Issues in Multimedia Authoring Keith Douglas
80-291/990 kdouglas@andrew

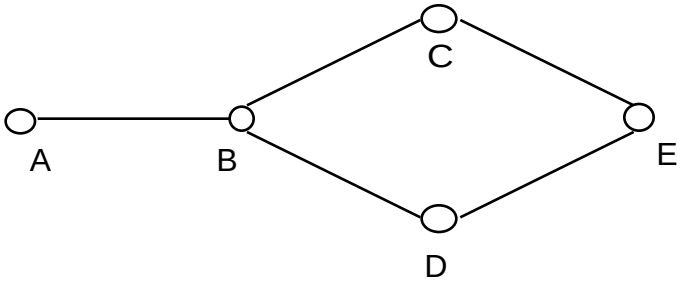
Discussion Paper #2

1.
Landow and Delany (2001 [1991]) characterize the “natural progression” from the printed word to hypertext and hypermedia. The traditional text (printed word) was characterized as being linear, bounded and fixed. Hypermedia by contrast is the use of computers to as they say, transcend these qualities.

Linearity is concerned with the composition order and pattern of reading of a text. A (non-hypertext) book is (usually) read sequentially, from beginning, to middle, to end. By contrast, a hypertext can be read in many ways. The choice of links on the part of the reader as she makes her way through this form of text allows this freedom. In other words, what might be middle or end to one reader might be at a different point for another or not even present at all. This quickly leads to the third of these qualities in the definition above. Since a traditional text (typically) is read only in one way[1] it is thereby fixed in a certain fashion. A hypertext, by contrast can be read in any number of ways and has thus a more fluid structure; the reader is even encouraged (through the use of colour, graphics and often even the tools to read it [like the webbrowser]) to make use of this facility. Finally, the traditional text is bounded in the sense that it is a well circumscribed unit; my copy of *Reflections on Kurt Gödel*, in my office shelf, is well delimited from *Mind Design II* and the other books. By contrast, a hypertext document can be easily linked to other such documents as effortlessly as writing a footnote in a conventional document. This blurs the boundary between texts somewhat. It also permits the overlapping of texts, something impossible to do with ordinary books except by

[1] Landow and Delany do make concessions to “hypertext-like” features of traditional texts such as footnotes, but note how “clunky” they can be in comparison to links in hypermedia documents.

consent of the author[2]. For instance, a hypertext can have the following link structure:



In the above, the nodes A-E represent hypertext pages (e.g. webpages) linked as shown. Two distinct hypertext documents are thus here: A-B-C-E, and A-B-D-E. These overlap in the sense that they share parts. (A, B, the edge between those and E.)

Moving on from their definitional characteristics, Landow and Delany show how these features of hypertext line up with some issues in contemporary literary and semiological theory. They claim that Derrida's "decentering", a Barthian "multivocality" and the notion of "intertextuality" favoured by other thinkers are illustrated by hypertext documents

I shall show how Landow and Delany's understanding of each of these features is to function by reference to some typical hypermedia documents. Appendix B contains a web page from MacNN.com. Since this page is from the MacNN discussion forum, the initial headline and story about Dell's revenue and Sony's laptop line is from the staff at MacNN.com. But this is meshed with the reader reaction (below and on the following printed pages), as well as the voice of various advertisers, creating a multivocal experience. To "grasp" the content of this page, then one has to successfully interpret the multivocality present - distinguish the comments from the article, distinguish the advertising from both of the previous and so on. It is even an illustration (to some extent) of the blurring of said voices that very often occurs in hypertext: when first looking at the page I could not tell if the "abusive man" ad and the "mentors" ad were for the same

[2] Books like the "Choose Your Own Adventure" and "Fighting Fantasy" series are in some ways overlapping books (in one volume) but they require the author to have designed them that way.

organization or not. (Since they both have to do with children, I assumed that they might; as it turns out they are not at least immediately the same organization.) Notice also that the page has a mechanism to further complicate this issue of vocality. Towards its bottom is a text edit box for the user to add his voice to the forum posts. She can thus change the vocality of the text; the URL, title and much content remain the same, but another user returning after she has said her piece will see a different text because of her contribution. Another way in which this forum can exhibit multivocality in the way a conventional text cannot is through the role of a forum moderator. The moderator can invisibly delete offensive or off topic messages at her convenience, adding another temporal dimension to the category.

Furthermore, the pages illustrate intertextuality. This concept characterizes the unboundedness discussed earlier. Along the sides of the page are links to other MacNN articles, to MacNN's self description, as well as to advertizers. Within the text we have links to articles on other news sites as well as yet more articles on MacNN. We also have a search engine, as well as a "forum jump" popup which allow still more blurring of the boundaries between documents. I cannot change Landow and Delany's text; many copies of the books in which it appears exist and so on; at best I could change my copy of it.

The document also exhibits a decentering. One way of understanding Derrida's notion as it applies to hypermedia is to directly contrast our sample webpage to a conventional paper. For the sake of irony, I shall compare it to Landow and Delany's own text. To see how this works, Landow and Delany (2001 [1991], pp. 213) encourage us to see the conventional text as static, unchanging and the narrative (in their particular case, explaining their thesis of convergence between hypertext and literary studies) as essentially sequential in scope. By contrast, the web page can be taken in a different way. The "abusive men" ad in the middle of the document is dynamic (in the vernacular sense of "changing"); it is an animated GIF. Another dynamic feature is the rotation of the advertisements; visiting this forum again may produce a different ad banner.

Furthermore, I am encouraged to “go off elsewhere” when I have finished reading the article here; I may decide after reading one forum comment that people are making irrelevant carpings as usual and I don’t wish to read the rest and instead want to go elsewhere. A click and there I am. On the other hand, Landow and Delany’s text simply ends; there is not even any attempt to connect it to what follows it. (This goes without saying, given that it appears as a reprint in a collection, but note that by contrast one could set up a hypertext document to automatically link to whatever “followed next” even if such was unknown at the time of writing.)

