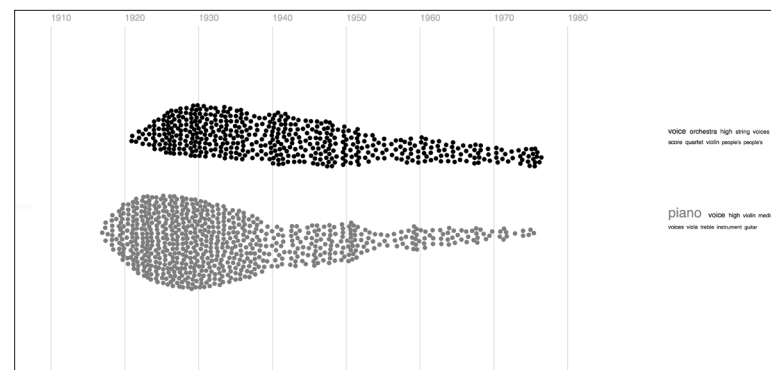


Figure 5. Krätli, 2013. Separating Britten’s works with the word ‘piano’ in their subtitle from all other works exhibits a bias in the collection, or in the way it is catalogued. Note that time-wise visualization reveals how the skew towards ‘piano’ arises particularly in the composer’s early compositions.



find a way to retain accessibility to individual records, even in collections that span hundreds of thousands of them.

We built a prototype visual layout we developed around a strategy we call Temporal Jittering. The diagram resembles a representation of a sound wave, but is actually composed of individual circles, which are positioned on the horizontal time axis anywhere within the timeframe allowed by their date brackets and vertically stacked by order of accession, and only after all possible horizontal positions have been occupied by other items. This allows us to generate a compact and aggregated overview of an entire collection, which can seamlessly be navigated by panning and zooming in to reveal individual records, along with their associated images where these are available. Essentially, we are exploiting the fact that we know that item dates have, in reality, a greater latitude than the data records seem to imply, in order to accommodate a more densely packed display than would otherwise be possible.

Again, we sought the expertise of curators and scholars in order to critically evaluate our prototype visualisation. The overall shape of the diagram gave an impression of the dating strategies employed by particular institutions. Cooper Hewitt, for example, tends to date objects either by year or by decade, while all the dates that the public Tate collection contains are set by year. The records in Oxford’s Beazley Archive, a collection of imagery of ancient Greek pottery, appeared to be dated primarily in periods of 50 years, a regularity that previously went unnoticed (Figure 2).

The entire visual timeline functions like a digital map of the collection and enables curators, sometimes for the first time, to get an impression of the size and scope of their collection. “What I find really appealing [is this] ability to see the entire database in a sense. You literally see it all” (PS). Curators appreciated the notion of being able to see everything, and then having the possibility of getting a narrower view, to look at the visualisation in more detail. “It is a really useful and intuitive way of filtering the data. I don’t think we can currently filter down to that level of detail” (LW). This behaviour, and how the visualisation affords it, is very much in line with Shneiderman’s visualisation mantra, “Overview first, detail on demand” (Shneiderman, 1996). Although Shneiderman has been criticised for a lack of evidence supporting his argument (Craft & Cairns, 2005), we have observed on a number of occasions that curators were enthusiastic for these all-encompassing views, echoing the opinions of their eighteenth-century predecessors for whom totality was also a key consideration (Boyd Davis, 2015a). Shneiderman later proposed a possible application of his mantra by enabling seamless transitions between aggregated overviews and atomic representations (Shneiderman, 2008), a behaviour our visualisation affords by letting users zoom in on the overview down to the level of individual records.

The visualisation also drew our attention to certain anomalies in the collection, which often manifested themselves as suspiciously regular clusters: peaks in the overall shape of the collection, groups of records that had the same or very similar-looking images associated with them, or sudden increases in numbers of items.

What these anomalies represented were not so much a reflection of the content of the collection, but traces of curatorial decisions as well as residues of the history of the collecting institutions. When looking at the database of the Britten-Pears archive from the perspective of the visualisation, it seems that Britten wrote primarily for the piano although, according to their curator, “he is not known at all as being a piano composer, and there it is” (LW). What the visualisation revealed was not so much representative of Britten’s oeuvre, as of the decision to classify most of his many childhood works as piano pieces.

A similar bias appears in the Tate digital collection. In this particular case, we did not collaborate with any curator of the Tate, but retrieved the data from their public GitHub repository (Tate Britain, 2014). According to these records, J.M.W. Turner produced close to 40,000 works, accounting for the majority of the entire Tate collection. The reason for this anomaly lies in both the composition of the collection and in the works’ classifications: “The Tate holds the Turner Bequest on behalf of the nation, which comprises a large number of Turner sketchbooks. Each page of these sketchbooks is classified as an individual artwork on paper, which makes up the lion’s share of this rather singular collection” (Barrett-Small, 2013). Such characteristics could equally have been identified through statistical analysis, but the visualisation made them immediately apparent; and, crucially, without explicitly having to look for them, the visualisation produced new knowledge in a highly accessible form.

Figure 6. Kräutli, 2014-2015. A closeup view of the timeline of works in the Tate collection that have been produced around 1820. It becomes evident that most of the works in the collection by J.M.W. Turner consist of sketches and prints, rather than finished paintings, where every page has an individual record.

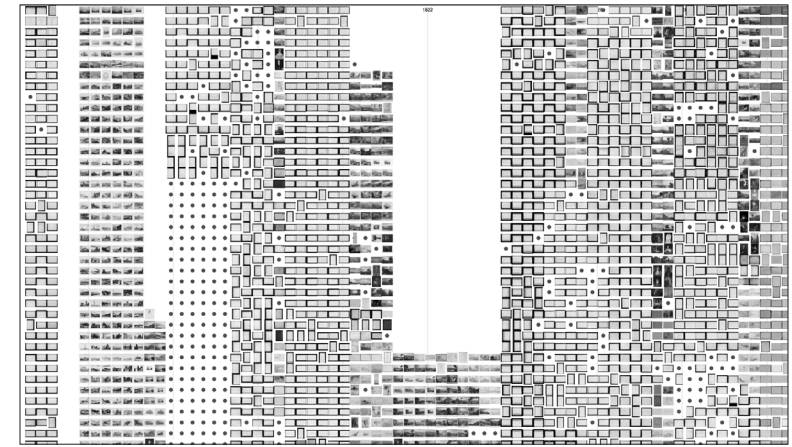
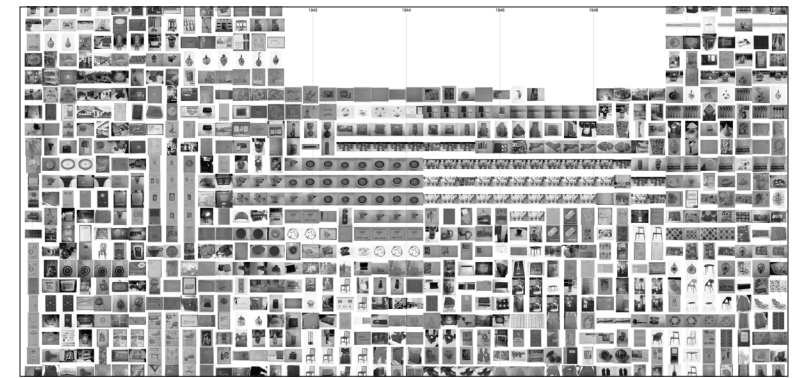


Figure 7. Kräutli, 2015. Where records have associated images, the visualisation may give an impression of the contents of a collection — in this case the collection of the Geffrye Museum, London. The images also allow for insights into curatorial practices. Two clusters of similar looking images appear in the centre of this screenshot, bearing witness to two sets of tableware that have been acquired around the same time and their parts catalogued as individual objects.



The questions that curators were requesting visualisations to address were initially primarily pointed ‘outwards,’ toward issues relevant in their field for which their archives might hold the answers. Through continued collaboration, and interaction with our prototypes, the focus of our discussions turned inwards, towards the history of the datasets and how these digital collections could be read as a mirror image of the institutions that produced them: “The shape of the collection is not an objective archive [...] [it] is determined by the administrative structure and preservation criteria — what the museum deemed important enough” (RT). Several curators suggested including ‘hidden data’ in the visualisation, the kind of data that is not entered with later use in mind, but is created by the database management systems, such as the digital traces of the people who edited it: “As much as you try to make [collecting] a scientific process, through policies, procedures, and guidelines, it’s always based on the whim of that panel of curators. [...] In the way you present it by curator, you see where trends in collecting have taken place, the themes different curators were

having in the development of the collection.” (AR) — and even: “It could be showing where an out-of-control curator has gone mad and acquired a lot of material.” (MT).

For professionals who work with digital collections on a daily basis, the fact that these biases exist is not news; however, it is not something that institutions generally like to admit — “Museums have practiced the concealment of uncertainty” (DR). As outsiders to the field of museology, creating visualisations of museum datasets and discussing our prototypes with experts allowed us to get a peek into the subtleties, imprecision, and messiness of digital collections. For curators and archivists, visualisations served as a way of providing evidence for their tacit knowledge: “It brings a real vision to the problems we’re constantly thinking about” (AR).

Discussion

Our own efforts in visualising cultural data over time share with the works of the early chronographers (discussed at the beginning of this paper) the observed merits of being able to visually grasp a dataset in its entirety, the ability to discover and study emergent patterns, and the pleasure people find in visually interacting with these datasets. The process of designing visual timelines has served as a way of problematising seemingly trivial notions of time and graphical expressions of temporalities.

Collaboration with museum professionals was crucial to our own way of working, not in the form of a typical relationship between clients and designers, but as co-researchers jointly trying to understand the opportunities and challenges posed by visualisation to the field of digital humanities.

In our iterative process, we increasingly customised conventional timeline formats and experimented with alternative ways of representing events in time, specifically with regards to uncertainties in dating and large humanities datasets. While curators were generally enthusiastic about our prototypes and found them to be useful, this departure from established graphical paradigms also caused some difficulties and required us to provide additional explanation. At times, there were insecurities about how to read our diagrams, what exactly the position or size of a graphical mark represents, and what an apparent pattern actually says about the underlying dataset. This forced us to be explicit about our designs and reasoning, just like our predecessors when they created chronographics for the first time.

We, as designers, had to learn to be critical about our motivations. Faced with problems and inconsistencies in the representation of data, we are trained to find a solution to make the problems disappear. Museum curators are similarly inclined to present a coherent view of history to the public and are often forced to display an unrealistic level of certainty about the contents of their collections.

Designers and curators are used to acting as ‘transformers,’ striving to “put the expert’s message in a form the reader can understand” (Macdonald-Ross & Waller, 1998). By collaborating early on in the design process and jointly uncovering the complexities of humanities data and visualisation design, we were able to use errors and inconsistencies as a point of departure for critical discourse rather than moving them out of sight for the sake of a universally understandable message.

Through our visualisations, we reveal issues that should not be ignored and, at the same time, we provide means for communicating and tackling them. Our work emphasises that there can be no transparent or ‘direct’ (Manovich, 2011) representation; all representations are based on selection, abstraction, pragmatism, and choice, not on simple matching to an external source (see Boyd Davis, 2007). By working closely with the ‘owners’ of the source material, we have been able to fine-tune our representations to key issues emerging from partial, incomplete, contingent — in other words, real — data. Museums and archives are aware of the fact that their collections are biased, but instead of having to surrender to this reality, curators and archivists are given an opportunity to confront and reflect on the collecting history and cataloguing practices of their institutions.

As designers working on digital humanities projects, we have to learn to account for irregularities, inconsistencies, and complexities in visualisations even if this means compromising on tidiness, cleanliness, and simplicity — attributes often held up as watchwords of design. Where information design aims to maximise usability and clarity, in the humanities we have to maximise honesty and transparency in order to do justice to the subtlety, imprecision, and messiness of history and historiography.

Data in the humanities has been re-characterised by Drucker (2011) as ‘capta’: subjective, flawed, incomplete, inconsistent and uncertain (though it could well be argued that data in the sciences has, in fact, many of the same features). Visualisations are not only representations of a dataset, but also always an image of the structure it is stored in, the authorities that produced it, and the motivations and beliefs that governed those authorities. As designers, we need to collaborate with humanities scholars in order not to mistake discoveries for errors and make the knowledge that we may find during the creative process available. We have said that chronographics both require and enable critical thinking. Chronographic visualisations still have the advantages claimed for them at their origins in the eighteenth century: comprehensive overview, ready apprehension, and the revealing of patterns, contemporaneities, dependencies, overlaps, outliers and other features that would otherwise be hard to discern. Far from mechanistically simplifying history, when treated with sufficient critical subtlety, they also have the potential to foreground the ‘thick’ (Geertz, 1973) layers of curatorial and historiographical practice that surround the objects, events, and records of the past.

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References

- Anderson, M. (2007). Quantitative history. In W. Outwaite & S. Turner (Eds.), *The Sage handbook of social science methodology*. London.
- Archer, L. B. (1968). *The structure of design processes*. Royal College of Art, London.
- Bachelard, G. (1963). *La dialectique de la durée*. Les Presses universitaires de France.
- Barbeau de la Bruyère, J. L. (1750). *Mappemonde historique ou carte chronologique, géographique et généalogique des états et empires du monde*. Paris: Buache. Retrieved from <http://catalogue.bnf.fr/ark:/12148/cb40753112q>
- Barbeau-Dubourg, M. (1753). *Chronographie, ou description des tems*. Paris.
- Barbour, J. (1999). *The end of time: the next revolution in our understanding of the universe*. London: Weidenfeld and Nicholson.
- Barrett-Small, R. (2013, November 27). Artworks incorrectly assigned to JMW Turner in artwork_data.csv · Issue #13 · tategallery/collection. Retrieved July 14, 2015, from <https://github.com/tategallery/collection/issues/13>
- Behrendt, A. (2011). Review of Cartographies of Time: A History of the Timeline. *Essays in History*. Retrieved from <http://www.essaysinhistory.com/review/2011/37>
- Bergson, H. (1950). *Time and free will: An essay on the immediate data of consciousness*. (F. L. Pogson, Trans.). London: George Allen & Unwin Ltd.
- Borgman, C. L. (2009). The digital future is now: A call to action for the humanities. *Digital Humanities Quarterly*, 3, 1–20.
- Bostock, M., Ogievetsky, V., & Heer, J. (2011). D³ data-driven documents. *Visualization and computer graphics, IEEE transactions on*, 17(12), 2301–2309. <http://doi.org/10.1109/TVCG.2011.185>

- Boyd Davis, S. (2007). A Schema for depiction. *Visible Language*, 41(3), 280–300.
- Boyd Davis, S., Bevan, E., & Kudikov, A. (2013). Just in time: defining historical chronographics. In: *Electronic visualisation in arts and culture*. Springer.
- Boyd Davis, S. (2015a). Beholder of all ages: The history of the world in a French mappemonde. *Textimage*. Retrieved from http://revue-textimage.com/11_illustration_science/boyd-davis1.html
- Boyd Davis, S. (2015b). May not duration be represented as distinctly as space? Geography and the visualization of time in the early eighteenth century. In D. Beck (Ed.), *Knowing nature in early modern Europe*. Pickering and Chatto.
- Cairo, A. (2015, February 7). Redesigning a circular timeline. Retrieved July 21, 2015, from <http://www.thefunctionalart.com/2015/02/redesigning-circular-timeline.html>
- Caviglia, G. (2013, March 12). *The design of heuristic practices*. Politecnico di Milano Dipartimento di design.
- Craft, B., & Cairns, P. (2005). Beyond guidelines: What can we learn from the visual information seeking mantra? Presented at the Ninth International Conference on Information Visualisation IV.
- Descartes, R. (1996). *Descartes: Meditations on first philosophy*. Cambridge University Press.
- Drucker, J. (2011). Humanities approaches to graphical display. *Digital Humanities Quarterly*, 5(1).
- Drucker, J., & Nowviskie, B. P. (2003). Temporal modeling: Conceptualization and visualization of temporal relations for humanities scholarship. *ACH/ALLC 2003 Conference*, 26–28.
- Fresnoy, du, N. L. (1729). *Tables chronologiques de l'histoire universelle*. Paris: Gandouin.
- Fruchterman, T., & Reingold, E. M. (1991). Graph drawing by force-directed placement. *Software-Practice and experience*, 21(11), 1129–1164.
- Geertz, C. (1973). Thick description: Toward an interpretive theory of culture. In *The interpretation of cultures: selected essays* (pp. 3–30). New York.
- Kräutli, F., & Boyd Davis, S. (2013). Known unknowns: representing uncertainty in historical time. In K. Ng, J. P. Bowen, & S. McDaid (Eds.), *Proceedings of EVA London* (pp. 61–68). BCS, London.
- Kwan, M. P. (2010). Feminist visualization: Re-envisioning GIS as a method in feminist geographic research. *Dx.Doi.org*, 92(4), 645–661. <http://doi.org/10.1111/1467-8306.00309>
- Macdonald-Ross, M., & Waller, R. (1998). The transformer revisited, 9(2), 177–193. <http://doi.org/10.1075/ldj.9.2-3.06mac>

- Manovich, L. (2011). What is visualisation? *Visual Studies*, 26(1), 36–49. <http://doi.org/10.1080/1472586X.2011.548488>
- Martignoni, G. A. (1721). Explication de la carte historique de la France et de l'Angleterre. Rome: British Library General Reference Collection C.106.f.19.
- Martin, R. E. (2010). *Kairoscope: coordinating time socially*. Massachusetts Institute of Technology.
- McTaggart, J. M. E. (1993). The unreality of time. In *The philosophy of time*. Oxford University Press, USA.
- Meeks, E., & Grossner, K. (2014). Topotime. Retrieved May 2, 2014, from <http://dh.stanford.edu/topotime/index.html>
- Monmonier, M. S. (1996). *How to lie with maps* (2nd ed.). University of Chicago Press.
- Monmonier, M. S. (2008). *Coast lines*. University of Chicago Press.
- Newton, I. (1687). *Philosophae naturalis principia mathematica* (Mathematical Principles of Natural Philosophy). London.
- Pellegrini, V., Caviglia, G., & Ciuccarelli, P. (2013). Minerva: An information visualization tool to support philosophical historiography. *CO Communicating Complexity Conference Proceedings*.
- Priestley, J. (1764). A description of a chart of biography (pp. 1–25). Warrington: Eyre. British Library: 611.d.30, 3.
- Priestley, J. (1765). A chart of biography. London.
- Ratto, M. (2011). Critical making: Conceptual and material studies in technology and social life. *The information society*, 27(4), 252–260. <http://doi.org/10.1080/01972243.2011.583819>
- Rose, G. (1993). Some notes towards thinking about the spaces of the future. In J. Bird, B. Curtis, T. Putnam, & L. Tickner (Eds.), *Mapping the futures: Local cultures, global challenges* (pp. 70–83). London: Routledge.
- Shneiderman, B. (1996). The eyes have it: A task by data type taxonomy for information visualizations. *Visual Languages, 1996. Proceedings, IEEE Symposium on*, 336–343.
- Shneiderman, B. (2008). Extreme visualization: squeezing a billion records into a million pixels. *Proceedings of the ACM SIGMOD International Conference on Management of Data*, 3–12.
- Swierenga, R. P. (1974). Computers and American History: The impact of the “new” generation. *The Journal of American History*, 60(4), 1045. <http://doi.org/10.2307/1901012>
- Tate Britain. (2014, January 1). *tategallery / collection* GitHub. *Github.com*. Tate.
- Thaller, M. (1987). Methods and techniques of historical computation. In P. Denley & D. Hopkin (Eds.), *History and computing*. Manchester University Press.
- Uboldi, G., Caviglia, G., Coleman, N., Heymann, S., Mantegari, G., & Ciuccarelli, P. (2013). Knot: an interface for the study of social networks in the humanities. *The Biannual Conference of the Italian Chapter of SIGCHI* (pp. 15–9). New York, New York, USA: ACM. <http://doi.org/10.1145/2499149.2499174>
- Weinert, F. (2013). *The march of time*. Springer Science & Business Media.
- Winchester, I. (1980). Priorities for record linkage: A theoretical and practical checklist. In J. M. Clubb & E. K. Scheuch (Eds.), *Historical social research the use of historical and process-produced data*. Stuttgart. Retrieved from <http://nbn-resolving.de/urn:nbn:de:0168-ss0ar-326405>
- Wood, D., & Krygier, J. (2009). Critical Cartography. In R. Kitchin & N. Thrift (Eds.), *International Encyclopedia of Human Geography* (pp. 340–344). Amsterdam: Elsevier.

