"How Can You Love a Text, If You Don't Know It?":
Critical Code and Design toward Participatory Digital Editions
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Prospectus for Literature Ph.D. Dissertation
Submitted April 9, 2013

I. INTRODUCTION

How do scholars interface with scholarly digital editions, and how can we improve the appearance and behavior of digital edition interfaces to not only better support current scholarly use, but predict and create new ways of reading, teaching, and learning about texts?

Digital editions are texts presented according to some critical ideal in digital space. We need to know more about how this scholarly form is used so that we can build sites that fully communicate and preserve literary texts, from the written word on the page to the iconic codes and materiality of the whole book, and so that we can in turn use digital editions as better platforms for inquiry into the nature of complex textual objects. I propose to build textual forms to understand them, creating three digital edition interfaces that separately explore the textual behaviors of **reading**, **teaching**, and **research**. One project will explore the social experience of critical **reading**, exploring whether a difficult Modernist text becomes "normalized" or "diminished" by moving to the center of a public annotation, interpretation, and conversation, and how we might curate the information overload of a vibrantly active digital edition reader/commentator base. Another project treats **teaching** as knowing, using a digital framework for the teaching of editing as a tool for tracing the development of textual scholarship theory and opinion. A third project assesses the whole use a scholar in a physical archive might make of a codex and imagines how we might use digital affordances, such as linkable metadata and 3D models, to bring a less partial simulation of the whole book to remote **research**ers. All three of these interface projects will be built around specific exemplar texts that push the boundaries of modeling via digital edition, texts that challenge both scholar and reader with a multiplicity of meanings (e.g. James Joyce's notoriously multilayered *Ulysses*) or that manifestly cannot be fully communicated by current digital edition formats (e.g. the rich design of a presciently-hypertextual Victorian edition of *Hamlet*). By building digital edition interfaces that employ and extend current textual theory, this dissertation will advance our understanding of how a key scholarly form creates knowledge around texts.

Studying our meta-texts by building. Textual studies concerns itself with the study of the history, forms, and whole content (from the linguistic to the material) of texts; digital textual scholarship, as a narrower discipline, focuses specifically on the preparation of such texts for scholarly use via a digital space. To push the current research, reading, and teaching abilities of the digital edition further, we need to move beyond the norm of theorizing on paper what needs to be changed about editions—it is necessary that we make these theorized changes to digital editions through web design and code work, then critically assess what our interventions teach us about the texts of these digital editions, the form of digital editions in general, and about literary research and teaching in digital spaces. This dissertation

proposes to take a step back from the specific literary texts prepared by textual scholars—and a step forward from the purely-written theorizing of textual studies researchers—to create tools that explore the critical efficacy and possibilities of that increasingly quintessential meta-textual form, the digital edition.

Participatory design and the urgency of the public humanities. Scholarly editor Gary Taylor has asked: "How can you love a work, if you don't know it? How can you know it, if you can't get near it? How can you get near it, without editors?" Scholarly editors are an integral part of the continuum that keeps the stories of the past available to and understood by the present—but just as important in Taylor's formulation is the *you*, that public of not just scholars, but also readers beyond the academy whose interest keeps the humanities alive and relevant. I intend to build tools and digital editions that help everyone—textual scholars and the lay person—participate in our love for the nuances of a text's materiality, history, and meaning. We need to rethink the structure—the look and behavior—of our most foundational form, the scholarly edition, looking to the full possibilities of the digital (and not just those that approximate traditional codex form) in order to see a more public textual studies—a textual studies that encourages participation outside of a limited circle of expertise, using games and ludic approaches, provocations to deeper thinking, visual design, and visual knowledge to share our intelligence about and passion for book studies more widely.

As researchers, we feel the urgency of a more publicly understood and useful humanities: convincing the public of our worth ties into how we are funded, but even more importantly, our ability to argue convincingly for our worth to non-specialists requires us to have an understanding of our studies so clear that it can be rendered into simple language: teaching is knowing[1]. Human-computer interaction, a field focused on interfaces between user and computer (including interfaces of reading and research), provides a useful approach to a humanities that simultaneously benefits the public and scholars: participatory design. Participatory design is an approach not just centered on the scholar or just on the public, but finessing the "third space" of discussion and shared learning that exists when the two groups come into conversation; results can include "challenging assumptions, learning reciprocally, and creating new ideas, which emerge through negotiation and co-creation of identities, working languages, understandings, and relationships, and polyvocal (many-voiced) dialogues across and through differences" (Muller 1). When we bring the public into our scholarly conversations, everyone benefits; designing for interactive participation and pedagogy is a scholarly activity that also benefits the public.

In my participatory design approach to digital edition interfaces, I draw on my own positive experiences in graduate literary seminars, in the belief that we can build scholarly digital editions that model two of the most rewarding aspects of a good class: communal enjoyment and communal knowledge of a text. A well-run seminar gets participants excited about the subtleties of a text, regardless of how remote its language or voice or subject matter might be from their own lives; a well-run seminar also results in everyone, teacher as well as students, gaining new insight into a literary text. As I experiment with the nature of digital editions, textual materiality, and other scholarly questions, I believe I can at the same time imagine digital editions as ideal communal spaces of literary conversation where scholars and public can learn from one another.