The text edit box for participation also illustrates the dynamism important to decentering. As noted above, the user may participate in the forum by using that field. This allows this one text (if a text is characterized by title and location [URL], at any rate[3]) to change, something that is not easy to do in conventional

[3] This points to one of several problems with Landow and Delany’s thesis. In order to illustrate that hypermedia allows change of our conception of document in any relevant respects, a model of what texts are in general prior to the contemporary considerations (or even the traditional) ones is needed. (Baring a weird form of platonism, there is no change it itself, just changing things.) If hypertexts are to be dynamic in a way that conventional texts are not, there must be something underlying the change, or else the next user of the MacNN forum on this topic is presented with a different text rather than a changed one. This distinction is vital, as a merely different text is very easy to do with conventional media. I can go to the library and censor all the naughty bits from Plato, for instance. Further, this can be done “for the user.” The book of Centralians in *The Boomer Bible* (Laird 1991) is already “censored” as part of the joke. (*The Boomer Bible* is hardly an ordinary text in a lot of ways, but it is at least a ordinary sequential ink-and-paper book.)

Furthermore, in order to test that the postmodern literary concepts apply more to hypertext, a comparison must be done with conventional texts. Some people claim that Derrida (for instance) can “decenter” anything he chooses; if so, simply showing that all hypermedia documents can be decentered is hardly a test of the concepts. See below for a similar remark concerning photography.

documents.

These principles can also be illustrated in a photograph, showing their general applicability. Appendix A (taken from CNN.com 2002) contains such; in this we see British ex-Prime Minister John Major and former minster Edwina Currie. While the photo is presented in the context of illustrating the two together for the story of her revealing that they had an affair, an intertextual element is still present. Notice the folder that Major is carrying. This presumably “links” us to the official tasks of the government and Major’s given office. The affair thus connects us (the viewer, presumably) to the professional concerns of the parties in question. Since such folders are also carried by those in business and commerce, it also connects us to those areas of human activity. “Second order” connections such as these can be multiplied almost at will, each of which could in principle have a “hypertext” link attached to make them explicit.

Clearly the photograph is also multivocal in so far as it illustrates at least three points of view; the two participants (Major and Currie) as well as that of the photographer. (I note that this makes all photographs of agents multivocal, except perhaps ones taken automatically.) If we allow “representations” to have points of view (metaphorically or otherwise), there are furthermore the points of view of “the government” represented broadly by Major’s folder (mentioned above), that of perhaps groups such as “men” and “women” represented by Major and Currie. Major and Currie might even stand in for “boss” and “subordinate” for some people.

Ordinarily we assume that a public figure smiling in a photograph is smiling out of genuine interest in his position, or at least putting on a good show for his public. However, since photograph is to illustrate the two subjects of the story, we may “decenter” the photograph by wondering what it is exactly Major is smiling about. He may have work clothes on and be carrying business with

him, but his “mind may be somewhere else.”[4] We may also decenter the photographer with equal ease. Typically we think of a photographer as a witness, or a passive participant in the political arena (at least qua photographer). But the photographer may have had other intentions, such as capturing one of the other voices discussed above. She might have also wanted to document “dirt” on the Prime Minister or Minister Currie.

2. In *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (1997), Janet Murray characterizes the aesthetic pleasures of digital media in three terms. These are immersion, agency, and transformation.

Immersion is to be taken psychologically. Murray (1997, pp. 98-9) explains that this psychological immersion is to be understood as “learning how to swim” (her phrase) in a new environment, this time a participatory one. The user of (the best of?) these new digital media is surrounded by something new and exciting. This affects senses as well as the intellect, and spurs action; motivation being a key psychological category.
However, this immersion is not to be taken merely sensorially in the narrow sense; Murray’s conception extends to temporal perception as well. Her discussions of MUDs as great consumers of time and requiring delicate balances of “real” and “virtual” life illustrates this. Immersion, however, must be structured. The user must be given a well defined role in a well defined context. If the user’s state in the virtual world is unclear, suspension of disbelief is lost.

Since the user of “the new media” is motivated to act in some way, Murray suggests that agency is also a vital aesthetic pleasure in these media. The user has to feel as if she can do things. This agency extends to the environment portrayed as well as to the

[4] An editorial comment: these analyses (such as they are) can be extended to show that these literary concepts are very slippery. If they apply equally well to conventional media like the photograph, Landow and Delany cannot be right in asserting that hypertext is a vindication of the semiotic concepts. To show that they apply better requires at least an ordinal scale of “decenteredness” or the like, which of course has not been developed.

user’s own persona (“avatar”). Murray suggests that this is an extension of participatory theatre. The participatory aspect not only allows the production of satisfaction in the usual way humans gain pleasure from doing and exploring the world, but also extends the usual artistic or authorial satisfaction one gets from building in many cases. Another related way in which agency can play itself out is in terms of problem solving. Rather than merely being swept along by fate, as it were, the user’s persona is actively engaged in figuring things out. Not only learning about the world she is immersed (see above) in, but in figuring out specific details. The “adventure” and “roleplaying” genres of computer games often have explicit puzzles.

Finally, the category of transformation concerns the ease of which the computer permits us to play a different role from the one we are used to in every day life. It can literally change our appearance as when we identify with an avatar in a “third person perspective” game or even the limited visual representation of part of a character in a first person game. However, not only is the user capable of transforming her appearance, but the environment itself is subject to this sort of transformation. But, as we have seen, the immersive quality of computing environments lead to another form of transformation, one with a more psychological flavour.

This in turn of course quickly blends with the category of agency. The agency of the participants allows them to transform their environment. The more the environment, story and self are malleable by action, the more real they seem, and hence the more immersive they become. The categories Murray discusses are thus very much interdependent.

