

Form, Complexity, and Computation.

SAA Seminar 15

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*“The nature of the material sets the problem to be solved, and the solution is the ordering of the material.”
– Cleanth Brooks, The Well Wrought Urn*

In this seminar we will ask how we can think about the complexity of literary texts in computational terms. How can we represent ambiguities of words, nuances of structure, the interaction of motifs, and the intensely intertextual way in which most literary research problems are formulated within the framework of quantification and categorization that computational approaches solicit?

Complex systems have been characterized as producing large scale, often unpredictable variations as the accumulated effects of miniscule changes in input. In other words, they can be thought of as generating structured yet non-deterministic effects based on concretely identifiable but small changes in their initial states. Examples of complexity abound in nature. From the structure of trees to swarms of living organisms, from the shapes of crystals to the flow of wind and water, we can find examples of such complex systems everywhere. Contemporary scientific disciplines have attempted quantitative models of such phenomena that try to accommodate their ambiguity, flexibility and fundamental indeterminacy and yet capture a sense of their overall structure.

In many ways, this notion of complexity has already found its way into our thinking about literary artifacts. We can see its shadow in the effectiveness of Moretti’s “tree” metaphor in tracing the development of the novel as a non-deterministic but structured phenomenon, or in the use of genetic metaphors of propagation and mutation in thinking of the “evolution” of genres, or their effects as caused by structures operating at the level of the sentence. One might argue that even if they are relatively under-theorized in literary studies, such metaphors for thinking about language modulate the ways in which we conceptualize the ambiguity and indeterminacy of literary language in the domain of computation. As we move from the shallow empiricism of verifiable, concrete claims about texts and start to use computational models to think about higher order literary and cultural phenomena, our ability to accommodate ambiguity and indeterminacy, and the ways we can reconcile them with overall accounts of structure will increasingly determine our relationships to texts (themselves digital surrogates for physical artifacts) and their quantitative surrogates – frequency counts, distributions, vectors, visualizations etc.

The literature on statistical and computational theory grapples with the inescapable ambiguity of data by adducing concepts like probability, bias, variance, entropy, information gain etc.; we hope to elicit papers that share the ambition of our colleagues in these fields, by demonstrating how ambiguity and complexity are accessible to quantitative representation. Papers might reflect on the processes of quantification, how we might rethink ideas of computational complexity in humanistic terms and express humanistic ambiguity within quantitative models, or demonstrate approaches to texts that seek to move beyond scale and account for literary complexity.

Seminar Abstracts:

Peter Berek, Amherst College

“What need one?” Counting Tragedy

Some years ago I wrote an essay about “Tragedy on Title Pages” (*Modern Philology*, Aug 2008; 106 [1]: 1-24) that argued for an association in the 16th century English book trade between the ostensibly generic term and both Protestant religion and English literary nationalism. Now I’m trying to look inside the books. Using a database of playtexts from the 16th and 17th centuries, and with the help of a student research assistant who is a computer science major, I’ve found significant variation from decade to decade in the frequency with which forms of the word “tragedy” appear in the body of the texts. By looking at the contexts in which the word appears, I hope to learn something that can help explain why the word is used most frequently in the 1580s, 1590s and 1640s. Because of the limitations of my own skill and of the database with which I’m working, what I produce for Vancouver will at best be an experiment from which I can learn how to carry out the project in a better way with better data. I promise modesty, brevity and some reflections about the issues involved when a person uses the skills of one discipline to explore the issues of another.

Douglas Bruster, University of Texas at Austin

Envisioning Shakespeare

Representing Shakespeare's verbal complexity visually is difficult but necessary, for illustrations can confirm research findings and sway opinion as to that information. This essay discusses intertextuality, focusing on the question of precedence involving *A Midsummer Night's Dream* and Nashe's *Have With You to Saffron-Walden*. Among the questions it asks: To what extent can visual representation serve as a tool for research as well as the presentation of research?

Carl Stahmer, University of California, Davis

Humanistic Content Based Image Recognition

Recent development in the area of Content Based Image Recognition (CBIR) can be leveraged to advance well established modes of philologic and bibliographic inquiry. Following the trails of literary and visual tropes as they move from text to text though both literal reproduction and conceptual adaptation and the study of textual materiality are both longstanding humanistic methodologies that have advanced a variety of traditional modes of scholarly investigation. Such work has historically relied on time intensive human cataloguing and has been limited by the human brain's ability to both remember and simultaneously compare multiple symbolic units and or physical objects. Today, the computational speed, random access, and hard memory of the average smart phone surpasses that of the average human. As such, a potential exists for computers to act as scholarly collaborators in longstanding modes of textual analysis because they are potentially better equipped than their human counterparts to perform large-scale recognition and classification tasks. This paper presents the preliminary results of recent attempts to leverage this potential at the *English Broadside Ballad Archive* (EBBA) and discusses potential avenues of future application and development.

