MODELS OF POETIC CONSTRUCTION AND THEIR POTENTIAL USE IN RECOMBINANT POETIC NETWORKS

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Abstract: If we consider the creative processes artists go through in making a work of art, is there a way to model these processes and "re-embody" them within computer mediated interactive environments? Computers present an artistic medium which heightens the potential for an intermingling of the knowledge of the viewer with the "re-embodied intelligence" of an author. Given that computers can house "recombinant" digital elements of image, sound, and text, how can the artist become an "author" of responsive, self regulating systems which enable "intelligent" emergent poetic responses to viewer interactivity via the application of models of poetic construction?

Keywords: Computer, Modeling, Intelligent, Recombinant, Re-embodied Intelligence, Poetics
New forms of poetic construction are being engendered within computer mediated environments. There is an increased interest in the creation of interactive artworks that exhibit "intelligent" responsiveness to viewer input. In Thinking Machines, The Search for Artificial Intelligence by Igor Aleksander and Piers Burnett, in the chapter called How Could We Tell If a Machine Was Intelligent, the authors state:

"Rather than becoming embroiled in the controversies which surround the nature of human intelligence, the practitioners of artificial intelligence have generally chosen to define their goals in empirical or operational terms rather than theoretical ones. An intelligent machine, they suggest, is able to do things which, if done by people, would be judged to require intelligence. On this basis, a definition of intelligence becomes unnecessary: The researcher simply choses a task that seems to require intelligence (playing chess say or recognizing visual images) and tries to build a machine that can accomplish it." (Aleksander, p13)

Like Aleksander and Burnett I also choose to leave the definition of "intelligence" open. Here, "intelligence" will be explored in the context of a new form of poetic construction which I call "Recombinant Poetics." Artworks which explore "Recombinant Poetics" are characterised by the interaction of a viewer with a system of meaning which carries compressed potential meaning constructed of language, image and sound elements within an engendered technological environment. The term 'Recombinant Poetics' coined by the author in 1995, utilises the concept of recombinant DNA in a metaphorical manner, referring to technologically manipulated modules of sound, image and text which are "spliced" and/or recombined. How can models of poetic construction be potentially employed in computer mediated Recombinant Poetic "networks"? How can the computer be used to technologically embody the 'intelligent' decisions that an artist makes? How might such a 're-embodiment' relate to concepts explored via Artificial Intelligence?

I will frame the problem as such "Given the set of elements and processes which the artist encodes into a potential artwork, construct the hypothesis that purports to enable the embodiment of selected elements as well as chosen processes within a computer mediated environment such that the elements and processes become available to the viewer as the emergent content of an experience engendered through interaction." In creating new computer mediated works of art, models of poetic construction can be applied which enable the work to potentially embody "intelligent" interactive responses to viewer involvement. Such responses can reflect the poetic sensibilities of the artist in a number of ways. I will outline below one such endeavour. A
larger examination of the salient characteristics of "Re-embodied Intelligence" as it applies to interactive artworks lies outside of the scope of this particular paper.

In terms of Artificial Intelligence (AI), an area of research known as "Expert Systems" was begun in the 1960's via the leadership of Edward A. Feigenbaum. Aleksander and Burnett state "The backbone of any expert system is, rather obviously, its 'knowledge base', the list of things it 'knows'...But an expert system does not simply have a range of facts at his disposal, he also has a methodology, a way of reasoning about those facts, which allows him to infer further facts and to take appropriate action." (Aleksander. p108) It is possible to load interactive works with selections from the re-embodied 'knowledge base' of the artist within interactive systems, by taking an intuitive approach to the construction and programming of the interactive poetic network.

