Collaborative Approaches to the Digital in English Studies

CHAPTER	9
TITLE	Interdisciplinary Knowledge Work: Digital Textual Analysis Tools and Their Collaborative Affordances; Response: "So What?" New Tools and New Humanities Paradigms
AUTHORS	Monica Bulger Jessica Murphy Jeff Scheible Elizabeth Lagresa Alan Liu
OVERVIEW	This chapter argues that interdisciplinary collaborative seminars/workshops are important to graduate study because they encourage students to think outside of their own disciplines while also thinking deeply about them. Drawing on their experience as graduate students from different backgrounds— comparative literature, education, English, and film and media studies —who came together as a team during an experimental workshop and used digital tools to engage in textual analysis, the authors discuss how the collaborative work helped them acquire useful technical knowledge, master a level of literacy with each team member's disciplinary approaches, and uncover elements of the texts that would have otherwise gone unnoticed. The chapter will end with a response from Dr. Alan Liu, UC Santa Barbara professor and author of *The Laws of Cool: Knowledge Work and the Culture of Information*.
TAGS	analysis, close reading, collaboration, collaborative, digital, education, graduate, group, humanities, interdisciplinary, interpretation, knowledge, knowledge work, literary, play, process, research, student, team, text, texts, textual analysis, tools
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Interdisciplinary Knowledge Work: Digital Textual Analysis Tools and Their Collaboration Affordances

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In *Laws of Cool: Knowledge Work and the Culture of Information*, Alan Liu (2004) asks, "What is the relation between the now predominantly academic and other knowledge workers . . . who manage literary value in 'cultural context' and the broader realm of professional, managerial, and technical knowledge workers who manage information value in 'systems'?" Liu suggests that it is increasingly important for those of us in the humanities and arts to understand, engage with, and influence the modes of knowledge work that take place in information and corporate economies, and to think critically about the technologies we use to perform these types of knowledge work. While it is individuals rather than teams who traditionally perform knowledge work in the humanities, Liu challenges us to think differently. Adopting a traditionally corporate or scientific model of knowledge work means engaging in "teamwork," drawing upon the collective expertise of people with different backgrounds who share common interests. One approach to the project Liu calls for is to bring people together into such a "team," provide them with access to digital technologies, and have them use these tools to create visual representations of their analyses (referred to here as *visualizations*). This chapter discusses our experience of this approach in Alan Liu's "[Literature+: Cross-Disciplinary Models of Literary Interpretation](#)" course offered during the 2008 winter quarter at the University of California, Santa Barbara. We reflect on our experiences as both students and researchers, moving beyond local context to offer recommendations for interdisciplinary collaboration as a teaching tool and research practice of relevance to English studies and humanities scholar-teachers.

In the experimental graduate seminar/workshop, Liu (2008b) asked students to [form groups](#) around topics of their choosing and to perform analyses using digital tools on their materials. These groups could be "tight," centered on a specific text and methodology, or they could be "loose," sharing only a methodology or only a text. Our particular group was a "loose" team of graduate students from comparative literature, education, English, and film and media studies who used a set of digital textual analysis tools on a variety of texts. Our positive experience with this type of collaboration suggests to other researchers that a team can form

successfully and productively around a mutual interest, no matter how seemingly disparate its members' disciplinary backgrounds or research goals might be.

Interdisciplinary collaborative seminars/workshops are important to graduate study because they encourage students to think outside of their own disciplines while also thinking deeply about them. Thus, students and professors mutually benefit. Liu describes these courses as invaluable opportunities for student researchers and their professors to "scout new knowledges" (A. Liu, personal communication, March 2, 2009). In this chapter, we will share strategies for and benefits of interdisciplinary collaboration in a digital humanities context and describe our "new knowledges." In particular, our experiences working on a team with four people from four different disciplines forced each of us to attend more precisely to modes and methodologies of producing information and interpretations. The collaborative experience also challenged our fundamental assumptions about the technologies we use to analyze our texts and generate knowledge about them. This creative teamwork helped us acquire useful technical knowledge and generate the visualizations and interpretations of our texts that we discuss below. The visualizations in many cases also uncovered elements of our texts that would otherwise have gone unnoticed.

DIGITAL TOOLS FOR CLOSE READING

Textual analysis tools most suited the methodological overlap between our group members' disciplines because the materials we brought to the team for analysis—student texts, ballads, translations, and a theoretical piece—each required some kind of close reading. The process of close reading is, of course, a fundamental element of traditional textual interpretation, by which texts are carefully examined for connections or disconnections in content, form, language, or context. Textual analysis is a crucial element of close reading, and it seeks to identify patterns within a text, such as concordance or unity (Rockwell, 2005), meaning (Samuels & McGann, 1999), truth (Brooks, 1947), or rhetorical strategy (Bazerman & Prior, 2004). The digital textual analysis we undertook was influenced by Lisa Samuels and Jerome McGann's (1999) notion of "deformative criticism," a method of looking at texts that goes against the norms of traditional interpretive ways of reading to accommodate what one might understand as a more poetic engagement with a text, foregrounding formal patterns and rhythms of language, placing less emphasis on decoding buried meanings. *Deformance* involves not only reading the text against itself but also doing things to it. Samuels and McGann (1999) see methods of deformance, such as reordering,

isolating, altering, and adding as a means to access the text's "systemic intelligibility."

Deformative criticism need not be digital, but using digital tools to perform it on texts allows for faster computations and a higher degree of textual manipulation. For instance, a digital tool could isolate all of the verbs in Richardson's *Clarissa*, a notoriously long eighteenth-century novel, in seconds, as compared with the traditional practice of searching the novel page-by-page to find the verbs one at a time. Or, as another example, one could use a digital tool to analyze a large group of student papers in an attempt to find all of the times each of the students quoted from a particular source. But digital methods of analysis offer much more than mere volume; they serve a creative function too. As Geoffrey Rockwell (2005), the project leader for the [Text Analysis Portal for Research (TAPoR)](#), which is a collection of text analysis tools, claims: "The computer does not replace human interpretation, it enhances it." One of the main ways digital tools enhance interpretation is by shifting the focus from the arduous technical aspects of analysis (e.g., finding and counting the occurrences of a word) to the intellectual goals of the process. Willard McCarty (2005) articulates this notion as "making new knowledge by manipulating hypothetical constructs."

