Utilizing the Natural Environment for the Exhibition of New Media

by

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Abstract

LocoMotoArt, an independent powered creative field system, was used as a vehicle for conducting media arts practice in natural setting for study of the relationship among humans, technology and the natural realm. Motivated by claims human disconnection to natural realm is a result of our intensive relationship with technology; I question whether it is possible for humans to experience a sense of greater interconnectedness with the natural world by way of digital technology.

The polarities of acceptance and rejection of digital technologies in contemporary culture is explored through five artist projects and use of LocoMotoArt. I argue such technologies and their ubiquity provides new opportunities for humans to reconnect to nature.

Findings indicate the notion of Human, Technology, Nature interconnectedness, is a possible conduit for establishing a relationship with digital technology beyond social networking, computing, information gathering and gaming, thus providing cognitive and social benefits of interacting with nature.

Keywords: LocoMotoArt; new media; natural setting; pico projection; digital technology; HTN triad-relationship

Dedication

For some reason, I have had to think about how I intend to dedicate my two-and-a-half years of extensive hard work. Feeling rather self-absorbed in the process, I have the thought I should dedicate to myself, acknowledging all that I have done! However, it is really in the association with others that I owe my success.

I therefore dedicate this thesis to the artists who participated in my work, because they made the entire process special. But, mostly I dedicate the work to my friends, family, and cat Attilla, who were all ignored and left wanting of my attention. I dedicate in memory of the relatives who transitioned during this process, Arnold Stanley, Mona LeVine, and Harvey Moster.

I dedicate this thesis to my dearest friend and life-sister Rose Marie Demko, who despite fighting lung cancer, lives in clam state of grace. It is by her example of strength and shared wisdom that I am guided through the difficult hurdles associated with this endeavour.

Finally, although I did not know him personally, I have been deeply affected by his death, so young, with such a great future ahead of him -- I dedicate my thesis to fellow graduate student, Andrew Wade.

Acknowledgements

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1. Introduction

It has long been argued that Western culture nurtures estrangement and disengagement from the natural realm - from the land, plants and animals and the "magic" of the sensorial experiences found there. Cultural ecologist and philosopher David Abram claims that this estrangement is rooted in our intensive use of technology (Abram, 1996). Even Kevin Kelly, cofounder of *Wired* magazine comments that, "Technology chips away at our human dignity, calling into question our role in the world and our own nature" (Kelley, 2010, p. 197).

Canadian scientist and environmental philosopher David Suzuki comments, "We are strangers in the world; we no longer belong," because we are experiencing an alienation of spirit (Suzuki, 1997, p. 191). He opines that we are now disconnected from the natural realm and living "chiefly by the mind"...because we no longer "see ourselves as physically and spiritually connected to family, clan or land" (p.191). In response to this perceived alienation Abram advises us to strengthen our connection to the sensorial dimension of experience with "[…] the living landscape, in which we are corporeally embedded" (Abram, 1996, p. 65).

Since Abram's 1996 comments about the alienating effects of technology, Western society has formed intense fascination with and symbiosis to digital technologies. Digital devices have been extensively integrated into everyday life and have become a significant element in human development. This integration is recent compared to our history of technology use and innovation. Consequently, at this point, there is limited understanding of the long term effects these devices can have on the development of the human brain.

Our relationship to digital technology is now of great interest to researchers within social, psychological, educational and environmental disciplines. Further, there is considerable research indicating the human brain and body are changing as a result of our relationships with digital devices. From the book *Digital Divide,* writer, consultant and

inventor Mark Prensky (2011) states in his chapter, *Digital Natives, Digital Immigrants,* that through extensive interaction with and use of digital technology, students of today "think and process information fundamentally" differently than previous generations. Further, Prensky adds that "it is very likely … true," that "student's brains have physically changed" (Prensky, 2011, pp. 4-5).

Social behaviour, attention, and boundary values are also shifting as a result of our use of digital technology. This technology is not only changing how we think, but also how we feel. We must now consider that "our brains are evolving right now" (Small & Vorgan, 2011, p. 77). Like Prensky, Small and Vorgan note that brain change has occurred over "a single generation." Also, they claim that the repetitious nature of processes associated with digital devices "will lay down a corresponding set of neural network pathways in the brain, which can become permanent" (p. 83). However, most interesting is how digital technologies are affecting the evolution of language. Through the repeated use of text messaging, a "whole new lexicon based on limiting the number of words used when communicating on handheld devices" is emerging (p. 87). Perhaps a more significant aspect of our repetitious use of digital devices is what is termed *continuous partial attention,* which differs from multi-tasking, where the purpose of each task is to produce a result more efficiently (Small & Vorgan, 2011, p. 92). Small and Vorgan suggest that, "when paying continuous partial attention, people may place their brains in a heightened state of stress. People no longer have time to reflect, contemplate, or make thoughtful decisions" (p. 92). Therefore, it is plausible to consider that digital tools are reshaping and restructuring humans on an evolutionary scale, but also revolutionizing our social and artistic constructs.

Motivated by two of Abram's claims, I want to address what is between the polarities of acceptance and rejection of digital technologies by exploring the manner in which artists employ these in the natural realm. First, the claims I investigate here are those regarding perception and landscape, or place as being intertwined with human experience and flourishing, and second, the claim that the intensive use of technology contributes to our disembodiment to the natural realm. I seek to determine whether digital technology can enhance our sense of connection to nature. It is my position that the very technology Abram claims is the root cause of our disconnection may actually provide new opportunities to reconnect through an augmented sense of relationship to

the natural realm. As argued above, we have now become so interwoven with and changed by our digital devices and technologies, that attempting to reconnect to the natural realm by way of these technologies seems to be a logical approach. One of the aims of this thesis is to construct knowledge regarding my hypothesis of the HTN triad-relationship. Briefly, I define the HTN triad-relationship as an awareness of the interconnected state of Human, Technology and Nature – this interconnection being in contrast to the culturally perceived separation of the three, one from the other.

I implemented a research plan to explore the plausibility and validity of my claim that digital technologies can enhance our connection to the natural realm by way of the HTN triad-relationship. In this plan, I turn to related research, among which are studies into the psychological effects of technology and relatedness in nature. I detail the role of the artist as expert, and the use of digital technology by artists within a natural setting as providing a conduit for the exchange of impressions, feelings, and imagination, exploring how new understandings about the relationship among humans, technology and the natural realm (the HTN triad-relationship) can manifest.

In Chapter 2, I briefly discuss the historical influences for this thesis. Visiting the Western movement of Romanticism I consider how it holds entrenched cultural assumptions about nature and landscape which remain embedded as contemporary cultural ideals. I argue that it is time to shed the veil of the romantic idealism of nature, and I propose that there is a new partner in our relationship to nature – digital technology. I provide my point-of-view and those definitions I rely upon, and then discuss my research claim, question, argument, and hypothesis. I consider problematic aspects of our current human-nature relationship, and our former sense of interconnectedness to the natural realm. I further detail the motivations behind my research. Finally, I complete the chapter with a discussion of related research studies and note how my research diverges from these.

In Chapter 3, I introduce and comment on significant art works borrowed from an extensive taxonomy I have assembled as part of this research thesis, entitled *Artists Using an Eco-Aesthetic* (Coles & Gromala, 2010, unpublished), which is comprised of artists who use digital technology in natural settings as part of their art practice. Artists of electronic media are interpreting, exploring, questioning, expressing, and contributing to

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the social and cultural constructs of their time by way of the digital revolution. Finally, I discuss these artistic interventions to show how digital technology, when used to create works positioned in natural settings, can communicate interconnectedness between humans, the technological realm, and landscape.

Chapter 4: In this chapter I present and discuss the development of the LocoMotoArt field system. LocoMotoArt is compiled with commonly used digital artefacts. The overall approach to assembling the system incorporates portable, sustainable and independent energy practices. I draw upon existing arts practices of visual and sound works, and extensively upon the interpretation of phenomenological experiences of two study groups, artists and spectators. I introduce and detail the methods I use for researching and supporting my thesis, including an extended focus group session regarding LocoMotoArt and independent power systems. Because of the peculiar challenges of implementing mobile technologies in natural settings, and in response to the phenomenological theories of Abram, I chose to borrow from some contemporary research in art and phenomenology as a helpful framework for my enquiry. To explore the notion of the HTN triad-relationship, I specifically chose art-based research as a method of enquiry, because I believe this method is particularly suited to exploring the dynamics of the world we live in – of everyday life experiences and social and cultural knowledge[s]. Similarly, our digital devices are part of these diverse dynamics.

Thus, my thesis is two-fold. First, it investigates the incorporation of digital and electronic art practices within natural settings, and second, it develops and explores the use of the LocoMotoArt field system as a vehicle for a media arts practice that resonates with the principles of environmental sustainability.

I conclude Chapter 4 by addressing anticipated challenges to my thesis, such as: 1) The argument against the use of the empirical metaphysical form of research as a valid means to form knowledge, 2) The argument whether interpretive analysis leads to empirical knowledge, and finally, 3), I address the challenge that confronts my claim in this thesis, that digital technology, i.e. digital mediation, can provide a sense of reconnection to nature.

In Chapter 5, I detail two of the three study platforms that comprise my research: 1) a prototype artist-study; and 2), five separate artist-event projects which were experienced by twenty-four spectators who commented on their experiences. These three aspects of the study were implemented to inform my claims for the existence of the HTN triad-relationship. In addition, I detail how each of the artist projects emphasized the use of the visual and auditory senses, via the use of both high resolution and pico projection systems, and all of which included an auditory experience in the form of a sound walk and/or soundscape composition.

The artist-event projects culminated in live audio performances or video installations in natural settings chosen by the artist. In this chapter, I discuss how several of the participants during pre-interview were sceptical of the notion of the HTN triad-relationship. I also reveal that there were a number of participants who pronounced a change in their scepticism after their experience of the artworks *in situ*. Further, I discuss the unexpected phenomenon that occurred while in the field. The information gathered from these experiences supported important and significant findings. I offer Researcher Interpretation at the end of each of the artist-event project descriptions.

In Chapter 6, I briefly revisit the research claim and problem as stated in the *Introduction* and in Chapter 2 *That Which Binds*, and provide a summary of the generalised conclusions of my field research. I conclude that my academic and field research support my claim for the existence of the HTN triad-relationship, and for the value of electronic and digital media reconnecting contemporary society to the natural realm. I also briefly consider how the LocoMotoArt system may be used and adapted in the future and how I might pursue this research toward contributing to a more integrated and sustainable future.

2.　That Which Binds

2.1.　Background

The interconnected relationship of humans and nature is readily accepted, as is the relationship between humans and technology. However, the idea of an intertwined beneficial or symbiotic[1] relationship of nature, the human and technology association is a more challenging proposition. It is a common idea that nature and technology are at odds with one another. Hence, the proposition of a positive symbiotic triad interconnection among human, nature and technology would appear to be at odds with contemporary thinking because such a proposition contradicts, or disrupts, our shared understanding of the relationship between nature and technology. Many thinkers have observed that the Western perception of nature is rooted in a dualistic separation of humans from the natural world. Technology is often blamed for this disengaged condition. The Western estrangement from the natural realm and our sense of disembodiment is often thought of as being rooted both in the philosophy of the ancient Greeks, and in the early traditions of Judeo-Christian religious beliefs. In the Bible, Genesis 1:28 God said "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and other every living things that moves upon the earth." David Abram reminds us that:

Both of these ancient cultures seem to have sown the seeds of our contemporary estrangement – one seeming to establish the spiritual or religious ascendancy of humankind over nature, the other effecting a more philosophical or rational dissociation of the human intellect from the organic world. (Abram, 1996, p. 95)

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[1]　I use "symbiotic" or "symbiosis" to mean either: 1) an interdependent, meaningful and beneficial relationship with the natural realm; or 2) as a form of psychiatric dependence upon an artefact, such as a cell phone, computers, the Internet, GPS, and social networking, in other words, a form of technological symbiosis. I explain myself further in the paragraphs of this section below.

While it is not within the scope of this paper to explore the genesis of our notions of disembodiment from the natural realm, it is worth noting, that such notions are common to the concept of mechanized dualism found in Platonic, Cartesian and Newtonian philosophies. Indeed, Descartes' contemporary, Sir Francis Bacon, advocated the "vexation" of nature to reveal her secrets for the betterment of mankind, thereby contributing to the idea that technology is against nature (Merchant, 2006).

It is clear that this difficult relationship between technology and nature has collectively troubled us for some time. The Romantic Movement of the late 18th and early 19th centuries emerged when urbanisation was intensifying and in response to the dehumanizing effects of the industrial revolution. The technologies developed and implemented for industrialization were seen as against nature. Romanticism was rooted within the classical pastoral genre that emerged during the Hellenistic period, specifically in the poem, *The Idylls*, by the Alexandrian poet Theocritus (c.316-260). It provided a set of literary and artistic conventions, which may be seen in the writings of the poet Wordsworth, the paintings of J.M.W. Turner, and in the works of musical composers such as Chopin, Liszt, and Mendelssohn. This era was marked by the spread factories, pollution of air and water, and poor living conditions (Ellul, 1964, p. 4). A sense of pastoral idealism was generated from the realization that the exploitations of industrial mechanized society were incompatible with nature, and with what E.O. Wilson would call the "biophilic" nature of the human (Wilson, 1984, p. 1).[2] The Romantics loved nature for its vastness, beauty and endurance, and a Romantic aesthetic was expressed in landscape painting and garden art (Garrard, 2004).

It can be argued that in contemporary environmentalism we see a new romantic idealism. Abram, for example, expresses Romantic views in his writings. Such idealism

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[2] Wilson informs us that "life is a deep and complicated mental development," (Wilson, 1984, p. 1). Wilson coined the word, "biophilia" in 1984 as a single word to define, "the innate tendency to focus on life and lifelike processes." Mithen states that "when considering the character of the modern mind… it is impossible to separate the effects of genes and the developmental environment" (Mithen, 1996, p. 66). Further, Smajs informs us that "the external environment had to be known by terrestrial, live systems from the monocellular level. This self-preserving method of biotic knowing, which is over 3.5 billion years old has been helping to reproduce and differentiate the biosphere, the layer of animate being that exists in co-evolution with inanimate being and created humans as a biological species" (Smajs, 2010, p. 37).

is often behind the denouncement of digital technology and its use in natural settings. Ironically, we are once again at a juncture where we are responding to a fear of the potential dehumanizing effect of our intensifying relationship with technology – in this case, digital artefacts. In response to such concerns, a new cultural movement is emerging and is represented in contemporary new media artworks in the natural landscape.

2.2. Definitions

Before I discuss the projects and the implementation of LocoMotoArt, it is necessary to briefly outline the framework I build upon to characterize nature and technology for the purposes of my argument. I note briefly the philosophical underpinnings of my understanding of the human condition. Finally, I delve into the historical perspective informing our human sense of interconnectedness to nature, and the representation of nature within Western culture. That said, this work does not engage with notions of reality or authenticity, nor do I take a firm position as to whether experiences in actual nature are better than those of mediated nature, (Kahn, Severson, & Ruckert, 2009). Further, philosophical dictionaries often define the words, "nature," and "natural" differently, and therefore it is advisable to take into consideration how such words are used. Yet, borrowing from Josef Smajs and his concepts of evolutionary ontology, it is now a necessary requirement that new concepts, new meanings and a re-thinking of these terms be undertaken, so that a "more suitable theoretical framework for an adequate understanding of nature; *a need for a better ontological concept of nature,"* be developed (Smajs, 2010, p. 129).[3] [Emphasis Smajs].

2.2.1. Nature

Within the context of this research study I define nature as the entire realm of the world that is not human-made. This includes all biological, geological and meteorological

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[3] Smajs promotes his concept of evolutionary ontology through a principle of *coevolution between culture and nature* [Emphasis Smajs]. That is the merging of terrestrial existence, i.e. the environmentally endangered culture, and one that is a sustainable culture, one of interaction with environment (pp. 13 & 196).

systems. Within this definition of nature I include humans as a species whose survival depends upon the life giving properties found in natural systems.

Also included in this definition are human biological systems of sight, smell, and auditory perception – that is, the human senses as a perceptual system. This system provides us with the capacity to detect and feel sensation, which is then perceived, (Gibson, 1966). There is a complex neural system associated with our perceptual system. The human capacity to apprehend the external environment, such as the natural world, or nature, is rooted in sensuous perception. Although I am not detailing sensuous perception thoroughly in this thesis, it is necessary to include the following in my definition of nature:

The biological systems of vision, hearing, smell and touch give humans the capacity to sense and interpret external nature. Vision, for example, provides reciprocal or "participatory interplay between the animal eye and the animate cosmos," (Sewall, 1999, p. xv). It is within the totality of the human sensorial system that we have the capacity to interpret, or internalize cognitively, that which is perceived. Internal and external perceptions are produced at the same time, and "in our experience we never find them disjoined" (Gibson, 1966, p. 1).

2.2.2. Technology

For the purposes of this research study, I define technology as a set of processes by which humans engage with the world, and also as the artefacts and tools by way of which we do so. In many cases, our technologies enhance our physical and sensorial capacities. I will be especially considering the use of digital technologies as employed by media artists in nature. Encounters by way of digital technologies and artefacts are providing new sensorial experiences of nature through ubiquitous interactions and interventions. We can now carry our technologies in our pockets, and thereby bring them with us even to remote natural spaces. "The general working definition of ubiquitous computing technology is any computing technology that permits human interaction away from a single workstation. This includes pen-based technology, hand-held or portable devices, large-scale interactive screens, wireless networking

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infrastructure, and voice or vision technology" (Abowd, 2004. as cited in Raisinghani, M.S., et al., 2004).

It is my position that much of the digital technologies currently used by humans are as much a part of nature as we are, because they are integrated into daily life. Such digital artefacts are not commonly perceived as unnatural in contemporary culture because media and mobile digital technologies "are now part of our world as much as trees, animals, and other manifestations of nature" (Bolter & Gromala 2003 p.112). Further, it is my view that digital devices and sensor technology provide enhanced and augumented human sensorial awareness within auditory, visual and haptic experiences. It is because of the these multi-sensory augmentations by way of digital technology that I propose they can be used to ressurect our culturally desensitized connection to the natural realm.

2.3. New Media

The term "new media" came into use in the twentieth century with the advent of computers and digital media. Lev Manovich, in his 1999 book *The Language of New Media*, defines "new media" as representing "a convergence of two separate historical trajectories: computing and media technologies." He traces this back "to the 1830s with Babbage's Analytical Engine and Daguerre's daguerreotype" leading to "the mid-twentieth century modern digital computer," which takes over from the mechanical. He further defines new media as the synthesis of these two trajectories (Manovich, 2001, pp.19-20). McLuhan reminds us that the effect of technology does not occur at the same temporal phase as the "level of opinions and concepts," a form of "culture lag" wherein the effects of the technology are delayed[4] (McLuhan, 1964, p. 18; Woodward, 1934 p. 388). Because the effects of new revolutionizing technologies apparently lag, and are not perceived immediately, an oscillation between the earlier version of the technology and the current version of the technology, or media occurs. An example lies in the

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[4] The Collins English Dictionary (2012) defines culture lag as meaning, "the difference in the rate of change between two parts of a culture." I also refer the reader to the writings of William Fielding Ogburn, and subsequent summaries by several authors.

cultural and societal strife that followed the invention of Guttenberg's printing system, which revolutionized the printing and distribution of content. The functionality of the printing media system was later improved by the invention of electricity and mechanization, and then employed to a greater extent by the newspaper and publishing industries. Today the media of newspaper and book printing is currently threatened by the innovation of digitized text and on-line technology.[5] Further, on-line social networking systems are now in the forefront of current political change on a global stage. Thus, "new media" becomes old through the occurrence of significant disuse, which shifts it from prominence to obscurity. Bruno Latour reminds us in his book, *Reassembling the Social: An Introduction to Actor-Network-Theory* (2005) that just because objects and their use can recede into the background does not mean that the objects "stop acting" but that their "mode of action is no longer *visibly connected* to the usual social ties" [Emphasis Latour].

Objects, by the very nature of their connections with humans, quickly shift from being mediators to being intermediaries, counting for one or nothing, no matter how internally complicated they might be. (Latour, 2005 p. 80)

2.4. Human Interconnectedness to Nature

I will now provide some historic context and argument in support of my claim that digital technologies in new media art provide a means of deeper engagement with the natural realm. I do so by considering an early example of human embeddedness in nature, as well as our use of both technology and art as methods of engagement with the non-human world. Included are some explanatory comments by anthropologist Steven Mithen, and observations of physicist David Bohm.

Archaeologists consider that early Palaeolithic and Neolithic humans had a more sensitive awareness of nature as not only life-giving but also interconnected. Despite the difficulties of tracing early human thought about sacredness and nature, (Mithen, 1996) anthropologists have developed an understanding of these dimensions based on the

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[5]   An example of this threat is in the popularization of the use of e-books and the Kindle digital book display, as bookstores are closing their doors. Even the bastions of the newspaper industry are transferring their print content to an on-line presence.

study of current existing indigenous cultures.[6] Within some indigenous cultures there exists a working knowledge of human-nature interconnectedness that Western culture has all but extinguished as common everyday knowledge.