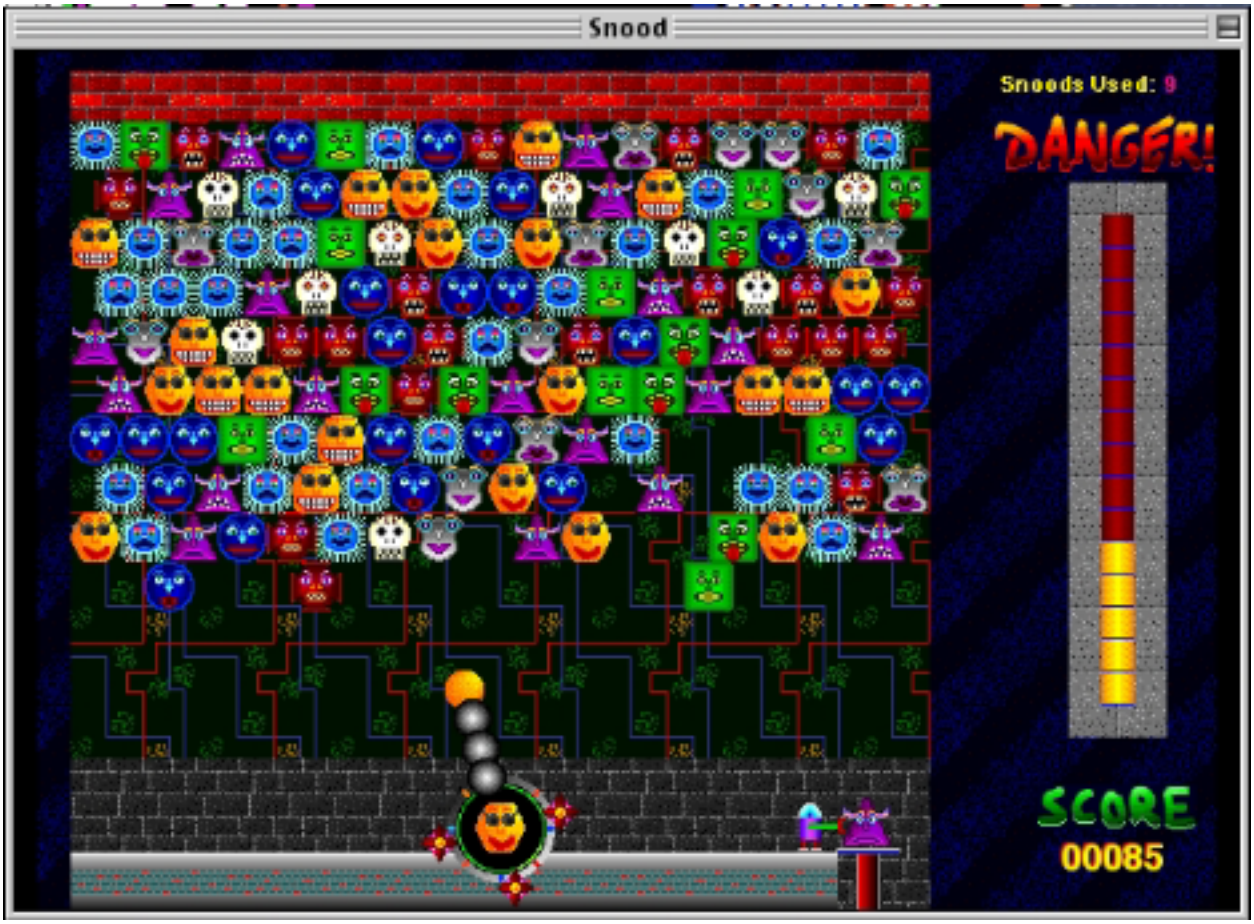
A large number of computer games illustrate these categories. Immersion is found best in graphically and aurally rich games, though by no means exclusively. The following screen shot (printed in greyscale) is from Bungie Software’s *Marathon 2: Durandal.*

The agent is surrounded in a rich 3D environment, bright colours and textured patterns. There is even a shadow, whose orientation does reflect the light in the room; other places in the game with dynamic lighting show how this is generated at runtime, not stored merely as a static texture. Another part of the graphic display has a “technological” feel to it, thus further immersing the user in the science fiction story. This latter feature, plus various aspects of the plot line (for instance, that the player’s character can survive falls that the humans in the story cannot) lead to many players speculating outside of the game about the nature of the player’s character: human or cyborg? (See, for example, bungie.org 2002)

The ambient sound (not reproducible in a paper such as this one!) echoes and whistles, and through changes in volume and subjective location attempts to convince the player that she is really in an

alien environment. Sounds of the marines and aliens (non-player characters) in the game alert the reader to certain circumstances. If the game is played with headphones or properly aligned speakers the sounds come from the appropriate direction; i.e. the player hears an alien to his left, and that's where it is visually as well.

A less graphically and aurally rich game but nevertheless one that is immersive is Snood.



The cuteness of the "Snoods" (the faces and so on filling most of the game display) lends to this, as are the spectacular plays that one can sometimes make in this strategy game. Here the emotional satisfaction of playing is more intellectualized than in some games, as is typical of the puzzle genre.

The immersive qualities also come from Snood's replayability;

Snood can be played in a various randomized modes, which allows one to try a different puzzle each time it is played. Registered users can even create their own scenarios. The game is in fact so immersive that the programmer has even included a “Just one more game ...” in the menu choices! Selecting this allows the user to play one game, and then after the game is over, Snood will automatically quit itself.

Other games illustrate agency very well. An ordinary (but computerized) game of chess[5] does this. The state of the game is uniquely determined by the previous decisions of the agents. Agency is thus in some sense at a maximum; there are no randomized[6] elements. In another respect, however, chess illustrates how agency goes beyond merely freedom from chance. In fact, players often play games that sacrifice this freedom in order to gain further agency in other respects.

