At the core of this book are convictions derived from a combination of theoretical investigations into problems of knowledge production and experimental projects conceived under the general rubric of speculative computing. Speculative computing arose from a productive tension with work in what has come to be known as digital humanities. That field is constituted by work at the intersection of traditional humanities and computational technology, using digital tools to extend humanistic inquiry. Speculative computing stresses the need for humanities tools in digital environments, thus inverting the power relation in which computational methods rooted in formal logic are granted more authority than methods grounded in subjective judgment. The arguments I make here—for the importance of aesthetics, subjectivity, and speculative work—are not relevant only to projects undertaken in electronic environments. But the insights arose in the process of working out problems in knowledge representation and interpretation that were central to digital humanities in the late 1990s and early 2000s. The goal of SpecLab was to challenge the conceptual foundations of digital humanities through aesthetic provocation.

Digital humanities, sometimes referred to as humanities computing, has taken upon itself the task of addressing the methods and implications of the migration of our cultural legacy into digital form and the creation of new, born-digital materials and tools. Nowhere was digital humanities more highly developed or charged as a field than at the University of Virginia in the 1990s. I arrived into that dynamic arena as a latecomer, but with a developed interest in aesthetics and digital work being done in new
media in fine arts, poetry, graphic and information design. With Jerome McGann and Bethany Nowviskie, I created several projects beginning in 2000 that became the core of SpecLab.

Under that rubric (short for Speculative Computing Laboratory) we undertook collaborations with uncertain outcomes (one part of the meaning of the term speculative), intent on pushing the limits of conventions that were already becoming consolidated in the digital humanities community. The happy circumstance of having a small cohort intent on introducing experimental projects within a community where the consensus for practices and methods was emerging created a fertile institutional context within which the undertakings on which this book reports were conceived and executed.

I now believe that the lessons of SpecLab are as vital to the future of the humanities as digital humanities is to the continuation of scholarship and research across the humanistic disciplines broadly conceived. We learned many lessons about knowledge and subjectivity, about information design and representation, about creating conditions of use and designing instruments to show the complex activity of interpretation. These have recast my understanding of traditional print materials as radically as my encounter with critical theory, deconstruction, and post-structuralism did twenty-five years ago. In many ways, SpecLab allowed those theoretical constructs to become applied to practice, even as they were combined with insights from quantum physics, ‘pataphysics, systems theory, and cognitive studies. vi

This book is thus addressed to several communities. Among digital humanists, its specialized research may generate reflection on lessons from the past and for the future. To the wider field of humanist scholars, it offers an introduction to the theoretical
implications of the practical changes being wrought by digital activity in the way we do our daily business. These technological changes extend critical investigations begun decades ago in theoretical challenges to received notions of author, text, image, and intellectual methods of inquiry. The field of digital humanities is not simply concerned with the practical matters of creating new electronic environments for access to traditional or born-digital materials. It is the study of ways of thinking differently about how we know what we know and how the interpretative task of the humanist is redefined in these changed conditions in ways that illuminate our traditional activities. SpecLab’s projects were not just designs of new conditions for work, but attempts at designing ways to model and demonstrate new conceptions of that work and its fundamental assumptions. For me, the guiding tenets of this activity have always been the same. What is the relation between aesthetic expression and knowledge? And then, how do we take such relations into account in modeling our interpretative approaches so that they expose the ideological as well as epistemological workings of complex cultural activities? From my very first encounters with digital media, I have been convinced that the powerful cultural authority exerted by computational media, grounded in claims to objectivity premised on formal logic, can be counter-balanced through aesthetic means in which subjectivity is central to the concept of knowledge as interpretation.

*Aesthesis*, as will become clear in the pages ahead, is the term by which I refer to a theory of partial, situated, and subjective knowledge—a theory whose aims are ideological as well as epistemological. Digital media, by their curious combination of capabilities (on which much will be said in the pages ahead), have the ability be the site of demonstrating simultaneously the exclusion of subjects (human, individual persons
constituted in their relation to social, cultural, historical circumstances) and their presence, inscription, and participation in the production of knowledge. I think this is what brought home so strongly the realizations that form my argument.

These are large claims. The concept of aesthesis engages basic questions about knowledge, its representation, and interpretative acts and the values assigned to these within a cultural frame. Insofar as form allows sense to appear to sentience, to paraphrase Aristotle, the role of aesthetics is to formulate an understanding of the ways the forms of knowledge provoke interpretation. Insofar as the formal logic of computational environments validates instrumental applications across the management and creation of digital artifacts, imaginative play is crucial to keeping that logic from asserting a totalizing authority on knowledge and its forms. Aesthesis, I suggest, is the study of knowledge as experience and interpretative events. But I am also using it in this context to insist on the value of subjectivity that is central to aesthetic artifacts – works of art in the traditional sense of richly imaginative expressions in poetry, visual art, or other spheres. Aesthesis is a term for placing subjectivity at the core of knowledge production in all of its dimensions.

