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The State of the Digital Humanities: A Report and a Critique

Alan Liu

Amid all the doom and gloom of the 2009 MLA Convention, one field seems to be alive and well: the digital humanities. More than that: Among all the contending subfields, the digital humanities seem like the first 'next big thing' in a long time, because the implications of digital technology affect every field.

--Pannacker (2009)

The digital humanities, clearly, are in a state of rapid expansion. But giving an account of that state of expansion without relying on anecdote is difficult. Empirical evidence of the field's growth is uneven due to uncertainty about what exactly should be counted (programs, jobs, conferences, publications, projects, funding competitions, usages of the phrase 'digital humanities'?). Even describing the shape of the field is complicated by its overlap with an older concept of *humanities computing* (oriented around tool-building, computational linguistics, text analysis, and text encoding) and some branches of *new media studies* (populated by theorists, critics, and artists focused on media and networks from a poststructuralist or cultural-critical perspective). Thus one of the best recent essays to survey the rise of the digital humanities, Svensson (2009), is necessarily (and impressively) multifactorial in exploring 'the discursive shift from humanities computing to what is now being termed the digital humanities.'¹

In actuality, the perception of the digital humanities as what William Pannacker recently called the 'next big thing' may be less a matter of empirical phenomena than what marketers call mind share. Separate approaches and fields have converged to give the humanities a new brand. The marketing metaphor is not extravagant when we consider that the rebranding effort is aimed first of all at the institution of higher education itself rather than directly at education's 'customers' (students or the public). Thomas Frank (1997) discovered that some of the most successful advertising campaigns of the 1960's (e.g., for the Volkswagen Beetle) began through what amounts to the marketing of countercultural 'cool' *inside* advertising firms themselves, which started to foster a new ideal of 'hip' rather than buttoned-down Madison Avenue 'mad men.' By analogy, as I have argued (Liu, 2004a), today's post-mainframe information technologies born in the same countercultural (or 'cyberlibertarian') epoch are cool in the same way. Information tech in the era of the personal computer and network is today's equivalent of a Love Bug that not only works but creates a new image of work that allows corporate and other organizational cultures to imagine a cool new vision of themselves.

Information technology, in other words, is an institutional desiring engine. Whether in general society or in higher education, one of its functions is to serve as an allegory of the social, economic, political, and cultural self-image of institutions (and, of course, also individuals) (see Liu, 2004a: 154 and *passim* on the digital as allegory). Even in the best of times, therefore, the iPads and other digital devices that some universities have been handing out to students would be fantasy machines before they can be proven to be learning machines. They channel the institution's (and, hopefully, also the student's) fantasy that knowledge can be cool. But in the worst of times, when economic crisis tempts some campuses to plug immense holes in their

funding with equally vast vaporware plans for money-making 'digital delivery,' information technology becomes an allegory of *need* beyond desire. Witness, for instance, the controversial call in 2009 by the dean of the law school at the University of California, Berkeley, for the University of California system to address its epic budget crisis by creating an all-virtual 'eleventh campus' or 'cyber-campus' based on the slimmest evidence of how a totally online educational system in the so-called quality or 'premier' higher-education sector might work (Edley, 2009).² In such cases, need forces higher education to adjust its image in the mirror of information technology to resemble that of consumer businesses perceived to be both cool *and* profitable (able to exert 'market appeal,' as the dean, Christopher Edley Jr., puts it).

In general, calls for the corporatization or privatization of higher education that make information technology their allegory for how to imitate the combined efficiency, flexibility, and marketing power of today's premier businesses subscribe to the postindustrial paradigm of knowledge work (see Liu, 2004a, for fuller discussion of this paradigm.) Partly real and partly ideology, knowledge work is now the dominant mode of production in states that take industrial extraction or manufacturing work for granted (or outsource it to developing nations), emphasize the service sectors instead, and--gravitating toward the premium 'knowledge' services--dedicate their best brains and venture capital to the so-called 'New Economy,' a phrase much in vogue during the run-up to the dot.com bust of 2000. According to the laws of the New Economy--a kind of economic version of Moore's Law doubling the number of transistors packed into an integrated chip every two years--ceaseless cuts in labor and fixed capital can be compensated for through 'smart' digital technologies that perpetually inflate intellectual capital. If the digital humanities are currently in a state of expansion, it follows that in some manner, for better or

worse, they serve the postindustrial state. A purely economic rationale for the digital humanities might thus be that they reengineer higher education for knowledge work by providing ever smarter tools for working with increasingly global-scale knowledge resources, all the while trimming the need to invest proportionally in the traditional facilities, support staff, and perhaps permanent faculty of what Bill Gates--in widely reported comments at the 2010 Techonomy conference--calls obsolete 'place-based' campuses.³

In this essay, I offer a report on the current state of the digital humanities. But, in order to see the field as the 'next big thing' it appears to be to the humanities at large, I will define it with unusual breadth. 'Digital humanities' will here have a supervening sense that combines 'humanities computing' or 'text-based' digital humanities (as I will sometimes call them for distinction) and new media studies (normally excluded from discussions of the digital humanities except for a few overlaps).⁴ This is the synthetic sense, we note, in which Pannacker actually uses the term in his comments about the 2009 MLA (quoted in my epigraph), since the conference sessions he refers to (not to mention the '700 digital-media programs in the United States' he cites for context) include both those in the digital humanities narrowly defined and in new media studies. Only such a synthetic sense makes possible a new kind of question about the digital humanities now that they are 'the next big thing.' Are the digital humanities ready to live up to their responsibility to represent the humanities and higher education as the latter negotiate a new relation to postindustrial society?

My report will end in a critique. Currently, I fear, the digital humanities are not ready to take up their full responsibility because the field does not yet possess an adequate critical awareness of the larger social, economic, and cultural issues at stake. The side of the digital

humanities that descends from humanities computing lacks almost all cultural-critical awareness, and the side that descends from new media studies is indiscriminately critical of society and global informational 'empire' without sufficient focus on the specifically institutional--in this case, higher education--issues at stake. The whole amounts to the lack of a mental and policy firewall against postindustrial takeovers of the digital idea along the lines of fantasized 'eleventh campuses' that merge educational, social, and for-profit motives without weighing the need for the evolution of *differences*, and not just similarities, between higher education and other stakeholder institutions in today's knowledge economy. Even if the digital humanities serve the postindustrial state 'in some manner,' as I equivocated above, it matters what that manner is.

A Report on the State of the Digital Humanities

The digital humanities (defined inclusively as per above) have recently expanded in several ways that make expansion not just a practice but ultimately a theme. Expansion in the sense I develop here is logically commutable with integration. The digital humanities are filling in some of the gaps that previously made the field a loose suspension of topics and approaches, and such integration effectively allows the field--like fencing in an open range--to enclose larger sets of issues relevant to the humanities at large. The following are five ways in which the digital humanities have recently become more integral and expansive.

1. Unification of Foundational Concepts. In the past, the digital humanities have only inchoately linked its three underlying concepts (for which 'digital' is only shorthand): *technology*, *media*, and *information*. Whether digital humanists privileged one or the other when they thought about their object of inquiry or their tools--and especially if they split the difference in such

hybrid formulae as *media technology* or *information technology*--these concepts fused or split unpredictably, leaving such basic questions as the following unsettled. Are the textual, visual, or other phenomena that the digital humanities treat best understood as technology, media, or information? Is all technology mediational, or vice versa? Is all media informational, or vice versa?