Three questions about interfacing with editions. Blake textual scholar Morris Eaves conceives of editions not just as vessels for textual content, but as "problem-solving mechanisms"; within my broader exploration of the future of digital edition interfaces, I will focus on several specific problems in the form of three digital coding projects that ask:

[1] "[Nobel-Prize-winning physicist Richard Feynman] prided himself on being able to devise ways to explain even the most profound ideas to beginning students. Once, I said to him, 'Dick, explain to me, so that I can understand it, why spin one-half particles obey Fermi-Dirac statistics.' Sizing up his audience perfectly, Feynman said, 'I'll prepare a freshman lecture on it.' But he came back a few days later to say, 'I couldn't do it. I couldn't reduce it to the freshman level. *That means we don't really understand it.*'" David L. Goodstein, in Feynman's Lost Lecture: The Motion of Planets Around the Sun

1. What happens to an intentionally complex Modernist text when opened to the hypothetically exhaustive interpretations of social annotation, and how might we curate a potentially large quantity of paratext to best serve users with different reading and research needs? (*Project #1, "Infinite Ulysses"*)
2. What might a framework for teaching the challenges of scholarly editing in turn teach scholars about how editing methodologies and theoretical biases arise out of the editing workflow? (*Project #2, "Choose Your Own Edition"*)
3. The visual, or *graphetic*, knowledges communicated by the visual choices in William Blake's image-texts are widely accepted as critically significant, but the same acknowledgement of the interpretive resonances of visual design is usually treated as post-critical when digital editions are created. What might a digital edition that treats its graphic design as a critical component look like, and what might such a meta-text teach us about the relationship between the physical boundaries of print and digital literary spaces? (*Project #3, "Material Editions"*)

Critical activities. Much of this dissertation will be critical code and design, conceptualized as digital experiments in tool form making statements about the nature of texts and editorial acts. While my methodology augments textual theory with diverse approaches such as user studies, participatory design, and information science, I will inflect this interdisciplinarity with a strong vein of the humanities' core valuing of subjectivity, resituating play, visual design, serendipitous exploration, uncertainty, failure, counterfactuality, and subjectivity as valid critical considerations when working with digital interfaces. This digital work will not be not forgetful of the end goal of digital edition creation: producing specific literary texts for use by scholars to gain new literary knowledges. Thus, this dissertation will bring each of its experiments round a full-circle path, basing each on literary precedents both print and digital, as well as highlighting how each approach is grounded in one or more of the tactics John Unsworth has described as "scholarly primitives", or methods held in common across humanities inquiry (e.g. comparing, annotating, and discovering).

A gap in knowledge about a quintessential humanities form. This dissertation addresses a gap in humanities knowledge: the digital edition, like the print edition before it, is developing into a key form of scholarly textual presentation, yet the advances in the past thirty years of textual studies have mostly focused on three areas of study to the exclusion of other knowledge: the development of a standard for encoding text (the Text Encoding Initiative), the development of archives presenting well-encoded text and textual images alongside tools for searching and inspecting these (e.g. *The William Blake Archive*), and theorizing possibilities for textual studies in digital spaces without making major changes to digital editions in concert with these theories (e.g. Jerome McGann's *Radiant Textuality: Literature after the World Wide Web*). To fill out the first two areas of study, we need to study in real scholarly situations how that encoded text, and those powerful but now fairly standard tools, are actually used and how they might be improved; to capitalize on the third area of study, we need to build these theories into our digital editions such that their innovative arguments are obvious to new users and empirically testable via user studies.

II. STATE OF THE FIELD: WHAT WE KNOW

Pertinent moves in textual scholarship. Textual scholarship has always intertwined theory and practice; arguments about which document (or eclectic patchwork of documents) best represents the ideal of a text, for example, were reified through editions of specific texts. As part of this theory through practice, design experiments are also a traditional part of textual scholarship, as with the typographic and spatial innovations of scholarly editor Teena Rochfort-Smith's 1883 *Four-Text 'Hamlet' in Parallel Columns*. The work of McKerrow and the earlier twentieth-century New Bibliographers brought a focus to the book as an artifact that could be objectively described and situated in a history of materials and printing practices, which led to theorists such as McKenzie and McGann's attention to the social life of the book—its publication and reception—as part of an edition's purview. This cataloguing and description eventually led to the bibliographic and especially iconic (visual, e.g. illustrative) elements of

the book being set on the same level of interpretive resonance as a book's linguistic content by scholars such as McGann, Tinkle, and Bornstein. Concurrently, Randall McLeod argued that the developing economic and technological feasibility of print facsimile editions placed a more unavoidable responsibility on editors to link their critical decisions to visual proof.

