

The Four Corners of the E-lit World: Textual Instruments, Operational Logics, Wetware Studies, and Cybertext Poetics

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The paper focuses on the frontiers of electronic literature as exemplified by four different but interconnected research areas: textual instruments, operational logics, cybertext poetics and wetware studies.

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Introduction

In this paper the field of electronic literature is treated as a flat world infested with wild rumours, speculations, and warnings concerning the dangers of going too far in directions where the e-lit as we know it may ultimately turn into something completely different, threatening the validity of our current (ten to twenty years old) conceptualisations. To use and eventually abandon this silly metaphor, we'll take a quick look at the four corners of this world specified by the transformative powers of cybertext poetics, wetware studies, operational logics, and textual instruments. From this perspective electronic literature looks very much like any other literature threatened by new media art and other arts, social and other sciences, games and play, and last but not least by stagnation (geritextuality).

Cybertext theory and its several hundred media positions undermine the specificity of electronic literature in two major ways: they point to several overlaps between electronic literature and literature executed in various other media, and offer a hypothetical yet pragmatic view from the sum total of all conceivable and theoretically valid media positions of which e-lit as we know it has utilized but a fraction.

Thinking about operational logics opens up a whole field of borrowing, sharing, combining, repurposing and adapting operations, which can

be moved from one domain and context to another and therefore also call into question the specificity of electronic literature. These practices are already exemplified by the use of collision detection in Stuart Moulthrop's *Pax* and Noah Wardrip-Fruin's *Screen*, as well as by Jim Andrew's *Arteroids* borrowing its readymade playability from an arcade classic.

While textual instruments and instrumental texts offer inspiring analogies to games, play and music, they also end up showing almost irreducible differences in how we experience repetition and variable expression in different aesthetic and social realms. This brings us to the fourth and final corner of wetware studies, which just may be able to situate ergodic action in a broader spectrum of human behaviour, including the well-known operational logics of the Milgram and Zimbardo (or Lucifer) effects, provided that we are willing to give up the magic circle surrounding literary production and consumption.

Cybertext poetics

Cybertextual thinking is not necessarily limited to those few genres of electronic and ergodic literature that were around in the mid-1990s, but can encompass literature in general, experimental and generic, actual and potential, ergodic and non-ergodic alike. For fifty odd years digital literature has been marginal, experimental, and crafted so as to maintain the 20th century triangle between various avant-gardes, modernisms and postmodernisms, as easily excluded from the realm of proper literature as video-, bio-, holopoetry, or just about anything else neither printed on paper nor orally transmitted.

Nevertheless, electronic literature forms a niche filled with counterexamples to almost every theory of literature that relies and builds on print literature alone. Therefore it is an almost boundless expansion set for literary theories as we know them, and a repository of untried possibilities that could affect every kind of literature, "high" and "low" alike. In short, the combination of electronic literature and cybertext theory can be used to challenge hegemonic theories of literature to rewrite themselves from the perspective of the sum total of the available media positions and not just the relatively few the print traditions have been able to use. In this sense cybertextuality is not just a perspective on ergodic literature, but on every kind of literature and literary theory. (Eskelinen, *Cybertext Poetics*)

However, the cybertextual angle is as useful in describing generic stagnation in the field of electronic literature as it is in showing the limitations of print literature (for example in terms of the latter's inherent lack of

temporal dynamics). To see what I mean, ask yourself why hypertext fiction is almost always static, determinate, intransient, impersonal, with controlled access and explorative user function, in addition to having links, the only thing it cannot abandon without ceasing to be hypertext. Why are so few hypertexts (with Stuart Moulthrop's *Reagan Library* as a rare exception) dynamic and transient, for example, in order to be able to vary more than just the order of presentation of their nodes (i.e. just one narratological variable out of many), as the well-known ergodic novels (of Saporta, Cortazar, and Johnson) did in the 1960s, without adding to the mix an overload of static repetition (i.e. the forced re-reading of the parts that will remain the same)?

To break free from the status quo between the limitations of print and the stagnation of digital literature (perhaps even closer to stagnation as a result of the emergence of popular digital literature via iPads, tablet computers and other gadgets), we will take another look at the two main constituents of cybertext theory: the feedback loop and the user's non-trivial work.