While blending Samuel and McGann's (1999) notions of deformance and McCarty's (2005) textual manipulation, our group also adapted Franco Moretti's (2005) practice of using digital tools to zoom out and view the broad structures and forms of texts. Zooming out allowed us to discover new connections and patterns not immediately visible in their traditional structures. We thus blended traditional methods of literary interpretation with digital textual visualizations to better understand the connections that underlay our chosen texts. By manipulating these hypothetical constructs, we found new and interesting ways to examine the texts with which we were working.

OUR PROCESS

Crucial to our collaboration and that of all of the groups in the Literature+ course was the wiki that Liu maintained as our project site ([Liu, 2008b](#)). The links to free textual analysis and visualization tools provided in the "toy chest," a section of the course wiki, ranged from literary characters in [Second Life](#) to digital concordances to tag clouds, with an ever-expanding list of possibilities. The "toy chest" was important to our group not only because it helped us find digital analysis tools; it also encouraged us to see ourselves as engaging in a kind of
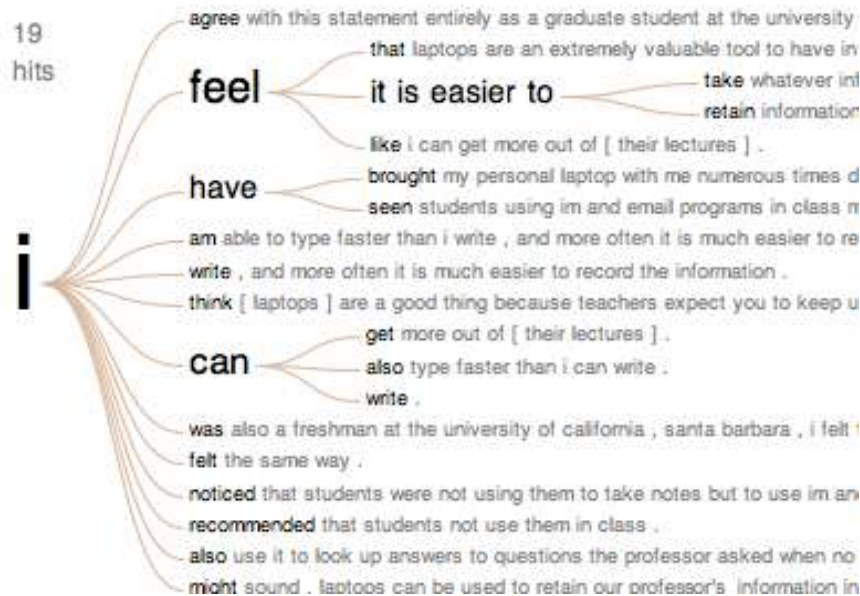
"play" and provided us with the opportunity to create our own learning experiences.

Groups formed during our second course meeting when Liu asked the twenty or so students to describe a project they wished to pursue. As people described their interests, the groupings became obvious: one group wanted to study gaming, another comic strips, another a literary text (*Alice in Wonderland*) and its representations across media. Each of the members of our group, however, expressed a curiosity about textual analysis tools. We each had individual projects that did not share obvious connections to other projects, but we did share an interest in finding new ways to read our texts closely. Our group was multi-level as well as multidisciplinary, as we were each at different stages of our graduate careers. Elizabeth was a first-year graduate student from the Comparative Literature program and was interested in comparing and deforming translated versions of literary texts. Jeff was a third-year student in the Film and Media Studies department and wished to analyze the use of parenthetical phrases in theoretical texts. Jessica was in her last year in the English department and wanted to analyze feminine language use in ballads. And Monica was graduating from the Department of Education and wished to study the use of source materials in student texts. Each of us had played a bit with the tools, but no one could figure out a thematic or methodological connection beyond our interest in textual analysis.

Experimentation with the text analysis tools in the toy chest helped us find our common interest. For example, Elizabeth, after ruling out the word cloud (used to visualize a ranking of the frequency of words within a text) and diagramming features of TAPoR, found that [Babylon](#), an online translation tool, processed her texts in a way that better complemented her research goal of deforming translated versions. Jessica also experimented with word clouds, but did not feel they offered an acceptable level of precision. It was the word trees (used to visualize individual word, phrase, or punctuation concordance within one line of text to reveal recurrent usage patterns) generated through [Many Eyes](#) that provided the networks of words needed for her analysis.

We quickly moved from experimenting with the tools on our own texts to experimenting with one another's. Each of us selected a tool and then ran other members' materials through it. For instance, Elizabeth found that Babylon most accurately translated Monica's student texts and was least accurate when translating Jessica's ballads. This discovery informed her assessment of Babylon as an appropriate tool for analysis. Likewise, Jessica created digital

concordances of each group member's text. As shown in Figure 1, Jessica used Many Eyes to diagram the use of "I" in two of Monica's student essays. While not a direct focus of her research, Monica reported that seeing the words that directly followed "I" in graduate student texts was useful, especially when compared with the used of "I" in undergraduate texts. In these examples, the exposure to the wide range of texts that formed our interdisciplinary team subsequently informed the discovery and assessment of our chosen tools' capabilities and limitations.

Figure 1. Many Eyes diagram of "I" in graduate student text.

By the middle of the quarter, we started to refine our research questions and report preliminary observations. At this point, we engaged in much questioning and clarification. We explained jargon from our fields, which seemed easy enough. The challenge, though, lay in our group's "so what?" questions. Why, for example, would Derrida's use of parenthetical phrases matter? Or, why would paraphrasing versus direct citation in student texts matter? So what? The questions that we asked one another as we searched for connections among our work forced us to reconsider our disciplinary assumptions and explain our research pursuits.

It was in the second half of the class—the workshop portion—that the links among our projects started to become clearer (Liu, 2008a). As we worked together and individually on our texts, we discovered shared methodologies; in particular, we learned that we enjoyed using tools against their intended purpose. When faced with a selection of tools that did not quite fit our research aims, each of us figured out ways to repurpose those tools. Thus, Monica used Pairwise

(2005), by design a punitive tool for plagiarism detection, to study students' composition practices. In particular, she used the tool to compare online source texts with student texts to find instances of paraphrasing and citations in students' essays (Bulger, Murphy, & Lagresa, 2009). Likewise, Jeff used the font color feature in Microsoft Word to isolate Derrida's use of parentheses; he used a word processor to deconstruct the text of a deconstructionist. At the end of the course, as we prepared to present our findings to the larger workshop group, we were surprised by how deeply related our research had become.

