LOCOMOTOART: INTERACTING WITHIN NATURAL SETTING THROUGH PERFORMANCE USING PICO PROJECTION

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LocoMotoArt is a creative field backpack that gives the user the capacity to explore and make digital art from, and in, the natural environment. Liquid Crystal on Silicon pico projection technology was studied during the production of two live technology-mediated experiments on the island of Hawai'i. We question whether different experiences of technology in nature can subvert preconceived notions of the human-nature-technology relationship.

Power
- OP-26 12V SLA battery pack 25Ahr 150Whr. with dual regulated inputs and triple outlet hub with meter
- Flexible roll up portable solar panel 55.4W 3600mA with 12V female CLA socket outlet
- 12V male cable, 12V DC 100W Mag Safe adapter for an Apple 15 inch Mac Book Pro laptop computer to power through the OP-26 battery
- 12V USB Port adaptor, for iPods, iPhones and other USB devices
- MH-C40-1FS-DC and AA AAA battery chargers

Capture
- H2 Zoom field sound recorder
- Canon Vixia HF R100 AVCHD mini camcorder Canon SLR digital camera

Production
- Apple 15" Mac Book Pro with Final Cut Pro, Adobe CS5, Adobe LightRoom 3, Aperture, Processing, Toast Titanium, DVD Studio Pro, iTunes, and Garage Band pre-installed

Playback & Display
- Three Aaxxa LCoS P1 Jr. pico projectors; 10 ANSI-lumens, <20dB 0.5w mono speaker, SD-HC card reader, mini USB, and composite A/V, 4:3 aspect ratio control, 10 ~ 50 inches projection image.
- Apple iPod, one Tunebug Portable SurfaceSound™ speaker where sound waves pass through the surface it rests on, and two Diamond Mini Rocker 4 Watt 4Ohm computer speakers with standard 3.5mm audio plug.

Figure 1. LocoMotoArt system components for backpack

Figure 2. (a) Kaumana Cave, (b) Coastal Forest Performance Site, (c) "Hand of Fate"; Cave Experiment. Photographs by Laura Lee Coles.

Introduction

The LocoMotoArt field system has four capacities: independent power, capture of sound and visual media, laptop for production and Liquid Crystal on Silicon (LCoS) pico projection technology for visual display in a natural setting. Various interactive components such as Wii controls and XBox Kinect compliment the system.

We define nature as the realm of the non-human made world. We refer to technology as this human made digital devices that comprise the LocoMotoArt system detailed herein. It is our position that much of the digital technology currently used by humans (mobile phones, GPS, electronic books, portable pads and pods, and computers) are more than appliances because "we experience them." Digital artifacts "are now part of our world as much as trees, animals, and other manifestations of nature". [1]

In his book "Spell of the Sensuous - Perception and Language in a More-Than-Human World," environmental philosopher David Abram postulated that Westerners are disconnected from the natural world, partially due to the intensiveness of interaction between humans and technology. According to Abram, humans still have the chance to re-connect to the magic and sensuous phenomena of the natural world within which "our technologies are rooted," because the implication of our symbiosis to technology does not make it necessary to "renounce our complex technologies." [2]

Through the use of LCoS pico projection in outdoor natural settings, our initial research seeks to provide insight in the area of mobile projection as a method to inquire our lost connection to nature that Abram posits. We question how the human experience of the non-mediated sensorial awareness of the natural world can be perceived and possibly changed through the experience of using digital mobile projection technology in outdoor settings. We further question whether values, behaviors or preconceived notions of nature and the use of technology can be changed through the user experience when placed in the context of a natural setting. What is the change, if any, and what caused it? To facilitate the study, two artists on the Big Island of Hawai'i were provided with LocoMotoArt for a period of ten-days.

Related Work

While some artists are using projection in nature, most of the research on mobile projection has been limited to indoor laboratory environments or urban settings. [3] They studied users in multiple environments such as a train station, bars, public transport, a museum, and shared public spaces during a three-day trip in Lancaster (UK). The scenarios tested included map interaction, media browsing, and projection onto alternative surfaces such as a wall, or the roof of a public bus. Vlahakis et al. [4] developed an augmented reality system users can wear to access visual and historical information regarding a specific ancient ruin while on site. We note that there is limited research on outdoor use of pico projection specifically in artistic practices in the natural landscape.

