

# LocoMotoArt: Interacting With Natural Setting Through Performance Using Pico Projection

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.

In his book "Spell of the Sensuous - Perception and Language in a More-Than-Human World," environmental philosopher David Abram postulated that humans 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 [1]."

We define nature as the realm of the non-human made world. Within these definitions we include the human sensorial realm of sight, smell, and aural perceptions. We refer to technology as those 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, computers, GPS, electronic books, portable pads and pods, and computers) are more than appliances because "we experience them." Such digital artifacts are less perceived as unnatural because media and mobile digital technology "are now part of our world as much as trees, animals, and other manifestations of nature [2]."

Through the use of LCoS pico projection in outdoor natural settings, our initial research seeks to provide additional insight in the area of mobile projection as method to experience 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 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 the creative field system called LocoMotoArt for a period of ten-days.

## Related Work

Artists are using projection in nature. Spanish artist Ibon Mainar recently utilized high resolution projectors for creating "Outside Video Projections" in landscapes in Spain through a grant from

the Basque government. Most of the research on mobile projection has been limited to laboratory environments or urban settings, as noted by Greaves et al.[3].

Greaves et al. commented on the potential issues of private versus public projection space. 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.

However, our research diverges from these forms. We note that there is limited research on outdoor use of pico projection specifically in artistic practices in the natural landscape or the use of the human body as a projection screen when in outdoor natural settings.

## System Overview

LocoMotoArt is a creative field system that provides 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.

LocoMotoArt was designed with four distinct capacities: independent energy source; devices for capture of visual and sound media; a laptop with software for producing media for playback and devices for playback of sound and visuals for display.

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 scene graphic lighting design or exhibition of photography using the slide show feature. The Tunebug was chosen because 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 informs of his vision of interpretive ethnography as ethnography 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." Denzin also informs citing Abram "that ethnography seeks to embed this self in deeply storied histories of sacred spaces, and local places, to illuminate the unity of the self and relationship to the reconstructed, moral and sacred natural world [4]."

## 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 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, absent the use of computers, cell phones, Internet and e-mailing. 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 regular 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. None 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 was separate and apart from nature. One artist and the non-digital user spectator indicated 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 they used digital technology on a regular basis and considered digital technology a positive influence on human factors, but emphasized the digital artifact should be used with restraint and not "takeover" 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.

## **Field Work**

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. Koester's used photographs taken during previous field excursions. Koesters manipulated the images using High Dynamic Range techniques for image processing. Additionally, natural ambient sound such as the pulse of ocean waves crashing upon the lava rocks and the Coqui frogs' robust chorus of chirp song was 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 SurfaceSound™ 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 a ghost or spirit was moving about the forest. This uncertainty of when or where the entity would appear 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 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 performance, the artists became more engaged as they discovered the technology offered new ways of seeing and understanding their art practice, both temporally and corporeally.

The artists also indicated 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 a new sensorial pathway to interact with nature warrants further research. Although small in scale, our initial 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 equipment. This portion of our study includes both artists of soundscape composition and video arts practice displaying their work in natural settings. The purpose is to understand if there is value in reversing and reorienting environmental arts-practice by placing new media in natural settings. This emancipates the spectator to have an enhanced experience between nature and technology, as opposed to a remediated gallery setting.

### References and Notes:

1. David Abram (1996). *Spell of the Sensuous Perception and Language in a More-Than-Human World*. Pantheon Books, New York, ix, x, 60.

2. Jay Bolter and Diane Gromala (2003). *Windows and Mirrors - Interaction design, digital art and the myth of transparency*. The MIT Press, Cambridge, MA and London, England, 112.
3. Andrew Greaves, Paul M. Akerman, Paul M., Enrico Rukzio, Keith Cheverst, Jonna Hakkila (2009). *Exploring User Reaction to Personal Projection When Used in Shared Public Places: A Formation Study*. Mobile HCI Workshop (CAM3SN): [http://eprints.comp.lancs.ac.uk/2264/1/cam3sn2009\\_greaves.pdf](http://eprints.comp.lancs.ac.uk/2264/1/cam3sn2009_greaves.pdf), retrieved January 7, 2011.
4. Norman K. Denzin (1997). *Interpretive Ethnography-Zeitschrift für Erziehungswissenschaft*. Volume 1, Number 3: 401-409.