

Physical Cinema: memory, schema and interactive video

Mike Leggett

Faculty of Creative Arts, University of Wollongong; Creativity & Cognition Studios,
University of Technology Sydney.

mike.leggett@uts.edu.au

Abstract

In the computer-based digital domain, interaction with video is becoming an everyday occurrence. Breaking away from our traditional regard for moving images organised along the linear principles of the filmic tradition we can now use motion pictures relationally, linking across and along shots and sequences. In so doing, the creative experience is shared as physical cinema.

My experience as an artist working with film, video and performance was based on levels of audience engagement ranging from the reflexive to the physically active. The experience of a durational artwork relies on both short and long-term memory and the anticipation of its process of change. Aesthetic issues of this kind helped form the conceptual foundations discussed in this paper.

Introduction

In the computer-based digital domain, interaction with video is becoming an everyday occurrence. Breaking away from our traditional regard for moving images organised along the linear principles of the filmic tradition we can now use motion pictures relationally, linking across and along shots and sequences. The artist and interaction designer can thereby share the making of the experience of the work with the audience, the active participant. In so doing, the creative experience is shared as physical cinema.

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The digital era, as a set of creative possibilities, began for me in the 1980s. Through experiments with early hypertext tools and the research and curation of interactive

multimedia art for museums and festivals [1], the ground was laid through the 2000s for my own creativeness in the field of interactive digital art.

Interaction with video for me has become a way of accessing and modifying the art experience through an approach to the 'open work', as proposed by Umberto Eco [2], setting out to confirm knowledge previously intuited rather than explicitly recognised. The processes of practice-based research in the development of an artwork has enabled me to reach a better understanding of the relationship between the act of making and the act of participating or sharing the experience of art.

A number of initial research questions were posed that were used to focus the investigations. During an interactive encounter, can a unique narrative be created with different permutations and combinations, arranged from the same collection of video files? How is memory employed during interaction with the file collections and can mnemonics or 'memory objects', aid this process? What are the practical aspects of the interface, the site at which interaction occurs with the full-screen motion picture image?

Interactive Video

Interactive video follows on from the sequential tradition of television and cinema, where one item follows another in the act of telling a story and where words are used to convey meaning and significance of images. The focus of my investigations into the browsing or exploratory process that commences interaction with a system focussed instead on our tacit knowledge of shapes 'in-the-world'.

The experimental system *Mnemoovie*, is based on similar frameworks and explored mnemonics, or memory images and events, as a basis for linking between digital video files. However, mnemonics functions differently for each interacting participant, between the implicit or the explicit association with meaning of an image and response to it. The *Mnemoovie* system has been developed using practice-based research methods, rather than user-centred problem-solving design approaches. The difference is that the practice-based approach is similar to an art making process, where the concept is developed directly through the practitioner's practice, applying knowledge, experience, skills and sense of creative enquiry [3]. The approach was extended with knowledge gathered from related research found in publications, together with an observation and evaluation process conducted toward completion of the research.

The process of interaction can be compared to hypertext linking in Web-based systems, where objects across the Internet can be linked via a word or an image – hypermedia.

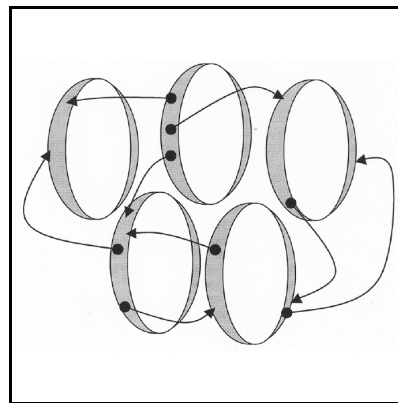


Fig 1: 'hypervideo' schema

Looping, a function of the motion picture image in both the analogue and the digital domain, [4, 5] is the basis of the second paradigm, a relational 'hypervideo' schema, linking between loops of both short and infinite duration (Fig 1). Linking individual frames from a video file across the Internet to other video files – 'hypervideo', whilst theoretically possible, is not currently practical because, at this point of time, very high-speed bandwidth is far from universal. The focus of my research, therefore, examined the principles of interactive video located as linked digital files on the desktop computer or Personal Digital Assistant (PDA), sites for practical experiment within the constraints of existing network infrastructure capabilities.

Four gestures were employed as the principle for interaction with the moving images on the computer screen. Initially, the mouse was employed to run the movie forwards with an upward motion, backwards with a downward motion, or to link to other video files by gesturing to left or right. Subsequently, the arrow keys on the keyboard were employed to effect a four-way interaction. Later, using a touch-screen interface, larger gestures became useful and appropriate.