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**critical
making**
DESIGN and
the DIGITAL
HUMANITIES

Jessica Barness
Amy Papaalias
guest editors

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critical making

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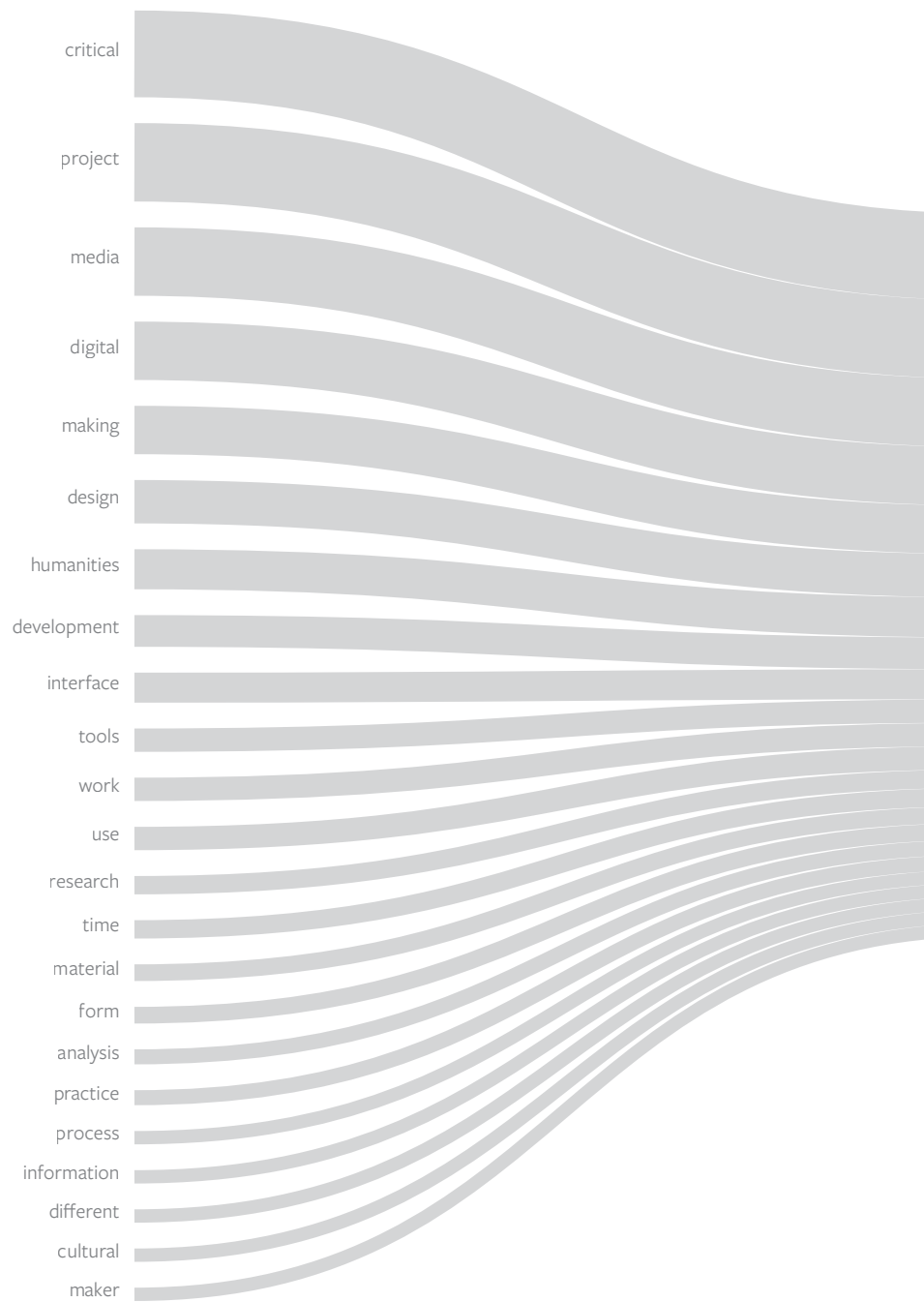
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Critical Interfaces and Digital Making

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 pejection 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's 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



Figure 1.
Vectors logo

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.

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 some-

thing 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.

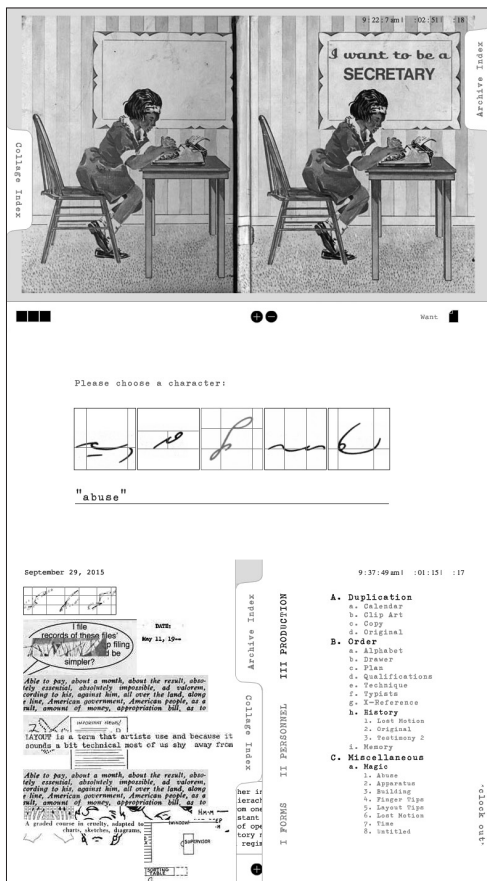


Figure 2. Screen shots from Alice Gambrell's Vectors project "Stolen Time Archive" designed by Raegan Kelly

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.

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



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

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

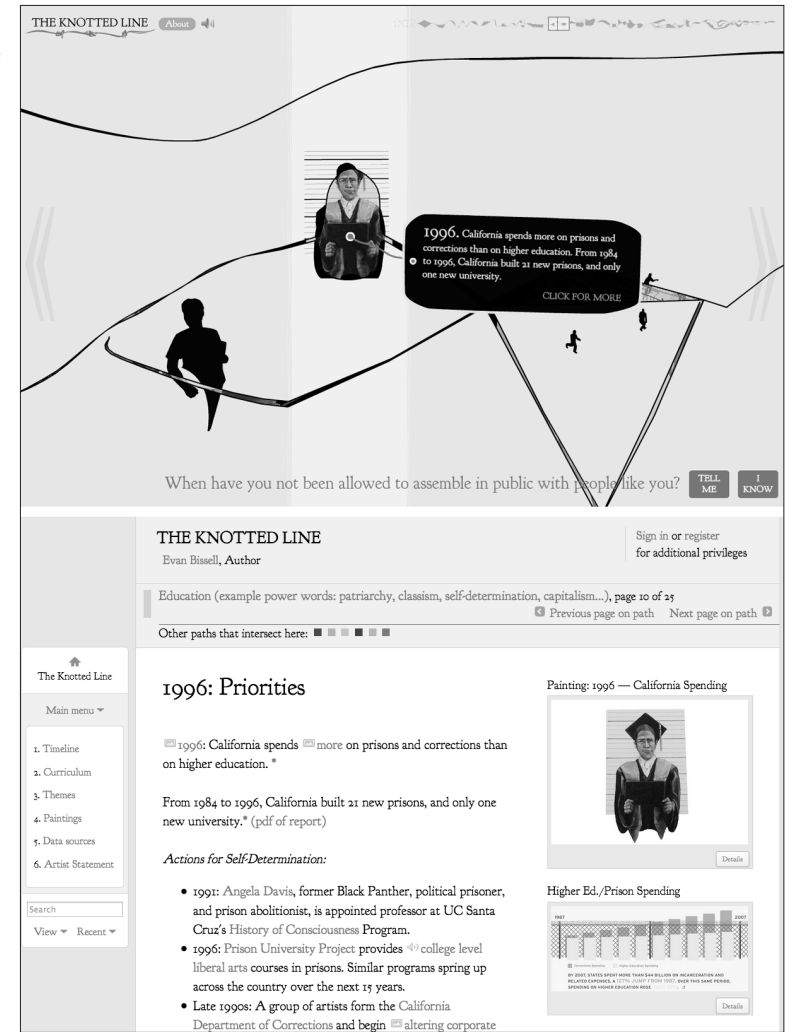
The next phase of software development by the *Vectors* team shifted focus from richly designed user interfaces to information architecture, seen most clearly in the electronic authoring platform Scalar. The goal was to take what was most productive about *Vectors*’ intervention in electronic publishing 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.

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 4. Scalar logo



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,

Critical Commons

For Fair & Critical Participation in Media Culture

Figure 6.
Critical Commons
logo

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.

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.

References

- Agre, Philip E. 1997. "Toward a Critical Technical Practice: Lessons Learned in Trying to Reform AI" in Bowker, Geof, et al, eds. *Bridging the Great Divide: Social Science, Technical Systems, and Cooperative Work*. Mahwah, NJ: Erlbaum Associates.
- Anderson, Chris. 2014. *Makers: The New Industrial Revolution*. New York: Crown Business Publishing.
- Aufderheide, Pat and Jaszi, Peter. 2011. *Reclaiming Fair Use: How to Put Balance Back in Copyright*. Chicago: University of Chicago Press.
- Balsamo, Anne. 2011. *Designing Culture: The Technological Imagination at Work*. Durham: Duke University Press.
- Bianco, J.S. 2013. "This Digital Humanities Which Is Not One" in Mathew K. Gold, ed., *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press.
- Cope, Bill and Kalantzis, Mary, eds. 2000. *Multiliteracies: Literacy Learning and the Design of Social Futures*. New York: Routledge.
- De Lauretis, Teresa, Huysen, Andreas, and Woodward, Kathleen, eds. 1983. *The Technological Imagination: Theories and Fictions*. Madison: Coda Press.
- Dourish, Paul, et al. 2004. "Reflective HCI: towards a critical technical practice." *Proc. CHI Extended Abstracts on Human Factors in Computing Systems*, ACM, 2004.
- Drucker, Johanna. 2009. "Blind Spots: Humanists must plan their digital future." *The Chronicle of Higher Education*, April 3, 2009. Accessed September 21, 2015. <http://chronicle.com/free/v55/i30/30bo0601.htm>
- Dunne, Anthony and Raby, Fiona. 2013. *Speculative Everything: Design, Fiction, and Social Dreaming*. Cambridge: MIT Press.

- Fitzpatrick, Kathleen. 2011. *Planned Obsolescence: Publishing, Technology, and the Future of the Academy*. New York: NYU Press.
- Friedman, Batya. 1996. "Value-sensitive design." *Interactions*, Vol. 3, No. 6, 1996.
- Gambrell, Alice. 2005. "Stolen Time Archive." *Vectors*, Vol. 1, No. 1, 2005. Accessed September 21, 2015. http://vectors.usc.edu/issues/1/stolentime/stolen_time_main.html
- Gitelman, Lisa. 2008. *Always Already New: Media, History, and the Data of Culture*. Cambridge: MIT Press.
- Hatch, Mark. 2013. *The Maker Movement Manifesto*. New York: McGraw-Hill.
- Hayles, N. Katherine. 2012. "How We Think: Transforming Power and Digital Technologies," in: Berry, D. M. (ed.), *Understanding Digital Humanities*. New York: Palgrave Macmillan.
- HermanMiller. 2015. "Innovation Through Experience: Reshaping Learning Spaces for Makers, Hackers, and Coworkers." (Zeeland, MI: HermanMiller self-published 2015). Accessed September 21, 2015. <http://www.hermanmiller.com/research/research-summaries/innovation-through-experience.html>
- Hertz, Garnet, ed., *Making Critical Making* (Hertz self-published 2012). Accessed September 21, 2015. <http://conceptlab.com/criticalmaking>
- Hobbs, Renee, Jaszi, Peter, and Aufderheide Pat. 2007. "The Cost of Copyright Confusion for Media Literacy" (Washington, D.C.: Center for Social Media).
- Manovich, Lev. 2001. *The Language of New Media*. Cambridge: MIT Press.
- McPherson, Tara. 2010. "Scaling Vectors: Thoughts on the Future of Scholarly Communication." *Journal of Electronic Publishing*, Vol. 13, No. 2, Fall 2010.
- McPherson, Tara. 2012. "Why Are the Digital Humanities So White? or Thinking the Histories of Race and Computation" in Mathew K. Gold, ed., *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press.
- Ratto, Matt. 2011. "Critical Making!: Conceptual and Material Studies in Technology and Social Life." *Information Society*, Vol. 27, No. 4.
- Rushkoff, Douglas. 2011. *Program or Be Programmed: Ten Commands for a Digital Age*. New York: OR Books.
- Said, Edward. 2004. *Humanism and Democratic Criticism*. New York: Columbia University Press.
- Schön, Donald. 1984. *The Reflective Practitioner: How Professionals Think In Action*. New York: Basic Books.
- Sengers, Phoebe, et al. 2005. "Reflective Design." In Proc. 4th Decennial Conference on Critical Computing, 2005.
- Snow, C.P. 1963. *The Two Cultures: and a Second Look*. New York: Cambridge University Press.
- Svensson, Patrick. 2010. "The Landscape of Digital Humanities." *Digital Humanities Quarterly* Vol. 4, No. 1, 2010. Accessed September 21. <http://www.digitalhumanities.org/dhq/vol/4/1/000080/000080.html>
- Wark, McKenzie. 2010. "Totality for Kids." *Vectors* Vol. 7 No. 1, 2010. Accessed September 21, 2015. <http://vectorsjournal.org/issues/7/totality>

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**critical
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DESIGN and
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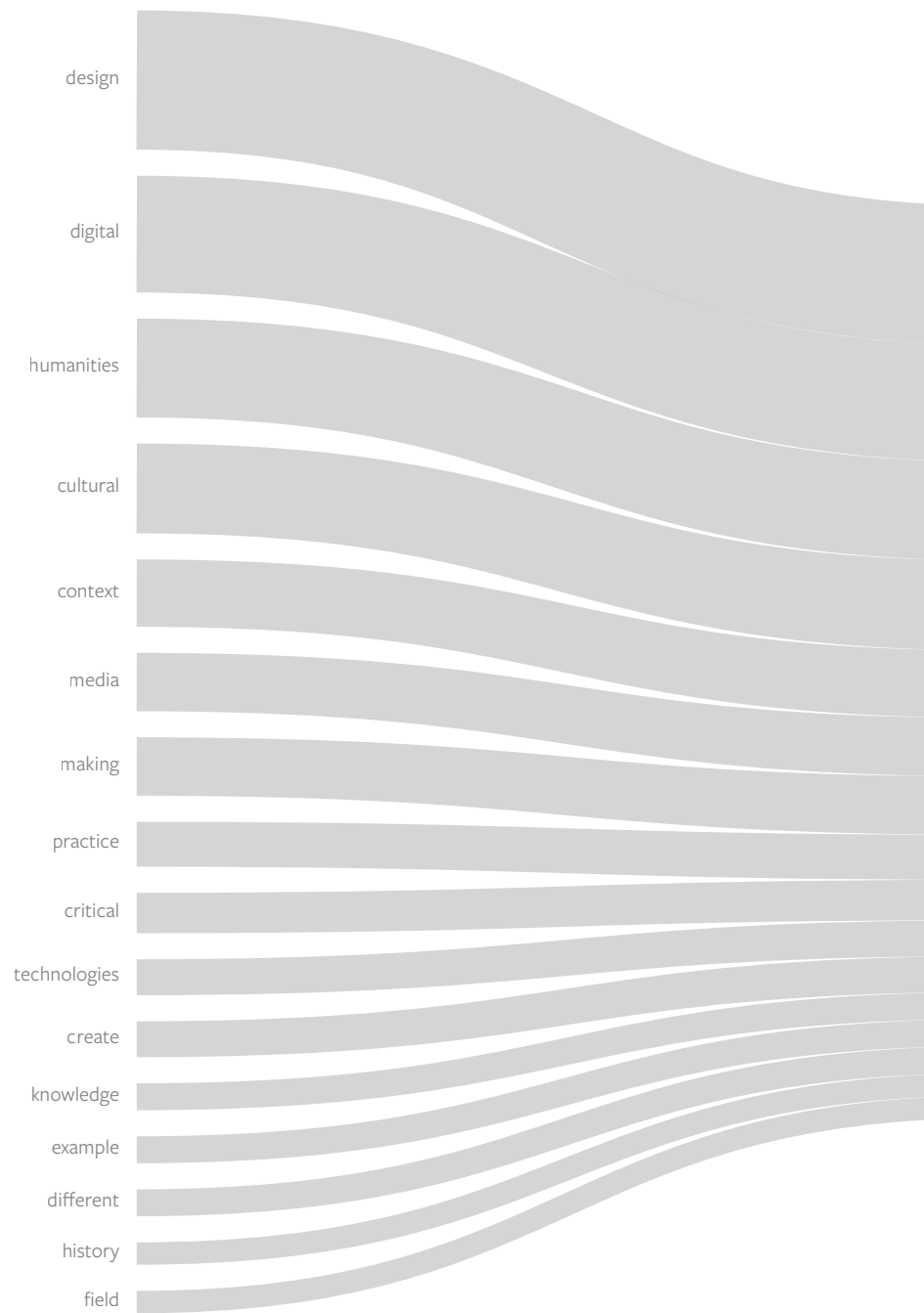
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Making Culture:

Locating the Digital Humanities in India

Padmini Ray Murray
Chris Hand

Abstract

What is called ‘making’ in North America and Europe is, frankly, a luxurious pastime of wealthy people who rightly recognize that their lives are less full because they are alienated from material culture [...] All over what is called the Global South there are makers everywhere, only they are not called makers.

(Csikszentmihályi, 2012; p9)

The context for making in the Global South is obviously different to the West. In this article we aim to explore what critical making in India might mean, and in particular how this debate and the practices around it can contribute to the development of digital humanities, particularly in the heritage/public history sector.

We consider two examples in order to demonstrate the role that design might play in helping digital humanities to take account of non-Western contexts. Firstly the Indian practice of *jugaad* – an indigenous combination of making-do, hacking, and frugal engineering – against the backdrop of making/DIY culture, and how local circumstances might shape intellectual explorations through critical making. Secondly we examine the case study of the design of an “Indian” videogame prototype, *Meghdoot*, produced as part of the interdisciplinary UnBox festival in New Delhi, 2013, which was used as an exploratory vehicle for what it means to make a culturally-specific digital game in India.

We demonstrate how cultural specificity and local context, with its emphasis on making culture – as opposed to localization and globalization – can contribute meaningfully to current understandings of the digital humanities, and extend the conversation to the Global South in an inclusive and relevant manner.

Keywords: Global South, India, *jugaad*, video games

Introduction

The practice and theoretical shape of the digital humanities has thus far almost exclusively been determined by scholarly work done in America, Europe, and Australia, which often fails to take into account the cultural, economic, and linguistic implications of what it means to be working in the field elsewhere, especially in developing and low income economies. The inevitable lacunae formed by this absence in the Western academy has meant that historically, the discipline has often been tone-deaf to the noise made by cultural criticism in the mainstream humanities post '68 — as McPherson (2012, para. 16) writes:

Much of the work in the digital humanities also proceeded as if technologies from XML to databases were neutral tools. Many who had worked hard to instill race as a central mode of analysis in film, literary, and media studies throughout the late twentieth century were disheartened and outraged (if not that surprised) to find both new media theory and emerging digital tools seem indifferent to those hard-won gains.

However, as the discipline matures, Liu advocates that digital humanists should become sharper critics of “how the digital humanities advances, channels, or resists today’s great postindustrial, neoliberal, corporate, and global flows of information-cum-capital” (2013, para. 5). Recent work in the field is increasingly self-reflexive about the resource-heavy and expensive nature of digital humanities projects and how there is a need to address this to ensure the discipline is not exclusionary. Concepts such as minimal computing (Sayers & Simpson, 2014) dwell on the dichotomy of choice versus necessity built on the understanding that computing resources in the developing world are not necessarily high performance and that much can be done by streamlining low-cost single board computers, such as the Raspberry Pi, for use in these contexts. Events such as digital humanities hackathons and THATcamps, which are held internationally, create spaces for faculty, students, and often practitioners from the GLAM sector to discuss, incubate, and even implement small projects by building upon or hacking existing resources.

Thinking and doing are crucial verbs that necessarily define the digital humanities agenda as digital resources, cultural products, and artifacts that we build have the potential to “both reify knowledge and communicate it” (Ruecker quoted in Ramsay & Rockwell, 2013, para. 6). If one of the aims of the digital humanities is to create resources that help perform the act of cultural criticism, there must be recognition that the vision guiding such resources is necessarily circumscribed by cultural specificity and particularity. These concerns operate both at the level of content and interface: for example, until relatively recently, much humanities work in Indic languages has been impeded by the lack of optimised character recognition software. Similarly, Reinecke and Bernstein’s (2013) seminal work on how cultural perceptions influence our sense of design has shown how Google’s struggle to get a foothold in the Korean market was due to local preferences for

more colourful and graphically populated interfaces compared to the search engine’s stark white background.

Consequently, the discipline needs to be transposed to fit these different local exigencies; this article will consider two examples to demonstrate the role design might play to accommodate these needs. The first is an examination of *jugaad*, an indigenous form of hacking that differs from its western counterpart in its ubiquity, precipitated by economic constraints and lack of resources. The second is a case study that considers the creation of an “Indian” videogame within a certain design context, comprising of a cultural critique of the digital game (or videogame) in India as well as how the medium itself can be leveraged as a vehicle of cultural criticism and the decisions that influenced its interface and interactions. In our discussion of the videogame, we uncover features such as localisation and internationalisation (tools of homogenisation that obliterate local context), and by extension and analogy, we will demonstrate that the digital is never neutral.

Critical making and *jugaad*

As the digital humanities grows increasingly embedded in university curricula internationally, there is a growing awareness that the creation of a conducive intellectual eco-system for the discipline should be informed by both building objects in response to these intellectual queries and setting the reflexive theoretical paradigms into motion by undertaking these thought-experiments and object lessons. Ratto’s formulation of critical making, “a series of processes that attempt to connect humanistic practices of conceptual and scholarly exploration to design methodologies including storyboarding, brainstorming and bodystorming, and prototyping” (2011, para. 9), is a challenge to thinking merely as a “linguistic practice — an internal monologue in which we use conceptual categories to make sense of the world around us.” Instead he seeks to link “material modes of engagement and crucial reflection on our technical environments” (2012).

Ratto and others such as Hertz (2012, pp. 4-6) are keen to distance critical making from the maker movement made popular by such publications as *Make*:

Make has done a lot of amazing work in popularizing the field, but it’s been sanitized into a consumer-friendly format in the process [...] I draw a lot of energy in my studio work out of rural kludging: creatively using things because you don’t have money or resources. *Make* doesn’t really speak to this [...] It’s as if “hacking” has been sanitized and transformed into “making”- with politics, activism, tactics, history, economics and social issues removed in the process.

