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# Special Section: Reconceiving Text Analysis

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## Toward an Algorithmic Criticism

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### Abstract

The inability of computing humanists to break into the mainstream of literary critical scholarship may be attributed to the prevalence of scientific methodologies and metaphors in humanities computing research—methodologies and metaphors that are wholly foreign not only the language of literary criticism, but to its entire purpose. Breaking out of this unfortunate misalignment entails reaching for more appropriate paradigms. The ‘algorithmic criticism’ here proposed rejects the empiricist vision of the computer as a means by which critical interpretations may be verified, and instead seeks to locate computational processes within the rich tradition of interpretive endeavours (usually aligned more with art than criticism), which seek not to constrain meaning, but to guarantee its multiplicity. Computational processes, which are perhaps more conformable to this latter purpose, may be usefully viewed as ways of providing the necessary conditions for interpretive insight. Algorithmic criticism seeks, therefore, in the narrowing forces of constraint embodied and instantiated in the strictures of algorithmic processing, an analogue to the liberating potentialities of art and the ludic values of humanistic inquiry. It proposes that we reconceive computer-assisted text analysis as an activity best employed not in the service of a heightened critical objectivity, but as one that embraces the possibilities of that deepened subjectivity upon which critical insight depends.

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What is the opposite of computer-assisted text analysis?

The question is appropriate, because we who use that phrase obviously mean to distinguish it from other types of text analysis (presumably from the sort of text analysis that our non-computer-assisted colleagues are doing) and to argue for its advantages. The question is appropriate, too, because the general sense, repeated over and over in the pages of *Computers and the Humanities* and *Literary and Linguistic Computing* over the last ten years, is that our attempt to tender this distinction into a place in the larger literary-critical discourse has largely failed. I am now

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the latest in a long line of commentators to proclaim the sad news: we have not penetrated the major journals of literary study with our graphs and tables, and in general, our methods are perceived as some sort of positivistic last stand against the vagaries of . . .

Well, of what, exactly? I was struck recently by a characterization made by Hugh Craig in a 1999 *LLC* paper provocatively entitled, 'Authorial attribution and computational stylistics: If you can tell authors apart, have you learned anything about them?' In that paper, Craig refers to the opposite of computer-assisted text analysis as 'impressionistic criticism'. He also states explicitly what may be regarded, at least within a certain prevalent mindset, as the central quandary of humanities computing:

The leap from frequencies to meanings must always be a risky one. The interpreter who is tempted to speculate about the world-view or psychology of a writer, based on quantitative findings, presents an easy target for dismissive critique (Fish, 1973). On the other hand, staying within the safe confines of the statistical results themselves means that one is soon left with only banalities or tautologies. Lower-level features are easy to count but impossible to interpret in terms of style; counting images or other high-level structures brings problems of excessive intervention at the categorization stage, and thus unreliability and circularity (Van Peer, 1989) Craig (1999).

This is a common form of dissonance in our community, echoed in one way or another by Van Peer (1989), Corns (1991), and Olsen (1993), among others. However, I believe Craig's particular enunciation of the problem as a choice between banality and meaning depends upon two very flawed assumptions that have been subtly implied countless times in the literature of humanities computing: first, that quantitative results represent a vantage point of comparative safety; second, that there is an 'excessive intervention', which represents risk.

Nearly every defender of computer-assisted text-analysis—from John Burroughs, to Rosanne Potter, to Paul Fortier—is beset by this awful anxiety that without some kind of objective, quantifiable, methodologically consistent framework for drawing the line between risk and safety, we are left with a sort of 'anything goes' hermeneutics. Without the computer, the interpreter is nothing more than some Romantic aeolian harpist drowning in the phenomenological abyss of their own 'impressions'. What can come of such excesses, they seem to say, except perhaps works that, like impressionist paintings, are coherent and beautiful, but vague, indistinct, and insubstantial none the less.

