

NON-LINEAR NARRATIVE

FICTION OR FILING?

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“Why lie, why give an appearance of fiction to that which is the groan of life.”

Antonin Artaud ¹

“Well, by ‘hypertext’ I mean non-sequential writing -- text that branches and allows choices to the reader, best read at an interactive screen. As popularly conceived, this is a series of text chunks connected by links which offer the reader different pathways.”

Ted Nelson ²

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¹ Antonin Artaud, ‘The Theatre and its Double’ 1938

² Ted Nelson, who coined the terms hypertext and hypermedia in the 1960s, wrote ‘Literary Machines’ published by the author, 1981, and ‘Computer Lib/Dream Machines’ 1974; *see Appendix for more references*

Definitions of computer-based non-linear narrative

“No significant cultural form springs into existence fully realized. There is always a gestation period, where the divisions between different genres, conventions, or media types are less defined.”³

“A cybertext is a machine for the production of variety of expression.”⁴

“As the cyber prefix indicates, the text is seen as a machine – not metaphorically but as a mechanical device for the production and consumption of verbal signs.”⁵

There appears to be a division between literary computer-based material usually termed hypertext fiction and that which includes, or is primarily, graphical. This is similar to the division between fiction and comic or graphic novel production in the real world. There is also a new strand of short films with interactive elements.

Most text-based narrative hypertext seems to come from a small academic community, or an even smaller practitioner community, who often sell software tools for the production of texts. Even though some of the texts refer to real world events there is a strange feeling of detachment and alienation around the works. An important early work ‘Victory Garden’⁶ is apparently set during the Gulf War, although it could possibly be set inside a simulation of the war.

This distancing effect is despite the fact that a click away is a world of news and current events, which is not usually dynamically integrated into texts, although there are some examples using links to online newspapers. Matti Niskanen's fiction ‘Leporauha’ was linked to the web page of a Finnish newspaper which changed daily. Markku Eskelinen's ‘Interface’ was updated by the author or others, and has parallels to a web log or Blog.

In many ways, the experience of reading, or rather navigating through, hypertext fictions is very challenging, and to misquote Mihaly Csikszentmihalyi:

“... If we don't take charge of its direction, our life will be controlled by the outside to serve the purpose of some other agency... other people will try to take as much of our energy as possible to further their own agenda – all of this without regard to how any of this will affect us.”⁷

Hypertext experimental fiction has been termed ‘ergodic’⁸, and requires some work to make sense (see Theory section).

The move from text to the movies

Ted Nelson invented the terms 'hypertext' and 'hypermedia', back in the 1960s, to manipulate and categorise text, while a post-graduate student working on a mainframe computer in Assembler language. His first paper on the subject was published in 1965⁹.

He is still developing the Xanadu software system, with the aim: “The World Wide Web (another imitation of paper) trivializes our original hypertext model with one-way ever-breaking links and no management of version or contents. Deep Hypertext, Intercomparison and Quotation.”

³ Stephen Johnson, *Interface Culture Basic Books 1997*

⁴ Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature Johns Hopkins University Press 1997*

⁵ Ibid.

⁶ Stuart Moulthrop *distributed by Eastgate Systems 1991*

⁷ Mihaly Csikszentmihalyi, *Finding Flow: The Psychology of Engagement with Everyday Life Basic Books 1998*

⁸ Ibid.

⁹ Ted Nelson Ibid

Text-only works now appear quite historical in interest, and subsumed within the vast hypertextual horizons of the web, now on nearly every computer, hand-held and soon mobile phone.

There is some correspondence between the ‘simple’ text-only hypertext fictions, with their maze-like structures and complex navigation, and the old-style programmed computer art. There is an element of experimentation, but also an edge of showing off the new technology.

“The computer will never replace the traditional media of pen and brushes, but can transcend them by offering the possibility of the convenient introduction of modification.”¹⁰

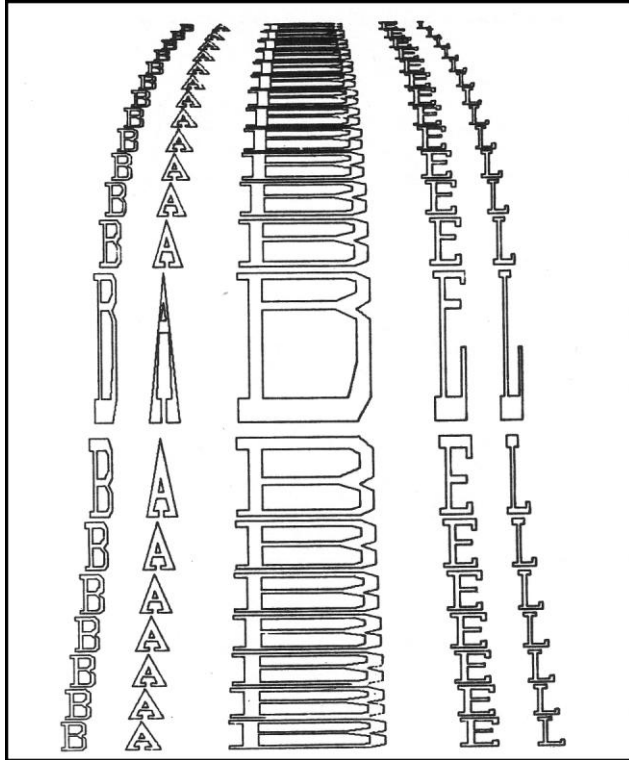


Figure 1: *Tower of Babel* (1967) by Leslie Mezei, an early example of programmed text art

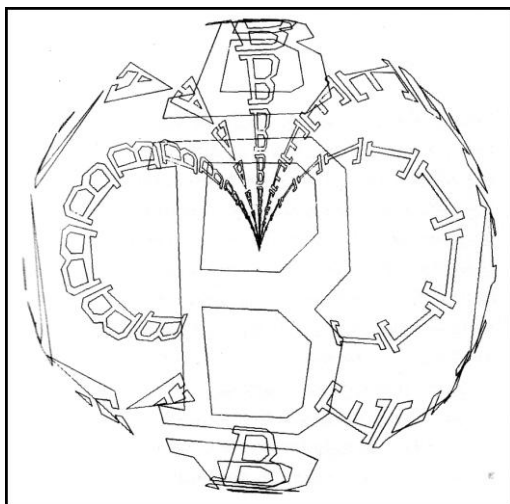


Figure 2: *Babel Exploded* (1967) by Leslie Mezei, showing similarities to modern Postscript vector text manipulation

¹⁰ Leslie Mezei, Professor of Computer Science, University of Toronto, quoted in Jasia Reichardt, *The Computer in Art Studio Vista 1971*

The early experiments such as that by Leslie Mezei and many others from the world of programming have echoes in some of today's programmed interactions and animations, such as the TextArc indexing work, where a large visual representation of all of the words in a text can be manipulated ¹¹. The programming of environments has become more sophisticated, for example 'Ghosts', ¹² a 3D vortex made up of text that has been entered 'live' by viewers. This has been shown at the Watershed gallery in Bristol, UK, and shows how computer art has moved from the climate-controlled IT labs of the 1960s, to hands-on public shows, or online access, of today.



Figure 3: Ghosts interactive text vortex

Despite a lot of computer art activity, there is no body of hypertext fiction, in the way there is a body of, say, crime fiction. The first hypernovel, 'Ambulance. An Electronic Novel' by Monica Moran ¹³ was published in 1993 and set the style for other comic book multimedia pieces. This was her only multimedia work. She later went on to appear in the films 'Sex: the Annabel Chong Story' (1999) and 'Take Her, She's Mine' an unreleased remake of the original 1963 film.

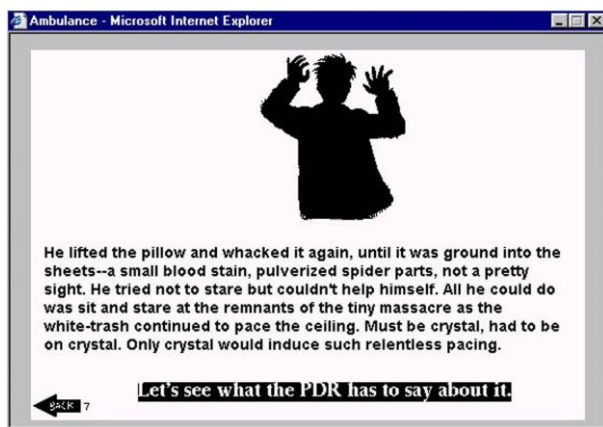


Figure 4: Page from Ambulance with hyperlink. For linear progression the reader clicks on main text

¹¹ TextArc at <http://textarc.org/>

¹² Ghosts, Gareth Bushell, James Lane and Anthony Rowe *Squid Soup* 2002

¹³ Ambulance. An Electronic Novel, Monica Moran 1993 now a web piece, available at eHollywood, see Appendix

Graphical works, using interactive images, video or animation, and sound, together with text, are mostly produced by a small art community, which also has very strong academic (art school) links. Although these are usually termed 'multimedia' some have a high text content, or mimic books, rather than films. Many examples of a more graphical type of non-linear fiction are at the Digital Fiction web site, which uses mainstream multimedia production products to produce sophisticated online art ¹⁴. This is some way from the old style of computer art produced in the 1960s onwards by programming the machine to draw lines or generate ASCII patterns.

The skills learnt and used in producing such complex multimedia works are useful in their own right on the job market. Many multimedia artists do commercial work as well as experimental artistic work, due to the lack of a commercial market for this type of art.

Theory

Ergodic

Ergodic texts require some work to make sense, from the Greek words *ergon* and *hodos*, meaning 'work' and 'path'¹⁵. Aarseth developed a theory of ergodic literature that subsumes 'cybertexts' as examples of an ancient tradition starting with temple writings and including the I Ching.

Ontolepsis

Defined as "the 'leaking' of ontological boundaries, narrative metalepsis being a special case of ontolepsis"¹⁶.

Fictional ontology (the principles and causes of being) involves the analysis of 'fictional worlds'. In normal fiction, the world is the real world, the characters, normal (or not) human beings. In Science Fiction, Mythical, Fantasy or Experimental fiction things change somewhat. In ontolepsis there is a non-rigid boundary between stories and their characters, and the outside or real world, allowing multiple readings to take place.

"When the border between "reality" and "illusion" disappears, the writers make use of a narrative technique that can be called "ontolepsis", seepage between different levels of reality."¹⁷

Metalepsis

"Metalepsis an indexical symbol which refers to another indexical symbol. An individual's conception of society is a metalepsis. We refer to our inner symbol of what society is, which can only refer to the outer convention (rather than a thing in and of itself). It is an individual index of a communal index. A game of smoke and mirrors, far removed from any directly referent reality."¹⁸

Also generally refers to the mixing and layering of a fictional character's awareness of their fictional and other environments, of future events etc.