Recently, however, the digital humanities have deepened the conceptual roots of all three cardinal concepts so that they begin to connect at an appropriately foundational level. Not all the possible relationships have thus far been developed with equal interest or rigor, but the trend is toward an integrated logic-circuit, as it were, of technology, media, and information.

Thus, for example, the digital humanities have recently begun to rationalize the connection between *technology* and *media* through such new approaches as *platform studies*, *software studies*, and *digital forensics*. These approaches start from the point of view of hardware and software technologies, but carefully relate those phenomena to interface experiences more commonly treated as media. For instance, Montfort and Bogost (2009), the first book in the MIT Press Platform Studies series, studies the hardware, screen, and game play of the historically important Atari system as an integrated construct of technology and media. Similarly, Wardrip-Fruin (2009) demonstrates how underlying software processes and 'operational logics' flow up to the media surface. Or, again, Kirschenbaum (2008) shows that the basic materiality of technology--right down to physical traces on hard drives--undergirds what he calls the 'formal materiality' (apparent differences between 'naturalized' and 'abstract' phenomena) that constructs the experience of digital media. In essence, such approaches recover a 'logic' in technology (or techno-logic) continuous with media logic. By viewing media as the interactive apparition and

operation of technology, they dissolve a particularly debilitating false binary that has long haunted the field: that technology is 'just' materiality (or, at best, tools) while media is 'just' spectacle (or, at best, interface).

Similarly, but starting from the reverse point of view of media, the *media ecology* and *tactical media* approaches (emerging from the new media studies side of digital humanities) also create a deep connection between technology and media. These approaches treat media not as something to be consumed passively (a holdover from the era of mass media) but as participatory or contestatory social action. Media is not just watching a screen, in other words; it is programming or hacking the screen. The logical connection between media and technology in this view rests on the fact that media becomes a mechanism that users operate. Media, we might say, is not 'found art' but a kind of found tool, instrument, or even weapon. The terms *ecological* and *tactical* specifically reinforce this active sense of media by emphasizing its difference from the monolithic and strategic media of earlier broadcast regimes. Because corporations and governments tend to monopolize media technologies wherever they can be treated as continuous and homogeneous (as in McLuhan's and the Frankfurt School's original idea of media), the media ecology and tactical media approaches concentrate on redefining the media-scape as diverse 'environments' of site-specific technologies with hidden 'tactical' (guerilla-like) potential. Thus Garcia (1992), Garcia and Lovink (1997), Wark (1997, 2006), Lovink (2005), Lovink and Rossiter (2005), Fuller (2005), and Raley (2009) on tactical media--not to mention the provocateur work of 'hacktivist' net artists--reenvision McLuhan's global village and the Frankfurt School's culture industry as an intricately non-homogeneous, multitudinous, and differentiated space of situated media technologies that users can operate for resistance or advocacy.⁵ The

media-scape, in other words, is a rich rain forest or tidal zone with plenty of edgy, interstitial margins in which culture guerillas can deploy media technologies irregularly (e.g., through local media takeovers, hacks, denial-of-service attacks, subversive video games, and so on inheriting the spirit of Situationist *détournement*, vintage hacktivism in the mode of the Critical Art Ensemble (1996), Michel de Certeau's pragmatics of 'tactics' (de Certeau, 1984), and so on. The end result is that the media ecology and tactical media approaches pay special attention to material technologies that retain an excess of user- or community-operated potential--e.g., pirate radio in Fuller's study, site-specific digital art installations in Raley's study, and so on.

A cognate development on the text-oriented side of the digital humanities, we may note, is the line of approaches that runs from the 'new textual scholarship,' sociological bibliography, and what might be called in general contextual or situational textual scholarship to the new digital forms of such textual scholarship--e.g., from D. F. McKenzie and Jerome McGann's originally print-oriented theories of textual scholarship (e.g., McKenzie, 1999; McGann, 1991) to McGann's, Kirschenbaum's, and others' digital extensions of the paradigm (e.g., McGann, 2001; Kirschenbaum, 2002). Such scholarship focuses on textual media as social practices inseparable from their historically situated material technologies. Similarly, the flourishing 'history of the book' field in recent decades (about which more below) has closely paralleled media studies in reenvisioning literacy as the social operation of writing and reading technologies--i.e., as the operation of what are essentially text machines (like the Early Modern tablets studied by Stallybrass et. al. [2004] via a material history of the book approach).

On a different front, the digital humanities have recently begun to thicken the conceptual relation between both technology and media and *information*. This is largely due to the fact that

such precursor information-centric influences on the digital humanities as information theory, cybernetics, computational linguistics, and corpora-scale text analysis have ceded to a new generation of paradigms, especially *encoding* and *data mining*. In regard to the former, *code* (with such related concepts as *metadata* and *standards*) has been the focus of the robust text-encoding community, which has not only expanded its guidelines and practices but extended the very idea of text encoding theoretically (as in controversies over the Ordered Hierarchy of Content Objects model).⁶ But *code* now also names what Sondheim (2001), Cramer (2001), Raley (2002), and others on the new media studies side of the digital humanities call *codework*. Whereas a core principle of text encoding is that the purpose of tagging texts with metadata is to allow 'content' to be displayed and manipulated independent of 'format,' codework artists such as John Cayley, Mez Breeze (Mary-Anne Breeze), Talan Memmott, and their interpreters insist on the ineluctable co-presence of code both operationally behind the scenes and phenomenally in a work's experiential form. Code thus manifests on the surface of Cayley's digital-media creative compositions or Mez's invented Mezangelle cyber-poetic language, or Memmott's *Lexia to Perplexia*.⁷ In both text encoding and codework, nevertheless, *code* is an informational concept increasingly linked to the ideas of technology and media. Thus, for example, digital humanists and new media scholars have begun conceptualizing *protocols* and *databases* as fused constructs of encoded information, technology, and media--as in Galloway (2004) on protocols, my own work on relational databases and the 'new encoded discourse' (Liu, 2004b), Hayles's recent writings on databases and narratives (e.g., Hayles, 2011; partly a response to Lev Manovich's well-known, controversial declaration that the two are 'natural enemies' [Manovich, 2001: 225]), and George Legrady's and other new media artist's imagination of databases as media forms (e.g.,

Legrady, 2001, 2007a, 2007b).

Data mining, meanwhile, is a phrase whose increasing use in the digital humanities (together with the related *text mining*) signals the mutation of an earlier paradigm of text analysis into *data analytics*. Examples include the text-analysis tools developed or combined by such projects as TAPoR, NORA, MONK, and SEASR.⁸ Just as *data analytics* in the information industry refers to the use of sophisticated software systems like IBM Business Analytics and Optimization or Google Analytics to sift business, customer, web-usage, and other information for high-level patterns buried in routine information, so the SEASR Analytics for Zotero now available through a plug-in for the Firefox Web browser (SEASR, 2009), for example, deploy author centrality analyses, author degree distribution analyses, and other pattern-recognition analyses to discern high-altitude patterns in texts or aggregates of texts. The overarching effect is that the digital humanities are forced to think more integrally about the relation between information and both technology and media. Data mining requires digital humanists to investigate underlying database, data-flow, cross-platform data architecture, and other computational technologies; while it also increasingly foregrounds the need for visual media able to facilitate pattern recognition (e.g., visualization tools). Indeed, the fact that data-mining visualizations are now organic to new media *qua* 'media' is illustrated by the fact that the Museum of Modern Art in New York City recently added to its exhibits of media art the iconic 'history-flow' visualizations of Wikipedia editing patterns created by Fernanda B. Viégas and Martin Wattenberg.⁹