Digital humanities and editing. Textual scholarship—in the form of standards for digital text encoding—has been a part of the digital humanities since its earliest days as humanities computing, and the success of endeavors such as the *William Blake Archive* (which received the MLA Prize for Distinguished Scholarly Edition in 2003) has assisted in the perceived legitimacy of the field. Because of entrenched funding and technological resources, many of the innovative large edition or archive projects of the 1990s continue to be the best-known and most active digital editing projects today, though, and the development of the Text Encoding Initiative standards for textual encoding (the first edition of which was released in 1994) has become mired in arguments over the purpose and direction of the standard. Experimentation usually takes the form of side-experiments to larger, more traditional digital edition projects (e.g. the *Whitman Archive's* TokenX intervention tool, the *Romantic Circles*' Villa Diodati MOO), rather than as innovations in whole-edition form. Editions such as the *Rossetti Archive* are often conceived as built theories about modeling the texts in question, but are rarely built as theories about non-text-specific editing approaches other than broadly identifiable ones such as how a print edition can be expanded in digital space. Specific questions, such as the place of crowdsourced curation and annotation in textual scholarship, play out in articles and books rather than in actual digital editions.

Interfacing editions. Both the call for a more public digital humanities—a DH that teaches our scholarship to others—and the growing idea that we really should make use of all this lovingly marked-up edition text connect in the development of new, multiple edition interfaces aimed at multiple audiences. Textual interfaces that act as portals for different uses or as provocations to different interpretations of marked-up text are an increasingly popular topic of theorizing (Nowviskie "Interfacing", Saklofske, Fraistat and Flanders). The proliferation of different forms (and different names for these forms) of digital editions has helped incline scholars to shift their focus from markup and traditional editing (online scholarly editions) to related concerns such as curation (thematic research collections), images and cross-collection knowledge discovery (digital archives), and broader encounters with digitized scholarly texts (digital engagements or interventions; Price), a diversifying of textual roles that could help resituate edition interface design as a critical rather than a post-critical activity.

The TAPAS project (TEI Archiving Publishing and Access Service), a recent effort toward allowing the editing and markup of text to live on beyond a single end use, promises to allow multiple reuses or interfacings of TEI-encoded text for different audiences, interpretations, and presentations. TAPAS focuses on the user experience of TEI-encoded data: "how TEI-encoded texts can enrich reading and analysis." Besides multiplying the end-products of TEI-encoding, TAPAS also provides a good model for how making tools (i.e. a framework for uploading and publishing TEI, various options for experimenting with the use of that TEI-encoded text toward scholarly ends) can be in itself a fruitful exploration of humanities theories (see Section VII for more on making theories).

User testing for the humanities. Many digital editions and archives are conceived and managed by developer-users: scholarly creators who are also key members of the main intended audience for the tool. Because of limited budgets, lack of exposure to user-centered design approaches, and in particular the lack of study into performing user research and tool evaluation for the humanities, testing the efficacy of these projects at assisting in critical work beyond that of these stakeholders is rare (e.g. Edwards; Harley et al.; Karlsson and Malm; Visconti "Songs"; Warwick, Terras, Huntington, and Pappa). Projects that wish to serve an audience broader than the small team developing them—or perhaps even serve a secondary, more public audience of self-motivated learners—need to design metrics for exploring four areas of project efficacy:

1. *Demographics*: Who is using your project, and what are their specific needs and obstacles to success?
2. *Use*: How are people using your tool--as expected, or otherwise? Do you want to cater to those unexpected uses?
3. *Usability*: Does your site support visitors doing what they want to do? For example, if you give them a simple research task, how many steps should it take them to complete it using your project—and how many does it actually take?
4. *Usefulness*: Is this tool making a difference in its scholarly field? Is it better than other similar digital or print tools?

My Response. This dissertation is very much about not just describing, but actually making tools that identify and respond to gaps I see in the field of digital textual studies; thus, the following descriptions of my dissertation's three coding projects provide the best picture of my research questions and practical goals. When this dissertation is eventually presented in its final form as a website, these code projects will be presented in the following order, with the code that is most experimental and least recognizable to the traditional literary scholar appearing last.

III. PROJECT ONE: INFINITE ULYSSES

What might we learn from crafting an interface to usefully curate quantity and quality of annotation and interpretation for digital editions of complex texts where the critical conversation is opened to the public?

Digital humanities websites are increasingly sites of wider participation in textual interpretation, with how to evoke and harness "meaningful" crowdsourcing, an increasingly urgent question to scholars seeking a more public humanities. As we use the Web to open the texts we study to a wider community of discussion, bringing in diverse knowledges and interpretive biases, how can we usefully structure the overabundance of information proceeding from public annotation of literary texts? And when this quantity of voices is combined with an unusually complex text such as James Joyce's *Ulysses*, how might we create a critical experience that adeptly handles not only issues of information quantity but also quality? If we invite everyone to participate in our scholarly conversation around a text, how might we automate the curation of multiple best ways to interface with annotations and interpretations of that text?