Metalepsis and ontolepsis are related. Ontolepsis refers to the world of the story, metalepsis to the world of the character.

¹⁴ Macromedia, <http://www.macromedia.com/>

¹⁵ Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature Johns Hopkins University Press 1997*

¹⁶ Raine Koskimaa, *Digital Literature: From Text to Hypertext and Beyond University of Jyväskylä Computing Centre, Finland, 2000*

¹⁷ Johan Svedjedal, *Ergodic Nightmare - The world of choices in Philip K. Dick's The Three Stigmata of Palmer Eldritch University College of Borås, HumanIT Centre, 2001*

¹⁸ Jeff Ward, *Metalepsis article in Visible Darkness web site Blog, 2002*

Diegetic

The diegetic is the spatial and temporal universe referred to in the primary narration. Any text can contain a number of diegetic alternative possible worlds, and these are created by the reader, usually by imagining a normal historically correct universe from different character's points of view. However it is open to the author to put in multiple meanings. This is a primary concern of experimental fiction, which includes most if not all hypertext fictions.

The reader can imagine multiple worlds from the same text. This is a standard device in any 'normal' fiction where the author has written in two or more narrative voices, such as first person narrations from two protagonists. This is usually contrived to give the reader a more God-like overview than is normal.

Web logs or Blogs

These structural and theoretical concerns have led to the dominance of academic-style hypertexts rather than popular texts or works. For a contrast with the generally academic hypertext industry, examine the world of the web log or Blog¹⁹. This is a simple dynamic diary-style system that allows people to publish their thoughts online, and has had a huge growth rate since being specifically named in December 1997. It is used for anything from personal reporting, from autobiography to reviews or comments, to news, to documenting research or play and sport activities. Often the first reports from conferences (especially computer related ones) come as a stream of Blogs, days ahead of even online journals. These Blogs, since they are 'linear' in the sense of chronological, are usually excluded from a study of hypertext, yet they are by definition hypertextual. Also, multiple Blog readings make up a full hypertextual reading of a situation, from the points of view multiple authors and so are closer to the true definition of a hypertext in the 'docuverse'²⁰.

The sociology of Blog production could be said to be democratic and populist, compared to Hypertext production, which is academic and professional. This is clearly apparent in the names, 'Blog' informal, vernacular, 'Hypertext fiction' academic, subject to many definitions and interpretations, and not even informative to people in the wider world of electronic communication. Status and setting are important to hypertext fiction production, but not so with Blog production. Hypertext fiction is always very clearly presented as 'serious' or worthy of serious study, whereas a Blog can swerve from serious to flippant in the same paragraph.

¹⁹ See Appendix for web address

²⁰ Christopher Keep, Tim McLaughlin, Robin Parmar, *The Electronic Labyrinth Canada Council for the Arts 1993-2000*

Linearity



Figure 5: *Hypertext Gardens* by Mark Bernstein, showing links, from the Eastgate web site

The Linearity of Hypertext (I)

“George Landow ... using the hypertext as an example of a user participatory medium, he quite boldly states: "Hypertext, which challenges narrative and all literary forms based on linearity, calls into question ideas of plot and story current since Aristotle" ²¹. Landow leaves two possibilities: either it's impossible to create narrative in a non-linear environment, or Aristotle was wrong. He then cites several examples of hypertext-written fiction. Case closed.

Or maybe not.

... on the surface, this leaves us with good old Aristotle again, with a beginning, an end, and consequently; a middle. This middle is the really interesting part.” ²²

The Linearity of Hypertext (II)

“...The common understanding seems to be that ‘non-linear’ writing or reading is an impossibility – as a better alternative, the expression ‘multi-linear’ has gotten strong support, to emphasise the fact that there are several possible reading orders in hypertext.” ²³

The Linearity of Hypertext (III)

“Reading and writing are linear phenomena; they are sequential and chronological, conditioned by the durative ordering of time, although their positions as stored and in space may have a nonlinear organization. But once a word or a sentence is read, it is chosen and taken out of its nonlinear context

²¹ George P. Landow, *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology* (Parallax: Re-visions of Culture and Society) *The Johns Hopkins University Press* 1997

²² Jørgen Kirksæther, *The Structure of Video Game Narration* *The Norwegian University of Science and Technology in Trondheim* 1998

²³ Raine Koskimaa, *Digital Literature From Text to Hypertext and Beyond* *University of Jyväskylä Computing Centre, Finland* 2000

and positioned as a sequence in the linear chain and in conditioned time. However discontinuous or jumpy the writing or reading of a hypertext might be, at one level it always turns out to be linear.”²⁴

The Linearity of Hypertext (IV)

“Cybernetic literature presumes the text as virtual reality; ... based on the reader's/user's identification with the cursor. Being there, the imperative for the total immersion in the text environment, is now enabled by the reader's identification with cursor. The act of clicking anticipates the user's meeting with the clickual reality and continual linking from one part of a text to the others... On the basis of this Mark Amerika defined his cyber-cogito: "I link therefore I am" . The reading of such literary projects is principally non-trivial and cybernetic. We read according to schemes, which we try to find, returning to the beginning many times. We print individual page (if it's possible), do scripts and schemes about already chosen links, meaning that we're utmost active in composing/supplementing the "textscape". A text which requires non-trivial reading is ergodic according to Espen J. Aarseth's claims in his book *Cybertext*. Such reading is also risky, because "the cybertext puts its would-be-reader at risk: the risk of rejection". ”²⁵

The Non-Linearity of Hypertext (I)

“The debate over whether hypertextual-constructs create nonlinear, anti-linear or multi-linear reading/viewing practices is similar to the great literary debates of the 70s over whether certain kinds of metafiction or fabulist fiction were in fact anti-realist or, even worse, immoral. ... Our channel-surfing consciousness (the "cyberspace" we enter when scanning cable TV) is informing our present-day reality to such a degree that it is no longer possible to distinguish one from the other, that is, consciousness (a hypertextual construct) is now compatible with more radical forms of random departure or instantaneous clickual realities than previously thought possible and our technology is finally catching up with our dream-narrative apparatus.”²⁶

The Non-Linearity of Hypertext (II)

“The networks [réseaux] are many and interact, without any one of them being able to surpass the rest; this text is a galaxy of signifiers, not a structure of signifieds; it has no beginning; it is reversible; we gain access to it by several entrances, none of which can be authoritatively declared to be the main one; the codes it mobilizes extend as far as the eye can reach, they are indeterminable . . . ; the systems of meaning can take over this absolutely plural text, but their number is never closed, based as it is on the infinity of language" (emphasis in original).”²⁷

Anti-narrative – the after-life with relatives

If the evolution of consciousness and self-awareness led to a belief in an after-life and a God or Gods, or ever-present ancestor spirits, then it has been argued that story-telling is a fundamental human characteristic. But this ‘after-life with relatives’ idea is not a story but a relationship. Pan-cultural concepts of archetypes, such as those of Jung²⁸, are no longer fashionable, now celebrating ‘difference’ is judged the best promoter of social harmony. It is also possible that a late capitalist society awash with story-telling technologies, and obsessed with personal destiny, has imposed this on ancient societies.

The concept of ‘work’ is also fundamental, since it is ‘work’ and not ‘stories’ that have led to human progress. Take as an example China, which was famed through the ages as a culture that had not changed for thousands of years²⁹. Rapid technological development started in the West were due to a

²⁴ Gunnar Liestol, Wittgenstein, Genette and the Reader's Narrative in Hypertext, in G.P Landow (ed) *Hyper/Text/Theory Johns Hopkins University Press 1994*

²⁵ Janez Strehovec, *Text as Virtual Reality (Techno-Aesthetics and Web-Literatures) paper at Digital arts and culture 98, Bergen, Norway 1998*

²⁶ Mark Amerika, *Grammatron* <http://www.grammatron.com/>

²⁷ Roland Barthes, *S/Z. Paris: Éditions du Seuil, 1970; S/Z. New York: Hill and Wang, 1974*

²⁸ Carl Jung, *The Archetypes and The Collective Unconscious Princeton University Press 1981*

²⁹ Stephen Haw, *China A Cultural History Batsford 1990*

break from religious 'stories', and a move towards empirical observation, measurement and analysis followed by scientific theories. Stability in old China can be seen as due to the stability of the relationships, based on the stability of external relations. China in Chinese means Middle Country. Explorations were rare and not followed up, with the outside world regarded as full of barbarians, in need of a wall to keep them out. China's 'stories' were internal and complete.

From this angle, 'stories' can be seen as floating on top of a general base made of economic activity, or work. Thus work is constantly reorganising society, in such a way as to include technological change and progress in materials and transportation due to the outward direction of social development, especially in the colonialist, Imperialist West. Then the individual consciousness is also seen as being contained within this larger force, which is not even human in origin, but a biological force to expand territory and strengthen the group. Think of ants or beavers. Are they telling each other stories to advance the race?

If story-telling is fundamental to human existence, why do people prefer to live at 'work places' where the principle characteristic is repetition? This is true in all work places from factories to schools, via the office. The only story available is that of 'personal destiny' or 'career' which is only available to few individuals. Most promotions within work places are due to ageing and experience rather than any personal dynamic, a kind of long-term filtering taking place. The story-telling in local environments is usually social and particular, and hardly likely to spark off a massive techno-capitalist society. The grand story-telling of the cathedrals is a form of theatrical 'réalité virtual'³⁰ suited to the mass mind of the pre-Renaissance human.

So if the idea of humans telling stories is exaggerated, could the notion of story-telling also be exaggerated? For instance, a child is told a bedtime story. Is it the actual story or the reassuring presence of the adult or older child, the soothing sounds, the repetitions, all leading to a reduction of anxiety helping the onset of sleep? Perhaps all stories are actually involved in creating 'comfort zones' where respite is found from the rigours of the working world (which could easily include deadly dangers, such as violence, unreliable procedures, poisons etc). Many people do not read fiction at all, although they will watch a film or TV series. And they watch these sitting on a soft seat in warm safety, in conditions not far removed from the warmth of a child's bedroom.

So perhaps most literary material is misnamed, and a lot of what are called 'stories' or 'fiction' are in fact sedatives or tranquillisers. As such the use of a computer as the interface to the material poses big problems. The material formerly known as narrative may well not actually be narrative at all. The combination of reading-as-tranquilliser and computer-as-sedative makes the experience of reading fiction off a screen not what it seems.