2. *Integration with the Past*. One earlier shortcoming of the digital humanities was the field's foreshortened, presentist focus. More accurately, scholars in the field were historically

schizophrenic. On the one hand, they focused on presentist issues or practices of technology-media-information from the mid-twentieth century on (e.g., since the Macy Conferences studied by Hayles [1999], with special emphasis on post-1980's computing and networking). On the other hand, they focused on the historical objects of study to which the new technological, media, and informational approaches were applied. Thus, for instance, such major first-generation digital humanities archives and editions as the Rossetti Archive, the William Blake Archive, the Walt Whitman Archive, the Women Writers Project, the Orlando Project, and so on had historically split personalities. At one point, for example, Jerome McGann's Rossetti Archive created an interactive 3D overlay of Dante Gabriel Rossetti's studio (in the now obsolete VRML Virtual Reality Modeling Language protocol) that had the perverse effect of drawing the user's attention away from the historical archive of Rossetti's works to experimentation with the cutting-edge VRML navigational environment (e.g., *what happens when I walk through that wall?*). In short, research on digital-humanities methods and the historical phenomena to which those methods were applied occurred on unrelated tracks.

Recently, however, two fields increasingly partnered with the digital humanities--*the history of the book* and *media archaeology*--are splicing those tracks together. In regard to the history of the book field (including also the history of orality, early writing, and reading), it is iconic that Elizabeth Eisenstein's preface to her influential *The Printing Revolution in Early Modern Europe* (1983: x) conspicuously acknowledges the intervention of McLuhan, and that Walter Ong's *Orality and Literacy* (1982) was subtitled 'the technologizing of the word.' While it was McLuhan who first unified and generalized the idea of media, it was up to contemporary book history to extend his approach by closing the divide he had himself interposed between the

past of the 'Gutenberg galaxy' and the present of 'electric' media. Recent book history thus enfolds historical and even prehistorical media within today's capacious media-technology-information concept. Surprisingly, the digital paradigm has only reinforced this manner of refreshing the history of the book. While elegies over the 'death of the book' in the digital age such as Birkerts (1994) continue to be common, the liveliest work on the history and future of the book treats the codex as what amounts to digital media *avant la lettre*. From this point of view, alphabetic script, cut pages, typographical formatting, navigational aids, and (beginning in the Enlightenment) 'extensive' reading practices were digital in principle. Thus such notable scholars in the book history field as Chartier (e.g., 1993, 2004), Johns (1998, 2009), and Stallybrass (e.g., 2002) increasingly compare, and not just contrast, earlier writing/reading practices to their digital successors. Clinching the point are such works as Drucker (2007), which recovers the programming-like 'functioning' of books as a tutor text for the digital age, and Vismann (2008), which studies how the documentary and archival form of the 'file' binds together the manuscript, print, and digital ages.

The implications of media archaeology are similar. Originally associated with Continental *Schriftlichkeitsgeschichte*, especially as developed in the poststructuralist mode of Friedrich Kittler's works (e.g., 1990, 1999), media archaeology is dedicated to the study of old media *as* media-technology-information. There never was a time 'before' media, in other words. Or as Gitelman (2006) conceives it, media archaeology is about old media when they were new media. The fact that media archaeology has attended especially to what might be called vintage-modern or threshold-modern media--that is, media, technology, and information from the Enlightenment to the early twentieth century--also means that it witnesses in media the history of the 'new' itself

or, most generally, of civilizational modernization. As Ernst (2006) points out, media archaeology follows the model of Foucault's 'archaeology' of knowledge, which in a postmodern manner traces the sequence of epistemic breaks--morphed in retrospect into continuities--that are the 'genealogy' of modernity. Such recent scholarship as the collection of essays by Siskin and Warner (2010) testify to the potential in thus witnessing the birth of modernity in the history of media. Answering anew Kant's question 'what is Enlightenment?,' Siskin and Warner argue in their introduction (2010: 1) that the Enlightenment was foremost 'an event in the history of mediation,' referring both to concrete media technologies and mediational forms, practices, and institutional protocols in societies on the threshold of modernity. For media archaeology, in short, there can be no fundamental difference between modern media and historical media because the media concept bears within it, like a genetic trace, the history of the possibility of the modern itself.

3. *Rejoining the Social.* It is striking that while digital humanists concentrate on technology, media, and information, they rarely give equal weight to the idea of *communication*, which in the social sciences is an equally foundational concept (as witnessed in their standard name for the digital: 'information and communication technologies' [ICT]). Perhaps this is not surprising, given the residual influence of the formalist and linguistic turn in the humanities dating from the early through late twentieth century. Generations of literary scholars, for example, followed the lead of the New Critics in deemphasizing the communicative function of discourse. This was the price that had to be paid to stand up to what the New Critics saw as the hegemony of referential meaning in the age of science (and, secondarily, of mass media). Fighting what Cleanth Brooks (1947) called 'the heresy of paraphrase'--or the idea that poems had

something declarative to *say* that could be put in the form of a science-like proposition (or mass-media sound bite)--the New Critics turned our attention to linguistic structures so 'ambiguous' or 'paradoxical' that they were not communicative. Instead, they were what John Crowe Ransom (1941) called 'ontological.' In the motto the New Critics took from Archibald MacLeish's 'Ars Poetica' (MacLeish, 1985: 106-7), 'A poem should not mean / But be.' Or, to cite an earlier passage in MacLeish's poem, 'A poem should be wordless / As the flight of birds.' Subsequent structuralist and poststructuralist critics muted the communicative function in similarly subtle critiques of meaning. Thus, when structuralists privileged systemic *langue* rather than discursive *parole*, or, undercutting linguistic system itself, poststructuralists focused on *meaning effect* rather than meaning, so too did communication hollow out into a *communication effect* (or 'rhetoric,' in the deconstructive sense that Paul de Man gave the term). Ultimately, the digital humanities on both its text-oriented and new media studies sides also hit the mute button on communication. In the mode of McLuhan's dictum, 'the medium is the message,' they find deeply meaningful the complex 'systems,' 'networks,' and 'protocols' of media-technology-information rather than whatever content--sampled texts or songs, crowd-sourced posts or tweets, etc.--actually transits through the whole buzzing apparatus. The upshot is that very little of what the social sciences, including communication studies, have learned about how to study ICT has been taken up in the digital humanities. For example, digital humanists have not to my knowledge used 'media richness theory' (e.g., Daft and Lengel, 1984) to study functional or perceived differences of media and their impact on evolving relations between 'one-to-one,' 'one-to-many,' and 'many-to-many' communications (adopting some of the vocabulary of the social sciences).¹⁰

However, this situation has begun to change due to the introduction in the digital

humanities of *social computing* as a field of study. As I have explored elsewhere (Liu, 2010b), social-computing scholarship arises as sociological and communicational theories are applied to Web 2.0 social-network technologies. Studying blogs, wikis, Twitter, and other many-to-many media technologies, for example, social scientists apply 'social network theory' to try to understand what Web 2.0 enthusiasts imprecisely call 'the wisdom of the crowd,' 'the rule of many,' and 'crowd sourcing.'¹¹ Now digital humanists are similarly addressing Web 2.0 by incorporating the new technologies and social network theory. Practically, for instance, digital humanities projects, journals, and interfaces increasingly make room for Web 2.0 by adding folksonomic tags, shared 'bookshelves,' and similar crowd-sourcing features. (An example is the shared-tags component of the Collex environment for searching distributed digital resources.)¹² And theoretically, new media theorists such as Galloway and Thacker (2007) are adapting social-network theory to explore 'a theory of networks'; literary scholars such as Piper (2009), Moretti (2011), and Frank (2011) use social-network theory to model literature; and the Transliterations Project I direct has developed a project that exploits the idea of social networks for the historical study of the humanities (in the RoSE Research-oriented Social Environment about which some of my collaborators write in this issue of *Arts and Humanities in Higher Education* [Chuk et al., 2012]).