In the book *Machines Who Think*, an engaging study of the history of Artificial Intelligence by Pamela McCorduck, Edward Feigenbaum states the following:

“I began to get interested in a set of problems that it seemed to me hadn’t been well explored by earlier AI work, namely tasks of empirical induction [Feigenbaum says]. Given a set of data elements, construct the hypothesis that purports to explain that set of data. And I viewed empirical induction as first of all being prototypic of scientific behaviour. So I was interested in modeling what scientists were doing in their problem solving, particularly in what they were doing in empirical induction activity.” (McCorduck)

The modeling of various forms of behaviour has been employed in the service of research in the realm of Artificial Intelligence. How might modeling the working methods relevant to the realm of art practice be explored. How can we model aspects of creativity? Attempting to answer this question creates a number of problems. Intuition, central to art practice, is difficult to model. There is a certain irony in terms of problem solving in relation to the arts, as Marcel Duchamp commented "There is no solution because there is no problem." (Cabanne)

I will first examine a work which I generated which deals with this issue of 'modeling'. In the interactive artwork *Passage Sets / One Pulls Pivots At The Tip Of The Tongue* (Seaman, 1995) an attempt to model specific aspects of the creative process was undertaken. Passage Sets is a navigable poem which is presented
in the form of an installation. The installation includes a poem generator which runs autonomously and an interactive videodisc which is controlled from a special interface programmed in Macromedia Director by Chris Ziegler in conjunction with the artist. The interactive videodisc includes music, spoken text, and video segments that are triggered from the navigable poem which is comprised of numerous photoshop stills with superimposed text. The work is displayed via two data projections and one video projection in a wide, darkened room. The following is an artist statement about the work.

"Passage" as text, "Passage" as travel, "Passage" as change over time, "Passage" as architecture. "Set" as pair, "Set" as illusionistic architecture, "Set" as device, "Set" as in mathematics... The work is drawn from architectural images shot in and around Tokyo, Japan and Karlsruhe, Germany contrasting the past and the present, focusing on travel, motion and light. An elaborate poetic text and soundtrack present the viewer with fields of meaning, forming an accumulated network of associations. The viewer can navigate an interface constructed from 150 connected images with superimposed poetic texts. A poem generator pulls the text apart and allows the viewer to construct new poems. Each word or phrase is linked back to it's original context in the poem thus the viewer can also navigate through an elaborate set of linguistic links. Images of a female and male participant, generating a series of abstract gestures, present a poetic musing on future interface relations. A set of "projections" dealing with notions related to sensuality/sexuality and identity in cyberspace are presented. The conceptual displacement or complex "space" engendered by future communication/sensual feedback systems is one field of poetic focus. The images reflect a superimposition or collision of psychological regions/states. The notion that a person in one part of the world can interact in a sensual/sexual manner with another person existing elsewhere, or with phantom identities engendered by the computer is also area of reflection. The navigation of illusionistic spaces ("sets") and historical media is also explored. The viewer is in one space, looking at another space (as menu system), navigating a superimposed alternate poetic linguistic space, which in turn triggers related associational video spaces. Simultaneously an autonomous poem generator constructs a linguistic space based on the displacement of language presented in the navigational poem. The conceptual superimposition of this entirety of spaces defines an open work and generates a reflective floating/shifting mind space for the viewer. Information technologies are forming new kinds of hybrid environments. Passage Sets poetically reflects on a potential future realm of sensual communication and exchange.

In the creation of the work Passage Sets, an initial linear text was written. This text was constructed of Haiku like short loaded "passages". Once this text was completed the process of examining the structure of
the poem was undertaken. Essentially the initial written poem was assembled with many modular sections comprised of four short phrases or words (although there was no exacting rule in that the initial poem was intuitively written). The work incorporated a specific set of puns. The puns were introduced to function as fields of potential meaning, with the knowledge that shifts in meaning could be activated and explored through navigation and subsequent re-positioning in alternate contexts as well as via juxtaposition with visual elements by the viewer/participant.