Remediation of the Book

Bolter and Grusin examined various electronic media methods and put them into an historical context to show that, rather than being fundamentally new, they are in fact 'remediations' of old media³¹. In an example from the world of the book, hand-drawn mediaeval illustrated manuscripts with large illustrated capital letters are shown as 'leading to' print graphic design, such as posters with letters composed of images, such as a postcard for Coney Island, New York, which 'lead to' the image and text heavy 'splash' page of web design.

The authors also quote Michael Hart, the editor of Project Gutenberg, which places 'classic' texts on the web as a resource, who sees computers as a 'Replicator Technology' since it can reproduce texts without errors. The authors call this 'respectful remediation' since the original is not changed (apart from being available to search and analyse statistically).

"Web and internet applications refashion the newer perceptual media of radio, television, and telephone more aggressively than they refashion print"³².

³⁰ Antonin Artaud, *The Theatre and Its Double: Essays* Calder Publications 1993

³¹ Bolter and Grusin, *Remediation* MIT Press 2001

³² Ibid

Books as an entity, and fiction in particular, are hardly mentioned in the book. The web is seen as the great absorber of all things, in a way that the novel was once seen as “like a pig, it eats anything” (Matti Pulkkinen, Finnish author).

This was covered extensively by Marshall McLuhan ³³:

“ ‘Authorship’ – in the sense we know it today ... – was practically unknown before the advent of print technology. Mediaeval scholars were indifferent to the precise ‘identity’ of the books they studied. In turn, they rarely signed even what was clearly their own. ...Many small texts were transmitted into volumes ... and often authorship was lost.

The invention of printing did away with anonymity, fostering ideas of literary fame and the habit of considering intellectual effort as private property. Mechanical multiples created ... a reading public. Xerography [photocopying] ... heralds the times of instant publishing.

As new technologies come into play, people are less and less convinced of the importance of self-expression. Teamwork succeeds private effort.

A ditto device.

“ “ “ “

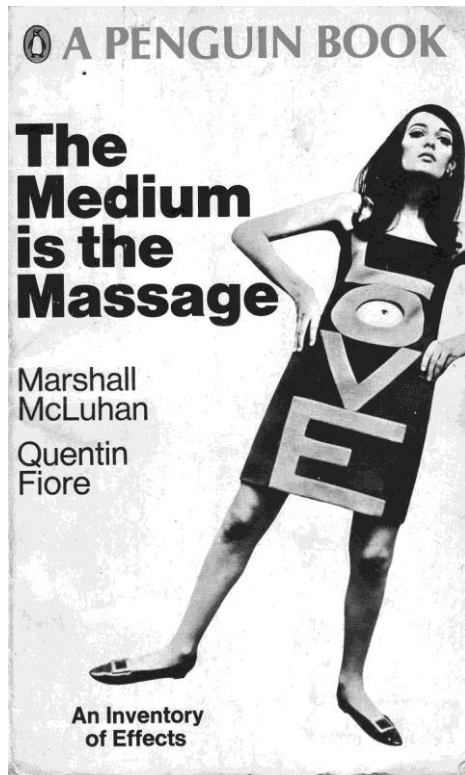


Figure 6: Cover of ‘The Medium is the Massage’ by McLuhan showing various text styles

McLuhan was right about the technology, but wrong about the return to an idyllic (Edenic?) anonymity. Today’s web logs and home pages are very personalised, in fact that is their appeal, the electronic whiff of authenticity. ‘Difference’ is now a key concept rather than ‘generalisation’. This ‘difference’ applies to everything, and is a process that once started never stops, like rust or viral replication. It is caused by over-production of material goods, which leads to the promotion of consumer desire as personal destiny, since the avenues for destiny are limited and largely pre-ordained. That which is ‘outside’ becomes the subject of computer games, for safe sublimation: crime, murder, power.

³³ Marshall McLuhan and Quentin Fiore, *The Medium is the Massage* (illustrated) *Penguin reprint 1969 (USA 1967)*

Information Architecture: Structure and Navigation

Information architecture (IA) is the philosophy and practise of organising all information within a given context. It is usually applied to computer data systems. It has become the primary concern of web professionals after the chaotic and expensive early years of web site development where the publishing model was used (see Bolter and Grusin³⁴). This led to category errors when web design companies came into contact with the client's information services (IS) departments, who were familiar with database and content management issues through the long-term development of internal company networks, prior to the use of web-protocol based intranet services. The main challenges facing web site integration are still not overcome with particular activity around site design and navigation, security, version control, content management, intranets, extranets, multiple language support, disabled access, and many other micro-issues particular to each project.

Information architecture and usability issues can be applied to non-linear narrative.

Apart from the research and academic community, interest in the internet only started when the HTML standard was invented for the World Wide Web (now universally known as the web) at Cern by Tim Berners-Lee in 1989. It took a while to interest the wider community, even within so-called cyberculture. In the review book 'Mondo 2000' published in 1992, there is a wealth of pseudo-information about virtual reality and other trendy topics such as 'techno-erotic paganism', and a chapter on hypertext where the Xanadu project is discussed, but there is no mention of the Internet, apart from an email address to sign up for the Electronic Frontier Foundation's *EFF News*³⁵.

Once images were added to the original text only browser (Lynx) and 'web' pages with images appeared, the floodgates were opened. Because photographic images and graphics could be used, the model moved from a 'computer network' for specialists to 'publishing' for all, at least all of those with computer access. The online equivalent of print magazines and advertising using print-derived design principles of visual impact, contrast, accuracy and clarity became the norm for web sites, with usability issues catching up after the rush of what were in effect faulty beginner's designs. Since there were no antecedents for web pages the print models used were not always the best. An example is pixel accurate cross-browser page design, which is very hard to do, and so very costly, but demanded by most corporate clients who want absolute brand uniformity with their print documents.

Information architecture has come to mean a particular thing to web site design, namely data organisation, labelling, navigation, and searching systems to help users find and manage information more successfully. IA issues have become subsumed under the general term Usability when applied to web sites, or multi-user computer services in general. Usability services even have a guru, Jacob Neilson, who is the most famous of all practitioners and highly influential, has overtaken in profile the more flamboyant web design gurus of the late 90s such as David Siegel, author of 'Creating Killer Web Sites'³⁶. This best-selling book and popular web site focussed on pixel-accurate page design and maximum visual impact, aggressively following the general principles of 'hypermediation' (mixing media and drawing attention to the media itself) spelled out in the already mentioned Remediation book. Incidentally, Siegel became disillusioned with the difficulty of cross-platform and cross-browser design and took up a new career.

With regard to literary hypertexts, the main failures (or successes, if ergodicity is the aim) are in the areas of:

navigation	loss of place, ignorance of direction
search	how to find a particular text in body of texts
labelling	what is this text compared to that text
organisation	how to return later to the same state, what is that state.

³⁴ Ibid

³⁵ Rudy Rucker, R U Sirius and Queen Mu, *Mondo 2000 A User's Guide to the New Edge Thames and Hudson 1992*

³⁶ David Siegel, *Creating Killer Web Sites Hayden Books 1997*

Texts

One of the gurus of interface design, Ben Schneiderman, has these general comments to make about hypertext³⁷:

“The dual dangers are that hypertext may be inappropriate for some projects and that the design of the hypertext may be poor (for example, too many links or a confusing structure). ... Of course, hypernovels, hyperpoems, hyper-fairy tales, hypernewspapers and hyperbooks are possible, but they require creative rethinking of the traditional forms to satisfy the Golden Rules of Hypertext.

... The golden rules... are:

- 1 There is a large body of information organised into numerous fragments
- 2 These fragments relate to one another
- 3 The user needs only a small fraction of these fragments at any one time.”

Schneiderman’s “too many links and a confusing structure” is almost a definition of ‘ergodic’ hypertext fiction.

The idea that any new reading of texts is possible with the hyperlinking of the web is not considered by the majority of web developers, whose aim is to lay out pages of text that can be easily navigated. This has led to the use of small, more concise texts, which can be size-controlled by the browser device. Even data input form design has changed with the use of multi-part forms with many short questions, with contingent navigation depending on user choices, rather than one long page. These also represent a strand of hypertextual non-linear navigation as the user’s answers generate the appropriate form.

The aim is to make text use and user input as seamless and non-thinking as possible. A most useful study in this area is *The Humane Interface* by Jef Raskin³⁸. He divides the mind of the user into the ‘cognitive conscious’ and the ‘cognitive unconscious’ and defines a new area of Cognetics to complement the old study of ergonomics. (The term was coined by the psychologist Kihlstrom). As such the aim of usability and interface designers is to make as much of the user’s experience automatic, happening in the cognitive unconscious, as this will speed up information flow and reduce stress. The cognitive conscious is then used for ‘steering’ the information flow, rather than working out how to use the navigation system.

The hyperlink of a web page is a basic navigating tool, with the structure ultimately provided by the information itself. This method is used in content management software where the content is defined by the navigation system, after initial data tagging during the site build phase. It is in effect positioned in the structure of the web site ‘on the fly’ depending on how it meets filtering criteria.

The problem with non-linear hypertext fiction is that it negates this basic rule of web page design, in order to add ontoleptic effects to ergodic texts (see previous definitions). It is as if the disciplines of information architecture and usability are contradicted, in order to produce texts that are difficult to read, in the name of special effects from the traditional domain of literary fiction. The most prominent feature becomes the linking, rather than the text itself, and these navigation decisions are moved from the cognitive unconscious to conscious. This reduces attention on the actual content of the text (the story) or narrative and focuses attention of the structure of the document.

“... the Web is developing as we speak, and experiments happen on the open Internet with us all as test subjects (not in a videotaped usability lab).”³⁹

³⁷ Ben Shneiderman, *Designing the User Interface Addison Wesley Longman, 1998*

³⁸ Jef Raskin, *The Humane Interface Addison Wesley 2000*

³⁹ Jacob Neilson, *Designing Web Usability New Riders Publishing 2000*

Spatial Experiments

“Digital environments are spatial: The new digital environments are characterised by their power to represent navigable space.” Janet H Murray ⁴⁰.

It is as if experimental writers were attracted by this new power, and so started the experiments with spatial navigation, as if the texts were laid out on scraps of paper on a large table. The software used for these hypertexts, such as Storyspace ⁴¹, encourage this approach.