4. *Scaling Up*. The current sense of expansion in the digital humanities also stems from sheer growth in the scale of projects in the field--to the point that scale itself has snapped into focus as one of the field's constitutive concepts.

The text-oriented digital humanities, of course, have always had large ambitions. Such early, definitive digital-humanities Web sites or other projects as the William Blake Archive,

Romantic Circles, Rossetti Archive, The Valley of the Shadow project, Walt Whitman Archive, Women Writers Project, and others proved to be like the Tardis in the BBC's *Doctor Who* television series: they were larger on the inside than they seemed on the outside. Though nominally constrained to a specific corpus, they grew into ever-expanding interior networks of resources and scholars. My own Voice of the Shuttle web site for the humanities--initially just 70 or so hand-crafted web pages when it started in 1994--followed a similar pattern, swelling in its later database-driven form to what is now an unmanageable extent.

But the scale of such early digital-humanities projects cannot match that of more recent initiatives designed in principle to scale up to tera- or peta-orders of magnitude. Like 'big science' in the physics or astronomy fields, such digital-humanities tools, environments, distributed repositories, or other initiatives as MONK, SEASR, TAPoR, and NINES envision operating on vast bodies of content (e.g., document collections totaling up to 200 million words in MONK, and at present nearly 966,000 digital objects across 105 distributed sites in NINES) to achieve increasingly complex pattern-recognition results and advanced research capabilities. The ultimate goal is rapid, online, and on-demand analysis of texts (and other resources) at the corpora scale or across distributed repositories. A scholar should be able to turn on a computer anywhere and not only access, but perform sophisticated processing on, all the world's information, or at least all that resides in digital collections.

The new media studies side of the digital humanities has similarly scaled up. However, whereas the mental archetype of scale for text-oriented digital scholars is still usually a corpus, archive, or library, the equivalent archetype for digital artists and media theorists has from the first more closely approximated the capacity of contemporary information. After starting with

CD-based works, they quickly scaled up to the paradigm of the database and the network, making databases and the Internet not just their platforms but part of the core idea of their work. An instance of what Vesna (2007) has called 'database aesthetics,' for example, is George Legrady's *Pockets Full of Memories* art installation (Legrady, 2001), which at its premiere at the Centre Pompidou in Paris required visitors to scan in items from their pockets and fill out an accompanying questionnaire about the object's attributes. The computers driving the installation then processed the initial assemblage of over 3,000 objects through a self-organizing map (SOM) algorithm and projected the results in a 'wall of images' that clustered the objects in both predictable and surprising ways. Notably, Legrady saw the end result of the project (like that of many of his later projects) to be not just a visual display but an exploration of the structure of the underlying database and data (Legrady, 2007a, 2007b; Simanowski, 2005). So, too, Lisa Jevbratt's well-known art project *1:1*, which ran first in 1999 and then again in 2001-02 (Jevbratt, 2001-02), systematically crawled the Web to create 'a database that would eventually contain the addresses of every Web site in the world and interfaces through which to view and use the database.' The most famous of the interactive interfaces that Jevbratt created for the project was 'Every IP,' which--in a style visually reminiscent of Abstract Expressionism--filled the screen with colored pixels each linked live to a URL. The advent of Web 2.0, whose technology combines databases with the network to drive blogs, wikis, social-networking sites, and so on then further stretched the canvas of net art, net criticism, and similar variants of new media studies.

In general, the future of the digital humanities (including new media studies) is likely to be big. Indeed, recent funding competitions have encouraged a new wave of projects focusing on

scale--e.g., the 2008 Humanities High Performance Computing grants (co-sponsored by the U.S. National Endowment for the Humanities and Department of Energy), the 2009 and 2011 Digging into Data Challenge grants (co-sponsored by an international consortium of funding agencies), and the 2010 Google Digital Humanities Research grants (which challenged humanists to exploit Google Books).¹³ Such bluesky competitions are on the same page--which is to say, millions, billions, and googols of pages--with the 'big humanities' challenge that Cathy N. Davidson, cofounder of HASTAC (Humanities, Arts, Sciences, and Technology Advanced Collaboratory) has made to the digital humanities community. Paraphrasing from one of her unpublished talks that I attended, Davidson (2006) asks: where are the big humanities projects that compare to big science by requiring petaflop supercomputing and terabyte storage; that necessitate sprawling, distributed teams of researchers; and that are magnets for science-scale government or corporate grants? As Davidson says (quoting a blog report of her talk [Fisher, 2006]): 'size matters (think terabytes + broad theoretical horizons).'

This last formula for the big humanities with its emphasis on theoretical horizons marks a crucial inflection point in the scaling up of the digital humanities. At these dimensions, scale is no longer a matter of improvising technical and workflow arrangements to allow the python, as it were, to swallow the mule. It is a matter of principled design requiring thought, both practical and philosophical. Early digital humanities projects had scaled up more or less accidentally, with the result (to the best of my knowledge) that every one of them ran up against the same virtual supersonic barrier. The barrier took the form of the following impasse: either a project retains established practices of scholarly quality-control (e.g., hierarchically-organized editing teams led by authorities, whose work is peer-reviewed in the traditional way by other authorities), in which

case no addition of terabytes and petaflops can allow it to scale up past the human bottlenecks (how many experts are there, and how many hours of time do they have each day to work on a project?), *or* a project uses some combination of algorithmic means and crowd sourcing to take the brakes off the terabytes and petaflops, whereupon quality-control no longer meets the standards of scholarship. Crossing this barrier between expert knowledge and algorithmic/crowd knowledge will require fulfilling the call that Bowker and Star have made for theorizing the 'scaling up' of information (1999: 290 ff.; see also Star, Bowker, and Neumann, 1997). While the challenge of an adequate theory of scale--technical, social, cultural, and even philosophical--has not yet been met in the digital humanities, the field has at least reached the threshold of thinking deliberately about the problem. An emblematic example is Galloway and Thacker (2007), whose approach telescopes between the micro-scale of information protocols and the macro-scale of what Hardt and Negri (2000) call today's globalist, virtual 'empire.' Scale is a new horizon of intellectual inquiry. What kinds of humanistic phenomena appear only at scale?

5. *Expanding the Interpretive Paradigm.* The overall outcome of the conceptual integrations and expansions I itemize above is that the digital humanities are now able to ask not just more questions about technology-media-information (as they relate to the past, to society, and to phenomena at scale) but also new *kinds* of questions that bring the field closer to mainstream scholarship in the humanities. The digital humanities are on the threshold of a new interpretive paradigm.