Michael Ulliot, University of Calgary

Language Use and Cognition: Shakespeare's Gradatio in Context

In *Figuring Style: The Legacy of Renaissance Rhetoric* (2014), Nancy Christiansen describes early modern language as a web of rhetorical figures. This resonates with our experience as readers of that language, particularly in literary texts where we encounter self-consciously artful usage. But is that usage necessarily artificial? Might it be, instead, behaviour that reflects the writer's natural habits of thought? And what is the relationship between natural thought and artificial language? This paper addresses some of these questions with an examination of the figures in Shakespeare's *Troilus and Cressida*, as compared to those figures detectable in a wider range of 400 early modern plays. Does *Troilus'* focus on rhetorical persuasion problematize both writers' and characters' uses of persuasive figures?

Micheal Witmore, Folger Shakespeare Library

Thought Experiments with Algorithms

This paper will explore the nature of a literary forms that become visible through massive, systematic digital comparisons. Advancing a notion of "utopian" criticism, the paper will ask what we can know learn from the placeless, abstract mathematical spaces in which texts – for example, the plays of Shakespeare – seem to reside once an algorithm has rendered them "actionable".

Bibliography

Anupam Basu:

Setting out to gather a bibliography on a topic might seem to imply that the topic is, if not quite settled, at least identifiable as a field of related texts and concepts. In this case however, we hope the bibliography will be speculative rather than comprehensive. The title of our seminar points to two very disparate but relatively well-defined fields as possible starting points for our (re)thinking – formalist and new critical thinking about literature on the one hand, and theorizations of computational complexity and computability on the other. The following short list collects texts from these domains in the hope that their “violent yoking” together will help us to speculate on the new metaphors of knowledge-making that characterize the computational turn in literary studies.

Peter Berek:

- J. Glenn Brookshear, *Computer Science: An Overview*, 8th ed., Chapter 11, “Theory of Computation” (Boston et. al.: Pearson Addison Wesley, 2005), pp. 457-489. An account of what computers can and cannot do. I’m guessing other introductory CS textbooks include similar sections.
- Lance Fortnow, *The Golden Ticket: P, NP and the Search for the Impossible* (Princeton: Princeton UP, 2013). Aimed at a general audience, this book gives an account of “complexity theory” as computer scientists use the term.
- I. A. Richards, *Science and Poetry*, Chapter 2, “The Poetic Experience.” Available in editions of 1926, 1935 (entitled *Poetries and Sciences*) and in *Collected Shorter Writings*, ed. John Constable (London and New York: Routledge, 2001), pp. 518-528. A classic account of the complexities of human responses to poetry.

Douglas Bruster:

- Marvin Spevack, "Shakespeare Microscopic and Panoramic," *Mosaic* 10.3 (1976): 117-127.
- Svetlana Alpers, "The Mapping Impulse in Dutch Art," ch. 4 in *The Art of Describing: Dutch Art in the Seventeenth Century* (Chicago: University of Chicago Press, 1983), pp. 119-168.
- Herbert F. Tucker, "Unsettled Scores: Meter and Play in Two Music Poems by Browning," *Critical Inquiry* 41.1 (2014): 24-52.
- A quotation: "Light is colourless'. If so, then in the sense that numbers are colourless." #35 from Ludwig Wittgenstein, *Remarks on Colour (Bilingual Edition)*, trans. G.E.M. Anscombe (Berkeley: University of California Press, 2007), 7E.
- a) the three-part posting, "The Novel and Moral Philosophy," on winedarksea.org by Eric Alexander, Michael Witmore, and Julie Park from October, 2014 <http://winedarksea.org/>
- b) Martin Mueller, "Shakespeare His Contemporaries: collaborative curation and exploration of Early Modern drama in a digital environment" *Digital Humanities Quarterly* 8.3 (2014)

Michael Ulliot:

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- Williams, David-Antoine. "Method as tautology in the digital humanities." *Literary and Linguistic Computing* [forthcoming] (2014)

Michael Witmore:

Carlo Ginzburg's piece in *Representations*, "Clues, Myths and the Historical Method" which deals with the Morelli method

of attribution in art history. It is not so much about "form" as about "tells," but that's an interesting topic. I also wonder about something by Todorov about genre, like the introduction to his book, "The Fantastic." That would be an interesting set of conditions -- his def. of a genre -- to try to reproduce algorithmically. There's also Rosalie Collie's work on genre, which might be good. Or better, Barbara Mowat's definition of romance plays via "family resemblance" in her book on the late plays. That would be excellent.

Anupam Basu:

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