Video Streamer

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ABSTRACT

Motion images are usually conveyed full-screen, coming to life through a rapid sequence of individual frames. The tools presented here allow a viewer to step back from the full-screen view to gain perspective of time, and then to transfer from sequential image streams to collages of parallel images. The Video Streamer presents motion picture time as a three dimensional block of images flowing away from us in distance and in time. The Streamer's rendering reveals a number of temporal aspects of a video stream. The accompanying shot parser automatically segments any given video stream into separate shots, as the streamer flows. The Collage provides an environment for arranging clips plucked from a sequential stream as associations of parallel elements. This process of arranging motion images is posed as an engaging viewing activity. The focus is on viewing utensils, but these tools provide an alternative perspective to video elements that also has bearing on editing.

KEYWORDS: time, digital video, video capture, video editing, video parsing, visual thinking

FLOWING THE SHOW

How can we quickly glance at more than an instant of video time? What are tools for viewing video? If we were to hold video in our hands, what shape might it have? These are some questions the Video Streamer and the Collage attempt to address.

Seeing Across Time

Once video is as easy to manipulate as text in a word processor, once it is as simple to form and reform as a lump of clay, more of us will use motion images both as a medium of communication and as a vehicle for thought. The Video Streamer and Collage present an alternative way of viewing and working with motion images that strives towards improved malleability. The Streamer, especially, offers a new twist to visualizing time by extruding volumes out of motion images. The Streamer ranges from a utility for reviewing and selecting video segments to a dynamic painting of motion rhythms.

The Streamer is about a half minute window of video where chunks of motion image time flow into and out of view as they are captured. This flow can be paused for review and selection. As the Streamer flows, the video source forms a three dimensional solid, stacking the picture frames into a block, like pages in a flip book. As new frames enter, they offset older frames in distance and in time. The editing rhythm, shot boundaries, and many camera motions are clearly visible in the flowing patterns appearing on the sides of this volume.

While the Streamer is paused for reviewing captured video, the source image remains on-screen and available to resume streaming later. With the stream paused, the user can stroke across it with the cursor to play back its contents in a window below, kind of like thumbing through pages of a flip book or an old mutoscope. An expansion of this viewer presents another view of temporal attributes, this time somewhere between the instant of a single frame and larger chunks of time that include several shots. Shot transitions like dissolves and wipes show up well in this expanded view. Reviewing footage by stroking across the frozen stream, the user can select a chunk of video from the Streamer and drag it to the Collage.

The shot parser accompanying the Streamer automatically segments any given video stream into separate shots as the streamer flows. The current algorithm only detects the sharp transitions of cuts and quick dissolves. It is nowhere near perfect, but it does reinforce the value of real-time processing in the attempt to keep the viewing experience dynamic and flowing at the speed of the viewer's mind.

Tools for Viewers

The Collage is a dynamic notepad for thinking with multiple motion pictures. One can resize elements and arrange them spatially as a way of organizing the ideas they convey. The Collage is intended as a simple tool set for managing a growing collection of video clips as a way of understanding their content and relationships. The aim

with the Collage is more to provide some tools for organizing these visual notes than to construct some sort of presentation. For example, someone watching a murder mystery might save clips containing clues in one part of the Collage and clips of suspects and incriminating evidence in another area. As a clue seems to increase in relevance, the viewers might enlarge it and move to the top of the heap to reflect their current thinking. As a suspect becomes increasingly suspicious, his clip might be moved over to a guilty heap. One could use the Collage as a scrapbook, saving and arranging home movie hilight clips and filtering out garbage shots. Or one might save a collection of game-swinging plays, controversial calls, and bloopers from a baseball broadcast forming a personal collection of replays. These are a few simple examples of ways one might use a video notepad. I hope the Interactive Experience at CHI will generate more ideas.

What Does Video Feel Like?

Besides its utility as a video capture application the Streamer also has a playful vein running through it.

The view on the Streamer's edges is similar to slit-scan photography. When the camera is fixed, the edges of the Streamer record changes in one place across time. When the camera moves, the edges show a scan of a scene, revealing some of the contents as well as temporal clues. As an interactive exhibit the Streamer begs visitors to investigate patterns of motion or just sway and bob to make swirlies on its sides.