A computerized roleplaying game, such as the classic *Might and Magic* (New World Computing, 1986) is illustrative of this latter point. While some of the encounters and treasures the player’s characters find are random, the over all plot of the game allows much freedom - it avoids what is called “railroading”[7].

[5] I have selected chess as an example here because I wanted to illustrate how the 3 categories can be more or less independent. Since we have seen how the categories are interrelated, it should not come as a surprise that there is residual immersion and a tiny amount of transformation in a computerized chess game.

[6] I am aware that some chess programs do involve a random move selection at some points. This does not seem to provide a counterexample to my thesis here as the randomness involved is not accessible to the player, unlike how it is in some games. There is also no particular reason why my remarks are aimed at just computer chess opponents either. Many people play chess via computer with other humans.

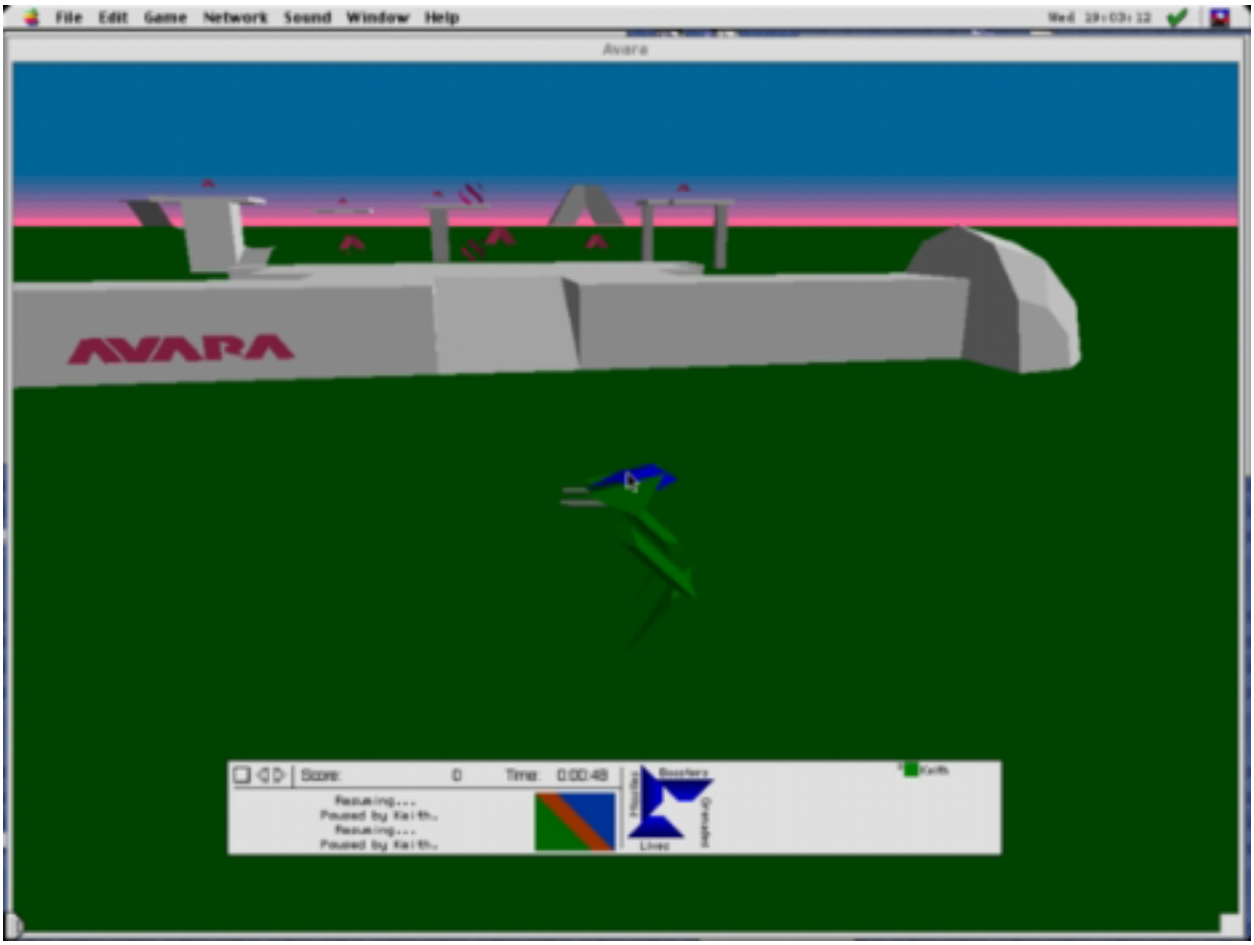
[7] At the opposite end of the rail-roading spectrum is the awful (but somewhat humourous) Leisure Suit Larry 5, by Sierra. This game is impossible to stump. The player cannot get Larry into a situation where he cannot continue. I played through this game with some friends in a single Saturday afternoon, and never once had to restart from a saved game, and beyond a certain point never even felt “stuck.”

Part of this was due to that at the time of release, Might and Magic was a rather large game, spanning 4 140KB disks in the Apple II version. Since an Apple II of the kind that was supported by the game only supported 280x192x6 colour displays and one bit sound, there was plenty of room for details that made the game immersive, rather than merely pretty pictures and no engaging elements as is typical for many games these days.

In fact, the game allowed so much freedom that I found myself a lot of the time doing what I wanted to do rather than attempt to complete the game's quest. (Unlike some other games in this genre, it was not immediately obvious what the game's quest even was[8].) Needless to say, this also illustrates immersion. The game becomes very freeform in its "exploration" once your characters learn the "teleport" and "etherealize" spells which allow them to go practically anywhere, regardless of how solid or impassible the terrain is. For instance, the mountains on the right of the screenshot can simply be teleported through, if the spell is available, etc. Once the characters have the "map of desert", the forbidding desert to the left also becomes navigable easily relatively easily.