"Infinite" annotations. While there isn't a completed digital edition of *Ulysses* yet published, that hasn't stopped Joycean scholars from anticipating issues that might arise with the eventual migration to digital space. Where the limitations of print space have in the past kept annotations of the notoriously complex text in check, what will happen when a digital platform allows the addition and navigation of infinite annotations? Can we migrate complex print hypertexts such as *Ulysses* to a digital space with socially multiplied annotations without "diminish[ing] the force of the book" or "normaliz[ing]" it (Attridge as cited in Marino, Marino)?

"What if we build an edition and everyone showed up?": Quantity and quality. While the final effect of unlimited space to discuss and interpret the text remains to be seen, this project will tackle two more immediate problems: quality and quantity of annotation. If everyone's submitting annotations, how can we automate the massive task of curation so that it occurs in a timely and unbiased manner? And once we've separated the wheat of critical yet diverse annotations from the chaff of repetitions, spam, and under-substantiated suggestions, how do we make the still-plentiful remaining material accessible to the users it would best serve?

A participatory edition framework. This project combines a speculative design approach with the scholarly primitive of curation (dealing with information abundance and quality and bias), imagining scholarly digital editions as popular sites of interpretation and conversation around a text. By drawing from examples of how people actually interact with text on the internet (e.g. on the social community

Reddit), I will create a digital edition interface that allows site visitors to create and interact with annotations and interpretations of the text through features such as:

- **tagging** of annotations (e.g. annotations translating "Medieval Latin" can be selectively hidden from readers not requiring this assistance)
- **toggling and filtering** of tags and editor user accounts (e.g. to hide content submitted by editors with methodologies/biases with which you regularly disagree)
- **assigning weights** to editor user accounts and individual annotations via voting and activity history, where weight is a measure of community-granted credibility that determines how often and high something appears in search results and browsing
- **cycling** through less-seen and lower-ranked editorial contributions to prevent certain content from never being read (a real issue unless every site visitor wishes to sit and rank every annotation!)
- tracking of **contentious** editorial contributions to identify material that receives an unusual amount of both up- and down-voting
- saving and describing both **private (personal) and public sets of annotations** that can contain annotations from both the creator and other editor accounts
- automating the awarding of editor accounts that regularly produce well-rated annotations with **a more visible platform for interpretation**

Because code modules already exist that allow many of these features within other contexts (e.g. upvoting), I will be able to concentrate my efforts on applying these features to editorial use and assessing user testing of this framework.

Precedents. Key print precedents for this project are variorum and other editions that deal with a large quantity of variants, marginalia, or other annotation, such as the Shelley-Godwin manuscript notebooks and Gabler's synoptic *Ulysses*; these last two examples have convenient digital counterparts in Michael Groden's *Ulysses in Hypermedia* prototype and the developing *Shelley-Godwin Archive*. I will also build on my own research into handling multiple categories of annotation begun with the 2008-2009 *UlyssesUlysses* prototype (UlyssesUlysses.com).

IV. PROJECT TWO: CHOOSE YOUR OWN EDITION

What might a gamic framework for teaching the challenges of scholarly editing in turn teach scholars about how editing methodologies and theoretical biases arise out of the editing workflow?

In *The Autobiography of Alice B. Toklas*, Gertrude Stein states, "I always say that you cannot tell what a picture really is or what an object really is until you dust it every day and you cannot tell what a book is until you type it or proof-read it. It then does something to you that only reading never can do." Most non-editors do not have a good comprehension of the complicated issues at stake in scholarly editing, imagining it to basically be a task of simple translation from page to page; being presented with a manuscript draft and asked to render a transcription of it is a wake-up call to the many decisions an editor makes on the page level, but an even more extensive exercise is needed to help non-editors understand the critical decisions at stake when editing a text.

Building on the exploration of meaningful public literary conversation begun with the "Infinite Ulysses" project, can we additionally improve this hypothetical public interest and increase attention to the cultural importance of scholarly editing by teaching people other than editors-in-training about the fundamental processes of editing? And as a bonus from this altruistic move, how might developing a decision tree model for our editing workflow as part of this teaching in turn help scholarly editors step back and re-evaluate their methodological biases?

Modeling Methodology. I will create a digital framework for tracking decisions about editing cruxes and assembling these choices into a cohesive methodology, a tool that will function as a way to teach non-editors about the questions and challenges of textual scholarship, as a simulation of how theories of editing are reflected in a host of small critical choices on individual pages of text, and as a model of how scholarly editing methodologies and biases evolve and solidify.

The tool will appear like a relatively short digital facsimile edition. Moments of challenging editorial decision-making on each page will be visually highlighted (e.g. how to identify a character who is referred to by various names?); when clicked, these moments provide a pop-up listing multiple possible editorial interpretations and interventions for the specific editing question from which the reader can choose, as well as the opportunity to suggest her own editorial solution. When the user reaches the end of the text, her cumulative editorial decisions will be presented as a single written methodology extrapolatable beyond the text in question. The individual editorial choices will be weighted among various characteristics of existing editing methodologies (e.g. "x choice is a feminist editing move" or "a and b choices both follow the theory set forth by Editor *C*"), which means that this tool can also provide suggestions to further readings in both similarly and oppositely thinking editorial schools.