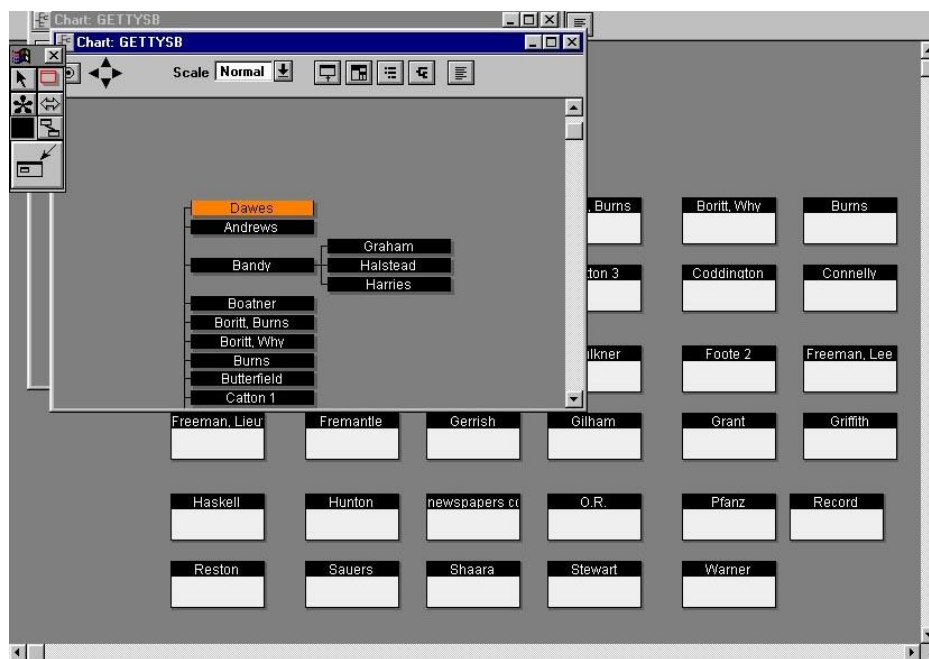


Figure 7: A sample Storyspace development scene

This also leads to the idea that perhaps the early experiments in online or computerised fiction were also experiments that have had their day, and are now of historical interest only, due to advances in usability studies of user interaction.

“We are, in fact, in a situation where we really have to consider the question if hyperfiction is, in the ten years from Joyce's *Afternoon* to *Twilight* (1997), come to the end of its road. This would not mean the total extinction of the genre, but rather the shift of focus to different areas, especially towards virtual reality worlds (or, narrative story worlds).” ⁴²

⁴⁰ Janet H Murray, *Hamlet on the Holodeck* MIT Press edition 2001

⁴¹ Software available from *Eastgate Systems Inc.* see Appendix for web address

⁴² Raine Koskimaa, *Ibid*

Rich Client Applications and Virtual Reality

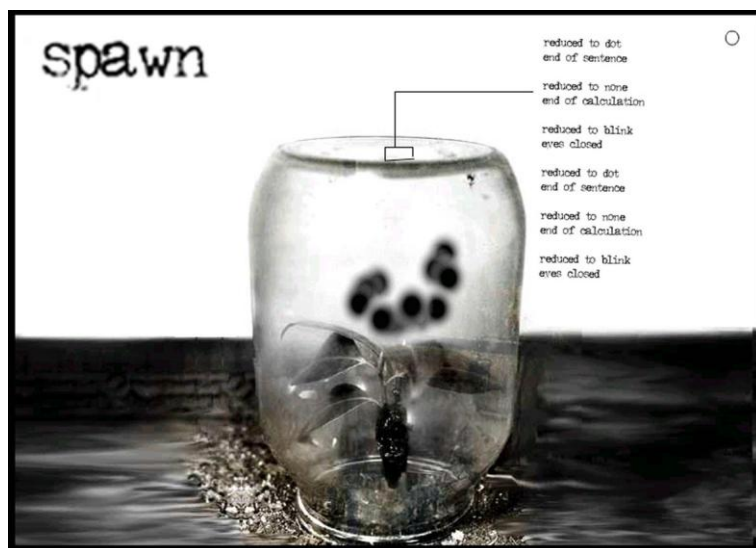


Figure 8: Still from *Spawn*, an interactive film on the *Digital Fictions* web site

The newer strand of film-style hypertexts, where images and movie clips are used to tell or supplement the story, often within a sophisticated 'rich client' application like Macromedia Flash or Director, removes some of the problems in using text, as the user will assume they are watching a movie, and so have a completely different set of interface expectations.

Virtual Reality ⁴³ worlds have been around for some time now, since the speed of computers allowed three dimensional simulations to be rendered in real time. There are a number of VR worlds accessible on the internet. These are multi-user and are popular if rather useless. The big growth area is, as usual, games, with online gaming moving from the office or home network to the internet. It is quite common for offices to turn into networked 'frag-fests' at 6pm, or when the boss goes home, with the office network running the multi-user game Doom or similar. Social bonding takes place as the competitive combat encourages trust.

Multi-User Domains

These spaces are not part of this study, as the 'stories' within them are more a part of the live experience of the web, rather than deliberately written for the web or computer display.

However, there was an amusing experiment at the Digital Storytelling Festival ⁴⁴:

"A country road. A tree. Evening." Two guys in hats -- Didi and Gogo, as they call each other -- are stranded in a desolate void, awaiting someone named Godot.

Finally, one of them cries out: "It's Godot! At last! Gogo! It's Godot! We're saved!"

It's a false alarm, as Samuel Beckett wrote the line. But wait! In this performance, there is somebody there -- some dude named Muscleman, a recumbent beefcake model straight out of a men's underwear ad. He pops in and asks, "Why are you waiting for him, anyway? I forgot."

The text was Beckett's. But the "stage" was a Palace chat room on the Net. The characters were those in the original play -- joined by anyone else logged onto the Palace that night who happened to stumble into the virtual room ("The Waiting Room") where the drama was unfolding.

⁴³ Custom systems: ActiveWorlds and open source systems: VRML: see Appendix for web references

⁴⁴ Digital Storytelling Festival, Crested Butte, Colorado, USA, 1997, reported at *The Salon*
<http://www.salon.com>

...

In "Waiting for Godot," as one critic famously put it, "nothing happens, twice"; in chat rooms, nothing happens over and over again, as people gather every evening and, mostly, wait for something to occur, for someone to say something interesting, for some diversion to help pass the time. To the artists who conceived and executed the stunt they called "Waiting for Godot.com" -- Adriene Jenik, Lisa Brenneis and Jonathan Delacour -- Beckett's existential vaudeville offered a perfect commentary on the world of online chat.

...

Thus the apparition of Muscleman, who -- like Thumper, a saucy- looking brunette pin-up, and several other avatars -- crashed the performance and interjected some ad libs. At one point, Didi and Gogo left their "Waiting Room" home to visit a crowded Palace space called the Pit, where their presence evoked comments like, "I think we should all change our names to Dodo and Gigi" and "didi and gogo r u hackas?" The improvisatory interruptions came full circle when Muscleman, getting into the spirit of the event, changed his avatar's name to Godot. That made this "Godot" a first: one in which Godot finally shows up. "

Non-linear fiction - the diaspora

Review of non-linear narrative, and its various definitions. This includes text, images and sound, fiction, with examples from computer and real-world games, TV and movies, plays, etc.

As I have shown above, there is some confusion around the terms hypertext fiction, non-linear narrative etc, and the scope of the topic. Non-linear narrative is a very loose term that is used to describe particular forms in computer games, cable TV shows, normal printed books and online hypertext fictions. Generally, the more serious practitioners use the term 'hypertext fiction' for non-linear narratives read on a computer or portable reader, although the term 'hypertext' describes the majority of things on the internet. Even the type of processing used to display pages is termed 'hypertext markup language'. So calling non-linear narrative 'hypertext' is like calling a golf caddy a 'vehicle' – accurate but not descriptive.

Real World Books

Many books have been published on traditional materials which have an open chapter or section order. Historical antecedents of the supposedly 'new' art of hypertext narrative might be the I Ching, which uses a chance act to select hexagrams which are used to provide enigmatic but profound advice. To jump forward historically, the Dadaists 'Exquisite Cadavers', where text or images are created independently but within a sequence, to give arbitrary readings on completion, are similar to the traditional party game 'Consequences'. Marc Saporta's 'Composition No. 1' (1962), had a deck of one hundred loose leaf cards, meant to be shuffled before each reading, so giving a random order for the text.

Printed book examples include Cortazar's *Hopscotch* (*Rayuela* in Spanish)⁴⁵, which can be read in any order, but has a suggested non-linear chapter order printed at the front, with 'expendable' chapters. *Hopscotch* is also a book full of jazz references, a music which thrives on improvisation. As an émigré from Argentina in France, the idea behind the lack of dictated linear structure is to encourage a search for many things, including "an alternative order that would transgress... Accepted notions of reality; values, social organization, knowledge & understanding (reason), language, family, city, nation; intellectually derived certainty; intellectually articulated self; For the reader: a similar quest"⁴⁶.

The earliest Western book example is Laurence Sterne's comic novel 'The Life and Opinions of Tristram Shandy, Gentleman'. This was published in nine volumes between 1759 and 1766. Childrens' books have often used this non-linear approach. The Dadaists created the Exquisite Cadaver, a game made up of separate sections, based on the game Consequences. Automatic generation of texts was a particular Dadaist trick (Tristan Tzara's 'Dadaist Poetry'). Early scrolls were discrete texts, and it is only recently that the idea of the narrative novel became predominant. As now on television, part publication was the norm. For instance, Dicken's works were published as parts, enabling easy purchase by his army of keen readers.

Digitised books

Project Gutenberg is the most famous example of an online electronic text library. These works are not only available for free, they are also of more use to students and researchers as they can be word searched, and stylistic analyses can be done, for instance to establish probable authorship in the case of texts of unknown origin. Other online text libraries include Textz, which as many modern texts and most publishers' web sites which have sample chapters from many books.

Text

Text adventure games in the Dungeons and Dragons style have a long history, being the first 'fictional' use of the developing internet, excluding digitisation and networking of texts such as papers and collaborative workgroups. MUD (multi-user dungeons, or domains) were set up to facilitate adventure game playing, with users reading bits of story action then typing in instructions such as 'open door'

⁴⁵ Cortazar's *Hopscotch* (*Rayuela*)

⁴⁶ Latin American Prose Fiction: An Archaeology of the "Boom" *University of Puget Sound 2001*

'get key' etc to navigate the game space. This basic method still works for a lot of modern high-resolution immersive 'shooter' games such as Wolfenstein, Goldeneye, TimeSplitters etc.