OUR STRATEGY FOR PRODUCTIVE COLLABORATION

Facing the possibility of disciplinary discord and the challenge of using new digital tools, we managed to engage in a productive collaboration because of the four principles that were the foundation of our collaboration:
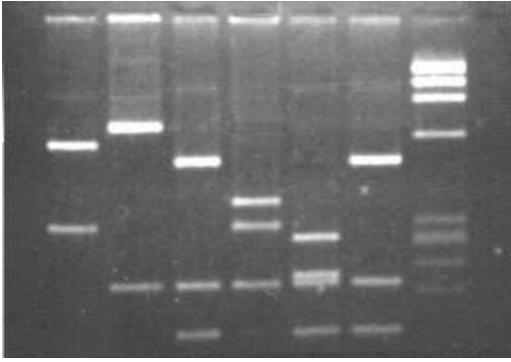
1. Respect for one another's work
2. Commitment to process
3. Sense of play
4. Flexible expectations

Despite disciplinary differences, we demonstrated a fundamental *respect for one another's work*. That respect was evident in our patience and willingness to pursue collaboration even when we did not fully understand one another's research goals. Thus, while tempting and possibly easier to pick a thematically unified project, such as an analysis of gendered language in the broadside ballads, we continued to pursue our individual analyses in a collaborative fashion. We engaged with texts outside our discipline, each applying the tools we found to our team members' texts. Once we ran the texts through our respective digital tools, we discussed their benefits and drawbacks. We trusted one another's expertise and considered applications of our team members' methodologies and theoretical approaches to our own work.

The outcome of a given research project is often prioritized over the process, but in our group (and in keeping with the embedded knowledge-work philosophy of the class more generally) there was a *commitment to process*. In framing our class assignment, Liu gave equal weight to both process and outcomes, as evidenced by the workshop portion of the course. He scheduled in-class workshop sessions—during which each group met to work on their respective projects—to give us time to experiment with our process. This time was important because, as graduate students engaging in interdisciplinary work, each of us was

already pulled in several directions, and the scheduled class time allowed us to complete our analyses collaboratively. In a sense, we borrowed our collaborative approach from the sciences by experimenting with processes that may or may not yield an end result. Throughout our collaboration, we often expressed confusion about where we were going, but we remained committed to the process of discovery. To work together, we had to develop a degree of understanding of one another's work. Part of our process, therefore, was to become literate in one another's disciplinary concerns, assumptions, and methodologies. This is not to say that we became experts; instead, we developed a shared literacy with which we could communicate effectively. That shared literacy resulted in continued challenges to our disciplinary assumptions, which contributed to the strength of our process.

As stated earlier, naming the resource page of our course wiki a "toy chest" established a *sense of play*; that is, Liu encouraged us to "play" with the tools. Elizabeth most strongly demonstrated this spirit in her tinkering with translation software. She translated our texts into Spanish and then back into English to see which themes remained, were lost, or even transformed. Jessica's text was in irregular early modern English spelling, and the translation software did not recognize many of the words or it translated them incorrectly in comical ways. For example, the opening of the poem in English, "Shall I wrestling in dispaire, / Dye because a womans faire, / Shall my cheeks looke pale with care / Cause anothers rosie are" becomes "Shall I struggling in dispaire, Tint because a woman faire, cheeks looke my pale with care" ([A new Song of a Young mans opinion](), undated). While Jessica's tendency might have been to preserve the text as it appeared on the page, Elizabeth suggested entering the text in modernized spelling. Jessica reported that this new and more playful way of working with the text was much richer than it might have been without its modernization. The re-purposing of the tools we mention above also grew from this sense of play. When Jeff first showed us his Microsoft Word document that had all of Derrida's text in white, with the exception of parentheses in black, Jessica laughed and said "those look like electrophoresis slides" because of the scattered appearance of the lines (see the image of gel electrophoresis in Figure 2). In his final analysis, Jeff described the look of his pages as "DNA electrophoresis" as a nod to Jessica's initial observations (see [Figure 5]()).

Figure 2. Gel electrophoresis (visualization play).

As this example shows, we were more willing to take risks with texts that were unfamiliar and new to us. In fact, that unfamiliarity was a significant catalyst for textual analysis—the texts became strange and new, which allowed for a richer reading.

We entered our collaboration with *flexible expectations* of our end product. We each had research questions we wished to pursue and an interest in digital textual analysis, but beyond these similarities, nearly every aspect of our collaboration was open to change. That flexibility was crucial to interdisciplinary collaboration because it left us open to learn. It was challenging to maintain a flexible vision, though. At times, we were concerned that nothing would result from our collaboration. Ultimately, however, our sense of the knowledge work we were engaging in together kept us resolutely adaptable. These four principles (respect for one another's work, commitment to process, sense of play, and flexible expectations) were important to the success of our collaboration, and their constant renewal in each of our meetings kept them at the forefront of our minds.

OUR METHOD FOR ANALYSIS

Despite our initially "loose association," we collaboratively developed a seven-step method for analyzing our texts. The method shifts from macro to micro to macro analysis, zooming in and out as with a camera lens. We began by selecting a work, then moved to small units of text and steadily worked toward identification of patterns and overarching thematic elements. The early steps of the process allow for collaborative analysis before ascending into discipline-specific complexity. The seven steps are as follows:

1. Develop research question.
2. Select texts.

3. Break texts into micro-elements (e.g., at the level of individual word or punctuation mark).
4. Select tool for analysis.
5. Use functionality provided by digital textual analysis tool to filter, isolate, count, categorize, aggregate, and so forth.
6. Render the results visually.
7. Use visual representation as basis for higher-level interpretive analysis.

Many of these steps occur in non-digital textual analysis; however, given the functionality afforded by digital tools, we performed much of the analysis collaboratively that is usually completed by a single individual. Digital tools allowed us to see texts through our team members' lenses and contribute to the analysis by preparing texts and performing initial analyses for one another. To illustrate our seven steps, and how we advanced our individual projects while collaborating in an experimental research team, we will draw on a case study: Jeff's "Digitally 'Whiting Out' Derrida with Microsoft Word."

Step 1: Develop research question. Prior to entering our collaboration, we independently pursued research in our chosen fields. Within our collaboration, we preserved our diverse research directions. Our research questions were developed individually, and while we were flexible about our expectations of the end product, we each remained committed to our fundamental research goals. Jeff was interested in focusing on parentheses in Derrida's essay "Signature Event Context" (first presented in 1971). He began with an informed intuition that they have both quantitative and qualitative significance: there are a number of parenthetical phrases, and honing in on them promised to resonate with and perhaps even shed light upon Derrida's interests in the essay and in his philosophy of writing more generally. In the essay, Derrida discusses qualities of communication and writing that move beyond meaning, and he is interested in terms such as *mark*, *displacement*, *saturation*, and so forth, which characterize inscriptive functions the parenthetical phrase in particular foregrounds. Given that Jeff wanted to take the parenthesis as a sort of unit of analysis, or unit of deformance, to approach Derrida's essay, he then wanted to figure out the best way to work, and get creative in a meaningful way, with the essay's parentheses.