In addition to reading this tool from start to finish (choices to methodology output) as a pedagogical endeavor, "Choose Your Own Edition" can also be read from finish to start to model various decision trees of critical textual decisions. This code and its accompanying analysis will consider critical factors of editorial decision-making, the comparison of possible critical choices as a scholarly primitive, and the role of the ludic in scholarly editing. Editing is a close reading game (what did an author mean?), a detective game (who's intervened with a text, and why?), and a design game (how will my editorial choices influence modern readings?), and textual scholars have begun to experiment with ludic methods over the past twenty years (e.g. McGann, Drucker, and Nowviskie's *Ivanhoe* game, *Romantic Circle*'s Villa Diodati MOO). In line with these gamic parallels, this tool references the genre of "Choose Your Own Adventure" stories and games in structure and layout.

Precedents. Print precedents for this project include introspective print edition methodologies such as those in Jeffrey Masten's *An/The Old Law,* Barbara Hodgson's *Taming of the Shrew*, Marta Werner's *Emily Dickinson's Open Folios*, and Robin Schulze's *Becoming Marianne Moore*. I will also consult digital editing methodologies such as those for the Blake, Whitman, Twain, and Shelley-Godwin digital editions, Willard McCarty's work on models and modeling, and writings on digital editing methodology development such as Eaves' "Electronic Textual Editing: Multimedia Body Plans: A Self-Assessment".

V. PROJECT THREE: MATERIAL EDITIONS

The visual, or graphetic, knowledges communicated by the visual choices in William Blake's image-texts are widely accepted as critically significant, but the same acknowledgement of the interpretive resonances of visual design is usually treated as post-critical when digital editions are created. What might a digital edition that treats its graphic design as a critical component look like, and what might such a meta-text teach us about the relationship between the physical boundaries of print and digital literary spaces?

Editing Theory and Graphic Information. The *MLA Guidelines for Editors of Scholarly Editions* barely address interface, although they do address digital editions: they check whether an edition provides documentation to help users understand how to navigate a site, and they are careful about how well an edition documents the graphical properties of the work on which the edition focuses. The *MLA CSE Guidelines for Scholarly Editions* are similarly sparse in addressing graphesis, with only a few questions about interface and materiality. These guidelines on materiality and the graphical properties of texts show an awareness of the effect of mediation and visual reception on interpretation of a work—yet the Guidelines do not extend that same knowledge to the form of the edition mediating the work (i.e. the edition).

Bornstein and Tinkle's *The Iconic Page in Manuscript, Print, and Digital Culture* illustrates our history of ignoring the information carried in the visual design of the codex page. Medieval illuminated manuscripts provided a sensory feast: colors and symbols; the texture, smell, and taste of parchment in the air or left on a reader's fingertips; the sounds of the typical method of medieval reading—aloud. Despite the first codices carrying this riot of sensory information, it isn't until the twentieth century and the work of the New Bibliographers that we really see scholarly attention turn to bibliographic code. After the New Bibliographer's systematic attention to the features of the work as an artifact, social editing brought an extra dose of iconic awareness through a new attention to textual collaborators such as printers and illustrators. The move of the last century to greater attention to graphic properties of texts has largely not extended to attention to the graphic properties of the forms mediating those texts —that is, to the visual features of editions.

Strange Vessels and Innovative Editions. How might digital editions look if we imported the same privilege we now grant to the iconic page of literary objects of study to those objects' meta-texts? Has editing theory succeeded at incorporating graphesis (e.g. via Bolter's "breakout of the visual" and "reverse ekphrasis"), and with what intellectual gain? This code experiment applies the current scholarly awareness of the impact of iconic choices to digital editions, treating digital edition interface as interpretation.

Andrew Piper claims that "the digital provides us with a critical lens to see the bibliographic with fresh eyes" (8); I would add that the lens works both ways, with bibliographic attention to print texts teaching us about the affordances and boundaries of digital literary spaces. I love the boundary-stretching textual forms—Grangerized and artists' books, hypertext novels, *Ulysses* and *Nightwood*—and I want to reflect these strange beauties by improving the metatexts that preserve, present, and interpret them, not just by providing high-quality facsimiles but by making digital editions themselves spaces of iconic and material meaning. I'm fascinated by what Alan Galey has called "old new media prototypes", old books dealing with modern, digital textual problems in unique and prescient ways, and I think digital modeling of these limit-testing texts could help us better comprehend the untapped, unskeumorphic possibilities of digital edition design.