Ratto’s critical making lab at the University of Toronto is located in the Faculty of Information, aiming to encourage “practice-based engagement with the pragmatic and theoretical issues around information and information technology” (Ratto, n.d., para. 1). While these are ostensibly also the concerns of the digital humanities, the dis-

cipline's origin story and the trajectory of its growth in the Anglo-American academy had placed the discipline squarely in the realm of literary studies, and it is relatively recently that its logocentric nature has been de-emphasised.

As the digital humanities grows more visible in South Asia, it is necessary to recognise the ways in which disciplinary practices might diverge in these regions, owing to the exigencies of language, rate of technological growth and obsolescence, and different institutional and cultural histories, all of which combine to create an alternative definition of what the discipline might offer. The contours of the discipline necessarily shift with both geographical and intellectual location, and theoretical practice emerging in the Global South has to adapt to different infrastructures, languages, and technologies. This article therefore seeks to add further nuance to ongoing discussions as to the state of the field, and indeed, extend the limits of the discipline itself.

The cornerstone of these investigations is laid by examining the concept of *jugaad* in conjunction with the idea of hacking, especially in the light of critical making, as well as by examining the status of craft and design in contemporary India. The conceptual category of hacking is slightly altered by both linguistic and cultural context: to hack contains within it both the meaning of subverting the authority of proprietary systems through some sort of destructive action as well as to come up with a quick solution, whereas the aim of *jugaad* is almost always constructive, often unaware of the capitalist systems it undermines and is truly born out of necessity. Sekhsaria's (2013, p. 137) formulation illuminates the many connotations of the word as concept:

The plasticity of the word and range of its usage is evident in the fact that *jugaad* can be concept, process and product all rolled into one at the same time; it means reconfiguring materialities to overcome obstacles and find solutions; it could mean working the system to one's advantage; and it is also used as a synonym in certain contexts for gambling and corruption. *Jugaad* is not just an inextricable part of local vocabularies in India, it is an integral part of the way life is lived and the world negotiated. It is noun as much as it is a verb; an idea and an articulation that has a wide range of meanings and usages that revolve primarily around problem solving or solution finding.

Of course, the practice of *jugaad* is not unique to India, resonating with other instances of "technological disobedience" (a term coined by Cuban artist and designer Ernesto Oroza) found in informal economies of the Global South, such as *Gambiarra* in Brazil, *Rebusque* in Colombia, and *Jua Kali* in Kenya (Radjou et al, 2012; Viña, 2012). However, this informality means that these practices have thus far been outwith formal academic contexts, though following Ratto's provocation – referencing the Frankfurt School notion of critical scholarship – that "criticality entails not just reflection but also intervention in society" (2012, p. 3) might allow us to conceive of digital humanities work in India that could facilitate dialogue between these spaces.

While the establishment of the 19th century liberal arts university was a British strategy to train their Indian subjects for the administrative service, thus seen purely as a utilitarian endeavour, "the contradictions between the educational goal of knowledge for its own sake and useful knowledge had little purchase in the Indian context even during nationalist times" (Sebastian qtd. in Srinivasan, 2013, p. 4). In contrast to this, the history of design education in India owes much to the initiative of the first post-independence Prime Minister of India Jawaharlal Nehru, who, committed to the industrial development of the newly-inaugurated republic, invited the noted American designers Charles and Ray Eames to visit the country to assess the impact that the nascent industrialisation would have on the extensive crafts sector and its small scale industries and to assess the appropriate management of design processes (Chatterjee, 2005; Balaram, 2009).

Their report (Eames & Eames, 1958, p. 9) recommended a research-based approach driven by local designers aiming to understand what values and qualities would be important to Indian citizens, and to identify requirements for a good standard of living (Balaram, 2009). In order to produce these designers, the report recommended the creation of a national design institute, resulting in the opening of the National Institute of Design (NID), India's first modern design school in Ahmedabad, Gujarat in 1961. The initial design curricula and pedagogical approaches implemented at some of the earliest Indian design schools – NID, IDC/IIT Bombay and CEPT – were all heavily influenced by the "Ulm Model", as researched, developed, and (crucially) documented by faculty at the Hochschule für Gestaltung (HfG) in Ulm, Germany, during the period 1953-1968 (Ranjan, 2013). In particular, the already internationally established *Vorkurs* (preliminary or foundation course) as promoted at the Bauhaus also became a staple of design education at these national institutes (Balaram, 2005). However, while the founding faculty members were keen for NID to absorb the best examples of design education from around the world, they were also wary of excessive influence from any particular foreign school – understandable given the perception that the preceding art education introduced by colonial powers during the 19th century imposed Western tastes, destroying the confidence and expression of Indian craftspeople in the process (Balaram, 2005).

While the liberal arts university was responsible for perpetuating a Western, elitist mode of knowledge which was at odds with the lives of the average Indian, design education in India strived to recognise and incorporate local modes of making in its curriculum. Even today, cottage industries and craft communities in India exist alongside small-scale and large-scale production. There is still an emphasis on exposing design students to indigenous knowledge and to connect with rural craftspeople – who might otherwise be intimidated by the arrival of more senior design 'experts' from the urban centres (Balaram, 2005; Kasturi, 2005). While such relationships are not completely uncomplicated (Kasturi has been critical of these kinds of superficial projects "branding" the craft sector, or simply exploiting its makers for the benefit of those further up the supply chain), there is an awareness that a more empathic and

holistic approach is just as much about promoting development as it is about design (Kasturi, 2005; Sen, 1999). As the Eameses put it, apart from learning to solve problems, graduate designers “should be trained to help others solve their own problems” (Eames & Eames, 1958, p. 9).

Local antecedents to critical making can also be found outwith institutional contexts in political resistance to colonial rule, at least in spirit. Bayly (1988) has persuasively demonstrated how the British exploited the talismanic and symbolic qualities of cloth in India in order to create a reliance on English-made goods, thus reducing the indigenous industry to poverty. The consequent backlash in the form of boycotts of British goods and the championing of homespun cloth (*khadi*) implemented by Indian national leaders, by Mahatma Gandhi in particular, laid the foundations of the *swadeshi* movement, which in part contributed to the freedom struggle which eventually resulted in the end of the British Raj.

Thus, the logic of making as critique has a significant history in India and should be taken into account in discussions regarding the emergence of the digital humanities in the region. Shah’s recent observations on the state of digital humanities education in India criticises the ways in which it has been adopted by the higher education sector, with an overemphasis on “careers, employability, access and efficiency” (2015, p. 106), but largely omits the significant role that design education and institutions can play in the local development of the discipline. The Grassroots Innovation Design Studio (GRIDS) located at the Srishti Institute of Art, Design and Technology, for example, seeks to adapt and work with “creative, frugal innovation,” inspired by the sustainability of modes of *jugaad*, and also work with local creators and innovators to help their work reach a larger audience.

As critical making becomes more accepted as a valid mode of digital humanities inquiry, it seems that the values at the heart of Indian design education, shaped by and cognisant of their local circumstances, suggest an ideal space to pursue such endeavours. In the next section, we will discuss how these qualities translate to the making of a digital artefact that privileges these values.

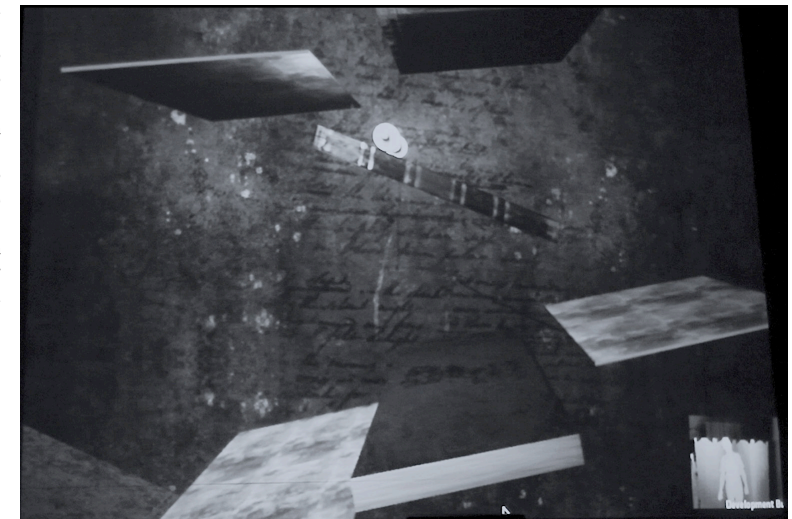
Unboxing an Indian videogame

There is growing recognition that the videogame market has long been overwhelmingly saturated by American (read: Western) or Japanese perspectives and there have been considerable academic analyses of this phenomenon. For example, Iwabuchi (1998) has theorised that the global popularity of Japanese phenomena such as the videogame character Pokemon is largely owing to its “cultural odourlessness” – meaning while it still comes across as relatively Japanese, it does not carry with it, say, the negative connotations of American neo-imperialist “coca-colonisation.” However, the nuances that are missed in this apparently easy transfer from one culture to another are those interventions made by corporate organisations to facilitate this travel: a practice known as localisation. This frequent exercise is undertaken in the videogame industry to hybridise and assimilate the cultural product so it might suit its target audience better. Pokemon, like many other bestselling games of its ilk,

was cut and repackaged for the U.S. market by removing or altering Japanese signs and references to Japanese life and culture and by altering or eliminating violent or sexualised content. Anne Allison has demonstrated American localisers’ tendencies toward cultural swapping – typified with Pokemon by the blotting out of rice balls and the rotoscoping in of doughnut replacements (2006, p. 246). Similarly, the practice of internationalisation, which deploys non-specific characters, stories, images, gameplay mechanics to appeal to the broadest possible audience, is executed at source by creators of artistic products, again enabling the smooth migration from one cultural context to another.

The research under discussion in this paper (Ray Murray et al, 2014) was funded by the Arts and Humanities Research Council in the UK and investigates the possibilities of creating an artistic artifact (such as a videogame) that can have global appeal **without** resorting to these practices that dilute cultural heterogeneity, such as lo-

Figure 1. Screenshot from Meghdoot where players have to use their body to roll the scroll-holder, a historical artefact (in the top half of the screen) from book to the bottom of the screen. Inset: a player as seen by the Kinect.



calisation and internationalisation. The methodology seeks to collapse the categories between prototype and theoretical position by creating a videogame as a knowledge object that does the cultural work of conveying the status of storytelling and storytellers in contemporary India.

The first author, Ray Murray’s role as research lead on the project, entitled *Meghdoot: Using new technologies to tell age-old stories*, was to respond to an open-ended brief which required her to work with a small team of seven (known as the Unplay team) that had been assembled as a response to the call over five weeks, to create a videogame prototype and based out of the offices of Quicksand, a design agency in Delhi, India. This was to be showcased at the Unbox Festival, an interdisciplinary festival bringing together “creative, academic, and development professionals keen on pushing the boundaries of their practice” (UnBox, 2014). Initiated by Indian

Figure 2. Screenshot from Meghdoot where players adopt the position of the Indian dancer in the corner to release letters to populate the typewriter at the bottom of the screen.



Figure 3. Textures and images from Old Delhi used as assets in the game.



design studios Quicksand and CoDesign in 2011, UnBox is indicative of a younger generation engaging broadly with the relationships between people, design, technology and society, while both firms are also players in the push for Indian design to find its own voice on a global stage.

Background and context

Despite India's reputation for excellence in information technology, and being a hub for outsourced animation, videogames based on original intellectual properties created in India are still few and far between. Commentators (e.g. Shaw, 2013) have assumed that industry expertise combined with visual vibrancy, narratives rooted in myth and legend, and the multimodal richness of a certain sort of India, embedded in ethnic otherness, could result in a watershed moment for the nascent Indian videogame industry. Indeed, eminent game designer and commentator Ernest Adams (2009) felt that India's lack of progress in the field could be rapidly compensated for by relying on adaptations of grand epic narratives — and many well-meaning enthusiasts still often suggest that a videogame based on the *Mahabharata* or the *Ramayana* might precipitate the Indian videogame's watershed moment. These assumptions inspired the Unplay team to consider what it meant to make an *Indian* game — whether it was possible to create a videogame that uses markers of cultural specificity in such a way so as to not pander to such expectations.

By envisioning a global audience for the game, the team needed to exercise caution regarding falling into the trap of what Graham Huggan (2002) has called “the postcolonial exotic”, especially given these kinds of narratives that have grown up around the potential of the Indian videogame industry. This trope of the postcolonial exotic has been making its presence felt in recent game design — while there is awareness in the industry that a huge audience exists in India for their games, as well as a need for more representation of people of colour — these have been characterised by a series of missteps. As Souvik Mukherjee (2014) has demonstrated, while in *Call of Duty* there is a mission carried out in Himachal Pradesh in Northern India, rendered in exquisite detail down to the quirky signage, the mission itself is a face-off between American and Russian soldiers, without any apparent intervention or even presence of the Indian army. A similarly implausible representation of India is in *Age of Empires III: The Asian Dynasties* (2007), which has Brahmin healers riding elephants and an infantry comprised of *Rajputs*, *Gurkhas*, and *Sepoys*. For those not familiar with Indian culture and history, this can be misleading: the *Sepoy*, unlike the Rajput and the *Gurkha*, is not an ethnic community but the standard name for a soldier in the East India Company's time. The word itself comes from *Sipahi* or *Sipah*, which was a generic term for infantry soldiers in the Mughal and Ottoman armies. Finally, elephants were traditionally used by the warrior class known as the *Kshatriyas*; *Brahmins*, or the priestly class, would seldom be seen near them.

Similarly, other tropes of popular culture are shaped by Western perspectives: Parikka (2013, pp. 1-2), has described steampunk as a suitable emblem for media

archaeology's tendency to draw heavily on the nineteenth century as the foundation stone for modernity in terms of science, technology and the birth of media capitalism.¹ However, most steampunk inflected narratives are set in Western contexts, often eliding the imperialist motivations and colonised workforces that enabled Victorian Britain to build such technologies. Nineteenth century India, of course, was a primary site for such technological diffusion and invention, demonstrating how colonial contact hastened the advent of technologies (such as the steamboats, railroads and the telegraph) and initiating Indian modernity. Marx (1853) famously predicted how such innovations would prove to be a double-edged sword for British rule, empowering and helping to unite a vast country against the colonisers.

Design decisions

In the face of these misrepresentations, the Unplay team felt that it was even more important that the 'Indianness' of the game should act as a corrective — leading us to consider how the game's Indian context informs its narrative and aesthetic design. *Meghdoot* was thus inspired by the allochronic nature of media forms in India — ancient modes of narrative dissemination such as oral storytelling still co-exist alongside cutting edge technologies, for example. This reality challenges Parikka's (2013, p. 2) definition of media archaeology which "sees media cultures as sedimented and layered, a fold of time and materiality where the past might be suddenly discovered anew, and the new technologies grow obsolete increasingly fast," as contemporary Indian encounters with narrative and media forms can be imagined as a media constellation rather than a stratified history. Instead, the vision for the game was shaped by what the team described as "Indian steampunk" which attempted to capture, as Sundaram (2009, p. 3) has described it, urban India's "proliferating media culture mixed with a proliferating city, with its palimpsest of technological infrastructures." Sundaram goes on to describe how India's cities recall the "frenzy of the visible" that characterized Europe after the industrial revolution "except through more intensive, cross-media forms" and the low-cost technologies of mechanical and digital reproduction enabling the subaltern population to access media.

This "frenzy" that has altered Indian landscapes irrevocably is a postcolonial response to the aesthetic of steampunk, for the rapid obsolescence that allows for an archaeology of media as Parikka signposts is not a reality in contemporary India in a *jugaad* culture that constantly recycles and reuses old machinery. Thus the aesthetic template for the game could be described as what Sundaram has called "technologized urbanism." Moodboards were created from photographs taken by the Unplay team on excursions in Old Delhi (see Figures 1-3; 1.04-1.35 minutes, Tzavara "Unplay

¹ Steampunk can be described as a sub-genre of science fiction that is set in an alternative history, often inspired by the latter period of the age of steam that coincided with Victoria's reign. The technologies of steampunk are fantastical machines, often hybrids of contemporary technology mashed up with steam-operated or analog devices; its impact on recent popular culture has been considerable — inspiring comics, novels, cinema and of course, videogames.



Figure 4. Meghdoot at Alchemy in London, where the Unbox Festival was a guest exhibitor.

2013") and textures and visual assets were then drawn from these photographs and used in the game.

The team was also working within considerable financial constraints and so decisions had to be made regarding how the game could be designed in response to its platform and device affordances. The decision was taken early on to work with Unity, an open source game engine, and the Kinect², which could be hacked easily to create a motion sensitive game, and the team was influenced by the desire to be as agile and cost-effective as possible given the limited time and budget constraints. The Kinect can detect facial features and recognizes voice commands and physical gestures. *Meghdoot* is mapped across three achievement levels, each of which showcases a different aspect of storytelling: textual, gestural, and oral. The potentialities of the Kinect therefore are to be harnessed to facilitate the different modes showcased: drawing on the gestural vocabulary of Indian dance to activate the device's motion sensing abilities and oral storytelling that can draw on its voice recognition capabilities.

The focus of the game is to encourage players to think about modes of narrative transmission, almost offering a metacritical commentary on gaming as a storytelling vehicle itself. At a very basic level, the story envisioned for *Meghdoot* was simple — an evil dark cloud swallows all the world's stories, and it is the mission of the player to recover them. This cloud messenger is a figurative representation of the cloud as understood in this networked world, an omnipresent, somewhat ominous keeper of the world's data. As commercial cloud services for media and books are monopolized

² The Kinect is an optional peripheral for use with the Xbox, though the most recent release of the Xbox, Xbox One, has the Kinect built in. The Kinect is basically a motion sensing device equipped with an infrared project and camera, which acts as a hands free controller, allowing users to interact with objects on screen by moving their bodies — unlike its competitor the Wii, which utilizes a hand held controller. While the Kinect has not succeeded as spectacularly as the Wii in the domestic market, it has always been popular with coders because of its open source drivers that allows for myriad uses beyond the gaming industry with applications in medicine, 3D mapping, touchscreen displays, and enhanced interfaces.

by vast technology companies, the game's themes reflect concerns regarding the consequences of such monopolies and the possible repercussions of such hegemonic domination by merchants of culture.

The finished prototype, which had two playable levels, was showcased at three venues: the Unbox Festival in Delhi, India; GameCity in Nottingham; and Alchemy (Fig. 4) in London. At the Unbox Festival, the space allocated to the game was decorated with elements and objects from the game, such as antique chest of drawers that features in the game's initial screen, with counters from the game half hidden in the drawers — so that entering the space itself would create an immersive experience (1:39-1:52 mins. Tzavara "Unplay 2013"). Most of the people who played the game were unfamiliar with the Kinect (footage of players can be seen from 1:53-end, Tzavara "Unplay 2013") but seemed to enjoy the learning curve and the gameplay. Players at all three venues commented on the "Indian" feel of the game and how it felt very different from most games they had played in terms of aesthetics and game mechanics.

The learnings from *Meghdoot* have been useful in a current project that some members of the original Unplay team have gone on to make — a game whose working title is *Antariksha Sanchar*. Based loosely on the life and personality of the mathematician S R Ramanujan, this point and click PC based game is set in a fictionalised version of Madurai. This game is intended for an international market and to be sold commercially. The first author was involved in initial discussions regarding this game that urged considerations of how worlds that might seem foreign and unfamiliar to a global audience might be designed without losing any sense of authenticity. While, obviously, for the purposes of the game, the makers are relying on a suspension of disbelief required by players in order to inhabit a fantastical world, the first author suggested that with subtitles for foreign audiences the language for the game could be Tamil to retain a sense of geographical and cultural location. While the game is still a work in progress, it clearly reflects the commitment to culturally specific aesthetics and game design that was set in motion by the earlier project, *Meghdoot*.

Conclusions

This article has aimed to demonstrate that the recognition of local context and cultural specificity places design at the heart of digital humanities practice. There is, however, an inherent tension between the agenda of the digital humanities, which is to broaden access, and resources that grow out of or in response to local contexts and needs. An excellent example of this is the *Mukurtu* project that was created to allow the Aboriginal Warumungu community of Central Australia "to circulate, view, and narrate materials following their own protocols" ("Mukurtu"). Contrary to most digital humanities projects, *Mukurtu* is meant to cater to a very specific audience, in observance of the community's cultural mores.

Similarly *jugaad*, while having similarities to hacking, should be understood in its culturally and historically specific contexts, which have been outlined in this article, rather than being forced into a Western template forged by the latter practice. These approaches that privilege the local should be seen as extending the limits of digital

humanities practice despite appearing, albeit superficially, to contradict the universalising impulse of the discipline.

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References

- Adams, E. W. (2009) The Promise of India: Ancient Culture, Modern Game Design. *NASSCOM Animation and Gaming Summit 2009*, Game Development Summit Keynote Address, November 7, 2009. <http://www.designersnotebook.com/Lectures/India/india.htm> (accessed July 24th, 2015).
- Allison, A. (2006). *Millennial Monsters: Japanese Toys and the Global Imagination*. Oakland: UC Press.
- Balaram, S. (2005). Design Pedagogy in India: A Perspective. *Design Issues*, 21(4), 11-22.
- Balaram, S. (2009). Design in India: The Importance of the Ahmedabad Declaration. *Design Issues*, 25(4), 54-79.
- Bayly, C. A. (1988). The Origins of Swadeshi (Home Industry): Cloth and Indian Society, 1790-1930. In *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge: Cambridge University Press.