The recent discovery of cave paintings at Chauvet in France supports the notion that early humans had a strong interconnectedness with the natural realm and that they expressed this interconnectedness through art by way of technologies developed to aid this expression. The Chauvet paintings are considered to be approximately 30,000 to 32,000 years old, considerably older than the cave paintings at Lascaux Cave, which are estimated to be only 17,000 - 20,000 years old (Coye, 2011; Mithen, 1996, p. 156).

Although access to Chauvet is restricted to all but researchers, the paintings can be seen through the lens of Werner Herzog's 3-D film, *Cave of Forgotten Dreams* (Herzog, 2010). As described in the film, the Palaeolithic sense of an interconnected relationship between man and the non-human realm was defined as one of fluidity and permeability. I will refer to the notion of "cognitive fluidity" as advanced by Steven Mithen (1996) in *The Prehistory of the Mind as a Search for the Origins of Art Religion and Science.[7]* Mithen explains that *Homo sapiens sapiens* first appeared approximately 100,000 years ago and that at 60,000 years, or the Middle/Upper Palaeolithic era, a major transition occurred – "a re-design of the mind took place" and the first wall paintings were created (pp. 151-153). Mithen explains:

There are three cognitive processes critical to making art -- mental conception of an image, intentional communication, and attribution of meaning – (these) were all present in the Early Human mind. They were found in the domains of technical, social and natural history intelligence respectively. (p. 162)

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[6]   There are indigenous cultures whose cultural practices have somewhat survived the onslaught of Western colonialism, who continue to practice ancient shamanism and nature-related rituals. We find in Mithen, a detailed analysis, but briefly, he points to the hunter-gather's the Walpri of Central Australian Desert (Mithen, 1996, p. 157).

[7]   Within this "cultural explosion" the origins of art emerge, thus, the emergence of human culture. Mithen acknowledges that there is debate over whether this major turning point in pre-history happened gradually over a long process and is reflected due to better preservation of artifacts, or whether the cultural explosion happened as a result of new forms of behavior. Mithen ascribes to the latter and points to the cave paintings of Chauvet as evidence of the cultural spark (pp. 151-152).

Mithen states that these domains began to work together effortlessly and easily sometime around 40,000 years ago, provoking a "cultural explosion" wherein human culture emerged. Prior to the new connections, these domains of intelligence were isolated cognitive processes. They somehow arrived at "functioning together, creating the new single cognitive process which we call visual symbolism, or simply art" (p.162). The painters of Chauvet Cave mixed natural history intelligence, and social intelligence, as if "they were one and the same…But this collapse in the cognitive barrier between the social and natural worlds also had significant consequences for their own behaviour, for it fundamentally changed their interaction with the natural world" (pp. 166-167).

Ancient man recognized his interchangeable connectedness with the animals, plant life, and aspects of the landscape, such as rocks, mountains, and rivers. The ancient inhabitants of Chauvet Cave created a means to bring forth a representation of the world they saw around them, the origins of art. This occurred through the human "activity" of painting. Using the hand, and possibly the mouth to paint, there is also the probability that painting tools were made and used. The Chauvet artist invented a tool, created an artefact. It is within the creation and use (technique) of such tools, that "technological phenomena" occurred -- the phenomena of invention (Ellul, 1964). The innovation of their making an artefact became an extension of the self, while the painted image became an extension of inner sense. Arguably, contemporary new media artists interact with nature through ubiquitous digital technologies *in situ* through a similar process of extension of self and inner sense.

The early Chauvet artists experienced the world, and then developed technologies that "fit" in order to express that world and their experience, and this parallels contemporary new media tools and digital artefacts as technologies that "fit" when developed and employed by artists within natural settings. By technologies that fit, I mean technologies that allow us to interpret and navigate the space between human and nature that first arrived with the "cultural explosion," when the brain was "redesigned," and humans came to increasingly understand themselves in a new relationship with nature. This space between human and nature has arguably widened, as can be seen in the 16th and 17th century mechanistic view of nature and of the human as increasingly outside of nature (See Section 2.1). Art, and the means (technology) to create it, early on became the method of connection, expression, translation and

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interpretation of the relationship between human and nature. In the contemporary world of ubiquitous digital media, I argue that such media are best used to fill this role of assisting us in interpreting and translating nature and better understanding our relationship with the natural realm. They are best suited expressly because they are so much now a part of how we move through the world.

I now borrow Bohm's concept of *artamovement* to further explain the important intertwining of the use of technology and the human sense of interconnectedness to nature, and how through innovation the creation of artefacts expresses that sense of interconnectedness. In his book, *On Creativity* (1996) physicist David Bohm states that the meaning of the word "artifact" means *"That which has been made to fit."* He introduces a "new word – *artamovement,* which means the movement of fitting.*"* The innovative creation of artefacts made by the Chauvet Cave inhabitants provides an example of Bohm's concept.

Not only is inanimate nature created and formed in art movement, but so also is life, in all its evolving and developing forms, going on to man, with his capacity for perception, feeling, thought and action. It follows then, of course, that the creation of artefacts by human beings is now to be regarded as a special case of *artamovement* (Bohm, 1996, p. 111). In the same way, the adaptation of digital artefacts when used in art events in natural settings can engender that sense of interconnectedness. Digital technologies "fit".

I want to now address Western culture's fascination with and intense relationship to digital technology. This human-technology relationship borders on a form of symbiosis – in psychiatric terms, a dependence upon an artefact where the person receives some kind of reinforcement, whether beneficial or detrimental. While not all human-technology relationships are symbiotic, the human relationship to digital technology is deeply embedded in Western society and culture.

2.5. Technological Symbiosis

We must acknowledge the fact that both technology and society exist within a tightly woven relationship and are "becoming one of the same," as Dutch social critic, Michiel Schartz reminds us:

Technology has become our environment as well as our ideology...We no longer use technology; we live it. (Glendinning, 1995, p. 45)

Further, digital technology is now ubiquitous – embedded in our lives, it is everywhere, it is often invisible and ambient.

Through the evidence of the Chauvet cave paintings we find that the human-technology-nature relationship has long been one of interdependence – a mutually beneficial relationship that is in a way a form of symbosis. But our sense of the human-nature symbiotic relationship itself has drastically changed as a result of continued human innovation in technology.

As civilization evolved out of the cave, into communities and eventually cities, humans thought less about a symbiotic and meaningful relationship to nature, and transformed the landscape. Currently, we are highly resource driven, and by exploiting the natural environment to manufacture our technological artifacts, we diminish our place within the natural realm, as we struggle with the resultant pollution and toxic waste. Mankind's inability or neglect to change the problematic aspects of this relationship with nature may be at the point of no return. We may soon lack the ability to reverse negative effects that will destroy the ecological system we rely upon for life. As Abram and many others point out, we are in a precarious position and our ineffectiveness in making necessary change may prove fatal.

Although a thorough response to these comments and observations is beyond the scope of this essay, I will mention and respond to the following questions that arise. Can we recover some of the arguably positive and beneficial aspects of our former human-nature relationship, such as those evidenced in the Chauvet cave dwellers, for example? If so, how could this occur? Would such a recovery be achieved by blending

or combining certain aspects of our technological symbiotic relationship with aspects of our deeper, more immediate, relationship to the natural realm?

Apropos of such questions, Abram observes that the sensuous world of the natural realm "is always local," as opposed to the wider, or global, quality of the technologically mediated world. For Abram, the natural realm is the "world of our direct, unmediated interactions," (Abram, 1996, p. 266). He further claims that we "short-circuit the sensorial reciprocity between our breathing bodies and the bodily terrain," as we are "transfixed by our technologies," and therefore our human awareness "folds in on itself" and becomes an "abstract mind bent on overcoming organic reality" (p. 267). However, these statements were made in 1996, when digital interfacing and the use of sensors in interactive installations were just emerging. Now, sixteen years later, the prolific use of such devices puts the question: in light of such ongoing concerns about technology and nature, can a sense of interconnectedness among humans, technology and nature exist? While I have earlier argued (See Section 2.4) on behalf of this interconnectedness, for digital technologies being those that "fit," in the sense Bohm describes, Abram's concerns are not uncommon, and are worth addressing. Is there cause for concern in our deep engagement with and through digital technologies and artefacts – especially when it comes to the human-nature (world) relationship?

2.6. Motivation

As Abram claims that our seemingly desensitized connection with the natural realm is partially due to the intensive interaction between humans and technology, he also expresses concern that our passion for technology is connected to the loss of the sense of the sacred in nature. Many cultures, such as North American indigenous peoples (as Abram brings forward various times) view natural places, including rivers and mountains, as embodying the sacred. Indeed, it has long been discussed that the 16th and 17th century cultural and scientific revolution removed the sacred from the world, and was the beginning of viewing nature and natural systems as mechanism. Sociologist Bronislaw Szerszynski discusses this "disenchantment and technological domination of nature" in his book *Nature, Technology and the Sacred* (Szerszynski, 2005, p. 31). The additional loss of the sacred along with the loss of a sense of deep

connection with nature further supports unsustainable exploitive practices, and engenders a more profound sense of loss and disconnection.

In concert with Abram, his book *The Sacred Balance*, David Suzuki reminds us that humans as a species are "connected through air, water and soil; we are animated by the same energy from the same source in the sky above" (Suzuki, 1997 p. 130). We see Suzuki, Abram, and other eco-philosophers calling for a necessary return to a more direct, unmediated, human experience of nature.

Abram informs us that it is "only at the scale of our direct, sensory interactions with the land around us that we can appropriately notice and respond to the immediate needs of the living world" (Abram, 1996, p. 268). Simon Schama reminds us:

For although we are accustomed to separate nature and human perception into two realms, they are in fact, indivisible. Before it can ever be a repose for the senses, landscape is the work of the mind. Its scenery is built up as much from strata of memory as from layers of rock. (Schama, 1995, p. 7)

As a way of trying to understand how comprehensive the human-technology relationship may be in contemporary culture, I began reading news articles. *The Seattle Times* ran an editorial in May 18, 2010, "Are We Becoming Addicted to Technology?" The editorial describes a research study conducted by the University of Maryland, which asked students to give up all technology for twenty-four hours, including iPods, cell phones and laptops, depriving these users access to social networking. Students reported symptoms of withdrawal, anxiety, and depression. Further, research has indicated that:

Overinvolvement [sic] with the Internet, however, can inhibit the development of skills needed for identity and intimacy, creating a spiral of internet use, difficulties with real life, followed by more Internet use as a means of avoidance and self-medication. (Kandell, 199, p.17)

British studies indicate that student's school work is greatly affected negatively from overuse of social media. While these studies do not confirm that technology causes human disconnection to the natural environment, there is certain reasoning in considering that digital technology may be a factor in influencing behaviour, human values, boundaries, and the ability to focus and be responsible (Kandell, 1998).

However, returning to my assertion that digital technologies currently used by humans are also a part of nature, I observe that much of our interaction with digital technology could be described as an "ecological system," as found within natural and human-built environments. Hughes informs us that such a system occurs where an architect considers natural forces in the design process of a structure, or city planners considering the natural flow of the rivers and streams through municipal landscapes, or "engineers and environmental scientists cooperating to restore ecological environments are often creating an ecotechnological system" (Hughes, 2004, p.156).

We must consider that there are many interactional experiences and relationships that exist in both natural settings and through the use of digital technology. Further, they both have the capacity to provide a wide array of perspectives. Both digital technologies and natural settings offer similar qualities of experience, such as multi-dimensional, mobile, sensorial experiences and elements associated with communication, and both require a sense of human communication. These similarities are exploitable for further study and exploration of the lacuna as stated in Section 2.9 and shown in Figure 2.1.

We currently engage with our digital technology in natural settings in several ways: taking pictures while hiking, camping, boating, or skiing, capturing video footage, or listening to music on portable devices, for example. These relationships involve some operational technique, which is knowledge of how to manipulate the device to achieve the desired result. I noted in my Introduction, that current research indicates that the human brain may be changing as a result of our use of digital technology. Marshall McLuhan also famously commented that "we shape our tools, and thereafter our tools shape us" (McLuhan, 1964, p. xi). He set up the notion that our tools are an extension of self, noting that we are perpetually modified by our technology, as we continually modify the technology in new ways (McLuhan, 1964, p. 46).

Considering once again technology and nature as inseparable, we can observe that "even the utilitarian exploitation of nature can be seen as having sacral underpinnings" (Szerszynski, 2005, p. 11) as has been observed by scholars in the social sciences, such as Szerszynski. I agree with Szerszynski, that within recent technology-nature relationships, new orderings of the sacred are emerging (Szerszynski,

2005, p. 175).[8] I want to address what is between the perceived polarities of technology on the one hand, and a sacred nature on the other. I reiterate my position that the very technology that Abram claims is a root cause of our disengagement to the natural world can in fact assist us in experiencing reconnection, and perhaps return us to a sense of the sacredness of the natural realm. While I agree with Abram that the technologically mediated experience cannot replace actual sensorial experience of the natural realm, I am convinced that digital technology can greatly enhance and augment our perception of nature – and of the human-nature relationship – in a multi-dimensional way.

2.7. Research Question

I have explored the conflicted relationship we have with our technologies, as expressed in the view of Abram and others that technology dangerously alienates us from nature, and indeed essentially changes us. I have also considered arguments that technologies are, and have been, a vital part of our lives since the Middle/Upper Palaeolithic era, and that our technologies have since mediated our relationship with nature in part through art practices. I have also drawn a parallel between those early art practices expressed through the technology of the time and interaction with nature, and contemporary new media art practices in nature, with my claim being that such contemporary practices fulfil, through current technologies, the same, or similar, role of expressing and nurturing a human-nature relationship.

- **Is it possible for contemporary artists and audiences to experience a sense of greater interconnectedness with the natural world by way of digital technology?**

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[8]   Szerszynski postulates three examples, the "[i]nterpenetration of science, technology and society"; second the "blurring of the boundaries between humans, technology and nature" in citing biotechnology as an example, and third, "the trend of breaking down the boundaries between the experiment and the real world" (Szerszynski, 2005, pp. 175-176).

2.8. Research Claim

The use of mobile digital technologies and new media by artists in natural settings (such as caves, forests, beaches or fields) can alter cultural notions of technology as antithetical to nature, by offering an enhanced experience of interconnection with nature.

2.9. Research Argument

I noted in my introduction and discussed in the opening paragraphs, that Abram's claim that technology is not part of nature is a common one. This may be the result of the tenets of the Deep Ecology movement, which inform much of Abram's work. Deep Ecology is generally considered to be against technology in general, but in fact this not the case. Deep Ecology presents the belief that humans are an equal and integral part of ecosystems, or nature, rather than as a force, acting upon an external nature and the non-human realm. Because this is the case, Deep Ecologists frown upon exploitive technologies that arise from mechanistic views of nature, and on what ecologist Neil Evernden terms "resourcism" (Evernden, 1985). However, Deep Ecology would look favourably upon technologies that "fit", insofar as they work within, rather than against, natural systems, are not aggressively exploitive, and enhance the relationship of human to world, or nature to culture (Lomba-Ortiz, 2003, p. 1). While Abram might concede that digital devices could provide enhanced sensorial experiences of nature, he is likely to insist that one can never replace the lived experience one gets with an unmediated *in situ* experience, because mediated experiences of nature could not be as real and immediate as direct sensorial experiences.[9]

I sympathize with Abram's view that technology cannot replace the unmediated natural experience of nature. At the same time, as discussed in Section 2.3 *Human*

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[9] This thesis is not arguing or defining what is real or unreal. The source of this comment is a private conversation I had with David Abram, August 29, 2011, at Vancouver, BC, Canada. For Abram, a "real" nature experience is denoted as experience without any artificial device mediating that experience. While Abram affirms that technology mediated experiences of nature is necessary; the experience of nature should not be reliant upon technology solely.

Interconnectedness to Nature and below in Section 2.10 *Related Research: Projection, Sound and Interactive Systems*; I believe digital technologies in the hands of artists are capable of providing a new ability to sense nature, or of offering an alternative, perhaps evolutionary, experience of being embedded within nature – a blended human-technology-nature interconnectedness. This belief arises in part from the long history of artists using the technologies of the time as a "method of connection, expression, translation and interpretation of the relationship between human and nature" (Section 2.3).

I have discussed that we are corporeally connected to landscape, and that our senses hearken back millennia to a time when the experience of interconnectedness was synonymous with survival and our understanding of the world. Humans were so deeply embedded within a sustenance relationship that a sense of reciprocity with the natural world was embedded in human existence and culture. As civilization advanced and we moved farther from pure subsistence, intellectual, philosophical, cultural and artistic movements influenced our sense of interconnectedness, pushing us away from it.[10] At the same time, as we moved farther away, it can be argued that we have had increasing need of the sensuous and mediating qualities of art and digital technologies – which are also an integral part of who we are as humans in the world.

As I have also discussed in Section 2.4, we are connected to our digital artefacts, and through the experiences they offer, we are embedded with these devices when interacting with them. It is important that we care about the opportunity to incorporate the notion of the HTN triad-relationship (as described briefly in my Introduction on page 3 in Section 2.9 *Hypothesis*, as well as throughout this thesis), as a new sense of embodied connection, because if we continue to see ourselves as separate from an external nature, and to view our technologies, (which, as discussed, are a large part of who we are in the world) as also separate, then we are doomed to perpetuate both a dangerous

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[10] History and cultural evolution play an important part of our human development and I refer specifically to Platonic, Newtonian, Cartesian and the Romantic Movement, as discussed in Section 2.1 – Background.

disconnection, and exploitive behaviours, which together will arguably condemn us to a future that is (in a manner unforeseen by Hobbes) truly "nasty, brutish and short".[11]

2.10. Hypothesis

I depart from the discussion of the environmental movement's concerns with and comments on technology and nature and look for answers within the study and research of new media and mobile digital technologies. I seek to answer my claim that digital technology can and should be used by humans in natural settings as a means to increase a sense of reconnection to nature. The rationale I draw upon to support this claim is as follows:

Humans are genetically predisposed to have "living" connections to the natural realm (Wilson, 1984, p. 1). There are also cognitive benefits to be had interacting with nature in that the peaceful aspects of such an environment restore directed-attention abilities and increase cognitive control (Berman, et al., 2008). In conjunction with this aspect of interaction with nature is the human desire for extensive interaction with digital technology. There is evidence that the experience of technical nature that is life-like provides improvement to health and mood. That is, technological nature "provides some but not all of the enjoyments and benefits of interacting with nature" (Kahn, et al., 2009, p. 41). Further, digital technologies also provide multiple sensory and interactive experiences and augment the human senses in ways which could be considered similar to the sense of arousal one experiences in nature settings. Some digital technologies are hand-held, portable, and provide for mobility – that is, they can be taken with us to natural settings. By combining digital technology experiences with experiences in natural settings, I explore the proposition of the HTN triad-relationship to determine whether a sense of reconnection to nature by this route is possible.

My hypothesis promotes a use of digital technology that extends user experiences beyond the basic utilitarian relationships most have, such as when one

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[11] Hobbes, Thomas (1660) *Leviathan*, now in the Public Domain. Hobbes declared that life in "a state of nature" (prior to the formation of a civil society and overseeing state) was "solitary, poor, nasty, brutish and short".

uses a camera to take a photograph of a landscape and goes home and places it on their Facebook page.

To explore the HTN triad-relationship hypothesis, several events were organized to study artists and spectators as they worked and experienced new media in natural settings, with the goal of discovering whether preconceived notions of the human-nature and nature-technology relationship can be subverted, that is challenged, through different experiences of technology in natural settings. Within this study there is an assumption that through the diversity of the various respondents and the various natural settings they experience, that the participants will provide useful data. I employed the methodology of interpretive arts-based research and incorporated methodologies as described in Section 4.2 as frameworks for data gathering and to answer my research question and claim that: The use of mobile digital technologies and new media used by artists in natural settings (such as caves, forests, beaches or fields) can alter cultural notions of technology as antithetical to nature, by offering an enhanced experience of interconnection with nature (See Section 2.7).

2.11. Related Research: Projection, Sound and Interactive Systems

Recent research indicates that designers of pervasive computing, augmented reality systems, and sound and interactive design, have begun using natural settings as research sites. While all such studies cannot be represented here, I have chosen six studies, which date from years 2001 through 2011. While the approaches of these related studies are not identical to my approach, they have similar elements such as outdoor independent power sources, and digital technologies used in natural settings as artistic interventions. I have chosen studies that used pico-projection, augmented reality, interactive narrative, soundscape and interactive sound design in outdoor environments. Thus, I find conclusions within these studies that are supportive of my thesis because they provide contextual support for the use of digital technologies in natural settings. In 2001, ARCHEOGUIDE, (Augmented Reality-based Cultural HEritage On-site GUIDE), provided the user with an outdoor augmented reality system to see a computer generated reconstruction of a cultural heritage site (Gleue & Dahne 2001). In the

ARCHEOGUIDE research, the outdoor experience of using technology is designed as an information presentation and simulates ancient architecture to reconstruct the ruined sites at Delphi, Greece. The user can, through the augmented reality program, stand in front of a ruin, select information, and view the building as it may have appeared a thousand years ago. The similarity to my system approach is that the researchers assembled devices within a backpack to provide users an enhanced mobile experience in an outdoor environment.