Formal logic, with its grounding in matheisis and claims to objectivity, can be challenged only by an equally authoritative tradition of aesthetic works and their basis in subjective forms of knowledge production. Conceived in such a framework, neither “works” nor “forms” are self-evident entities. They are emergent phenomena constituted by shifting forces and fields intervened by productive acts of interpretation. Thus “forms” (that is, texts, images, complex expressions of any kind) are coded artifacts, constrained and specific, that provoke a reading or interpretative event. This “interpretative event” is
an act of intervention in a probabilistic field, or a discourse field. This field is related by association and links to a sphere of cultural production that has historical and temporal dimensions as well as bibliographical, cultural, and other facets, but for an individual reader, the field thus intervened is often accessed only through an encounter with the artifact. (Scholarly work, research, and criticism deliberately expand beyond the “artifact” into the broader discourse field of production, reception, etc.)

Conceived in this way, knowledge forms are never stable or self-identical, but always situated within conditions of use. Therefore knowledge, this tradition asserts, is always partial, subjective, and situated. Objectivity, we have long recognized, is the wish dream of an early rational age, one that was mechanistic in its approaches. But the persistence and success of that rational tradition is realized in the extent to which our contemporary administered culture builds its own authority upon the formal procedures computational logic enables and makes instrumental.

*Aesthesis* challenges the authority of this systematic rationality by questioning its founding assumptions, particularly, its totalizing concepts of knowledge. In a curious historical coincidence, the very era that witnessed the taking apart of truth claims by poststructuralist practice and deconstructive theory witnessed the rise of the cultural authority of computational media as it insinuated itself into the infrastructure and rituals that form the basis of daily life. So though a philosophical base for undoing that authority exists, so is a pervasive tendency to bracket the critiques offered by such insights in the course of getting on with daily business. Nowhere was such a contradiction more evident than in the compromise between theoretical understanding and practical application in the digital humanities community. Time after time, we watched concessions to the
“requirements of computational protocols” in the struggles of humanistic theory to remain central to the digital humanities. As one of my digital humanities colleagues used to remark, we go into the technical discussions as deconstructed relativists and come out as empirically oriented pragmatists. In case after case, I’ve watched the terms of design and conception dictated by the coercive protocols of digital technology.

Thus the single most important challenge we gave ourselves in SpecLab was to design knowledge representations that modeled subjectivity within knowledge production. Showing these subjective acts of interpretation, and the role of imaginative play, was to serve as a challenge to the authority claims of formal logical systems. The entire event of interpretation in a digital environment includes many steps. These include creating a model of knowledge, encoding it into representation, embodying knowledge in a material expression, encountering it in a scene of interpretation through acts of reading, viewing, or response. All are part of a performative system governed by basic principles of second-generation systems theory, in particular, codependence and emergence. These can be used to describe an aesthetic experience grounded in subjective judgment just as surely as they can be used to describe formal systems. We worked with fundamental principles of design according to which subjective conditions and scenes of interpretation are structured.

I arrived at these principles through experience of a culture of design and visual knowledge that was conspicuously missing in the University of Virginia environment. Where interest in visual or graphic design existed at UVa, its assumptions came from information design and its ideals of transparency in the representation of data. Literary projects in critical editing, corpus linguistics, translation, and archive building had been
central to early digital projects. Subjectivity and attention to the rhetorical properties of
graphical aesthetics were not part of the vocabulary of design practice here (or anywhere
at that time, in fact). For the most part, however, basic graphic design and interface
design were often minimal, their contributions treated as final window dressing or
display. The tasks of creating content models for many text-based projects in digital
humanities had been undertaken without consideration of interface, as if design for use
would simply be added as a last minute skin or portal onto an already formed information
structure. The understanding that design is information was not a part of the approach.

