

Paper Summary 4: Realistic Books: A Bizarre Homage to an Obsolete Medium?

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The promise of the “paperless office” has been floating around the societal consciousness for several decades now, and we seem to be no closer to seeing its fruition than an observer in the 1960’s. On the contrary, most studies show that instead of reducing the amount of printed material and documents, the proliferation of modern imaging and scanning equipment has only served to *increase* the amount of paper we interact with in our daily lives. I think most people intuitively grasp that a primary reason for this phenomena is found in the natural affordances of paper products; not only the ease with which paper documents and books are handled and read, but also the aesthetic and intangible aspects as well. It is from this perspective that the authors of this paper approached their problem: heightening the user experience in a digital library.

In their introduction, the authors describe how the *experience* of physically interacting with a book conveys much meaning to a reader—the touch and texture of the pages, the visual pleasure derived from fine illustrations and page layout, even the smell of the pages—all communicate “ambient qualities of the document it represents” [1]. Their goal, therefore, was to create an interface to a digital library that could convey this same information to the reader using the familiar metaphor of the book. However, while many text-driven interfaces use a “book” metaphor—pages, chapters, section and headings—this project went one step further and used geometric modeling to create a simulated 3-D book object that could be manipulated on the screen; rotated, bent, pages turned and flipped, etc. The goal was to re-create for the user the actual experience of looking at a book.

While they built on previous research by the British National Library [2], they avoided the BNL’s painstaking task of photographing an animation, in advance, of each page-turn in the target document in order to map it to a 3-D model; instead, they used dynamic texture-mapping to transmit the contents of a “page” (which could be from PDF, HTML, or plain text, among others) onto a 3-D model of the page-turn, hence providing for a scalable, dynamic system (and allowing the concept to be used by almost any content currently served by a digital library).

The authors discussed their implementation in some detail, taking care to explain their choices regarding what physical behaviors they modeled and what they left out. For example, clicking on a page and dragging will lift the page and begin turning it (deforming the page naturally as it turns), and once the page reaches half-way over, letting go will cause the page to fall on toward the other side, whereas letting go early will cause it to fall back to the original page. However, they did not take into account the momentum of the page, so that when (if) you let the page go early, it seems to stop abruptly and begin its descent back to its original location. This could certainly be disconcerting from a UI point-of-view, especially given the stated goal of replicating the “real book” experience as closely as possible; however, the authors provided the reasonable explanation that the cost involved in the implementation of this model would outweigh any benefits, since this action seldom occurred anyway. Additionally, this software is only a proof-of-concept version; presumably, if a final version were to be produced, these sorts of issues would need to be addressed.

One interesting feature of this model is the ability to communicate various pieces of meta-data through visual cues; for instance, the more often a page had been accessed (by any user), the “dirtier” the page appeared to be to the accessing reader, by creating virtual “smudges” on the margins of the page. This gave a realistic patina to the page that indicated either age, or use, or potentially both. Another example replicates the feature found in some reference works, where small cut-outs in the pages create “tabbed” placeholders that allow instant access to pre-ordained divisions (like the letters in a dictionary). This feature could be replicated in their system, and extended in novel ways not available in a physical model (not to mention that it can be turned on and off at will, according to the usage and preferences of the current reader—very convenient).

Some features not discussed in the paper involved the pagination of documents; frequently, the right or left-handed placement of the page in the book can affect the layout significantly, even altering the author’s original conception of the content, or at least how he intended to convey it to the reader. This paper doesn’t discuss this issue, so it’s not clear how their system would handle these cases.

The last section of the paper reported on a formative user evaluation they conducted on their software, involving eight computer-experienced participants. After being shown the mechanics of the interface with a sample book, they were then asked to browse two different documents, a shorter (34-page) fiction work, and a longer (~600-page) technical manual. They were given no specific tasks to perform, and the authors were evidently not looking to establish an efficiency gain over other interfaces. Instead, the readers were simply asked to manipulate and browse the document, and tell the researcher about its attributes (although the researcher did not mention any specific attributes as being of particular interest). Questionnaires were completed both before and after the study.

The overall response from the evaluation was positive with user’s making comments like *“It is life-like”* and *“This electronic book is like a normal book”*. They also provided many suggestions for improvement, such as adding searching capabilities, “goto” functionality, and feedback when the mouse hovers over an actionable area (i.e., tell the user which chapter will be the result if an anchor point is clicked). The authors stated

that all these suggestions could be implemented easily in the framework they had developed. The users were also to quickly and easily tell the researchers information about the documents size and content—such as differentiating between the small fiction work and the large technical manual—at a glance to the 3-D representation. Locating their current place within the work was also accomplished easily. As far as the artificial “aging” effects, the users consensus was that this would be more useful to indicate use (how many times has this document or section been accessed before) than age, as this could just as easily be represented with a textual representation.

In conclusion, the authors insist that this project is more than just a whimsical exercise that provides nothing more than a diversion to serious DL research: they make a strong case that the book metaphor—even in this extreme implementation—is an effective and natural way for a reader to interact with, and understand a document. Beyond the utilitarian arguments, however, the authors also argue that it is “shortsighted and misguided—if not absurd—to view any technological artifact in purely utilitarian terms” [1]. Real life—and hence the intersection of technology with life—is always seen by humans through the subjective lens of their experience, including the pleasure they derived from engaging in the activity. It is for this reason that interfaces such as this will be useful—and perhaps even necessary—if we are ever to realize that elusive goal of a paperless office (or library).

REFERENCES

1. Chu, Y., Bainbridge, D., Jones, M., and Witten, I. Realistic Books: A Bizarre Homage to an Obsolete Medium? In *Proceedings of the ACM/IEEE-CS Joint Conference on Digital Libraries 2004*, 78—86. ACM, 2004.
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