The installation explores composition, decomposition and recomposition. The initial poem was slowly, intuitively\(^4\), deconstructed to help define the model. A loose poetic grammar and syntax was formulated. Artworks, unlike AI, can bend rules. The slow process of modeling the poetic construction of the original text was undertaken. All of the words of the poem were placed into four lists. There were multiple uses of certain key words. Each list carried a polyvalent linguistic fragment of a potential new poem. The analogue task of positioning the words into appropriate lists in order to reflect the original construction was arduous although this process insured the working quality of the model in that it would exhibit a high degree of potential functionality in terms of emulating the initial text during recombination. Thus after the list building was completed, reading one word from each list generated a new text which was reflective in structure and quality to the original poem. The Macromedia Director program written for Passage Sets facilitated a system which enabled the viewer to redistribute the initial vocabulary of the poem in an 'intelligent' recombinant manner, via interaction. The lists were incorporated in the interactive artwork along with a 'navigable' version of the original poem. Thus the viewer could see how a word was used in relation to a particular visual/textual context, and then experience the word in relation to other words from the derived lists. Another feature in the poem generator section of the work was a random button allowing the viewer (and artist on subsequent occasions) to generate semi-random new poems (based on random choices from the 4 derived lists). Once generated these can also be altered word by word, drawing from the four original vocabulary variable lists. A set of 10 passages from Passage Sets:

1) entering / the voice / disturbed / air; 2) occupancy / of language / within this / meta-net; 3) physical / in one place / accessing / another; 4) the sensual / generator / of thought engines... / signals; 5) the machine / spawns / titles; 6) oscillation engines / talk / to the memory / of sliding fields; 7) ephemeral / gathering state / building / of emotives; 8) response / situation maps / memory / of touch; 9) constructions / fabrications... / reality set / shifters; 10) rotate / soft / erobotic / agent spokes.
A set of 10 derived passages from the lists - Random mode:
1) refinement / within a code / incidental / choir; 2) code / to be entered / forged / expression; 3) body / of sensation / elaborate / dance; 4) biomechanics / of triggered salt / infra-red / fabrications; 5) a truth / of shift / arching / motioning; 6) one / of reverie / soft / neck; 7) whispers / of skin / pneumatic / addressing; 8) rhythms / with intention / shifting / calls; 9) buddha / of codes / incidental / instance; 10) multi-voice / across the space / bridged / rise;

If the viewer clicks on a selected word from the derived text they call up the image which also houses that word. The viewer can navigate through the visual panarama of 150 images, each of which displays one haiku-like passage from the poem. These passages are presented in a scattered visual composition on each frame. In Passage Sets, if the viewer clicks on any of the words presented on the image panorama, they trigger the presentation of the poem generator, via hyper link. This menu presents the four poem generator lists in a stimulating spatial manner. Thus the poetic 'network' is vastly cross-referenced. Scrolling through these lists has an oddly sensual physical quality, as if one's hands were inside the system moving the lists. The viewer can delicately manipulate the speed and direction of the scrolling lists. As the viewer navigates, they can position the cursor over one of the four lists. As the viewer moves their cursor away from this list, only the new chosen word remains. Thus the viewer can generate (or 'write') a new poem by making a choice from any one or all of the four lists. This presents the opportunity for an intermingling of the knowledge of the viewer with the "re-embodied intelligence" of the author. There is a sense of active creativity in the navigation and substitution of these words by the viewer. Such a role extends the the level of engagement of the viewer in the construction of meaning. Roland Barth in Writing Degree Zero says...
"Text means Tissue; but whereas hitherto we have always taken this tissue as a product, a ready made veil, behind which lies, more or less hidden, meaning (truth), we are now emphasising in the tissue, the generative idea that the text is made, is worked out in perceptual interweaving." This statement was written by Barthes about non-computer mediated language. The mobile/fleeting character of computer mediated interactive environments presents an amplified, experiential version of 'making' the text and working it out through literal and metaphorical "perpetual interweaving." (Barthes) Again, the viewer can examine how the chosen word or phrase functions in multiple contexts within the 'network'. Many of the words have been chosen because of their specific ambiguity. This strategy insures a maximum mobility in relation to poetic construction, yet functions within certain bounds.
Artificial intelligence is not being employed in this system, yet the mechanism derives quite beautiful new poems which are highly reminiscent of the original. In one sense the computer is exhibiting "intelligence" as described above, that of the programmer, "re-embodied." Such a system would pass what Kurtzweil calls a "domain specific Turing test". He states "A narrower concept of the Turing test is for a computer to successfully imitate a human within a particular domain of human intelligence." (Kurzweil) He applied such a test to his own 'model' based poetry generating project. "The Kurzweil Cybernetic Poet is a computer program (written by the author) and provided with an input file of poems written by a human author or authors. The program analyzes these poems and creates a word-sequence model based on the poems it has just read. It then writes original stanzas of poetry using the model it has created."(Kurzweil)