As pervasive technologies improve, the desire to use them outdoors is being explored through wireless networked devices and technologies. With interests in designing "ambient computing events for children in a wooded area, technological, logistical and design dimensions were studied in the project entitled, *Ambient Wood*. (Harris, Fitzpatrick, Rogers, Price, Phelps & Randall 2004). In their paper *From Snark to Park: Lessons learnt moving pervasive experiences from indoors to outdoors* (2004) Australian Computer Society Inc. as part of the 5th Australasian User Interface Conference, (AUIS2004), Dunedin, various devices were installed in a wooded area. The intention was for children to experience collaborative learning through visual and audio display devices which allowed them to find out information not "normally or readily available" (Harris, et al., p. 41). Motivated by the interests to "explore ways of augmenting the physical world to promote thinking and reflective skills in the context of learning about scientific enquiry" (p. 41), independent and sustainable power choices were incorporated, using battery systems to run the various devices while on the field. While this research speaks directly to the various design choices that the difference between indoor and outdoor scenarios present, such as the "trade-off and compromises" that occur between controlled environments and those that are natural, conclusions indicate that there is a "need to engage in such projects with a multi-dimensional team," and that "lessons learnt here in the wood…will never be learnt in the lab." Finally, Harris et al. concludes that "we have to adapt to the environment outdoors whilst indoors we have a choice to manipulate, build and create things more easily to a predetermined design" (p. 47).

In regard to location-based experiences, I turn to research regarding an audio drama called *Riot 1831*, which was an interactive play based on the riots at Queens Square, Bristol, England and staged at the actual historical site. In the paper *Parallel*

Worlds: Immersion in location-based experiences, CHI 2005, April 2-7, 2005, Portland, Oregon, the authors indicate that their research examined how environmental elements "combined with the physical aspects of movement," and how these aspects become experience when an person is immersed in a location-based audio drama. Audience members could walk around the square, where at any of the thirty-four "regions" sound files would be triggered. Audience members would wear a "back-pack containing an iPaq, PDA, GPS receiver and headphones" (Reid, Geelhoed, Hull, Cater & Clayton. 2005, p. 1733). Experiences of discovery, navigation, searching and communication permeated the encounters of individual participants. While some were more engaged and deeply immersed, others had different experiences such as "the re-awakening of your senses to actual environment after a terrifying experience will bring a feeling of relief," (p. 1736). The authors inferred that the historical experience came alive as "a special form of immersion that is related to the nature of the play and the historical setting," (p. 1734). They also noted that two participants indicated in answers to a questionnaire, that they had feelings of being in "parallel worlds." They observed that oscillation between the deeply immersed sound environment and the actual real world environment created a variety of states of mind in participants ranging from "euphoria" and "confusion" to "terror." Further, they opined that the deep immersion can be experienced as a transient state, that can be "fleeting or can last for several minutes," (p. 1735). Reid, et al. reported that the user rated their experience as an experience that was enjoyable because history "came alive," when the transition between "immersion and non-immersion has been smooth" (p. 1736). They concluded that "the prominence of real world environment means that the immersed states are short with continual dipping between parallel worlds of the digital and physical" (p. 1736).

Jan C. Schacher reported in his paper *davos soundscape, a location based interactive composition*, (2008) how he used an experimental dedicated GPS-enabled computing platform for the implementation of a location-aware site specific musical work. Schacher created situations for social interaction to bridge "the gap between the virtual, online and Internet based media and the physical world" (Schacher, 2008, p. 198). There were eight routes or interactive sound zones, positioned along a lakeside in Davos, Switzerland. This work was presented during an annual music festival. The "user" experience entailed moving around the natural landscape about the lake, which would

trigger a sonic sound or music experience. The music consisted of brief sequences of field recordings made on site, some of which were displaced. For example, while in the mountain woods, the sound of the sound of waves against the lakeshore would be heard, or alternatively, the sound of the cow bells from the meadows would be heard on the busy main thoroughfare in town, and so forth. Further, Schacher explains that each of the routes had overlapping areas, and all were treated differently in regard to how musical segments would connect differently, "according to the point of entry and the direction along which one walks on the promenade," (p. 169). Besides using GPS, Schacher used a Linux for the platform and PDa as a framework to run originally authored code to obtain GPS coordinates from the receiver, which was triggered when the user was in front of any one of "86 points of interest" which were physically marked by stakes painted bright orange. For details of how the system was devised and operated see page 170. The goal of *davos soundscape* was to provide "a seamless experience" using technology in a natural setting. Feedback from members of the audience indicated that they experienced a "memorable sonic experience" (p. 171). Schacher concluded that "it still seems an intriguing concept to be able to take a device capable of real-time interaction with intelligent electronic music generation out into nature and witness a musical expression and spatial sonic experience which would not be possible any other way" (p. 171).

I discovered very few research papers on the outdoor use of pico projection, specifically in artistic practices, as well as its use in the natural landscape. This shortage of research is to be expected because mobile pico projection devices are a recent introduction to the world of digital technology. The luminosity of the Aaxa pico-projectors used in LocoMotoArt is limited. The P1 Jr. has 10 ANSI-Lumens with a projection image of 10 – 50 inches, at a 4.3 aspect ratio while the P4 has 80 ANSI-Lumens, with a ratio of 2000:1 with a projection image from 7 to 80 inches. Thus, these projection capacities translate into smaller and more intimate screening environments when compared to the projection capabilities of a high-resolution projectors and large-scale outdoor screening surfaces. This contrast of intimacy versus spectacle is seen in examples of the use of video mapping projected against buildings. In these applications, the viewer is given a colossal visual experience because the projections are gigantic.

While some research studies using projected imagery have been conducted outdoors, the user experience has remained framed by the concept of indoor use (Greaves, Akerman, Rukzio, Cheverst & Hakkila, 2009), where scenarios tested included map interaction, media browsing, and projection onto alternative surfaces such as a wall, or the roof of a public bus. Greaves, et al. commented on the potential issues of private versus public projection space, and 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). I have not found what I consider suitable related research on projection in natural settings, however, within my artist taxonomy; I turn to the work of the prolific collaborative artist group ecoarttech in Section 3.1.2, wherein they used projection technology in a natural setting in 2005, in their work *Technorganics.*

Dr. Matthew Burtner and his project *EcoSono*, has sought to redefine "forms of collaborative engagement" within the human-nature relationship through sound art works *in situ,* by using digital technology as a new way of sensing "symbiosis" between "music and the environment" (Burtner, 2011, pp. 234; 237). He states that current contemporary music, "has perpetuated a preference for mediation over human-environment collaboration" (p. 235). Similar to the conceptual context for LocoMotoArt and this thesis, Burtner insists that pursuing the impractical methodology of going outdoors with electronic equipment we can "break away from this pattern" of seeing such methodologies as impractical (p. 236). Related to my research, I will argue that this "impractical methodology" is in fact practical and governed by choice, behaviour, and values as to whether technology is a necessary component to our ever changing relationship to the life-world. I further advocate that as evidenced in the artist-projects of this thesis, artists can offer spectators an enhanced sense of interaction and interconnection between digital technology and the natural realm. Burtner terms his concept, *EcoSono*, as "an evolving practice and philosophy of eco-acoustic sound art" (p. 234). The LocoMotoArt research diverges slightly from Burtner's in that it incorporates not only sound in natural environments, but also projection of visuals, as well as performative and storytelling aspects.

New media art forms, propelled by the capacities of digital technology, have subsequently changed the nature of human experience and perception of place, space

and time. This shift in perspective is most evident in the user relationship with a computer screen and the web (Thornburn, 2003, pp. 1-2). In addition, digital technologies have changed the platforms for mediation, immediacy, and re-mediation.[12] For this thesis, I am interested in how behaviour, attitudes, use, mobility, and interaction with digital technology in natural settings functions as an intermediary, to inform whether the notions of separation of technology and nature can be changed and thus bridge the lacuna, mediation will be addressed in light of my question of whether digital technology can mediate the relationship between humans and nature. The goal of this research is to explore if this lacuna, as portrayed as the squiggled doubled ended arrow in Figure 2.1, is discoverable, and whether my question is answerable herein.
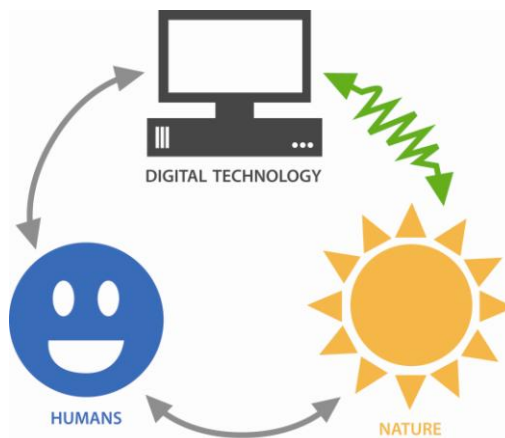
Figure 2.1.   The Lacuna between interconnectedness of humans to nature through digital technology mediation

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[12] The defining of these words is complex. I refer the reader to Bolter and Grusin's analysis in *Remediation* (Bolter & Grusin, 1999) for comprehensive definitions of these words, however, briefly they state*,* "we regard them as practices of specific groups at specific times" (p. 21). *Immediacy,* although first existing during the Renaissance as "the defining feature of western visual representation...manifested much differently with each age that followed." (pp. 21 – 22). *Remediation* "operates under the cultural assumptions of about immediacy and hypermediacy." Today, the computer, interfacing and virtual reality for example, provide what Bolter and Grusin say is the "interplay of the aesthetic value of transparency" (p. 24). The basic definition of *Mediation* as noted in the *Merriam-Webster Dictionary* (Merrium-Webster, 2012) states, "occupying a middle position; acting through an intervening agency; and exhibiting indirect causation, connection and relation." In terms of digital technologies, the *Oxford English Dictionary*, (Oxford English Dictionary, 2012) is more related, "Agency or action that is an intermediary; the state of serving as an intermediate agent, a means of action, or a medium of transmission, instrumentality."

Finally, I argue that when using communication technologies (sound and visual) in natural settings, the lacunosity between technology-nature mediation can be replaced through the intermediary power of the action. It is through action of re-orientation and re-positioning of new media in natural settings for spectators to view that the experience of a cultural transformation of the human-technology-nature relationship begins.

3. New Media, Natural Setting, and the Eco-Aesthetic

Art can and should strive for an alternative that is not only aesthetically affirmative and productive but is also beneficial to all forms of life on our planet. (Araeen, 2009, p. 684)

As part of my approach for my thesis during coursework in IAT 811 – Computational Poetics, I authored a taxonomy entitled, *Taxonomy of Artists Using an Eco-Aesthetic* (Coles & Gromala, 2010, unpublished). The taxonomy includes fifty artists to date. To anchor the taxonomy, I chose the domain of Landscape and identified artists whose works incorporated landscape in some form into their practice. That is the artists either created from, in or of landscape. From the anchor point of landscape, I further categorized the works of artists by incorporating three criteria: Analog, New Digital and Digital. The following disciplines were reviewed: Architecture, Sculpture, Installation, Photography, and new media. The various disciplines provided a glimpse into the qualities that separate or integrate these works as environmental or eco-art.

I chose to include artists whose works I consider exemplifies elements of Rasheed Araeen's definition of "eco-aesthetic," such as, Ap Verheggen's incorporating the issues of global warming, or ecoarttech's interest in the politics of nature. These artists draw the spectator's attention to experience of technology in natural setting, but also imbue an environmental message in a multi-dimensional manner by way of artistic expression. Although these artists may not personally equate their approach to Araeen's definition of the eco-aesthetic, I found that by way of instilling environmental messages, images, subject matter, that they are, in fact, part of this movement, or the movement I am advocating, that of Eco-Futurism. I coin the term "Eco-Futurism," as a movement that encompasses a variety of environmental art expressionism, and not limited to artists, but inclusive of environmental literary theorists, psychologists, and activists who are concerned with contemporary environmental issues, but utilize artistic craft and expression within natural setting, and most significantly, by way of digital technology.

Turning to eco-art historian and critic John K. Grande, who emphasises that the future of environmental art is one that manifests a strengthening of our relationship with nature, he further posits that the human experience cannot be fulfilled without considering nature. I do not draw upon the specific movement of the Futurists of Italy (1909), who concerned themselves with portraying the mechanized world and rejecting traditional forms of art, music and literature. I diverge in the use of the word "futurism" as associated with the Futurist art movement of the early 20th Century and use "futurism" to denote anticipating future trends and events related to the environmental artistic practice that employs the influences of "eco-aesthetic", specifically. Additionally, I implicitly include in the definition of Eco-Futurism, electronic environmental site-specific new media works that are positioned *in situ* of natural setting, as being primary to the Eco-Futurism movement. It is with inspiration, hope, consciousness, and using creative self-powered field systems and the incorporation of sustainable arts praxis such as using systems like LocoMotoArt. Finally, I conceive the term Eco-Futurism, in its totality as a new "cultural explosion" similar to Mithen's postulates of that which occurred at Chauvet (Mithen, 1996) because of the evolutionary considerations associated with digital technology on the human brain and behavior as mentioned in Section 2.4. But this topic is the subject of future papers and there is not space in this thesis to present it fully.

While researching artists for my taxonomy, I became aware of Spanish artist Ibon Mainar, and his work of high-resolution projection in natural environment. I contacted him and he agreed to become my first artist interview. From this experience, I was able to develop the concept of my field research questionnaires and study plan. I discuss the interview results in further detail in section *5.1 Ibon Mainar*. Further, I will draw upon the taxonomy to discuss the following artists in chronological order to provide a sense of the scale and magnitude of how the movement of an artistic Eco-Futurism is emerging in contemporary culture. I briefly introduce works by British photographer and global warming activist, David Buckland and his piece, *The Cold Library of Ice* (2004), American artist-researchers Cary Peppermint and Dr. Leila Christine Nadir founders of ecoarttech and their works *Technorganic* (2005), *Wilderness Information Network* (2006), and a more recent work, *Indeterminate Hikes + (IH+)*, a phone app (2011), and Dutch artist, Ap Verheggen and his work *Dog Sled Riders* (2010) which is one of a planned seven part series entitled the *cool(E)motion project*.

3.1. David Buckland:
The Cold Library of Ice (2004)

An example of digital technology used in natural setting is seen during one of British Photographer David Buckland's Cape Farewell excursions (2004-2005) into the High Arctic polar ice region. Buckland's Cape Farewell brings artists, scientists and educators together on a Dutch schooner to raise awareness about climate change. *Ice Texts*, consisted of a series of text images projected onto the walls of icebergs he called *"The Cold Library of Ice" (2004).* The words used in Buckland's projections were appropriated from the text of Gretel Erlich's story, *The Future of Ice* that she wrote after a Cape Farewell residency. Buckland used and projected her words from a moving ship onto an ice cliff in the Arctic (Buckland, 2004). Buckland's expeditions into the arctic region with several artists in tow, is deeply centered in drawing awareness to the affects of global warming, as this is the purpose of the *Cape Farewell* project. It is however, worth noting that the creation of the media was done elsewhere, not in natural setting. This work integrates new media in natural setting as a potential exhibition space as suggested by the concept of LocoMotoArt system.

3.2. ecoarttech:
Cary Peppermint and Dr. Lelia Christine Nadir

Sustainability and independent power sources are found in the work of the artist group "ecoarttech" founded in 2005 by Cary Peppermint and Dr. Lelia Christine Nadir. Of all the artists I included in my taxonomy, this group exemplifies succinct evidence of the potential of artists creating and displaying new media in natural setting as practical and common method of arts practice. Further, their work seems to incorporate elements of introducing the audience spectator to the notion of human-technology-nature relationships, as advocated by my notion of the HTN triad-relationship. These artists "investigate the overlapping terrain between "nature," built environments, mobility, and electronic spaces" (Peppermint, 2012). According to ecoarttech's catalogue of works, the implementation of independent power sources has been incorporated successfully in the field for the purpose of new media exhibition and display in natural setting and urban settings to wide audience appeal. Their works are in the collections of the Whitney

Museum of American Art, Walker Art Center, Rhizome.org at the New Museum for Contemporary Art, Computer Fine Arts, and (soon) the Cornell University Rose Goldsen Archive of New Media Art. In 2012, ecoarttech will be "off-the-grid" artist-residents at Joya: Arte+Ecología, in an Eastern-Andalusian national park the summer of 2012 (Peppermint, 2012).

Ecoarttech's work is prolific in its concerns for using digital technology in natural settings, and I address three specific works briefly: *Technorganics* (2005); *Wilderness Information Network* (2006) and *Indeterminate Hikes + (IH+)*, a phone app (2011). Further, it appears their philosophical concerns are in alignment with this thesis in that they state, "We see humans as essentially technical beings: human-animals literally cannot survive without technics" (Kosmaoglou, 2012).

Technorganics (2005) took place as a mini-festival on the autumnal equinox for one single evening. The purpose of this event was to merge new media art technologies with an emphasis on creative "figurations" of the natural environment (ecoarttech, 2005). "The way we put together media and the environment is shocking for many people because they expect media to be used in instrumental, goal-oriented ways involving direct communication or exchange of information. We try to show how media is also an ecological space that can be enabled to make room for "wild" experiences, akin to wilderness sites. And, that the media landscape is part of our ecological being just as

Figure 3.1. **"Technorganics." Photo used by permission of ecoarttech.**

much as the physical environment" (Nadir, 2012). Ecoarttech has indicated that at that time, the fusion of computers and technology in the forest was uncommon. Via an e-mail interview, I posed questions to ecoarttech about some of their experiences and observations in this early work. "We think that people are not sure how to connect new media and computers with nature and environment, but they want to do it. They want to connect the possibilities of both spaces together, but in our culture, nature and technology are always so separate" (Nadir, 2012). The event took place at the Pine Lake Environmental campus of Hartwick College (Hartwick College, 2012) in the upper Catskills, eight miles from the main campus in Oneonta, New York. The evening included multi-media, video projections as seen in Figure 3.1 and installations, digital media, sound and performance works (ecoarttech, Technorganics, 2005). *Technorganic* used "iPods, eMacs, Mac Minis, radio transmitters, and Dell Axim X50s were used as delivery platforms. Power was generated via a 3000W PVS including 4 Evergreen Panels and one Honda generator converted to run on propane" (Nadir, 2012). JBL powered speakers were used.

The following year, ecoarttech displayed the *Wilderness Information Network* (2006), wherein participants had to hike to reach the solar powered installation as seen in Figure 3.2. This project was made possible by support from the New York State Council on the Arts (NYSCA), The Upper Catskills Community Council for the Arts, Hartwick College, and again was positioned at The Pine Lake Environmental Campus of Hartwick College, which is a rural area sporting deer, foxes, coyotes and currently undeveloped. After hiking two-miles to the installation site, participants could plug in their listening devices and download sound works created by "over thirty international artists who were selected to create a sonic field of information imaging the human-nature sonic communication." Of the several sounds works, artists included Joao Ricardo, and Andrea Polli was among them (ecoarttech, 2006). "Participants were provided AM radio receivers to listen to the broadcast within a 300 foot radius. Or they could bring along their own laptop or handheld device and download mp3s. An iPod, a radio transmitter, and a Dell Axim X50 were used as delivery platforms. We used Evergreen solar panels, a Mac Mini, a GPS, an Arduino, and custom software written in Quartz Composer and Processing" (Nadir, 2012). By presenting works of technology in this remote setting and questioning the technology-nature relationship, the impression that new media

technologies have limits in such settings is circumvented. I further asked ecoarttech about their observations and to describe audience comments regarding this first experience:

Dr. Nadir: [o]ur participants have a twofold response: (1) initial skepticism (What are these artists doing? This doesn't make sense! Why hike 2 miles to an art opening?) Then (2) eventual euphoria. A lot of our exhibitions/performances, including WIN, leave people feeling altered, as if they have experienced something they had never expected that has stimulated their thinking. (Nadir, 2012)

To further their work, ecoarttech expanded on the re-articulation of mobile technology and digital networks in their recent work entitled *Indeterminate Hikes + (IH+)*, a phone app (2011) "[t]hat maps a series of trails through the city. IH + can be accessed globally, or wherever users have access to Google Maps on their mobile phones. After identifying the users' location, IH + generates a route along random "Scenic Vistas" within urban spaces. Users are directed to perform a series of tasks along the trail and provide feedback in the form of snapshots generating an ongoing, open-ended dialogue" (ecoarttech, Indeterminate Hikes, 2012) (Kosmaoglou, 2012). The artists indicated during an interview with Sophia Kosmaoglou published at www.futherfield.org, that "By

Figure 3.2. *"**Wilderness Information Network***." Photo used by permission of ecoarttech.*

importing the rhetoric of wilderness into everyday life through Google-mapped hiking trails, the app attempts to inspire a sense of ecological wonder at usually disregarded spaces, such as city sidewalks, alleyways, and apartment buildings.

