

CollageMachine: Temporality and Indeterminacy in Media Browsing via Interface Ecology

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ABSTRACT

CollageMachine synthesizes artistic and computational practices in order to represent media from the World Wide Web (WWW). It functions as a process-based art work, and as a special browser which can be useful for searching. Media elements are pulled from Web pages and composed into a collage which evolves over time. The evolving art work / browsing session can be shaped by the user. The temporal composition of the collage develops with relation to its visual composition and semantic content. The CollageMachine engine combines structured randomness and the user's expression of preferences and interests with design rules and semantic rules to make decisions about the collage's layout, and about which media to retrieve. My approach in blending music composition strategies, visual art aesthetics, and computer science techniques into this interactive environment arises through application of the theory of Interface Ecology.

Keywords

World Wide Web, temporality, indeterminacy, visual design, entertainment, interface ecology, interaction design, interaction paradigms, design techniques, Web browsers

INTERFACE ECOLOGY

Interface ecology intermeshes thinking from different disciplines. To act ecologically is to develop one's work as part of an open environment, rather than stuck in the box of this or that discipline. I am drawn to the WWW as a venue, because a large audience may be reached, and as a medium, because so many *objets trouves* (found objects) are available for reassembly. I began to create a conceptual interface between the practices and ways of thinking of computer science, visual art, and music composition by asking myself the question, "How will I compose in the medium of the World Wide Web?" In conceptualizing

CollageMachine, I have employed stock postmodern art methods, such as indeterminacy and the use of found objects. These methods were first suggested by the Dada artists, Trstin Tzara and Marcel Duchamp, and developed by Max Ernst, John Cage, and others [5, 1].

Temporal Composition

Cage introduced indeterminacy to the musical processes of composition, and performance [1]. His "Imaginary Landscapes" features an ensemble of performers, each of whom turns the dial on a radio for some period of time, waits for a period of time, then continues. The times for each performer were predetermined by a chance procedure. CollageMachine is a sort of "Imaginary Landscapes" translated, in which instead of using radios, I use the WWW, or some relational database, as the source for media. The user-responsive performance is carried out by software. No two CollageMachine performances are alike.

Traditionally, the work of a composer is to create temporal structures with sound. In CollageMachine, it is a visual presentation which develops over time. While the user may influence this process, it can proceed with or without user interaction. Media elements which may be images or chunks of text are added to screen in a definite rhythm. Digital media naturally afford this new ability to compose visual work which is temporal.

Visual Design

Visual arts principles are active in CollageMachine algorithms. The algorithm which makes choices about color uses indeterminacy and interprets Johannes Itten's theory of color design [3] to implement harmony and contrast. Objects are sized and placed with a fuzzy sense of proportion in order to develop coherence in their layout. By necessity, the visual media elements may overlap, and build up layers, as the screen can be easily filled in the course of a collage episode.

COMPUTATIONAL METHODS

Structured randomness in CollageMachine is implemented via methods from computer graphics. The Perlin Noise function is used as a source of smoothly varying pseudo random numbers [4]. I also use Perlin's intuitive functions

for tweaking values, bias and gain, in order to create procedural expressions which cluster randomness around or at extremes from a mean.

Each collage episode is seeded with the URL of an HTML file. CollageMachine begins by parsing this file into a set of text chunks, and image URLs. The images are downloaded. Files pointed to by links are also downloaded and the process continues recursively, as in Web crawlers like the Xerox Web Forager [2]. The multithreaded Java implementation of CollageMachine permits the visual evolution of the collage, the parsing of HTML, and the downloading of media to proceed concurrently as soon as the first HTML file has arrived and been partially parsed.

Graphical User Interface (GUI)

I have extended my composition for the medium of the WWW with user-centered interactive features. The work of art becomes a tool. The most basic interactive mechanism provided by CollageMachine is goto mode. In goto mode, when a user clicks on an element of the collage, a new Netscape browser window opens, displaying the media element in its original context or following a link. At this time, in its early development, the GUI also provides the user with simple mechanisms for expressing interest or disinterest in collage elements which are on the screen. An element may be brought to the top or removed from the collage. These actions influence the CollageMachine engine's choices in prioritizing media elements for continued downloading and presentation. Development of sophistication in CollageMachine's choices of priority for downloading, through user interest advisor agents, is a future direction for this work.

APPLICATION DOMAINS

The collage which evolves over time is a new paradigm for multimedia content browsing. The goal of CollageMachine is to create a user experience of the WWW which is both entertaining and useful. I want, on the one hand, to appeal to the video game crowd of young channel-surfers. I offer an environment in which no two visits to a Web page are ever the same. I would like to create a sense for the user of the Web as a collage geography which one can steer through by indicating affinity or disinterest in various content.

CollageMachine also wants to appeal to people who are using the Web as a research tool. By initiating a CollageMachine session with a page which is the result of a search engine query, CollageMachine can deliver the results as a visual assemblage. Indeterminate strategies for sifting through search data offer the possibility of unexpected experiences which can stimulate creative thoughts, like those which arise by chance occurrences while browsing library stacks. A browsable collage is also

an ideal way to use computing resources after initiating a search, and while pausing to perform some other task or get a cup of coffee.

CollageMachine principals are appropriate for application to a wide range of data banks, including CD-ROMs. A multimedia kiosk could display its wares in an ambient collage presentation in the absence of user-input.

CollageMachine practices interface ecology by combining a creative, artistic process, and an analytic, scientific process to create an entertaining and useful media environment. Interface ecology treats the many factors which are active when human beings meet computers as phenomena of culture. As the Greek root of ecology, *oikos*, means house, so the framework of interface ecology builds a perspective which brings the study of the ensemble of mutually interactive interdependent layers of culture which live in any human computer interface, and the manifold disciplines essential to understanding them together into one house. In CollageMachine, the principles of interface ecology find form and come alive.

ACKNOWLEDGEMENTS

My interface ecology research is supported by the NYU Media Research Lab, the Courant Institute for Mathematics and Sciences, National Science Foundation Grant GER-9454173, and Creating Media. This development of this article has benefited from on-going dialogue with Ken Perlin, Richard Schechner, Barbara Kirschenblatt-Gimblett, and Melissa Lang. CollageMachine graphic design is by Cathy Lynn Gasser, who also contributes to the visual design of the collages.

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