A meta-meta-text. Teena Rochfort-Smith's complex Victorian presentation of *Hamlet* is one such print precursor of the digital edition, presenting both a fascinating example of visual knowledge and a test of the limits of information in print space through its innovations of annotation, layout, and typography. With this coding project, I will create a digital edition that uses Rochfort-Smith's unique text to explore the parallels between the stretching of print and digital boundaries for edition design, and experiment with presenting the iconic and material properties of print texts through digital editions. Tactics may include:

- **Modeling** Rochfort-Smith's prototype in digital space, then **identifying her core editorial and design values** and using these to design one example of how a finished, twenty-first-century version of her edition would look and behave
- Locating and linking to special collection holdings of texts that share various **material similarities** with Rochfort-Smith's text; when a scholar cannot travel to experience a text in person, she might be able to assemble a patchwork of real sensory experiences of features of the text in question such as the same type of paper, color of inks, binding material, and whitespace ratio
- **Speculative recommendations** for using existing technology to better experience the materiality of remote books; a 3D scanner and 3D printer could be combined, for example, to bring a magnified model of the surface of a page, or the dimensions and binding geometry of a volume, to a remote scholar
- In addition to a standard textual introduction and editing methodology, developing an **introduction** specifically discussing the history of graphic design feeding into the print text's appearance, and a written **methodology** arguing for the critical decisions that shape the graphic design of the digital edition

My goal is not just to build a digital tool for textual scholars, but to create an experimental space that relies on a two-way conversation between the materiality of a specific print text and the digitally coded tools that can increase our access and understanding of codex form. How do the affordances of the codex, and old new media prototypes in particular, suggest the possibilities and limits of the digital text? What role should the visual information of the text play in the visual design of the metatext; what is the information a digital edition is trying to convey, and how can the visual design be a critical part of this communication? How can digital editions capture, present, and teach the whole book and not just its linguistic content?

Precedents. The Folger Shakespeare Library's copy of Teena Rochfort-Smith's *Four-Text 'Hamlet' in Parallel Columns* prototype will be the focus text for this experimental digital edition; although unfinished due to Rochfort-Smith's untimely death, the three-scene prototype "demonstrates that, once completed, Teena Rochfort Smith's edition would have been the most complex presentation of the texts of *Hamlet* ever attempted", offering a prescient solution for presenting parallel views of multiple textual versions (Thompson; Visconti "Teena Rochfort-Smith"). Other print precursors and resources for this project are Jeffrey Masten's layout-aware edition of *An/The Old Law*, various artists' books that include graphic design as part of textual conceptual wholes, and William Blake's image-texts. Alan Galey's *Visualizing Variation* project and Jon Saklofske's *NewRadial* exploration of creating a new interface for the *Blake Archive* are digital precedents for this project.

VI. MY METHODOLOGY

The coding and design in this dissertation is scholarly work, and thus I will attempt to not be doubling this critical effort by creating the traditional monograph-length written work alongside these scholarly digital objects. My final dissertation will consist of the following components:

1. A written introduction to the entire dissertation's methodology, research questions, theoretical grounding, and goals (length estimated at 20 pages, with much of the theoretical discussion specific to the various projects held over to those projects' individual introductions)
2. For each of the three coding projects, a scholarly, article-length (30-60 page) write-up containing:
    a. a literature review situating the coding project as building on a tradition of editing and literary theory
    b. a history of specific scholarly precedents in both print and digital space
    c. research questions for the project
    d. a rationale for any technical choices
    e. curated selections from academic blogging completed during the building process (to record scholarly considerations as the code progresses)
    f. results of a short quantitative and qualitative user study matching real scholars and students with the tool, plus next steps suggested by these results
3. A link to a public repository containing the code for the finished projects, as well as a sandbox website where the tools can be explored in either working or prototyped form
4. A written conclusion on the theoretical and practical successes, failures, and next steps for the overall dissertation project (length estimated at 15-30 pages)

Project #1 ("Infinite Ulysses") will be the most finished project, with a completely functioning site released for public use as well as formal, thorough user testing with the Editing Modernism in Canada group and possibly other interested readers, scholars, book clubs, and/or academic classes. To achieve this level of completion, half of the length of my dissertating will be spent on this development (see Section VIII, "Timeline", below). Project #2 ("Choose Your Own Edition") will deliver a working but hardcoded prototype (i.e. the tool will only be usable with its specific example text, instead of functioning agnostically from the text used with it); user testing will be less formal, with use and observation solicited from the digital humanities community via Twitter. Project #3 ("Material Editions") will include different levels of completion, from mock screenshots to functioning digital edition page

examples to well-researched suggestions for future coding. I will meet with my committee one year into the project to assess the work completed so far and to rescope the remaining projects as the vagaries of estimating coding time dictate.

VII. METHODOLOGICAL REASONING AND PRECEDENTS: "THINKING THROUGH MAKING"

Why not just create a traditional monograph addressing these research questions? Above, I discussed why building is a necessary move for the field of textual scholarship to innovate; now, an explanation of why this building is itself scholarly work:

Scholarly experimentation: speculative computing and timely experiments. In the late twentieth century, McGann claimed that "the next generation of literary and aesthetic theorists who will most matter are people who will be at least as involved with making things as with writing texts", and indeed a large part of the burgeoning interdisciplinary community of digital humanists is focused on building projects ("Radiant Textuality").

