UZUME
A performative Event In Virtual Reality

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ABSTRACT

Immersed in *Uzume*, a sensitively responsive, dynamic environment surrounds the visitor, unfolding the communicative nature of a strange, virtual entity. Yet, participants are not able to directly control the environment's evolution and need to develop a playful gestural dialogue with the abstract, virtual opposite.

The work addresses the aspects of presence, control, reflectivity, and otherness as they develop in an immersive, responsive environment. Users are confronted with a chaotically evolving, spatial entity, whereby the process of their perception and interpretation of its appearance and behavior alternately veils or unveils the underlying computer system.

This paper provides an introduction to the theoretical, conceptual and architectural levels of *Uzume*. The performative experience, along with the evolving dialogue between the user and the environment, will be the main focus of exploration.

General Terms

Performance, Experimentation, Theory.

Keywords

Virtual Reality, virtual environment, CAVE, art, presence, performative, control, dialogue, mirror, other, chaos.

1. INTRODUCTION

Uzume is named after a Japanese Shinto goddess and means 'whirling'. The story of Uzume tells of her strange dance that lured the sun goddess Amaterasu out of the cave where she had hidden herself.

Uzume was implemented for a 4 to 6 wall CAVE[®] projection environment. Visitors are invited to physically move around within the projection space, and are equipped with two hand sensors and tracked shutter glasses. The sensors' positions are constantly sent to the VR system, which is thus provided with a limited possibility to 'perceive' its users.

The aspects of this projection medium that initially attracted me, are the human-scaled physical projection space and the ability of the VR system to update the content in real-time. During the working process, the focus shifted more and more towards the communicative aspects of this ability and the relations of input and response. Thus, the most interesting quality of this projection space is the physical integration of its inhabitant in the evolving progress. It is the 'observing' (tracking and processing) capability of the computer-controlled system that permits the viewer to be 'present' and involved. The evolution of the environment becomes thus an individually characteristic event. In the following sections I will discuss the performative, as well as the critical aspects of such a dialogue.

Figure 1. CAVE[®] shot 1

2. STRUCTURAL LAYERS

The appearance and behaviors of *Uzume* evolved in the idea of a space that forms and changes dynamically over time. During the process, the question of controlling —or rather not controlling– the evolution of this space, but still being able to intuitively take part in a situation, driven by mutual influence, became the most important aspect of designing its architectural layers. Following are the four different sets of instructions, each of which is modulated by the movements of the visitor.

2.1 Temporal behavior of dynamic systems

The whirling structures are based on spatial representations of the temporal behavior of nonlinear, chaotic systems, so called 'strange attractors'. Their parametric fields are spatially mapped around the user's body, and hence, by gesturing with their hands, they actually traverse the various chaotic states of the system.

2.2 Fluid-like force field

The attractors, as well as the users, are embedded in a viscous fluid-like force field that displays the 'medium' of this environment. It sensitively reacts to the physical presence of the visitor, thereby displacing and locally transforming the visible, chaotic patterns.

2.3 Sound space

The basic modules of the spatial, real-time composition consist of various discrete voices, whose compositional parameters are spatially mapped around the user. They become combined and modulated by the movements of the participant.

2.4 Choreographic rule-based system

The choreographic 'layer', whose decisions are indirectly influenced by the behavior of the user, controls the temporal conditions and initial properties of simultaneous events, as well as the transitions between these configurations.

Figure 2. CAVE® shot 2, force field and attractor

3. THE PLAY

3.1 Performative Aspect

The chaotic behaviors of nonlinear systems, as well as the complex conjunction of all architectural layers (2.1) confront the participants with a system that they will never be able to fully comprehend, and that thus defies control, and any form of colonization.

In that any emerging moment is ambiguous and neither previously given, nor explicitly deducible, each moment represents a singular event –and yet only one point in an infinite evolution. The performative quality unfolds exactly in this dynamic interrelation, as each (inter)action is undirected and each sequence becomes arbitrary, without pursuing any specific interaction/control purpose. The subject of the encounter consequently results in the whole, the interconnection of all events.

3.2 Process of identifying

The spectators become players, who identify themselves with the situation, and attribute some form of liveliness to the unpredictable evolution of the environment. Thereby the willful behaviors of *Uzume* seem to counterbalance its rather abstract appearance. The mode of our perception, based on which we apprehend and interpret patterns by networks of associations, rather than mathematically or geometrically related terms, becomes quite apparent during the process of identifying.

3.3 Vision of Control

Since it would be illusory to assume that the 'virtual' opposite wouldn't gain any influence over the visitor, the relationship in this projection space evolves in a mutual interrelation. Yet, the users interact not only with the idea and its realization, but also inevitably engage the underlying control system. Paradoxically they have a much better chance to succeed in interacting and controlling, the more powerful this control system is.

