

Designing Intimate Experiences

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INTRODUCTION

Communication and computing technology is advancing at an accelerated pace. Humans are finding it difficult to keep pace with these changes, and yet these new technologies are supposedly made for the benefit of people. Established in 1998, the Human Communication Technology (HCT) Research Laboratory researches a number of key issues which put people “back in the loop” and allow us to communicate experiences to computer systems and each other more effectively. An awareness of people’s different cognitive, physical and emotional capabilities provides a foundation for acquiring, analyzing, representing, storing, retrieving, transmitting, communicating and ultimately synthesizing human experience. Faster processing machines, bigger data capacity, new algorithms, multimedia and multimodal systems combine with developments in psychology, sociology and art to enhance the communication abilities between people and machines.

Our innovation stems from the integration of human-computer interaction and artificial intelligence. We seek to incorporate human experience as the critical entity processed by people and systems. This focus on experience leads to novel ways of thinking about how our machines facilitate and support communication between people and machines. These concepts in turn allow the exploration, creation and development of new technologies, as well as radically new metaphors for work and play. As the functionality of our machines out-paces our needs, the focus on human experience becomes even more critical.

At the HCT lab, research focuses on new human computer interaction technology and theories of embodiment and intimacy between humans and computers. Projects cluster into three main areas: 1. creation and analysis of new interfaces. 2. modeling, tools and graphics and 3. art, music and technology. New interfaces include using metaphor for interface design, whole-hand interaction devices and immersive environments for enhanced communication.

We are actively working on a parallel distributed camera array (PDCA) and a 3D articulatory speech synthesizer as part of building larger tools and models. The PDCA project is looking at developing

new techniques for image processing based on FPGAs and ARM based processors.

Our architecture supports multiple applications using arrays of low-cost, high frame rate cameras including our Local Positioning System (LPS). The LPS tracks infrared LED tags identified by unique asynchronous blinking patterns. Our 3D articulator speech synthesis project seeks to construct a full 3D model of a vocal tract capable of producing speech through the simulation of air flow.

We also are actively creating new interfaces for musical and artistic expression. Artworks are typically either installations or performances that focus on audience participation or interaction. We also explore pieces that are about technology to expose issues relevant to a contemporary understanding of it. Some examples include the Iamascope, Forklift Ballet, PlesioPhone, Tooka and Waking Dream.

FRAMEWORK

Our framework underpinning the research builds upon the notion that people form relationships with objects external to their own self. These objects may be other people, devices, or other external entities. The types of relationships that form and the aesthetics of the relationships motivate the development of interaction skill with objects as well as bonding. We focus on four types of relationships as shown in Figure 1. In the first type of relationship, a person

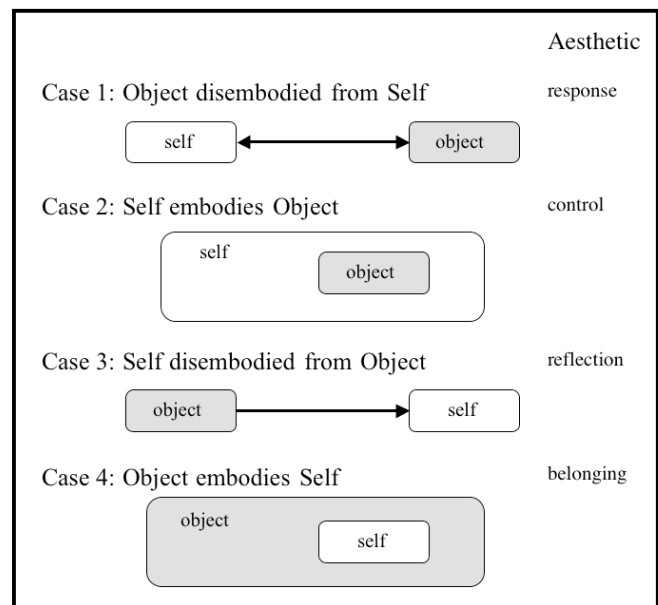


Figure 1: Four types of relationship between a person and an object including aesthetics. The relationship types are not mutually exclusive and may be happening simultaneously at varying degrees.

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stimulates the object which responds. If the response is what the person wanted they are satisfied. In the second type, the object feels like an extension of the person. In this case, the person is embodying the object and the interface is transparent so that the person feels intimate with the device. The control of the object itself provides the aesthetics. In the third type, the object stimulates the person without any interaction by the person. Based on the person's own knowledge and beliefs, the stimulus may be satisfying. Finally, in the fourth type of relationship the person allows himself to be embodied by the object. Thus, the object can control the person. In this case, the feeling of belonging can be satisfying. For effective human computer interaction, all relationships should be active simultaneously.

In this presentation, I explore and illustrate this framework and illustrate with examples from some of our research.

Further Reading

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