What might be called classic hypertext fictions are mainly text-based, but might have some graphic illustration, and involve moving around links to navigate a pre-ordained (although sometimes changing) structure. Mark Amerika's term 'clickual' describes the user interaction with this type of work. Examples are Michael Joyce's 'Afternoon. A Story' (1987), Stuart Moulthrop's 'Victory Garden' (1991) and Shelley Jackson's 'Patchwork Girl' (1995). All are available from the Eastgate web site ⁴⁷. Incidentally, the hyperfiction that Eastgate sell is very expensive, especially given the amateur nature of the field, suggesting an academic and research, rather than just normally curious, audience. The self-proclaimed first hyper-novel, *Ambulance* by Monica Moran, is considered later.

Computer and Online ebooks

There is a small but growing market for 'ebooks' which are electronic versions of normal linear texts for use with computers or portable devices, such as laptops or Palm Pilots, or dedicated readers such as the Gemstar eBook, or the more general use eBookMan from Franklin (USA). Of course these ebooks can be read in any order but so can a printed text. The aim of these ebooks is to emulate rather than enhance the reading experience, although basic computer functions such as copy and paste are available on some texts. Note that the Adobe Acrobat PDF (portable document format) does not allow copy and paste of text, and is often used by businesses for this reason, to prevent easy copying of documents, although this is also its most irritating feature.

Hypertext fiction

Hypertext in HTML and Javascript can be created in a simple text editor. Dedicated software exists for making hypertext web pages and assembling them into web sites with data representation, navigation and overall structure such as Macromedia Dreamweaver or Microsoft FrontPage ⁴⁸. There are also specific tools for fiction or 'creative' text.

The main hypertext fiction site on the web is Eastgate Systems ⁴⁹: "At Eastgate, we create new hypertext technologies and publish serious hypertext, fiction and non-fiction: serious, interactive writing." But they also say "At a time when even the best hypertext, on or off the Web, often seems empty and superficial..." in relation to a new piece of work they are selling. This site has many interesting and informative articles, reviews etc, some in normal page style, and some as hypertext. As such it is a good place to see whether hypertext actually works. For instance, Mark Bernstein, the technical director of Eastgate, has a small hypermedia piece 'Chasing Our Tails (1997)' on the site which explores issues around books, hypermedia, etc. This is an absorbing way to spend ten minutes and raises some good points; but it seems that a normal linear version is trying to jump out of the links. There is also the structure of this piece of hypermedia, displayed in Storyspace, a product for creating linked texts. In this the simple and admirably clear paragraphs are shown as a large cloud of texts with many links. What was a straight-forward essay has become a jumble of possible links. What is gained by viewing it as a hyperfiction? It is not at all clear.

Text Generation

I will use my own work as an example of a story generator.

In the early 80s I was experimenting with the then-new home computer, specifically the Sinclair Spectrum 48 and the Acorn BBC Micro. The two of interest to this study were:

Cow Boils Head (story text generator, Spectrum, 1983-84)

SCUM Manifesto (animation, Spectrum, 1983-84)

These came out on my own Micro Arts data cassette 'software label' and were also distributed as 'telesoftware' by Prestel (1984-85). Other titles included conceptual pieces, graphics and animations ⁵⁰.

⁴⁷ Eastgate *see Appendix for web address*

⁴⁸ See Appendix for software details

⁴⁹ Ibid

⁵⁰ See Appendix for software details

It was distributed as a data cassette, and ‘telesoftware’ on the original Prestel network, which had many unused resources as it had not really been taken up by any community. It had been invented in 1979 as part of BT and no-one knew what to do with it, so it was given to the public at no cost as part of the telephone service. When Micro Arts approached them in 1984, we were given 500 pages and told to do what we wanted. At the time, Micro Arts was also working with London Video Arts on an art version of Teletext for Channel 4. This was broadcast in 1985 under the name C5 (no relation to the current Channel 5). All this mid-Eighties activity has been lost to history as the protagonists (Micro Arts, and even London Video Arts) were not connected to the mainstream of academic activity, and so the activities were not documented.

Cow Boils Head

Story text generator ⁵¹.

This had a short story ‘Cow Boils Head’ concerning the displeased reaction of cows to the BSE crisis. This new type of disease, based on toxic protein material called prions, had just hit the scientific headlines many years before the news reached the general public.

The text (2000 words) of the story was made into data banks which contained synonyms and antonyms for all of the words, without changing their classification, so verbs corresponded to verbs, nouns with nouns etc. When the software generator ran it selected between the possible words for that position in the sentence and created new sentences. These were not random as they were all entered in the first place, rather than coming from a large dictionary, so it could be categorised as a multiple path hyperfiction on a sentence level.

The texts it produced were similar to the language substitution experiments of Raymond Queneau in ‘Cent mille milliards de poemes’, part of the 1960s group OULIPO ⁵². This work was published as a book with pages cut into one line strips. His aim was ‘poetry should be made by everyone’.

‘Cow Boils Head’ was shown at the 1984 London Film Festival along with the SCUM Manifesto animation. It was left running for 4 days at the Camden home of the London Film-Makers Coop. Although the endless surreal text generation caused a ripple of interest within the nascent video art community (David Larcher, Steve Hawley, Cerith Wynn-Evans etc) the experiments were not followed up as I moved to Zimbabwe to write ‘normal’ linear fiction. I later worked at Sheffield Hallam University as the lecturer/manager running their new Computer Graphics facility, and my interest moved towards the computer production of 3D and 2D images. In those days it was not that easy to find out about things in any possible hypertext fiction scene, as the web did not exist, and the computer art genre was much despised, or at least ignored, by the mainstream art scene. At that time there was only JANET (Joint Academic Network) for email and file transfer, and the great explosion of communication caused by the web had yet to come. Text and computers was also a difficult and unrewarding genre, perhaps only worthy of experimentation.

The Cow Boils Head hyper-stories were lurid and shocking substituting Angels and Lizards etc for Cows, in the best tradition of experimental fiction.

⁵¹ Spectrum, Micro Arts 1983 *see Appendix for software details*

⁵² See Appendix for web details

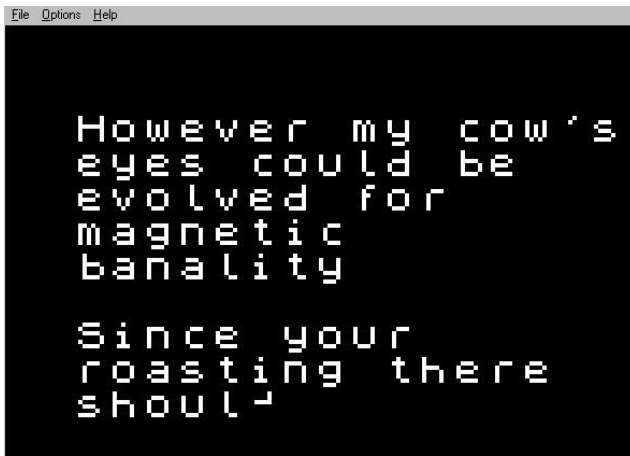


Figure 15: 'Cow Boils Head' onscreen scrolling text (ZX Spectrum PC emulation)

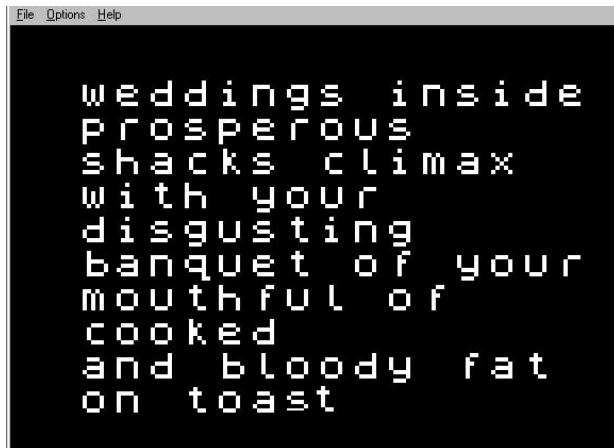


Figure 16: 'Cow Boils Head' onscreen scrolling text

Poetry

The author William Gibson wrote semi-autobiographical poem 'Agrippa: a Book of the Dead'⁵³ specifically for computer reading with distribution by disk. Gibson is famous for the novel *Neuromancer* (1984) which introduced the term Cyberspace and the genre Cyberpunk. *Agrippa* was distributed with a limited release of special 'reader' screens. The reader units had etchings by Dennis Ashbaugh which were light-sensitive and changed from one image to another when exposed to light. The text of the poem, when read, was erased from the disk – it could only be read once. The text disappeared off the bottom of the screen never to be seen again. This text has since been uploaded to the web.

A current example of computer poetry is the 'Cybernetic Poet' Poem Generator⁵⁴ although this produces randomised text supposedly in the style of famous poets. There are now many examples of this type of software on the web, including corporate blurb generators, 'pornolisers' that can regenerate any input web page as hard core gibberish, and so on.

Text as Instruction

Brian Eno and Peter Schmidt developed some randomised text instructions with his 'Oblique Strategies'. These were text cards with advice for people in recording studios, applicable to a number of creative situations (these are now available as a download⁵⁵). At the time these concepts were not mainstream at all, and seemed very exotic outside of the art school, despite the slight similarity to Tarot cards.

Animation from existing texts

⁵³ See Appendix for web details

⁵⁴ Kurzweil CyberArt Technologies, Inc *see Appendix for web details*

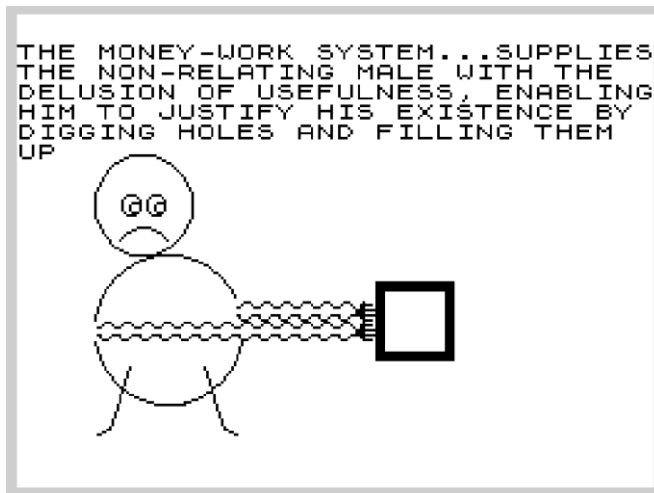
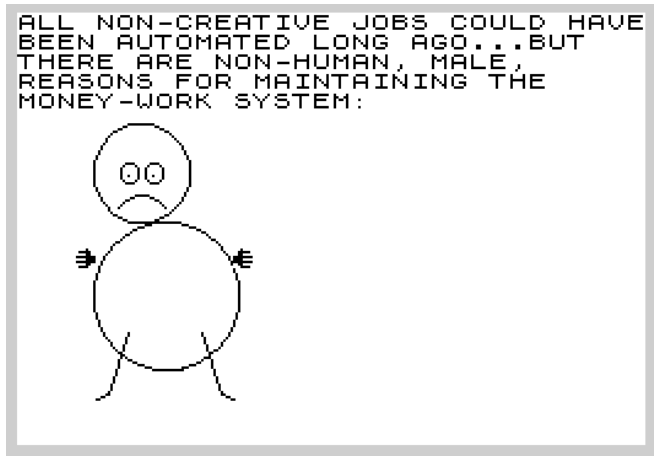
⁵⁵ See Appendix for web details