I may seem to overstate the case, but how else can one interpret Potter's eleven steps (alas, not twelve) for overcoming 'data inundation' when working with texts. 'The *sine qua non*', writes Potter, 'for avoiding data inundation is a firm resolve to go to the data only when one is testing a clearly stated hypothesis . . . . If one starts a literary critical investigation with data, one can, by definition, go *anywhere*' (emphasis mine) (Potter, 1989). Paul Fortier echoes the sentiment:

This is not to deny the historical, social, and cultural context of literature (Bakhtin, 1981), and of language itself (Halliday, 1978). Nor can one overlook the very rich and subtle elaborations of literary theory in the forty years since Barthes published *Le degré zéro de l'écriture* (1953). In point of fact, most of these elaborations have the technical status of hypothesis, since they have not been confirmed empirically in terms of the data which they propose to describe—literary texts. This is where computer techniques and computer data come into their own (Fortier, 1993).

This is perhaps where computers come into their own, but it is precisely where humanities computing threatens to declare its practical and philosophical irrelevance to the larger community of literary exegetes. I, for one, do not find this moment of loss particularly mystifying. The notion of hypothesis testing and empirical validation comes out of the language of experimental science—a rhetorical tradition that evolved to lend some structure to the exploration of the natural world by providing a method for separating the universally agreed-upon ('the facts') from the focus of current disagreement and debate. It is not difficult to imagine why such language would seem foreign, even nonsensical, in a field so focused—pedagogically as well as intellectually—on encouraging the critical discourse to continue. Even if one could empirically verify the insights of Roland Barthes by appealing to French literary works—a dubious proposition at best—we might want to ask whether such a result would serve the ends of humanistic inquiry in any meaningful (which is to say useful) way.

Lest I be accused of quoting only less recent works, allow me to cite Susan Hockey's 2000 book on electronic texts in the humanities:

Computer-based tools are especially good for comparative work, and here some simple statistical tools can help to reinforce the interpretation of the material . . . . These studies are particularly suitable for testing hypotheses or for verifying intuition. They can provide concrete evidence to support or refute hypotheses or interpretations which have in the past been based on human reading and the somewhat serendipitous noting of interesting features (Hockey, 2000).

Hockey goes on to defend computer-assisted literary analysis against the charges of various critics, but this paragraph—at once dispiriting to the computing humanist and disparaging toward the conventional scholar—is to my mind somewhat worse than the barbs of our detractors. Computers, in Hockey's estimation, are good at counting, providing accuracy, and isolating patterns. She considers these elements useful adjuncts to literary criticism, because without such prerogatives, critics are forced to rely on 'human reading', intuition, and serendipity. Computers are astonishingly powerful, but ultimately impotent; human readers are the ultimate source of meaning, but only in a limited and idiosyncratic way.

What is the opposite of impressionistic criticism?

The question is appropriate, because the answer is *not* computer-assisted text analysis. The opposite of impressionistic criticism as undertaken by scholars is the profusion of non-scholarly interpretive methods which have moved through the intellectual landscape of world literary culture since ancient times. These include certain mantic traditions like the stochastic reading of the *I Ching* and the *sortes Virgilianæ*, as well as various forms of isopsephia such as Hebrew *gematria*. It includes the interpretive methods of various movements usually thought of as closer to art-making than scholarship: the Dadaists, certainly, but also the generative aesthetics of Oulipo. Typological traditions in biblical criticism—the ancient ancestor of modern hermeneutics—are also part of this group.

These methods are not distinguished by lack of rigour; it would be exceedingly difficult to imagine a method more rigorous than, for example, *gematria*, with its complicated rules and traditions. These ‘ludic’ traditions are distinguished, rather, by a refusal to declare meaning in any final form. One throws yarrow stalks not to narrow the field of interpretation, but to allow new meanings to emerge—new ways of seeing the semantic relations at hand. *Gematria* is likewise meant to demonstrate the inexhaustible nature of divine meaning—a meaning so rich and so deep that even the graphical symbols themselves can assume new interpretive valences. By allowing one to interchange the lines of ten separate sonnets, Raymond Queneau’s *Cent Mille Millions de Poèmes* allows one not just to go on interpreting forever, but to go on reading forever (or at least for a very long time); according to Queneau, a person reading the book 24 hours a day would need 190,258,751 years to finish it (Mathews, 1998). The question these methods propose is not, ‘What does the text mean?’ but rather, ‘How do we ensure that it keeps on meaning?’—how, in other words, can we ensure that our engagement with the text is deep, multifaceted, and prolonged?