[8] I still do not quite understand it, 13-14 years later. The game is subtitled "Secret of the Inner Sanctum" and I must confess I do not know what that secret is, despite having "won" the game and hence visited the Inner Sanctum itself.

Murray’s category of transformation is best illustrated by a game where the character of the player is quite obviously not an ordinary human being. *Avara* (Ambrosia Software, 1996) illustrates this as seen below. In this game, the player controls a robot that carries guided missiles and moves around by strutting awkwardly, bending in funny ways and so on. Despite this, the game is normally played first-person perspective and thus gives the player the experience of being the robot. (The game has a third person perspective mode, useful in some situations. The below shot is taken in that mode to illustrate the robot character.)



The fact that the player's character is a funny shaped robot is of vital importance at several places in the game. One can have it jump up and land with its guns catching on a ledge and its legs dangling off in a way no human could be stuck. The robot character's weight also affects how high or far it can jump; some missions are impossible to complete if the robot and gear it is carrying are too heavy. The player thus gets transformational qualities out of the restrictions placed on her actions based on the choice of character in very concrete and easy to perceive ways. For instance at one point while playing, I realized that my character could be made lighter and make a jump I needed to do, and so I wasted a missile doing so.

A slightly stranger way in which *Avara* illustrates transformation, at least for the present author, is how it convinces his inner ear that he is moving in strange ways. The present author is (alas)

susceptible to motion sickness, and the curious movements in this game are sufficiently transformative of his vestibular system that he can feel queasy after playing this game too long. This seems to occur because the inner ear is convinced it is moving in certain “unnatural” ways.

Another game also provides an illustration of Murray’s third category. Below is *Prince of Persia* (Konami, 1992) as it appeared on the Super Nintendo Entertainment System.

Note how the player’s character is capable of superhuman feats such as the leap depicted; the character will land well beyond the virtual 2 meters or so that one might expect from an ordinary human. In this game, the character is also capable of swordplay, absorbing wounds from weapons and holding on to edges of floors above long falls and other abilities at levels of ability most humans do not have. We are thus transformed into a superhuman

character when we play this game. I have also witnessed this extended to players who when the character has to grab onto a platform and “hang” will often grimace and so on as if they were the (to-be) prince. “Middle eastern” music and dress (or rather, what the programmers took to be middle eastern dress) also provide transformative cues in this game.

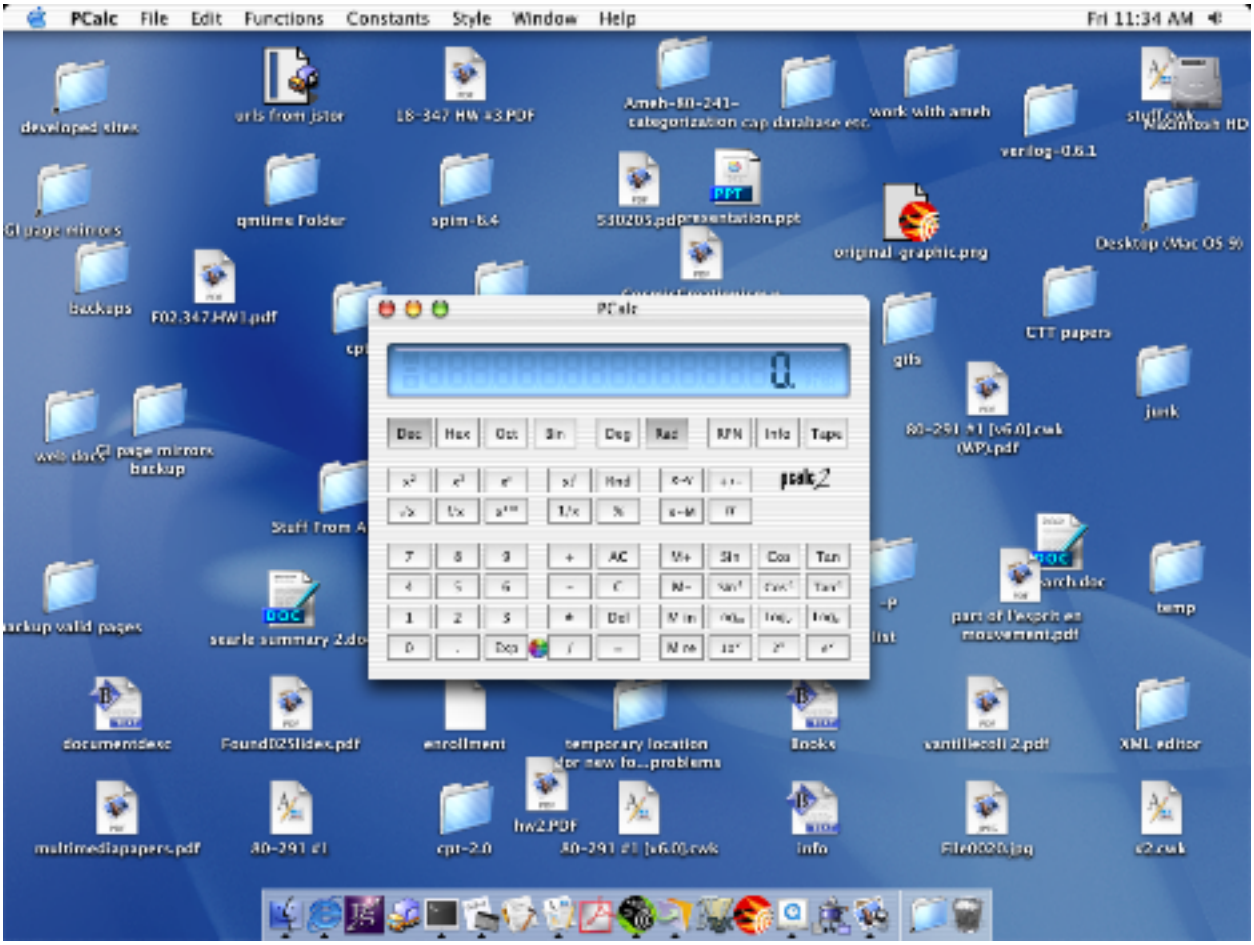
3. Brenda Laurel considers four models of computer interface design. The first of these is the view that the interface is just the boundary between the computer with its internal operations and the user. This is immediately rejected as being too simplistic. Second, Laurel considers a “mental models” view of interfaces. In this approach, the user and the computer both have “mental models” of what the other is like in order to guide expectations and actions. The problem with this approach is the potential infinite regress - how does one avoid modeling the model that the other has of oneself and so on, ad infinitum. A third approach she considers is the view of the interface as a joining of human and computer. This approach, according to Laurel, is simply vague. What does it involve to say that the interface joins a human to a computer? This is not meant literally, in most cases, so in order to work with it it would require elucidating it. But Laurel has no desire to do so; she has her own (presumably less vague) model. We shall look at this now.

