critical
making
DESIGN and
the DIGITAL
HUMANITIES

Jessica Barness
Amy Papaelias
guest editors

December 2015

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design

critical

interface

new

digital

humanities

technologies

making

interpretation

form

tools

future

development

use

project

writing

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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 interpetation.

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 <u>potential</u> 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 <u>theoretical and design speculation</u>** — 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 **<u>dialogical hypotheticals</u>** — 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 <u>futuring</u> 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 **<u>generatively</u> 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 humanites: 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

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.

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

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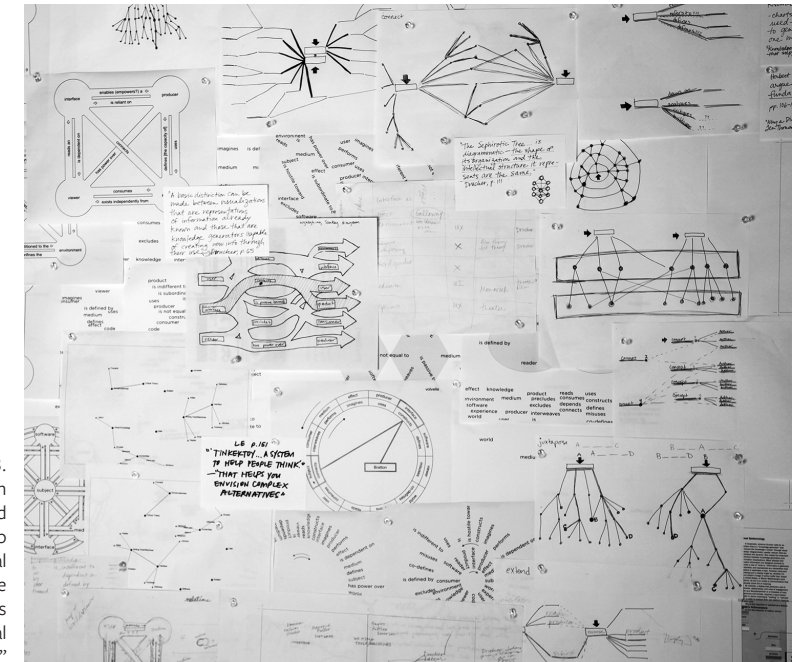
What became clear in our process was that in order to evaluate the generative aspect of any diagram we composed, we had to imagine a reader in the act of reading. This led us to move away from the design of formal configurations toward

Figure 4.
A spatial writing
exercise created by
Margo Dunlap and
Anne Burdick to think
through ideas
about interface.
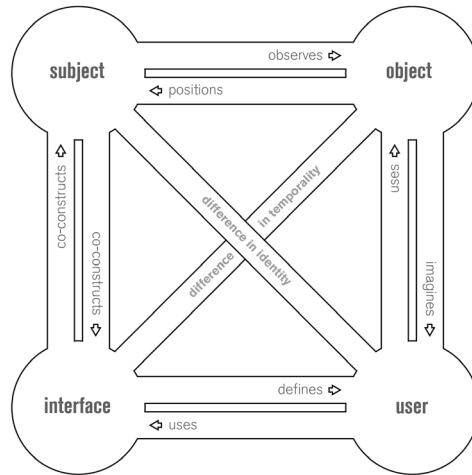
the design of "ways of reading" or the design of "meaning-producing spaces." For our test content, we used our own literature review around theories of users, subjects, products, and interfaces — concepts that are defined by their relationality. Having an idea or argument to construct allowed us to move 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 autopoeitic, 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.
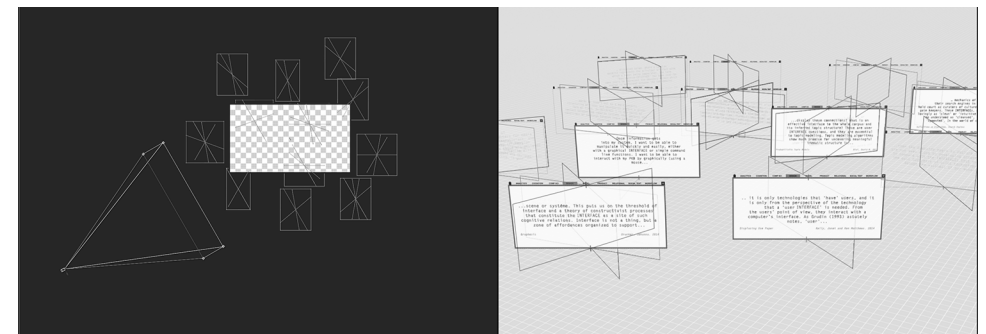