Step 2: Select texts. Selecting texts for close reading actually occurred as part of Step 1. This step, however, refers to the selection of texts appropriate to digital textual analysis. Some of us had to create digital versions of our texts, while others had to prepare texts for analysis. In Jeff's case, for example, he wanted to have multiple versions to work with to control for variations in translation styles

and reading experiences. He worked with the original French version of "Signature Event Context" and two different English translations, one of which was found online. He scanned the other two through optical character recognition software to generate digital files, which he was then able to convert into Microsoft Word documents.

Step 3: Break texts into micro-elements. In this step, we determined the scope of our analyses by focusing on specific textual elements. For example, Jessica focused on the use of *I* and *you*, while Jeff examined patterns of parenthetical phrases. Our commitment to a focus on these micro-elements informed our tool decisions.

Step 4: Select tool for analysis. We used *functionality, accessibility*, and *applicability* as our guidelines for selecting tools. We tested the *functionality*, or capabilities, of each tool. For example, when building tag clouds, we evaluated the extent to which we could control the analysis and appearance setting, whether we were able to save the resulting image to our personal computer, and if we could consistently recreate the visualization/analysis. We also considered *accessibility*; for example, Jeff's choice to use Microsoft Word, a widely available program, meant that each team member could experiment with isolating text elements using font color. We also evaluated *applicability*, or relevance to our research questions. Just as children would behave around a true toy chest, we discovered many fun and potentially distracting tools. While exciting and interesting, many were not relevant to our work. Within the framework of play, we tested tools for one another, considering how various functionalities applied to team members' research goals.

Jeff was not exactly sure what the "work" of isolating parentheses and parenthetical phrases in Derrida's essay would entail, but importantly he wanted that process to emerge relatively organically out of a balanced consideration of the other tools and texts his project collaborators were working with and of the relationship between the user and the technology. There are many applications that allow users to do interesting things with words in texts, such as tag cloud generators, but there are considerably fewer that accommodate analogous procedures with punctuation marks. However, [Many Eyes](#) does allow users to search text by punctuation marks, thereby making visible patterns of languages that surround a given mark. When experimenting with Many Eyes for the team, Jessica ran Derrida's essay through it, and while it was provocative to see the frequency with which various words surrounded parentheses in the essay, in terms of Jeff's interests in the essay, he was ultimately unsatisfied with the

information it generated and with the aesthetics of the output (which is to say that it did not capture the artfulness of Derrida's writing style). Our group had many such moments—visualizations that did not lead anywhere, findings that were underwhelming. As with teamwork one might see in the sciences, though, it is important to remember that failures can be as significant as, and sometimes even more important than, successes.

Being surrounded by a group of people experimenting with a wide range of digital tools helped us question just what a tool is in the first place. It occurred to us that scholars do not necessarily need to turn to new, specialized software and technologies to play with text. A textual analyst can take texts apart with the same word processing applications he or she uses to write them. Thus, Jeff considered Microsoft Word a tool for Joseph A. Schumpeter's (1942) "creative destruction" (as cited by Liu, 2002) by which we, "from within," use the technologies and commodities of (post-)capitalist societies to defamiliarize the familiar as a means of engaging in creative acts and aesthetic inquiry.

Microsoft Word, after all, is fundamentally a textual "toolbox" that many of us use everyday. In fact, when it was first released in 1983, its name was "Multi-Tool Word." It has since replaced "multi-tool" with the name of the corporation that owns Word, though the metaphors the program draws upon are very much enmeshed in skeuomorphic terms that refer to functions of tools that predate the computer. It has a "Tools" menu, in which spelling and grammar checking functions are located, alongside language counters, language preference settings, and much more. Another menu features icons such as scissors and paintbrushes that find computer word processing analogies with tools of older media forms. The features in the "edit" menu group several everyday metaphors for manual operations that the application performs—"cut," "copy," "paste," "undo," and "redo." This list in particular might remind us how the process of writing is often already a process of deformance.

Step 5: Use functionality provided by digital textual analysis tool to filter, isolate, count, categorize, aggregate, and so forth. This step was the initial realization of our research question. Here, we performed digital textual analysis and generated preliminary results. The process varied for each of us, with Elizabeth uploading files to a program that quickly delivered results and Monica's laborious uploading of 150 student essay files and 30 online source texts. One example of filtering is the numerical data generated by Monica's use of Pairwise (see Figure 3).

Results for name:cse_10207

File Name		Score
name:102607MIRAMAR_22	=	14
name:10407Gaviota_07	=	9
name:110807Miramar_14	=	8
name:110107Miramar_23	=	7
name:102607Miramar_14	=	5
name:102507Quant_112	=	2
name:10407Gaviota_05	=	2
name:10407gaviota_21	=	1
name:10207gaviota_18	=	0
name:10407gaviota_22	=	0
name:110107miramar_07	=	0
name:110807miramar_22	=	0
name:columbia_120107	=	0
name:110807Miramar_23	=	0
name:102507quant_122	=	0
name:110807miramar_02	=	0
name:10407Gaviota_16	=	0
name:110107miramar_22	=	0
name:10407Gaviota_15	=	0
name:10207gaviota_24	=	0
name:110807Miramar_24	=	0
name:10207Gaviota_07	=	0
name:10407Gaviota_13	=	0
name:102507Quant_119	=	0
name:10407Gaviota_25	=	0
name:110107miramar_16	=	0
name:10207gaviota_08	=	0
name:110107Miramar_17	=	0

Done

Figure 3. Use of Pairwise to measure similarity between online source texts and student essays.