I have answered my initial question and its corollary with an unlikely set of oppositions between computer-assisted text analysis and mainstream scholarly criticism on the one hand, and between mainstream scholarly criticism and the ‘ludic’ traditions on the other. Something even more unlikely occurs if we place these various approaches to interpretation on a scale from the least to the most tractable from an algorithmic standpoint. Ironically, it is not the methods of the scholar that reveal themselves as ‘computational’, but the methods of the gematrist and the soothsayer. Saying that computerized methods are qualitatively different from the methods of literary criticism depends a great deal on what you mean by literary criticism.

No computer in existence is capable of generating a critical paper on gender dynamics in *King Lear*, or the figure of the *flâneur* in the nineteenth-century French novel, or even the assonantal structures of Old German poetry. We would be within our rights to consider such feats among the hardest of the AI-hard problems now extant. To think of this as what literary critics do, however, is to state in broadly elliptical terms

what is in fact only the end product of a process that shares some enormous similarities with the methods of the ludic tradition.

The outline of that process is most evident in the way we teach students to write critical essays. Although it is true that we do not typically ask them to cast yarrow stalks or choose things at random, we do ask them to find some pattern beyond the apparent pattern of the text. We might ask them to notice all the female characters in *Lear* and what they say; or to find instances of *flâneurs* in French novels and to notice the way they move through the storylines; we might ask them to count occurrences of assonantal syllables in a line of verse. We ask them to select, isolate, notice—to consider a small group of sub-patterns from among the infinity of patterns that make up the text. Having done this, we then ask them to re-articulate those patterns in narrative form as elucidations of the texts in which they occur. We call those articulations ‘meanings’, and we call the act of embedding them in a narrative framework ‘interpretation’.

The sense of which selections, isolations, and noticing will yield suggestive patterns can only be expressed in terms of heuristics. It is an intuitive, experiential, social, contextual endeavour. We might also say, with Wittgenstein, that the operations those heuristics produce (operations that we can very often represent on a computer) are like the steps of a ladder that we can throw away once we ‘climb up beyond them’ (Wittgenstein, 1994). Throwing away the ladder in this way has, in fact, been the consistent method of literary criticism, which, as a rhetorical practice, is indeed often concerned with finding ways to conceal these steps by making it seem as if the author went from the open possibilities of signification in *Lear* to the hidden significance of the Fool in a single bound. The computational substrate upon which algorithmic criticism rests, however, demands that one pay attention to the hidden details of pattern formation. Algorithmic criticism might indeed be conceived as an activity that seeks to scrutinize the discarded ladder.

It is, of course, possible to go to a literary text armed with a hypothesis, but we do better to go to it with a hunch borne of our collective musings—a sneaking suspicion that looking at it *this* way will turn up something interesting. Or better still, we could go to it with a machine that is ready to reorganize that text in a thousand different ways instantly. The humblest search engine gives us an alternative vision of the text; every concordance produces page after page in which a word we hardly noticed becomes that toward which every utterance tends; TEI tags are not merely structural delineations, but patterns of potential meaning woven through a text by a human interpreter. And we can do better still: we can envision machines that assist the literary critical scholar at the stage at which all truly illuminating engagements begin: that point when the reading of a text becomes a re-creation (perhaps even a recreation) of the text according to new rules—a playful quest for the patterns that the critic will hold up as illustrative of an un-recreated original. Instead of concordancing the nouns in a text, we might create machines that cleave off all words *except* the nouns; instead of flagging the gender terms in a text,

we could reverse them; instead of generating word frequency lists, we can alter the typography by order of frequency.

Several critics have already begun to show us the way to this sort of tool. Estelle Irizarry's computationally enacted 'tamperings', inspired by a constellation of Hispanic poets ranging from Pas and Borges to Juan-Eduardo Circlot and Clara Janés, attempts to increase critical awareness through explicitly ludic methods:

Computer-enabled 'play' can accomplish the same type of alteration which these writers have pursued in their works. Such poetic play, beyond the poetic products themselves, serves as a tool to increase readers' awareness of poetry by a unique blend of word, structure, and pattern. By imbuing the poetic text with a new dimension, on-screen manipulation of what has been called 'electric poetry' (Silverstein) evokes the reader's participation in the poetic process. The interactive modality offered by the electronic medium destabilizes the text, allowing the reader to explore it more thoroughly than is possible in the fixed printed medium and to both appreciate and experience poetry as 'play' (Irizarry, 1996).