The old paradigm, especially on the text-oriented side of the field, was constraining. That paradigm was empirical. As Ramsay (2003) and Flanders (2005) observe, scholars such as Potter (1989a, 1989b), Fortier (1993/1994), and Hockey (2000) had perceived humanities computing (in

Ramsay's paraphrase) to be about 'hypothesis testing and empirical validation.' The computer, in other words, prepared for, assisted, detailed, confirmed, or corrected human acts of meaning-making.¹⁴ In Flanders' witty comparison, a computing humanist was thus seen as a "pedant" of the sort that Jonathan Swift and others once lampooned in the age of reason: a drone with an algorithm who mindlessly churns out reams of detail proving either the obvious, probable, and tautological that humans already know or, more egregious, the contingent, entropic, and meaningless about which humans do not care. The flip side of the equation was equally debilitating: if computers took charge of evidentiary and analytical operations, then humans proper (in this context, humanists) were boxed into the opposing role of geniuses who had to create hypotheses *ex nihilo*. Thus Ramsay (2003: 169) points out that Hockey had to split the firmament of interpretation between computers that 'are good at counting, providing accuracy, and isolating patterns' and humans reliant on 'intuition, and serendipity.'

The new paradigm allows computers and humans to share responsibility for the full act of interpretation, including the component acts of hypothesis-framing, observation, discovery, analysis, testing, reiterative hypothesis-framing, etc. A vivid example is the experiment in which Jerome McGann and Johanna Drucker repeatedly ran an advertisement page from a nineteenth-century periodical through a scanner and optical character recognition (OCR) software, just to see what would happen (McGann, 2001: 137-60). What happened was that the computer was unpredictable in the way it structured and 'read' the complex textual-graphical codex page. The initial hypothesis driving the experiment--that every page is rich with complex, even ambivalent structural metadata--came from McGann and Drucker as humans (conditioned as they were, of course, by a lifetime of immersion in the codex). But the resulting full act of interpretation--in

which the combined empirical and playful interventions of the machine (like a fine musical instrument that 'plays' the intention of a musician though unpredictable, yet somehow profoundly wise or beautiful, evolutions of resonance and timbre)--belong to the cyborg assemblage of McGann-Drucker-scanner-OCR-and-computer. 'It occurred to us,' McGann writes, 'that we might take advantage of the elementary reading operations carried out by . . . OCR programs' (2001: 144). The Zen truth of this statement hides behind the verb *occurred*. *Occurred* is where human 'intuition, and serendipity' (in Ramsay's phrase) happen. But such happening is really relayed back and forth in a feedback loop between humans and computers in the latter's role not just as empirical testers but as co-discoverers. As in Bruno Latour's 'actor-network theory' of distributed human and machinic agency (e.g., Latour, 2005), the computer participates in the act of intuition and serendipity. We note, for example, that while McGann (2001: 144-45) recounts programmatically the sequence of steps that he and Drucker took--e.g., 'a repetition of operations 1-6 except we would lift the document and replace it in as nearly the same position as we could'--at no point do the procedures come close to the rigorous standards of scientific experimentalism. (For instance, what exactly is the hit-or-miss logic of *nearly*--a kind of fake empiricism--that governs the attempt to put the document back 'in as nearly the same position as we could'?) Basically, McGann and Drucker were playing around to see what the computer could do to help humans discover new ways of reading or, just as important, new understandings of how we have always read.

This example illustrates how digital humanists have recently diversified their idea of what the computer is supposed to be doing even in the most empiricist domain of their field: text analysis. One of the most significant changes in the digital humanities in the last few years is thus

that text analysis has finally allowed itself, as it were, to inhale or take LSD. In other words, it's as if the cyberlibertarian era of the 1970's and early 1980's that text analysis was originally coeval with, but from which it held itself apart by dressing in a scientist's white lab coat while everyone else wore hippie tie-dye and batik, is finally being acknowledged in a second-generation cyberlibertarian revolution. Computational tools originally designed to produce concordances, collocations, frequency analyses, and so on are now complemented by tools that either have no apparent empirical function at all (e.g., the Word Brush tool that TAPoR includes for painting evocative visual sprays of words based on a source text) or that have so many empirical functions (e.g., the multipanel collage of text-analysis tools offered by HyperPo and subsequently Voyeur, themselves invoked in TAPoR) that empirical investigation undergoes a phase-shift from testing or verification to playing around. And, of course, empiricism has never much impeded artists and theorists on the new media studies side of the field, however much they sometimes delight in adopting empirical sources and presentation forms as good camouflage for art, much as Marcel Duchamp once appropriated such pedestrian objects as a urinal or snow shovel. An example would be Lise Autogena and Joshua Portway's *Black Shoals: Stock Market Planetarium*, an art installation that fused two found forms to present empirical data as an 'an animated night sky that is also a live representation of the world's stock markets, with each star representing a traded company' (Autogena and Portway, 2001; see Raley, 2009: 109-52, on this installation).

In general, perhaps the single most important theoretical development in the digital humanities in recent years has been the explosion of non-empirical interpretive paradigms for what the computer can do. In their influential essay 'Deformance and Interpretation,' for example, Samuels and McGann (1999) give the computer a performative role that 'deforms' texts to release

previously unseen potentialities of meaning and experience. McCarty (2005: 26, 38, 39) articulates a philosophy of 'modeling' leading to 'meaningful surprise,' 'the computationally unknown,' and (a post-Newtonian scientific motto he borrows from McGann) 'the hem of a quantum garment.' And Rockwell (2003: 13-14) and Ramsay (2003: 171) argue that the digital humanities should be conceived as 'disciplined play,' 'algorithmic criticism,' or 'playful quest.' Even Hoover (2005), who not only argues against Samuels and McGann's particular examples of 'deformance' and their conclusions but also ran his own OCR experiment to refute the bolder claims of McGann and Drucker's experiment, includes (in the process of arguing for interpretive methods that converge on, rather than diverge from, texts) a surprising number of examples of deliberate or implicit textual deformations, or what he prefers to call 'alterations.' For example, besides the suite of alterations of Joyce Kilmer's 'Trees' poem that concludes his essay (Hoover, 2005: 91-99), he includes an example from his collection of 'found poem' word-frequency lists (produced by text analysis) that have the oddly readable appearance of modernist poems:

Burning companion

(Heaven kissed ladies learn)

Leaves natural notice

O society, spread twice west! (Hoover, 2005: 79)¹⁵

Thus even text analysis that defends the verifiable integrity of texts--whether in the spirit of empiricism or the 'close reading' that the New Critics proposed as a rival to scientific empiricism--adds an element of play to the work of verification. Put another way, such text analysis reveals the restless exploratory spirit that had always lain beneath truly robust acts of verification.

A Critique of the Digital Humanities

A fuller account of the state of the digital humanities might consider additional ways in which the field has become more integrated and expansive. For example, I have written elsewhere about how the field has evolved organizationally and made connections with other disciplines (Liu, 2009). But I will close on a monitory note by indicating several conspicuously lagging areas in the digital humanities, ending on what I feel is the field's single greatest deficiency at the present time.

What are the digital humanities missing?

For one thing, the field has so far largely lacked a considered focus on new-media *forms*, whether in terms of genre, rhetoric, or style. By comparison with their preoccupation with technology, media, and information, digital humanists have so far been theoretically inattentive to the formal (as opposed to technical or social) differences between, for example, static-page versus template-driven Web sites, blogs versus wikis, and so on--not to mention between 'born-digital' forms in general and such digitized-print forms as online 'documents,' 'books,' 'encyclopedias,' 'editions,' 'archives,' and 'libraries' (the usual focus of the text-oriented side of the digital humanities). Indeed, with the exception of some innovative research on inventing new bibliographical conventions for describing born-digital forms (e.g., Kirschenbaum, 2002: 43-51), digital humanists tend to understand new-media forms as residually print-centric to the point of blinding us, for example, to the fact that the *least* interesting aspect of an online 'book' in the age of Google Books is its resemblance to a book, or that Wikipedia is only an encyclopedia if we agree that its many unexpected contemporary social functions and behaviors, including what Lih (2004) calls 'participatory journalism,' are encyclopedic.