The Money Work System - SCUM Manifesto, Valerie Solanas

Animation, Micro Arts 1984

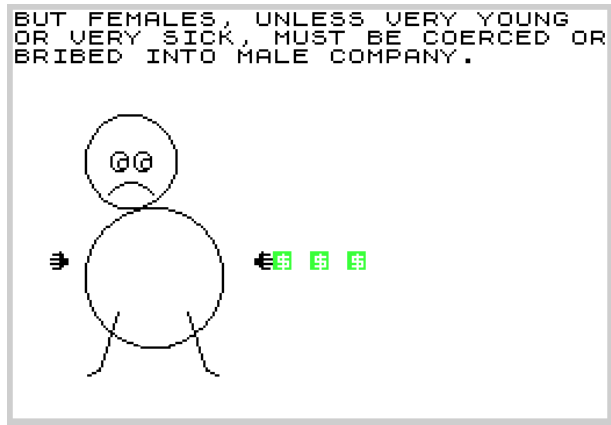
'The Money Work System' was an excerpt from Valerie Solanas' SCUM Manifesto⁵⁶. The animation had simple illustrations and animations. On checking copyright, the Matriarchy Study Group had folded. This piece was not conceptually challenging, comprising simple graphics and text.

The story of Solanas' attempt on Andy Warhol's life has been shown in the film dramatisation 'I Shot Andy Warhol', 1996.⁵⁷



⁵⁶ Valerie Solanas, The SCUM Manifesto (*Society for Cutting Up Men*), Matriarchy Study Group 1968

⁵⁷ See Appendix for film details



Figures 17, 18, 19: Scenes from Money Work System, SCUM Manifest animation (ZX Spectrum PC emulation)

Interactive TV

There are examples such as the police action series *mvMax*⁵⁸, written and structured by Kent Massey, which allows the viewer to choose a course of action at a decision point. These affect the narrative as different video clips are available for playing. However the narratives work their way back to the same node point for the next 'interactive' user decision. These are still genuine non-linear narratives even if the multiple courses are predefined, and can be called multi-linear narratives.

Plays

Audience participation has become less fashionable, but there are many examples of plays where the audience chooses outcomes. This often had a political or sociological aim, to empower the audience against the powerful hand of the author. The *Wheel of Fortune*, BBC Radio's first-ever interactive radio drama was broadcast in three streams in September 2002⁵⁹. It was written by Nick Fisher, an experienced TV and radio playwright. The different narrative streams could be followed on two different radio stations (BBC Radio 3 and 4) and the internet, with the narrative course controlled by the listener switching channels.

Sound

Narrative sound would include anything with a lyrical element, such as opera, folk music, country music, and some rock, jazz and blues. However instrumental music can follow a narrative course, as in Tchaikovsky's 1812 Overture (formally called *The Year 1812*) to commemorate the Russian defeat of the Napoleonic invasion 1812, with cannons and bell-tolling. Progressive rock developed the concept album, where a theme is developed over many songs, or fewer long arranged pieces. Often the music is as much a part of the story as the lyrics, as in the Pink Floyd's *Dark Side of the Moon*, or Genesis' *The Lamb Lies Down on Broadway*, both about madness and social pressure.

Interactivity in music software is usually musical as lyrical and singing content is difficult to simulate in real time. Now that computers are fast enough to process large chunks of data, audio arranging software has become available, usually known as looping software, as they work with repeating loops of audio data. Audio sequencing and mixing software is available in any style. In fact many software packages are aimed at a subset of the market such as guitar, hip-hop, techno, ambient etc.

⁵⁸ See Appendix for web details

⁵⁹ See Appendix for details

Graphics: Comics

Monica Moran's 'Ambulance. An Electronic Novel' ⁶⁰ was a murder / drug / horror story promoted as the first on-floppy-disk novel. It was badly received as it was very punky, and the bass-heavy music and graphic page-turns caused as much interest as the drug-saturated and gory story. The particular black and white comic style would probably be more popular now than then, just at the point when smoothly rendered colour computer graphics were becoming fashionable amongst the *digerati*. Jaime Levy, the 27-year-old producer/publisher of *Ambulance*, created the first electronic novel on disk, and went on to run the web site *Word* (now sadly defunct), an art / text site that was innovative and entertaining. *Ambulance* was "...Animated graphics and floppy fiction. Monica Moran calls it hyper-comics." Levy now runs the eHollywood web site ⁶¹.

This now seems not that shocking, and still has a great comic book feel (Jaime Levy illustrated *Love and Rockets* comic).

My own contribution to this area comes with the multimedia piece for the novella 'Life in the Bubble World' ⁶² which was a click-through animation with audio. This was designed by Resident (artist Paul Greenleaf), and was available from the publisher's web site and as a stand-alone ebook.

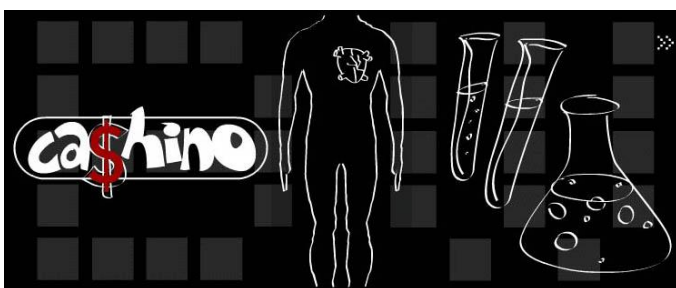


Figure 20: *Life in the Bubbleworld* animation – opening scene

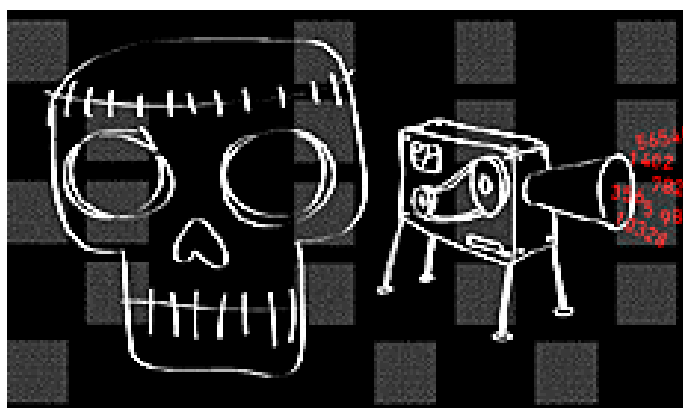


Figure 21: *Life in the Bubbleworld* animation – EMU currency

Computer Games

Most computer games involve a non-linear narrative. These include adventure games, platform games, first person shooters, driving and sport games. All games that are posited in a virtual world need a structure supplied by reference to the real world. In games without a clear story-line, such as a sports simulations, there is a series of targets, leagues etc., which require team-building and learning exercises which involve achieving tasks set by the computer within a structured world. The games outside of this are the pure memory or spatial games such as solitaire or Tetris, and even these exist in a real world of achievement and task accomplishment.

⁶⁰ See Appendix for web details

⁶¹ See Appendix for web details

⁶² Geoff Davis, *Life in the Bubble World Em Publishing 1997-1998-1999 see Appendix for web details*

This is a very large area, and now the divisions between films and games have blurred. All action films have a game for the new games platforms, which offer back-story, multi-stranded narrative, contingent events etc.

Myst

Explore virtual world with very pretty and realistic scenery, solve puzzles, find new levels. Good ambient audio settings. First major game to work on art level. The user has to work out what is going on, so is in mystery genre.

The Sims

After the success of Sim2000, Sim3000, which are city and environment building games, they moved to simulating people and families, and relationships.

“Sims speak gibberish, and dream and converse by using icons rather than words. Unlike other failed attempts to realistically simulate human life and language, Wright, the author of game, came up with an elegant solution that not only works but also encourages the players to project their thoughts on the cute little computer people” Gonzalo Frasca ⁶³

Sit-com genre.

Black and White

Much-hyped recent game with creation of deity that rules villagers. Sets up a moral world with repercussions from actions. Battling with other demons, monsters etc.

Religion / Fighting genre.

Any Recent Action Film

Such as Reign of Fire 2002, in the film, dragons take over the world, heroes save world, in the usual Fantasy genre way. The game has the same story as the film, but with the added ability to act as a dragon, not a human, with different aims.

These games have story lines from the films, and are not open ended as all the game play depends on completing missions that are like small scale scenarios based on the film events. There is no particular character development.

Fantasy / Action / Sci-fi genre.

Getaway (driving)

Tony Hawk Pro Skater (skateboard)

Many driving / sport skill games appeal to virtual sports enthusiasts. Story lines are usually missions (driving games, usually from the gangster genre) or long-term competition (football, skiing, etc with tournaments and leagues involving team selection etc).

Genre Sports, Gangster, Action, Simulation

ParisieNnn

I had a cyberpunk novella ‘Nnn Goes Mobile’ published ⁶⁴ and the publisher wanted multimedia to accompany the book. The publisher insisted the piece had to fit on a single floppy disk. Robert Mettler had just finished his Masters degree and set to work from my instructions to produce a game-style multimedia piece in Macromedia Director. This was called ‘ParisieNnn’ as the action was in Paris. It

⁶³ Gonzalo Frasca on Game Studies web site <http://www.gamestudies.org/0101/frasca/>

⁶⁴ Geoff Davis, Nnn Goes Mobile *Juma Publishing 1994*

was an adventure game, with multiple paths, leading to a single resolution. It also had a soundtrack and interactive sound cues at certain points.

However it was difficult to play as the clues were very cryptic and the clickable areas on the multiple screens were quite hard to find. At the time the adventure genre had puzzles and keys or pick-ups, or finding, discrete objects or places, in order to proceed, as their main navigation control devices, and this was no exception.