Ecoarttech has experience observing audience reactions to their work over a seven-year period of time, which is greater than the study of LocoMotoArt research. I asked Dr. Nadir if "at anytime during your series of exhibitions, has anyone who was an audience member or participant conveyed that they felt interconnected to the environment through the mediation of the technology?" She indicated that the answer "is yes – but how does one specifically communicate such things?" She shared her observation from a recent experience:

Dr. Nadir: On one of our latest hikes, in the area surrounding UCLA's Design Media Arts Gallery space, our hiking group was filled with skeptical artists and their friends. They chatted through much of the start of the performance, not paying attention to the app, the performance, or the directions, but within one hour the group was entirely silent, concentrating on their surroundings and engaging with the IH+ app and the world around them in an intense way. In place of artworld posturing, there was suddenly laughter, smiling, joy, and elation. (Nadir, 2012)

3.3.   AP Verheggen Dog Sled Rider (2010) from the cool(E)motion Project

Dutch artist Ap Verheggen is a transdisciplinary artist, who is a sculptor, designer, writer and documentary film maker and a cultural ambassador under UNESCO-IHE for the Institute for Water Education (UNESCO-IHE, 2012). As part of cool(E)motion Project, *Dog Sled Rider* had many funding partners, one of which was the WWF (World Wildlife Federation) whose aim is to keep the issues of the effects of climate change in the forefront of climate change discourse. *Dog Sled Riders*, is an artistic work that draws attention to global warming and its effects on a particular community in Greenland as seen in Figure 3.3. Verheggen erected his large-scale iron sculpture *Dog Sled Riders,* using helicopters, on an iceberg off the west coast of Greenland near the village of *Uummannaq* in early March 2010. Incorporating a significant aspect of Inuit culture as metaphor for the iceberg's journey, the artist informs us that "Usually it is the driver who determines when the journey begins, where it goes, and when it is over." By placing the dogsled driver on an iceberg, we show that nature

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ultimately determines the course of the journey." Verheggen's *Dog Sled Riders* is an example of a project, inclusive of the local-culture for both the design influence and in the staging of land-based site specific artworks, with purpose to draws immediate attention to the actual melting of ice fields and the adverse affects of climate change upon the local inhabitants. "Climate change brings about culture change," says Verheggen on the project website (Verheggen, cool(E)motion, 2010a). On March 30, 2010 the iceberg left the coastline and began floating in the "open wilderness of the ocean." Originally the intent of this project was for people to follow the journey of the iceberg. *Dog Sled Riders* was outfitted with a live GPS satellite feed that enabled a viewer to track the location of the piece through 3-D plug-in of Google Earth. Verheggen is quoted on the project website, 'Yes, in time the sculptures will disappear, but hopefully their memory will trail the arctic seas.' The effort, he says will put the feeling and emotion back into the debate about climate change. Unfortunately, human behaviour intervened and forever changed the work. On June 2, 2010, while viewing the GPS feed, it became apparent that the tracker signal moved constantly, and "faster than an iceberg would move." Ultimately the signal led to a fishing vessel that ended up in a particular fishing village of *Satut* (cool(e)motion, 2010). The blog indicates, "We contacted our friends in Uummannaq, who took a boat to have a look, but they couldn't find our iceberg anymore. What happened we never will know. Too many options are open. Is this the end of our art project? We keep you updated!" (Verheggen, cool(E)motion, 2010b).

As a land-based site-specific installation, Verheggen's *Dog Sled Riders* had existed in the reality of natural landscape but provided a temporal oscillation between the on-line world, real time feed, and satellite tracking, that the viewer could experience using a computer, or Smartphone. The work involves the story of an actual living culture under actual threat of climate change. With the use of digital technology Verheggen provided the viewer the experience of an expansion of time and place through telepresence. I find this work a primary example of Eco-Futurism, because *Dog Sled Riders* transcends the boundaries of time and place, and greatly expands the reach of the audience about an issue of environmental concern.

As seen in the works of these artists and many others from the digital age, it is apparent that as soon as digital technology was introduced to the general public, artists, used this technology to create innovative works to communicate that interactions between humans, technology and nature is possible. Therefore, in pursuit of my enquiry, I facilitated my study with the creation and development of a creative field system that enables the artist and the audience to experience new media in natural settings, with the aim to sense a more intimate relationship with both technology and nature in order to bridge the gap of perceived separation of technology as "object" from both humans and nature.
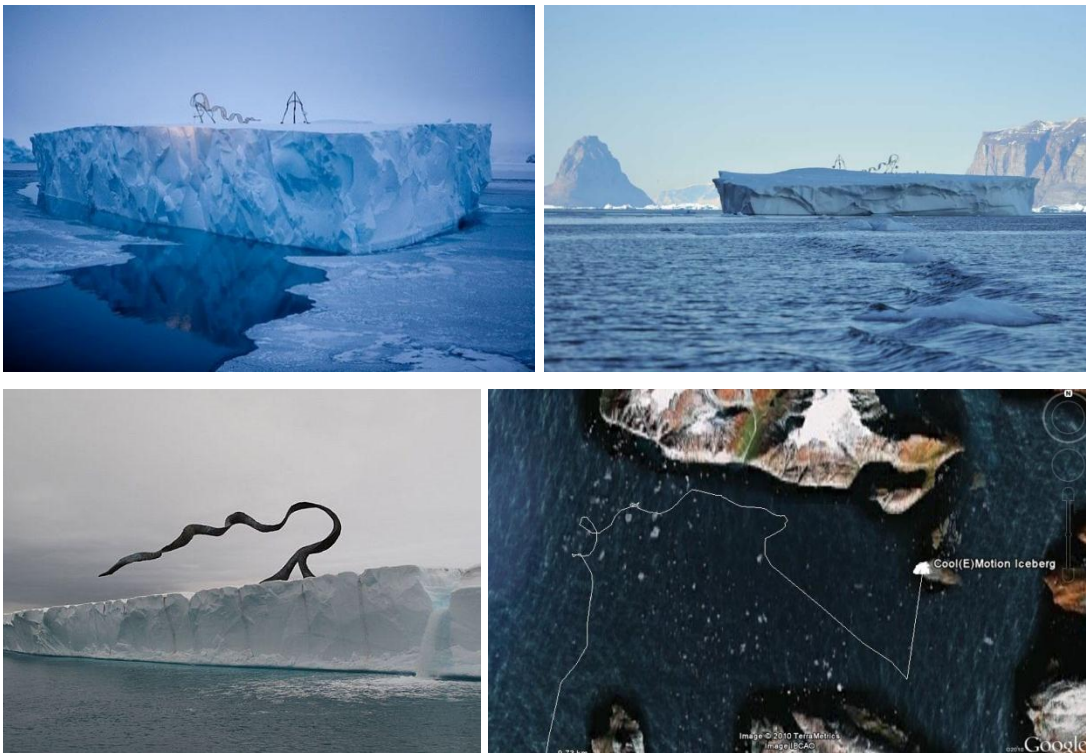
Figure 3.3. *"Dog Sled Riders." Upper Left & Right: Floating ice berg and Sculpture, Bottom Left: Close up Dog Sled Rider, Bottom Right: Screen shot Google Earth, tracking of the iceberg. Photos used by permission of Ap Vergheggen.*

4. LocoMotoArt System, Methodology and Methods

4.1. The LocoMotoArt System

To facilitate the five artist-event project studies, I developed a creative field backpack, which is comprised of digital devices that are commonly used by most individuals in everyday life, such as an iPod, laptop computer, and digital cameras. I took a bottom-up approach to creating the LocoMotoArt system which is rooted in a synergistic design concept, meaning that existing digital artefacts were combined with independent portable power systems. None of these devices were re-worked or changed, rather they were introduced for the purpose of field use – creating and displaying new media in natural settings.

LocoMotoArt was assembled to provide three types of user options: Module 1, a basic system that fits into a backpack, as seen in Figure 4.1 below; Module 2, an intermediate system with the option to use higher powered projection systems, an expanded power system that responds to higher watt power requirements and a larger battery operated amplifier for sound playback, and Module 3, solar panels and video projectors assembled for the use by interactive artist Jamie Griffiths in the Amazon River Region. Within the three modules there are four distinct field capacities: 1) POWER to provide independent energy source while on the field and to operate and extend the battery life of the laptop; 2) CAPTURE, devices for capture of visual and sound; 3) PRODUCTION, a laptop with software for producing media and converting it for playback while on the field; and, 4) DISPLAY, devices for playback of sound and visuals for exhibition.

Figure 4.1.   LocoMotoArt Module 1 – backpack system. See corresponding numbers listed below

Module 1: LocoMotoArt standard backpack system consists of all of the equipment following equipment and weighs approximately 20 pounds. The full backpack module weighs 40 pounds when users choose to include the portable 12V battery pack for field use.

Power:

- Flexible roll up portable solar panel 55.4W 3600mA with 12V female CLA socket outlet (See No. 2);
- OP-26 12V SLA battery pack 25Ahr/150Whr. with dual regulated inputs and triple outlet hub with meter (See No. 3);
- 12V male cable, 12V DC 100W Mag Safe adapter for an Apple 15" Mac Book Pro laptop computer (See No. 4) (to power through the OP-26);
- 12V USB Port adaptor, for iPods, iPhones and other USB devices;
- MH-C401FS-DC and AA/AAA battery charger

Capture

- H2 Zoom field sound recorder
- Canon Vixia HF R100 AVCHD mini camcorder (See No. 9)

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Figure 4.2.   The PowerFilm 55.4W 3600mA Solar panel from Module 1.
Photo: Pat Subyen

Production

- Apple 15" Mac Book Pro with Final Cut Pro (See No. 1), Adobe CS5, Adobe LightRoom 3, Aperture, Processing, Toast Titanium, DVD Studio Pro, iTunes, and Garage Band pre-installed

Display

- Three Aaxa LCoS P1 Jr. pico projectors. 10 Lumens (See No. 5).
- One Tune Bug Portable SurfaceSound™ Speaker (See No. 6), Apple iPod (See No. 7), two Diamond Mini Rocker computer speakers (See No. 8)

The Aaxa P1 Jr. hand-held LCoS pico projector (10 lumens) was specifically chosen because of the array of multiple features in relation to its affordability. The unit is quite small. There is a slide show feature, SD-HC card reader. Inputs/outputs include mini-USB, composite A/V capabilities. These features make it ideal for mobility and flexibility while in the field. Another motivation to include the Aaxa P1 Jr., was that should the device break or fail due to weather or other natural conditions the expense associated with the loss would be small (Specifications Aaxa P1 Jr., 2010). The Tunebug Portable SurfaceSound™ Vibe speaker was chosen because it is compact and can turn any surface into a playback source (Tunebug Vibe, 2010).

Figure 4.3. ***Marine batteries and 300 W and 600 W pure sine wave inverters from Module 2 Extended Power system of LocoMotoArt***

Module 2: LocoMotoArt intermediate power system consists of the same artefacts as Module 1, but includes the following equipment to enhance the power and exhibition, or display, capacities of LocoMotoArt.

Power:

- Two 300 Watt Nautilus Marine Batteries
- One Samlex America PST-60S-12A Pure Sine Wave inverter -- 600 Watts continuous output power; 10.7 - 16.5 VDC input; and 120 VAC, 60Hz output
- One Samlex America PST-30S-12A Pure Sine Wave intverter – 300 Watts continuous output power; 10.5 – 16.5 VDC input; and 120 VAC, 60Hz output,
- One Nautilus MotoMaster Intelligent Battery Charger Class B; Input: 120V AC ; Output: Automatic 15A max continuous and manual: 2/10/15 A 12VDC

The PowerFilm flexible folding 55.4 Watt 3600mA portable solar panel, as seen in Figure 4.2 above, can be used to recharge each of the 300 Watt Nautilus Marine batteries. However, the panel is designed for full sunlight and will not work in inclement weather. The two sine wave inverters provide up to 600 Watts of clean inverted power suitable for electronics that require greater draw.

Display
- One Roland KC-110 battery operated amplifier
- Two Aaxa P4 pico projectors
- One Epson EX3210 2800 Lumen projector

The Roland KC 100, as seen in Figure 4.5 below, was adopted by recommendation of one of the artists who wanted larger spatial sound delivery during playback. While originally designed as a keyboard amp, this amplifier can also be used with a computer or iPod, live string instrument, field recorder or microphone for vocals. The Aaxa P4 (80 lumen) pico projector was introduced to increase the level of lumens in the field. Features include built in processors with Windows CE, VGA, composite inputs, SD-HC, and USB readers. Both the Aaxa P4 and the Epson EX3210 projectors support MP4, MP3, AVI and JPG (Specifications Aaxa P4, 2010). The Epson EX3210 has the following features (Specifications Epson EX3210):

- Epson 3LCD, 3-chip technology
- Pixel Number at 480,000 dots (800 x 600) x 3
- White Light Output: 2800 lumens (ISO 21118 Standard)
- Colour Light Output: 2800 lumens
- Aspect Ratio: 4:3
- Native Resolution: 800 x 600 (SVGA)
- Resize: 640 x 480 (VGA), 1024 x 768 (XGA), 1152 x 864 (SXGA), 1280 x 800 (WXGA), 1440 x 900 (WSXGA), 1400 x 1050 (SXGA+)
- Throw Ratio Range: 1.45 – 1.96
- Size (projected distance): 30" – 350" (0.76 – 8.9 m)
- Remote control with an operating distance of 19' (6 m)

Module 2 is also portable, but requires two people to carry for hiking or backpacking purposes, and a hand-truck for transporting the heavier batteries.

Module 3: This module of the LocoMotoArt enhanced independent power system was assembled for wilderness use and tested by interactive artist Jamie Griffiths in the Amazon River forest, and is briefly discussed in Section 6.2. This system consists of the following, which can also be incorporated and combined with Modules 1 and 2 if so chosen:

Power
- Two Powerfilm Rollable 14W solar panels
- One PVC storage/transport tube for solar panels

Figure 4.5.   Roland KC-110 battery operated amplifier LocoMotoArt.
Photo: Wynne Palmer.

- One Brunton Impel battery pack
- One PowerFilm Daisy-Chain cable
- One Ansmann Vario universal lithium/camera battery charger
- One Apple Airline MagSafe connector

Display

- Two Aaxa Pico P4 (80 lumen projectors)

During the process of creating the LocoMotoArt system, I kept open minded, meaning that I accepted the comments, suggestions and recommendations by the artists, which included the introduction of new artefacts to the system. It is from this open

Figure 4.4.   Aaxa P4 80 lumen pico projectors from Module 2 and 3 of LocoMotoArt

mindedness that the system evolved. Considerations about sustainability, weight, portability, cost, and capabilities were paramount in decision making.

4.2. Multiple Methods

There are benefits to implementing various methods as opposed to a singular method. It is within the blending of several methods that multi-causal relationships inform research (Midgley, 2000). I also incorporated the process of a focus group, a research website and specific study. I am interested in how the various relationships between people, technology and the natural environment take form. I draw upon the participant's values, notions, behaviours, attitudes, and their individual and collective definitions of specific words, such as nature and technology. Further, I considered how the conditions found in the environment influenced feelings or the choice of words the participants used to define their experiences.

To meet the demands of this complex enquiry I chose a qualitative research approach, drawing extensively on interpretive arts-based research (Sullivan, 2010) and phenomenological observation (Booth, Colomb and Williams, 2008; Butler-Kisber, 2010). There are often multiple realities to knowledge: social, scientific, artistic, political, and economic. Therefore, it is within a qualitative approach that an understanding of these subjective meanings becomes a form of knowledge-building where no single truth is sought (Nagy Hesse-Biber & Leavy, 2011). My methodology favours multiple events as sources of information (Creswell, 2007; Nagy Hesse-Biber & Leavy, 2011).

Interpretive Ethnography is defined by Norman Denzin as an approach 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, 1997).[13] In this approach

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[13] It is worth noting that Bunker and Koesters are the only artists where I utilized Interpretive Ethnography implicitly. Because I did not use interpretive ethnography with the other artist-projects, they unfolded differently. First, I did not have as much time to observe each artist, but rather had limited time to observe them during field work. It became glaringly clear that interpretive arts-based research was more in alignment to what was transpiring while researching the other artists because of not being embedded in their day-to-day, hour-by-hour lives.

the ethnographer is visible and present in the enquiry, in constant dialogue with participants. I note that I chose to incorporate Denzin's approach for the first of my artist-project studies, because the research involved being in residence with the artist-experts Anne F. Bunker and Gerald "Chuck" Koesters for a ten-day period on the Big Island of Hawai'i. I was embedded in their day-to-day life, as well as during field excursions, and their use of the LocoMotoArt system. For the other artist events, I neither lived with the artists, nor was I embedded in their day-to-day, hour-to-hour activities.

A primary goal of this thesis is to provide evidence of the HTN triad-relationship (as defined in the Introduction and Section 2.9 *Hypothesis*) and argue for its importance to contemporary culture. The HTN connection may be experienced or understood by some as a re-sacralising of nature. As discussed in Section 2.5, our ability to connect with the sacred in nature is generally understood as being accomplished by way of direct experience of, a sensuous engagement with, nature. Also discussed in this same section are my claims that we can also be sensuously and immediately engaged through our technologies and that in this way we may also nurture, or foreground, a sense of interconnectedness and of the sacred in nature.

I wish to acknowledge the common notion in Western industrialized cultures that gaining knowledge by way of sensuous engagement is suspect – and that such ways of knowing have long been denigrated and held in suspicion. It remains the case that when interpretive methodology is the foundation of a research plan, both the researcher's perspective and the validity of findings are called into question. Recent acknowledgement of the inescapability of researcher bias notwithstanding, research by way of the senses is still considered to lack sufficient rigour, and findings are therefore not understood as contributing to empirical knowledge.

Specifically because this enquiry addresses the relational aspects of human, nature and technology, I have departed from the demands of scientific enquiry which form the basic tenets of empirical research, and instead seek answers through the practice of phenomenological informed and arts-based research, relying upon the detailed descriptions of the artists and spectators that make up this study. Through documenting the research participant's experiences, their descriptions and representations become findings (Sullivan, 2010). I understand that interpretation under

these conditions could be deemed unreliable, because interpretations can be influenced by a variety of factors, such as personal perspective, which is influenced by differences in experience, education, and economic background. Interpretations can also be shaped by one's personal spiritual beliefs about creation, about the nature of the world, of the role of technology in our lives and in the world, or even how an individual feels. However, Graeme Sullivan, citing Michal Parson's definition of intersubjectivity, states that there exists a realm of "shared symbolic-mediated meanings" (Sullivan, 2010, p. 39). The goal, therefore, is to determine a consensus, or common experiences, among participants, so that the different data collected can be used to assemble a conclusion which is trustworthy – that is, the data is elicited from a framework of research "practice". Sullivan, citing Henk Borgdorff, (2006), explains arts-practice-based-research as follows:

Art practice qualifies as research if its purpose is to expand our knowledge and understanding by conducting an original investigation in and through arts objects and creative processes. . .(In this practice) Research processes and outcomes are documented and disseminated in an appropriate manner to the research community and the wider public (page 23). (Sullivan, 2010, p. 79)

To anticipate potential challenges to my research methodology arising from the above noted cultural bias toward an empirical model, I implemented the following processes for data gathering: 1) multiple case studies, (artist-projects culminating in an artist event); 2) Interviews, including pre and post-events, 3) Questionnaires; 4) Field work, and 5) Video, photographic and sound documentation. These multiple methods were structured within a specific study plan that emphasized an atypical or contradictory methodology to that usually employed by the artist in practice, or a re-orientation of the participant's usual way of making, displaying and experiencing new media. The interview process is effective as a method because participants provide a wide array of perspectives that go beyond the researcher's knowledge and skills. Further, as a form of research, narrative collaboration occurs when the interviewees together define and describe their observations or experiences (Warren, 2002). Also by way of narrative collaboration, the participants' perspectives are woven into the construction of this thesis. Creswell comments, "We talk about our experiences in conducting the study, and how they shape our interpretation of the results. We let the voices of our participants speak and carry the story through dialogue…" (Creswell, 2007, p. 43).

A total of twenty-four spectators were interviewed for this research. They ranged in age from nineteen to sixty-years of age. They were of various levels of education, cultural backgrounds, economic status, and profession. The interview brings nuances of social relationships forward – sometimes spontaneously.

Before I detail the interview methods I used, I will briefly describe the study protocol involved in my research approach in order to further contextualize my methodology. My study protocol involved two distinct study groups: artists and spectators. The decision to create two separate groups was made in response to validity concerns as discussed above. Information and data were gathered from these groups, who each had experienced the same event. This provided two different perspectives – that of artist-participant, and that of community participant as spectator. Desiring to elicit new and unexpected information from the artist-participants, I had to first subvert each artist's habitual practice methods. The artist was requested to reposition and re-orient their work in an outdoor natural setting as opposed to the use of a typical indoor setting such as a gallery. The subverted practice methodology created an immediate challenge and gave rise to a myriad of characteristics (as noted in Section 5.0) that might not have emerged from observing habitual practice.

