Every Object Tells a Story: Physical Interfaces for Digital Storytelling

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ABSTRACT

We have designed a novel interface for interactive storytelling, where users manipulate physical objects to access various portions of a narrative. The story is designed so that the physical artefacts play meaningful parts in the narrative, thus blurring the line between *story* and *interface*. In informal tests and demonstrations users found the interaction easy to understand, thus indicating this could be a promising way to increase user involvement in interactive narrative.

KEYWORDS

Interactive narrative, tangible interfaces, multimedia

INTRODUCTION

Computers have been used to tell interactive stories for several decades – from the *Adventures*, *Zorks* and *MUDs* running on university mainframes in the 1970's, to today's beautifully rendered home computer and video games such as *Riven* and *Final Fantasy VIII*. But apart from the switch from text-based interfaces to point-and-click GUIs, little seems to have changed in the actual interaction. Users still give commands to a disembodied on-screen alter ego, with no real physical involvement in the narrative. However, recent advances in human-computer interface research (e.g. [3]) show that it is possible to construct interfaces that provide much richer interaction than that which is possible with just a mouse or a joystick.

In this project, we wanted to "break the glass" that isolates the user's reality from the story world, by giving users access to *actual physical artifacts* that represent portions of a narrative. Our aim was to provide a heightened sense of involvement and give the illusion that the story world was so rich that parts of it could not help but "fall out" and land in the user's lap! To do this, we constructed a prototype (see **Figure 1**) where users would "read" story elements associated with a variety of physical object, thus completely doing away with any mouse or keyboard input.

Related Work

Several tangible interfaces have been constructed to explore new modes of human-computer interaction, e.g. letting users explore a story in the form of an audio-augmented comic [2], to access electronic memories associated with keepsakes [1], or to arrange multimedia material [4]. Toy manufacturers are currently exploring similar possibilities, e.g. *Smart Toys* by Zowie (www.zowie.com), where a variety of toys can be used as a computer interface.

Figure 1: Users manipulate various objects to view "memories" in the form of multimedia clips, which when taken together will form a narrative

THE NARRATIVE PREMISE

To provide an appropriate setting, we first designed a futuristic scenario. We imagined that advanced technology would make it possible to record *actual memories* on small electronic devices, or "memory chips". By connecting a chip to a reader, memories contained in that chip are played back through a combination of audio and video segments, representing whatever events someone has chosen to record on the chip. The video segments are seen from a first-person point of view, recalling similar sequences in movies like *Strange Days* (d. Kathryn Bigelow, 1995). However, after establishing this premise, we also wanted to be able to break away from the first-person views and provide other aspects of certain events. We did this by introducing the concept of "object memories", where physical objects other than dedicated memory chips (e.g. a spoon, a toy car) could also contain traces of events, which could be accessed by the user in a way similar to the memory chips. Since these objects might also appear in some of the other recorded memories, we wanted to create the illusion that the user is given access to actual artifacts from the story – objects that have their own history, which the user has the opportunity to explore.

THE PROTOYPE

In our implementation, the user is given a set of un-marked (or partially-marked) memory chips and objects, representing a variety of memory fragments. The user's task is to piece together the story from these fragments, gradually forming an understanding of the whole narrative, much like

a detective or an archaeologist reconstructs a series of events through found artifacts and clues.

We constructed our prototype using the *nTropolis* multimedia authoring software. Film segments were recorded with a digital video camera and played back using Quicktime. The application ran on a standard laptop computer. We used barcodes to tag a variety of objects with unique identities, and an off-the-shelf barcode reader as input device. When read, the barcodes would trigger various screens and movie segments authored in nTropolis, giving the illusion that the user was re-playing a stored memory.

Memory objects

We prepared a total of five "memories", three of which were associated with memory chips and two with objects. Several memories were designed to communicate the impression that the protagonist had a disturbing obsession with a certain woman. The nature of this obsession, crucial to the complete narrative, is only hinted at in this implementation.

Memory chips

The 3 "memory chips" were constructed by wrapping rectangular sticks in shiny tinfoil, which gave the impression of a set of suitably strange, high-tech objects. They were:

1. The "stalker" chip: A disturbing sequence where the protagonist is following a woman through an urban landscape, until she finally stops and tells him to stop pestering her.

2. The "spoon" chip: The protagonist explains to a friend in a café that he has found a way to "make objects tell stories". He continues: "I can read the *traces* of the *history* of an object! Take – take that spoon!" (grabs spoon from friend's cup) "It has a memory! That memory can be brought back and re-played – *just like a video!*" (puts spoon in pocket)

3. The "broken" chip: To further the illusion that the user is handling a very delicate and advanced technology, we introduced the notion that some chips may be malfunctioning. This chips presents a garbled screen with a variety of images and sounds, some of which may contain important clues to the mystery.

Memory objects

We constructed two sequences where ordinary objects were used to play back sequences, giving the illusion that the actual memories of the objects were somehow tapped.

1. The toy car: In another disturbing sequence showing the protagonist's obsession, he phones up the woman seen in the "stalking" memory (above). We hear the woman's worried voice, while the protagonist is absentmindedly playing with the same toy car that is now "replaying" the memory.

2. The spoon: In a reprise of the "spoon" memory above, we are presented with the exact same scene – but this time from the viewpoint of the spoon! The protagonist grabs the spoon from the friend's coffee cup, while the same dialogue can be heard, thus proving beyond a doubt that the method of replaying an object's memory really works.

USER EXPERIENCE

The prototype has been tested and/or demonstrated to approximately 100 people during the course of a year. Novice users seem to understand the interaction metaphor almost immediately, and have no trouble exploring the story through the various objects. The main limiting factor is that the number of story fragments is currently very low, which means that we can not say much of how successful the interface is in communicating a complete narrative.

FUTURE WORK

We would like to further explore the possibility of integrating the unfolding of the narrative even closer with the manipulation and sharing of objects. For instance, if there existed 100 memory chips and story objects, and each user was given only a selection of these (say 50), a situation would arise where users have to share and swap story segments between each other to get the whole picture. Some objects might come to be considered very valuable because of their rarity, or because certain unique insights they provide into the narrative. Thus, to get access the entire story, users would necessarily have to find ways of sharing elements between them, making for a truly collaborative (or perhaps competitive?) storytelling experience.

CONCLUSION

By constructing an interface where users manipulate actual physical artifacts that form part of a narrative, we aimed to make the interface both more intuitive and more engaging. It is clear even from this limited implementation that such an interface can provide new opportunities to constructing engaging applications for interactive narrative.

But it might be questioned whether this is really an "interactive" story at all. Since all material is pre-recorded, the user has no chance of affecting the outcome of the story, and only has a hand in uncovering its components. We argue that the interactive element in this case is first and foremost intended to heighten the user's involvement in the story, as opposed to letting the user be a co-creator, and that the resulting experience can feel just as interactive for the user as a truly non-linear interactive narrative. We think that the blurring of the line between interface and application that we have accomplished here can be a very powerful technique for constructing many types of applications that require a strong engagement from the user.

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