In Figure 3, the left column lists the file name of each student essay and the right column lists the percentage of similar phrasings compared against a single source text, in this case an article from *Christian Science Monitor* (labeled at the top as "cse_10207"). Monica examined texts with higher than five percent similarity in order to study whether students quoted, paraphrased, or exactly copied online source texts in their essays.
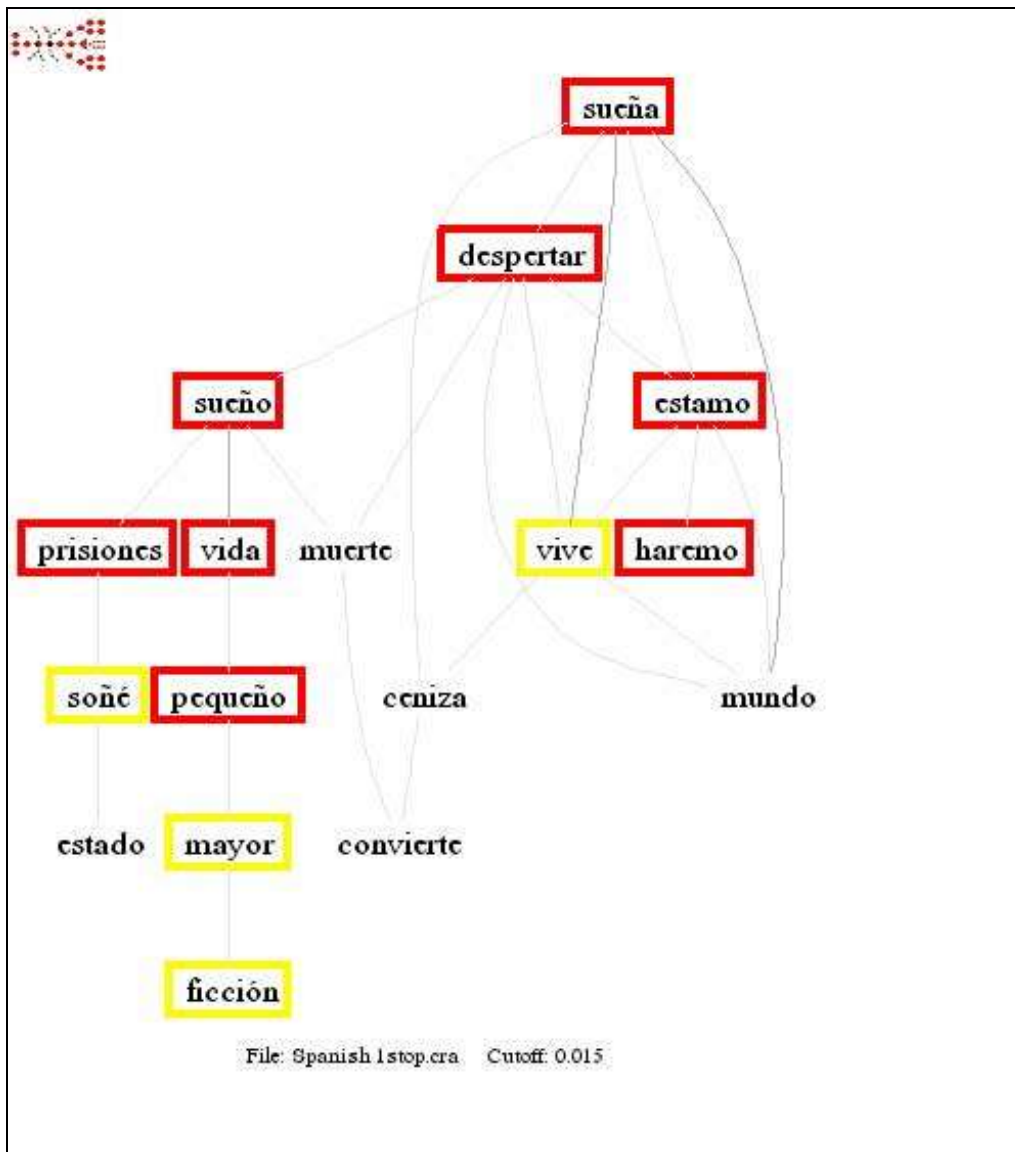
Jeff used Microsoft Word to perform what Samuels and McGann (1999) refer to as "isolating" deformances, critical practices that single out parts of a text. In keeping with his research question, Jeff chose to isolate parentheses and parenthetical comments in the different documents. The process of isolation involved, first of all, selecting all the text, a feature in the Edit menu, then making the font color of the text white (Format > Font > Font color). He then highlighted all the parentheses black by using the "Replace" function in the Edit menu. When there, he entered an opening parenthesis in the "find what" field, then in the "replace with" field, entered an opening parenthesis again, and in order to highlight it, had to expand his options by choosing the down arrow, which opens up a "format" option, where one can select "Highlight." Jeff then "replaced all" so that all the white opening parentheses in the document were replaced with white parentheses that were highlighted black. He repeated the same find and replace

function on all closing parentheses. The result of this experiment was saved in a document as one deformance.

Step 6: Render the results visually. Until this step, we were basically using the digital tools to do traditional readings, but faster. Because we firmly believed that methods drawing upon digital technologies do more than just increase the volume and scope of what a person can process, we produced visual representations of our results for analysis.

While Steps 3 through 6 were performed collaboratively with each of us testing one another's texts with our chosen analysis tool, the higher-level interpretive analysis required discipline-specific knowledge. Just as our formulation of research questions and selection of texts were performed independently, so was this last step. Figures 4a and 4b provide samples of our initial results.

Figure 4a. Elizabeth's diagram of [Crawdad](#)'s tree-flow visualizer, which provides a network model of the most influential words in a text along with their level of interconnection.
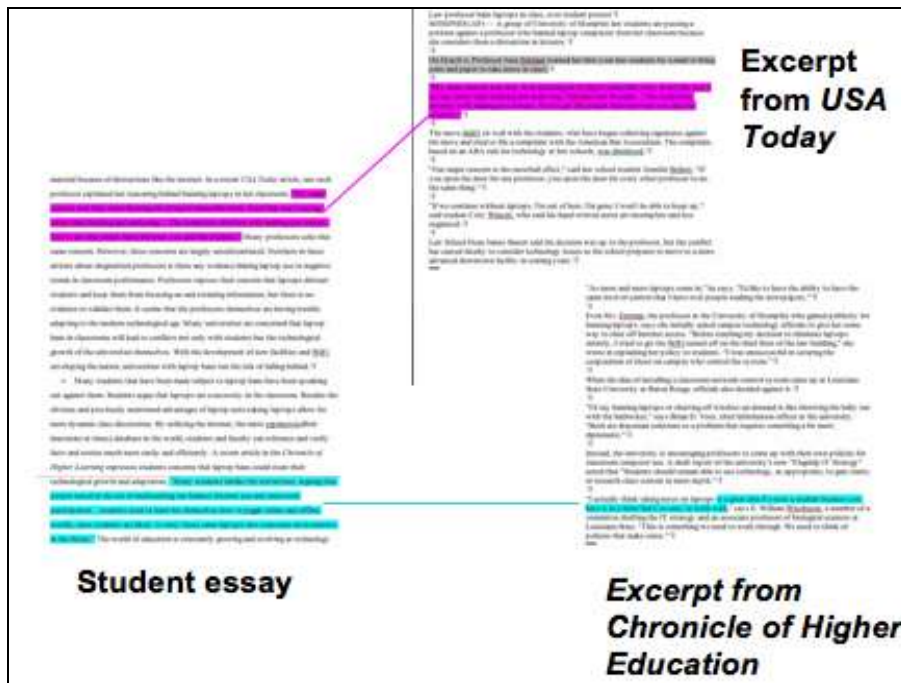
Figure 4b. Monica's diagram of source use in student essays.

