

Robotany and Lichtung: a contribution to phenomenological dialogue

Jill Coffin

Georgia Institute of Technology
Atlanta, Georgia USA
jill@gatech.edu

ABSTRACT

This paper discusses phenomenological structures relevant to tangible and embedded interaction through a phenomenological interpretation of an interactive art piece. This discussion distinguishes between two basic traditions in phenomenological philosophy, the Husserlian and the Heideggerian. In addition, it illustrates the notions of Lichtung, intentionality, Verhalten, ready-to-hand and present-at-hand. The paper concludes with some implications of a Heideggerian phenomenological framework.

Author Keywords

Phenomenology, Husserl, Heidegger, embodiment, interactive art, hybrid, robot, ethics.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

The tradition of phenomenological dialogue in computing and interaction communities can be traced to Dreyfus' 1972 critique of artificial intelligence [3] published ten years after the first English translation of *Being and Time* [7]. Other notable contributions are from Winograd and Flores [14, 15] and Dourish [2]. These texts form an American West Coast tradition of phenomenological interpretation applied to computing and interaction.

The goals of this paper are to present the interactive art piece, Breeze, and interpret the piece using Heideggerian phenomenology. This interpretation is inevitably influenced by the West Coast tradition; however, it contributes to TEI dialogue by discussing relevant phenomenological structures and differentiating between Husserlian and

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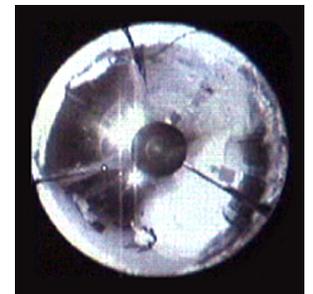


Figure 1. Visitors interacting with Breeze.

Heideggerian philosophies. Tangentially, this paper responds to dialogue in the HCI community about critical practice [1, 12] and the role of art [9].

ROBOTANY

Breeze is a robotic live Japanese maple which senses and responds to human presence and movement. Breeze was designed around the radial morphology of a tree as opposed to the bilateral symmetry of android robots. Breeze's 360° 'eye' is a



catadiotropic lens positioned above the canopy. Its compound 'ears' are a custom ultrasonic sensor array positioned radially below the canopy. I leveraged the joint structure of the tree and actuated limbs through building gross and fine nitinol-based muscular systems.

When approached, Breeze gestures toward visitors with a response materially determined by its hybrid organic/robotic nature. Breeze's movement is silent and smooth, without the mumbling and grumbling of motor-based actuation. This is due to the material interaction of nitinol wire and the resistive yet flexible maple limbs. Because its entire canopy is active, Breeze can conduct several physical conversations at once. Breeze appeared at the Belluard Bollwerk International Festival in Fribourg, Switzerland in 2006. Breeze is funded by the Canton of Fribourg and Fondation Nestlé pour l'Arte.

THE PHENOMENA

Consistently I, my collaborators and festival administrators witnessed and documented visitors engaged in ongoing and evolving physical dialog with the tree. We witnessed and documented a range of spontaneous, unscripted behaviours and movements such as dancing, waving, and even kissing, petting and toasting Breeze with wine. As one can suppose from these examples, the overall stance of visitors toward Breeze was affectionate. A group joined hands around the tree and sang to it. It was common to witness passersby greeting and saying goodbye to Breeze. These behaviours were exhibited across genders and at age groups from one year through roughly seventy years old. Video documentation is available at dm.gatech.edu/~jill/robotany.



Figure 3. Visitors interacting with Breeze.

EXPERIENTIAL ATTRIBUTES

Totemic

Breeze is a totem. A totem is a non-human being recognizable within a culture's mythology. Totems have a lived relationship to the individuals within a culture, and it is possible for members of that culture to communicate with them. Animated totemic trees are embedded within our Western cultural mythology. Examples occur in the films *Wizard of Oz* and *Lord of the Rings*. Physical interaction between humans and trees is portrayed in the Japanese animation *My Neighbor Totoro*. Plant and animal totems form "necessarily abstract and metaphorical relations to humans" [13]. Shore quotes Goldenweiser's characterization of totems as "familiar and congenial to man, yet outside the circle of specifically human things and activities, thus not being subject to the disturbing agencies that abound within that realm" [5]. Thus, according to this statement, totems would be less apt to fall into uncanniness than androids.