Figure 22: Scene from ParisieNnn showing text clues and scroller (right bottom)



Figure 23: Scene from ParisieNnn mobile device (left bottom) that gave out more clues



Figure 24: Scene from ParisieNnn

Appendices

Timeline

1945	Memex	Vannevar Bush	microfilm based device for associative writing (made obsolete by digital computers) From the essay "As We May Think" as FD Roosevelt's World War II science adviser
Late 50s-60s	NLS System 'Augmentation' NLS means 'online system'	Douglas Engelbart	Associative and networking system. Engelbart invented the mouse pointer and the use of windows
1974-81	Project Xanadu Named after an actual place in Mongolia named in 'Kubla Khan', a Coleridge poem. "Deep electronic documents" Ted Nelson published his ideas in his 1974 book Computer Lib/Dream Machines and the 1981 Literary Machines .	Theodore "Ted" Nelson	Invented terms hypertext and hypermedia, author 'Literary Machines' http://xanadu.com/ Project Xanadu was the explicit inspiration for the World Wide Web (see Tim Berners-Lee's original proposal for the World Wide Web), for Lotus Notes (as freely acknowledged by its creator, Ray Ozzie) and for HyperCard (acknowledged by its developer, Bill Atkinson); as well as less-well-known systems, including Microcosm and Hyperwave. Still developing. Aim: "The World Wide Web (another imitation of paper) trivializes our original hypertext model with one-way ever-breaking links and no management of version or contents. Deep Hypertext, Intercomparison and Quotation." Term 'hyper-text' (sic) first used 1965 at at Vassar College. Project Xanadu looking at payment models Permapub and Permapstore.
1985	Hypercard Stacks of linked cards Was 'WildCard'	Apple	Card linking authoring system, used for teaching aids etc, some fiction eg Ambulance Monica Moran 1992 Disk distribution
1980s onward	Text based Disc and network works Hypertext	Various, Eastgate System Inc eHollywood etc	Disk distribution, computer networks including internet
1989 onward	HTML World Wide Web invented	Everyone, everywhere	Tim Berners-Lee at Cern. Huge growth in text and image hypermedia. Later, rich client applications (sound, video).
1990s onward	Still Image based, some 3D CDROM Maze-like worlds	Myst, Peter Gabriel Real World etc.	CDROM market seen as next big thing Disk distribution with book-like packaging
2000s	Film-based or animated Multimedia Films with interactivity	Digital Fiction site etc	Broadband streaming, using mainstream multimedia products Everything online

Non-linear narrative online references and comments

These are references from within the text, and some other interesting items. I have put their particular term *for non-linear narrative* in italics as it is interesting to see the range of terms used for this field.

Aarseth, Espen J.

Author: *Cybertext: Perspectives on Ergodic Literature*
(1997, The Johns Hopkins University Press)

Parts of the book are online at

<http://www.hf.uib.no/cybertext/TOC.html>

This includes the definitions of Ergodic literature and historical examples.

Aarseth's home site

<http://www.hf.uib.no/hi/espen/>

Cybertext

Ergodic literature

Abbe Don Interactive Inc.

(site for owner of above site)

<http://www.abbedon.com/>

Interactive storytelling

Digital storytelling

ActiveWorlds

Online immersive 3D virtual space with avatars

<http://www.activeworlds.com>

ActiveWrolds Educational

AWEDU

<http://edu.activeworlds.com>

Aquanet

Software

“A hypertext tool to hold your knowledge in place”

<http://www.csd.tamu.edu/~shipman/wiki/papers/ht91/ht91.html>

Unix X-Windows

“The Aquanet hypertext system described in this paper is designed to support knowledge structuring tasks. Aquanet is a browser-based tool that allows users to graphically represent information in order to explore its structure.

The power of hypertext derives from its dual nature: hypertext is simultaneously a tool for managing and presenting information and a tool for representing the underlying structure of that information.”

Hypertext

Bubbe's Back Porch

Fiction site run by Abbe Don, he doesn't use any new media terms. Preferring ‘Storytelling in the Digital Age’

<http://www.bubbe.com/>

The Digital Story

Stories with oomph

Clicking for Godot

Digital Storytelling Festival in Crested Butte, Colorado, US, 1997
Reported at The Salon online magazine

<http://archive.salon.com/21st/feature/1997/10/02godot.html>

Crichton, Michael

Adventure - gameography
Timeline (2000), Eidos Interactive
Amazon (1984), Telarium

Cybernetic Poet

Software
Kurzweil CyberArt Technologies, Inc
http://www.kurzweilcyberart.com/poetry/rkcp_overview.php3

“A screen saver that writes poetry, a Poet's Assistant that helps you write poetry (and song lyrics!), and 50 professionally - designed "poet personalities.”

RKCP reads a selection of poems and then creates a "language model." RKCP then writes original poems from that model.”

Not hypertext but interesting as electronic text producer.

Cyberspace, Hypertext and Critical Theory

All-inclusive web site
<http://www.scholars.nus.edu.sg/cpace/>

Has all definitions, links not updated so some missing (see Project Xanadu, emphasising link integrity).

Digital Fiction

<http://www.digitalfiction.co.uk/digitalfiction/>
Site with graphical fictions, mostly done in Flash, UK arts sensibility here

Digital Fiction

Electronic interactive narrative

Digital Literature

From Text to Hypertext and Beyond
Raine Koskimaa 2000, University of Jyväskylä
Computing Centre, Finland
<http://www.cc.jyu.fi/~koskimaa/thesis/thesis.shtml>

Dissimulations

Mostly gone, part of Westminster University
<http://www.daimi.au.dk/~sbrand/mmp2/Dissimulations.html>

The Interactive Story

Eastgate Systems Inc

Largest and most authoritative site, selling a software tool Storyspace, which will favour certain types of activity. Also a note management system Tinderbox.

<http://www.eastgate.com/>

Eastgate is a home for 'serious hypertext' and has the very respected 'hypernovels', Michael Joyce's *Afternoon. A Story* (1987), Stuart Moulthrop's *Victory Garden* (1991) and Shelley Jackson's *Patchwork Girl* (1995), and many others. It also sells the reprint of Ted Nelson's classic 'Literary Machines'.

Hypertext

Serious hypertext

Serious, interactive writing

Hypernovels

See also Storyspace and Tinderbox.

Electronic Hollywood

<http://www.ehollywood.net/>

Production studio for the web, but is also a site for filmic multimedia and links

The Electronic Labyrinth

<http://www.iath.virginia.edu/elab/elab.html>

"A study of the implications of hypertext for creative writers looking to move beyond traditional notions of linearity". Refers also to InterMedia development team (Yankelovich), and Delany & Landow.

Hypertext

The Hyperbook

Docuverse

Eno, Brian and Schmidt, Peter

Oblique Strategies' Brian Eno and Peter Schmidt also popularised an aleatory technique with his 'Oblique Strategies'. The series stopped on Peter Schmitt's untimely death on holiday in Spain in 1980.

<http://www.rtqe.net/ObliqueStrategies/>

It is available for free download for Apple Mac (Hypercard), Windows and Palm Pilot.

From Edition 1 (1975), sample 'instructions' were:

Abandon normal instruments

Accept advice

Accretion

A line has two sides

Allow an easement (an easement is the abandonment of a stricture)

Are there sections? Consider transitions

Erasmatazz

Site promoting software Erasmatron for making..., devised and run by Chris Crawford.

<http://www.erasmatazz.com/>

Interactive storyworlds ("Interactive storytelling allows a player to act inside a dramatic universe called a storyworld." – declines inclusion in other definitions)

Fisher, Nick and The Wheel of Fortune

Three-way narrative broadcast on BBC Radio 3 and 4 and the internet simultaneously.
<http://www.bsbc.co.uk/radio4/wheel/>

The Fray

“The fray is a place for people who believe the web is about personal expression and a new kind of art”
<http://www.fray.com/>

A new kind of art

Ghosts

Gareth Bushell, James Lane and Anthony Rowe
Producers Squid Soup.

Text entered into a 3D vortex.

“Ghosts explores digital communication, the longevity of information and leaving ones mark on another's experience.

Visitors to the installation can enter text messages and see them appear within a virtual, permanent, 3D sculpture.”

This digital sculpture is also available at

<http://www.squidsoup.com/ghosts/>

Gibson, William

AGRIPPA (A Book of The Dead)

Etchings by Dennis Ashbaugh

(C)1992 Kevin Begos Publishing

Disk distributed etext.

Text now online at:

<http://eserver.org/cyber/gibson/agrippa.txt>

See also Neuromancer etc

Grammatron

Mark Amerika

<http://www.grammatron.com>

Theory and fiction

Hypertext

Clickual experience

Hypercard

From Apple, still available from the store, but no longer under development.

<http://store.apple.com/>

Hypercard 2.4 now sold as presentation tool

“Hypercard 2.4.1 is a comprehensive package of tools for authoring media-rich interactive solutions.

Create your own wide range of applications including multimedia presentations, CD-ROM titles, courseware, and computer-based training materials.”

Resources:

<http://www.jaedworks.com/hypercard/resources.html>

Alternatives to Hypercard: “The most popular HyperCard-like programs are SuperCard (an excellent program, though Mac-only), MetaCard (a powerful, cross-platform program), and Revolution (which uses the MetaCard engine, but with a friendlier interface). MetaCard and Revolution are too expensive

for most hobbyists, but free demo versions are available which might be all you need.” From HyperCard Heaven
<http://members.aol.com/hcheaven/inactive.html>

Hypertext Kitchen

General news site

<http://hypertext.pair.com/>

Hypertext

Electronic Writing

Digital narrative

HyperText Tool

Software

Jerry Tutsch

Mac only

<http://my.execpc.com/~tutsch/HTT-Home/top.html>

Introduction To HTT:

“HyperText Tool, "HTT" for short, is an easy to use Macintosh program that enables you to write and read hypertext documents. It can be used to learn how to write self-contained nonlinear computer based documents and to create HTT generated WWWeb documents. It provides true WYSIWYG hypertext editing. It is a structure editor, not an HTML editor.”

Hypertext

Hyperizons

Shop site for ...

<http://www.duke.edu/~mshumate/list01.html>

Hypertext fiction

Inform

Site for games-style software

<http://www.inform-fiction.org/index.html>

Interactive fiction

Kirksæther, Jørgen

<http://cmc.uib.no/dac98/papers/kirksaether.html>

The Structure of Video Game Narration, Department of Art and Media Studies at the Norwegian University of Science and Technology in Trondheim 1998

Komninos, Zervos

Cyberpoetry site, University of Queensland, Australia

http://www.gu.edu.au/ppages/K_Zervos/

Cyberpoetry

Latin American Prose Fiction: An Archaeology of the "Boom"

University of Puget Sound 2001

‘Some Essential Notes on Julio Cortázar’s Hopscotch’:

<http://www.ups.edu/faculty/velez/FL380/Cortout.htm>

Hopscotch was filmed as Rayuela Directed by Jaime Kogan (1994)
<http://members.tripod.com/~titoegurza/OBRAS2/RAYUELA.htm>

Liestol, Gunnar

“Wittgenstein, Genette and the Reader's Narrative in Hypertext”, in G.P Landow (ed)
Hyper/Text/Theory, 1994, Johns Hopkins University Press.
See also <http://users.rcn.com/mackey/thesis/liestol2.html>

Moran, Monica

Ambulance. An Electronic Novel

Published by Electronic Hollywood

Now online as a Director piece (<http://www.ehollywood.net/>, follow link).