Methodology

At the heart of the *Mnemo* system is a 'presentation engine'. The "...presentation engine allows content authors to describe ... content through associated XML [and .dcr] files. Interpretation of those files, content layout, and all ... communication is automatically handled by the presentation engine.." [6]. This is a common approach to building an interactive system that simplifies the technical implementation, for non-programmers in particular. It thereby enables the practitioner to concentrate on making models that combine a linking schema with a particular movie collection. The

Mnemo engine comprises a software framework made up of the presentation engine and the media database.

Each of the paradigm models involved collecting and preparing digital video files, a process as time-consuming as coding each of the engine schemas. Personal reflection, combined with comments from friends and colleagues, informed the progress of each paradigm. This form of formative evaluation anticipated outcomes and guided the development of each of the schemas and the interactive models.

The *Mnemo* test models were later evaluated using a modified user studies approach as outlined above, employing evaluation paradigms adapted from accepted techniques (methods) appropriately. These include usability testing and observation of user activity in a controlled environment followed by questionnaires and interviews. [7].

Two Schema Models

The Circle schema accesses the video file collection using a repeating or looped duration of video made from the sampling of the twelve 3-minute movies in the collection. The motion is very fast and is read as “speeded up”. This loop enables the user to identify a movie of interest, choosing from one of the twelve 10-second extracts in the loop using control of forward and backward movement, and selecting using movement to left or right. This ‘open’ orientated searching is completed when an image is determined on the first run through as a prompt for selecting one of the three-minute movies to be run at normal speed.

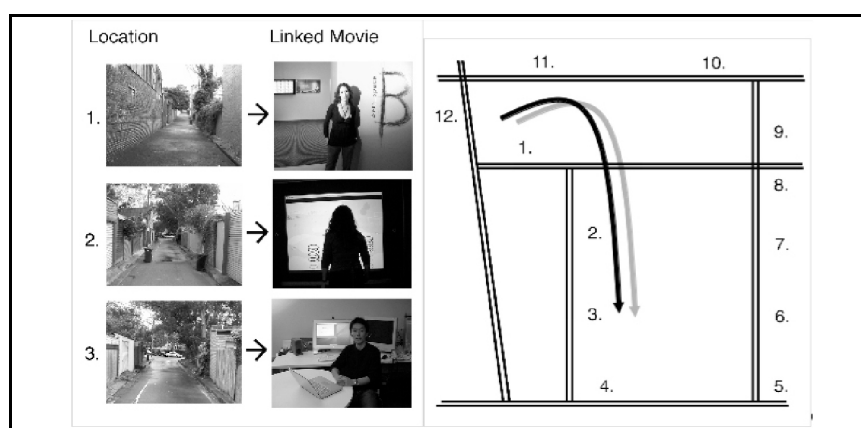


Fig 2: The 'Grid' schema: navigating movies of the streets to locate the linked movie collection.

The Grid model simulates the grid structure of an inner city block, (as seen on the right of Fig 2), and is the concept schema for locating each of the same twelve movies

encountered in the Circle schema. On the screen the participant sees a point-of-view (POV) image of walking down a street; interactively a route is followed to navigate from Location 1 to 3 (left of Fig 2) and run the Linked Movie associated with the image of the locations. As with the 'Circle' schema, interaction follows the same three principles: Navigation, Linking; and Returning. The \uparrow -key runs the Point-of-View (POV) movie forward; the \downarrow -key turns the viewpoint through 180° and retraces the previous viewpoint. Linking using the \downarrow -key or the \rightarrow -key will achieve one of two outcomes: a) when adjacent to a street corner a link is made to the movie POV of the adjoining street; b) relational to its location on a section of the street, a link is made to one of the twelve movies. For example, location 1, 2 and 3 (Fig 2) are the 'places' with which a link to the movie is associated (left of Fig 2).

In the Grid model as in the Circle, the participant has a choice of accessing and viewing a movie using either the visual cues learnt during initial exploration, or the text-based Titles accessed using the \rightarrow -key.

Participation and Evaluation

An evaluation of three selected models was conducted with a small representative sample of participants with different levels of experience of viewing movies on computers.

This approach proposes that the researcher defines what is to be achieved by participation in the interaction design as a 'problem-setting' or 'problem-finding' experience [3], a creative rather than a reductive process. It becomes possible using several evaluative approaches to assess not only the data gathered during interaction by the user-participants with the designer's model, but also the quality of the overall experiences represented by their reflections on the system.