- Chatterjee, A. (2005). Design in India: The Experience of Transition. *Design Issues*, 21(4), 4-10.
- Csikszentmihályi, C. (2012). Sixteen Reflective Bits. In *Critical Making: Manifestos* (Version 2012-11-14-1225). Available at <http://conceptlab.com/criticalmaking/> Accessed 9 May 2014.
- Eames, C. & Eames, R. (1958). *The India Report*. Ahmedabad: National Institute of Design.
- Hertz, G. (2012). Introduction: Making Critical Making. In *Critical Making*. Hollywood, CA: Garnet Hertz/Telharmonium Press. <http://conceptlab.com/criticalmaking/PDFs/CriticalMaking2012Hertz-Introduction-ppo1010-Hertz-MakingCriticalMaking.pdf> (accessed June 25th, 2015).
- Huggan, G. (2002). *The postcolonial exotic: Marketing the margins*. London: Routledge.
- Iwabuchi, K. (1998). Marketing 'Japan': Japanese cultural presence under a global gaze. *Japanese Studies*, 18(2), 165-180.
- Kasturi, P. B. (2005). Designing Freedom. *Design Issues*, 21(4), 68-77.
- Liu, Alan. (2012). Where Is Cultural Criticism in the Digital Humanities? In M. K. Gold (Ed.), *Debates in the Digital Humanities* (Open-Access Edition). University of Minnesota. <http://dhdebates.gc.cuny.edu/debates/text/20> (accessed July 24th, 2015).
- Marx, K. (1853). The Future Results of British Rule in India. *New-York Daily Tribune*, August 8, 1853. <https://marxists.anu.edu.au/archive/marx/works/1853/07/22.htm> (accessed July 25th, 2015).
- McPherson, T. (2012). Why Are the Digital Humanities So White? or Thinking the Histories of Race and Computation. In M. K. Gold (Ed.), *Debates in the Digital Humanities* (Open-Access Edition). University of Minnesota. <http://dhdebates.gc.cuny.edu/debates/text/29> (accessed July 24th, 2015).
- Mukherjee, S. (2014). Press F6 to Reload: The Past, Present and Future of Indian Gaming. Talk given at *Of Games II*, Khoj International Artists' Association, New Delhi, India. 4 September 2014.
- Mukurtu. <http://www.mukurtu.org/about/> (accessed 11th September, 2015).
- Parikka, J. (2013). *What is media archaeology?* Hoboken, NJ: John Wiley & Sons.
- Radjou, N., Prabhu, J., & Ahuja, S. (2012). *Jugaad innovation: think frugal, be flexible, generate breakthrough growth*. San Francisco, CA: Jossey-Bass.
- Ramsay, S., & Rockwell, G. (2012). Developing Things: Notes toward an Epistemology of Building in the Digital Humanities. In *Debates in the Digital Humanities* (Open-Access Edition). University of Minnesota. <http://dhdebates.gc.cuny.edu/debates/text/11> (accessed July 24th, 2015).
- Ranjan, M. P. (2013). Web of Connections: Indian Design education with influences from the HfG Ulm. In *Zeitschrift bauhaus 5 – Tropen* (*Bauhaus magazine 5 – Tropics*). Bauhaus Dessau Foundation.
- Ratto, M. (n.d.). *Critical Making Lab: About the Lab*. <http://criticalmaking.com/about/> (accessed 25th July, 2015).
- Ratto, M. (2011). Critical Making. In B. van Abel, L. Evers, R. Klaassen & P. Troxler (Eds.), *Open Design Now: Why Design Cannot Remain Exclusive*. Amsterdam: Bis Publishers.
- Ratto, M. (2012). Interview with Matt Ratto. In *Critical Making*. Hollywood, CA: Garnet Hertz/Telharmonium Press. <http://conceptlab.com/criticalmaking/PDFs/Critical-Making2012Hertz-Conversations-ppo1010-Hertz-RattoInterview.pdf> (accessed June 28th, 2015).
- Ray Murray, P., Kumar, A. & Mishra, A. (2014). Unplay: Using new technologies to tell age-old stories. Arts and Humanities Research Council. <http://www.ahrc.ac.uk/documents/project-reports-and-reviews/unbox-2013-unplay-using-new-technologies-to-tell-age-old-stories/> (accessed 24th July 2015)
- Reinecke, K. & Bernstein, A. (2013). Knowing What a User Likes: A Design Science Approach to Interfaces that Automatically Adapt to Culture. *MIS Quarterly*, 37(2), 427-453.
- Sayers, J. & Simpson, J. (2014). Minimal Computing. <http://www.globaloutlookdh.org/minimal-computing/> (accessed July 24th, 2015).
- Sen, A. (1999). *Development as freedom*. Oxford University Press.
- Shah, N. (2015). Beyond Infrastructure: Re-humanizing Digital Humanities in India. In P. Svensson & D. T. Goldberg (Eds.) *Between Humanities and the Digital*. Massachusetts: MIT Press.
- Sekhsaria, P. (2013) The Making of an Indigenous STM: Technological Jugaad as a Culture of Innovation in India. In K. Konrad, C. Coenen, A. B. Dijkstra, H. van Lente, C. Milburn (Eds.) *Shaping Emerging Technologies: Governance, Innovation, Discourse*. Berlin: IOS Press / AKA.
- Shaw, A. (2013). How Do You Say Gamer in Hindi?: Exploratory research on the Indian digital game industry and culture. In N. Huntemann & B. Aslinger (Eds.), *Gaming Globally: Production, Play, and Place*. New York: Palgrave Macmillan. pp. 226-250.
- Srinivasan, S. (2013). In Search of a Concept of Education: Liberal Education and the Case of India. In *International Journal of Social Sciences and Humanities*, Vol. 2.1. pp. 1-30.
- Sundaram, R. (2009). *Pirate modernity: Delhi's media urbanism*. New Delhi: Routledge.
- UnBox (2014). About UnBox. <http://unboxfestival.com> (accessed 24th July 2015)
- Tzavara, E. (2013). UnPlay 2013. <https://vimeo.com/63169831> (accessed 12th September, 2015)
- Viña, V. (2012). DIY in Context: From Bricolage to Jugaad. Keynote at *Fadfest: Open Design Shared Creativity*. Barcelona, Spain, 3 Jul 2012. <https://www.scribd.com/doc/98988556/DIY-in-Context-From-Bricolage-to-Jugaad> (accessed 19th July 2015)

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making**
DESIGN and
the DIGITAL
HUMANITIES

Jessica Barness
Amy Papaalias
guest editors

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critical making

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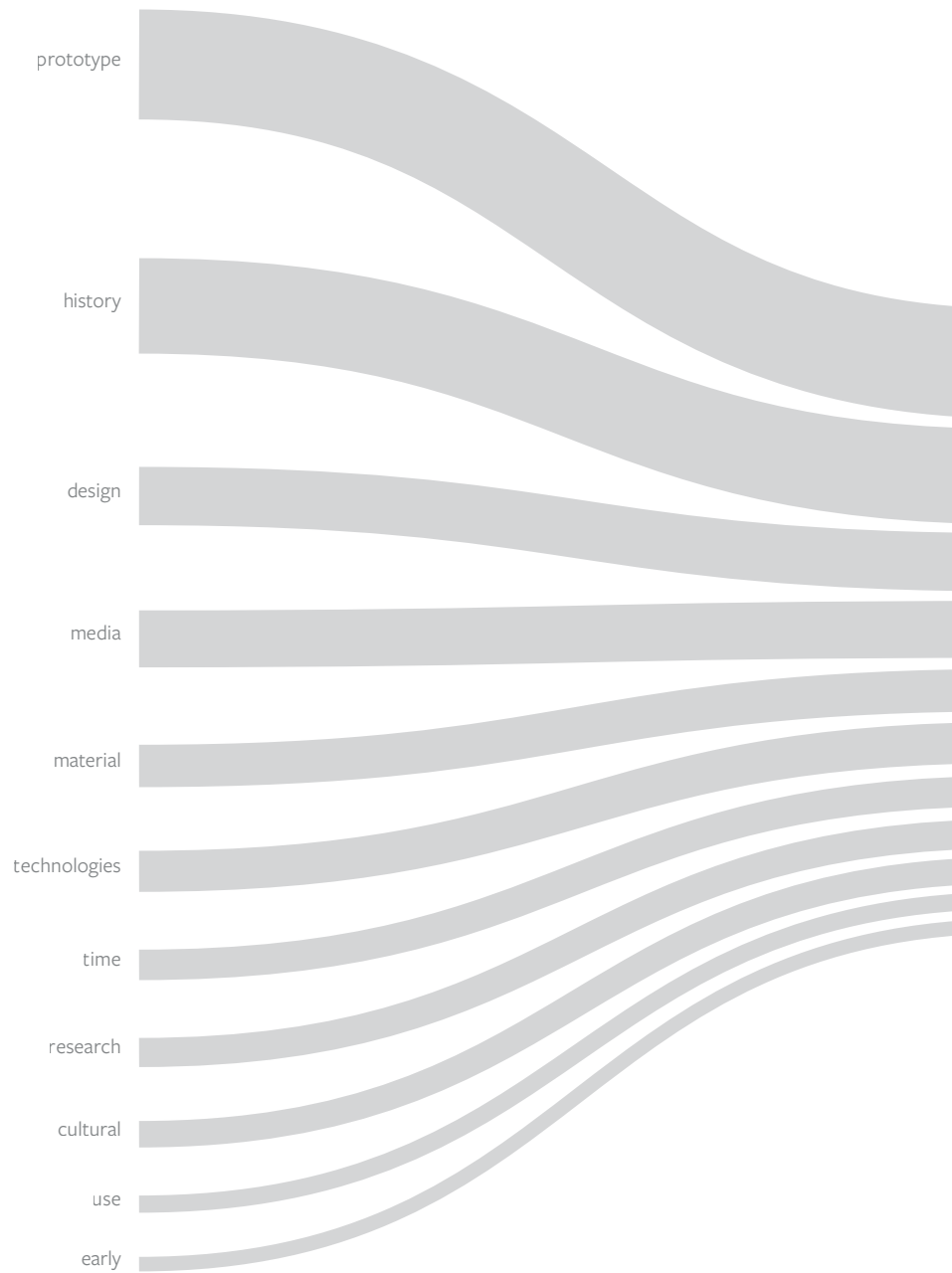
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Prototyping the Past

Jentery Sayers

Abstract

This article outlines a methodology for combining media studies with rapid prototyping and computer numerical control (CNC) techniques premised on remaking technologies that no longer function, no longer exist, or may have only existed as fictions, illustrations, or one-offs. Called “prototyping the past,” the methodology understands technologies as entanglements of culture, materials, and design, and it explains how and why technologies matter by approaching them as representations and agents of history. Informed by hermeneutics, it refuses to take historical materials at face value. It situates media history in a particular thing and the contradictory interpretations that thing affords. It also relies upon trial-and-error negotiation across modes of 2-D and 3-D production, creating media that function simultaneously as evidence and arguments for interpreting the past. Yet most important, prototyping the past does more than re-contextualize media history in the present. It integrates that history into the social, cultural, and ethical trajectories of design. To demonstrate the methodology, I detail how the “Kits for Cultural History” project at the University of Victoria prototypes absences in the historical record and prompts audiences to examine the conditions of that record. I then dedicate my attention to one Kit in particular: the “Early Wearables Kit,” which remakes an 1867 electro-mobile jewelry piece from Paris. After interpreting the Early Wearables Kit from three different perspectives, I articulate eight ways to understand prototyping and media history together, with an emphasis on how prototyping the past stresses the contingent relations between matter and meaning.

Keywords: jewelry, media history, rapid prototyping, reverse engineering, wearables design

Introduction

New technologies can now be used to fabricate old ones. With rapid prototyping techniques, a nineteenth-century mechanism from Cornell University's Kinematic Models for Design Digital Library (KMODDL)¹ can be downloaded, translated into code, fed to a 3-D printer, and used to repair a watch, all in about an hour. While 3-D fabrication tends to fetishize objects, in the following paragraphs I propose an alternative for media studies: "prototyping the past," which prompts scholars to remake technologies that no longer function, no longer exist, or may have only existed as fictions, illustrations, or one-offs. Conceptually, prototyping the past understands technologies as entanglements of culture, materials, and design, and it explains how and why technologies matter by approaching them as representations *and* agents of history. Practically, it is a trial-and-error negotiation across modes of 2-D and 3-D production, and it creates media that function simultaneously as evidence and arguments for interpreting the past. Yet most important, it does more than re-contextualize media history in the present. It integrates that history into the social, cultural, and ethical trajectories of design.

More common in art, design, engineering, and architecture than the humanities, rapid prototyping entails producing materials through a combination of computer numerical control (CNC) machines — such as 3-D printers (additive manufacturing) and routers (subtractive manufacturing)² — with manual approaches to wood, paper, clay, cardboard, and the like. The aim is to subject a model to repeated feedback and hands-on use throughout the development process. In this sense, the design cycles are small, not grand. Also, the models are versioned. Instead of working toward a single model for all audiences and contexts, multiple models are maintained and tested throughout production. This approach is steeped in "design-in-use," which privileges situated activity over some ideal model or user (Botero, 2013).³ Through design-in-use, a prototype is treated like a congealed dialogue or relationship between interested groups. Recalling Marx, it is necessarily social.

Given common associations of rapid prototyping with waste and trinkets, researchers should be skeptical of enthusiastic applications of CNC techniques to media history. One reason not to integrate CNC into scholarly inquiry is solely for the sake of wow or whiz-bang (Sayers, 2015a). All too often, CNC machines, especially 3-D printers, are gadgets unrelated to research, and they are quite conducive to a "print now, think later" mentality. Other reasons to avoid rapid prototyping include the learning curve, the costs of acquiring and maintaining CNC machines, and the labour demanded by the manufacturing and post-production process. Additionally, scholars

1 See kmoddl.library.cornell.edu.

2 More specifically, CNC work involves the use of computer-aided design (CAD) and manufacturing (CAM) to fabricate models in tactile form.

3 I would like to thank Kari Kraus for pointing me to design-in-use.

who stress process over product may worry that prototypes — as objects — too easily mask the decisions involved in making them.⁴

With such concerns in mind, below are a few reasons why scholars of media history may wish to experiment with prototyping the past as part of their research. These reasons are informed by materialist media history⁵ and inspired by the work of Kari Kraus (2009), Anne Balsamo (2011), Leah Buechley (2012), Hannah Perner-Wilson (2012), Morgan Ames (2014), Larissa Hjorth (2014), Kat Jungnickel (2014), and Daniela Rosner (2014). They also correspond in part with arguments published in "New Old Things" (2012), by Devon Elliott, Robert MacDougall, and William J. Turkel. There, Elliott *et al.* express two important points. First, "matter [is] a new medium for historical research. Working with actual, physical stuff offers the historian new opportunities to explore the interactions of people and things" (2012, p. 122). Second, prototypes may be understood as *situations* for interpretation, without an impulse to create exact reproductions of historical artifacts (2012, p. 127). Reading these two points together, the use of matter as a medium for historical research need not fetishize the past. Instead it can become a time and space to interpret the intricacies of materials design and interaction, both now and then.

Reasons to Prototype the Past

One of the most obvious appeals of remaking technologies that no longer function, no longer exist, or may have only existed as 2-D media is that remade technologies may be circulated as tangible reminders of what was forgotten, ignored, destroyed, or lost. Yet prototyping the past also affords critiques of what is ready to hand, either online or off. That is, *it refuses to take historical materials at face value*. Through trial-and-error experimentation, it iteratively tests the plausibility of historical claims.⁶ After all, what is depicted in a journal, patent, illustration, or notebook may not be accurate. It may contain redactions, deliberate omissions, purposeful obfuscations, or accidental occlusions. Using historical materials to prototype a technology amplifies the meaningfulness of these absences.

Put this way, prototyping the past is deeply intertwined with hermeneutics and close reading.⁷ However, its emphasis on physically remaking historical technologies expands those legacies to include the centrality of translation and tacit knowledge to media history. For example, as material is expressed across schematics, laboratory

4 For more on process over product, see Ratto on critical making (2011). For more on prototypes as arguments, see Galey and Ruecker (2010).

5 For example, see Kittler (1999), Gitelman (1999, 2006, 2014), Bowker and Star (2000), Sterne (2003, 2012), Chun (2005, 2011), Galloway (2006), Kirschenbaum (2008), Vismann (2008), Ernst (2012), Parikka (2013, 2015), and Starosielski (2015).

6 Here, we might follow Kraus's arguments for conjectural approaches to texts and editorial styles, especially her comments about the "attested states of texts" (2009, n. p.).

7 For a history of hermeneutics by way of media theory, see Galloway (2013): "Hermeneutics tries to, as it were, unmask the status quo, focusing on a development or reform of the work... [A]ny hermeneutic reading will tend to run 'against the grain' of literal or latent truth visible in the work" (2013, p. 37).

experiments, notebooks, and journal publications, information is both gained and lost.⁸ Indeed, changes occur across media. Even if they cannot be fully recovered, prototyping puts pressure on these changes, opening them up to speculation. By re-contextualizing historical technologies in the present, prototyping also accentuates differences across time, including discrepancies between materials, modes of production, conditions of use, and habits of perception. When, for instance, a technology from the 1860s is prototyped in the present, we are reminded that — echoing Jonathan Sterne (2003, p. 19) — we cannot inhabit the world like they did back then. Social interactions, including interactions with technologies, are not somehow ahistorical or universal. The ways in which technologies are perceived and shape perception are situated, too. What was once an innovation in the 1860s becomes an antique or relic in 2015. Alternatively, these differences across time may turn things of the past into the stuff of present curiosity.

Rather than transcending such differences or romanticizing them through nostalgia, prototyping the past grounds media history in a particular thing and the interpretations it affords. Following the work of Karen Barad by way of Donna Haraway, such grounding posits prototypes as entanglements of meaning with matter by attending to the substance of “fine-grained details” (Barad, 2007, p. 90).⁹ Here, neither meaning nor matter can be relegated to a concept or abstraction. Again, situations are significant. And prototyping reminds scholars of that significance. It is a deeply embodied process involving frustration and surprise. It also troubles paradigms of humanist control over technologies by distributing agency and intent. The material intricacies of prototyping highlight how technologies do not effortlessly emerge from the minds of brilliant inventors, engineers, geniuses, or makers. They also remind scholars that 1) the sources of matter and meaning are forever unstable and under dispute, 2) historical materials are not “total” works or complete objects but rather compositions of parts that change — degrade, rot, morph, warp, break, swell, or grow — over time, 3) numerous contributors and negotiations are always involved in a given design cycle, 4) technologies structure knowledge and perception, and 5) materials resist or diffract as many interpretations as they facilitate.

Speaking generally, then, prototyping the past refuses to essentialize technologies. It versions them, investigating how they are variously interpreted, by hand, on paper, on screen, in the past, over time, and in the present. In so doing, it expands what we imply by scholarship, including how scholarship is communicated and interpreted, and how it may shape the trajectories of design practice. Consider an example.

8 These expressions may be understood as remediations. For more, see Bolter and Grusin (1999).

9 Writing about the work of Niels Bohr, Barad argues: “apparatuses are the material conditions of possibility and impossibility of mattering; they enact what matters and what is excluded from mattering” (2007, 148). Later, she notes: “Causality is an entangled affair: it is a matter of cutting things together and apart (within and as part of phenomena)” (2007, 394).

The Kits for Cultural History

At the University of Victoria’s Maker Lab in the Humanities (“Lab”), which I direct, the Kits for Cultural History (“Kits”) project remakes technologies from the past, packages them in bespoke containers, contextualizes them with historical materials, and encourages people to disassemble and reassemble them in numerous ways. Comparable to Heathkits¹⁰ of yore or Adafruit¹¹ kits of today, the Kits include components and guides for assembly.¹² However, the guides are not reducible to instruction manuals. They are steeped in cultural history (e.g., how the technology at hand was entangled with material conditions) and do not assume a single or “correct” approach to assembly. By design, this resistance to determinism and uniformity is

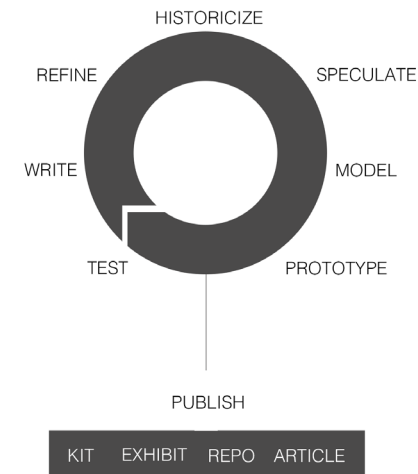


Figure 1. Design Cycle for the Kits for Cultural History, Care of Nina Belojevic, Tiffany Chan, Nicole Clouston, Katherine Goertz, Shaun Macpherson, Kaitlynn McQueston, Danielle Morgan, Victoria Murawski, and Jentery Sayers

essential, since the Kits focus on technologies that are, for all intents and purposes, inaccessible today. These technologies are not found in galleries, museums, archives, or collections; they no longer function as they once did; or they were never actually built or mass-manufactured. Such inaccessibility necessarily entails a degree of uncertainty and ambivalence where research is concerned. Rather than approaching this uncertainty at a remove, *the Kits prototype absences in the*

historical record and prompt audiences to examine the contingencies of that record. Anchored in design-in-use, this iterative method presents the prototype as a negotiation, not a definitive replica of the historical technology under examination. In the case of prototyping the past, to assert the latter would be disingenuous at best.

The design cycle for the Kits is visualized in Figure 1, with the understanding that stages in the cycle routinely overlap and that, despite the tidiness of Figure 1, messiness and surprise are fundamental to the Kits as forms of inquiry.

Once the Lab selects a technology for remaking, we historicize it through archival materials: component parts, patents, illustrations, recordings, reviews,

10 Heathkits are a brand of do-it-yourself electronics kits for building everything from radios to robots. For more on Heathkit culture, see Haring (2006).

11 Adafruit is an open-source hardware company that makes and distributes electronics kits with a bias toward creative applications.