Because the traditional exhibition paradigm was subverted from indoor gallery or concert hall environment to outdoors, it was axiomatic that the spectator was positioned outside of the typical role of an immobile audience member. The spectator served in two roles: one of an emancipated audience member, (mobile and free to walk and move around and be immersed within the natural setting/performance space)[14] and two, as performer/informer during video-taped interviews and group discussions. Because the natural setting was an event place that subverted stage or gallery, it became a place of "theatrical mediation." Drawing briefly upon the writing of Jacques Ranciere, the positioning of the spectator in such light re-affirms the spectator and "involves an idea of

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[14]   Ranciere reminds us that theatre is the place where the spectator remains immobile and passive when restricted to traditional seating and becomes an "active participant" as "opposed to passive voyeurs" when removed from the traditional position of strict observer. Ranciere promotes that it is in the abdication of the very position of viewer, that theatre becomes an "exemplary community form" (Ranciere, 2009, pp. 2- 5).

community as self-presence, in contrast to the distance of representation" generally found in traditional settings (Ranciere, 2009, pp. 5-6).

The artist study group consisted of five interdisciplinary artists who have a distinguished background as electronic media artists. Their work includes video and sound production within their artistic practice. In order for an artist to be selected, a level of professional expertise was required.

The research process consisted of two interview cycles. The first was a private pre-event interview with each person. I also separated the two participant groups (artist and spectator community, respectively) during these pre-event interviews. Each participant was asked the same three questions during pre-event interview regardless of whether they were artist or spectator. While artists were introduced to the research and given an orientation of the LocoMotoArt system, spectators received only a research overview. The pre-event interview included asking each participant to define "nature" and "technology." Further, they were asked to comment and give their opinion as to whether they felt it was or was not possible for humans to have an experience of sensorial engagement with the natural realm through the use and experience of digital technology. As their answers emerged, depending upon what was said, the interview questions became more in-depth if warranted, in order to lead to more discoverable information.

To compliment the pre-interview process the two groups were given separate questionnaires. One questionnaire, titled *Device Use,* asked the artist or the spectator to note the amount of time they generally spent using a particular digital device, and whether it was used at work or at home for pleasure. The artists were given an additional questionnaire to fill out, entitled, *Artist Questionnaire #1: Background and Experience*, which asked them to detail their arts practice and expertise. Because of existing relationships between some group members and me; it became obvious that a distance between me and the subjects was required. I quickly responded and established this necessary distance during the first set of pre-event interviews.

The second interview process was post-event, where a collective approach was used. Post-event interviews were conducted as an open group discussion. While the

artists were present during the spectator's post-interviews, the spectators were not present for the artist post-event interviews. Artist interviews were done separately in the first instance because of the specialized nature of the questions regarding the use of the system, and in the second, to avoid any temptation to "perform" on the part of the artists.

There were several elements that made the group discussions informative, such as the spectator's prior and current knowledge of the art form, or spectators who are also practicing artists of the art form, or people who had already experienced a particular artwork in a gallery setting and then experienced it repositioned in outdoor setting. From their various perspectives, other members of the group would either agree or disagree with comments made by some. However, when an individual's description or interpretation was debated by others in the group, it did not prove problematic during analysis; rather it informed the research. During the group post-interview cycle my role as researcher was well established in the minds of the participants.[15] They were eager to share their impressions, both positive and negative.

4.3. Field Work

As noted in above in Section 4.1, the primary purpose of my field research – the development and implementation of the LocoMotoArt system – was to support my claim for the existence of the HTN triad-relationship, and show that such a relationship can be revealed through the practice of new media art in natural settings. Rich results were produced in the field work. This research was distinguished from that done in other, more controlled, locations in that the natural setting became, in a way, an active participant, an agent within the research. Field work, according to Wolcott, is research that takes place outside the controlled environment of a laboratory, or other controlled indoor space (Wolcott, 1995, pp. 63-66). Such settings could be indoor settings, but are essentially removed from the researcher's place of research. Further, field work is

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[15] I purposefully oscillated between interviewing participants, completing that task, then socializing and serving dinner to them, then appearing to be a spectator, yet I was distanced in observing them, and finally, reverting back to researcher to ask them post-interview questions. I conducted all the interviews, I interacted with the participants regarding signing of ethics consent forms, and I cooked and served a gourmet meal prior to each artist-event in exchange for their time and effort.

defined by the intent behind it. Wolcott further defines field work as "...[a] form of enquiry in which one is immersed personally in the ongoing social activities of some individual or group for the purpose of research" that is validated through "the requisite reporting and results from it" (Wolcott, 1995, p. 66). Field work requires building trusting relationship with those being studied. Being honest, friendly, caring, and having sensitivity are important (Butler-Kisber, 2010, p. 30), because the field researcher "is the mediator of a relevant social-psychological science" (Bouchard, 1976, p. 368).

Field work should include planning to make time for observation and data gathering. Having more time to spend in the field gives rise to opportunities for a broader range of interactions to occur and thus reported. Such opportunities can take the form of unexpected interactions from outside external sources. Planning time may include the duration of the immersion of the researcher within the social environment of the participants, or anticipating the effects of unexpected conditions within the field environment itself (Creswell, 2007). Events can change quickly in the field. Within this iterative quality of field work there are other challenges such as managing field texts and documentation, field memorandum, as well as the demands of multi-tasking, timeliness of transcription and the analysis of field data.

There are several characteristics associated with field work that are challenging for a researcher. Thomas J. Bouchard Jr. informs us that these are "intensity, range, frequency and duration," which are considered boundary factors (Bouchard, 1976, p. 364). Bouchard also states that there are "symptoms" associated within the field characteristics, such as natural time constants critical to the outcome of particular manipulations; natural units of behaviour occurring in conjunction to environment; and complexity, as in open and dynamic settings (Bouchard, 1976, p. 365). He states that there are two final factors: setting effects (diversity of outcomes) and representativeness (clear observation of an expected effect on the field, not to be missed), that must be considered.

The five artist-event projects took a total of nine months to conduct. Each individual artist project varied. There were repeated field visits with the artists. Through repeated field visits, information emerged that would not otherwise have done, had I relied solely on the short interviews and questionnaires. Each artist responded differently

to the field work aspect of the research. Fruitful social and environmental interactions between researcher and artist occurred; some positive, some negative, and both inform this thesis. Also, the hours spent on the field with artists yielded opportunities for unexpected interactions.

In comparison, time spent with spectators rarely exceeded one hour of personal attention over a five hour observation period. It was not necessary to spend an extended period of time with the spectators because their role was different than that of the artists. The role of the spectator was to provide pre-event and post-event responses related to the artist event. I adhered to a framework of "constant comparative inquiry" (Butler-Kisber, 2010, p. 46). Constant comparative inquiry speaks to the credibility of the interpretation and writing of the researcher of events that occur on the field (p. 46), and is implemented to arrive at commonalities, similarities, patterns and themes, all of which reveal shared understandings across experiences as they transpire on the field (p. 52).

Direct observation during field work can be demanding. A lot is happening and it becomes necessary to detail a variety of elements and preserve the moment. Therefore, documentation methods such as using video and photographic or sound field recording to document, is essential in field work. Further, the researcher can meet any discrepancies that occur between the participant's perception and that of the researcher's. For my study, I documented the interviews of all participants, pre and post event. Additionally, I documented the actual artist event itself as it occurred. This method of documentation helped me revisit the event and assisted me in contextualizing the participant's preconceptions and notions about nature and technology. I summarized the transcripts of the spectator's description of experiences of the artist event in greater depth. Therefore, I did not rely solely on immediate impressions or memory of events. I also wrote field memoranda immediately after the field work session.

Field work with each artist had to be scheduled and generally consisted of three to four field visits, each consisting of approximately one to three hours. The artist had to be willing and able to proceed despite the potential obstacles of a natural setting and the limitations of the equipment. Finally, the artist needed to demonstrate a final work as an event within the natural setting.

The second study group was comprised of individuals who were invited to participate as spectators. This was not a controlled effort and there was no specific requirement to be a spectator. Essentially, anyone who volunteered to make the time to attend and consent to participate was accepted. During each artist-event, the spectators were treated to a dinner. I therefore limited the number of attendees for each event to no more than fifteen people. This was done so that the case study was manageable in terms of both time and cost. During the work with the Vancouver artists, I also incorporated one to two research assistants to film and record the events.

It is worth noting that there were familiar and therefore converging relationships existing within the participant pool. For example, not all of the participants were complete strangers to the researcher. The artists were all known to the researcher. However, many of the research spectators were friends of the artists and not known to the researcher. However, some spectators were friends of the researcher, while some were friends of both the researcher and the artist, while others were strangers to the artist and researcher alike. To account for this diversity, as researcher I established a form of distancing during the interviews and attempted not to be too familiar.

I also chose to incorporate the process of a focus group. On July 8, 2011, prior to beginning the research with four of the Vancouver artists, sixteen people attended a workshop given by Graham Morfitt of Modern Outpost, Ltd., the solar and power consultant associated with this research (Modern Outpost, 2012). The workshop was set up primarily for the research artists to test and learn about the enhanced power module of the LocoMotoArt system. However, other artists and environmental activists were invited to attend as additional participants. The details of the workshop are not discussed here in detail, however; it is worth noting that questions about whether both art and nature could be incorporated, and the ethics of technology in natural settings, emerged from the conversation.

4.4. Participatory Observation

The incorporation of participant observation can be a strong component in research. Further, long-term participant observations yield more complete data and

different kinds of data because the sustained timeframe gives opportunities for more detailed documentation of the events (Maxwell, 2005, p. 110). Using participatory observation as a method is not without its challenges. For example, there is the "potential deception of the people being interviewed" or the complex task of managing the variety of impressions (Creswell, 2007, p. 134). However, it is important to realize that truly independent observation is not possible (Midgley, 2000, pp. 7-8).

The role of the researcher in the act of observation is an important consideration within the method of participatory observation. There is the possibility for oscillation between the researcher and those being researched. Therefore, the researcher must be sensitive to moving from one role to the other and also know how to look at the broad picture, or have the ability to shift to a narrower one. This is another reason why video and sound recording documentation is important; it becomes an observational tool.

4.5. Grounding Aspects of Reporting and Researcher Interpretation

To ground the variances and complexities of the five artist-projects, I will briefly address the following for clarity and uniformity of reporting.

- "Artist Project," which gives a description of the artist's project including photographic documentation;
- "Pre-event Interview Biases of the Artists," indicating any bias that emerged from the interview data;
- "Field Work," with the artist;
- "Overview of the Post-Interview spectators;"
- "Spectator Experience," which is a description of the artist's event;
- "Overview of the Post-event Interview Artist;
- "Overview of the Post-event Interview Spectator;" and
- "Research Interpretation."

Within each of the sections, I address the following:

- Reporting on contributions made by the artist in the way of suggestions, ideas, and the introduction of new artifacts into the LocoMotoArt system.

- Description of unexpected phenomenalogical experiences that emerged and how they inform the research.
- Spectator reactions and descriptions their phenomenalogical experiences related to the artist event.
- Reporting of the artist's explanations to the challenges and what solutions were taken, if any.
- The artist's reaction to the approach of repositioning and reorientation of their artistic practice.
- The artist's use of natural setting in context to their piece.
- Statement of why the artist stated chose to stage their event in a particular landscape or place.
- Affect the natural setting had on the spectator perspective of the artist's event.

Within the Researcher's Interpretation, I address the following

- Changed perspectives regarding assumptions and patterns;
- Significant differences or similarities between artist-projects that inform the thesis;
- Findings which support the hypothesis of a sensorial awareness of the existence of human-nature-technoogy interconnectedness – the HTN triad-relationship;
- Significance of unexpected phenonenological events and responses.

4.6. Research Website

There is a research website at www.locomotoart.com. This website promotes the research and promotes the various events and research contributions made by the participant artists. In addition to the home page seen in Figure 4.6, the site profiles each artist's project on their own page. Bunker and Koesters are under the "*Hawai'i* Project, and videos of the *Kaumana* Cave experiments are there. For the remaining artists, their pages exist under "Vancouver Projects." There is a section for conference papers, pending events, and contact information. One of the future goals is to invite others who
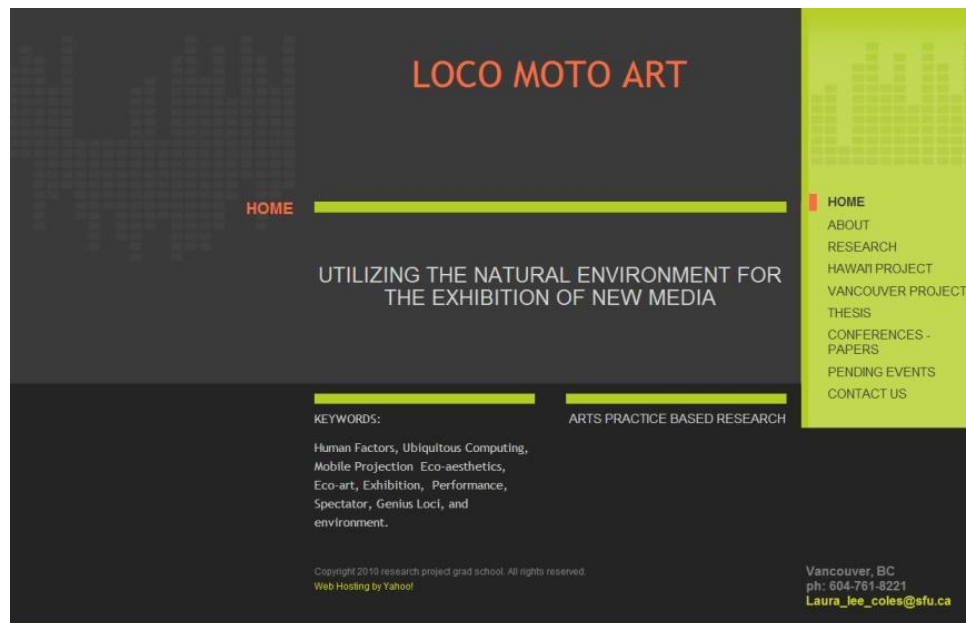
Figure 4.6.   *Homepage website www.locomotoart.com*

are working similarly to upload information about their use of digital technology in natural setting, to create an artist archive of such works.

4.7. Analysis of Data

Analysis of the data was restricted to a review of the transcription of audio from the various interviews and field study documentations. Coding was not done due to time constraints. Instead, I conducted in-depth general analysis of those transcriptions, and relied on my insight, awareness, suspicions and questions. I made word clouds of the words used by the spectators and the artists to visualize what was said within the descriptive language and thoughts of artists and spectators. The word cloud created from the focus group session is seen as Figure 4.7.

Figure 4.7. ***Word Cloud of Focus Group session.***

Because this research is also based in phenomenological enquiry, I used the following analytical steps: I highlighted significant statements within the transcripts, both positive and negative, I noted specific physical occurrences and actions such as weather conditions, shifting behavior, responses to obstacles to limitation and challenges of the natural setting, or the equipment, and highlighted biases that were voiced or observed as body language, emphasis in the tone or inflection of the voice, whether the interviewee challenged or opposed to others statements. For the purpose of this research, I use the word bias to denote a person's particular inclination or preference. I am interested in the preconceptions or entrenched attitudes that might permeate their responses when defining nature and technology as it relates to my research. To uncover potential biases or predispositions towards a particular definition, I asked each participant to tell me their definition of nature and technology pre-event, and measured it against their response post-event regarding their comments about the HTN triad-relationship.

I also specifically looked for similarities, comparisons and contrasts among the five studies and noted them because they articulate the findings and thus inform the report (Creswell, 2007, pp. 170, 180, 184-187, 189, and 243-244). Further, any unexpected encounters while on the field were openly accepted.

When one is implementing interpretive and phenomenological reporting it is essential that sound validation strategies be used to meet challenges. The strategies I incorporated to ensure reliability were as follows: 1) being persistent during observation on the field yet removing myself from the activity; 2) use of multiple sources, that is using two study groups comprised of several individuals; 3) I took some of my ideas and created a focus group of artists, graduate students and professionals with expertise in new media, environmental art practices, and solar energy power systems for feedback; 4) I showed writing samples and talked about concepts and ideas I was formulating, including introducing my claim to David Abram when I met him in August 29, 2011; and 5) I considered and welcomed evidence that was disconfirming, or negative and actively sought participants for the spectator pool who could provide contrasting points-of-view.

Within the concept of a synthesis of validation perspectives, I used consensual validation by seeking the opinions of others. This is evidenced in the interview process I implemented and also achieved during group post-event interviews where I sought participant's interpretations and observations. Additionally, I relied on "substantive validation," that is, deriving understanding from corroborating evidence from and between the multiple sources (Creswell, 2007, p 206). This is achieved by looking at the transcripts for comparisons, patterns, similarities and dissimilarities as noted in Section 4.3. *Field Work.*

4.8. Validity Challenges Regarding Bias and Deception

Intentional deception by the researcher is unethical and has potential to taint research results, thereby exposing conclusions to challenge and attack. In regard to my research, I decided not to mask or withhold information from participants in the study; rather I embraced them as collaborators in exploring my hypothesis. However, in these circumstances there is potential for respondent deception, which may lead to unwarranted conclusions. Researcher inexperience can also unwittingly weaken research results. To address these potential concerns, I utilized an interview method from the realist standpoint in which data is considered evidence. I moved away from the positivist view and chose instead to frame my interview questions within the realist domain. Within the realist domain, the interview or research questions are established to

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"test ideas about the existence and nature of the phenomena" being studied. From the realist standpoint, I drew conclusions as to whether the hypothesis set forth in Section 2.6 Research Question could be realized. Also, within the realist approach, *data* was considered *evidence* (Maxwell, 2005, p. 73).

I remind the reader that the interview and the questionnaire were primary sources for data collection because my research design was steeped in phenomenological reporting (as discussed in Section 4.3.8 – Analysis of Data. The realist approach is not without risks. Maxwell notes that influence of researcher assumptions and reliance upon "inference" can also lead to "unwarranted conclusions" (Maxwell, 2005, p. 73). I remained mindful of such concerns in order to insure the validity or legitimacy of the interpretation of data, and my interview and questionnaire methods were designed to address the potential for unwarranted conclusions.

Being mindful of my inexperience, I employed careful planning in the design of my research model. Because I draw conclusions from the interview transcripts based on the feelings, descriptions, and beliefs of the research participants, I initiated the following steps to reduce reliance on inference and to ensure integrity of the findings:

- I obtained informed consent. Participants were given a description of the intent and purpose of the research in a consent form, which they read and signed;
- I obtained responses during the pre-event interview phase, including the participant's own definition of key words;
- I asked all participants to describe their own experience of the artist-event, or situation-based phenomena.

It could appear that I asked a leading question by requesting research participants to comment on my hypothesis in the pre-interview phase. In defence of this I turn to Kvale, who informs us that there is a sound alternative view regarding such questioning in research. "The interview is a conversation where the data arise in an interpersonal relationship, coauthored and coproduced by the interviewer. The decisive issue is not whether to lead or not to lead, but *where* the interview questions lead, whether they lead in important directions, yield new and worthwhile knowledge" (Kvale, 1994, p. 156). Further, Kvale states that "hypothesis testing is not a necessary part of interview research, but it may take place," and "the interviewer's questions may be

designed to test a hypothesis, with interplay of counter questions, leading questions and probing questions and so forth." This alternative is becoming accepted in qualitative research, and "it seldom follows a linear route from hypothesis to data collection" (p.160).

Further, in qualitative research a researcher can legitimately gain support from participants when the researcher conveys openly "the purpose of the study" because this action does not "engage in deception about the nature of the study" (Creswell, 2007, p. 142). However, as mentioned above, there is potential for participant deception, that is, deception on the part of the interviewees (Creswell, 2007, p. 134). Participant deception, either intended or unintended during the interview process, is not uncommon in marketing, social or psychological research. For example, there is the tendency for respondents to acquiesce, or give what is termed a "socially desirable response or SDR" (Nancarrow & Brace, 2000, p. 1). SDR occurs for two reasons, either by way of personality trait, or because of the demands of a particular situation. However, Nancarrow and Brace conclude in their article, *Saying the "right thing": Coping with Social Desirability Bias in Marketing Research,* that: "Finally, there appears to be no certain way of totally eliminating or circumventing socially desirable responding if a question is thought to invite this type of reasoning. The problem may be reduced in certain situations, but there is no way of establishing how much has still taken place" (p.5).

Further, even if a research environment is "well controlled," deception cannot be perfectly eliminated. One way to distinguish factual from non-factual responses is to check whether the "self-report" matches the observed behaviour. According to Bond and DePaulo, "people are not accurate at detecting deception," and "vary in the ability to detect lies" (Bond & DePaulo, 2008, p. 477).