Laurel’s own model is derived from a metaphor of theatre, and as such encourages us to understand interface design using the analytical categories used to understand theatre. In particular, she recommends we use Aristotle’s. She suggests that we use the Aristotelian four causes as well as his specific notions for theatre. The four causes are material, formal, final and efficient; the theatrical categories are action, character, thought, language, pattern, enactment. Since human computer activity is not quite like theatre, Laurel adds a seventh category to the traditional six. This is the category of interactivity.

Here I will focus on the four causes. The first of these, the material cause, is what transpires in front of the user. Here I shall illustrate with Apple’s QuickTime Player for MacOS X.

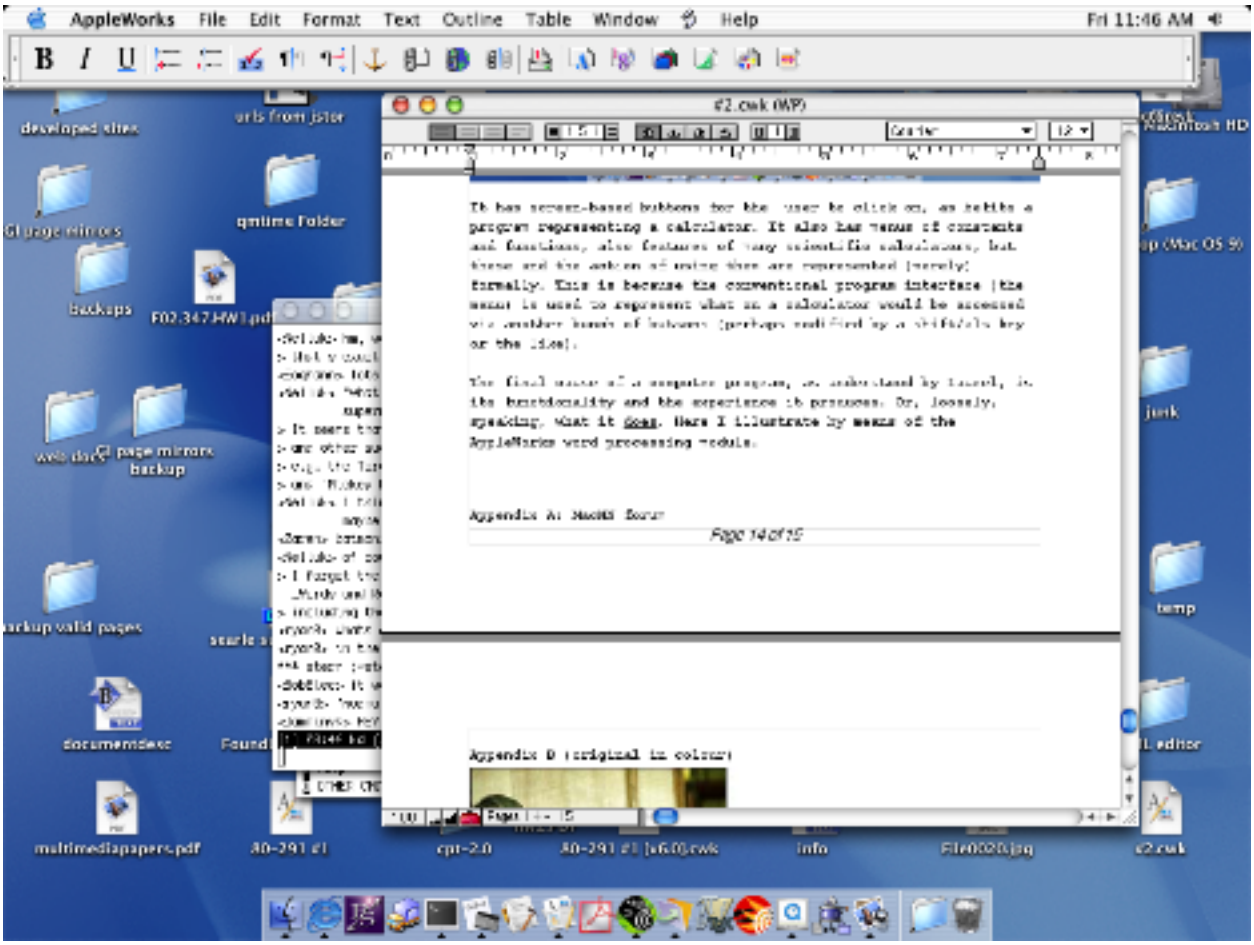
QuickTime Player is in the foreground as shown. It launches, and finds a default piece of “advertising” from somewhere on the network. (Here the ad is for some sort of musical album called “Hijas Del Tomate”.) It encourages the user to interact with the player, using the the stop, rewind, fast forward, etc. buttons. The user may also use the conventional menus. Each of these leads to a different response, and a different action unfolds. Clicking on the window fetches a URL in my default webbrowser, and so the action here is not even limited to QuickTime Player itself. Note also that the “outside action” is not limited to QuickTime Player acting on other applications; other applications can interact with QuickTime Player; for instance, Finder can send it a message to play a given movie, or a user’s lowering of the system volume in another application will affect the sound of the playing content in QuickTime Player if there is any.