12 Kits currently under development include an early wearables kit (based on an 1867 electro-mobile skull stick-pin), an early magnetic recording kit (based on Valdemar Poulsen’s work in the 1890s), and an optophone kit (based on Raoul Hausmann’s work in the 1920s and 30s). For more on the design of the Kits, see Sayers (2015b).

photographs, notebooks, and even works of fiction. Informed by existing theories of media and technologies, the Lab then speculates about absences in the historical record and determines how those absences might manifest in tactile form. Next, we model, fabricate, and assemble the technology's component parts into prototypes, which we then test and share with other researchers. After testing and feedback, the Lab writes about the prototyping process and related media history. When bundled together, the writing, prototyping, and testing refine our research, and the design cycle is repeated until we deem a Kit persuasive. Once a Kit is ready for circulation beyond the Lab, we publish it in tactile Kit form (delivered by hand or post), as an online repository (“repo”), and as part of an *in situ* exhibit.¹³ With these, the Lab also authors scholarly articles about the Kit's contribution to media studies. Even if they do not emerge simultaneously, we treat these publications — the tactile Kit, repo, exhibit, and article — equally as elements of scholarly communication.

Throughout the design cycle, the Lab asks several questions of the technology we are prototyping: 1) Who made it? For whom? When? 2) How was it made? Of what? How did it work? How and why was it used? 3) Do any instances of it still exist? If so, then where are they, and can they be handled, used, de-manufactured, or reverse engineered? 4) Under what assumptions was it made and used, and with what relations to history? 5) How might prototyping it shape design in the future?

While these questions resonate with existing media studies methodologies, they also push historical inquiry into a praxis informing how design can or should happen. Again, prototyping the past is more than re-contextualizing media history in the present. It constructs situations for integrating that history into the trajectories of design practice. Consider an instance in the Kits project.

The Early Wearables Kit

Part of the Kits series, the Early Wearables Kit (“Wearables Kit”)¹⁴ contains digital and analog components, a guide, and historical materials for assembling, disassembling, and interpreting an early wearable technology — specifically, a mid-nineteenth-century, electro-mobile jewelry piece made in Paris (see Figure 2). At the time, the piece was understood as a personal ornament and an innovative gadget.

Although wearables date back to wristwatches (designed for women) from the 1790s (Ryan, 2014, p. 26), *bijoux électro-mobiles* from Paris remain some of the earliest — and most ignored — wearables across histories of fashion and technology. Among these electro-mobile pieces were bird-shaped hairpins as well as skull and rabbit cravat pins (“stick-pins”). As Charlotte Gere and Judy Rudoe suggest, these pieces are “objects that would be hard to believe existed were it not for the contemporary documentation” (2010, p. 200).

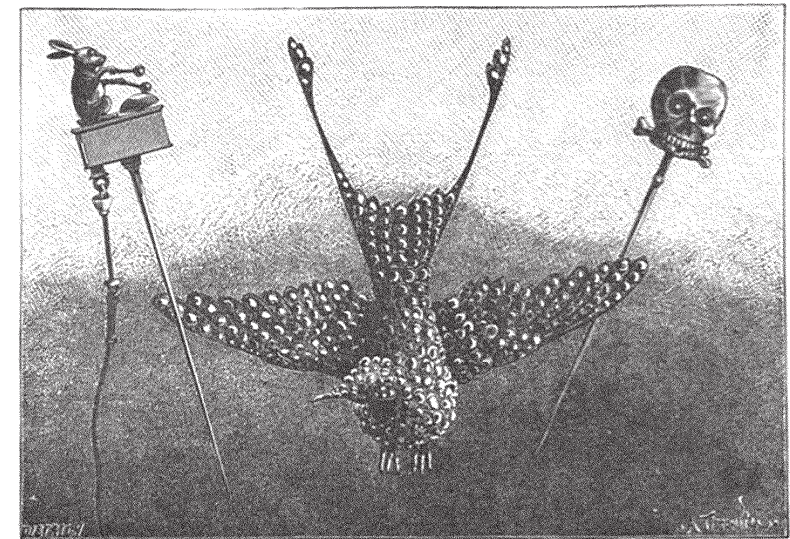
¹³ The Kits are not intended to generate profit.

¹⁴ A repository for the Wearables Kit is at github.com/uvicmakerlab/earlyWearablesKit.

Figure 2. Photograph of an Early Wearables Kit, Care of Nina Belojevic, Tiffany Chan, Nicole Clouston, Katherine Goertz, Shaun Macpherson, Kaitlynn McQueston, Danielle Morgan, Victoria Murawski, and Jentery Sayers



Figure 3. “Large Scale Representation of Rabbit, Bird, and Skull Electro-Mobile Jewelry,” Care of *La Nature* (1879) and Barral (1891)



To the Lab's knowledge, only one of these pieces is currently housed at a memory institution: an electro-mobile skull stick-pin at the Victoria and Albert Museum (“V&A”) in London (M.121-1984)¹⁵ (see Figure 3, the pin is on the far right). It is possible, too, that none of the other pieces in Figure 3 existed as anything other than

¹⁵ At the V&A, the stick-pin is located in Jewellery, room 91, case 23, shelf A, box 12. Another instance of the stick-pin circulated through Sotheby's in London in 2003.

Figure 4. Care of the Victoria and Albert Museum, London (Museum Number M.121-1984), Two Photographs of an Electro-Mobile Stick-Pin by Gustave Trouvé and Auguste-Germain Cadet-Picard.

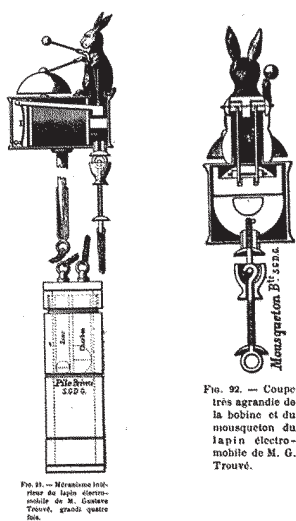


Figure 5. “Inside Mechanism of an Electro-Mobile Rabbit Enlarged Four Times” (left) and “Enlarged Image of the Coil and Carabiner of the Electro-Mobile Rabbit” (right), Care of Barral (1891).

16 George Barral (1891) suggests that the bird, skull, and rabbit all functioned at some point. However, his text is prone to hyperbole, and working instances of neither the bird nor the rabbit exist today.

17 For more on Trouvé and nineteenth-century instrument-making, see Blondel (1997).

18 Details are available via the V&A’s online collections: collections.vam.ac.uk/item/O115814/stick-pin-cadet-picard-auguste/.

19 Trouvé is frequently credited with designing the first miniature hermetically sealed battery, which he patented (granted on July 1, 1865, No. 67294).

a prototype or one-off.¹⁶ The Lab is certain, though, that none of them, including the skull, was ever mass-manufactured.

Designed by Gustave Trouvé (an engineer and instrument-maker¹⁷) and made by Auguste-Germain Cadet-Picard (a jeweller), the electro-mobile skull stick-pin at the V&A is 9.2-centimeters-tall, 1.5-centimeters-wide, and 1.6-centimeters-deep.¹⁸ Dated 1867, it is made of gold and enamel with diamond sparks. Originally, the eyes of this “death’s head” were said to roll, and the jaw was said to snap, both when charged by “a miniature hermetically sealed battery” hidden inside the wearer’s pocket (2010, p. 210).¹⁹ The intended wearers were middle-class men (e.g., merchants and entrepreneurs) who

Figure 6. Diagram of an Interrupter-Type Electric Bell (Image in the Public Domain)

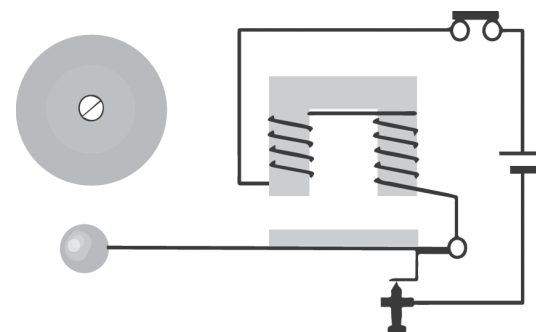
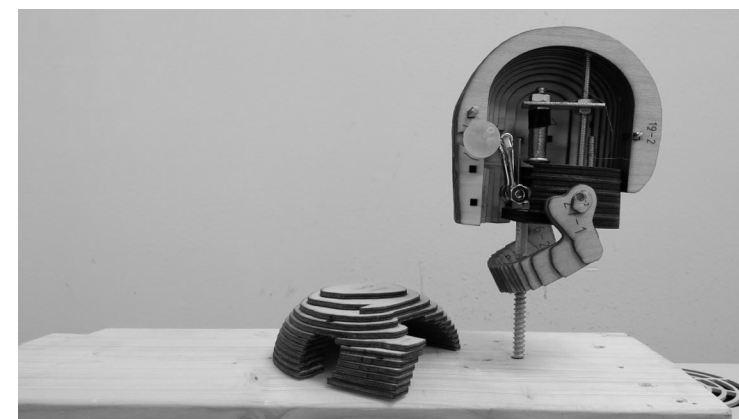


Figure 7. Photograph of a Large-Scale, Functioning Prototype of an Electro-Mobile Skull Stick-Pin, Care of Nina Belojevic, Tiffany Chan, Nicole Clouston, Katherine Goertz, Shaun Macpherson, Kaitlynn McQueston, Danielle Morgan, Victoria Murawski, and Jentery Sayers



could afford novelties (2010, 190). A work of neither high art nor exquisite jewelry, the electro-mobile skull aimed to entertain.²⁰ It was never fashionable.

Today, the skull stick-pin at the V&A (see Figure 4) is not animated. Indeed, batteries are not included.²¹ They did not stand the test of time, and thus the skull’s eyes and jaw do not move automatically. The piece is also behind glass and cannot be handled — let alone de-manufactured — by researchers.²² This means the skull’s interior remains nearly invisible to audiences, with the mechanisms for animating its eyes and jaw rendered practically opaque. What is more, Trouvé’s archives were destroyed in a fire (Desmond, 2015, p. 179). With these factors combined, determining how

20 During the 1880s, Trouvé made illuminated jewelry, which combined his hermetically sealed battery with newly developed incandescent lamps made with carbon filament (Gere and Rudoe 2010, 210). This illuminated jewelry received attention from *Scientific American*, *The Voice*, *The Electrician*, *La Nature*, and *The Jewelers’ Circular and Horological Review*. Illuminated jewelry tended to display masculine innovation on women’s bodies during stage performances and theater productions.

21 Gere and Rudoe write: “The battery no longer survives but the connection for the wire is visible beneath the crossbones” (2010, p. 210, Figure 162).

22 In an email to me, dated 15 May 2015, Richard Edgcumbe of the V&A’s Metalwork Collection wrote: “There is no access to the works of the V&A’s pin.”

Figure 8. Photograph of an At-Scale, Functioning Prototype of an Electro-Mobile Skull Stick-Pin, Care of Nina Belojevic, Tiffany Chan, Nicole Clouston, Katherine Goertz, Shaun Macpherson, Kaitlynn McQueston, Danielle Morgan, Victoria Murawski, and Jentery Sayers.



Trouvé and Cadet-Picard animated the skull — *if they actually animated it* — is difficult. However, some digitized illustrations of *bijoux électro-mobiles* remain, including the illustration in Figure 5 of an electro-mobile rabbit.²³ With some additional research and contextualization, including newspaper publications about the stick-pin’s demonstration at the 1867 *Exposition universelle* in Paris, these 2-D images can be translated into a functioning electro-mobile skull, which — as Figure 5 suggests — was animated by a mechanism found in interrupter bells.

After the development of electromagnets during the 1820s, such bells were common in Europe by the 1860s. They were found in doorbells, alarms, telegraphs, and — later in the century — telephones, too. These everyday devices probably informed Trouvé’s electro-mobile pieces. Relying on digitized illustrations, the Lab therefore combined nineteenth-century bell and jewelry designs, including illustrations in Figures 5 and 6, to create functioning prototypes of the skull stick-pin. While the prototypes are not exact reproductions of the original, they give researchers a tangible sense of its composition. With computer-aided design (CAD) software and CNC machines, the Lab also experimented with large-scale prototypes, which are easier than the original to examine and test by hand (see Figure 7). The large-scale prototypes help the Lab gradually fabricate and assemble prototypes at scale, including the prototype pictured in Figure 8.

Collectively, these prototypes serve as situations for research across meaning and matter, with an emphasis on the assumptions under which the skull stick-pin was

²³ Thanks to Lab researcher, Danielle Morgan, over two hundred illustrations of Trouvé’s work are publicly available at github.com/uvicmakerlab/trouve. Morgan extracted these illustrations from Barral’s 1891 Trouvé biography and translated all captions from the original French into English.

made and used. As the prototypes re-contextualize the past in the present, they also inform future design practices. Consider three interpretations of the Wearables Kit.

Mourning, Ornament, Protocol

The skull stick-pin at the V&A was novel in the 1860s because it combined electric bell designs with designs for mourning jewelry and personal ornamentation. This historically unique combination resulted in a popular attraction (at the 1867 *Exposition universelle*) that also received rather negative reviews from critics. As one may guess, the pin was ultimately deemed more of a technical achievement than an aesthetic innovation. However, it also operated across several social and cultural registers, as a commentary on nineteenth-century protocols for bereavement and dress.

While mourning jewelry is typically understood as a gesture of remembrance and respect toward the dead, it is also a *memento mori*: a reflection on mortality and transience — on the inevitability of death and the passing of time (Taylor, 2009, p. 185). During the 1860s, fashion appropriated various mourning mementoes (e.g., skulls, bones, hair, and teeth) from centuries ago (2009, p. 185-189), with mourning jewelry frequently functioning as a status symbol. While it was accessible to many, the quality of materials worn nevertheless marked class and social standing. Lou Taylor writes: “Special jewellery and accessories become yet another expensive item to be added to the long list of requirements considered socially essential after bereavement” (2009, p. 185). Indeed, across Europe, including England and France, decrees as well as norms of etiquette, gender, and sexuality regulated mourning during a time when, by today’s standards, mortality rates were high and life expectancy was low, particularly in urban areas. After a death, mourning jewelry was to be worn almost immediately (Gere and Rudoe, 2010, p. 125), and there were prescribed stages of mourning (e.g., “first mourning” and “second mourning”) as well as acceptable jewelry colors, usually white, black, and gold.²⁴

Popular publications proliferated these dress rituals by helping to commodify death. While offering suggestions for mourning fashionably (2010, p. 125), magazines documented how high society mourned in public. For instance, on April 1, 1867, the *Ladies’ Treasury* in London reported how Queen Victoria was publicly mourning the 1861 death of her husband, Albert, Prince Consort:²⁵ “At the Court recently held by the Queen, Her Majesty wore a black silk dress, with a train trimmed with crape, and

²⁴ Of course, these colors were worn outside of mourning: “[t]he use of black in Victorian dress is intensely ambiguous, especially in light of mixed feelings about the brilliant colours that became available in the 1850s. A preoccupation with death that permeated Victorian culture at all levels has led to the assumption that women depicted in black with jet jewellery must be in mourning. But this must be backed by evidence showing that the trimmings are of crape, a fine wrinkled silk, or that the dress is made from the twilled silk and worsted called bombazine, both materials specifically decreed for mourning wear” (Gere and Rudoe, 2010, pp. 120-121).

²⁵ As Gere and Rudoe note, when Albert died, “[m]emorial pendants with the Prince’s photograph by Camille Silvy taken on 3 July 1861, in a setting of Fountainebleau-style strapwork, were ordered for many of the Queen’s closest confidants. . . . Men were presented with stick-pins with the portrait set in gold martyr’s palms” (2010, p. 56).

the Mary Queen of Scots cap, with a long veil of white crape lisse, and a coronet of jet. Her Majesty also wore jet ornaments, the Riband and Star of the Order of the Garter, and the Victoria and Albert Order” (1867a, p. 186).²⁶ Among these, jet jewelry — such as French jet (a type of glass) and Whitby jet (a type of fossilized wood) — was quite popular during the period. Across Europe, but especially in England, mourning jewelry was a lucrative industry. Businesses that invested in jet mining, carving, and supply thrived during the 1860s and ’70s (Taylor, 2009, p. 195-199), and they did so without bespoke production. Since mourning pieces were worn just after a death, they were simple and impersonal (Gere and Rudoe, 2010, pp. 124-125), making them all the more conducive to standardized manufacture.

Alongside the popularity of mourning jewelry during the 1860s, men routinely wore — and were expected to wear — pieces such as cravat pins, rings, cuff-links, and neckwear. Later in the century, watches and watch-chains gained traction. As with mourning jewelry, these pieces marked status and wealth, and they, too, were regulated by norms of etiquette, gender, and sexuality.²⁷ On the topic of stick-pins in particular, Gere and Rudoe write: “Stick-pins were vehicles for little masterpieces of jewellery, for novelties of all kinds, including mottos and puns” (2010, p. 135). This observation applies to the electro-mobile skull. A novelty somewhere between mourning jewelry and personal ornamentation, it is a pun on *memento mori*: With its snapping jaw, death literally reminds people of itself. An ornament not only made of gold but to be worn on the chest, it is also a rather playful expression of death’s reminder. It could have even been a joke directed at British severity about Albert’s passing. It may have mocked the sternness of Victorian dress guides that advised against trends, false jewels, elaborate styles, and conspicuous dress.²⁸ And it may have revelled in mourning culture as a lucrative industry at the time. Whatever the interpretation, it certainly experimented with decrees and etiquette. Yet, in so doing, it actually reaffirmed their potency. It demonstrated how, more often than not, puns in design merely accentuate the pervasiveness of norms.

Prototyping this pun foregrounds how, as both metaphor and matter, it intersected fashion with technology, mourning with ornamentation, jewelry with gadgetry. The pin is treated not as a complete object to be consumed but rather as a series of component parts to be reverse-engineered and reassembled. Doing so traces how seemingly diverse materials — diamonds, gold, wires, electromagnets, iron, carbon, zinc, and more — collectively became a novelty in 1867. It also tests historical accounts of the pin. Shaped by the rhetoric and whiz-bang of grand exhibitions, these accounts lean toward the hyperbolic, and they come with their own assumptions. For instance, after attending the *Exposition universelle*, a reporter for *The Times* in London said a button caused the “death’s head to chatter and roll its horrid eyes” (1867b, p. 9).

26 Gere and Rudoe (2010, p. 124, Figure 79) quote these two sentences; however, their quote does not correspond exactly with the content of the source.

27 Gere and Rudoe write: “there were many opportunities for men to wear jewellery in much the same way as women” (2010, p. 135).

28 For an example of how skull stick-pins were perceived in London, see Leech (1853).

Aside from the value judgment implied by this description (which rehearses cultural apprehensions toward animating inanimate objects, or giving life to the dead), the stick-pin was not button-triggered. Instead, the wearer actuated a hermetically sealed, 1.5-volt pocket battery — made of zinc and carbon and activated by ammonium chloride — by flipping it from a vertical to a horizontal position.²⁹ Perhaps this detail is too fine-grained, but it meant the wearer had less agency over the skull’s animation than a button would afford. In this sense, electro-mobile jewelry differed from electric bells found at hotels and railway stations during the 1860s.

For current design practice, the stick-pin’s composition and cultural function remind us that wearables are not merely additive or superficial. They should not be reduced to symbols or accessories, or to forms of romantic self-expression. They are imbricated with protocols that shape choice, behavior, identity, and interaction. Today, with wearables producing data about people’s physical and social activities, this lesson is all the more important.

Miniaturization and Nostalgia

An electrical engineer trained in clock- and watch-making, Trouvé specialized in experiments with miniaturization. In 1882, *Scientific American* borrowed language from Alexandre Dumas to suggest that Trouvé’s fingers had “at once the strength of those of the Titans and the delicacy of those of the fairies,” noting, too, that “[i]t is in small works that electricity excels” (1882, p. 5767). Later, in 1891, George Barral claimed: “One cannot imagine anything more charming, more graceful, more fun than these little figures animated by Trouvé’s Lilliputian battery and his electro-motor so microscopic that it can fit in 3 cubic millimeters, barely one one hundredth of a sewing thimble” (translated from original French; 1891, p. 161). These inflated comments position the stick-pin as a crafty gadget. Together with the technical terminology (e.g., “battery” and “electro-motor”), there are references to technological progress (e.g., “excels”) and material achievement (e.g., “graceful” and “so microscopic”) as well as to skilled manual labor (e.g., “strength” and “delicacy”). Read collectively, the language marks an alignment of aesthetics and miniaturization with mastery and positivism. As Susan Elizabeth Ryan observes of early wearables, such an alignment is historically masculine (2014, p. 29). During the 1860s, it was also steeped in nostalgia, or a yearning for unadulterated life found in miniatures at the fingertips.

Susan Stewart argues that “[t]he miniature does not attach itself to lived historical time... [A]s an object consumed, [it] finds its ‘use value’ transformed into the infinite time of reverie” (1993, p. 65). Following Stewart’s logic, crafting the electro-mobile skull was synonymous with crafting private time, which — during the second half of the nineteenth century — intersected with the recovery of authentic skills and preindustrial labor amidst the emergence of industrial capitalism and factory work (1993, p. 68). Here, the pin’s size and use are crucial. Again, it is 9.2-centimeters-tall,

29 For more on the battery, see Desmond (2015, p. 27-30).

1.5-centimeters-wide, and 1.6-centimeters-deep, and it fits easily in a cravat. It is hand-made, and its battery — ostensibly “one one hundredth [the size] of a sewing thimble” (Barral 1891, p. 161) — is called Lilliputian, a reference to Swift’s *Gulliver’s Travels* (1726). Returning to Stewart: “As is the case with all models, it is absolutely necessary that Lilliput be an island. The miniature world remains perfect and uncontaminated by the grotesque so long as its absolute boundaries are maintained” (1993, p. 68). A source of power tucked in a coat pocket, the battery is not only small. It, like its engineer,³⁰ is hidden from view, heightening its influence as both pun and trick by separating it from the skull’s performance higher on the body, nestled in a cravat. The material particulars of design, or how this becomes that, matters less than the effect or experience of animation. In fact, too much attention to particulars would contaminate the boundaries drawn between the miniature and its power source.