The purpose of the interview was for obtaining interviewee descriptions of their experiences of the artist events *in situ* so that I could interpret them in relationship to my hypothesis. To the extent to which I was able to determine, the research participants answered honestly and openly, and there was no intended or perceived deception. Hence, I assume that their responses were dependable and trustworthy. Many of the participants had strong personalities, and within the post-interview phase would say

openly if they disagreed with certain statements of others. I did not observe that anyone was easily swayed.

By asking the participants to define the words "nature" and "technology" prior to them experiencing any other research activity, I was able to gather factual information regarding their notions, attitudes and beliefs about these subjects in advance. I also gathered factual information post-event, and compared this to the previous information on attitudes and beliefs in order to determine changes in these (Nancarrow & Brace, 2000, p. 2). However, participant social deception or SDR can occur because of two factors. The first fact occurs, as "self-deception," where "the respondent actually believes a statement to be true of him or herself, even though it is inaccurate." The second factor occurs, as "other-deception," where the respondent seeks to avoid evaluation and purposefully misrepresents the truth (Nederhof, 1985, p. 264). From reading the interview transcripts and through my observation, I do not believe that participants engaged in SDR as they were interested, informed, engaged independent thinkers. I rely upon the mutual trust factor established between myself as researcher, and the responding participants. According to Nederhof, in his article *Methods of coping with social desirability bias: a review*, published in 1985; there are methods to prevent "social desirability bias." These are described as: forced-choice items where subjects are made to choose between two items relating to different topics; randomized response technique, which allows subjects to answer one of two randomly selected items, not knowing what item was answered; and self-administered questionnaires. Of these I chose to incorporate the self-administered questionnaire, adapting this to discover participant familiarity with and use of digital technologies to date.

Finally, in support of my interview methodology I turn to Kemmis and Tagart who talk of Habermas's argument that it is only through "communicative action that legitimacy of the information or data is guaranteed." The means towards accepting responses as truthful is found when people decide for themselves, as in the following:

- What is comprehensible to *them* (whether in fact they understand what others are saying)
- What is true in the light of *their own* knowledge and in the shared knowledge represented in the discourse used by members

- What the participants *themselves* regard as sincerely and truthfully stated (individually and in terms of their joint commitment to understanding)
- What the participants *themselves* regard as morally right and appropriate in terms of their individual and mutual judgment about what is right, proper, and prudent to do under the circumstances in which they find themselves (Kemmis & McTaggart, 2005, p. 577).

My qualitative research plan included arts-based research and responses based in common ordinary speech. With an emphasis on conversation and interaction as "communicative validity", this methodology purports to investigate without misrepresentation. Qualitative research interviews and interpretation are considered invalid if no numbers result in the measuring "of what we think we are measuring" (Kvale, 1994, p. 166). It follows that in cases where we can measure change, or "what we think we are measuring", then such research becomes valid, and that it "suggests [an] alternative context for understanding the validity of social research" (Kvale, 1994, p. 168). From my research, results did provide numbers, that is, three of the six artists reported changes to previously expressed scepticism, and three of four spectators who had not considered the hypothetical questions plausible, changed their point-of-view during post-interview, with one of the three spectators defending her changed notion within a group of eight individuals. While a small study, these numbers indicate a valid measuring of the research problem and more than just corroboration amongst participants.

Finally, I will reaffirm that this thesis work employed arts-based research, not scientific quantitative research, and therefore it would be inappropriate to impose the same criteria that which defines conventional experimental research. Such criteria are inappropriate in a phenomenological based inquiry such as this. While such a qualitative inquiry is an alternative form to scientific study, all intent and purpose remains scholarly (Lincoln, 2005, p. 171).

4.9. Anticipated Challenges

Several arguments against the notion of the existence and/or the value of the HTN triad-relationship as I have expressed it are possible. While I cannot address all potential challenges, the following conversation anticipates some of these.

A challenge may be as simple as a declaration that that such a relationship does not exist, and cannot be proved. Resistance may also include scepticism as to the worthiness or benefits that the HTN triad-relationship might hold for culture and society. Another potential challenge is that such a claim cannot be declared valid because the methodology used in this research was not that of a scientific empirical study, and indeed, I have not provided empirical equations to establish my results scientifically. Further, critiques as to the ethics surrounding the use of projection and technology in natural settings also emerge.

I will address these possible challenges, providing historical and rhetorical examples in support of my arguments. Although conclusions of my research may face other challenges, for example, by cognitive and perceptual scientists (and I agree that future and further study by these scientists may be warranted); I will not be addressing these challenges here.

First, I will address the argument against the use of the metaphysical empirical form of research (in this case, arts-practice-based research), by claims that the scientific form is the only form leading to legitimate "empirical knowledge." The argument that the metaphysical form is not reliable falls flat simply because not all issues, conditions, or situations being studied require a scientific approach to garner sound results – and, as Aristotle would have it, within basic logic there are no absolutes.

Any insistence that the scientific empirical form is necessary to prove the results of my research is moot. I have concerns that researchers who rely heavily upon the assumptions embedded within the scientific empirical method have a deep and unacknowledged pre-existing bias. I am not alone in these concerns. Many have noted that the scientific empirical model comes with its own biases. As scientist and theorist Rupert Sheldrake reminds us, "Contemporary science is based on a claim that all reality is material or physical." He adds that the beliefs and assumptions embedded within modern science as practiced "are powerful, not because scientists think about them, but because they don't. The facts of science are real enough; so are the techniques that scientists use, and the technologies based on them. But the belief system that governs conventional scientific thinking is an act of faith, grounded in a 19th century ideology…

Believers are sustained by the faith that scientific discoveries will justify their beliefs" (Sheldrake, 2012, pp. 6, 7 and 9).

While there remains a common bias against results gleaned by the metaphysical form of empirical study, Sheldrake notes that "Despite all the achievements of science and technology, materialism is now facing a credibility crunch that was unimaginable in the twentieth century" (p. 9).

I submit that attacks on knowledge gained through metaphysical empirical methods of study are essentially indefensible, not only because in the first instance these are themselves based on a dogma, or faith-based ideology, as noted above, but also because when and where the implementation of qualitative methods leads to the discovery of valid, confirmable, and measured results, those facts hold their own weight and can also lead to new understandings, and thus, knowledge gained. To propose an analogy, scientific elitists do not walk around wearing the costume of 16th and 17th century thinkers, so they should stop characterising their arguments in such dressings. It is just as out-of-place and awkward in the 21st century and the current digital technological paradigm to think in such fashion.

Second, there is the potential of a challenge levied against the use of interpretive analysis. I spoke of this in detail in Section 4.2, but I will respond by repeating that careful attention was paid to the research design and implementation of data gathered in my studies. Further, a personal sense of research honesty and ethics was adhered to throughout. While this alone should suffice to counter this challenge, I also point toward the fact I recorded measured changes from pre-interview and post-interview phases. These changes, albeit a small example, none-the-less presents a *prima facie* case for the HTN triad-relationship; that is, the results speak for themselves. Please see Sections 5.1 through 7 5.7.6, for detailed findings and discussions and again in Section 6.1.5.

Without entering a lengthy discussion and defence of arts-practice-based research in particular, I offer the defining comments of Dr. Tim Collins, Professor and Acting Head of Research at the Glasgow School of Art, who has specifically researched and written on the topic:

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Art research is creative inquiry in relationship to society, disciplines and subject experts. It is defined by its interrelationship with those similarly engaged on common topics. The product of art research is unique but intellectually transparent. Aspects of the work are imitable, applicable or replicable by individuals beyond the primary author. It results in material/performative and intellectual contributions to knowledge. (Collins, 2012)

Regarding the HTN triad-relationship, there have been extensive studies on biophilia (Wilson, Ulrich & Orr, 1993 in Kellert, (Ed.) and research on the benefits of technological nature compared to actual nature experiences, (Kahn, et. al.), which reveal there is already a strong basis in support of the existence of the HTN triad-relationship. For additional discussion in support of this, please refer to Sections 2.3, 2.8, 2.9, and 6.1.5 as well as additional comments and observations made throughout this document.

Regarding the use of technology in nature, and in further support of the HTN triad-relationship, ecoarttech shared with me observations from their work dating from 2005 to present day, regarding audience reactions to the use of technologies by artists in natural settings. See section 3.1.2 for a detailed account of the three artworks I incorporate herein.

A third challenge confronts the claim that digital technology provides a sense of reconnection to nature, or a sense of interconnectedness between humans, a man-made object (digital artefact) and the non-human realm, nature. How can the lacuna inherent in technological mediation possibly be bridged when there remains a wide belief that our digital technologies are taking us further into a disconnected state from the natural realm. I have addressed such concerns throughout this document for example, (See Section 2.3), where I discuss the intertwining of humans, their technologies and the natural world; Section 2.4, and Chapter 5, where independent observations by others about their practices are incorporated in support of my claim.

While the sense of the existence of HTN triad-relationship may occur only momentarily, and obviously not everyone senses it at the same moment, there is evidence that this sense is a reproducible condition. My research and analysis reveal that the testing for the HTN triad-relationship is reproducible within a variety of situations using technology in natural settings. A larger study is warranted to find deeper meaning within the human capacity to recognize the HTN triad-relationship and how changes in

the brain, based on use of digital technology, may be contributing to this sensed relationship.

Finally, I address the anti-technologist sentiment. It is worth noting from the beginning that the assumption of an unbridgeable nature-technology divide, whether argued from the position of technophiles, or the position of technophobes, rests on a similar premise of divisiveness. On the one hand, we have a group who supposes that humans and technology belong together, on the other, a group that insists that humans (and not their technologies) are a part of nature. The two groups agree, however, that on the idea that nature and technology; we are inherently at odds.

The anti-technology sentiments found in contemporary culture are similar to the sentiments found in romantic idealism, as discussed in Section 2.1. Similar to the 19th century "Romantics" who were appalled at what they perceived as the excesses of technology and its impacts on the natural world, workers a century later took a stand against the effects of technology. Referred to as "Luddites,"[16] rather than being against technology per se, they were against the effects machine technology represented, such as the replacement of humans by machines. The term "Luddite" has come to be commonly used to identify someone who does not understand, engage with, or support, technology and technological innovation. In contrast to the Romantics, the Luddites were primarily concerned with the loss of their traditional livelihoods and autonomy, rather than the loss of natural beauty and the pollution of air and waters. And history repeats itself. In today's contemporary sense, the term neo-Luddite is being used to describe those who are against digital technology because it is perceived that it is a replacement of human to human interaction, or even a replacement for human-nature interaction. Drawn from the historical lineage of the Luddites of the 19th century, Steven E. Jones notes in his book *Against Technology: From the Luddites to Neo-Luddism* (2006). Routledge Taylor & Francis Group, New York and London, 2006, states that neo-Luddism is based on the idea that "technology is a powerful, autonomous, inevitable force…a force for destruction and the diminishment of humanity" (p. 23). A revival of

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[16] Established in 1811 to 1816, British textile workers of the early 19th century who fought against their redundancy created by the machine age, protested under the banner of General Ned Ludd, a fictional character who was created by activists of that period for symbolic means. The movement grew out of this original inception (Jones, 2006).

Luddism is often attributed to Kirkpatick Sale. In his book *Rebels Against The Future: The Luddites and their War Against the Industrial Revolution: Lessons for the Computer Ages* (1995)*,* Sales specifically cites as problematic a "high tech industrialism of ever-more complex technologies – computerization, robotics, biotechnology, artificial intelligence and the like" (p. 20). He mentions that neo-Luddites are frequently academic ecologists and active environmentalists, and broadly represent a "traditional biocentrism against the anthropocentric norm", resisting a "high-tech onslaught" (p. 20).

Such could certainly be the characterization of David Abram's position that nature cannot be successfully technologically mediated to the well-being of the human-nature relationship. However, I would argue that it is not technology per se that is against, or inherently separate from, nature – it is rather the manner of how the artefacts are used and developed. It is true that within the processes for development and manufacturing of digital artefacts, there is insensitivity to the natural world, which often times can be devastating by way of pollution and disruption of natural resources relied upon for livelihood of indigenous populations. I will not address the potent argument about the ethics of the manufacture of digital technology. However, I will say that the problematic aspects of our technologies do lie within the sorts of technologies we develop, and in how we choose to develop them, to use them, and how we engage with our technological selves. Our technologies can be seen as manifestations of, and in service to, a particular worldview - the mechanistic stance that also informs the empirical scientific model, as noted above in this section. So long as we continue to see ourselves, and our technologies, which are an extension of ourselves, as separate from an external nature – which is understood in terms of resource and dead material, completely lacking agency – then we will perpetuate dualism and be unable to even think or perceive otherwise. Our artefacts reinforce their ontological genesis. I refer once again to MacLuhan's comment that we are shaped by our tools as much as we shape them.

It is necessary to abandon the mechanistic view of nature, and human-nature dualism in Western culture as I have discussed in Section 2.1. As technologies came to be, and are, developed without consideration of the well being of the natural realm, a similar adoption of a form of the worldview of the industrial revolution is carried forward into 21st century realities. Such a worldview, based on outdated and easily challenged

thought processes – on "faith" as Sheldrake reminds us – is simply out of step with reality, and with new understandings. Hence, notions that technology must always be at odds with nature, and as such are to be feared, is much like the expressed 19th Century fear that moving at 15 mph on a steam locomotive would cause the engine to explode, and human beings to disintegrate.

I now briefly investigate the idea that it is not technology per se that is problematic by returning to my research on the development of technologies/tools for art-making in the Middle/Upper Palaeolithic period (See Section 2.3). To briefly reiterate, the coming together of "technical, social and natural history intelligence" brought us a "cultural explosion" out of which arose art-making as a means of navigating the new relationship of human to natural world and other beings, made possible by the technologies/tools created to realize this.

Our technologies are developed in accordance with our perceived needs and interests, in accordance with a worldview. Aspects of the worldview of our Chauvet ancestors may not be as far removed as the intervening time would suggest, nor are we so different from these people in the desire to make meaning of the world around us and express it through artistic expression and thus innovate tools to achieve that aim. The essence of this aim is contemporaneous, because it has never left the human condition. If our technologies, in the hands of artists, are inescapably a part of the human condition, then different, and new, technologies/tools can fill the same roles and needs within our cultures.

5. Five Artist-Projects

The future of art will manifest a strengthening of our relationship with Nature. We can rediscover a basic curiosity as to who we are, why we are alive, and where we stand in relation to the universe. (John K. Grande, 2004, p. 95)

5.1. Prototype Artist Study Ibon Mainar

As a prototype for development of my artist-study method, Spanish artist Ibon Mainar consented to being a participant in my research and responded to a series of questions as described in Section 4.3.2 of this thesis. His responses were used as a keystone to contextualize the various aspects of the other five artist-project studies. The following is extrapolated from his e-mails, where he answered the questionnaires and follow-up questions. This communication transpired via e-mail from January, 2011 through July, 2011.

Ibon Mainar's art practice is multifaceted ranging from drawing, sculpture, photography and video installation. Typically, he explores projecting images on alternative materials. Mainar "intervenes" his projections in landscape "to feel the feedback that doesn't happen when projecting in "other spaces." Influenced by the urban screenings of Tony Oursler and the work of Daniel Canogar and Jennifer Steinkamp, Mainar indicated to me that the use of surfaces in natural setting seemed like a likely choice for exploration within his artistic practice (Mainar, 2011).

Ibon Mainar presented *Proyecciones en el Exterior (2010),* in outdoor landscapes throughout the Basque Region as part of a grant for Visual Arts Development awarded to him by the Basque government, as seen in Figure 5.1. The outdoor projections use of projection techniques and maintained the spectacle experience of urban screening. There was no music or "performance" associated with the projection event. Mainar used the following equipment:

Figure 5.1.   Image of "Proyecciones en el Exterior" Ibon Mainar © 2010

- Christie Model LX650 XGA LCD Projector (6500 ANSI lumens and 2000:1 contrast ratio)
- Honda EU2000i Generator (CARB-Compliant)
- MAcbookPro Computer

Proyecciones en el Exterior (2010), was experienced by fifteen people, eight men and seven women between the ages of twenty and sixty. When asked about the response and comments of the spectators, Mainar indicated that:

Normally, people are very surprised. They see the projection far away and they don't stop searching until they find the projector in order to understand what is happening. They have curiosity. (Mainar, 2011)

However, no one commented to Mainar about their feelings or experiences. Neither did anyone mention whether they sensed a connection to nature and technology. Instead, they asked "technical questions" about how the projection was being done.

However, Mainar conveyed his perceptions in regard to his artistic process and experiences from using high-resolution projection in natural setting. Being from an urban background, he indicated he felt closer to nature during *Proyecciones en el Exterior (2010)*. "I feel very relaxed, like when I turn off all the equipment and again nature is

there, looking at you..." He further indicated that the experience lingered afterwards, and he felt "the necessity to do more projections." The use of natural setting is of interest to him as a visual artist because of the sense of intervention. Nature to him is a "place where you can feel really vulnerable. You are a guest there." But this intervention is not without concerns. "What do the trees feel when they are projected [on]? Do they start to photosynthesis? Is the projector's light harmful?" He also indicated that the bugs swarmed around when he turned the projectors on. Additionally, Mainar described his field system. He chose to use a portable generator as an independent power source, transported the equipment car to the various locations, where it was mounted on a platform. In using high-resolution projectors, he positioned the car at a distance of "60 to 70 metres."

For my research plan, each artist and their work was known to me and chosen for their professional expertise and knowledge of new media technology.

5.2. Artist-Event Project Overview: Phenomenological Reporting

Five artist-event projects were initiated to uncover assumptions and pre-conceived notions about nature and technology. From these artist-projects I used phenomenological reporting as a method as discussed in Chapter 4 - Section 4.3.8. I present each of these projects in chronological order just as the research evolved from project to project. Artists were used as practitioners, informers, creators, and experts, while spectators acted as informants. For my research plan, each artist and their work was known to me prior to the research and chosen for their professional expertise and knowledge of new media technology. The artists that comprised this research are: Anne F. Bunker (dancer, choreographer and creative director of OTO Dance and Gerald Chuck Koesters (musician, photographer, videographer and lighting and media designer), herein referred to as Bunker and Koesters; Dinka Pignon a video installation artist; Bobbi Kozinuk, a video, radio and interactive artist; Phil Thomson, a digital audio artist and computer music composer; and Dave Leith, a multi-disciplinary artist and sound art composer. Background information on the artists is found in Appendix A.

Figure 5.2 & 5.3.   Coastal fishing site outside Hilo, Hawai'i; View of section of coastal forest at fishing site Bunker and Koesters project

5.3. Artist-Project
Anne F. Bunker and Gerald "Chuck" Koesters

From December 9-19, 2010, the first prototype study of LocoMotoArt was conducted with Bunker and Koesters. For a period of ten-days, I was embedded in the artist's living environment and participated in every aspect of the research, though strictly as an observer, which was to say that the study was conducted as an ethnographic research study. Two technologically mediated studies happened at the end of the ten-day period: 1) a performance at night at a specific site in the natural landscape of a coastal forest; and 2) a series of small experiments in a lava tube cave.

5.3.1.   Coastal Forest Site Hilo, Hawai'i

The artists chose to stage a live technologically mediated performance in a forested area at the end of a road near the coastline of South Hilo, a route commonly used by local fishermen as seen in Figures 5.2 and 5.3. The performance took place at nightfall, so that the projections would not be washed out by light. Koester's used pho-tographs taken during previous field excursions, and manipulated the images using High Dynamic Range (HDR) techniques for image processing.

The spectators of interest in this study consisted of two nineteen-year-old males. Unexpectedly, one spectator indicated that he was educated at a private school that em-

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phasized a non-digital environment, therefore absent of the use of computers, cell phones, Internet and e-mailing. His current use of digital devices is extremely limited and he indicated that he uses an electric typewriter instead of a computer, and a cell phone for approximately ten minutes per day. I refer to him as the "non-digital user." 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 and uses the computer, e-mail, Internet, cell phone, and social networking on a daily basis. I refer to him as the "digital user."

5.3.2. Pre-event Interview and Biases

When asked if they thought that humans could use digital technology to experience a connective sense to nature, the artist and spectators voiced scepticism. 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 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 one spectator stated they used digital technology on a regular basis and considered it to be a positive influence on human factors, but emphasized the digital artefact should be used with restraint and not "takeover" a person's life.

All of the participants claimed not to have addictive tendencies towards digital technologies, and indicated they are attuned to natural settings, through hiking, camping, and trekking.

5.3.3. Field Work Bunker and Koesters

The artists used LocoMotoArt in the following settings: a lava field, on the beach near the ocean, inside a lava tube cave, at a grove of trees near a swimming area, and a forest near the coast on the Big Island Hawai'i. Bunker was observed immersing within the setting; picking up rocks, branches and other items, exploring them, playing with

them, rolling them around on the ground, climbing trees, rocks, swimming in the water. Bunker was primarily interested in the space and how it provided performance opportunities, while Koesters captured photographs of the surroundings for media creation as seen in Figure 5.4.