My background combined historical and practical approaches to graphical forms
of knowledge production, as well as a theoretical disposition inclined to produce a critical
meta-language for describing these approaches. I had everything to learn about digital
humanities when I arrived at UVa. I didn’t know the basics of HTML (the code used to
create display of information in an onscreen/browser environment). I was far from
initiated into the mysteries of TEI (Text Encoding Initiative, a set of rules for putting texts
into the form of structured data through the use of tags marking different types of
information) or XML (Extensible Markup Language, a generic form of tagging and
structuring data of all kinds for search, display, or processing). But my training as an
artist-practitioner and art historian had given me a deep conviction about the ways
graphical forms of knowledge embodied subjective inflection. The specificity and variety
of graphical expressions, and their relatively unstable (as opposed to formal) codes,
combined with the rhetorical force of presentation—all constitute an argument in any
information display.
I joined the digital humanities community at UVa at a fertile moment. Under the visionary leadership of John Unsworth, IATH, the Institute for Advanced Technology in the Humanities, had established itself at the forefront of the field. The international reputation, justly deserved, had fostered an atmosphere of heady engagement with questions of metadata, display features and functionalities, and such now-quaint but still persistent topics as overlapping hierarchies. In the early 1990s, when a gift from IBM was used to establish the research center within the Library, Unsworth had the insight that the future of digital humanities was on the Web. IATH created pioneering projects with a core group that combined the talents of computational humanists, philosophers of information science, and some senior scholars who were early and eager adopters. The Rossetti Archive established by Jerome McGann as a demonstration of the capacity of computational technology to provide an environment for scholarly editing and archival research, and The Valley of the Shadow, Ed Ayers’s showpiece of historical interpretation in an environment where all primary materials would be made available as part of scholarly work, were two of the initial undertakings.\footnote{Note} Along with other major projects at UVa and elsewhere (the Blake Archive, Project Muse, The Crystal Palace, Voice of the Shuttle, Perseus Project, and others) these became the testing ground for the successes and failures on which first generation digital humanities scholarship came of age.

These institutional and intellectual settings were in a condition of rapid transformation in 1999. The Web was only a few years old, though the Internet backbone on which it was built had been in existence for decades.\footnote{Note} In 1999 Palm Pilots, PDA (personal digital assistants), iPods, RW-CDs, and DVDs were still future technology or just on the horizon. Critical studies in digital media were beginning to appear, with a
handful of serious works of the cultural impact of new technology, particularly in the
arts. A decade earlier, real-time interactions in virtual space using text-only display
had already demonstrated the addictive quality of social networking and online
evironments in multi-player games. MUDs (Multi-User Dungeons) and MOOS (MUDs
Object-Oriented) had proved to be so seductive when introduced in the 1980s that
undergraduates would go without sleep, food, sex, and face-to-face social interaction in
order to keep playing a game. But in the 1990s, the graphical interface that had made
desktop computing so user-friendly had only just been translated into browser-enabled
display. Instead of text-only screens, blinking green or amber against dull black, the
online world was suddenly coming up in vivid color. Search engine wars were on with
AltaVista, Jeeves, Google, and others now-vanished from the scene. Amazon and e-Bay
were already well-established brands, but online news and day-trading were still
primitive. So much of what is now established habit was then still barely in view.

As an early adopter, the University of Virginia had invested in creating an
infrastructure to encourage the delivery of services in electronic form and in providing
the essential foundation for a digital library. Most importantly, it had fostered the
development of crucial models of electronic scholarship. These projects were using new
technology to ask research questions that could not be asked using traditional print-based
materials. Many of these questions had a meta aspect to them, fostering reflection on
models of knowledge, rather than simply focusing on objects, artifacts, or scholarly
inquiry. In a period in which serious discussions about the right to self-determination of
intelligent machines and the possibilities of silicon-based life replacing carbon forms
were raging, such scholarly undertakings may have seemed tame by contrast.
Discussing classification systems and staying up nights thinking of ways to structure data may have been without any attraction for many, but for those of us engaged in the dizzying tasks of “disambiguation” and “content modeling” required by digital methods, these activities were engrossing and stimulating.

Not since my days in the poetry world of the Bay Area in the 1970s, or the film theory circles at Berkeley in the 1980s, had I experienced such intellectual camaraderie and exuberance. The generosity of colleagues towards each other and commitment to the common undertaking of figuring out what digital humanities had to teach us about our traditional approaches to our work and unexamined assumptions as scholars was striking. The willingness to engage in serious conversation about knowledge representation, subjectivity, content modeling, classification systems, and other matters minute or grand related to the study of information structures, computational language, and the cultural, ideological, and transformative effect was unusual. We shared readings and projects in an atmosphere of generative collegial contention, without any reserve, and within SpecLab in particular, we had the rare opportunity to develop a specialized insight and understanding that has yet to be fully documented and described. This book aims to communicate the spirit and substance of that activity from my own experience.