Moulthrop, Stuart

Author of Victory Garden (1991); Professor, School of Information Arts and Technologies, Yale
Gordon College of Liberal Arts, University of Baltimore
<http://raven.ubalt.edu/staff/moulthrop/>

“An information-age practice called "cybertext". This is writing (or more accurately, textual production in various media) that depends on a feedback mechanism operated and partly controlled by the receiver to evoke a particular state of a variable or combinatorial text.”
The term Hypertext is used more generally.

Multiverse: General article ‘Taming the Multiverse’

http://www.meta-religion.com/Physics/Cosmological_physics/taming_the_multiverse.htm

Music Scales

This is a very complex area (“There is an infinity of scales. Scales may also be created while composing. Composers such as Claude Debussy, Olivier Messiaen, and Bela Bartok, among others, have done so in the recent past.” Teoria website) but a good introduction is at:

<http://www.teoria.com/reference/scales.htm>

and

<http://www.scalamusica.com/engsys/index.htm>

See also

http://www.pan-pipes.com/The_Most_Exotic_Music_Scales.htm

This can get very specialised, see

<http://www.batish.com/archives/rago1/>

for North Indian overview

mvMax

Interactive television company developing a multi-linear cop drama.

<http://www.mvmax.com/>

NLS System

‘Augmentation’

NLS means ‘online system’

Douglas Engelbart

<http://sloan.stanford.edu/mousesite/1968Demo.html>

Narrative Intelligence Conference

Carnegie Mellon School of Computer Science – interesting view of narrative as part of AI, “narrative as a way of understanding the world”

<http://www-2.cs.cmu.edu/~michaelm/cfp.html>

Interactive systems

Narrative experiences in interactive story-telling

Nelson, Ted

Creator of a software framework he named Project Xanadu to process non-linear texts.

Invented the term Hypertext in the 1960s.

Also, hypergrams (branching pictures), hypermaps (with transparent overlays), and branching movies.

Hypertext

Hypermedia

Literary Machines

See Project Xanadu

Nielsen, Jakob

Usability expert, author of Hypertext and Hypermedia, etc

<http://www.use-it.com>

Hypertext (non-sequential writing)

OULIPO

“OULIPO is the Ouvroir de Littérature Potentielle, or Workshop of Potential Literature, a group of writers and mathematicians. Members include Raymond Queneau, François Le Lionnais, Claude Berge, Georges Perec, and Italo Calvino.

This laboratory of literary structures produced, among other works, Queneau's outlandish book: Cent Mille Millions de Poèmes, which indeed offers the reader one hundred trillion (10¹⁴) poems.”

<http://www.nous.org.uk/oulipe.html>

See Queneau, Raymond

Project CICM

Collaborative and Interactive Cybermedia (expired)

<http://www.cwrl.utexas.edu/~runnion/cicm/>

Cybermedia

Hypermedium ('substrate' for hypertext)

Project Xanadu

<http://xanadu.com/>

Ted Nelson summary

<http://www.mcluhan.utoronto.ca/tednelson.htm>

Quantum Mechanics: Many Worlds theory

Everett, Hugh

The Everett Relative State interpretation ('Many Worlds Interpretation')

Doctoral thesis Cambridge University 1957, developed by DeWitt and Graham (1973) and David Deutsch (1985, 97)

<http://www.qubit.org/people/david/David.html>

See also Multiverse

Queneau, Raymond

‘Cent mille milliards de poemes’, part of the 60s group Oulipo.

See Short History of Interactive Fiction at

<http://www.inform-fiction.org/manual/html/s46.html>

See OULIPO

Ryan, Marie-Laure

Narratology, Construction of Narrative Space

<http://lamar.colostate.edu/~pwryan/narr.htm>

Multi-path narrative

Multi-stranded or parallel plots

David Siegel

Creating Killer Web Sites

<http://www.killersites.com/>

The Sims Online

Online worlds for Sim characters – plenty of narrative here, but no terminology used at all – just ‘make your own world’ etc.)

<http://www.ea.com/eagames/official/thesimsonline/home/index.jsp?>

Solanas, Valerie

The SCUM Manifesto (Society for Cutting Up Men)

The SCUM Manifesto was written in 1967 and published in 1968 as a Phoenix Press booklet, the year she shot and wounded Andy Warhol. Republished 1983 by the Matriarchy Study Group.

Text now online at <http://www.ai.mit.edu/~shivers/rants/scum.html>

Also a film ‘I Shot Andy Warhol’ 1996, dramatised documentary, Director Mary Harron.

Storyspace

Mac and Windows

Eastgate Systems Inc

<http://www.eastgate.com/Storyspace.html>

“A Hypertext Tool for Writers and Readers”

“Storyspace is a hypertext writing environment that is especially well suited to large, complex, and challenging hypertexts. Storyspace focuses on the process of writing, making it easy and pleasant to link, revise, and reorganize. Storyspace is available for Windows and Macintosh computers.”

See also Eastgate and Tinderbox.

Strehovec, Janez

Text as Virtual Reality

(Techno-Aesthetics and Web-Literatures)
Paper at Digital arts and culture 98, Bergen, Norway 1998
<http://cmc.uib.no/dac98/papers/strehovec.html>

Techno-literature
Cybernetic literature
Web-literature
Techno-word-image

SuperCard

<http://www.supercard.us/>
See also Hypercard

Svedjedal, Johan

Ergodic Nightmare - The world of choices in Philip K. Dick's The Three Stigmata of Palmer Eldritch
<http://www.hb.se/bhs/ith/23-01/js.htm>

TextArc

“A TextArc is a visual representation of a text—the entire text (twice!) on a single page. A funny combination of an index, concordance, and summary; it uses the viewer's eye to help uncover meaning.”

Visual representation of a text, not a common hypertext, but uses visual processing and selection as a tool to analyse full texts of books

<http://textarc.org/>

Tinderbox

Mac only
Eastgate Systems Inc
<http://www.eastgate.com/Tinderbox/>

“The PERSONAL content management assistant”

“Tinderbox is a personal content management assistant. It stores your notes, ideas, and plans. It can help you organize and understand them. And Tinderbox helps you share ideas through Web journals and web logs.

Tinderbox's agents automatically scan your notes, looking for patterns and building relationships. Agents help discover relationships and help make sure important things don't get lost. Agents are easy to make and easy to modify. They're flexible and powerful.

Tinderbox can even gather and update changing information and breaking news from the internet.”

See also Eastgate and Storyspace.

Tzara, Tristan

Surrealist Games
<http://www.madsci.org/~lynn/juju/surr/games/games.html>

“To make a Dadaist poem:

Take a newspaper.

Take a pair of scissors.

Choose an article as long as you are planning to make your poem.

Cut out the article.

Then cut out each of the words that make up this article and put them in a bag.

Shake it gently.

Then take out the scraps one after the other in the order in which they left the bag.
Copy conscientiously.
The poem will be like you.
And here you are a writer, infinitely original and endowed with a sensibility that is charming though beyond the understanding of the vulgar.”

VRML

Virtual Reality Modelling Language (and other systems)
Home of the Web 3D Consortium
<http://www.vrml.org>

Ward, Jeff

Metalepsis article in Visible Darkness web site Blog, 2002
<http://www.visibledarkness.com/blog/mt/000123.php>

Word Circuits

“This is a place for poetry and fiction born to pixels rather than the page--writing that's digital down to its bones. Art is the technology of the soul. New media poetry and fiction.”
<http://www.wordcircuits.com/>

Word Circuits also have a good hypertext authors' page:
<http://www.wordcircuits.com/dir/authors.htm>

*Hypertext used generally, with
Cybertexts the all-inclusive term.*

“Hypertextual, interactive, self-generating, kinetic, and multimedia poetry and fiction.”

Word Circuits Connection Muse

Software and general site
<http://wordcircuits.com/connect/>

Word Circuits Connection Muse (formerly called the Connection System) is a set of software tools specifically for authors of Web-based hypertext poetry and fiction. Most hypertext tools available today for the Web are intended primarily for creating informational Web sites where readers will usually browse (in the original sense of rather haphazardly sampling some of the content) or seek out specific information. Literature, on the other hand, demands a system designed for whole-text reading--that is, one designed to accommodate readers who wish to consume an entire hypertext in a satisfying manner.

XYZZYnews

Home for retro adventure gamers
<http://www.xyzzynews.com/>

Interactive fiction
Text adventures

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Labyrinths: Selected Stories and Other Writings *Penguin Books 2000*
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Consciousness *Weidenfeld & Nicolson 2002*
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The Complete Illustrated Lewis Carroll *Wordsworth Editions Ltd 2001*
- Cortazar, Julio**
Hopscotch (*Rayuela*) *Spanish 1963, Avon Books 1966*
- Csikszentmihalyi, Mihaly**
Finding Flow: The Psychology of Engagement with Everyday Life (MasterMinds Series)
Basic Books 1998
- Haw, Stephen**
China A Cultural History *Batsford 1990*
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- McLuhan, Marshall and Fiore, Quentin**
The Medium is the Massage (illustrated) *Penguin reprint 1969 (USA 1967)*
- Murray, Janet H**
Hamlet on the Holodeck *MIT Press edition 2001*
- Neilson, Jacob**
Designing Web Usability *New Riders Publishing 2000*
- Neilson Norman Group**
Towards a User-Friendly Web Reader, one-day seminar Amsterdam, April 7 2000
Selection of usability papers.
Published by Neilson Norman Group, ACS-I, Van Dusseldorp and partners Emerge.
- Raskin, Jef**
The Humane Interface *Addison Wesley 2000*

Reichardt, Jasia
The Computer in Art

Studio Vista 1971

Rucker, Rudy, Sirius, R U and Mu, Queen
Mondo 2000 A User's Guide to the New Edge

Thames and Hudson 1992

Siegel, David
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Hayden Books 1997

Shneiderman, Ben
Designing the User Interface

3rd edition, Addison Wesley Longman 1998

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Matriachy Study Group

Trifonas, Peter Pericles
Barthes and the Empire of Signs

Postmodern Encounters Icon Books 2001