Prey: De/composing Memory and Experience

Tiffany Renée Sánchez
Department of Visualization
Texas A&M University
College Station, TX 77843, USA
tiffany@arch.tamu.edu

Jinsil Hwaryoung Seo
Department of Visualization
Texas A&M University
College Station, TX 77843, USA
hwaryoung@tamu.edu

Abstract

Prey explores digital storytelling and the de/composition of memory and experience through the infusion of the old with the new, a hybrid grafting of the aged and organic with interactive technologies, creating an entirely new form of codex. *Prey* is a reinvention of lucid childhood dreamscapes and a recreation of imaginary entities made incarnate in the form of three vintage interactive novels. *Prey* utilizes simple and intimate forms of interactivity. Users must coax the tales within using touch, rather than follow the contemporary tradition of reading text. Technology lives quietly in the background, allowing users to reflect directly on the rich materiality of the piece and their own sensorial experiences without distraction.

Author Keywords

Organic; interactive; touch; immersive; hybrid

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous; J.5. Arts and Humanities: Fine arts.

Introduction

Societies across the globe seem intent on moving technologically forward while increasingly synthesizing urban life, as if the only way to move forward is to

leave all else behind. As artists, researchers, and makers, we pick apart existing paradigms to recreate realities instinctually. We are not predetermined to continue down this path, abandoning nature or our natural selves, in pursuit of progress. Rather, we may seek to preserve our bodily experiences and evolve through our emerging technologies.

The world and its inhabitants are endlessly de/composing around us. Our hybrid practice embodies this notion; we *de/compose* organic and synthetic forms, breaking down and reassembling the aged with the new, in pursuit of hybrid evolution and the preservation of experiential artifacts. We seek to preserve, share, and overwrite memory through the use of meaningful materials and mindful interaction. By integrating traditional craft and physical computing methodologies, we give life to experimental art objects, creating *tangible memories* - sensorial vignettes bridging body, nature, and technology.

At first glance, *Prey* appears as a small collection of standard vintage volumes. Once their worn leather covers are opened, however, each reveals a handcrafted vignette carefully embedded within gilded pages lined with fur [Figure 1, Figure 2]. As you run your hands across their sumptuous bodies, a warm light responds to your every touch and gently illuminates the delicate assemblages of natural artifacts encased within. The longer you sooth and stroke each novel, the more each narrative is revealed.

Background
Personal *Motivation*
This project was greatly inspired by the lead artist's childhood. The process of design and fabrication for

Figure 1. (Left) View of embedded vignette lined in rabbit fur comprised of snake skin and small fragments of egg shells, (Right) View of embedded vignette lined in rabbit fur comprised of vulture vertebrae and bullet casings.

each novel was a continuous unearthing of uncanny vestiges, early memories of innocence and curiosity entwined with the dark stain of abuse. As a child, she felt she was living in a world where you must eat or be eaten. And she no longer wished merely to become someone else's *Prey*. She learned to adapt. She found comfort in books and solitary exploration. Using her cache of natural artifacts, a practice that continues to haunt her adult life, she created her own imagined sanctuaries. They became portals to new worlds, almost sentient in their ability to give her solace.

Design and Implementation
Prey is the product of traditional bookbinding practices and physical computing techniques. While their design is driven by a deeply visceral aesthetic, each novel hosts touch responsive led illumination and pressure sensitive

Figure 3. Even while establishing our selection of natural materials, technology was always close at hand.

skins mapped to a microcontroller embedded within each book. These carefully custom fitted digital components were sewn directly into the pages of worn vintage photo albums and serve to augment an assortment of scavenged materials including bones, snakeskin, and fur. *Prey* enhances the multi-sensory experience, provoking participants' memories or imaginations through soft electronic technology.
Each novel is fitted with a tactile interface comprised of soft, conductive materials capable of sensing quality of touch, stroking, and caressing. Seamless integration of interactive technologies into the lead artist's collection of vintage and natural and artifacts was integral throughout development [Figure 3].