The precise nature of the feedback loop, or differences between several possible types of these loops, are not discussed in Espen Aarseth's *Cybertext*; neither are the differences between the effects or consequences the user knowingly chooses and the ones he merely causes without knowing that he does so. It is not difficult to design and program a text (Eskelinen; Eskelinen and Koskimaa) that analyses its reader's (temporal) behaviour and changes its own content, structure, and behaviour accordingly, while the reader is moving freely in the text making interpretations and enjoying random access. In such situations readers don't necessarily make any explicit non-trivial choices, even though the way they read will affect the text: there's a feedback loop but the reader-user doesn't use it intentionally and may not even be aware of its existence. Depending on one's perspective this semi-ergodic solution either combines the best of both worlds or represents a pathetic compromise between non-ergodic reading and dynamic textuality.

The feedback loop between user and text is not the only feedback loop we should pay attention to, as the loops also exist or may exist between different parts and phases of the text, between two or several users, and between two or several texts. Moreover, given the plurality of digital networks, the emergence of RFID (radio-frequency identification) technologies and ubiquitous digital environments, and the prospects of every little thing, particle and sensor around us having its own IP-address, we should perhaps pay more attention to the qualitative differences between different kinds of loops. In short, we may want to ask who or what is in the feedback

loop or loops, what kind of information about the user passes on in the loop, and how is the information used and the user profiled, targeted and protected, and focus on text machines that profile their users and predict their behaviour based on more intimate, personal, and embodied data than what can be gathered by analysing the traditional user activities of clicking, typing and selecting. The mixture of harmless aesthetic feedback loops and less benevolent military-political-economical loops could give rise to many kinds of cybertextual apartheid practices, based on the system's interpretation and measurements of the user's body, behaviour and consumption patterns, when the user finally meets and struggles with his or her profile.

Finally, we may examine more closely the non-trivial work that characterizes the user's ergodic activity. Is it just work or could it become, under certain circumstances, play? Enter textual instruments.

Textual instruments

Roughly a decade ago, when certain ludologists started to construct a conceptual and theoretical basis for non-narrativist (digital) game studies, the ideas centred around games and play were also taken up in discussions of electronic literature. John Cayley (2003) started to talk about textual instruments and Stuart Moulthrop (2004) about the shift of focus from work to play. Noah Wardrip-Fruin (2003, 3) offered a working definition of a textual instrument as "a tool for textual performance which may be used to play a variety of compositions." Compositions consist of "a body of text (and/or means of acquiring text) and a set of "tunings" for the instruments used." (ibid.) Wardrip-Fruin also distinguished between instrumental texts (capable of playing only one composition that is usually attached to the instrument that plays it) and textual instruments (capable of playing several compositions). This difference is important, even though Wardrip-Fruin later abandoned it for practical (and not theoretical) reasons.

The idea of textual instruments pushes electronic literature in several directions, most often towards music and games. The latter guarantee playability, as is the case with Jim Andrew's *Arteroids* and its borrowed interactivity from an arcade classic. The former offers useful analogies and suggests a new diversity of roles for those who participate in the instrumentality: composers writing and programming playable texts, craftspeople designing and building the actual instruments that could play any number of compositions while allowing improvisation, and both ordinary and virtuoso players of those instruments.

In retrospect one could say that textual instruments were a nice dream. Problems were at least threefold, one for each interested party. Here's the author's problem clearly expressed by John Cayley:

I can configure a poetic environment until it becomes playable, like an instrument, but it will not by dint of this potential become an 'instrument' as we currently know them. Its range of expression will be constrained within an extended (and playably extensible) but limited field that is determined by the significance and affect already inscribed within the work, within the poetic environment in this case. (Cayley, *riverIsland*)

Probably the only way around this problem is to balance the variable poetic expression with the kind of instrumentality and activity that is enjoyable in itself, instead of being merely subservient to the linguistic and poetic expression, but as Roberto Simanowski (42-53) has shown striking this balance is close to impossible.

Ultimately the musical metaphor for textual instruments also fails from the user's perspective. Playing for fun, improvising (individually or collectively), and varying well-known compositions all require skills that usually take quite some time to develop, but when a certain level of competence is reached, things change. The ability to play music will be useful for decades, as thousands of compositions become available to instrumentalists who have sufficiently mastered their trade; this is one of the crucial motivational factors that encourages further learning. This is not the case with textual instruments that offer far fewer rewards to the player-in-progress.