This book is not a history of digital humanities nor an introduction to its tenets or practices. Nor is this a history of IATH and the other activities at the University of Virginia. That story is not mine to tell. Anyone interested in the intellectual frameworks of that community and its development would do well to read Jerome McGann’s, Radiant Textuality, and the history it traces through his participation from the outset. A fascinating journalistic account could be written documenting the curious history of
digital humanities at UVa. But at this moment, it seems vital to communicate the intellectual substance of what we learned and use it to envision the next phase of work and projects.

From the very beginning of my engagement with digital humanities I have had the benefit of a community of colleagues of exceptional generosity and vision. Most immediately, the aforementioned John Unsworth, Matt Kirschenbaum, Kim Tryka, Mike Furlough, Bethany Nowviskie, Daniel Pitti, Thorny Staples, Worthy Martin, Geoff Rockwell, and Andrea Laue made substantive contributions to our work and thought. More recently, Bess Sadler, Bradley Daigle, Nick Laicona, and Eric Rettberg provided their unique skills. Others passed through our orbit with different degrees of impact Nathan Piazza, Steve Ramsay, Annie Schutte, John Maeda, John David Miller, and so on.

In the last decade, I have had the good fortune to enjoy an ongoing dialogue with Jerome McGann. He is the other of the “we” that frequently appears as a first person plural throughout many moments in this text. Rare indeed to have so kindred a spirit for so unusual an undertaking. Our talents are complementary rather than overlapping, though our shared interests and sensibilities, as well as common reference frames, make our exchanges a highly fruitful exchange between well-matched but different partners in an ongoing intellectual game. The spirit of play and invention in the service of imagination is crucial to our vision, and I cannot imagine that this work would have come into existence were it not for his engagement in the conception and execution of many of its ideas and arguments. However, my approach brought the emphasis on visuality and design into our conversations and projects as a crucial component of aesthetic insight. I came to subjectivity from a studio practice and critical study of graphical objects. The
conviction that led me to write the essay “Can Graphesis Challenge Mathesis?” in the late 1990s had been forming for a decade before I had met Jerry or come to UVa. The issues that were formulated in a rudimentary way in that piece, and later expanded from graphical issues in knowledge representation to the larger question of subjectivity and the design of conditions of use and interpretation, are of a quite different kind and sensibility than those that come from textual scholarship. They overlap in the fundamental and crucial interest in designing electronic instruments to engage and demonstrate the subjective character of knowledge as interpretation. But my contribution was to take what I had learned about subjectivity through visuality and aesthetics into our collective labors in speculative computing.

This book has evolved considerably. Originally conceived as a collection of the essays on which it still draws heavily in this version, it was simply going to replay the development of our thinking and projects at SpecLab. Under the influence of my judicious readers and with the support of Susan Bielstein at University of Chicago Press, it has become a more synthetic book. My central argument is that subjectivity and aesthetics are essential features in the design of digital knowledge representation as that terrifying but very real prospect comes to fruition – the migration of cultural legacy into electronic environments and the instrumental processing of nearly all aspects of daily life through digital media. The lessons of digital humanists apply to the culture broadly scripted, not just to the tiny world of its practitioners. The lessons of this book are not confined to insights into how to make things in a digital environment. They spring from that source—I hope they provide insights into how to think within our contemporary cultural environment. Where, how, and through what means can we model our
understanding of knowledge as a humanistic endeavor within the structures and strictures of our increasingly administered and digitally instrumentalized world?

The first section of the book, “From Digital Humanities to Speculative Computing,” provides an introduction to digital humanities for those readers to whom its basic precepts are unfamiliar in order to contrast with it the distinctive character of speculative computing. The second section, “Projects,” describes the development of our work in SpecLab, and traces the way hands-on design and production are integrated with theory as a working process in order to imagine environments for subjective knowledge production. The third section, “Aesthetics,” various aspects of the materiality, specificity, and implications of the study of digital media are discussed. The section begins with a discussion of my initial impulse to examine graphical codes and their challenge to logical premises to questions. This discussion extends into the examination of texts and codes, insights that shifted from mechanistic to probabilistic approaches to materiality, and led to investigations of higher order intellectual structures in metadata and modeling. A discussion of the aesthetic properties of digital media from historical and contemporary perspectives is followed by a discussion of ideology and virtuality. A concluding note sketches a few thoughts on lessons of SpecLab for digital media studies, current and future design practices, and humanistic inquiry.