Prototyping this miniature attends to exaggeration in its historical description, yet it also identifies where the skull may resist or diffract desired effects. Attention to such surprises exposes some of the humanist impulses (e.g., assumptions that people control matter) in Stewart’s arguments while granting significant legitimacy to tacit knowledge — both then and now — of the stick-pin. As the Lab discovered, prototyping an electro-mobile wearable at scale is quite difficult even today. However, this difficulty need not reaffirm masculine histories of mastery and manipulation. And it need not facilitate an homage to Trouvé, Cadet-Picard, or preindustrial craft. In fact, it should do quite the opposite: raise questions about the degree to which the discourse of miniaturization corresponded with what was actually made, how it was made, whether it was made, how it was maintained, and how reliable it was.³¹ In the last instance, did the skull’s jaw snap or eyes move in a persistent fashion? Were they ever animated? We will never know for sure. What we do know is that hyperbole plays a key role in media history, and historical materials should not always be taken at face value. In fact, the inflated discourse around early wearables may also explain, at least in part, why so few *bijoux électro-mobiles* exist off both paper and screen today.

Where future design practices are concerned, early rhetoric of miniaturization maps rather neatly onto current yearnings for pre-digital living. If, during the 1860s, miniaturization enabled a private experience somehow removed from the storm of industrial capitalism, then today many maker movements promote a do-it-yourself ethos that longs for a simpler, slower, more authentic moment prior to the Internet and personal computing. These visions are not only nostalgic for a past that never happened. They are also subtended by technological determinism, and they generally ignore the social and cultural nuances of manufacturing. Indeed, for most people (including workers across 1860s Europe), manufacturing was not — and is not — a leisure activity rife with play and experimentation. It was and remains a situation with

30 Stewart: “The automaton repeats and thereby displaces the position of its author” (1993, p. 60).

31 As Rosner and Ames (2014) argue, maintenance and repair play a fundamental role in technology, culture, and infrastructure.



Figure 9. “Enlarged Interior View without Electric Engine of Mechanism for the Eyes and Jaw of an Electric-Mobile Turk,” Care of Barral (1891)

FIG. 93. — Vue intérieure très agrandie (l'électro-moteur étant enlevé) du mécanisme des yeux et de la mâchoire du turco électro-mobile de M. Gustave Trouvé.

many risks. As design research proceeds, it could thus attend more to the material conditions of manufacturing, without encouraging a privileged withdrawal into the romantic experience of a maker outside of industry.

Orientalism and the Mechanical Turk

To communicate the technical particulars of electro-mobile jewelry, Trouvé published two illustrations of the electro-mobile rabbit’s interior (see Figure 5). While few scholars, including Marvin (1988), Gere and Rude (2010), and Ryan (2014), have written about electro-mobile jewelry, publications across academic and popular venues tend to reference only these two illustrations. To the Lab’s knowledge, what has not been addressed is the fact that Trouvé also designed an electro-mobile “turk,” which, together with the rabbit illustrations, is the only surviving representation of the jewelry’s inner workings. While one of the rabbit illustrations was published in *La Nature* (1879), Figure 9 only appears in Barral’s 1891 Trouvé biography.

This illustration suggests that, like many other nineteenth-century engineers, Trouvé redeployed Wolfgang von Kempelen’s orientalist construction of the chess-playing Mechanical Turk automaton (1770) for his electro-mobile designs. As Ayhan Aytes explains, the Mechanical Turk performed “a particular form of docility that conveys the idea of the disciplined productive body” (2013, p. 83). The chess-playing automaton was in fact a mannequin manipulated by von Kempelen’s assistant, who hid in a cabinet at the base of the mechanism and controlled its behaviors (2013, p. 82). Through this articulation of technology and culture, the Mechanical Turk embodied orientalist assumptions that enlightened, white minds in Europe could program racial others and render them media for rationalist expression (2013, pp. 82-83). Even if Trouvé or Cadet-Picard unconsciously revitalized these orientalist assumptions through electro-mobile jewelry, the important fact is that the assumptions persisted — via design — well beyond von Kempelen’s eighteenth-century automaton. In fact, as Aytes points out, von Kempelen’s model persists today. In 2005, Amazon named its online micro-tasking platform the Mechanical Turk (2013, pp. 79-81).

Through what Anne Balsamo calls “hermeneutic reverse engineering” (2011, p. 14),³² prototyping the V&A’s electro-mobile skull stick-pin underscores how the

32 Hermeneutic reverse engineering is a “framework [that] combines insights from interpretive theory with standard designing practices used by engineers, computer scientists, and cre-

Mechanical Turk (in particular) and orientalism (in general) are meaningful not only as concepts or metaphors; they are also mechanics operating through models and matter over time. Across Trouvé's various electro-mobile designs, his use of an electromagnetic mechanism is consistent. To borrow language from present-day software rhetoric, he simply changed the "skins" of the jewelry pieces. At the time, this combination of consistent mechanics with aesthetic variation was anchored in an electromagnetic worldview,³³ or the belief that electromagnetism could account for all scientific *and* natural phenomena. For Trouvé and others, electricity and magnetism were thus ways to control life itself. From an engineering perspective, they were also ways to automate von Kempelen's assistant and delegate his decisions to a technology. If we map Stewart's interpretation of miniaturization onto an electromagnetic worldview, then von Kempelen's Mechanical Turk could not only be further manipulated through a change in scale, reducing it to a piece worn on the body. Von Kempelen's logic could also be extended to all bodies and life forms. Put this way, during the second half of the nineteenth century, electromagnetic mechanisms³⁴ became vehicles for rationalist expression through human *and* non-human others. The use of "skins" to render these mechanisms opaque merely increased the appeal of instrumentalist design and its perceived effectiveness as a logical paradigm.

The trajectories of design practice can learn from this history by first recognizing that the past is more than a referent. It is an active ingredient of technologies across their construction, circulation, and use, even if it does not determine their development. Accordingly, Trouvé's remaking of von Kempelen's Mechanical Turk demonstrates one among many reasons why prototyping the past should refrain from fetishizing or commodifying history. Much like writing one's way through an archive, prototyping the past is a form of inquiry: a methodology for unpacking and examining the matter and meanings of media, including absences. *Without hermeneutic reverse engineering, prototyping risks naively rehearsing or celebrating history.* For instance, we may consider ongoing concerns with steampunk (which plays counterfactually with Victorian aesthetics and identities) or, again, a now common yearning for pre-digital living — a nostalgia that ignores political economy to invent historical experiences.

With this nostalgia in mind, prototyping the past highlights how black box³⁵ theories are steeped in legacies predating cybernetics and software. In the case of von Kempelen's assistant in a cabinet or Trouvé's bell in a skull, an instrumentalist

ative thinkers... [W]hat is reverse-engineered are the elements that contribute to the meaning of a given technocultural formation" (Balsamo 2011, p. 14).

33 I would like to thank Edward Jones-Imhotep for pointing me to the intersections between electro-mobile jewelry and an electromagnetic worldview.

34 Hans Christian Ørsted is credited with discovering, in 1820, the relationship between magnetic fields and electric currents. William Sturgeon is credited with inventing a seven-ounce electromagnet in 1824. Sturgeon later published his work, in 1826, in *Annals of Philosophy*.

35 For more on black box theory, see Latour (1987): "The word black box is used by cyberneticians whenever a piece of machinery or a set of commands is too complex. In its place they draw a little box about which they need to know nothing about its input and output" (p. 2-3).

worldview turns this into that, under an assumption that "sourcery" (Chun, 2011, p. 19) — or a privileged mastery of technologies as the materialization of reason — allows makers to manipulate life at their fingertips. Historically intertwined with an electromagnetic worldview, sourcery masks more than the magic of technological process. Consciously or not, it masks values, too. That said, while *bijoux électro-mobiles* may appear "quaint" as historical novelties, neither their matter nor their meanings should be romanticized or relegated to amusement.

Ways of Prototyping

The electro-mobile skull stick-pin at the V&A yields no coherent or unambiguous interpretation. It does not add up, and no single paradigm anticipates its relevance. Such is the effect of prototyping the past: *refusing to take history at face value results in irony and surprise.* Here, then, I would like to reflect upon arguments I made in this article by listing ways to think about media history and prototyping together: 1) prototyping the past demands methods and perspectives from across disciplines; 2) prototyping is not always futurist, and it is not restricted to forecasting; in fact, it is arguably fundamental to the practice of materialist media history; 3) 3-D media such as tactile models are not more persuasive than 2-D media such as illustrations; both may include exaggeration and omission, and they should be interpreted in tandem, not in opposition; 4) many aspects of media history remain inaccessible even with direct access to physical materials at memory institutions; having these materials at hand neither resolves issues of absence nor guarantees certainty about the past; 5) contrary to instrumentalist approaches invested in exact reproductions of history, prototyping the past may resist nostalgia, glorification, re-enactment, or fantasies of "being there"; as with any research method, it is not immediate and cannot access "real history"; 6) prototyping the past may be premised on *not* replicating history — on what, from a cultural, social, or ethical position, we should *not* repeat; 7) where it is intertwined with hermeneutics, prototyping may test suspicions we have about history by grounding them in fine-grained details of matter and meaning; and 8) prototyping the past is closer to Derridean deconstruction than Hegelian idealism. It need not aim for a totalizing or rational history without remainders. Instead, it can recognize how many aspects of the technologies we use to reproduce history exceed our control and understanding. Indeed, the speculative elements of prototyping can be anchored in the specificities surrounding historical absences — of what we cannot prove or do not know for sure but certainly shapes us. Most important, prototyping the past may concern itself primarily with the *contingent* relations between matter and meaning. It is not a metaphysical project. It is a realist one, moving from the particulars at hand, to conjecturing what may have been at hand, to prototyping an otherwise inaccessible apparatus in the present, with considerations for future design practices. Rather than fetishizing history, it pursues an objectivity it knows it cannot achieve in the first place.

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References

- Anonymous. (1867a, April 1). The fashions. *The ladies' treasury*, p. 186.
- Anonymous. (1867b, April 11). The great French exhibition. *The Times*, p. 9. London, England.
- Anonymous (1879, September 15). Trouvé's bijoux électriques lumineux. *La nature: revue des sciences et de leurs applications aux arts et à l'industrie*, Issue 528, p. 5. Paris, France.
- Anonymous (1882, December 9). Gustave Trouvé. *Scientific American Supplement*. Vol. 14, Issue 363, p. 5767. New York.
- Aytes, A. (2013). Return of the crowds: Mechanical turk and neoliberal states of exception. In T. Scholz (Ed.), *Digital labor: The internet as playground and factory* (pp. 79–97). New York: Routledge.
- Balsamo, A. (2011). *Designing culture: The technological imagination at work*. Durham NC: Duke University Press Books.
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.

- Barral, G. (1891). *Histoire d'un inventeur: exposé des découvertes et des travaux de m. Gustave Trouvé dans le domaine de l'électricité*. Paris: G. Carré.
- Blondel, C. (1997). Electrical instruments in 19th century France, between makers and users. *History and Technology*, 13(3), 157–182.
- Bolter, J. D., & Grusin, R. (1999). *Remediation: Understanding new media*. Cambridge, MA: MIT Press.
- Botero, A. (2013). *Expanding design space(s) : design in communal endeavours*. School of Arts, Design and Architecture, Aalto University.
- Bowker, G. C., & Star, S. L. (2000). *Sorting things out: Classification and its consequences*. Cambridge, MA: MIT Press.
- Buechley, L., & Perner-Wilson, H. (2012). Crafting technology: Reimagining the processes, materials, and cultures of electronics. *ACM Trans. Comput.-Hum. Interact.*, 19(3), 21:1–21:21.
- Chun, W. H. K. (2005). Did somebody say new media? In *New media, old media: A history and theory reader*. New York: Routledge.
- Chun, W. H. K. (2011). *Programmed visions: Software and memory*. Cambridge, MA: MIT Press.
- Desmond, K. (2015). *Gustave Trouvé: French electrical genius (1839-1902)*. McFarland.
- Elliott, D., MacDougall, R., & Turkel, W. J. (2012). New old things: Fabrication, physical computing, and experiment in historical practice. *Canadian Journal of Communication*, 37(1), 121-128.
- Ernst, W. (2012). *Digital memory and the archive*. (J. Parikka, Ed.). University of Minnesota Press.
- Galey, A. & Ruecker, S. (2010). How a prototype argues. *Literary and Linguistic Computing* 25(4), 405–24.
- Galloway, A. R. (2006). *Protocol: How control exists after decentralization*. Cambridge, MA: MIT Press.
- Galloway, A. R., Thacker, E., & Wark, M. (2013). Love of the middle. *Excommunication: Three Inquiries in Media and Mediation* (pp. 25–76). Chicago: University of Chicago Press.
- Gere, C., & Rudoe, J. (2010). *Jewellery in the age of Queen Victoria: A mirror to the world*. London: British Museum Press.
- Gitelman, L. (1999). *Scripts, grooves, and writing machines: Representing technology in the Edison era*. Palo Alto, CA: Stanford University Press.
- Gitelman, L. (2006). *Always already new: Media, history and the data of culture*. Cambridge, MA: MIT Press.

- Gitelman, L. (2014). *Paper knowledge: Toward a media history of documents*. Durham, NC: Duke University Press.
- Haring, K. (2006). *Ham radio's technical culture*. Cambridge, MA: MIT Press.
- Jungnickel, K., & Hjorth, L. (2014). Methodological entanglements in the field: methods, transitions and transmissions. *Visual Studies*, 29(2), 136–145.
- Kirschenbaum, M. (2008). *Mechanisms: new media and the forensic imagination*. Cambridge, MA: MIT Press.
- Kittler, F. A. (1999). *Gramophone, film, typewriter*. (G. Winthrop-Young & M. Wutz, Trans.). Palo Alto, CA: Stanford University Press.
- Kraus, K. (2009). Conjectural criticism: Computing past and future texts. *Digital Humanities Quarterly*, 3(4), n. pag.
- Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Cambridge, MA: Harvard University Press.
- Leech, J. (1853). Taste. *Punch*, (Jan-Jun.).
- Marvin, C. (1988). *When old technologies were new: Thinking about electric communication in the late nineteenth century*. New York: Oxford University Press.
- Parikka, J. (2013). *What is media archaeology?* Polity.
- Parikka, J. (2015). *A geology of media*. University of Minnesota Press.
- Ratto, M. (2011). Critical making: Conceptual and material studies in technology and social life. *The Information Society*, 27(4), 252–260.
- Rosner, D. K., & Ames, M. (2014). Designing for repair?: Infrastructures and materialities of breakdown. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing* (pp. 319–331). New York, NY: ACM.
- Ryan, S. E. (2014). *Garments of paradise: Wearable discourse in the digital age*. Cambridge: MIT Press.
- Sayers, J. (2015a). The kits for cultural history, or Fluxkits for scholarly communication. *Hyperrhiz: New Media Cultures* 13, n. pag.
- Sayers, J. (2015b). Why fabricate? *Scholarly and Research Communication*, 6(3), n. pag.
- Starosielski, N. (2015). *The undersea network*. Durham, NC: Duke University Press.
- Sterne, J. (2003). *The audible past: Cultural origins of sound reproduction*. Durham, NC: Duke University Press.
- Sterne, J. (2012). *MP3: The meaning of a format*. Durham: Duke University Press.
- Stewart, S. (1993). *On longing: Narratives of the miniature, the gigantic, the souvenir, the collection*. Durham: Duke University Press.
- Taylor, L. (2009). *Mourning dress (Routledge revivals): A costume and social history*. London: Routledge.
- Vismann, C. (2008). *Files: Law and media technology | Cornelia Vismann, Translated by Geoffrey Winthrop-Young*. (G. Winthrop-Young, Trans.). Palo Alto: Stanford University Press.

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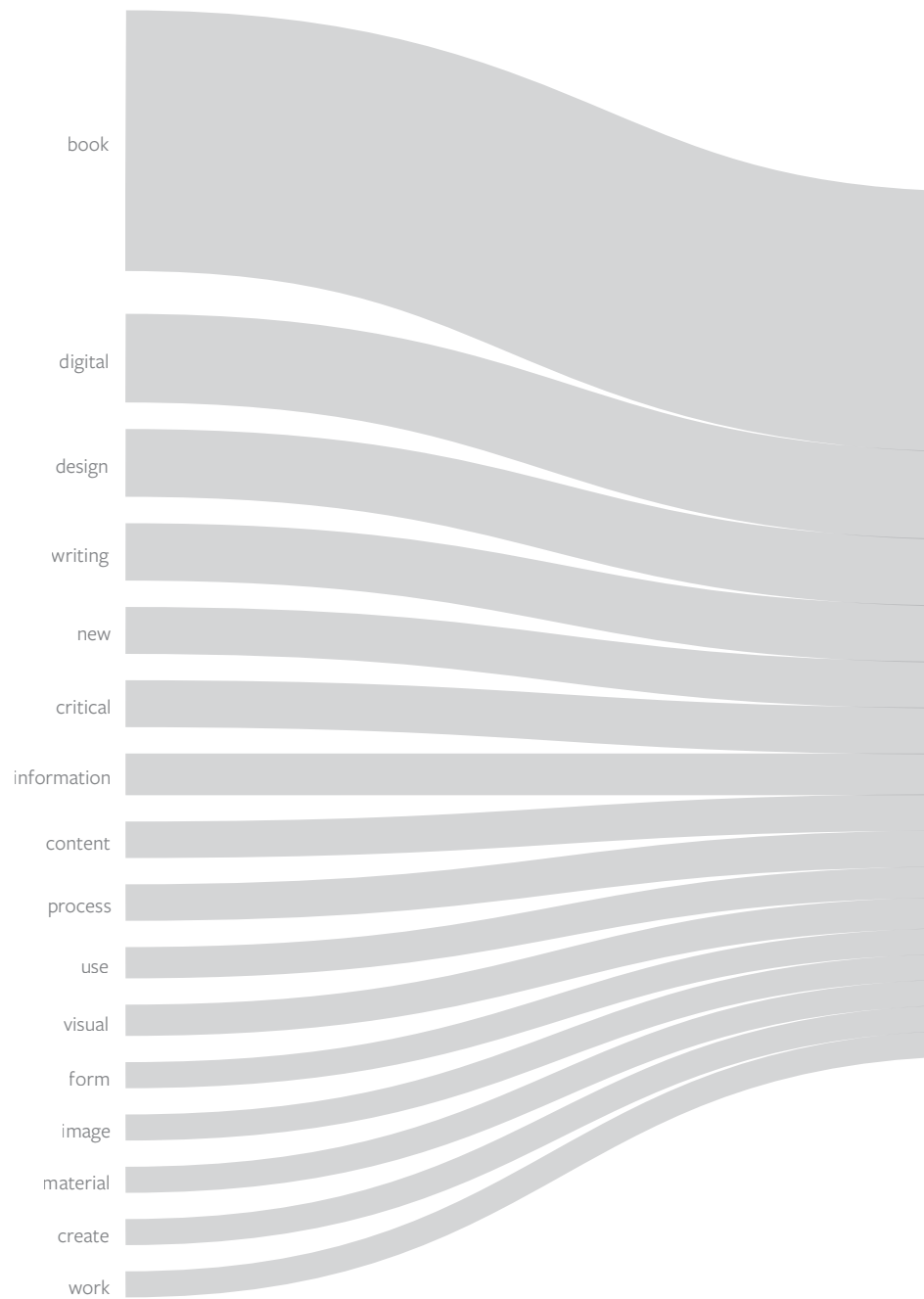
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visual book review + essay

Book Art: a Critical Remix of *The Electric Information Age Book*

Steven McCarthy

Abstract

Operating under the theoretical frameworks of ‘remediation,’ ‘recontextualization,’ and ‘critical design,’ this project, titled *Book Art The Information Electric Age*, proposes an alternative method to standard book reviews and to notions of publishing. It is a critical book review with a supporting essay that includes an in-depth description of the author’s hybrid digital-analog process. *Book Art* is a critical remix of *The Electric Information Age Book: McLuhan/Agel/Fiore and the Experimental Paperback* by Jeffrey T. Schnapp and Adam Michaels, with cameo appearances by *The Medium is the Massage*. *Book Art* uses collage to reconfigure and re-imagine these books as a commentary on mediation, information, expression, communication, and authorship.

Book Art is freely available as a PDF download at

<http://faculty.design.umn.edu/mccarthy/BookArt-aCriticalRemix-McCarthy.pdf>

Printed copies of *Book Art* may be purchased online at

<http://www.lulu.com/shop/steven-mccarthy/book-art-a-critical-remix/paperback/product-22375643.html>

Keywords: authorship, book review, collage, critical design, remix

‘Copy. Paste. Undo. Save as...’ Digitization has fundamentally changed writing and graphic design by making both activities increasingly synthetic and malleable. The iterative process that these discursive methods embrace is fractal-like, with versions repeating in seemingly infinite ways. Instead of a typically linear progression from writer to designer to publisher to reader, texts and images — inclusive of their shared literal and visual properties — can be thought of as instantiations in an ongoing, communicative performance.

Even when a work has been made manifest in the analog world (say, a printed book), it offers itself as fodder in a digital or analog remix through scanning, sampling, and a material unbundling of the original. Consider this action as opportunity for both remediation, when new technology repurposes its forebears (Bolter and Grusin, 2000), and recontextualization, whereby uncreative “patchwriting” and digital parsing establish that “context is the new content” (Goldsmith 2011, p. 3).