These problems of authors and users culminate in the third aspect of the problem: "The problem is that there is no predetermined shape to the machines and instruments of textual representation in new media" (Cayley, "From" 11) Generally speaking the metaphors and heuristics of play and instruments usually move in at least four different directions: music and musical instruments, child's play and bodily improvisation, arcade and card games, and drama and performance. One could perhaps add another potential metaphor to those four: medical and scholarly instruments that extend our perceptive capability to things not seen or otherwise grasped without them. Medical instruments and especially everyday medical devices could be used to integrate the rhythm of the user's varying bodily states (such as body temperature, pulse, and blood) into play with texts.

This brings digital literature closer to the theme and cliché of embodiment, as well as to several new media practices that demand much more than clicking and typing from the user. To the degree the portable and networked medical instruments measure the states of a human body that most humans cannot control, and if these states affect the state of a liter-

ary work, we are finally playing with and building literary systems on responses as authentic as they can possibly be. These bodily texts or “metabolic narratives” could be embedded within locative narratives, especially if the latter evolve beyond their current state of GPS meets audio guide, hypertext fiction, or installation art.

Operational logics

To Wardrip-Fruin (*Expressive* 13), operational logics are patterns of the interplay between data, processes, surface, interaction, author and audiences, and these logics “can be implemented in a wide variety of ways on a continually expanding set of platforms.” (14) In addition to operational logics there are effects that “can arise in the relations between system processes and audience experiences.” (15) To Wardrip-Fruin there are three major possibilities: first, the work’s surface simplicity is based on and conceals the underlying complexity of its data processes (the Tale-Spin effect); second, the work’s surface complexity is based on and conceals the underlying simplicity of its processes (the Eliza effect); and finally, the work’s surface complexity matches and does not conceal underlying complexity, constituting the SimCity effect that occurs whenever the system’s surface experience enables the audience to build up an understanding of the system’s internal structure. (Wardrip-Fruin 16) This is all clear and simple, but it also presents a problem to electronic literature.

This is, first of all, because two of these three effects constitute a failure in the areas of poetics and aesthetics. Eliza/Doctor doesn’t live up to the user’s expectations, or at least the expectations of a user innocent enough not to know this already, and very soon the simple mechanics beyond the dialogue lead to non-sensical communication that makes the user want to quit—or alternatively and for some time to play with the limitations of the underlying system and either maintain or break the communicative illusion. In short, the work has an inherent expiration time that precludes long-term engagement.

In Tale-Spin the user usually only gets to read a series of unimpressive stories, the quality of which leaves much to be desired. The question then becomes why we as users should learn anything more about the underlying processes and their configurations if the system is only capable of producing failures, i.e. lousy stories with occasional absurdities that pale in comparison with the masters of the trade such as Daniil Kharms.

The case is very different with SimCity, in which the complexity of the surface mirrors or reflects the complexities of the processes making up the

town planning simulation. In short, while Wardrip-Fruin's two literary examples fail, the game or simulation or software toy effect works just fine and one may wonder what the actual lesson to be learned here is. Were we to take a more pragmatic turn we could ask what digital literature could possibly learn from the SimCity effect, begin answering that question by comparing the degrees of structural, behavioural and ergodic variation in literature and games, and end up with several kinds of dynamic textual wholes.

Instead, and given the constraints of space, we limit ourselves to learning a lesson from games with mimetic interfaces. In these games "the physical activity that the player performs mimics the game activity on the screen." (Juul, *Casual* 5) Games with mimetic interfaces, as well as many other casual games, favour the kind of interface design that foregrounds Ben Shneiderman's suggestions of continuous representation of the object of interest, physical actions or labeled button presses instead of complex syntax, rapid and reversible operations whose impact is immediately visible, and approaches to learning permitting usage with minimal knowledge. (Juul, *Casual* 35) In doing so they may also constitute a fourth effect missing from Wardrip-Fruin's account: operational logics with matching simplicities of processes and audience experiences—a combination that could be called the arcade effect.