A key finding emerged revealing the *style* of interaction as a factor for further analysis. Characterised as 'Quickies' and 'Explorers', the Quickie personas exhibit a desire to complete a task rapidly using ready-to-hand prompts, or affordances. Explorers, on the other hand, enhance the process and the experience by gathering knowledge more generally from within the system. Their process of investigation thereby amplifies the development of a visual syntax – or schema - by the participant. Cognitive learning and responses lead to interaction 'styles' that are characterised laterally and relationally, rather than vertically and sequentially. The aids to memory using mnemonics are critical to interaction of this kind, being one of the system affordances that enabled creative interactive behaviour.

System Affordances	Interactive Behaviour	
	<i>Quickies</i>	<i>Explorers</i>
Interactivity	Infrequent	Frequent
Navigation	Options taken infrequently	Options taken frequently
Mnemonics	Text preference	Image preference

Fig 3: System Affordances and Interactive Behaviours

The interactive behaviours listed in Fig. 3 are summarised as follows: Quickies reduce the number of interactive events and use familiar devices such as the alphanumeric indexing option. The frequency of navigational options was also observed to be at variance between both groups. Explorers, in taking time to interact with the system, have a preference for using images as mnemonics experienced during the familiarisation stage. The reasons for doing so are many; in the words of one of the participants, “I valued the maker crafting a path, resulting in a satisfying experience.” Another participant “...was totally surprised at how different the beginning and end experiences were ... just navigating the same corpus..” (collection of video files). The Quickie experience as one of the participants described would be more “...like reading a book ... like jumping links on the internet really ... something to do by yourself as your mind goes from one track to another”.

In choosing to take their time, Explorers employed a richer approach to interactive experience than Quickies, taking more navigational options and thereby discovering subtler use of mnemonics and nuanced use of the memory objects, accessed through the system.

Implications for Interaction Design

Reflections on the data gathered to this point in the investigative process has revealed that creativeness in the act of navigating a collection of movie files is as essential as creativeness in the process of aligning the links between them. In June 2006, one of the handful of invited delegates to the Symposium on Supporting Creativity with Search Tools, Washington DC, affirmed the activity of searching a database or collection as “...part of a creative process.” [8].

Modern audiences are not simply ‘users’ but creative minds [9, 10] interacting with documents of the past, requiring us increasingly in the contemporary context, to acquire, order and link collections of motion picture files.

Participants identified in this research have distinct needs:

the individual artist, researcher or designer creating systems to be deployed in contexts specific to their practice. The implications for artists and designers of the findings is that the interactive experience with design qualities tuned to the Quickie and the Explorer personas, will encourage creative tendencies that move away from traditional notions of experiencing the individual artist's singular 'statement'. The shared artefact becomes an entity open to taking account of the participant's interaction style, the experience becoming an art or cultural practice explored by both parties as an act of shared expression.

the specialist community who are enabled to define from within a toolset, (such as that used for building the experimental models used in the current research), the needs to be addressed by a system. Domains of particular interest for further work in this respect will be interactive systems designed for trans-lingual contexts, and domains in which knowledge classification is explicit, for instance zoology, geology, anthropology etc.

the general audience, encountering a system in a public place and without prior knowledge, will need to be encouraged and guided within an interactive navigation schema. Though the general population in many countries are alert to computer-based systems and the everyday use of mobile phones and other devices, there is the need to signal the central theme or rule that govern the relationships created by author and designers for interaction with a collection of movies.

During interaction with *Mnemovie*-based models, the audience is between the state of making and that of participation, of creatively sharing work as a means of modifying the abstraction of their experience, abstracted from the everyday, inserted as an encounter with maximum affect, broadening and stimulating our understanding of the world. The arena of audience involvement with art specifically, will shift and mutate towards what Toft has described as creating human computer interaction of a different order, between respondent and correspondent [11]. The role of initiator and auteur is becoming attenuated, less 'in charge' of how an encounter with motion pictures may proceed. By bundling and linking a variety of electronic and microprocessor devices, this approach moves the art activity decidedly away from the geographically installed and hard-wired artefact towards systems and processes that are multi-valent or interdisciplinary, more mobile and harder to classify within the taxonomies of art, becoming instead phenomena of social behaviour.

As a filmmaker having moved on from analogue practice, in the digital domain the possibilities for reinventing cinematic experience, a physical cinema, begin to emerge.

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