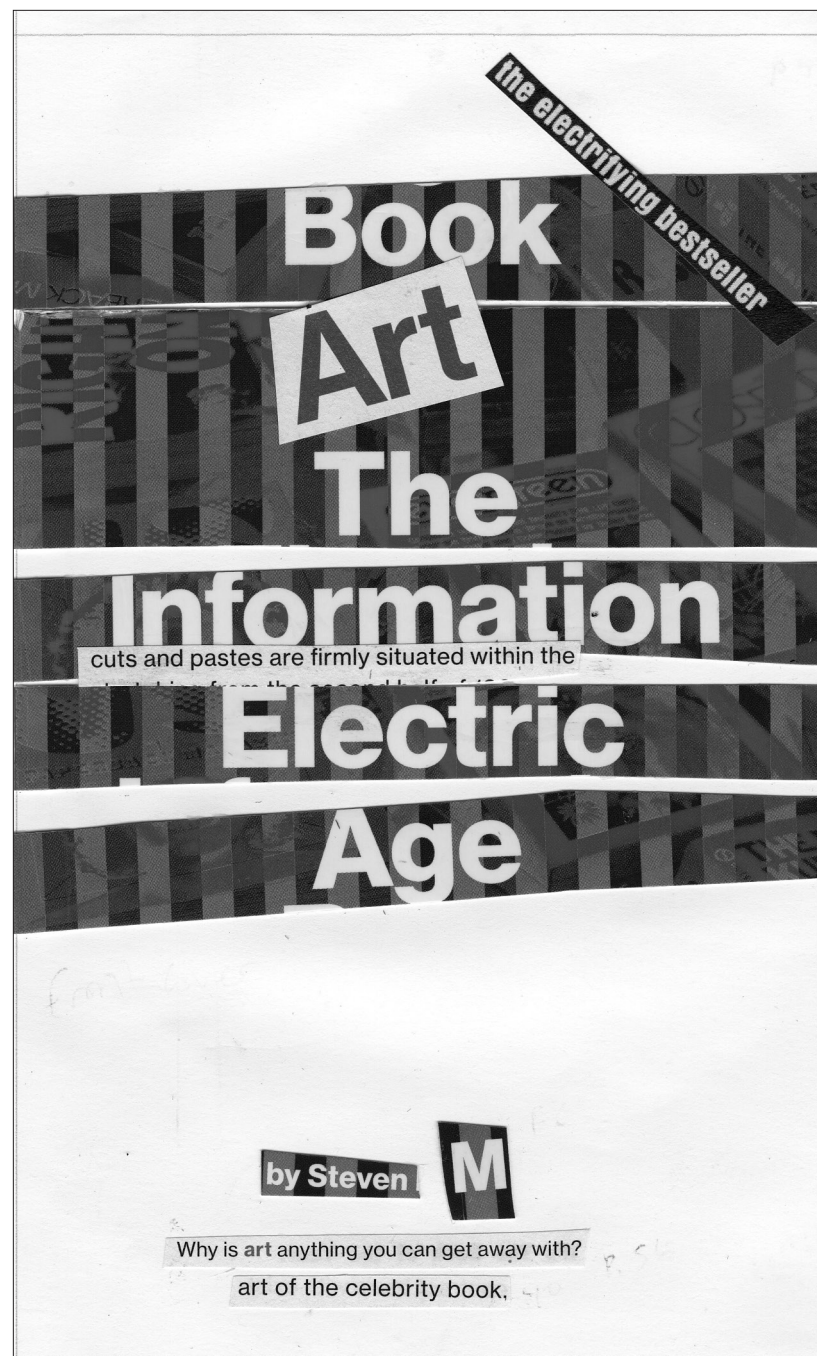
The Electric Information Age Book: McLuhan/Agel/Fiore and the Experimental Paperback by Jeffrey T. Schnapp and Adam Michaels is an example of this dual phenomenon. Their book discusses *The Medium is the Massage*, the seminal collaboration between media theorist and writer Marshall McLuhan, graphic designer Quentin Fiore, and producer and editor Jerome Agel: “co-ordinated by Jerome Agel” (McLuhan and Fiore, 1967, back cover) as well as other experimental paperback books from the 1960s and ’70s.

The Electric Information Age Book (TEIAB) does not simply show examples of *The Medium is the Massage* and other works by the trio, it channels them. A number of full-page spreads are faithfully copied at 100% scale; similar indexical and rhetorical devices are used; self-referential asides abound. It presents itself less as critic and more as progeny, and in this regard succeeds conceptually and graphically.

The spreads depicted here are from *Book Art The Information Electric Age*, a critical remix that uses collage to reconfigure and re-imagine *The Electric Information Age Book* as a commentary on mediation, information, expression, communication, and authorship. *Book Art* also includes a number of images and texts from *The Medium is the Massage*, itself repurposed visually, stylistically, and conceptually through Schnapp and Michaels’ book. The remix is an attempt to arrive at an alternative understanding of *TEIAB* and *Massage* through an unconventional, albeit relevant, process.

Collage (inclusive of photomontage and assemblage) is both an additive and subtractive process. Through juxtaposing elements from different sources or by rearranging elements within a single source, collage subverts originals — both in form and in content.

Two works served as collage-book precedents for *Book Art*; one offered literary, rhetorical, and graphical inspiration; and the other showed how analog-digital text-collage could be used as an essential part of critical writing. One book used conventional collage — cutting and pasting pieces of printed paper, while the other employed its digital parallel — scanning, sampling, and layering.



Book Art The Information Electric Age (front cover)

Graham Rawle's novel, *Woman's World*, hand-collaged from 40,000 snippets of text from 1960's British women's magazines, has a rich graphic texture while honoring the linear reading required of a coherent story (Rawle, 2005a). In *Woman's World*, Rawle's writing drove his collage decisions; he states, "In my first experiments... I allowed the found text to determine the direction of the narrative, but the writing quickly veered out of control. To tell a properly structured story, I realized I would need to put the collage method to one side and write my book in the conventional way, as a word-processed document" (Rawle, para. 2, 2005b).

The second influence, a critical examination of three books, exists in Anne Burdick's design of the MIT MediaWorks 'pamphlet' *Writing Machines* by N. Katherine Hayles (Hayles, 2002). Burdick weaves text passages clipped from the source (apparently scanned from the original printed books) into her page layouts of Hayles' text. While the texts are different materially and graphically, their overall syntax adheres to standard English. Even while it is obvious that the text was 'sampled,' it behaves in a coherent manner. Burdick "also 'bulges' passages of text for emphasis; this effect questions the page as a material surface for writing and activates the gap between writer and reader" (McCarthy, 2013, p. 55).

Book Art differs from *Woman's World* in that the writing was entirely inspired by, and based on, the texts and images found in *TEIAB* and *Massage*. Chance and juxtaposition pre-determined authorial intentionality, so no script was followed. A concept about using collage to create a critical book review was the author's guide.

Unlike *Writing Machines*, which wove the collaged elements into Hayles' scholarly text primarily for their literary properties, *Book Art's* approach is more visual and non-linear. It is part Punk, part Fluxus. Simultaneously using quantitative parsing and qualitative criticality, *Book Art* critiques through visual form and literary and pictorial content.

Some of the dominant themes in *TEIAB* – repetition, self-awareness, collaboration, humor, and experimentation – were considered when aggregating the words, pictures, and excerpts of text that would illustrate these ideas. *TEIAB* is not just an historical explanation of *Massage*, but a homage to it and, to a considerable degree, a reenactment of the book and its genre. The author's intention was to continue this trajectory as a critical commentary on publishing, literary and design criticism, and design authorship.

Book Art literally repurposes *TEIAB* and *Massage* by cutting them up and pasting them into a new work, one possible interpretation of remediation as defined by Bolter and Grusin, which can include a reverse trajectory from digital to analog, from new to old. As *Book Art* leverages unique artistic production (individual creation), mass reproduction (unlimited cheap paperback books), and reader-ordered digital publication (on-demand PDF file), perhaps it does subsume the *Massage* era while commenting on and leveraging present media. Unlike the remediation of Issuu.com, a digital publishing platform that replicates books online with tropes like page turns and gutter shadows, *Book Art* embraces a digital-analog hybridity.

Theories like Goldsmith's, the uncreative parsing enabled by digital tools and processes that mine data devoid of human aestheticism to reveal alternative patterns and meta behaviors, were influential to the creation of *Book Art*. In contrast to machine filters, however, human parsing is subjective based on one's humanity. Some collage elements were aggregated based solely on their material properties: the bold blue type within *TEIAB's* text, for example; but when gluing them down, the author kept finding opportunities for poetry or parody. Furthermore, the objectivity of authorial intervention is inherently suspect if founded on the shoulders of Schnapp and Michaels, and on those of McLuhan, Fiore and Agel, themselves subjectively authorial.

Book Art uses on-demand digital printing, both to participate in the "thin paperback books" (Heller, S. in Schnapp and Michaels, 2012, p. 13) genre that *TEIAB* and *Massage* so successfully exploit, and to leverage the benefits of digital production when appropriate. Lulu.com offers the relative best of both worlds: professional-grade production comparable to mass manufactured offset printing, and limited edition printing inherent to the world of craft book production. The per unit cost for *Book Art* is less than \$5 for a perfect bound pocketbook in four color process, printed when ordered. At 74 pages, it is thinner than *Massage* (160 pages) and much thinner than *TEIAB* (240 pages).

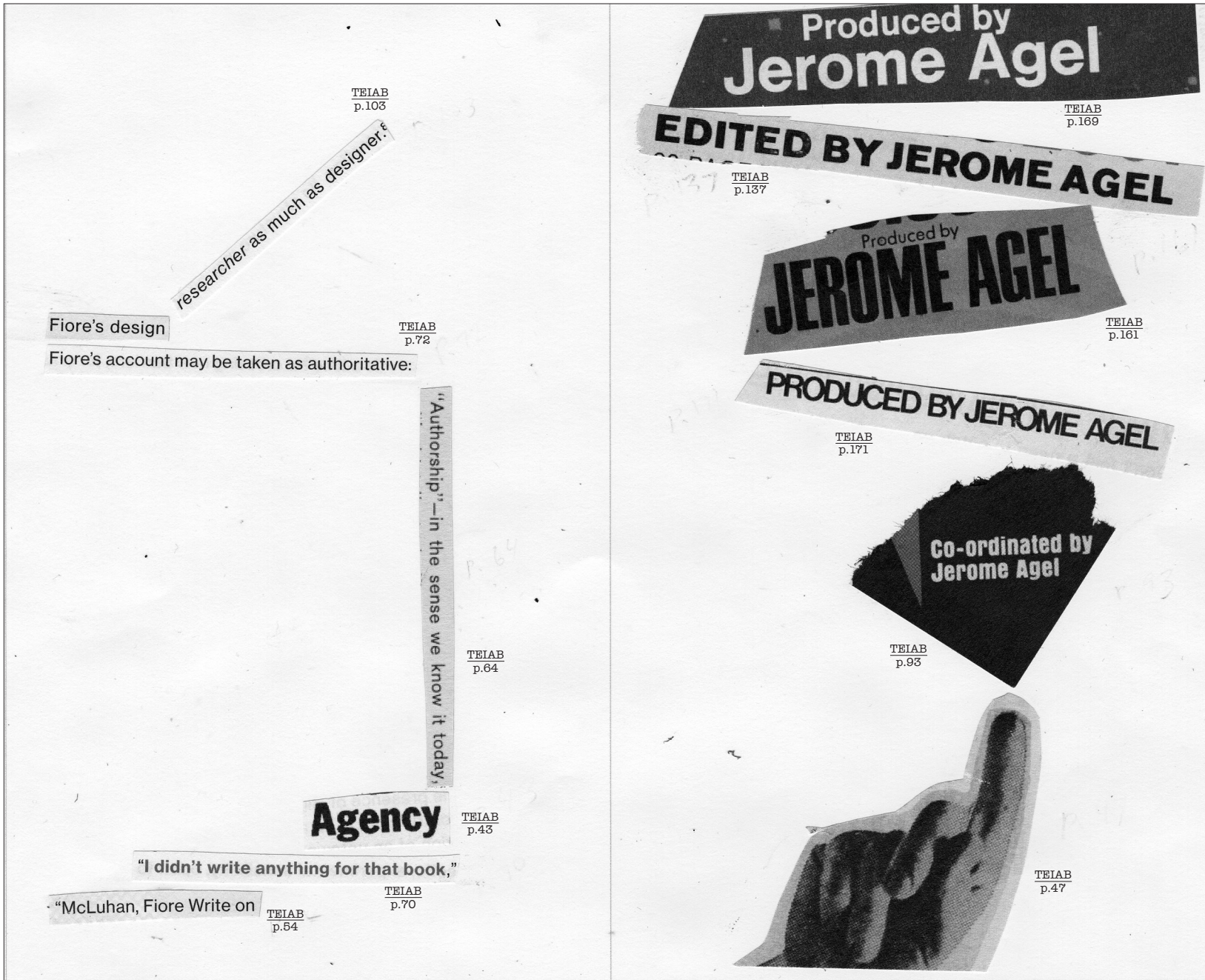
Prior to printing, a master paste-up template that mimicked the 'mechanical boards' typical of graphic arts production in the pre-digital design era was created as a canvas for the *Book Art* collages. 'Non-photo blue' guidelines (an invisible color to the era's high contrast photostat cameras) and black crop marks were rendered. This faux mechanical board's live area was 6.875 x 8.5", the same size as a Lulu pocketbook two-page spread, which matches the sizes of *TEIAB* and *Massage*. Ironically, these anachronistic templates were created in InDesign and printed on an ink jet printer.

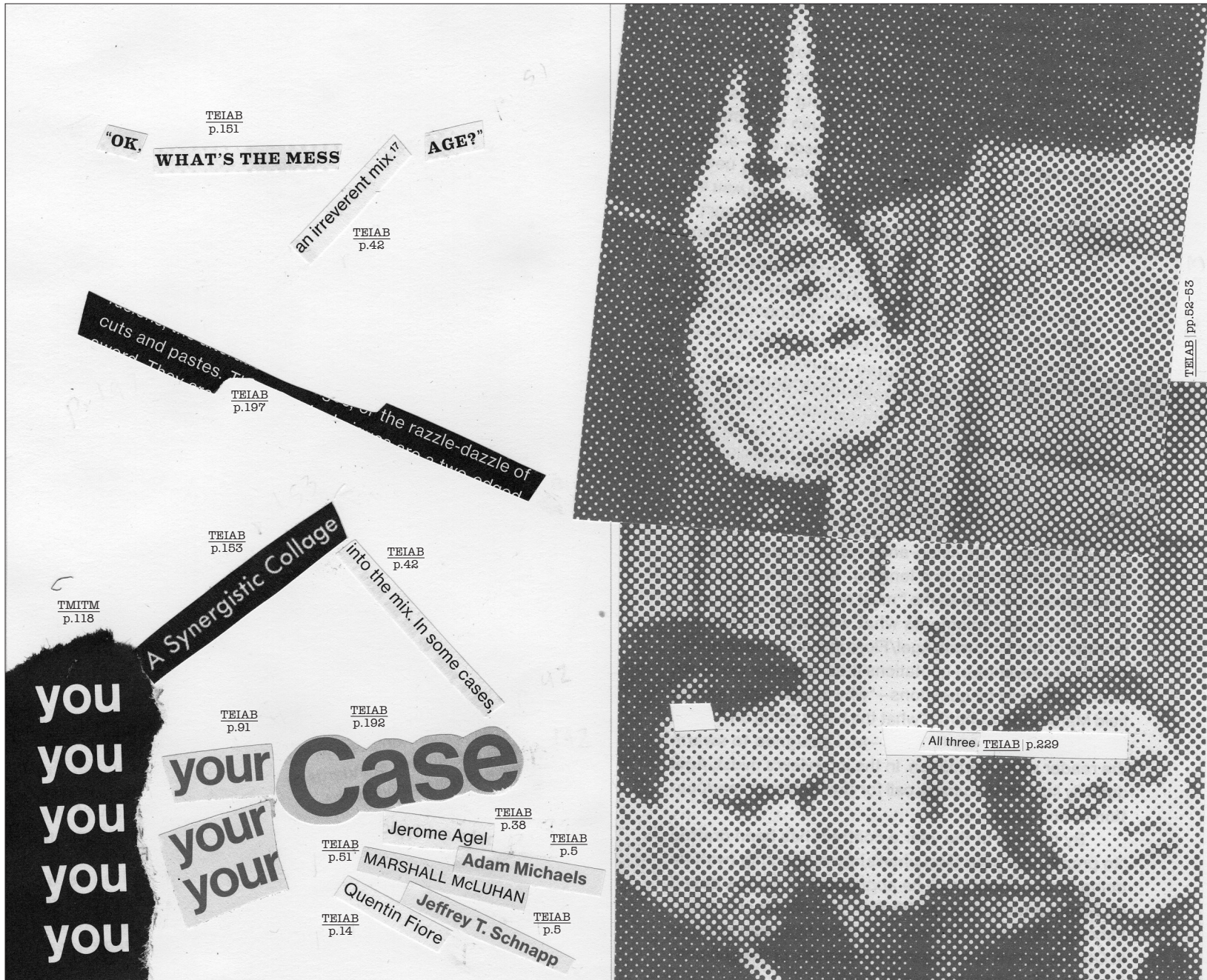
The collages were created in spreads and in multiple page sequences, as one can imagine Fiore and Michaels working, gluing things down incrementally, and adding related elements as they were found. These elements, words, lines, passages, pictures and fragments, were mostly cut out and occasionally torn.

Besides the paper templates, tools consisted of an X-Acto knife, a Uhu glue stick, a pencil, and scissors. There are 321 individually applied collage elements in *Book Art*, some two page spreads taken verbatim and others a single word on a piece of paper one-half by one-eighth inch.

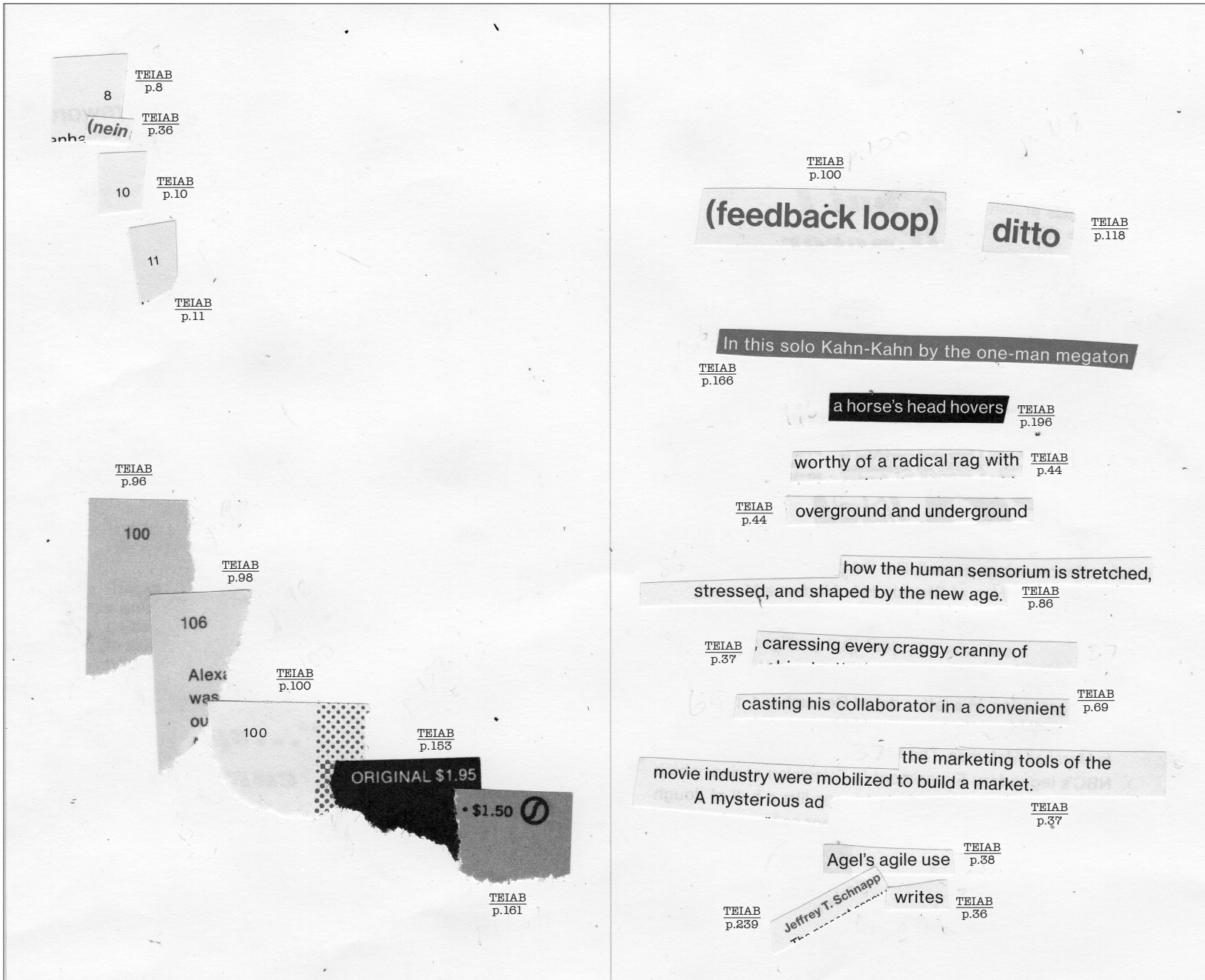
These were the self-imposed rules of production: only the words and pictures from *TEIAB* and *Massage* would be used to 'write' and 'illustrate' the book, every snippet would be cited to its source, and work would be performed at 100% scale directly from the original. No attempt was made to clean up the spreads after they were scanned: erasure marks, glue residue, creases, and the mechanical board guidelines remain as evidence of a hands-on process.

The following pages contain select spreads from Book Art. Essay continues on page 199.





Book Art *The Information Electric Age* (select spread)



Book Art *The Information Electric Age* (select spread)

176
Dear Mr. Lakein: I am three and
one-half years old. You're right.

TEIAB
p.176

TEIAB
p.143

143
Dear Mr. Kubrick:
I am three and one-half years old.
You're right!

[Name withheld on parents' request]
Champlain, New York

Dear Mr. Schnapp: I am three and
one-half years old. You're right.