5.3.4.   *Spectator Experience of the Coastal Forest Performance*

Koesters played a dulcimer as live accompanied by recorded original music compositions. The recorded tracks were played back using a Tunebug Portable Surface-Sound™ Speaker and an iPod. However, Koesters also introduced a Roland COSM battery operated amplified speaker into the LocoMotoArt system. This provided a larger sound radius for the live dulcimer. 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 pico projector as a hissing crackling sound. During the performance a light misty rain fell (Coles & Pasquier 2011b, p. 3).

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

Figure 5.4.   Koesters working on the field.

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ground. Bunker used two projectors and layered projected images simultaneously, creating 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 and white clad figure, as though she was a projection screen. Bunker would occasionally shut off the projectors, retreat under a large black cloth, and discretely 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. The uncertainty of when and where the apparition would appear created a spontaneous dramatic effect to the performance. Because the spectators shared an intimate proximity to the artists, the stage area functioned as an immersed environment. Therefore, any limitations in the illumination of the projectors or any restrictions in the sound radius of the speakers, was overcome within this setting because of its intimacy (p.3).

5.3.5. *Overview of Spectator Post-Interview Forest Performance*

The spectators conveyed changed notions from their pre-interview positions, particularly the non-digital user. When asked to comment on the event and the spectator experience, the non-digital user commented, "Peaceful, nice." The digital user said: "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. The non-digital user said: "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." The digital user said: "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" (p. 3).

5.3.6. Overview of Post-event Interview with Artists and Spectators

The artists and spectators were utilized as human agency to inform the research; therefore, the criterion of bias was used to situate the discussion regarding their points-of-view. [17] I present two separate overviews for each artist project.

Artist-bias prevailed early in the use of LocoMotoArt. This took the form of not wanting to use the Apple Mac on the field for concerns that the humidity of Hawai'i would destroy an "expensive computer." Additionally, Koesters preferred to produce work on his own computer, a PC. However, as the artists used the mobile projectors during performance, they became more engaged with the use of LocoMotoArt.

Bunker indicated she was 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. (Coles & Pasquier 2011b, p.4)

5.3.7. Kaumana Lava Cave Experiments and Results

The second site, Kaumana Cave, is situated in the foothills above Hilo, Hawai'i. 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. The space did not have an echo and there was water dripping from the ceiling of the cave.

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[17] For the purpose of this research, I use the word bias to denote a person's particular inclination or preference. I am interested in the preconceptions or entrenched attitudes that might permeate their responses when defining nature and technology as it relates to my research.

Bunker positioned one of the projectors at an arms-length and pointed it at an angle from above, overhead, and she projected the HDR images and video footage onto her hand. The scene was observed as a hand or entity suspended in space creating an otherworldly or spectral figure, as seen in Figure 5.5 (Coles & Pasquier 2011b, p. 3). When Bunker moved the projectors along the wall, floor and ceiling of the cave, content became form (page 3). This occurred because the projected visual content combined with the material textures of the natural environment. The contours of the ancient lava rock, added a three-dimensional aspect and it appear in certain instances that faces were emerging from the rock. Like the camera, the Liquid Crystal on Silicon (LCoS) pico projector operated as a prosthetic extension of the artist's body, and provided the artist with an enhanced extension of sense of embodiment. In this embodied experience, while hand-held, Bunker transformed the pico projector as theatrical apparatus. The dark density of the cave functioned as a dark stage, and the positioning of the projector, created a technique found in traditional theatre scenography.

Figure 5.5.   "Hand of Fate" Kaumana Cave experiment with Bunker and Koesters

5.3.8. *Researcher Interpretation*

Despite the initial biases and scepticism of the artists and the spectators, both study groups reported 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 indicated promise that my hypothesis that digital technology may serve as unexpected sensorial pathway to interact with nature warranted further research. Although small in scale, this initial study provided insight that was important in the study of locative mobile projection because it assisted in understanding the human relationship to digital technology, which consequently informs design.

Through exploration, the human factor of body movement and gesture provided an interesting lighting effect of intermediacy (Coles & Pasquier, 2011a, p. 2). The experiments revealed digital artefact were used as theatrical apparatus. Further, the artists each explored new ways of seeing and understanding their art practice, both temporally and corporeally. It is from these new possibilities within artistic practice that emerging characteristics transform knowledge, and thus the artistic aesthetic experience (p. 2). Thus, these artists experienced a new sense of embodiment, extension of self and mobile projection as prosthetic.

Similarities, dissimilarities, contrasts, and other related aspects of Bunker and Koesters research contributions will be interwoven throughout this thesis as we discuss the other projects. As the first artist-project and field study, Bunker and Koesters provided a framework for discussing the iterative nature of the research process.

Further, this approach assists in grounding the complexities that emerge from the remaining artist-projects in a counterpointed manner, so that any empirical knowledge gained, can be presented as a comparison, opinion, or a claim in support of the thesis argument.

5.4. Artist-Project Dinka Pignon

On July 29, 2011, artist Dinka Pignon presented her video installation, *Water Words,* in an urban natural setting at Kitsilano Beach, Vancouver, British Columbia. She

Figure 5.6.   Staging site for "Water Words." Photo: Andrew Hawryshkewich

chose an area that "felt somewhat isolated and secluded" in relationship to the rest of the primary public area of the beach. Although framed by a cityscape, Pignon indicated that she chose this particular area because of several natural characteristics that appealed to her practice interests of manipulating perceptions and reality by projecting on unusual surfaces.

To reach the site, one must traverse down an embankment that has a steep incline. Once standing on the beach, the embankment forms a natural backdrop which serves to buffer the area from most noise and traffic. Also, when facing away from the cliff, the site is fore grounded by an expansive panoramic view of English Bay across the water, as seen in Figure 5.6 above.

As one walks down the beachhead away from the installation site, the embankment becomes a small cliff. There are various large to small trees, several species of natural tall grass, and a significant proliferation of blackberry vines that crown the top of the cliff. Also present are several large to mid-sized boulders Pignon chose to use as projection surfaces. The boulders become submerged in water depending upon the time of day and the tide level.

Water Words was accompanied by an original music composition by sound artist Dave Leith, who recorded waves splashing upon a particular location along Kitsilano Beach and re-imposed this sound by layering it within his composition. Leith played back

his composition at the site by using an Edirol R-09 field recorder through a battery-operated Roland KC 110 30 Watt powered amplifier, which has two 6.5 inch speakers and two tweeters. The Roland KC 110 had a considerable sound capacity for outdoor use. A similar device had been introduced into the LocoMotoArt system during the Bunker and Koesters artist-event project; it worked so well for outdoor playback, and was thus incorporated by Leith. Unlike Bunker and Koesters whose practice extensively includes site-specific work in natural landscape, Pignon indicated that she does not utilize the natural environment in her practice of exhibition. Instead as a video installation artist, she utilizes traditional exhibition spaces such as gallery, or indoor setting to display of her works.

5.4.1.   Pre-event Interview Artist and Biases

Pignon's initial reaction to LocoMotoArt was similar to that of Bunker and Koesters. She chose to work exclusively with the Aaxa P1 Jr. Pico projectors and edit from her home studio computer. However, while Bunker and Koesters captured media from the natural environment to create images to superimpose back in the same environment, Pignon did not create media from the field. Instead, Pignon chose the human form as her subject matter and decided to place that image squarely within the contours of the landscape of her chosen site. Similar to Bunker and Koesters, she used her own camera for recording video; however, these sessions were conducted indoors in a studio environment at Vivo Media Arts Centre, Vancouver, British Columbia.

At first, Pignon was uncomplimentary regarding the limitation of Aaxa P1 Jr., which has only a 10 lumen projection capacity. She referred to them as "nothing more than mere toys!" She expressed concern as to whether the projectors would work to her satisfaction to meet the artistic standards and integrity for public presentation. Given that Pignon works specifically with manipulating reality and perception, she is accustomed to using high-resolution video projectors with an intensity of 2500 to 6500 lumens. Therefore; what she perceived as limitations became mildly frustrating to her as she learned the system. It is worth noting that as part of the research, I purposefully did not have a written cheat sheet or guide explaining the equipment. However, manufacturer manuals were provided.

During the collaboration with sound artist Leith, Pignon deferred to his decisions regarding equipment. As made visible in the Bunker and Koesters project study, Pignon and Leith, gravitated towards using their own equipment also, even though LocoMotoArt provided equipment with similar capacity. Because the artists were put under several challenges, I can only surmise that this need to gravitate towards using their own equipment is to be expected.[18] Familiarity makes things seem less time consuming and simpler, therefore, frustrations can be minimized. It appeared that this choice was a natural reaction within the research, because they wanted their work and efforts to be an enjoyable and garner specific high quality artistic results. It is worth noting, that Bunker and Koesters, approached their project more as an "experimental observation event," rather than contextualizing as a developed art work (. In contrast, Pignon conceptualized and named her work specifically with the intent of maintaining curatorial longevity and reproduction qualities. In contrast, the live technology mediated event of Bunker and Koesters, was disciplined as a spontaneous and improvisational performance site-specific work. While the Bunker and Koesters event can be easily restaged or duplicated in concept and form; the outcomes will be different from the original. Even though the same competency of artistic merit exists, as in Pignon's work, it is steeped in repeatable live performativity.

Finally, it is notable that during the focus group discussion prior to the implementation of the artist's project event, Pignon emphasized her point-of-view:

I find it impractical to work with technology in nature. I think it is interesting what you said, about what am I am bringing to nature. I don't want to touch nature, and I was thinking about how art and nature are totally opposite, how nature is natural and art is artificial and has nothing to do with nature, and that's it. I don't know what I am thinking, but it's instinct, art is not supposed to mimic nature or to you know enhance nature, or bring it to nature.

5.4.2.   Field Work Dinka Pignon

An interesting phenomenon occurred during the final field excursion with Pignon. While Pignon was on the beach testing video media a few evenings before her event, as

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[18]   That is, pressure of time restraints, required to conduct work opposite to their arts practice comfort zone, technical limitations of the equipment, and the uncertainty of the natural environment

seen in Figure 5.7, several people suddenly appeared and interrupted the process and proceeded to describe what they were feeling and experiencing from viewing the work. I was able to gather several comments. One twenty-something male and his girlfriend explained that they had been walking above the embankment on the footpath and saw some light beams and decided to explore in attempt the source. This is interesting, because the footpath is a considerable distance from where the projectors were position and the Aaxa P1 Jr. has a very limited projection capacity with only 10 lumens. The young man indicated that upon first noticing the light, he experienced, an "unexpected intense feeling of curiosity and excitement." Another individual walked over with a group of friends, identified himself as a graduate student of a master of applied arts at Emily Carr University of Art and Design in Vancouver, British Columbia, and he offered his opinion regarding his immediate observation. This individual indicated that the site made him feel there as though there was a "blended interconnection between the media and the natural setting." He further opined that installations in natural settings should be done more often because it was "a good way to tell a story." However, while the student was commenting another individual (male 40-something), indicated that while he liked the projections, he thought it was "highly controversial to place projection in natural setting." He wondered what the comments would be from a person who is "First Nation" because "their perception of the world is based in oral tradition," and he was curious to know if they would think projection in natural setting was "appropriate."

Before Pignon left the site, two individuals [twenty-something males] wandered into the staging area and started to take photos with their smart phones of Pignon's media testing. One of these individuals commented that he felt the experience of seeing projection in natural setting would "stimulate people's awareness of natural environment." As a researcher interested in taking advantage of the gift of spontaneous spectator reaction, I continued to ask each new person who came to the site, their opinion on the notion that humans can experience a sensorial interconnection between digital technology and the natural realm. Remarkably, no one disagreed with this statement. In fact one individual remarked, "We use digital technology all the time, it is a part of us," thus, reiterating Bolter and Gromala (2003). These comments are assurances that several individuals find the partnering of visual and digital technology displayed in natural setting as normal, acceptable and exciting. The acceptance of this partnering may be a result of their openness to experiential relationships between digital technology and natural setting. On October 9, 2011, an on-line blog site, "Pico Projector-Info.com" released information regarding this project in a short article entitled, "New art projects use pico projectors to create projection installations in natural setting" (picoprojector-info.com, 2011). A Google search indicated that several such technology blogs repeated the information extensively such as "About Projectors.com" under the

Figure 5.7.   Pignon using the Aaxa P1 Jr. 10 lumen pico-projector during a
field test at Kitsilano Beach, British Columbia.
Photo: Andrew Hawryshkewich

heading, "Turning Rocks into Art with Pico Projectors" (aboutprojectors.com, 2011).

5.4.3.   Overview of Spectator Research Participants

For Pignon's artist-project event, there were originally nine spectator research participants and consisted of four males, ranging in age from early-thirties to late fifties, and five females ranging in ages from approximately early-thirties to late fifties or sixty-years-of-age. There were an additional six non-research participant spectators. One male dropped out during pre-interview, got agitated and left because he didn't like the language of the consent agreement regarding non-disclosure. Another element is that of the remaining eight participants, only one indicated that she did not subscribe to the notion that humans could have a sensorial experience of the natural realm using digital technology. This particular spectator, admitted to being a former computer programmer. She held a strong opinion on separating man and machine, which I find worthy to quote.

Spectator: I think the two are separate. Spectator is everything. It is everything around us and including us . . .is in constant communication. But to communicate you need a sender and a receptor, so communication is a tool, a two-way street…requires two so not to be isolated, not to be a dead end. So something that is digital to me is more of a one way communication, it is dependent on input and doesn't produce output unless there is a self-initiated communication. So if I am to personally define any sort of communication it has to self-initiate.

Researcher: So it needs humans?

Spectator: Yes….like many other people I took it for granted. The bottom line is it has to respond on its own in order to be considered an equal partner in communication. It's too dependent on too many things, like power for example. I just don't see it.

Researcher: By power you mean electrical power?

Spectator: Yes, electrical power. Without that it is all dead, without that power, they are just dead.

The explanation is in sharp contrast to the other spectator participants. When compared to the entire spectator pool, the other participants affirmatively ascribed to the notion of sensed interconnectivity. Interestingly, two individuals claimed to be

practitioners of the Wiccan[19] "religion," which was described as spirituality that embraces the natural realm -- the earth, plants and animals. It was my assumption upon knowing this about them that they would be opposed to the use of technology in natural setting. However, the opinions of the individuals who are Wiccan compared to spectators who were more technology users were similar.

5.4.4.   *Spectator Experience of the "Water Words" video installation*

Spectators sat and watched the sun set from a vista point above the beach before being led down to the site after dark. As the spectators came down the hill and descended on to the sandy beach, the first thing they saw was one large rock with a face of a man, eyes closed, as if sleeping. As they approached, only the sound of amplified waves splashing against the shore could be heard. At the instance that the spectators walked to the right, curving towards the installation site, two other rocks came into view. One with a man sleeping, and the other a woman, sleeping on her side as seen in Figure 5.8. The spectators could then see three human faces sleeping, which resembled heads floating upon the water. The spectators were free to walk around and view the projections while listening to the music composition. Some chose to stay in one location. The performance of the video took approximately fifteen minutes.

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[19]   Wicca is a modern pagan religion that promotes oneness with all that exists. It is a reconstruction of pre-Christian traditions originating in Ireland, Scotland and Wales (The Celctic Connection).

Figure 5.8.   *"*Water Words" *Photo: Andrew Hawryshkewich*

5.4.5.   *Overview of Post-event Interview Spectators*

A post-event interview with spectator participants was initiated immediately while they were still *in situ.* Spectators were asked two questions, "What did you just experience? And, what did you sense?" Each of the responses was detailed and lengthy, and most spoke to their immediate reaction, and their assessment as of the artistic strength of the work. A few of the spectator's commented on how their sense of aural reality was also affected because they were momentarily unsure as to whether the wave sound they first encountered was real or not. The type of comments that dominated the discussion:

Unexpected first reaction;

Wow;

Intriguing;

The technology was practically invisible;

Magic;

Usually you see in a gallery, but it is totally a different thing when projected into nature,

I wasn't even thinking about the technology behind it.

The less intrusive it is the less obvious it is, that it seems to be technology, then the more delightful it is.

Negative comments were not voiced. However, it is necessary to point out the comments of one of the Wiccan participants because it was unexpected that she would say the following:

I felt the technology enhanced my connection with the nature in terms of the environment….it totally worked. [20]

Two spectators remarked separately that they would have enjoyed the experience of the installation in a "wilderness" setting without the urban influences. These impressions are important to note because the original intent of the thesis was to take artists and spectators into a wilderness setting, but cost and time prevented it. I did not reveal this intent to anyone; therefore, their interest in this possibility was spontaneous and based upon their own cognition and sense of interconnection they felt during this experiment.

5.4.6.   Overview of Post-event Interview Artist

The artist provided comments regarding the challenges she encountered using the LocoMotoArt system, the Aaxa P1 Jr. projectors and in addition, her experience of having to reposition her art practice into natural setting. She noted the trials of figuring out the equipment, familiarizing herself to the various limitations and what kind of piece would be possible within the technical confines. She also reiterated that LocoMotoArt should come with a how-to manual. While this would be a welcomed element, I did not reveal to any of the artists, that the lack of information created a specific trait, which was deliberate. I kept this knowledge from them as it was not negotiable. Additionally, Pignon indicated that nature is always a challenge because you never know what to expect. In regard to a practice concern, for example, sound quality changes when played back in vast openness of the outdoors in contrast to sound played back on headphones or from speakers mounted indoors. She mentioned this was a technical consideration specific to outdoor natural setting. Knowing that Pignon had such strong opinions of the separation

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[20]   I refer the reader back to Section 4.3.2 *Pre-Event Interviews* to recall each of the spectators was asked to comment and give their opinion as to whether they felt it was or was not possible for humans to have an experience of sensorial engagement with the natural realm through the use and experience of digital technology. This particular spectator responded knowing that the research asked if such a sense was possible.

of nature, technology and art, during the focus group session, I asked her to describe how she felt about the experience of using digital technology in natural setting as opposed to indoor gallery setting.

Pignon: It felt incorporated with the environment. I didn't have a sense of, oh this is nature, this is technology, this is artist, this is audience, I think it felt like it all belonged.

Researcher: So you felt an interconnection with all of it?

Pignon: Yes I did. What I enjoyed here was the vastness of the environment, just open. I think the environment absorbed it or the other way around (or we did), it was a good fit so-to-speak.

5.4.7.   Researcher Interpretation

Interpretive ethnography methods were incorporated. Eight spectators were interviewed pre-event, and then asked to describe their phenomenological experience post-event, while *in situ.* From their comments, I find that the fixity and hierarchy of the indoor gallery exhibition style paradigm restricts the spectator's ability to recognize of the complex relationships between humans to digital technology, and digital technology to the natural world. Therefore, the repositioning of most electronic environmental artworks within a natural setting offers heightened ways of seeing, hearing and experiencing natural realm.

Through the experience of *Water Words* both the artist and spectators had enhanced and engaged experience of new media installation work in natural setting. Additionally, the spectators wanted to express their opinions and feelings about the experience through dialogue. I am of the opinion that their comments and impressions support and inform my proposition that humans can experience an interconnection with landscape and the natural realm through digital technology. It is within this new partnership of two existing natures that the HTN triad-relationship exists. Secondly, both the artist and most of the consenting research participants shared similar cognitions, in which they sensed that the use of the technology for *Water Words* was implemented expertly, and deemed un-obtrusive to the natural setting, as well as the invisibility of the

digital artefacts.[21] For the artist, the use of technology, enabled her to feel her piece was "absorbed" within the landscape, thus becoming one with it. And perhaps most significant is the realization that the repositioning or re-orientation of new media into a natural environment augments the representational qualities of the new media aesthetic. I make this claim because results from Bunker and Koesters and Pignon's artist project events give indication that there is value in artists challenging their traditional exhibition paradigm of indoor display through repositioning electronic environmental art works in natural setting. It is in the inclusion of the various sensual relationships that exist in landscape, which greatly enhance the overall experience for artist AND spectator. Such inclusions narrows the representational distancing that is symptomatic of electronic environmental artworks when exclusively exhibited indoors.

The significance in this particular artist-project event was that the artist used the natural setting and manipulated the spectator's perception of the reality of that landscape, both visually and aurally. Further, despite of limitations of the LocoMotoArt Aaxa P1Jr. projectors (10 lumens) the spectator was able to perceive the visuals clearly. Her original preconceived notion that art and nature are separate, were admittedly dispelled in relation to her experience.

The artist took careful considerations in positioning the spectator. This included the way and manner that spectators were lead to the installation; when and what point spectators would first hear and see the particular attributes within the installation; where the gaze of the spectator was led to a particular spot on the beach, and how the timing of the changes to the faces were reflected within the narrative of the installation. These aspects to influence the spectator's sense of perception were deliberate choices by the artist, which demonstrates her expertise to manipulate the temporal and spatial reality.

Commenting during the *in situ* post event interview, one spectator explained:

The three-dimensional aspect became real (with the rock) for me, and I saw the entire sculpture of the face in the rock face. It stopped being flat and became the nose and eyes sunken back and the nose coming out….I can't articulate it, but I loved it.

[21]   Reponses by spectators indicate they did not notice, or the fact that the projectors and sound speakers were visible did not affect their experience, because they commented that it felt as if it was a part of natural setting.