Figure 5.
A work-in-progress
view showing plan and
elevation as Xiangjun
(Shixie) Shi Trofimov
creates a 3-D digital
environment as
a form of critical
making to investigate
Jerome McGann's
concept of "texts
in n-dimensions."

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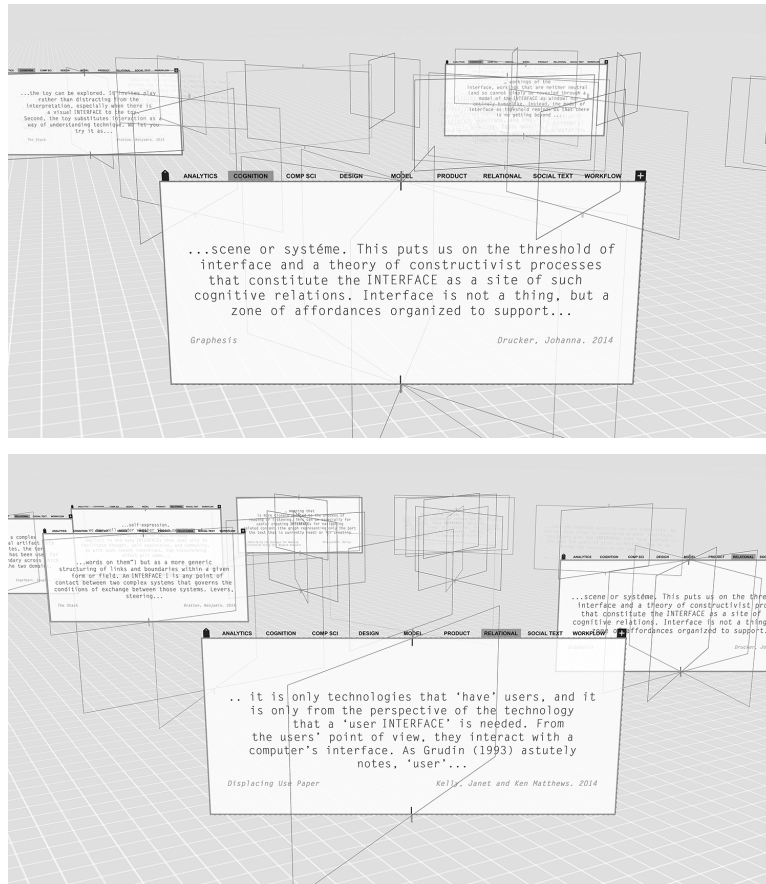
same direction. When a subject-observer is added to the 3-D world, he can move to positions that allow him to see the faces of all texts that share the same tag. So, for instance, if he moves to the "relational" tag position, he will see the faces of all texts tagged "relational." As the subject-observer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

Acknowledgements

About the Author

Anne Burdick is Professor and Chair of Media Design Practices at ArtCenter College of Design. Her long-standing research into writing+design includes interdisciplinary collaborations with texts and authors across media, including: her own design-driven inquiry into knowledge production futures through *micromegameta.net*; designer and co-author (with Johanna Drucker, et al.) of *Digital_Humanities* (MIT Press, 2012); designer and design editor of *electronicbookreview.com* (1995-2012); Leipzig Award-winning designer for the *Fackel Wörterbuch: Redensarten* (Austrian Academy of Sciences, 2000). Since the mid-1990s, she has presented papers and projects on design and the digital humanities at SIGGRAPH, HASTAC, and MIT's Media in Transition, among others.

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