The desire for an ultimate control system seems inseparable of the idea of highly advanced VR systems. As for pioneers, Ivan Sutherland euphorically states in 1965: "The ultimate display would, of course, be a room within which the computer can control the existence of matter." [1] Myron Krueger, working on interactive, computer-controlled installations since 1969, envisions: "Imagine that the computer could completely control your perception and monitor your response to that perception. Then it could make any possible experience available to you." [2] Control is the magic key -- on the other side of the system is the user, who seeks to control the environment.

3.4 Oscillating opacity of control system

A control system of such capability, of course, must be able –and permitted-- to thoroughly observe, analyze and interpret our actions.

In my work, the ambiguity of such visions becomes an oscillating interplay between masking and unmasking. As mentioned above, a system, which behaves so variably and unforeseeably, and yet which cannot be determined by its visitors, lends a sense of life to the computer-generated situation. Combined with the rather abstract appearance of this 'entity', the subjective perception becomes thus the degree of the opacity that this illusion can gain.

Meanwhile, I watched several hundred visitors develop a form of emotional relationship to their computer generated opposite and observed them talking to or yelling at these whirling lines. Often there's a moment, when the visitor starts smiling --the kind of smile that one smiles when caught talking to oneself. That's the moment, where the usually transparent borderline between the play and the underlying control system becomes opaque to the user –and they are thus able to cross it.

Figure 3. CAVE® shot 3

4. THE DIALOGUE
4.1 Transforming and distorting
"...an interactive technology is a medium through which we communicate with ourselves - a mirror (or, more precisely, a transforming) mirror" [3]

Based on Ovid's 'Metamorphosis', the artist David Rokeby examines how the image of one's self and the relationship to one's world gets reflected and transformed in interactive works. On the one hand he refers to the story, in which Narcissus sees his image in a pool of water and falls in love with himself. While the story, in which Echo, punished by Juno, is only able to repeat back the last words said to her, and consequently Echo only has the ability to transform Narcissus' words of rejection into an expression of her love, provides an example, where the input gets re-contextualized. "While the unmediated feedback of exact mirroring produces the closed system of self absorption (the reflection of the self is re-absorbed), transformed reflections are a dialogue between the self and the world beyond." [4]

4.2 Projecting and pretentious
Communicating with *Uzume* unfolds a process similar to pursuing a dialogue without being capable of the language of the other. Imbuing the mirror (4.1) with a 'projecting' quality shows the ambiguity of such a dialogue, in which the opposite reflects the quality of input by specifically changing the 'face', and yet the relationship between input and response isn't necessarily comprehensible and never is reproducible. The environment evolves to some extent self-independently and hence inversely challenges the user to explore its language. Input and response become thus a dynamic interplay, creating a communicative surface, in which users are able to discover themselves, as well as the other.

4.3 The other
The process of exploring or getting acquainted with the environment merely creates another, newly generated environment – an infinite sequence of configurations. Thus, the visitor is only able to approach the surrounding opposite in tiny steps, just enough to capture brief moments of intimacy, which again immediately dissolve in something unfamiliar.

Due to the chaotic nature, the evolution of the system seems almost open –despite of being defined by its code. Thereby a dynamic space is constructed, composed of an infinite number of boundaries –and thus impossible to grasp. The relationship, as well as its mirror image, remains thus always open, equal to something unconditional that can only be approached without being forced by rules.

Jorge Luis Borges describes such a fluctuating experience in his 'Book of Sand', a book that "has only one spine, but a hundred faces". [5] Turning the pages, one always discovers new ones, and when looking back, the preceding pages have mysteriously multiplied, becoming a labyrinth of possible sights and eventually resolve like fine sand.

Figure 4. CAVE® shot 4

5. CLOSING

Hereby, the virtual emerges from the substance of the relationship spanned 'in between' the projected space and its participant. Michael Heim, discussing the meaning of 'interface', provides with his interpretation of the ancient Greek term 'prosopon' an interesting metaphor for the independently evolving substantial quality of the 'state in between': "In ancient times, the term interface sparked awe and mystery. The archaic Greeks spoke reverently of prosopon or face facing another face. Two faces make up a mutual relationship. One face reacts to the other, and the other face reacts to the other's reaction and so ad infinitum. The relationship then lives on as a third thing or state of being."[6] In the zone between the (visually and acoustically) represented and the participant all modes of possible realities are coexisting. The dialogue as such creates thus an 'interspace' that unfolds beyond the third dimension, in which the virtual actualizes itself.

6. ACKNOWLEDGMENTS

7. REFERENCES

[1] Sutherland, I. E., The ultimate display. In Proc. IFIP Congress, volume 65 (1965), 506—508

[2] Krueger, M., Artificial Reality II. Addison-Wesley, Reading, MA (1991)

[3] Rokeby, D., Transforming Mirrors: Subjectivity and Control in Interactive Media. In Critical Issues in Electronic Media, ed. Penny, S., State University of New York Press (1995), 133-158

[4] Rokeby, D., *ibid*

[5] Borges, J.L., Das Sandbuch [The Book of Sand]. In Gesammelte Werke, Band 4: Erzählungen 1975-1977, Carl Hanser Verlag (1982)

[6] Heim, M., The metaphysics of virtual reality, New York (1993), 77