Turning now to the formal cause, we find an example of this in PCalc, again for MacOS X. PCalc represents the use of a scientific calculator. The formal cause of something as understood by Laurel is primarily the shape.



PCalc has screen-based buttons for the user to click on, as befits a program representing a calculator. It also has menus of constants and functions, also features of many scientific calculators, but these and the action of using them are represented (merely) formally. This is because the conventional program interface (the menu) is used to represent what on a calculator would be accessed via another bunch of buttons (perhaps modified by a shift/alt key or the like). The use of the “tape calculator” mode in PCalc (not shown) also is purely formal; it does not actually produce printed output (at least directly, like a real tape calculator would).

The final cause of a computer program, as understood by Laurel, is its functionality and the experience it produces. Or, loosely, speaking, what it does. Here I illustrate by means of the AppleWorks word processing module - another MacOS X application.

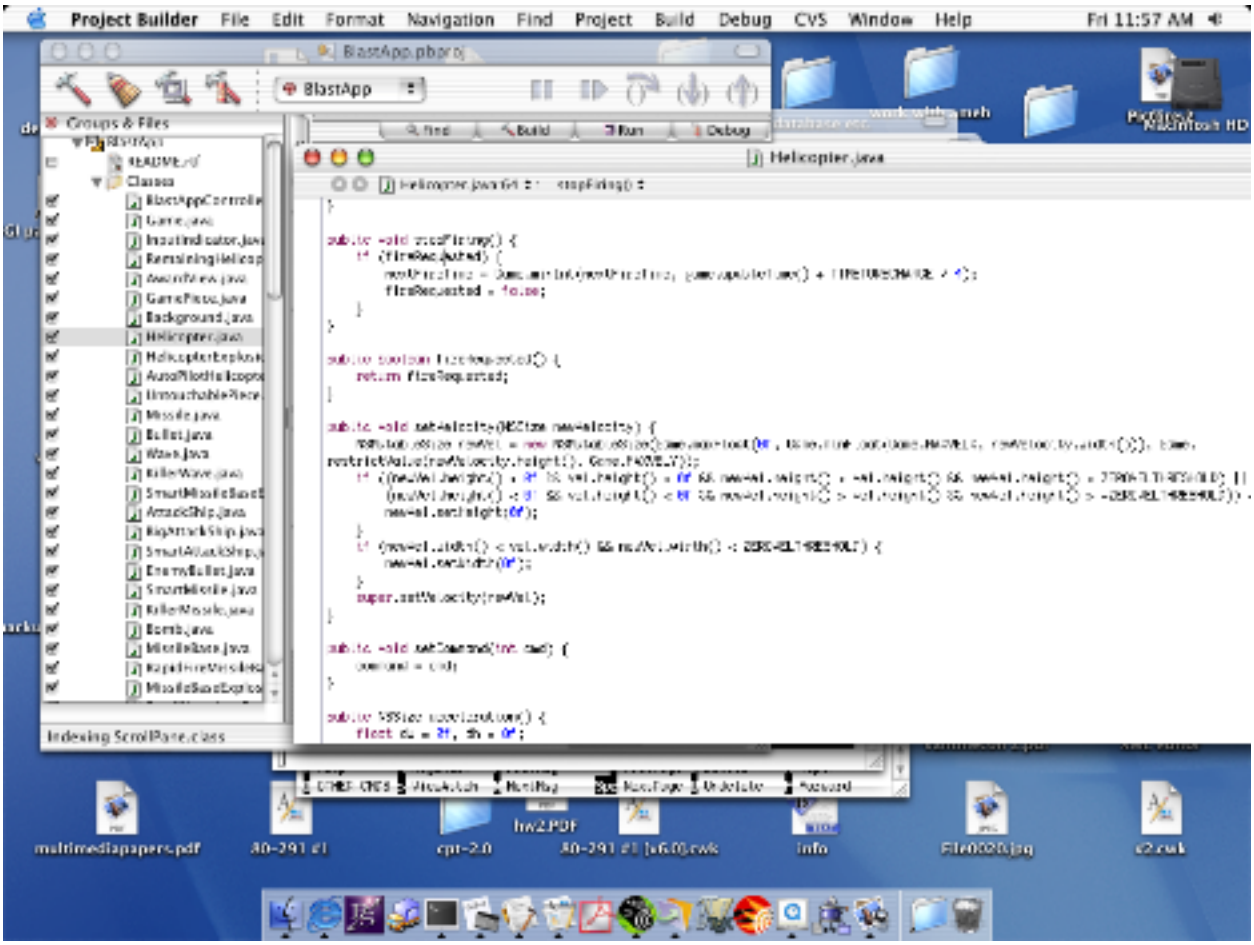


The goal of using a word processor is to produce documents focused around words and text. In the above screenshot, we see a document being composed. At the top, we find the ubiquitous menus, this time tailoured to producing said document. The user can modify her text through the Text menu, plan ahead using the Outline menu and so forth. She can also modify the appearance of the text as well as prepare it for use on the World Wide Web by using the button bars. She can also merge two sorts of documents by creating those of another sort with other button choices. The above document has a photograph in it, imported as a “painting” document.

We have said above that the formal cause of a program is roughly

its shape. But there are elements of shape that appear as parts of the final causes of a program. Since the end of word processing is a document, the user interface of a WYSIWYG word processor like AppleWorks includes some elements that represent this end. In particular, the window graphically depicts the margins of the document, its page size and locations of page breaks and so forth.