System Overview

LocoMotoArt is a creative field system that provides the capacity to the user to make digital art from and in the natural environment. All digital devices for LocoMotoArt are transported in a standard backpack. The system weighs 20 pounds without the portable battery pack and 40 pounds when users

choose to include the portable 12V SLA battery. The components for the backpack system are listed in Figure 1.

Despite the very low lumen capacity, the Aaxxa P1 Jr. pico projector was specifically chosen for this project because of the multiple features in relation to its affordability. The unit is quite small which is ideal for using as wearable projection. The LocoMotoArt user, therefore, may use the Aaxxa P1 Jr. for small scène graphic lighting design or exhibition of photography using the slide show feature. The Tunebug was chosen because it is compact and can turn any surface can become a playback source.

Detail of Study

The research during this small-scale pilot study employed interpretive ethnography, participation observation methods and incorporated field notes, photographic and video documentation. Norman K. Denzin, [5] citing Abram, defines his vision of interpretive ethnography as that which "…seeks to ground the self in a sense of the sacred, to dialogically connect the ethical, respectful self to nature and the worldly environment."

Background of Study Participants

Anne F. Bunker, choreographer and director of OTO Dance, a multi-media aerial dance company and partner, musician and multi-media designer, Gerald Chuck Koesters participated in the initial research study. The artists have expertise through their combined extensive professional background in lighting, performance and sound.

The spectators studied consisted of two nineteen year old males. Unexpectedly, one spectator indicated that he was purposefully educated at a private school that emphasized a non-digital school environment, in which the use of computers, cell phones, Internet and e-mailing was absent. His current use of digital devices is extremely limited. He indicated that he uses an electric typewriter instead of a computer and a cell phone ten minutes per day. Unlike the non-digital user, the second male's digital technology use had been closely monitored by his parents. He is currently a user of digital technology. He stated he uses the computer, e-mail, Internet, cell phone, and social networking on a daily basis.

Pre Interviews and Biases

When asked if they thought that humans could use digital technology to experience a connective sense to nature, the participants from both groups voiced skepticism. No one believed that they would be able to recognize a personal connection between their use of digital technology and the sensorial realm of nature because nature is so "unique" and "special" while technology is separate and apart from nature. One artist and the non-digital user spectator indicated that digital tools were "annoyances" and "disruptive" of the human condition.

Unexpectedly, the non-digital user spectator stated that digital technology made him feel "angry" because "people use them over human contact". However, the other artist and other spectator stated that they used digital technology on a regular basis and considered digital technology a positive influence on human factors, but emphasized that the digital artifacts should be used with restraint rather than "take over" a person's life.

All of the participants claimed not to have addictive tendencies towards digital technology. All participants indicated they have existing personal attunements to natural settings, through hiking, camping, and trekking.

The artists used LocoMotoArt in a lava field, near the ocean, inside a lava tube cave, a grove of trees near a swimming area, and a forest on the Big Island Hawai'i.

The artists chose to stage a live technology mediated performance in a forested area at the end of a road near the coastline of South Hilo, commonly used by local fishermen. The performance took place at nightfall so the projections would not be washed out by light. Koesters used photographs taken during previous field excursions. Koesters manipulated the images using High Dynamic Range techniques for image processing. Additionally, natural ambient sounds such as the pulse of ocean waves crashing upon the lava rocks and the Coqui frogs' robust chorus of chirp song were incorporated into the soundscape.

An additional soundtrack from Koesters' footage of Kilauea volcano eruptions played on the mono speaker of the LCoS projector as a hissing crackling sound. During the performance, a light misty rain fell.

The second site, Kaumana Cave, is situated in the foothills above Hilo, Hawaii. The cave is a lava tube that was created when the volcano Mauna Loa erupted in 1880. This site was chosen for a brief exploration of sound and video using pico projectors because it is a dense and dark environment. It had no echo, and there was water dripping from above.