How might a formal analysis of new media proceed in a way that draws on the resources of new media itself to reveal salient formal distinctions? A first step, I suggest, would be to follow the lead of digital humanists who have used computational text analysis to facilitate the stylistic or generic analysis of historical print forms. Such approaches are today increasingly ambitious in their hermeneutical aim. The 'corpus stylistics' or 'quantitative stylistics' projects embarked on by Matthew Jockers, Franco Moretti, and their students at the Stanford Literary Lab, for instance, not only correlate low-level textual features with high-level genres (see Jockers, 2009) but show that analysis of such features can guide powerful interpretations of what genres *mean* in their larger literary and social envelopments. Thus text analysis of titles of British novels from 1740 to 1850, Moretti (2009) shows, unlocks new understandings of novelistic genres that are not just mechanically but meaningfully formal. As he puts it, quantitative stylistics can 'take those units of language that are so frequent that we hardly notice them, and show how powerfully they contribute to the construction of meaning' (Moretti, 2009: 156). Reflecting on the general relation between quantitative analysis and formal understanding, he adds:

This is a quantitative study: but its units are linguistic and rhetorical. And the reason is simple: for me, formal analysis is the great accomplishment of literary study, and is therefore also what any new approach--quantitative, digital, evolutionary, whatever--must prove itself against: prove that it can do formal analysis, better than we already do (Moretti, 2009: 152-53).

The second step would then be to bring the same approach to bear on contemporary new-media genres. One way to do so would be to apply such text-mining methods as those deployed by Jockers and Moretti to new forms of writing and publishing today, including blogs, wikis,

Twitter, and even the new online or hybrid digital/print forms of scholarship in which research *about* the new forms must itself now be conducted. In regard just to scholarly online forms, for instance, what might text analysis (or, more generally, data-mining analysis) of online archives and editions, major digital project sites, conference sites, online journals, or scholars' blogs and tweets reveal about new-media styles and genres? For example, are there differences in the ways an online 'archive,' 'library,' 'edition,' 'portal,' 'journal,' etc., deploy such basic topoi of the new media as a 'link,' 'navigation bar,' 'banner,' 'footer,' 'tag cloud,' and so on that might illuminate the deep logic of new scholarly forms as the constraints of old metaphors fall away to reveal new possibilities (e.g., 'archives' that replenish through crowd-sourced rather than authoritative curation so as to alter the meaning of 'archive')?

In general, digital humanists need to inquire into the evolving *idea* of form in an age when 'templates' and 'stylesheets' mediate automatically between underlying database content and rendered surface content so as to alter the very parameters of a formalism that originally arose among early twentieth-century poets, designers, and critics on the premise that artist-authors directly designed words on a page, or typography on a poster. In this regard, *pattern* (as discerned through algorithmic pattern-recognition) is as yet just a placeholder for *form*. While forms have meaning in great part because they are specifically opposed to other forms (as the Russian Formalists early theorized), patterns cannot be distinguished from other patterns without the overlay of formal criteria. Otherwise, pattern is only opposed to random noise.

It may be added that the tendency on the new media studies side of the digital humanities to suspend formal analysis almost entirely in favor of 'network' analysis has its own problems, especially the fact that very few scholars and critics (by comparison with a somewhat greater

number of net artists) understand technically what is happening inside today's server architectures, distributed 'cloud' architectures, and Internet protocols. The result is that *network* often becomes a totally formless concept unable to compensate for the lack of formal analysis by supplying structural analyses of the new kinds of form innate to the technology of networks (e.g., the way a blog page is constructed through constellations of mixed PHP/HTML files that extract content from databases and dynamically wrap that content in 'themes' obedient, for instance, to generic expectations about what a 'post' is in relation to a 'comment').

Beyond an understanding of form, the digital humanities are also missing what might be called *close reading 2.0*, or a method of micro-analysis in the era of big humanities. One of the most influential developments in humanistic methodology in the last few years has been what Moretti calls 'distant reading' (succinctly demonstrated in Moretti, 2005), which extends the large-scale, serial data method of the *Annales* school in French historiography to literary phenomena (e.g., cyclical patterns that can be discovered in the rise and fall of genres by looking at thousands of novels at a time).¹⁶ Big-humanities projects in the digital humanities are natural collaborators of such distant reading--in the way, for example, that Jockers's 'macro-analysis' methods collaborate with Moretti's distant reading methods.¹⁷ But how do we read individual objects of humanistic interest in the era of distant and macro analytics?

An interesting test case comes from one of the winners of the Humanities High Performance Computing grant competition: the Software Studies Initiative led by Lev Manovich at University of California, San Diego. The Initiative develops 'cultural analytics' projects that use 'computational and visual techniques for exploring massive visual data sets' (Software Studies Initiative, 'Cultural Analytics'). One of the Initiative's projects--shown in a video demo

(Douglass, 2009)--allows for continuously drilling down from a macro-view of data points representing Mark Rothko's artistic production to high-resolution images of each picture behind a point. The result is like the seamless experience of zooming down on a location in Google Earth. Nevertheless, the system cannot overcome the fact that the interpretive or analytical methods at the two ends of the scale, macro and micro, are anything *but* seamless in their relationship. It is unclear, for instance, that there is any resemblance between macro-scale data visualization and the way an expert art historian (or, to vary the example, a good reader of a poem) analyzes imagery. It may be predicted that one of the next frontiers for the digital humanities will be to discover technically and theoretically how to negotiate between distant and close reading. For instance, how might computational text analysis be relevant to the reading of the interior structure of individual poetic lines or a single Tweet? How do discoveries about novels at the generic, generational, and national scales of the sort analyzed by Moretti and Jockers change the way we read at the scale of the traditional unit of literary analysis: a block-quotation paragraph?

Something else missing in the digital humanities--more on its text-oriented than new media studies side--is what might be called *data aesthetics*. By contrast with new-media art or net art, the parts of the field that emerged from text analysis, text encoding, edition- and archive-building, and so on have paid scant attention to the aesthetic and affective experience of processing and harvesting data--i.e., the expression of search results, sampled or aggregate data, remixed data, and patterns of all kinds. For instance, one has only to view any typical data visualization from the text-oriented side of the digital humanities (concordance-like lists, line or bar graphs, clichéd tag clouds, etc.) to recognize the near-total imaginative poverty of the field in crafting an aesthetics of data. In great part, this is due to the conceptual separation in the field

between the formatting of 'data' and the encoding of 'metadata,' where metadata--or data-about-data intended to help computers manage the primary data--is presumed to operate on logical structures (e.g., the nested relation between stanza groupings and verse lines in a text-encoded poem) independent of expressive structures (e.g., font, spacing, and margin decisions in the presentation of stanzas and verses). In practice, this means that text-oriented digital humanists devote a great deal of thought to developing metadata, and very little to the look-and-feel of data. Thus, for example, they seem agnostic about, if not oblivious to, whether texts should be in serif or sans serif fonts. By contrast, just about the whole population of new-media artists and designers--rooted in the traditions of twentieth-century modernist design stemming from Bauhaus, the New Typography, and so on (the same minimalist industrial aesthetic that shapes the Mac computers they prefer)--swear allegiance to sans serif as not just logically functional (its original modernist rationale) but expressively 'good design.' What is missing in the text-oriented digital humanities is similar attention to the feedback loops that arise between conceptual and expressive design--to the reverberation of logic on style, and vice versa.

