Screen: Bodily Interaction with Text in Immersive VR

Joshua J Carroll[*]
Brown University

Robert Coover[†]
Brown University

Shawn Greenlee[‡]
Brown University

Andrew McClain[**]
Brown University

Noah Wardrip-Fruin[††]
Brown University

Abstract

Bodily interaction with text creates new reading experiences by involving the body of the reader. This has been explored in video installation art, but without immersive 3D. Using a virtual reality environment (the Brown University Cave) we are able to make the bodily experience more direct. In our initial piece, *Screen,* the reader produces three different textual experiences from the same body of text, two of which differ significantly based on how her body is employed to "play" the piece.

1   Bodily Interaction

Video installation art such as Camille Utterback and Romy Achituv's *Text Rain* (SIGGRAPH Gallery, 2000) enables readers to interact with text via an image of their bodies [Utterback 2003]. In pieces such as David Small and Tom White's *Stream of Consciousness* (SIGGRAPH Gallery, 1998) readers may use their bodies to alter the text itself, but the interface's connection to the body is even more indirect (a blue glow represents the hand) [White and Small 1998]. Virtual reality systems seem to hold the promise of more direct bodily interaction. However, head-mounted display systems actually cut users off from their bodies —they are like blindfolds with televisions inside. VR systems like the CAVE, on the other hand, enable the creation of virtual experiences that still allow the user to be grounded by the presence of his body. Artworks like Simon Penny's *Traces* have taken advantage of this to allow for the direct use of the body as the VR interface—creating nearly-athletic experiences in the normally passive VR environment [Penny et al. 1999]. Such projects, however, have not yet explored the possibilities for interaction with text. We use Brown's Cave (an IBM-sponsored immersive display with three walls and a floor) to enable direct bodily interaction with text. Our work is carried out as part of ongoing research in spatial hypertext writing.

2   *Screen*

Screen creates three reading experiences. The first is relatively traditional, projecting text at the distance of the screens that make up the walls, producing the illusion of a normal video installation. This is important because (a) it reinforces the location of the walls, which is necessary for the second stage of reading and (b) this relatively traditional reading experience creates a point of reference for the experiences that follow.

Once the initial text (a meditation on memory as a virtual experience, and on memory's instabilities) has been displayed, the second stage of reading begins. At the outset of this stage a word peels from one of the walls and flies toward the reader. When a word peels it is accompanied by an appropriately-positioned ripping sound as well as the sound of a word being read. If the reader does nothing, the word circles around her. Soon another word peels, and then another, at an increasing pace, flocking around the reader (figure 1).

The reader can intervene in this process by striking words with her hand (tracked with either a glove or wand). This body-involved process—of reading the words that fly at you, of reading the flock of words around you, of reading individual words while striking them with your hand—is the second stage of reading.
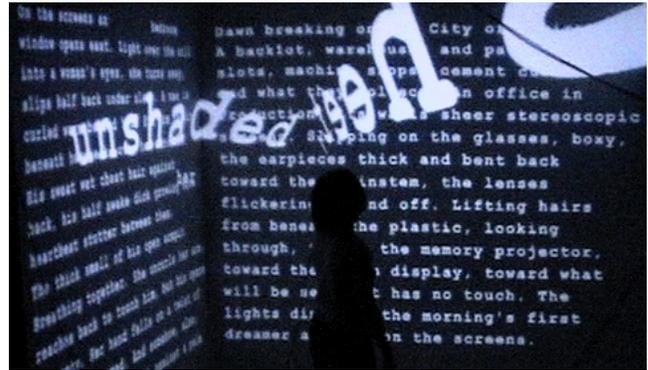
Figure 1. Reader with Peeled Words. (Michelle Higa)

The third stage of reading overlaps with the second. It is what is produced on the walls through the bodily interactions of the second stage. When a flying word is struck it flies back toward a wall. If it is the only word off the wall it will return to the space it left empty. However, if more than one word is off the wall then a hit word may return to a different space. Further, words can break into syllables that find spaces between (often abutting) words in place on the walls. The second stage continues until the majority of words are off the wall. Thus it lasts longer the more actively the reader plays the text (in a sense of "play," perhaps, between that of the computer game and that of the musical instrument). As the pace increases, prolonging the experience requires progressively greater physical exertion. Finally, being overwhelmed by words is inevitable, no matter how much the reader exerts himself (and no matter how much prior practice he has playing the piece).

In our initial evaluations, *Screen* produces an experience new to those familiar with both related video installation and VR art. It is a new type of relation to language, and a new confrontation with text. In its development, McClain proposed words flocking around and overwhelming a reader. Wardrip-Fruin proposed text peeling from walls and being struck back with the hand. Greenlee designed the sound and implemented the system. McClain began the implementation of the graphics and interaction system, which Carroll completed and improved. Wardrip-Fruin and Coover wrote the text. Interaction design was shared by all five authors.

References

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