Results Coastal Forest Performance

Live dulcimer and recorded original music compositions were played using a Tunebug Portable Surface-Sound™ Speaker and an iPod. Koesters also introduced a Roland COSM battery operated amplified speaker into the LocoMotoArt system.
Bunker and Koesters handheld or fixed the projectors onto their wrists. Bunker moved the images along the tree trunks and canopy of trees, onto rocks, and the ground. Bunker used two projectors and layered projected images simultaneously in a collage effect. Koesters was lying on the ground, hidden in the darkness, projecting video footage of Kilauea's volcanic lava flow onto Bunker's moving white clad figure as if she was a human projection screen. She would occasionally shut off the projectors, retreat under a large black cloth, move unnoticed to another location of the forest, drop the cloth and start the projectors again. This imagery gave an impression of a ghost or spirit moving about the forest. This uncertainty of when or where the entity would appear again portrayed a body without identity.

Limitations in the brightness of the projectors and sound playback were overcome because the spectators shared an intimate proximity to the artists, which became an immersed stage setting.

Results Kaumana Cave Experiments

Bunker positioned one of the projectors overhead at an arms-length and pointed it at an angle. She projected images and video footage onto her hand. The scene was observed as a hand or entity suspended

in space, moving, existing otherworldly and spectral. The projected visual content got combined with the material textures of the natural environment when Bunker moved the projectors along the wall, floor, and ceiling of the cave. Content became form. Like the camera, the relationship of LCoS pico projector to the body operated as a prosthetic extension and provided the user with an enhanced extension of self. In this embodied experience, Bunker transformed self as theatrical apparatus.

Overview of Post Interviews

Artist-bias prevailed early in the use of LocoMotoArt. However, through their use of mobile projectors during the performance, the artists became more engaged as they discovered that the technology offered new ways of seeing and understanding their art practice, both temporally and corporeally.

The artists also indicated that they were amazed by a new sensorial awareness to "place, time, and body movement". Both artists remarked that pico projectors worked like "mini-gobo stage lighting" effects and would be fun to use in costuming. The artists also indicated they felt a closer connection to nature when they used technology in a natural setting. Koesters: "I had doubts at the start of this project and was surprised how well it worked to tell the truth. As a performer, there were moments I felt completely connected to the environment, Anne [Bunker] and the technology. All those things came together in a surprising way." Bunker: "Space was altered when shining the projectors up and down the trunks of the trees and into the canopy, it flattened out the canopy, became two dimensional, a very different kind of surface. I was able to carve space with the projections and move space around in the darkness which was interesting."

Spectator Experience Forest Performance

The spectators both conveyed marked changed notions from their pre-interview positions, specifically the non-digital user. When asked to comment on the event and the spectator experience, the responses were as follows: Spectator non-digital user commented, "Peaceful, nice." Spectator digital user: "I don't know, I saw a stage, really that is what it was." When asked whether the technology detracted from their sense of nature. Spectator non-digital user: "No made you notice it more, I don't think I would have sat there in the trees in the dark without that going on. Not really sure, kind of why it appealed to me, not exactly sure what I got from it physically." Spectator digital user: "When I saw it, I didn't think digital technology. It did not separate itself from the environment, which was nice. It was a very symbiotic relationship."

Conclusion and Future Research

Despite the initial biases and skepticism of the artists and the spectators, both study groups indicated a new appreciation of digital technology as a means in sensing interconnectivity to raw nature and natural settings. Because of the change in attitudinal perspective, these initial results indicate that the hypothesis that digital technology may serve as unexpected sensorial pathway to interact with nature warrants further research. Although small in scale, our study gives insight that may be of importance in the study of locative mobile projection because it assists in understanding the human relationship to digital technology which consequently informs their design.

Future research includes the study of the LocoMotoArt enhanced field power system, which operates higher powered electronic equipment. This portion of our study includes both artists of soundscape composition and video arts practice displaying their work in natural settings. The purpose of this study seeks to understand the values of reorienting environmental arts practice by placing New Media works directly in the natural landscape. We are reminded of Arnold Berleant's idea of the "aesthetic field," and the importance of how his concept of the "aesthetic engagement of nature" may bare upon the future of electronic environmental art praxis. Situated at the intersection of human societal concerns for the environment and interests in the human-machine relationship, our research responds to both, and to the particular demands of the dialog between them.

References and Notes:

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