It is here important to consider the role of the programmer, an author of logical code which allows the system to operate, and other programmers and artists who write "upper level" code exploring interactive non-hierarchical, non-linear structures. This leads to a series of thorny questions which are outside the realm of this particular document yet are valuable to consider. How might the notion of modeling other forms of creativity be applied to interactive art? How can an artist/programmer go about writing high level logical systems which exhibit, through interaction with a viewer, new creative knowledge characteristic of that artist/programmer? Can new operating systems be generated which optimise the exploration of creative models? In terms of modeling creativity, how can the programmer and/or artist most clearly reflect upon and 're-embody' the processes inherent to their learning and actually create systems which observe and 'learn about' creative processes, and subsequently apply that knowledge to generate new works? How might distributed systems be connected to form resonant poetic networks such that the intermingling of a number of interactive artworks, each exploring different creative models, could be enabled.

Many of these questions will take numerous years of research to answer. It is an optimistic hope that research into such systems will help us come to better understand ourselves. The exploration of computer mediated poetic systems, notions of "intelligent re-embodiment", and extended forms of authorship, form the basis of this ongoing research. It is through both theory and practice that we seek to explore the generative poetic resonances that computer mediated systems can exhibit.

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Notes

1 The term 'Recombinant Poetics' was created by the author in 1995. The term 'Recombinant' can be defined as follows, "Any new cell, individual, or molecule that is produced in the laboratory by recombinant DNA technology or that arises naturally as a result of recombination". (Parker) Recombinant DNA technology can be defined as follows, "In genetic engineering, a laboratory technique used to join deoxyribonucleic acid from different sources to produce an individual with a novel gene combination. Also known as gene splicing." (Parker)

It was introduced to Roy Ascott as a potential area of investigation at CAiiA, the Centre For Advanced Inquiry in Interactive Art, during ISEA (September 1995), and registered within my Ph.D. application title in December 1995. Work delineating the concept was first published on the World Wide Web in April, 1996 on the CAiiA website - http://caiiamind.nsad.gwent.ac.uk. Subsequent research has shown a related metaphorical use of the word “recombinant” by Mitchell in his discussion of 'recombinant architecture' (Mitchell 1995). Other artists and researchers have used the term 'recombinant' in a metaphorical manner including Arthur and Louise Kroeker, and Diana Gromala who is working on a book called Recombinant Devices: Ideologies of Virtual Design. The notion of modular, recombinational systems can be witnessed in my work as early as 1981.

2 We will consider "networks" in an all inclusive manner, from the scale of the individual artwork to that of the World Wide Web.

3 An earlier work of mine, The Exquisite Mechanism of Shivers, explored a related territory, employing a specific grammar and syntax in a interactive audio/visual sentence generator - Interactive Video, 1991 and CD-Rom, Artintact1, Cantz Verlag (Ostfildern Germany, 1995) compared to the intuitive, 'loose' grammar and syntax of Passage Sets.

4 Programmer intuition also plays a role in the development of models employed in AI systems.

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