Sensing Human Touch
The touch sensitive fur was made out of small pieces of genuine fur and conductive threads. To create the touch sensitive field, we used a soft-circuit technique

inspired by Hannah Perner-Wilson's stroke sensor [1]. The soft circuit was made from conductive threads in insulating fabric sewn parallel with the fur and connected to an Arduino© LilyPad board with an LED for output [Figure 4]. When the sensor is stroked, the threads brush against each other closing the circuit and providing power to the LED. As the user's hand moves away the threads return to their vertical state, breaking the circuit and turning off the LED once they are no longer in contact. This creates an interface capable of transmitting binary information representing quality of touch and whether or not the fur is being stroked.
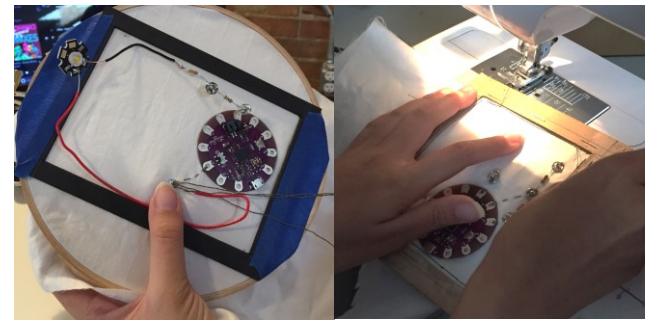

Figure 4. Soft circuit creation for *Prey*

This technique has been utilized for gesture recognition before, as seen in the Gesture-Aware Furry Robot by Dr. MacLean's team [2]. In his team's implementation, conductive threads were sewn into faux animal-like fur creating a weak circuit. When a person touches the fur, the hand motion changes the resistance in the circuit, which is reflected in voltage level changes across the fur.

By sampling voltage changes in our own materials as well, we were also able to classify and utilize gestures

using machine learning methods. Conductive threads sewn into the fur layer provide the interface through which the electrical capacitance of the human body is measured using the Arduino CapSense library [3]. The original sensor [2] setup required a medium to high value resistor and a length of wire capped with a small piece of conductive copper tape. At its most sensitive, this sensor would sense a hand or body inches away from the sensor. Since we used a smaller value resistor (1M ohm), our sensor functions more so like a touch/pressure sensor than a proximity sensor.

In addition to the touch sensor incorporated into the fur pelts, we also embedded into each novel a pressure sensitive page comprised of 3M Velostat sheets, a piezoresistive material. Its electrical resistance decreases when pressure is applied across its surface. When sandwiched between two conductive layers, it is able to act as both a pressure and bend sensor. By adding the second sensor, we were able to capture
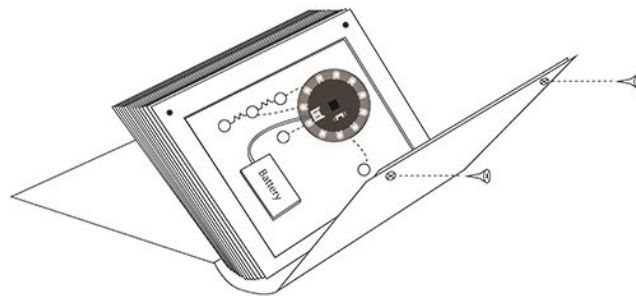

Figure 5. Soft circuit placement in *Prey*

various qualities of touch.

Illumination
The soft circuitry was carefully integrated into the book structure [Figure 5]. Two glowing LEDs, embedded into the top and the bottom of the vignette within each book, are programmed to increase and decrease in intensity according to the quality of touch detected by the sensor. The gentle illumination, reminiscent of breathing, guides the reader deeper and deeper into the vignette, gradually revealing the intimate childhood memories of the lead artist captured and preserved within its pages.

Conclusion
Through the de/composition of organic and synthetic materials we created a series of *tangible memories* in the form of three touch sensitive novels. *Prey* uses this natural and intimate gesture to guide mindful interaction with personally meaningful artifacts, creating a new form of digital storytelling.Throught Throught

References
1. Perner-Wilson, H.a.B., L., Satomi, M. 2011. Handcrafting Textile Interfaces from a Kit-of-No-Parts. in *the Fifth international Conference on Tangible, Embedded, and Embodied interaction*.

2. Flagg, A., Tam, D., MacLean, K. E., and Flagg, R. 2012. "Conductive Fur Sensing for a Gesture-Aware Furry Robot*," in Proceedings of IEEE Haptic Symposium (HAPTICS '12)*, Vancouver, Canada, March 2012, pp. 99-104.

3. Arduino CapSense Library. Accessed on Feb. 14, 2017. http://playground.arduino.cc/Main/CapacitiveSensor?from=Main.CapSense