Responsive

Breeze's interaction with humans is built upon a stimulus-response model. The action behind Breeze's interaction is simple: sense presence and movement and move toward it. The responsive attribute can be contrasted with the procedural. Responsivity is less concerned with representing a world than with supporting action.

PHENOMENOLOGICAL DISCUSSION

Background

Many alternatives to Cartesian cognitivist modeling which HCI and interaction theory draw upon, such as Varela's embodied cognition, Garfinkle's ethnomethodology and Merleau-Ponty's phenomenology of perception, are descended from the thinking of the phenomenologists Edmund Husserl and his protégé Martin Heidegger. Blanket treatments of phenomenology risk conflating the ideas of these two very different thinkers; thus, it is important for practitioners employing phenomenological interpretations to distinguish between them.

Phenomenology, in a general sense, is a practice of reflection upon the structures of lived experience. Husserl originated phenomenology as a philosophical movement. He had a background in mathematics and became concerned with the relationship between scientific theory and the phenomena of experience. He focused on the analysis of mental representations as the foundation, or proper study, of philosophy. His starting point for phenomenology was the lived world as accessible through perception. For Husserl, the primary reality of a thing is how it appears in one's consciousness. Phenomenological descriptions are formed by direct subjective experience which constructs representations in the mind. Objectivity is reached through intersubjective empathy with other people.

Husserl and Heidegger share similar concerns with how things are revealed to us and concealed from us in time. Both understand lived experience as some combination of conscious, semi-conscious and unconscious experiences and beliefs in negotiation with society, culture and the environment. However, Heidegger's starting point for phenomenology is existence (*Being*) instead of subjective perception. For Heidegger, one must exist in order to perceive; thus the question of existence, or Being, is more primary than perception. Starting from the question of Being, Heidegger obtains different results than Husserl. For Heidegger, Being occurs in and is inseparable from time. All things that exist, including ourselves and other human interactors, do so as events. We are not subjects which commit actions toward objects. We *are* action. Thus, for Heidegger, action in the everyday world is the proper study of phenomenology.

Lichtung

Breeze's manifestation (revelment) as a totem occurs in an opening, or clearing, through which possibilities for interaction emerge. This clearing is an illustration of Heidegger's structure, *Lichtung* [7]. The *Lichtung* is a field of possibilities for interaction. It is a central structure of Heidegger's ontology. The nature of the beings, objects and the context (Heidegger's *world*) of the interaction determine the possibilities presented. Thus, attributes of Breeze contribute to the nature of the interaction, as do the beings present, the social and cultural milieu, and the overall environment.

The *Lichtung* prioritizes possibilities over actuality. Thus, an interactive artifact which incorporates open-ended response (vs. scripted procedure) can create possibilities for ongoing, engaged, unscripted, emergent interaction as we saw with Breeze. An experience with Breeze provides an illustration of this concept. A visitor remarked (translated from French), “The tree moves when I move, so what?” My collaborator John Taylor, noticing that the man who said this was actively dancing around the tree as he spoke, replied, “It is not what you do to Breeze, it is what Breeze does to you.” It would also have been appropriate to reply “it is a matter of the possibilities that appear in the *Lichtung*,” but we don’t usually go around talking like that.

Intentionality and *Verhalten*

‘Intentionality’ is a philosopher’s term with only a loose relationship to the notion of intending something. Intentionality refers to the mind’s capacity to be directed toward an object. I see a tree. I imagine a dragon. I am worried about driving in the rain. Every mental act is directed toward or about something beyond that mental act. This notion is central to Husserlian philosophy. Simply put, for Husserl, it is through the act of intentionality that representations of things appear in the mind [10]. This perspective posits the mind opposite the world, configuring the world as phenomena for consciousness. When Dourish writes that “Intentionality is central to any understanding of embodied interaction” because “[c]omputation is fundamentally about representation” and therefore “refers to things” [2, p. 137], he is employing an understanding of Husserlian intentionality.

Heidegger rejected Husserl’s neo-Cartesian focus on consciousness and perception, as well as the reduction of things to their accessibility to consciousness. Instead, for Heidegger, our being relates to things more basically through use. Thus he emphasizes encounters with tools, whereby phenomenology reveals our being in the context of interaction. Heidegger replaces Husserl’s notion of intentionality with *Verhalten* [6] or performative behaviour toward an object. While Husserl’s notion of intentionality expresses that we *perceive* our experience, Heidegger’s notion of *Verhalten* expresses that we *perform* our experience (within a *Lichtung* and a world).