In general, while text-oriented digital humanists have expanded their paradigm of interpretation (as I described earlier), they have not yet realized that the corollary of such expansion is a wider expressive repertory of interpretation. Indeed, the verb *interpret*--ordinarily affectless in scholarship because it is keyed to the cerebral registers of epistemology and hermeneutics--may not even be the right word anymore. As noted above, the verbs *deform*, *model*, and *play* have been added to the repertory. Student digital projects created for my 'Literature+' courses in the past few years (see Liu, 2008a) prompt more verbs: *perform*, *adapt*, *parody*, *translate*, and *read* (in the sense of a poetry or script reading). In short, *interpret* is only

adequate if we begin to see the interpreter in the role of a musician, actor, or painter 'interpreting' a scene or score. All those additional verbs take on connotations of affect and aesthetics that exceed the normal reception of 'data' as such. In popular culture, as I have noted in my *Laws of Cool* (Liu, 2004a), such data-affect currently collects in the lumpen-aesthetics of *cool*. It will be up to text-oriented digital humanists working in league with new media artists to exceed cool by extending the affective and aesthetic register of their work through metadata symphonies that can make data also seem beautiful, tragic, comic, ironic, elegiac, and so on. Handling metadata so as to create a feeling for data--and so collapsing the phenomenological divide between metadata and data--may well be the secret formula for what Hayles (1999) calls the *embodied* experience of information.

The missing or lagging areas in the digital humanities I outline above are each worthy of fuller discussion, since they are staging grounds for new developments in the field. But I will rest this essay on a larger, superseding deficit. The digital humanities are not yet prepared to accept their likely future responsibility to represent--both by critiquing and advocating--the state of the humanities at large in its changing relation to higher education and the postindustrial state.

If the field of the digital humanities has expanded (and integrated) its fundamental concepts, historical coverage, relationship to social experience, scale of projects, and range of interpretive approaches, then it follows that it increasingly resembles the humanities in general. A commonplace prediction in the digital humanities, indeed, is that one day the field will just be identical with the humanities in the way the 'print humanities' once were when the study of print was capacious enough to serve as the container of human studies at large. More realistically, it may not be that the digital humanities will in the near future reach the point of identity with the

humanities, but the digital-humanities field *has* entered a transitional state when it is capacious and multifaceted enough to serve as a credible *allegory* of the humanities of the future.

To recur to the business analogy, the precedent is the so-called 'productivity paradox' in the U.S. in the 1980's and early 1990's (see my fuller discussion in Liu, 2004a: 152-54). The productivity paradox refers to the period when massive U.S. corporate investment in digital technology led to flat or declining productivity, raising the question: what was all the computing and networking for? The answer, in part, was that computing and networking fulfilled the need of U.S. business (goaded by frightening competition from revolutionary Japanese business practices) to imagine fundamental change in its processes, organization, and 'knowledge work.' Computing was an allegory for the not-yet-realized postindustrial corporation. Indeed, business theorists and gurus enthusiastically borrowed metaphors from the vocabulary of digital or networking processes to describe, for instance, the 'virtual corporation' (Davidow and Malone, 1992). The humanities, we may say, are now caught in their version of a productivity paradox. Even with all their new disciplinary or interdisciplinary approaches, their productivity, as understood by society, is flat or declining. This is one way (and there are much unkindly ways) to say that the humanities are found wanting in their contribution to postindustrial productivity, a perception that results in the recent systematic defunding of the humanities by some governments and public university systems.

Business 'solved' its productivity paradox by drawing a third, imaginary axis on the XY graph of information technology versus productivity--a new Z-axis of development on which information technology projected a *qualitative* change ('reengineering,' 'restructuring,' 'disintermediation,' 'downsizing,' and so on) whose results did not yet show up in productivity

metrics but predicted the postindustrial corporation. How might the humanities, and higher education in general, solve its productivity paradox by using information technology to draw its own version of an imaginary Z-line of development whose results may not yet be fully visible in productivity but forecast a role for the humanities in the postindustrial university? That, we may say, is the *advocacy problem*: how to use the new media technologies to advocate for the future of the humanities. The pendant question is of the sort: is the only projected Z-line of development one that will lead to 'eleventh campuses' and 'cyber-campus' that are the same in all essential principles and practices as the 'virtual corporation'? Will there be no differentiated role for institutions of higher education, including such disciplines as the humanities, within the postindustrial state? That is the *critical problem*.

If I am right that the digital humanities have entered a phase where they are sufficiently 'big' enough to serve at least allegorically as a representative of the future of the humanities in higher education, and in turn (in league with new media and technology approaches in other disciplines in the university) of the future of higher education in the postindustrial state, then digital humanists are now uniquely positioned to play a role in both humanities advocacy and critique. This raises a whole new class of issues--for example, not just *how can the digital humanities serve the humanities?* but *how can the digital humanities help the humanities and higher education serve larger society so as to show the distinct value of the humanities?*

The digital humanities have so far not been up to the task of addressing such issues. While much of the rest of the humanities have been influenced by cultural criticism, for instance, the text-oriented side of the digital humanities has been almost wholly uninterested in any social, political, economic, or cultural inquiry into the contexts and implications of information

technology--to the point that one thread on the Humanist Discussion Group in 2010 (a listserv focused primarily on the digital humanities) worried that in pursuing technical developments the field was all about 'industrialisation.'¹⁸ The new media studies side of the field--especially in its emphases on net critique, tactical media, and so on--has been much more aware, sometimes almost exclusively so, of social, political, economic, and cultural issues. Yet its mode of sociocultural critique often inflates issues of technology-media-information to the hyper-global scale of the 'crowd' versus the 'empire' (a contest, we may say, of alternate totalities) with little attention to the complexly related, yet differentiated, *institutions* in between that do the messy and patchy (i.e., partially totalistic) work of mediation between peoples and states. In particular, new media studies often seem oblivious to the complex nature of the higher-education institutions in which they are embedded--i.e., the concrete tactical ground of what Foucault (1980: 126-29) called the 'specific intellectual.' It is as if every aspect of society and states were open to new-media, tactical, and hactivist critique except the tolerance, protection, or other set-aside that society usually (with some notable recent exceptions) provides for the differentiated role of universities within societies--e.g., universities with new media studies programs.¹⁹

This is the opening of a larger argument about the digital humanities and the differential nature of contemporary institutions. But rather than try to outline that argument here, I close simply with a comment I made recently in a live debate staged between myself and Pierre Lévy on the topic of "Collective Intelligence or Silicon Cage?: Digital Culture in the Twenty-First Century':

The institution of the humanities prepares the individual (e.g., the student) to become part of the universal (society). But it fulfills that mission in ways different

from military institutions inducting a recruit, business institutions recruiting a graduate, etc. . . . To bring their field to maturity, I predict, humanists interested in cyberspace will need to articulate the institutional specificity of the 'digital humanities' and 'new media studies.' What are the organizational, procedural, social, cultural, political, economic, gender, racial, and other historical specificities of these new fields; and how does the institutional difference of these fields contribute to the universal without totality? (Liu, 2010a)

I also add, as the latest development of this line of thought, that I and others in the international digital humanities community started in November 2010 the online initiative *4Humanities*, whose 'About' statement reads: '4Humanities is a platform and resource for advocacy of the humanities, drawing on the technologies, new-media expertise, and ideas of the international digital humanities community. The humanities are in trouble today, and digital methods have an important role to play in effectively showing the public why the humanities need to be part of any vision of a future society.'