The spirit of play with which we imagined these projects is an essential aspect of generative insight. Around conference tables or in public presentations, our projects were always provoking the query, “Are they serious?” The discussion and design of Temporal Modeling, Ivanhoe, and our sketches for the ‘Patacritical Demon or my Subjective Meteorology all generated this response. The discomfort caused by challenges to the
cultural authority of computational methods registers the significance of subjective approaches and the threatening aspect of playfulness as a generative engine of imagination. That was crucially important. That moment of questioning disbelief showed that we were creating a gap between familiar ways of imagining what we know and unfamiliar possibilities for re-imagining them. In that gap we created the projects of SpecLab.

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ii Jerome McGann’s *Radiant Textuality*, (NY and Hampshire: Palgrave, 2001), offers critical reflections that trace the development of the field from one perspective. Anyone seeking a philosopher’s reflection on the field of humanities computing, as it is called in a British context, should take up Willard McCarty’s *Humanities Computing*, (Hampshire and NY: Palgrave, 2005).


iv The online archives of the Institute for Advanced Technology in the Humanities gives a vivid picture of the range of experiments undertaken at Virginia beginning in the 1990s. http://jefferson.village.virginia.edu/iathrails/projects/homepage
My interests in this area go back to the early 1980s, when digital technology and its mythologies were being introduced at Berkeley, where I was a graduate student. Because of the impact of digital tools on artistic production for print artifacts, we became actively involved in new media and quickly aware of its implications by the end of the 1980s. In the early 1990s, I took on the task of guest editing an issue of the *Art Journal* on the topic of digital media and arts, in a moment when such activity was still highly marginal and the community of theorists and practitioners still relatively small. *Digital Reflections: The Dialogue of Art and Technology, Art Journal*, Fall 1997; with articles by Simon Penny, Janet Zweig, Deborah Haynes, Paul Zelevansky, Eduardo Kac, Dew Harrison, Jonathan Harris, and Jon Ippolito.

Specific references for each of these will appear in the pages that follow, and rather than create a long list in advance of the arguments for which these are relevant, I refer to reader to the bibliography or to notes for the next chapter.


Theories of subjectivity are crucial to this discussion. Mine come from structural linguistics, psychoanalysis, film theory, feminist theory, and cultural studies. Much of this is reading done in the 1980s, but whose lessons became foundational: Claude Levi-Strauss, and Ferdinand de Saussure, Sigmund Freud, Jacques Lacan, Julia Kristeva, Gerard Genette, and then the applied and synthetic work of Rosalind Coward and John Ellis, *Language and Materialism: developments in semiology and the theory of the*
Subject (London and Boston: Routledge and Paul, 1977); Paul Smith, Jacqueline Rose, Christian Metz, Jean-Louis Comolli, Bertand Augst, Stephen Heath, Elizabeth Grosz, Lisa Tickner, Peter Wollen, Laura Mulvey, Mary Kelly, and other writers in Screen, Tel Quel, Camera Obscura, Representations, and Discourse.

ix The basic concept of performativity derives from the work of John L. Austin, How to do Things with Words (Cambridge: Harvard University Press, 1967). Even though it has proliferated across disciplines and fields in an wide range of variations, the fundamental concept remains the same: a word, action, or behavior that effects change or other result, rather than simply stating, describing, or representing an idea, thought, feeling, or expression.

x My background in book arts, printing, letterpress, design, and studio production in the graphic and visual arts, and ongoing work as a practicing artist, make one contribution to this point of view. But even in the academic sphere, in the 1990s I was teaching visual art, graphic design history, and theory of visuality and representation in ways that helped formulate my intellectual perspectives.

xi The Crystal Palace and Pompeii projects both embrace such premises, and thus strive towards clarity of presentation in their use of visualization, as do many of the IATH projects created over the years (see url in note 4 above). The use of graphs, charts, maps, timelines, and other graphical conventions adopted from statistics are all based in shared assumptions about the transparency of graphical forms. The practitioner most renowned in this field is Edward Tufte, whose biases derive from engineering and statistical methods, and whose influence has been enormous even while his assumptions go

xii See Jerome McGann, *Radiant Textuality*, op.cit.. and his discussion of the Rossetti Archive design for a thorough description of the extreme to which this went.


xiv Traditional semiotics and other descriptive methods of analysis point out the difference between the nature of linguistic codes, particularly the double articulation of language, and those of graphical media. No equivalent to the morpheme as a signifying unit exists in graphical systems. Roland Barthes, *Image / Music / Text* (NY: Hill and Wang, 1977), and Nelson Goodman, *The Languages of Art* (Indianapolis: Bobbs-Merrill, 1968).


For a profile of Douglas Engelbart, sloan.stanford.edu/MouseSite/dce-bio.htm and for information on his work: www.invisiblerevolution.net/