The challenge for applying phenomenological concepts to tangible and embedded interaction is that computational systems, particularly procedurally-based systems, remain in a Husserlian stance. As Dourish points out, they depend upon representation. Representation creates a separation from action. Dreyfus characterizes Heidegger’s position toward such intentional states as distorting the phenomena of everyday responsive engagement in the world [4, p. 54].

Visitors to Breeze do not act through a computationally mediated representation as much as they act in unscripted dialogue with a computationally mediated response. If the response of the interactive system maps well to our meaning-making sensibilities, our actions can be effortless,

unscripted, emergent, and engaged. Thus, in the *Lichtung* created by the totemic relationship with Breeze, *Verhalten* is satisfied through a coupled response and sustains a lived relation.



Figure 4. Visitors interacting with Breeze.

Ready-to-hand, present-at-hand and meaning

For Heidegger, a being’s relationship to tools, technology, and other artifacts can occur in two modes: *ready-to-hand* and *present-at-hand* [7]. In the *Lichtung*, possibilities can emerge through an encounter with things whereby the boundaries between being and technology are diminished. In this sense, the being experiences the artifact as ready-to-hand. The notion of ready-to-hand corresponds to Breeze as described throughout this paper, as providing an opening for emergent behaviour. When a breakdown occurs and possibilities for interaction are obscured, we see the mechanism as a thing available for inspection and analysis but not for engagement. It is bracketed from a connection with us. It becomes present-at-hand. Several authors, including Dreyfus, Winograd and Flores, and Dourish, have written about this dynamic. Experiences with Breeze provide an example that illustrates the framework.

Breeze was presented in two venues: as a fully funded project in Switzerland and overseas as an unfunded project in the United States. We accepted a donated mountain laurel to replace the Japanese maple which was the original Breeze 1.0. Unfortunately this tree did not have physical and material characteristics amenable to the piece. The high, stiff canopy rose above people’s heads and foregrounded the technological mechanism over the totemic nature of the tree. Also, the nitinol muscles strained against the stiff branches and did not produce a mappable response.

Within a framework of action and possibility, meaning is as meaning does. Visitors became an audience which approached the piece as an interesting technological object to look at. They commented on the design and engineering craft. The *Lichtung* revealed meaning that could be named, pointed to and articulated (present-at-hand). Heidegger considers this to be a derivative form of meaning. In [7, sec. 32], Heidegger presents the example of a door and explains that we make use of a door before we consider its physical or metaphysical properties. In fact, it takes a certain stance

toward an object to consider its existence independent of other objects and categorize its properties. This stance is valid for various purposes such as scientific inquiry, but does not exhaust meaning. Another perspective on this breakdown is what I will call a 'hybrid shift.' The emphasis shifted from a balanced hybrid organism to its mechanism.

WITHIN THE LICHTUNG

Heidegger was concerned with connected action in the milieu of everyday lived experience. The emphasis is not on representing the human actor, but on possibilities in the space of interaction. Human centered computing/user centered design exists for good historical reason, i.e. to take emphasis from humankind serving the machine to the machine best serving the needs of humankind. A Heideggerian interpretation of interaction takes emphasis off the human actor and places it on interaction in an ecology. This shift places our caring, as we design and build, into a wider sphere of concerns.

Such an interpretation becomes particularly compelling in an age of increased competition for resources and as computing proliferates in our environment, osmoses into our bodies, and transmogrifies from electronics-based systems to biological, genetic, chemical, pharmaceutical and hybrid systems. As designers and builders of technology, we will need to take emphasis off the human actor and place it in a wider ecology. Heidegger characterizes the possibilities of the relationship between humans, technology and nature in his essay "The Question Concerning Technology" [8]. Another way to understand this issue is to consider the objectification that occurs in the present-at-hand state. In Heidegger's thought, this objectification has ethical consequences, particularly when nature or the local milieu is objectified as present-at-hand. The ontological problem with this characterization is that it explains everything in relation to the human at the center.

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Figure 5. Mechanism for gross actuation.

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