"Speculative computing" is a flavor of digital humanities that emphasizes the subjective, the aesthetic, and the non-computational in humanities computing work. While on the one hand relying on an experimental or provocational approach somewhat unfamiliar to the traditional humanist, speculative computing is a response to what humanists saw as the loss of subjectivity and aesthetics experienced by the humanities as it came into contact with the algorithms, code, and objectivity of computer science (Drucker "Speclab", Burdick et al.). A similar approach, speculative design, imagines future challenges and opportunities—as with my designing a digital edition that could handle a public wildly interested in annotating a complex text—and in response to design solutions that are both imbued with theoretical innovation and the possibility of future utility (Lukens and DiSalvo).

Less speculative, more immediately applicable experimental work is routinely pursued by major digital humanities centers such as the Maryland Institute for Technology in the Humanities. As DH centers moved from sites of service to sites of inquiry over the past twenty years, so too has humanities work shifted to include digital projects not just as means to literary understanding, but as embodying literary arguments themselves. In addition to the larger projects pursued by DH centers, smaller interventions by individuals and student groups are also common in the digital humanities; Jean Bauer's *DAVILA* is a digital overlay for DH project databases that reveals the critical choices inherent in relational database structure to non-developers, and the Praxis Program's *Prism* visualizes the intersection of many interpretations of a common text.

I agree with the form-agnostic attitude toward what "counts" as scholarship described by Mark Sample: "When does anything—service, teaching, editing, mentoring, coding—become scholarship? My answer is simply this: a creative or intellectual act becomes scholarship when it is public and circulates in a community of peers that evaluates and builds upon it". It isn't whether something is written, or can be described linguistically, that determines whether critical thought went into it and scholarly utility comes out of it: it's the appropriateness of the form to the argument, and the availability of that argument to discussion and evaluation in the scholarly community.

Prototyping: arguments in the object. It isn't only experiments that can be scholarly, but also experimental artifacts; new media scholar Ian Bogost describes building objects that are themselves arguments (what Bogost calls "carpentry") as "making things that explain how things make their world" (93). Stuart Moulthrop similarly identifies how objects can themselves—apart from any additional written explanation—"challenge underlying assumptions or reveal new ways of proceeding" when added into an existing framework such as an edition (212).

Textual scholars historically reified their theories about the nature of texts and authorship in the editions they crafted, but editions—works of scholarly building centered around a specific literary text—are not the only way textual scholars can theorize through making. Alan Galey's *Visualizing Variation*

coding project is a strong example of non-edition critical building work from a textual scholar. Galey's experiments with animating textual variants, layering scans of marginalia from different copies of the same book into a single space, and other approaches embodied as code libraries are themselves critical arguments: "Just as an edition of a book can be a means of reifying a theory about how books should be edited, so can the creation of an experimental digital prototype be understood as conveying an argument about designing interfaces" (Galey and Ruecker). The *Visualizing Variation* code sets, whether on their own or applied to specific texts, are a scholarly response to the early modern experience of reading, when spellings varied wildly and a reader was accustomed to holding multiple possible meanings for badly printed or ambiguously spelled words in his mind at the same time. By experimenting with digital means of approximating this historical experience, Galey moves theorists from discussing the fact that this different experience of texts occurred to responding to an actual participation in that experience.

Precedents for dissertational making as scholarship. While dissertations focused on experiments (such as medical studies or the creation of a programming language aimed at a specific computing problem) are fairly normal in non-humanities fields, a dissertation that centers itself on building as much as this one does—building that does not also require a complete doubling of work effort in the form of an accompanying book-length dissertation—is rare within the humanities. This is not to say that such work is without precedent. As demonstrated above, coding as scholarly work is an accepted method within the field of digital humanities. Even in the most traditional literature departments, there is a precedent for thesis work focused on producing a scholarly object instead of only a written piece; a dissertation focused on producing a scholarly edition of a literary text has long been accepted as a valid final product, and a trend toward dissertations deeply intertwined with their digital components can be illustrated with a current and a former member of this department: my advisor Matthew Kirschenbaum's 1999 digital dissertation was the first at the University of Virginia and one of the first in the country, and alumna Tanya Clement's 2009 dissertation made strong use of digital editing and modeling tools. My diverse background in information science, graphic design, professional web development, and user studies supports what is, for a humanities dissertation, a non-traditional but effective and historically inevitable method of inquiry.