The efficient cause of a program are the skills and tools and techniques of its makers, designers and so forth. I illustrate these with two programs, showing two (not separable, but nevertheless distinct) aspects to this.



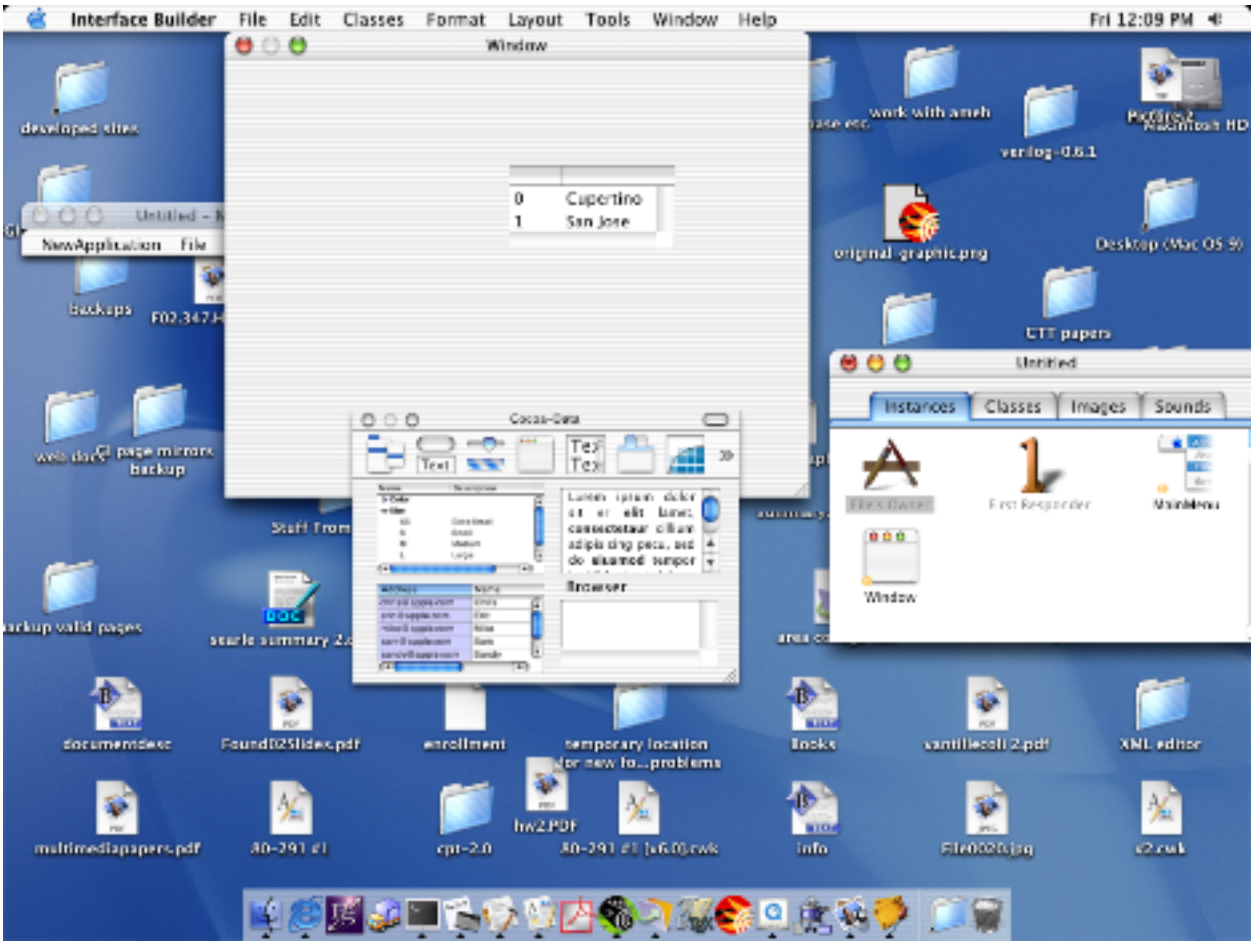
The first illustration (above) is Project Builder. This is Apple's IDE for MacOS X. It supports many programming languages (e.g. C, Objective C, C++, Java, AppleScript), and involves a front end to debugging tools (gdb), version control (cvs), sophisticated build instructions, class browsing and so forth. The usual "textual

part” of programming can be done by the integration between a compiler and a programming oriented text editor (one with smart indenting, syntax colouring and so forth). Above we see a project in Java being maintained and one of its source code files being edited. The programming language, its compiler, the debugger and so forth are in some sense tools for making the finished product, in this case a very simple “shoot’em up” game.

Our final example is Interface Builder. This is Apple’s GUI development tool for MacOS X. It allows the programmer to build the appearance (and some functionality) of her application by arranging menu items, placing scrollbars, designing the look and feel of windows and so forth. It is thus part of the “other end” (to programming) of program design hence of the efficient cause of programs. Here a window has been created with a specific kind of datapane. Because of the way MacOS X’s Cocoa API works, many functionality features (i.e. what things do) are also managed by Interface Builder. This is in contrast to other, earlier, interface tools such ResEdit which focuses much more on interface appearance than on interface functionality.

This even allows the user interface developer to make use of Interface Builder to develop some functionality independent of the design of the main program she is developing for (assuming an Objective C application). This makes use of a crucial feature of Cocoa applications on MacOS X, called “late binding.”

The tradition of regarding the two kinds of tools (interface and implementation) as separate is thus blurred in this context.



It is important to realize that Project builder and Interface Builder also illustrate material causes of software itself; there is a sense in which source code and interface elements are the parts and material of which software is made. This part-whole relation is very vaguely elucidated as far as the present author is concerned, however. It does not appear to fall into either of the usual mereological relationships of overlap or juxtaposition axiomatized in Bunge 1977.

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Appendix A (original in colour)

Appendix B: MacNN forum (see over)