From Wardrip-Fruin's concluding perspective,

most authoring of digital literature has focused on data—primarily text, image, and sound—while employing a small vocabulary of processes and surfaces. This has led to wide exploration of works for personal computers that employ a set of processes that are in danger of becoming clichéd. These include processes of unconstrained randomness, simple link-based trails of association (and their cousin, Storyspace links with guard fields), and simple spatial organizations. (Wardrip-Fruin, "Bejond" 246)

In the same spirit we may turn our attention to recent examples of what simple or complex surfaces can offer if we move from the intellectual cliché of the materiality of language to the actual smart materials and structures. The nanotechnologically modified pages in Eduardo Kac's *Aromapoetry* release 12 different smells for a long period of time. The obvious question with literary and criminal historical precedents is what else could books release and transmit in addition to smell, medicine, poison, drugs and meanings. Even more to the point (that I don't have the space to make) are the possibilities of adding smart materials and RFID transmitters to the traditional dumb media, resulting in digital literature co-inhabiting its newly-discovered round world with bio- and nanotechnologically modified objects, processes and surfaces.

One of the key political examples in Wardip-Fruin's important book is related to the notion of false positives resulting from the problems of statistical AI, which in the form of n-grams is in good use in many textual instruments such as his own *Regime Change*. The point is to show that software does not work the way too many people think and expect it does, as is the case with profiling people based on the way they use language. These are also questions for ergodic design: how to profile users, citizens and consumers, what kind information to gather, how to analyse it, and, ultimately, for what purposes to use it. These concerns may seem unnecessary or inconsequential if and when applied to ergodic and digital literature as we know it, but not if we re-think these questions not only through cybertext poetics but also in the context where the magic circle is not necessarily there any longer to protect and serve literary production and consumption. Enter wetware studies.

Wetware studies: ergodic behaviour outside the magic circle

The question of how independent the ergodic side or layer of a text could possibly be from its other linguistic and extralinguistic layers is mostly left unanswered in *Cybertext*. We could ask whether Abbie Hoffman's *Steal This Book* is an ergodic work. The question is what kind of action the work could possibly require from the user in addition to or instead of the more typical interfacial acts of clicking, typing, moving, mimicking and making gestures.

To put this in Wardip-Fruin's terms, we could say that in wetware studies we are dealing more with authors, audiences and interaction than with data, processes and surfaces. If we see ergodic literary works as examples of playable media, and consequently the user as a performer and a player, then we may want to ask further questions about the immediate context of her ergodic and non-trivial effort. One of these question concerns the magic circle.

According to Salen and Zimmerman's definition (99) that is based on Huizinga's earlier definition, "the magic circle is the space within which the game takes place. Whereas more informal forms of play do not have a distinct boundary, the formalized nature of games makes the magic circle explicit." Jesper Juul compared rules and fiction in an interesting way: "Rules separate the game from the rest of the world by carving an area where only the rules apply; fiction projects a world different from the real world. The magic circle of a game creates a space in the world in which the game is played. Fiction creates another world outside the actual world." (Juul, *Half-Real* 146)

In effect the magic circle separates and protects—or is supposed to protect—players and performers from the audience and from outside interferences, but as we know experimental games, theatre and performance art tend to break the circle or play with the expectations of the circle. The violation of the assumption of the magic circle is a standard trick of the trade: the performer may not be protected from the audience or it is unclear who is an actor, a performer, or a player and who is not.

Compared to this, the users of ergodic and non-ergodic literature are well protected within their respective magic circles (with the exception of totalitarian and fundamentalist regimes), both on and beyond the screen, at home and in a gallery alike, but this could easily change both with and without the user's permission.

The current ideologies around games and gameplay either take them to be good and at least harmless for players, or demonize them without a shred of evidence for their supposedly violent, desensitizing or addictive effects. In both cases the more realistic darker sides of play are left out of the picture, although these are well-known to scholars of play behaviour such as Brian Sutton-Smith and Gordon M. Burghardt. The former concluded that play “should not be defined only in terms of restricted Western values that say it is non-productive, rational, voluntary, and fun,” (Sutton-Smith 218) and the latter reminded us that play can also be cruel, risky and dangerous. (Burghardt 385-390)

If these notions ever find their way to discussions of playable media, we may find ourselves discussing two other effects on the frontier between ergodic literature and social-psychological experiments (including misinformed test subjects). The Milgram effect will then repeatedly show how far we tend to follow rules laid down by what- or whomever we take as authority, and the Zimbardo effect how far and fast we can head towards degrading practices just by playing with and letting us get too deep into antagonistic roles.