VIII. TIMELINE

- **May 2013:** Technical research and website set-up, gather first set of annotations, create literature review
- **June 2013:** Various digital *Ulysses* events, editing/annotation of example section of *Ulysses*
- **July 2013-November 13:** Coding for Project #1
- **December 2013:** Prep site for going public next month, final user testing solicitation, tutorials on site use
- **January-March 2014:** User testing and responding to user testing (fixing issues, adding features)
    - **January 2014:** Release public beta of Project #1 site, MLA 2014 Presentation (demo of Project #1)
- **April 2014:** Rewrite blog posts as scholarly article and submit to journals, meet with committee to decide scope of dissertation for remaining year, begin work on cruxes and possible responses for Project #2
- **May-July 2014:** Coding on Project #2
    - **May 2014:** Theoretical/technical research, literature review, website set-up, cruxes and response options
    - **July 2014:** Prep site for going public next month, final user testing solicitation, tutorials on site use
- **August 2014:** Release public beta of Project #2 site, user testing and responding to user testing
- **September 2014:** User testing and responding to user testing, unfinished coding work, begin Project #3 research
- **October 2014:** Project #2 showcase website, rewrite blog posts as scholarly article and submit to journals, rescope remaining dissertation time/Project #3
- **November-December 2014:** Coding for Project #3
    - **November 2014:** Theoretical/technical research, literature review
    - **December:** Prep site for going public next month, final user testing solicitation, tutorials on site use
- **January 2014:** Public beta release, user testing and responding to user testing
- **February 2014:** Respond to user requests, final Project #3 coding
- **March 2014:** Project #3 showcase website, rewrite blog posts as scholarly article and submit to journals
- **April 2014:** Write introduction (based off prospectus) and conclusion (discussion and next steps), polish website showcasing entire dissertation work
- **May 2014:** Dissertation defense

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ONE-PAGE ABSTRACT

How do scholars interface with scholarly digital editions, and how can we improve the appearance and behavior of digital edition interfaces to not only better support current scholarly use, but predict and create new ways of reading, teaching, and learning about texts? Digital editions are texts presented according to some critical ideal in digital space. We need to know more about how this scholarly form is used so that we can build sites that fully communicate and preserve literary texts, from the written word on the page to the iconic codes and materiality of the whole book, and so that we can in turn use digital editions as better platforms for inquiry into the nature of complex textual objects.

Textual studies concerns itself with the study of the history, forms, and whole content (from the linguistic to the material) of texts; digital textual scholarship, as a narrower discipline, focuses specifically on the preparation of such texts for scholarly use via a digital space. To push the current research, reading, and teaching abilities of the digital edition further, we need to move beyond the norm of theorizing on paper what needs to be changed about editions—it is necessary that we make these theorized changes to digital editions through web design and code work, then critically assess what our interventions teach us about the texts of these digital editions, the form of digital editions in general, and about literary research and teaching in digital spaces. This dissertation proposes to take a step back from the specific literary texts prepared by textual scholars—and a step forward from the purely-written theorizing of textual studies researchers—to create tools that explore the critical efficacy and possibilities of that increasingly quintessential meta-textual form, the digital edition.

I propose to build textual forms to understand them, creating three digital edition interface projects that separately explore the textual behaviors of reading, teaching, and research. Project #1 ("Infinite *Ulysses*") will examine the social experience of critical reading, exploring whether a difficult Modernist text becomes "normalized" or "diminished" by moving to the center of public annotation, interpretation, and conversation, and how we might curate the information overload of a vibrantly active digital edition reader/commentator community. Project #2 ("Choose Your Own Edition") treats teaching as knowing, using a digital framework for the teaching of editing as a tool for tracing the development of textual scholarship theory and opinion. Project #3 ("Material Editions") assesses the whole use a scholar in a physical archive might make of a codex and imagines how we might use digital affordances, such as linkable metadata and 3D models, to bring a less partial simulation of the whole book to remote researchers. All three of these interface projects will be built around specific exemplar texts that push the boundaries of modeling via digital edition, texts that challenge both scholar and reader with a multiplicity of meanings (e.g. James Joyce's notoriously multilayered *Ulysses*) or that manifestly cannot be fully communicated by current digital edition formats (e.g. the rich design of a presciently-hypertextual Victorian edition of *Hamlet*). By building digital edition interfaces that employ and extend current textual theory, this dissertation will advance our understanding of how a key scholarly form creates knowledge around texts.

Textual scholarship has always intertwined theory and practice; arguments about which document (or eclectic patchwork of documents) best represents the ideal of a text, for example, were reified through editions of specific texts. As part of this theory through practice, design experiments are also a traditional part of textual scholarship, as with the typographic and spatial innovations of scholarly editor Teena Rochfort-Smith's 1883 *Four-Text 'Hamlet' in Parallel Columns*. Furthermore, textual scholarship (in the form of standards for digital text encoding) has been a part of the digital humanities since its earliest days as humanities computing. Both the call for a more public digital humanities—a DH that teaches our scholarship to others—and the growing idea that we really should make use of all this lovingly marked-up edition text connect in the development of new, multiple edition interfaces aimed at multiple audiences. To understand how these interfaces are experienced, though, we need to move beyond the norm of developing digital editions and archives based on what their scholar-developers imagine as their use, instead developing a user studies specific to humanities research, teaching, and reading to test and improve digital editions.

This dissertation is very much about not just describing, but actually making tools that identify and respond to gaps I see in the field of digital textual studies; thus, the main prospectus' descriptions of my dissertation's three coding projects provide the best picture of my research questions and practical goals. The coding and design in this dissertation is scholarly work, with the final deliverable consisting of a written introduction and conclusion, three scholarly articles, and a public website where each of the projects I create can be used.