TEIAB
p.130

[name withheld at the
parents' request]
Champlain, New York

TEIAB
p.152

Dear Mr. Agel: I am three and
one-half years old. You're right.

Dear Mr. Kahn: I am three and
one-half years old. You're right.

TEIAB
p.160

30

Dear Mr. Agel: I am three and
one-half years old. You're right.

[name withheld at the parents'
request]
Champlain, New York

TEIAB
p.30

recursive patterns whose syntax is continuously

TEIAB
p.129

Book Art The Information
Electric Age (select spread)



intertwined content and form

TEIAB
p.11

TMITM
pp.49-50

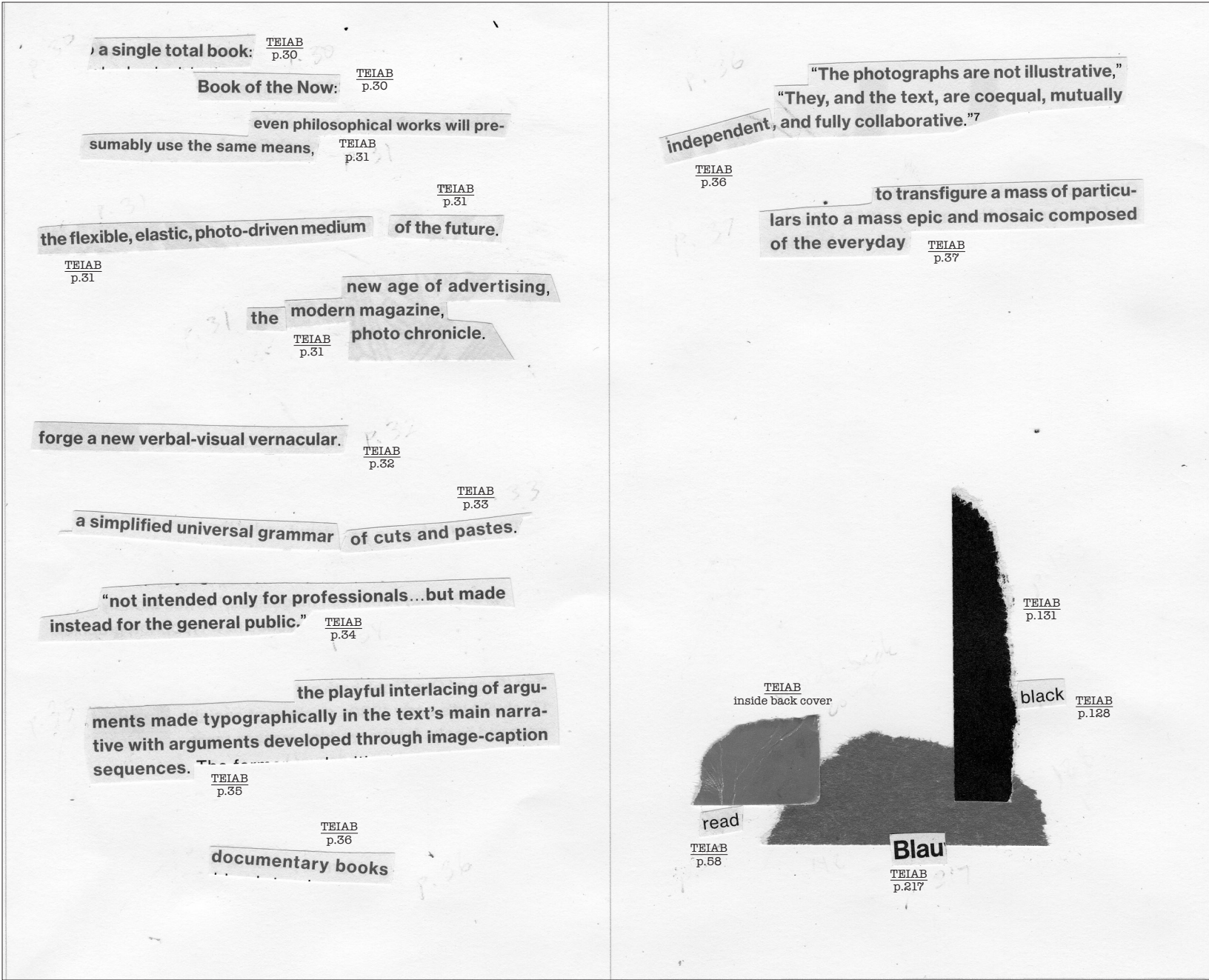
The printed egg

TEIAB
p.85

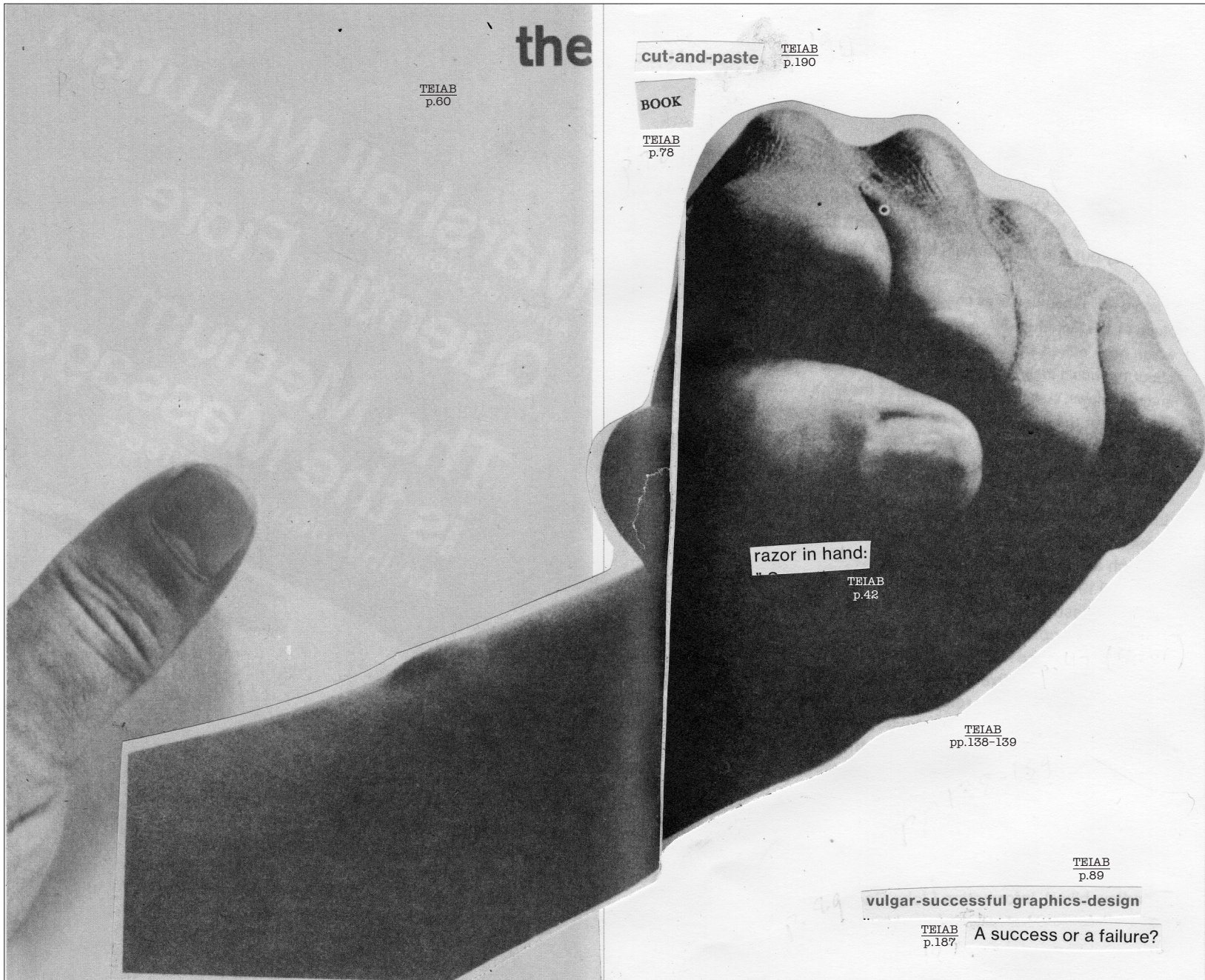
TMITM
pp.98-99

TMITM
p.9

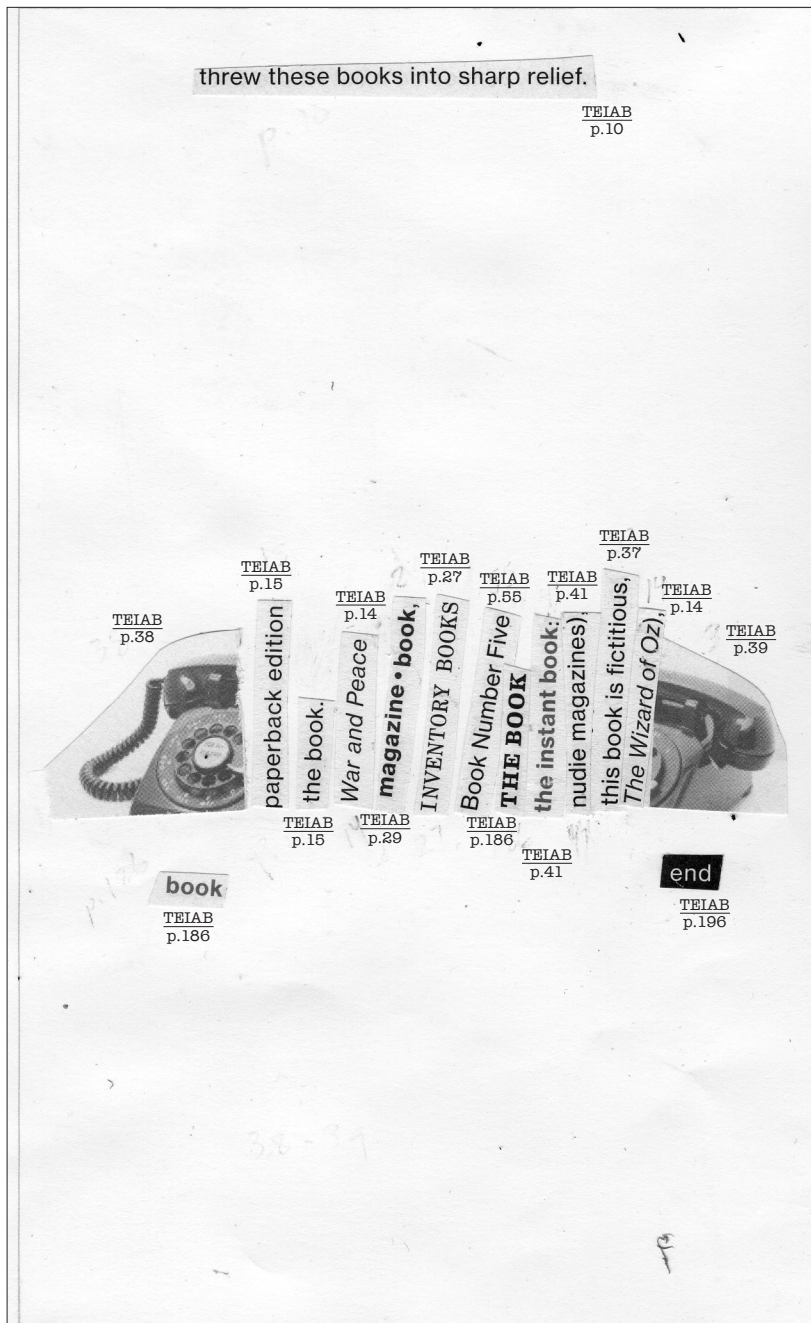
Book Art *The Information Electric Age* (select spread)



Book Art The Information
Electric Age (select spread)



Book Art *The Information Electric Age* (select spread)



Book Art The Information Electric Age (back cover)

The spirit of both *TEIAB* and *Message* would be embraced by being experimental graphically, being irreverent of canon while respectful of new theory, and by being aware of the media implications of the book. The evolution of design authorship, as manifest in both books, makes the subject and process of both paperbacks highly compelling. The blurred and inverted roles, the unconventional processes, the symbiosis of form and content, the high degree of personal agency — all combine to make *TEIAB* and *Message* memorable, and now, inextricably linked to, and through, *Book Art*.

Because both books were cut up, second copies were on hand to reference intact page numbers, to check a page's verso to ensure that something better on the opposite side was not erroneously cut, and, of course, to preserve the book for posterity in the author's personal library. In the digital realm, cutting and pasting rarely sacrifices the original — it is all additive. Working materially with knife and glue involves commitment, consumption, and loss.

It is likely that only *Message* had a solely analog life: typewritten manuscript, Xerox mock-ups, darkroom chemistry photography, photostatic reproduction, mechanical boards for paste-up, galley of photo-type, hot wax adhesion, non-photo blue guidelines, film overlays for separations, pre-press stripping, and other pre-digital methods. Although eventually an offset printed book, *TEIAB* was likely 'born digital': online searches, word processing, digital scans, page layout and image manipulation software, digital type, desktop printed proofs, emailed electronic files, and so on. *Book Art* is a hybrid: computer generated templates, hand-made collages, flatbed scanned TIFF files placed into InDesign, typeset citations, and a PDF file that was exported and uploaded to Lulu. Readers will have a choice between an electronic file and a printed book.

Unlike using digital tools to parse a text in Microsoft Word (searching, changing, etc.), all the words and phrases used in *Book Art* were found through visual and spatial perception. The collaged syntax grew organically, as words were often found that added humor or unexpected insight to the commentary. For example, the author couldn't find the word "blue" to label a swatch of *TEIAB*'s secondary color; a workable solution was found, however, in borrowing the first half of essayist Andrew Blauvelt's last name, the German word for blue. Even if there were the ability to digitally search *TEIAB*'s text, some words would remain unfound; "brain-picker" was part of an image readable to the human eye but buried in the data of a gray scale image file (Schnapp and Michaels, 2012, p. 65).

With content from the *Message* book, an additional collage technique was utilized: some pages were folded before adhering, simultaneously revealing recto and verso sides. This enabled the author to show two partial pages at once, demonstrating how Fiore would sequence words and pictures for maximum cinematic effect. The single fold created a triangular front-back shape that, besides serving as a dynamic pointing element, challenged the 'material surface for writing.'

Book Art belongs to a third generation with genetic ties to both parent and grandparent while going off in a new direction behaviorally (the paperback equivalent of a rogue grandchild). “Behaviorally” is stated to denote the serendipity and intentionality of the collaged design. A digital interpretation of behavior suggests the unintentional errors (or artistically intentional) that occur through digitally glitched artifacts, which are perhaps analogous to genetic mutations.

This approach is validated by *TEIAB* author Jeffrey Schnapp’s remarks in a *Design and Culture* journal interview. “Critically and creatively excavating the genealogy of pre-digital experiments with interactivity seems to me a rich avenue for establishing freshly textured models of interaction with books. Remediating print culture is one of the great tasks of the digital era.” (Guffey, Michaels and Schnapp, 2014, p. 101) The sentence presciently sums up the rationale for *Book Art*; even the verb “excavating” references the physical nature of ‘mining’ a text with scissors and knife.

Book Art comments on Jeffery T. Schnapp’s writing (a page dedicated to Schnapp’s penchant for alliteration, another to the recurring letter from a three-year old child, one of which is addressed to “Mr. Schnapp”), and on Adam Michael’s design (typographic hierarchy, cinematic pacing, references to books’ structural properties like margins, gutters, folios and the fore-edge). It also addresses both *TEIAB* and *Massage*’s concerns about time and space, and the way *TEIAB* channels *Massage* through strategies like copying, repeating, repurposing, and parodying.

One reproduction common to all three books, and indicative of repurposing as performance, is the spread from *Massage* showing a close up of a human eye; this image is also reproduced in the book *Design Writing Research* by Ellen Lupton and Abbott Miller (1996). As analog reproductions, the image quality suffers a bit with each copy. *Book Art*’s version adds the collaged caption, “create... *iconic* double-spreads,” (McCarthy, 2015, unpaginated [Italics in original quote]) as a commentary on the idea of becoming iconic, even memetic, through constant reproduction.

Schnapp admits that he and Michaels “...sought to ‘contaminate’ the style of our book with its objects of study, at once playfully and critically echoing, reworking and remixing features of what we call ‘inventory’ books.” He continues, “...there are layers of ironizing and even pastiche” (Guffey, Michaels and Schnapp, 2014, p. 93).

Book Art attempts to take this notion further – more contaminated, more playful, an inventory of defects, and pastiche galore! – using snippets from *TEIAB* to justify its own existence. “Might this *process*-centered understanding of the book not be a plausible, even compelling, interpretation?!” and “GrAnd son of *Massage*... As a book that proves it own point, as an example of itself” (McCarthy, 2015, unpaginated [italics in original quotes]).

Book Art participates in the mode of making referred to as ‘critical design.’ Critically designed messages and “objects may function in the traditional sense, but their main goal is to contribute to the field’s discourse as polemical actors” (McCarthy, 2013, p. 25). While some critically oriented designers, “have distanced themselves from today’s commercial design world, they sometimes use its mechanisms to pose

questions about technological, social, and ethical questions. Their ambivalent, critical position towards design and the spirited, playful form language used to express this is a constant theme...” (Z33, 2007).

Even the full title, *Book Art The Information Electric Age*, a remix of *The Electric Information Age Book* with the insertion of the word “art” (appropriated from Steven Heller’s introductory essay), asserts its tongue-in-cheek subjectivity. In this context, it signifies that a single author’s contrarian artistic expression and poetic commentary, self-published, makes a valid contribution to the humanities, digital or analog. Another reference is to the ‘book arts’ or ‘artist’s books’ genre, an art form that uses books’ visual, textual, material, temporal, and spatial qualities for expression.

Book Art is not a book review in the traditional sense, although its approach can be simultaneously interpreted as critical, complimentary, celebratory, and participatory. It seeks to contribute to the critical discourse on the objects, processes, and systems in visual and literary language.

The book *Post-Digital Print* aptly describes the efforts of *Book Art*, “It may be worth envisioning a kind of ‘print sampling’ comparable to sampling in music and video, where customized content (either anthologies or new works) can be created from past works. Such a ‘remix’ publishing strategy could create new cultural opportunities, and open up new ‘processual’ publishing practices” (Ludovico, 2013, p. 156). Even publication here in *Visible Language*, at 100% scale and with gutters aligned, can be seen as a fourth generation “processual” publication.

As a final nod to publishing and reproduction in the digital age, *Book Art* is released under a Creative Commons Attribution license. While firmly protected under the Fair Use clause of the U.S. Copyright Act as a derivative work (*and* a work of commentary), the author wishes to acknowledge the channeling of others’ content.

Book Art invites other designer-critics to remix it digitally from the PDF or collaged from the print version. Of course, the process can be applied to any book: cut up, re-arrange, re-publish. ‘Processual’ publishing practices can redefine what it means to ‘review’ a book.

The quote, “All human progress is the result of standing on the shoulders of our predecessors” (Schnapp and Michaels, 2012, p. 97), is featured over a full bleed, two-page spread photograph of what appears to be a prototype of an armored personnel carrier crushing an automobile, and is a 100% scale reproduction from pages 100–101 of McLuhan, Fiore and Agel’s *War and Peace in the Global Village*.

Book Art The Information Electric Age offers its shoulders to the global village. It is advised that any strain to its shoulders – being a very thin paperback book – should be followed by a text massage.

About the Author

Steven McCarthy (MFA Stanford University) is a professor of graphic design at the University of Minnesota, Twin Cities campus. His long-standing interest in design authorship, as scholar and practitioner, has led to publications, presentations, exhibits and grant-supported research in a dozen countries. His book on the topic, *The Designer As... Author, Producer, Activist, Entrepreneur, Curator and Collaborator: New Models for Communicating* was published in 2013 by BIS Publishers, Amsterdam. McCarthy is currently serving a three year term on the board of the Minnesota Center for Book Arts. <http://faculty.design.umn.edu/mccarthy/index.html>

References

- Bolter, J. D. and Grusin, R. (2000). *Remediation: Understanding new media*. MIT Press: Cambridge, MA.
- Guffey, E., Michaels, A. and Schnapp, J. (2014). *Dialog: Reinventing the paperback book in the digital age*. *Design and Culture*, 6 (1), 85–109. Bloomsbury: London.
- Goldsmith, K. (2011). *Uncreative writing: Managing language in the digital age*. Columbia University Press: New York, NY.
- Hayles, N. K. (2002). *Writing machines*. MIT Press Media Works Pamphlet Series. Lunenfeld, P. Ed. MIT Press: Cambridge, MA.
- Ludovico, A. (2013). *Post-Digital print: The mutation of publishing since 1894*. Onomatopée 77: Eindhoven, The Netherlands.
- Lupton, E. and Miller, A. (1996). *Design writing research: Writing on graphic design*. Phaidon Press: London.
- McCarthy, S. (2015). *Book art the information electric age*. Self-published.
- McCarthy, S. (2013). *The designer as... author, producer, activist, entrepreneur, curator and collaborator: New models for communicating*. BIS Publishers: Amsterdam.
- McLuhan, M. and Fiore, Q. (1967). *The medium is the message*. Bantam Books: New York.
- Rawle, G. (2005a). *Woman's world*. Atlantic Books: London.
- Rawle, G. (2005b). *Woman's world* editorial. <http://www.grahamrawle.com/woman-world/> (online 7 September 2015)
- Schnapp, J. and Michaels, A. (2012). *The electric information age book: McLuhan/Agel/Fiore and the experimental paperback*. Princeton Architectural Press: New York.
- Z33 Gallery (2007). Nr. 15 Designing critical design. <http://www.z33.be/en/projects/nr-15-designing-critical-design> (online 22 July 2015)