Recent work by Jerome McGann and Lisa Samuels likewise puts forth the notion of 'deformance'—the self-conscious reconfiguration of textual artefacts for the purpose of releasing what the Oulipians would call their 'potentialities'. As with Irizarry, the goal is to bring forth 'poetic and artifactual media that usually escape our scrutiny':

But this enlargement of the subject matter of criticism doesn't define the most significant function of deformative operations. Far more important is the stochastic process it entails. Reading backward is a highly regulated method for disordering the senses of a text. It turns off the controls that organize the poetic system at some of its most general levels. When we run the deformative program through a particular work we cannot predict the results. As Dickinson elegantly put it, 'A Something overtakes the Mind,' and we are brought to a critical position in which we can imagine things about the text that we didn't and perhaps couldn't otherwise know (McGann, 2001).

Stéfan Sinclair, in what is perhaps the boldest implementation of these ideas, has written *HyperPo* precisely to enact these theoretical notions. If John Bradley and Geoff Rockwell do not consider themselves full-fledged members of Stéfan's *OuLIInPo* movement, their work on exploratory text analysis demonstrates a desire to go far beyond critical insight validators.<sup>1</sup>

Ideally, the 'algorithmic criticism' that arose from such machinations would possess a methodological honesty without precise parallel either in conventional written criticism or in computer-assisted text analysis—the playful reorderings not only available for inspection, but a privileged part of the argument being made. This type of activity would depart from

1 OuLIInPo (Ouvroir de Littérature Informatique Potentielle) is Stéfan Sinclair's term for work that combines computers with oulipian constraints. 'The cross', as Sinclair notes, 'is certainly not new for Oulipians: "La littérature potentielle est, par définition, riche de toutes les potentialités. Parmi celles qui nous attendent (nous guettent?) figurent évidemment l'informatisation!" (Paul Fournel).'" See <http://www.ualberta.ca/stefan/Oulipo/en.html>. Other projects that employ similar or related strategies include Johanna Drucker and Bethanie Nowviskie's Temporal Modelling (an interface for facilitating the interpretation and analysis of 'the subjective experience of temporality in historical documents or imaginative artifacts'), McGann and Drucker's The Ivanhoe Game (a game environment that allows users to make critical interventions in imaginative works), and several other emergent projects associated with UVA's Speculative Computing Lab (<http://www.speculativecomputing.org>).

conventional criticism in refusing to conceal the (at times arbitrary and even whimsical) transformations that inspire narratives of meaning, but neither would it mimic text analysis in attempting to labour under the strictures of experimental science. With algorithmic criticism, one would not ask how the ends of interpretation were or were not justified by means of the algorithms imposed, but rather, how successful the algorithms were in provoking thought and allowing insight.

Empirical validation of ‘impressionistic’ or ‘serendipitous’ critical readings gain no traction with mainstream literary critical scholarship not because our colleagues have not seen the light, but because they do not comprehend the light. Empirical validation and hypothesis testing simply make no sense in a discourse where the object is not to be right (in the sense that a biologist is ever ‘right’), but to be interesting (in the sense that a great philosopher is ‘interesting’). In the end, the failure to transform technical achievement into interesting literary critical discourse is among the most baffling features of our discipline—particularly when we consider the analytical skills of the people who have come to define the activity. Burrows and Craig (1994) use principal component analysis to show us patterns in the word frequencies of Romantic and Renaissance drama that are simply astonishing, but rather than using those patterns to do literary criticism, they simply note that their results do not contradict the impressions of earlier critics—as if there had been no net gain to their work at all. Paul Fortier deftly locates an amazing series of statistical convergences running through several modern French novels, but ends by noting that ‘The results correspond to known and documented literary phenomena’—as if critical insights were like species of butterflies in need of Latin names (Fortier, 1989). Eric Johnson writes a program that computes the minimum number of actors necessary to mount a production of a play, but ends the paper in which he describes this marvellous tool by saying that ‘The program can probably be used to document a character’s role in ways its creator never imagined’ (Johnson, 1995). It certainly can. If the goal is to break into the mainstream, it will have to.

And that should be the goal, because ‘breaking into the mainstream’ is another way of saying that we have found a way to communicate our ideas to the wider community of humanist scholars to the benefit of all.

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