Jeff's deformed "Signature Event Context" is nineteen pages of white space with scatterings of narrow black strips with white parentheses inside them. He printed these pages out and laid them side-by-side in a few rows on the floor of his home and took photographs of these texts to generate yet another visualization of the deformed essay that allows one to see multiple pages at once. He did this to afford a better overall visual sense of the patterns of parentheses in the text that he felt would be more difficult to see page by page on a computer screen. A valuable benefit of collaboration came at this stage, too, when he could share his visualizations with team members as he generated them. As mentioned previously, Jessica, for example, noticed the ways in which individual pages of this deformance and the photographs of multiple pages of this deformance, resemble scientific diagrams, such as a DNA electrophoresis maps with scattered bars (see Figure 2). It is as though the visualizations outline the essay's genetic makeup, indicating just how many parenthetical chromosomes there are in its biological composition.
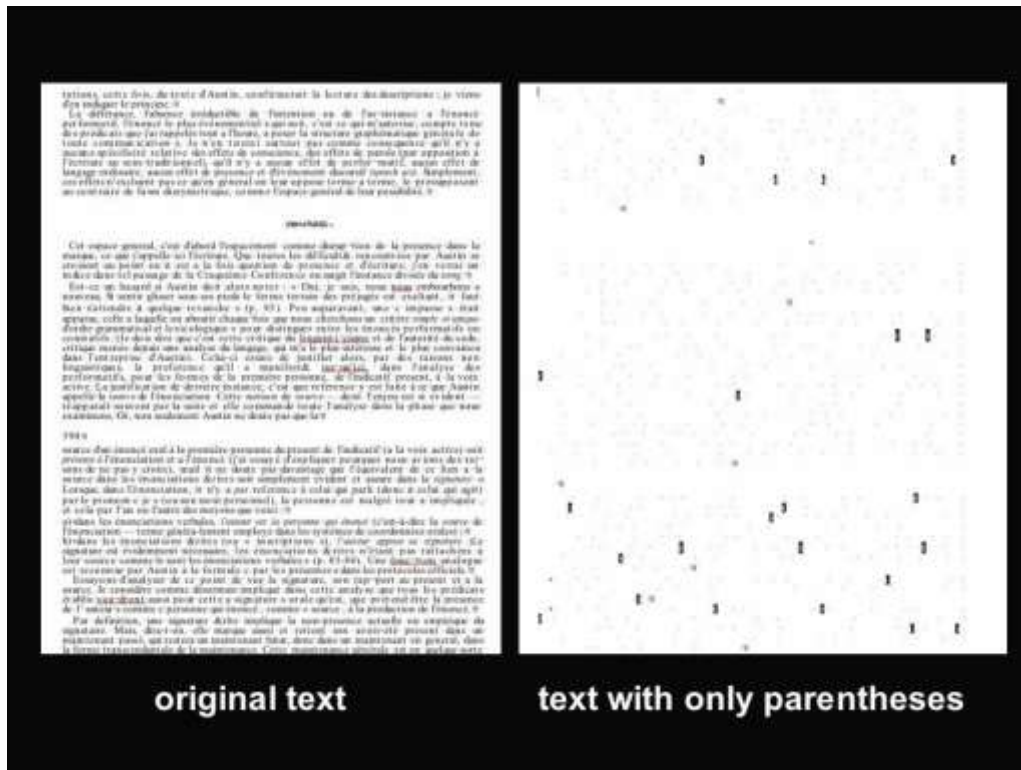
Figure 5. Visualization created using Microsoft Word.

Figure 6. "Signature Event Context," four pages side by side, just the parentheses highlighted.

The images of isolated, highlighted parentheses shown in Figures 5 and 6 are visually informative, but without words, they have little to say about the actual content of Derrida's writing. In an effort to justify the significance of this seemingly obscure project to the rest of the team (again, part of the value of teamwork is the consistent self-evaluation that happens due to knowing your accountability to others), Jeff decided to make other deformances to think more qualitatively about the essay's parentheses. To do this, he started with the original document of the previous deformance and next—with all the parentheses highlighted, surrounded by white text that was indistinguishable from the white background of the computer screen—changed all the text in between highlighted pairs of parentheses from white to black, parenthetical by parenthetical. He then deleted all the highlighted parentheses surrounding the bits of parenthetical text. In this deformed version of the text, then, there are nineteen pages of scattered text—sometimes single numbers or words, and sometimes quite lengthy notes—of just the text's parenthetical content, with the nonparenthetical text and the parentheses themselves "whited out," to borrow a metaphor from another manual operation to apply to this digital context (see Figure 7).

Figure 7. Just the parentheticals.

Step 7: Use visual representation as basis for higher-level interpretive analysis. Jeff's deformances white out sections of text, maintaining the spatial relationships between words and parentheses within the document. With the essay's spatiality intact, especially when the pages are laid out side by side, one can observe that parentheticals proliferate in the essay as it proceeds, as if "infecting" the essay itself with the displacement and supplementation of philosophical thought. In his interpretative analysis of these deformances, Jeff argues that this is quite significant for a variety of reasons—for example, as a grammatical performance of Derrida's deconstruction of traditional philosophical writing. If Jeff had not whited text out with Microsoft Word, he would not have realized this systemic quality and pattern of parentheses in the text, nor would it have occurred to him to look for it.

As the example of Jeff's project shows, our seven-step method of collaboration in digital textual analysis yielded some surprising results. When we began working together, we certainly did not consider that the program we all used to take our meeting notes would work to create an aesthetic and analytic representation of one of our texts.