We can also unwrap the Streamer's surface to present its six sides as an unfolded box. When we print this out and fold it back up we have a hand held block of a frozen chunk of video time. This physical manifestation of Video Streamer is often beautiful and surprising.
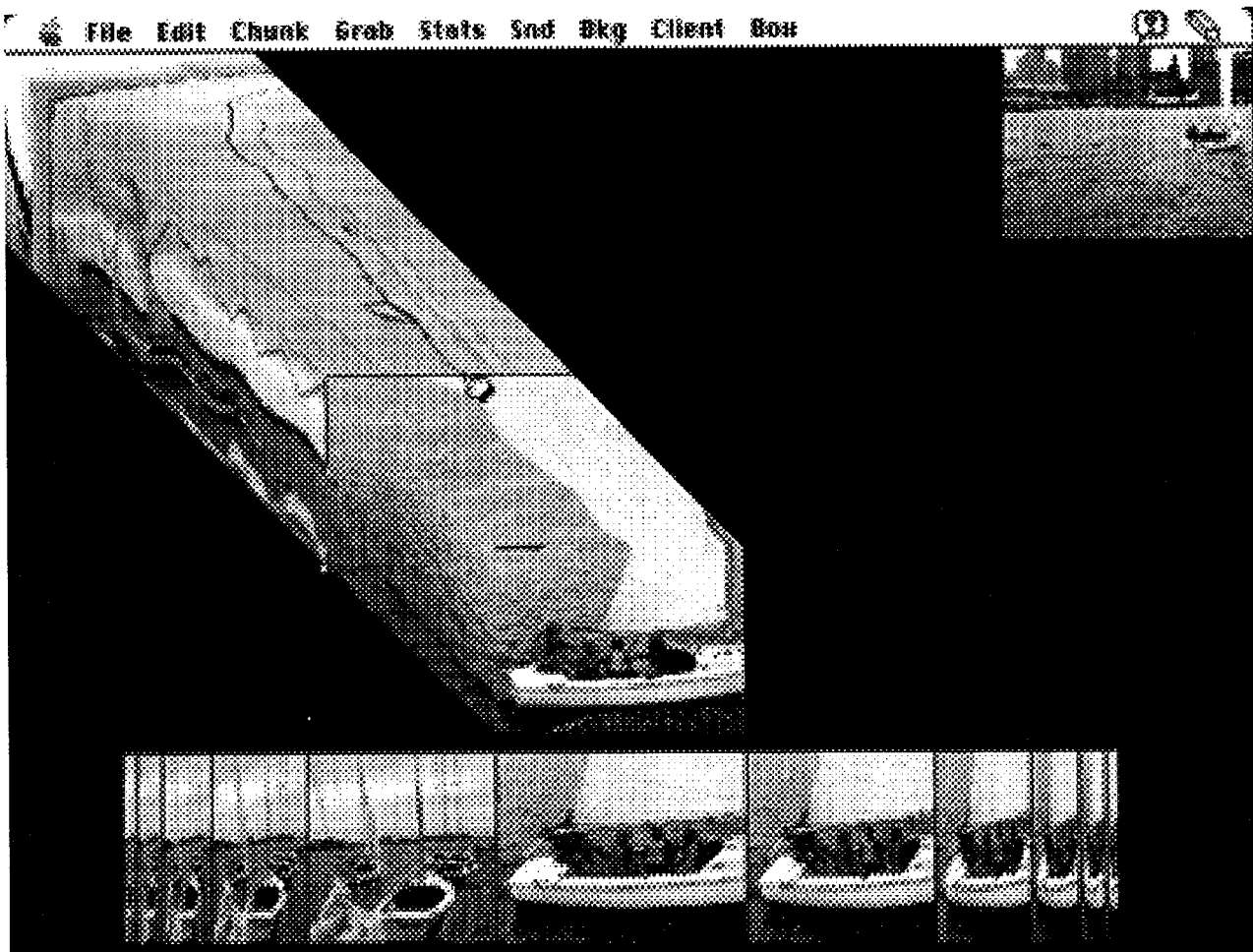
The Video Streamer flows from the center to the upper left. The live source is in the upper right. The cut between two shots is visible along the bottom.