In short, if we know that an entity formerly known as reader will be or has to be at a specific location at a specific time, is walking around and reading the only thing we have in store for him or her? It seems that there is a very low threshold between a typical locative text (utilizing GPS to augment an environment) and performance art, invisible theatre, and happenings, not to mention the potential connections between these practices and civil disobedience, smart mobs, activism and hactivism.

If we start taking effective steps away from the literary magic circle to the darker sides of play, then the ergodic shape of rule-, role- or instruction-based action needs a much closer look, especially if we wish to see more clearly the relations of ergodic literature to ergodic art and

beyond, that is, to the realm of human action and its more or less complex “genres”. The operational logics of instructed humans are different from the operational logics of software systems and machinic instructions.

Conclusion

As a provisional conclusion, we could begin folding these four corners closer to each other to make the e-lit world a little rounder and fuller. If we combine operational logics with wetware studies we may, among other things, want to find out what kind of responses seriously misfiring or inappropriate operational logics trigger in the population. If we combine wetware studies with cybertext poetics, we need to redefine ergodic action and feedback loops in less formal and functional terms. If we combine cybertext poetics with textual instruments we have to ask additional questions about the nature and quality of the non-trivial ergodic work, not to mention the actual traversal of the work. More pairs, triplets and quartets could be constructed in this fashion before letting this conceptual Golem go, but there is not enough space to do it here.

We have already seen a glimpse of digital literature that borrows its operational logics from un-, a- and non-literature and especially from the other new media arts and games; gets more involved in the lives of its readers, users, players and performers both within and beyond the magic circle; combines ergodic action with social-psychological experiments; multiplies its feedback loops, blurring the lines between chosen, caused, imagined and given states of things; tunes and models its mixture of visible and invisible instruments to measure what we cannot directly perceive or consciously control (and thus putting our cognition, affects, values, pleasures, and memory to the test and at risk); and conceptually and theoretically devours, challenges and modifies hegemonic theories and ideas of literature, whatever they happen or remain to be. That would have been a good place to actually begin this presentation.

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Štirje vogali sveta e-literature: besedilni inštrumenti, operacijska logika, študije wetwara in kibertekstna poetika

Ključne besede: digitalna literatura / elektronska literatura / kibertekst / tekstualnost

V članku so uporabljene štiri različne vrste analize digitalne literature, kot jo trenutno poznamo. Z opazovanjem digitalne literature skozi oči kibertekstne teorije in poetike ne vidimo zgolj skupne vsote poetičnih možnosti, temveč tudi mesta, kjer se različni literarni mediji prekrivajo, in znake, ki nakazujejo stagnacijo v več pogojnih žanrih digitalne literature. Besedilni inštrumenti nam omogočajo, da preučimo posebnosti spremenljivega izražanja na ravni besedilnih strojev, ki so oblikovani kot inštrumenti, zmožni igrati več različnih skladb različnih avtorjev. Hevristična zamisel o besedilnih inštrumentih ob temeljiti analizi propade, saj navdihujoče analogije z glasbo in igrami vodijo v razlike med temi domenami človekovega izražanja in sporazumevanja, ki se jih skoraj ne da zmanjšati. Tretjič, nedavne raziskave operacijske logike, ki jih je opravil Noah Wardrip-Fruin, ponujajo nov niz vpogledov v programirljive stroje ter odnose med površinskim besedilom in globinskimi procesi. Ni čudno, da so najuspešnejši artefakti (tj. tisti, pri katerih se površina in procesi popolnoma ujemajo) računalniške igrice, ki predstavljajo še eno mejo digitalne literature, tudi zaradi njihove odvisnosti od simulacijske moči računalnikov. To mejo oziroma oviro dodatno preučujejo t. i. študije wetwara, ki so nujni korelat in dodatek Wardrip-Fruinovim raziskavam programske opreme. Avtor obravnava uporabnika kot izvajalca in igralca tako znotraj kot zunaj magičnega kroga literarne produkcije in potrošnje.

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