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Notes

1. For another impressively multi-dimensional attempt to defined the scope of 'digital humanities,' see Rieger, 2010. For my own earlier account of the way different elements of 'new media studies'--including institutional programs, canonical texts, pedagogical readers, etc.--came together after about 2000 to form 'a coherent, if not wholly unified, field,' see Liu, 2008b: 228-29.

2. Edley's op-ed essay contained little evidence of successful precedents in large-scale virtual higher education at the level of research institutions such as the University of California universities. His primary precedent is drawn from the United Kingdom: 'there are some important success stories. Britain's government-funded Open University, begun 40 years ago, offers some lectures in partnership with the BBC. It claims 5% of Britain's adult population has taken at least one of its courses, and it ranks second in student satisfaction out of 258 British institutions, with high marks from government inspectors too.' To be fair, Edley's call for action on this front has since been followed up by the UC Online Instruction Pilot Project, which has started incubating a small set of online courses in the University of California system to test directions and formats (University of California Office of the President, 2010a; Kaya, 2010). In November 2010, the University of California Commission on the Future--created to suggest strategies for the university to adapt to severe budget cuts--included a version of the online-instruction proposal

and the pilot project as one of the recommendations in its Final Report (University California Office of the President, 2010b: 14-15). The language of the recommendation included the qualified statement: 'If questions related to quality, cost, and workload can be satisfactorily answered--a hotly debated issue among the UC faculty--online delivery of instruction would offer several benefits.'

Other universities in the U.S. are experimenting in the same direction (see Gabriel, 2010).

3. Gates commented that 'Five years from now on the Web for free you'll be able to find the best lectures in the world. It will be better than any single university. . . .College, except for the parties, needs to be less place-based' (quoted in Young, 2010). See also Fried, 2010.

4. Most notably, the overlap between humanities computing and new media studies occurs in the area of creative digital literature--especially as the practice and study of such 'electronic literature,' as the Electronic Literature Organization calls it, verge into multimedia, algorithmic, and network art as well as gaming studies.

5. Garcia and Lovink (1997) offer the definition: 'Tactical Media are what happens when the cheap 'do it yourself' media, made possible by the revolution in consumer electronics and expanded forms of distribution (from public access cable to the internet) are exploited by groups and individuals who feel aggrieved by or excluded from the wider culture. Tactical media do not just report events, as they are never impartial they always participate and it is this that more than

anything separates them from mainstream media.'

6. On text encoding, Renear (2004: 218) observes: 'Text encoding holds a special place in humanities computing. It is not only of considerable practical importance and commonly used, but it has proven to be an exciting and theoretically productive area of analysis and research. Text encoding in the humanities has also produced a considerable amount of interesting debate -- which can be taken as an index of both its practical importance and its theoretical significance.'

On the Ordered Hierarchy of Content Objects problem, see Renear, Mylonas, and Durand (1993); Hockey, Renear, and McGann (1999); and McGann (2001: 139).

7. On the work of Cayley and Mez Breeze, see Raley (2002). Memmott's *Lexia to Perplexia* (Memmott, 2002) is now a standard work in the 'electronic literature' canon, as in the discussion by Hayles (2002: 46-63).

8. My understanding of data mining in the specific domain of text mining has been assisted by a survey and analysis of the field conducted by Rama Hoetzlein (2010) during work on the RoSE (Research-oriented Social Environment) project for the Transliterations Project.

9. The display of the graphic visualizations by Viégas and Wattenberg at the Museum of Modern Art in New York City (during my visit in July 2010) was labeled 'History Flow.' For the original,

influential article that introduced history-flow visualizations of Wikipedia editing patterns, see Viégas et al. (2004).

10. My thanks for the reference to media richness theory to Bola C. King-Rushing, whose dissertation in progress at the University of California, Santa Barbara (entitled 'A Theoretical Framework for Virtual-Worlds Research: Toward a Proxemics of Virtuality') bridges between humanities approaches and the methods of communication scholars.

11. A good introduction to using social-network theory to study online social networks is Garton, Haythornthwaite, and Wellman (1997), which appeared prior to Web 2.0. A similar introduction updated to the Web 2.0 milieu is Hogan (2008). The 'wisdom of the crowd' and other phrases I use here are now commonplace in discussions of Web 2.0.

12. Collex can be seen in action on the home page of NINES (Networked Infrastructure for Nineteenth-Century Electronic Scholarship). For information about Collex, see <http://www.nines.org/about/software/collex.html>.

13. See Bobley (2008), Digging into Data Challenge (homepage, n. d.), and Google, Inc. (2010).

14. In a passage cited by Flanders (2005: 43), Potter (1989b: xvii) writes, 'Objective treatments of texts frequently involve not only finding examples of features, but also counting them and

comparing the results with known facts about language. Things counted produce sums; . . . statistical analysis follows almost inevitably.' The characterization of this paradigm as 'hypothesis testing and empirical validation' is Ramsay's (2003: 169).

15. My thanks to David Hoover for showing me a larger collection of such examples of text-analysis 'found poems' when we met at the Digital Humanities Summer Institute at the University of Victoria in May 2008.

16. While the influences that underlie Moretti's approach are multiple, I make the connection to *Annales* historiography in particular because of Moretti's own citations of Fernand Braudel's work (e.g., Moretti, 2005: 4, 13-14, 24).

17. My thanks to Matthew Jockers for conversation during my visit at Stanford University on 21 May 2010 about his idea of 'macro-analysis,' which he analogizes to macro-economics, and for a manuscript section he subsequently sent me on this topic from his book manuscript, *Beyond Search: Literary Studies and the Digital Library*.

18. Willard McCarty started the discussion thread on 'industrialisation' of the digital humanities. The thread is available in the Web archive of the Humanist listserv (beginning with McCarty, 2010). My statement here that the text-oriented side of the digital humanities has been almost

wholly uninterested in cultural-critical inquiry is a simplification. A more extended discussion would note that the latent cultural-critical interest of the digital humanities lies recurred within digital textual methods influenced by the 'new textual scholarship' and sociological bibliography I mentioned earlier, which (as I described) focus 'on textual media as social practices inseparable from their historically situated material technologies.' (My fuller discussion of the missing cultural criticism in the digital humanities occurs in Liu [2011b], with a shorter online version in Liu [2011a].)

19. In mentioning 'some notable recent exceptions,' I allude especially to the case of Ricardo Dominguez, Associate Professor in the Visual Arts Department at the University of California, San Diego, who in academic year 2009-10 applied his hacktivist methods (well-known in the new media studies community) to the University of California system after the university reacted to California's budget meltdown that year by imposing harsh budget cuts. As widely reported--e.g., Kolowich (2010) and Goldstein, (2010)--Dominguez initiated a 'virtual sit-in' by launching against the Web site of the UC Office of the President a version of the distributed denial of service (DDoS) hacker attacks he was known for using in earlier artistic/political projects. This led to an investigation of Dominguez by UC and ultimately to a negotiated agreement that 'Dominguez will stay in his current position and has agreed not to interfere with the server of the office of the president or use university resources in any way that "might result in permanently or temporarily damaging the integrity or availability" of other Web sites' (Goldstein, 2010).