PRACTICAL APPLICATIONS OF JEFF'S DEFORMANCE

Looking at the actual content of the parentheses without the theoretical density of the rest of the text was quite helpful in bringing much of the essay's significance into sharper focus. In fact, we would all highly recommend teaching dense theoretical texts to students by having them perform parenthetical deformances or similar operations that isolate textualities. Since parentheticals are often spaces in which authors attempt to clarify or qualify the nonparenthetical text around it, one notices that in his parentheticals, for example, Derrida clearly makes his main points and identifies his conceptual concerns, which could otherwise easily be overlooked amidst the dense text. (Normal reading practices might encourage us to gloss over parentheticals, as we often read them as optional parts of a text we could do without.) Secondly, as parentheses are often a site of citation, glossing an essay's parentheses in isolation also maps out what we could refer to as the text's discursive field of references. In the case of "Signature Event Context," this parenthetical mapping provides an informative point of entry into understanding Derrida's engagement with other philosophers.

In addition to using Microsoft Word to write essays about other essays, books, and works of art, then, scholars, teachers, and students should also use it as a tool to un-write their objects of study, to turn them into their own works of art, and

to learn from them in new ways. Without having to suffer the inevitable learning curves that accompany using new software, it is worthwhile spending time thinking about more creative ways to use familiar software against their conventional and intended uses. It is important to remember that tools are just as much for taking things apart as they are for making them (Manovich, 2001). Microsoft Word, which presents itself as a box of metaphorical tools, might indeed be thought of as a toolbox not only for writing but also for de-writing and re-writing already "finished" writing. One can use it to find and replace; change font color; draw tables; track changes; leave comments in text balloons; highlight; reconfigure margins and line spacing; and much more. In this sense, our knowledge work not only models itself after systems of creation in the corporate world, but it also takes inspiration from digital remix cultures, transforming and sampling from pre-existing media objects into new, creative media objects (Jenkins, 2006).

WHAT WE LEARNED FROM OUR INTERDISCIPLINARY COLLABORATION

Given the diversity of our interdisciplinary team, collaborative textual analysis would seem challenging from the outset. While we shared interest in textual analysis theoretically and methodologically, our interests diverged in the theoretical and methodological approaches to the texts. For example, Elizabeth's work compared different translation versions of a Golden Age play, while Jeff's work considered the rhetorical function of parenthetical phrases. Both engaged in textual analysis, but for different purposes. As a starting point for our collaboration, the digital tools became a means to interact with one another's texts. Performing filtering processes on one another's texts, through sampling, sorting, aggregating, and counting, enabled meaningful engagement with both the theoretical and methodological approaches of our team members.

Liu's vision of collaborative knowledge work in the humanities structured our pursuits. Within the framework of his graduate course, we adopted a sense of play with our texts and the textual analysis tools we used, while sometimes simultaneously feeling overwhelmed by our disciplinary differences. Educators would call these challenges "teachable moments," and indeed, Liu's course provided many moments of insight into the inner workings of interdisciplinary collaboration.

Our use of digital textual analysis tools opened doors for us to accomplish what is usually impossible in any form of collaboration, let alone an interdisciplinary one. In the early steps of our process, digital textual analysis allowed us a means

of deeply exploring one another's texts. As we played with the tools and experimented to find functionalities that fit our research questions, we continually interacted with and examined our diverse corpus. Thus, we moved beyond the usual discussion of one another's work and, through the use of the tools, contributed to one another's analytical processes.

In addition to filtering one another's texts, we also assisted in rendering the results visually, as shown in Figures 1, 2, 4, and 5. Visualization tools allowed us to concretize abstract concepts by illustrating the basis for our analyses. For example, Jessica's word trees diagrammed the relationship of words that suggest female agency in the ballads, such as *I* and *you,* and Jeff's isolation of parenthetical phrases showed their increased occurrence in later parts of "Signature Event Context." Through these visualizations, we were able to, in effect, "see" what our interdisciplinary partners look for in their textual analysis and, through discussion, view the texts through our partners' lenses. This practice enabled in-depth understanding of interdisciplinary approaches to analysis and a deeper understanding of one another's topics.

Whether in the classroom or beyond, collaborative work places high demands on researchers. Participating in deeply interactive collaboration with colleagues from a variety of disciplines requires researchers to master a level of literacy in their team members' disciplinary approaches. As our process demonstrates, these shared literacies are developed through much discussion, practice, error, and play. We found that our team members' disciplinary approaches forced us to reconsider our assumptions about their work and our own in valuable ways. As researchers attempt to understand and engage with one another's analytical processes, they will be challenged, as we were, to make their own processes visible.

Response: "So What?" New Tools and New Humanities Paradigms

Alan Liu

In a recent article entitled "Digital Humanities and Academic Change" (Liu, 2009), I recount a formative incident in my career as a digital humanist when, in a meeting with faculty from other disciplines studying information technology, we went around the table and gave examples of our work. After a dose of advanced literary interpretation from a colleague, I recall, a computer scientist "rocked back in his chair, folded his arms, and, after a pause, asked: 'What was that for?'"[1] Brusque as he was, the engineer who asked the question was less dismissive than genuinely curious and open-minded. Indeed, what is humanities-style reading or interpretation for? What does it help build, design, or change? What might an engineer interested in working across disciplines learn from it?

I am struck by a similar question in Monica Bulger, Jessica C. Murphy, Jeff Scheible, and Elizabeth Lagresa's chapter: "So what?" After acclimating to each other's assumptions and vocabularies, they faced the inevitable challenge of so what? Why, for example, would Derrida's use of parenthetical phrases matter? Or, why would paraphrasing versus direct citation in student texts matter? So what? The questions that we asked each other as we searched for connections among our work forced us to reconsider our disciplinary assumptions and explain our research pursuits.

Like the engineer's *what was that for?* the *so what?* question from outside one's discipline—the question that demands that one justify one's assumptions, methods, and goals to those working in other research paradigms—has the potential to be hostile.[2] It is like the border guard or immigration officer's challenge: So you are esteemed and credentialed in your own country. So what? But as in the case of the engineer's *what was that for?* Bulger, Murphy, Scheible, and Lagresa's *so what?* ultimately opened, rather than closed, borders of knowledge.

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[1] See pp. 25-26 for the incident I recount. The engineer was Kevin Almeroth of my campus's Computer Science department. The meeting, which occurred in March 2004, was called by my campus's Center for Information Technology and Society to explore possible grant projects involving scholars of information technology from multiple disciplines.

[2] See also Liu, 2005, which responds to the *huh?* question—mainstream society's reaction to literary study, the humanities, and the digital humanities—ventriloquized in Joanna Drucker's (2005) review of my *Laws of Cool: Knowledge Work and the Culture of Information* (Liu, 2004). My meditation on *huh?* responds to reviews of my book in the same issue of *Criticism* by Drucker and N. Katherine Hayles (2005).

The strategy for doing so is collaboration, which their essay crisply defines in four principles: "respect for one another's work, commitment to process, sense of play, and flexible expectations." While researching corporate culture for my *Laws of Cool: Knowledge Work and the Culture of Information* (2004), I came across many definitions of collaboration and teamwork. Few seem to me as true and well formulated as this. *Respect for one another's work* opens a space of tolerance within *so what? Commitment to process* provides a structure—not to mention a space and time—for the conjecture to play out. *Sense of play* activates what is really crucial in playing out such conjecture: play, which prevents process from becoming just routine by dedicating it to open-ended discovery. And *flexible expectations* means facing up to the consequences of discovery: not just the reward of expected results but the real risk of failure. ("At times," Bulger, Murphy, Scheible, and Lagresa recall, "we were concerned that nothing would result from our collaboration.") Or, better: result versus failure may be understood according the paradigm of "modeling" that Willard McCarty (2005) explores in his *Humanities Computing*. It is less a binary opposition than a process of ameliorative iteration. One fails, and then one learns what went wrong and tries again. The academy calls this *education*, which now expands through collaboration beyond the more traditional, and far lonelier, paradigm of individual humanities failure and learning.

Especially relevant for this volume is how such a strategy of collaboration and learning can be facilitated—indeed, modeled—by digital tools. In this light, the initial problem is the notion of *tools* itself, which—along with ideas like *applications* or, more recently, *analytics*—has often been adopted without adequate interrogation by digital humanists under the pressure of grant competitions requiring *deliverables*. Some historical perspective is useful: there are tools, and then were/will be tools. Tools that connote precision, analytical metrics (they measure and provide feedback even as they operate), slaving to specifications, exact repeatability, and so on—that is, the whole program of rationalism implemented through Taylorism (the ghost of Frederick Winslow Taylor measuring work processes with stopwatch in hand still haunts our dreams)—are of specifically modern vintage. Such tools do not agree with the longer premodern history, and even prehistory, of tools—for example, an axe or hammer handled with considerable play between their technique and technology, as when we say that even a well-oiled machine part, not to mention a musical instrument, has *play* in it. (For a discussion of technique versus technology, see Liu, 2004, pp. 294-297, and Liu, 2008c, pp. 187-188.) And they do not now coincide with the postmodern (postindustrial) understanding of tools. Applications

or "apps" for the iPhone may be a perfect symbol of the latter. Some apps are functional and rational. But many are just playful. And this is not even to consider the delicious overlap between functionality and play—called *design*—that is part of the very mystique of contemporary tools (for which perhaps no corporation today is more famous than Apple).

As recently as poststructuralism, humanities researchers lived under a contradiction by which the *theme* of their research was all about play (e.g., Derrida [1978] on language as play, Barthes [1974] on connotation, and Deleuze & Guattari [1986] on rhizomes) while the *practice* of their research—at least the kind that gets jobs and tenure—was all about rigor. Hence, adherents of deconstruction, especially in the ascetic style of Paul de Man, demanded both play (like letting students run wild through the streets of Paris in May 1968) and— a word that comes up with disturbing frequency in the deconstructive school— *rigor.*[3] To adapt Foucault's (1965) adage about madness, rigor bound play "to Reason, to the rules of morality and to their monotonous nights" (p. 64). Of course, it would be unfair to ascribe this contradiction just to deconstruction. It went back at least to the New Criticism and, more generally, to formalism, whose "close" and technical reading methods taught us at once to play with language and, rebuffing the preceding era of belle lettrism, to grind out ever more hard, difficult, unpleasurable, and agonistic ("ironic," "paradoxical") readings.[4]

By comparison with such humanities research, I venture, engineers had more fun. The function of advanced digital tools today is to restore the sense of play in humanities research by baking into humanities methodology at a low level the principles of collaboration outlined by Bulger, Murphy, Scheible, and Lagresa. When I say "advanced" digital tools, I mean Web 2.0 tools with highly-evolved information architectures across all the "resource" (back-end), "service" (middleware), and "client application" (front-end) tiers. (For a view of the underlying information structure of Web 2.0, see Governor, Hinchcliffe, & Nickull, 2009). But as Bulger, Murphy, Scheible, and Lagresa delightfully show, even apparently workaday digital tools older than the Web itself—for example, Microsoft Word—can be used against the grain to defamiliarize what we thought we understood about the way humanities discourse works. The important point is that the engineering, as it were, is now finally (or at least mainly) under the hood.

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[3] For a critique of the "rigor of deconstruction," see the section on "De Rigueur, or the Charisma of Routinization" in John Guillory's (1993) *Cultural Capital: The Problem of Literary Canon Formation*. Guillory's reading of deconstruction is especially interesting in the present context because of its thesis that deconstructive rigor is "technical," "a kind of technology," and "a mimesis of the technobureaucratic itself" (pp. 201, 206; see also pp. 181, 257).

[4] Besides American New Criticism, for instance, there was the earlier paradigm of Russian Formalism with its emphasis on what Victor Shklovsky (1965) called "Art as Technique."

Humanists no longer must, though they should, learn HTML to hop on the information superhighway. All they have to do is drive the new blog, wiki, social-networking, textual-analysis, visualization, mapping, mashup, machinima, visual programming, and other software engines. Tooling down the information superhighway in these new machines, we can at last look up from managing low-level routines to see the world as it appears from the technical platform, while, reciprocally, we can also look at the social, political, economic, and cultural nature of the technical platform from the perspective of the world.[5] These new information engines have lots of rigor and precision. But their rationality has not yet been fully rationalized. Indeed, in a manner hearkening back to 1970's cyberlibertarianism, they often seem ideologically biased against rationalization. Or, at least, they are in an open space where it is unclear whether they are rational or not. It is ambiguous, for example, what some of the new information engines (e.g., Twitter) are actually *for*, let alone what their business model might be. *What was that for?* and *so what?* can fairly be asked about all of them.

The new software machines encourage humanists to rev them up. The goal is to open up reading and interpretation to such new digital methods capable of flexing between rigor and play as "distance reading" (Moretti, 2005); "modeling" (McCarty, 2005), and "deformance" (McGann & Samuels, 2001).

When I designed my Literature+ course, I called such tools or machines "toys." That may be the most important move I made.

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[5] My observation that humanists no longer must look under the hood of the new information technologies does not mean that they *shouldn't* look under the hood. Part of my practice in research and pedagogy on information culture has been to insist on getting hands-on enough with the technologies that humanists can use them not just as applied tools but as thinking tools—something one both sees through and sees as an object of thought.

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