5.5. Artist-Project Bobbi Kozinuk

On the same evening that Pignon displayed *Water Words* at Kitsilano Beach, artist Bobbi Kozinuk presented a single channel video installation, entitled *Come Here.* Due to scheduling limitations, Bobbi was unable to use LocoMotoArt in the field, and therefore purposefully selected a work from her catalogue with the expressed intent to reposition it into the natural landscape of Kitsilano Beach. Kozinuk did not capture images found in the natural environment. Instead, she chose to use the image of a person and project that image onto the natural landscape, similar to Pignon, who also chose to project human faces. Bunker and Koesters on the other hand, chose to project images of the natural setting imposed back onto the actual natural setting from where the image was taken.

Come Here was installed at the top of a steep sandy cliff, surrounded by trees and other indigenous vegetation, such as tall grasses, and blackberry vines as seen in Figure 5.9, Left. Kozinuk indicated that she chose the site, because the physical attributes fit the work and enhanced the various perceptual elements inherent in the installation. There was a feeling of isolation due to the fact that the back end of the beachhead has a steep inclined embankment. The steepness of the embankment increases further down the beach. At the installation site for *Come Here*, there were groupings of boulders strewn and piled about at the foot of the embankment. These boulders are a natural barrier; and to get closer to the installation a person has to climb over the boulders, as seen in Figure 5.9, Right.

Kozinuk displayed *Come Here* using her own Epson 3500 lumen high-resolution projector, the iPod feature of her iPhone for sound and visual playback, and ran sound through the Roland KC 100 battery powered amplifier. To power the projector, Kozinuk opted to use a 300 Watt Nautilus marine battery and Samlex America Pure Sine Wave inverter, from the LocoMotoArt enhanced power field Module 2. Kozinuk concealed the equipment out of sight of the spectators.

Come Here was originally presented in a closet, where the door was partially open, but could not move. The spectator could not open or close the door. A figure of a woman in a white dress is floating, dangling, hanging, twirling from her body weight and motioning with her arms as she calls and beckons the viewer to "come here, come on! What are you waiting for? I have something to show you!" When positioned at Kitsilano Beach, Kozinuk projected onto a white bed sheet, stretched between two large trees.

5.5.1.   Pre-event Interview and Biases Artist

The pre-interview was conducted at the installation site a few days before the scheduled event. The artist had limited time to contribute to the research project, but was highly motivated to participate as an artist-research participant. Thus, she made a firm decision to pull a work from her existing catalogue and reposition it in a suitable section of the exhibition site. Kozinuk was originally motivated to use and experience the

Figure 5.9.
Left: Bobbi Kozinuk investigating potential exhibition site;
Right: Bobbi and boulders at foot of embankment.

entire power system in the field. Due to timing issues, she did not use LocoMotoArt on the field to capture or create media. Thus, there were no specific biases against equipment that emerged after orientation or during the pre-event interview phase. Further, I did not have an opportunity for repeated field observations with this artist, which is in marked contrast to the extended time on the field with Bunker and Koesters and Pignon.

Though not a direct bias in relationship to the use of LocoMotoArt, (which became a pattern), the artist didn't feel centered in the natural landscape immediately. Kozinuk shared her thoughts about being predominately "a city person," and deeply immersed in urban life where her sense of the, "energy of the city…is broken up." She further indicated she would have preferred the opportunity to get away and spend some time in a natural setting before initiating her artist-event. It was important for her to "be in nature" for an extended period because it takes a couple of days for the "city energy to be stripped away", and the "flowing" sense of nature to replace that "broken" sense. She further indicated she had come to the Kitsilano Beach site "searching for inspiration", to guide her as to what technological tools and artistic crafting methods she would incorporate to present her work.

Unlike the previous artists, Kozinuk was admittedly less talkative, and preferred to engage her mind-body sensibility silently, while actively making artistic decisions related to the site. Because she had been unable to get away from the city, Kozinuk revealed that her approach of being immersed at the site during field visits was necessary, "for me to try to make a connection with nature." She indicated she was able to do some kayaking around the area a few days prior to the event, in order to situate her feelings about the natural world from that experience.

Stimulated by the fact that the work was originally designed for traditional indoor display, and the decision to deviate from the original research plan, including the non use of tools and method, was a mild form of bias. Thus, the landscape strictly dictated how the artist developed the new spectator experience for *Come Here*. It is within the re-contextualization of her work and the necessity to re-articulate the manipulation of the spectator's gaze from the original focal point of the closet, that decisions were being

made. Kozinuk wanted to insure that the work would resonate appropriately in an outdoor natural exhibition site.

5.5.2.   Field Work

As stated earlier, the artist field excursions were limited to visiting the Kitsilano Beach. The first site visit entailed deciding on a suitable installation area that was within relevant distance to Pignon's staging site, but also suitable for Kozinuk to recreate *Come Here,* and maintain the original element of "tension" and sense of "inaccessibility." I detail the contents of the original video below. A second site visit entailed determining logistics, such as how to hang the screen between two trees, where to position the focal point of the projector to manipulate the gaze and experience of spectator, and how to position the technical equipment in a way that they would not be seen by the spectator and spoil the overall effect.

5.5.3.   Overview of Spectator Research Participants

Kozinuk and Pignon shared the same fourteen individuals as a spectator participant pool. However, there is an anomaly worth mentioning. A total of six individuals; had seen *Come Here* in a gallery exhibition. For these participants, the prior

Figure 5.10.   Left: Detail of Come Here.
Right: Spectator climbing up rocks for viewing. Photos: Andrew Hawryshkewich

knowledge of and experience in a changed environment is of particular interest and significance, and is noted below in my discussion of the post-event interview.

5.5.4. Spectator Experience of "Come Here" video installation

As the spectators walked down the beachhead away from the installation site of *Water Words*, the beach became more isolated because the embankment changed into a steep cliff. When they arrived at the site, the spectator gaze draws upwards into the trees, where a figure of a woman is projected onto a bed-sheet, which is hung on a rope strung between two trees. The scale of the projection was large, approximately 6 ft. in width and 6 feet in length, and areas on either side of the projection are very dark. The leaves and branches of the trees, which frame this screening surface are silhouetted and appear like dangling fingers of some sort of creature across the screening surface as seen in Figure 5.10 Left. The woman takes on the appearance of an apparition, a mysterious spectral figure of the forest, or a ghost bent on trickery. She calls out, asking the spectator to come closer. Kozinuk positioned the Roland KC 110 amplifier, the projector, and electric chords from the Nautilus marine battery and sine wave inverter so that this equipment was hidden from view of the spectator. Therefore, the sound and visuals were integrated into the site. The artist sought to recreate the sense of tension of obstacle that exists in its original gallery setting exhibition style format, and augment that sense of tension using natural setting.

The spectator viewed *Come Here* from a distance. They were confronted by several boulders at the foot of the installation, which obstructed any attempt to respond to the calls of the woman. To respond or follow the woman's calls meant the spectator had to confront the obstacles of the boulders or perhaps even internal fears. The spectator would have to climb over the rocks, which may be perilous or compromising. Thus, the spectator had an immediate sense of hesitation.

5.5.5. Overview of Post-event Interview Spectators

Having a second installation that was of a completely different aesthetic from the friendly and poetic style of *Water Words* produced some interesting comments and behaviours from the spectators. These relate to how the landscape and forest enhanced and augmented the "essences of the piece."

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There was one unexpected phenomena that occurred that is worth mentioning. A group of people unrelated to the research, were off to the side (drinking alcohol) and one individual became highly excited and animated when the projection started. The young man, who was quite inebriated, thought the beckoning female was real at first. When told it was a projection, he exclaimed numerous expletives and proceeded to jump the boulders that obstructed the path to the cliff, and further attempted to climb up the cliff as seen in Figure 5.10, Right. Because of the sand, he lost his footing and slipped down the earthen wall. I was fearful that he might fall and break open his skull. Several of his friends and spectators eventually convinced him not to pursue that action, because it "wasn't real." However, for the remaining spectator's, this interaction with both the installation and the landscape was profound within their personal experience. The post interview comments are telling.

Spectator: During Bobbi's I was afraid of it the whole time, and I don't know why, like it was the woods, the voice, and the gestures and I was around it for a very long time today, so I still had that resonating feeling and I think I am going to have nightmares. I don't know why that is, it obviously triggered something from my childhood and I grew up near the forest and there were a couple of bad things that happened, so it could just be something that is a deeply personal reaction for me. But the whole idea of the idea of the technology and the reality piece of it near nature, really, really worked for me.

Spectator: And then the piece in the woods, yeah it was pretty scary and creepy and I sure didn't want to go there, but for me it was projecting our creepy imagination onto the park.

5.5.6.   Overview Post-event Interview Artist Bobbi Kozinuk

During the post-event interview session, Kozinuk indicated that she was motivated to recreate the tension caused by the jammed door in the original setting of the gallery-by maintaining the tension that aspect of the original work had.

Researcher: Has this experience [or repositioning in natural landscape] informed your practice in anyway, changed it in anyway?

Bobbi: Thinking about it made me realize that I don't have that connection to nature and made me want it for a long time…and it is probably a good thing to try and get more of that, wipe away some of the citiness away from me.

5.5.7.   *Researcher Interpretation*

The artist did not use the LocoMotoArt system to create a work from and in natural environment, but chose to use the independent power system to restage a previous work instead. By asking the artist to reposition her typical electronic art work within natural setting; both artist and spectators experience heightened ways of seeing, hearing and experiencing *Come Here* through the experience of natural realm. Results from this artist-project inform that the approach to create a unique study case is a workable solution for data gathering. *Come Here* further provides indication that both the artist and spectators had enhanced engaged experiences with digital technology when used in natural setting. The responses of the spectator's indicated that the use of technology was not noticeable, and did not detract from their experience of the natural setting. There were no comments during post-event interviewing that indicated that the technology in natural setting was disruptive to the spectators' notion of nature. Rather, the landscape augmented and enhanced the sense of emancipation of the spectator to freely climb and immerse with the natural landscape.

Come Here provided interesting aspects that were not present in the other artist-events. First, the sense of tension and danger; second, several individuals had viewed *Come Here* when it was positioned within an indoor gallery-exhibition style paradigm and now had a contrasting view point; third, the natural landscape made the message of the piece more defined to spectator. All of these aspects provided an awareness of the elements of natural world, which translated as apprehension, hesitation, but most importantly stimulated actual "fear" and sense of "creepiness." This is not to say that the "closed closet" exhibition method didn't portray the sense of apprehension, but placing it in natural setting increased the tension, and added metaphor of the "dark forest' where none had been before.

Such comments by the spectators, affirms the notion that displaying electronic art-work in natural landscape added dimensions that augmented the original conceptualization of obstacle and obstruction. In doing so, an increased level of emotional response of fear was generated. The embankment and boulders served as a stimulation mechanism, like a special effect. Even the walking on the sand of the beach, feeling the weight of each step change, feeling the sand in the feet, smelling the water,

manoeuvring over boulders, looking up into the canopy of trees, hearing the various urban sounds oscillating with natural sounds; all these sensuous attributes contributes to the bringing forth of cultural and metaphorical constructs. Therefore, I opine that repositioning new media in the natural environment is highly transformative, not just in the power of myth, but in recognizing that digital technology experience can lie in partnership with natural setting without disrupting or disturbing the spectacle of the art expression, rather, it extenuates the aesthetic experience to nature also. According to Berleant, there are two principles. One *sensory* "that is primary" and the other "*experience* of meanings." [Emphasis Berleant]. "Aesthetic experience seems to transcend the barriers that ordinarily separate us from the things we encounter in the world" (Berleant, 2010, p. 29). Assumptions were set aside, consciousness opened, that is the phenomenological experience became the "originating point of inquiry," (Berleant, 2010, pp. 21 - 22). Berleant informs us further that, "Acknowledging that the aesthetic begins and ends in sense experience, we can at least on principle consider aesthetically any object and any experience that can be sensed" (Berleant, 2010, p. 27).

5.6.   Artist-Project Phil Thomson

On August 19, 2011, artist Phil Thomson presented a sound event at Stanley Park, Vancouver, British Columbia, for twelve spectators. For this artist-project, I requested that the performance of the composition be re-oriented specifically into the environment from where the artist had recorded it. Thomson chose to emphasize both the urban and woodland park soundscape[22] into his performance event: a soundwalk[23] leading up to a semi-secluded woodland area as seen in Figures 5.11 and 5.12.

[22]   A soundscape exists when sound or a combination of sounds, are present in both natural and human-built environments. There is a long tradition and history of the study and performance of soundscape, whose lineage can be traced in Europe to the Futurists of the early 20th Century, and more recently, in North America at Simon Fraser University with the World Soundscape Project established by R. Murray Schafer during the late 1960's and 1970s. I refer the reader to the works and writings of R. Murray Schafer, Barry Truax, and Hildegarde Westerkamp.

[23]   A soundwalk is directed walk through an environment where the listener can immerse within the relationship of sounds to the environment.

Figure 5.11 & 5.12.   Left: Thomson selecting soundwalk site;
Right: Detail of woodland space chosen for project by Thomson.

Within this bifurcated approach, between the urban and woodland, Thomson incorporated a 20-minute soundwalk to engage spectators in an aural experience of the immediate urban environment as they were led to a particular wooded area of Stanley Park for the composition performance. The woodland site was chosen by the artist because it is a "natural" space that exists within an urban one. This emphasized his

Figure 5.13 & 5.14.   Left: Seating at Thomson site of performance Stanley Park; Right.
Detail of Thomson installation and performance site, Stanley Park, Vancouver, B.C.

Figure 5.15.
Looking out down path next to Thomson installation and performance site.

interests to provide a staging platform to balance or harmonize human-made sounds with the natural. The site was a small open space surrounded by large cedar trees, creating a sense of an alcove, within which a large tree has fallen and formed a natural bench for sitting as seen in Figures 5.13, Left and 5.14, Right.

The sense of privacy is created by the many tall samplings and bushes, and the lush forest floor underbrush, which includes ferns and decaying trunks of old growth forest. These plants became a natural wall, sheltering the site from the view of passing foot traffic as seen in Figure 5.15.

Within the soundscape practice, the composer records sounds from urban and/or natural environments, noise from found objects, and takes those sounds back to a recording studio environment. From this indoor electronic environment the various sounds are manipulated through the use of studio-based equipment (Burtner, 2011, p. 235). Thomson initiated the creation of his sound piece from within the traditional practice paradigm of soundscape composition and recorded the various sounds from the site at various times of day.

Unlike soundwalks, sound art composition is not traditionally performed outdoors because it is predominately presented within a gallery or concert stage environment adhering to a traditional exhibition-style or concert hall paradigms (Burtner, 2011, p. 235). This traditional performance paradigm is globally accepted within the sound art composition community because it has had many years of development and acceptability as an art form. The access to electricity is necessary to this practice, and we find few examples of independent power systems being utilized, although while there are artists and artist groups who present works in atypical performance spaces, it is not the norm. Sound performance is rarely reoriented to the sound environment from which it was created. For the performance of his composition, Thomson used the 300 Watt Nautilus Marine battery and 1 Samlex America Pure Sine Wave inverter from the enhanced independent power system Module 2 of LocoMotoArt. So that he could live-mix during the performance, Thomson used his lap-top computer and music production software, Plogue Bidule, and the Roland KC 100 amplifier for stereophonic sound playback as seen in Figure 5.17 below. The soundtrack consisted of a mixture of sounds that exist in this space such as sea gulls, wind in the trees, as well as sounds from the sea plane terminal, tankers travelling into the shipping port, horns, sirens, automobiles, including horse's hoofs clomping on the asphalt, and conversations of passing hikers.

Thomson employed a variety of sound techniques in the creation and presentation of his sound composition. He chose to use comb filters "quite a bit," and also "some convolution." Convolution is actually a mathematical term, which is applied to the theory or audio and electro-acoustic music. This is part of sound theory and is discussed by audio theorists as a mathematical algorithm. For more in-depth study, I recommend the reader study the Fourier Theory, which is the basis for frequency analysis in science and engineering and to study the subsequent challenges to Fourier by Poisson and others. Essentially, convolution involves the time and space of a sound or tone signal when processed digitally. These digital signals can be a sampled sound or a tone.[24] Convolving is about the time frequencies of two sounds or even possibly partial

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[24] Thomson indicated in his field notes that he "tuned" the sounds he used to the note of the "*O Canada*" horn, which can be heard daily at noon, and is part of the environmental sound ecology of the woodland site. It is common in music if have a key tone, or a dominant tone that the composition is built around.

**Figure 5.16.   A segment of the LocoMotoArt playback system,
Roland KC 110 used by Phil Thomson.**

segments of a sound. However, it always involves two sequences or two sampling of sounds, not just one. Further, at the end of the cycle of the sound, there is delay. The two signals and the time frequency delay at the end of the cycle, which creates the convolution (Berbanek, 1988). Thomson considered this physics of sound in his design.

Thomson indicated he used a process he calls "auto-convolution," which consists of convolving a sound with itself. Thomson further explained, "In terms of digital signal processing, when you convolve a sound with another sound, you are multiplying their spectra. The spectrum in acoustics is the distribution of effective sound pressures or intensities measured as a function of frequency in specified frequency bands (Berbanek, 1988, p. 34).[25]

According to Thomson, in auto-convolution, you are multiplying a sound's spectrum by or with itself. "In simple and practical terms, this means that prominent frequencies in the sound are amplified, the sound is stretched to twice its original length, and events within the sound have the effect of being 'smeared' in time."

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[25]   Frequency is referred to as the rate of repetition of the cycles of a periodic phenomenon. It is reciprocal of the period, "the unit is the cycle per second," (Berbanek, 1988, p. 23).

5.6.1.   Pre-event Interview and Biases of Artist

Thomson decided to use his own field recording devices and home studio for production and forfeit the field production capacity that LocoMotoArt offered. Thomson's preference for his privacy and non-invite into his home studio superseded my research aim of observing production challenges. It is important to note that the choice of using one's own equipment rather than that supplied by LocoMotoArt prevailed consistently amongst each artist project as stated in *Section 5.3.2 Pre-event Interview Artist and Biases* (Bunker and Koesters), and *Section 5.4.1 Pre-event Interview Artist and Biases* (Pignon).[26] It is understandable that the artists prefer to work within a mode that is most efficient to them, however; part of the research required the artists use the limited equipment found in LocoMotoArt. Koesters was hesitant to take equipment into natural setting due to environmental conditions. In the case of Bunker and Koesters; the Hawaiian humidity and moisture in the cave was of concern to them. Koesters suggested using a Panasonic Toughbook® as opposed to the Mac Book Pro ® computer on the field as a solution to this concern. However, the Toughbook® computer is a PC and not a MAC product. As part of a synergistic design plan, LocoMotoArt incorporates Apple devices and software because most artists are using Mac based software and interactive programs (Goodnight, 2011). In the case of Pignon, she viewed production work outdoors as impractical, but this was an expected bias as she doesn't incorporate natural setting in her practice. Further, I remind the reader of Pignon's comments made at pre-event interview stage and during the focus group as stated above in Section 5.4. Further, Bunker and Koesters and Pignon chose the familiarity of their own equipment and the sanctity of the home studio environment. Similarly, it was Thomson's initial reaction to protect electronic equipment from outdoor influences, and similarly he chose to use his own equipment for production.

Initially, Thomson considered placing several small speakers within the site as a surround sound installation piece, so that spectator would experience sounds from

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[26] This bias may be associated with a perception by the artists that the work process gets slowed down when one needs to learn a new tool. There were times, frustration was expressed to the researcher regarding the learning curve and time it was taking to get the Aaxa P1 Jr. to accept video MP4, or to synchronize video playback, for example.

various directions, however, in the end, he decided upon using the Roland KC 110,[27] because of its two 6.5 (16cm) stereophonic speakers and two tweeters and EQ effects control. The Roland KC 110 speakers have the capacity of sound intensity, due to the amplifier in the unit. Therefore, sound playback would be distinguishable within the confines of the woodland's open air space.

Significantly, Thomson's field notes indicate his mindset through the process of recording sounds from the environment, processing them in studio, and the various challenges. Thomson felt that the re-orientating the new composition back into the original sound environment as a "disconnect between the studio and the site," and as "problematic."

Thomson: The usual electro-acoustic studio works for most electro-acoustic music because there is similarity between the studio and the concert hall. They are both indoor spaces, acoustically conditioned in a particular way, with a context of relative quiet in which the sounds can be apprehended. But when you are presenting in an outdoor space, particularly one which has been chosen for its sound characteristics (birds singing, planes taking off, etc.), working in a run-of-the-mill electro-acoustic studio doesn't work as well.

Thomson: I found I had no way to know how to proceed [sic] compositionally without the guidance of the space itself and its particular soundscape.

Thomson: The natural landscape I am using is always changing. It is never the same twice. It is an ever-shifting mix of sounds…Randomness is not the only form of unpredictability, but it is the easiest to implement.

However, Thomson found that the process informed his practice, and he experienced positive outcomes in several ways. I expand upon these outcomes in discussing the field work, artist event below.

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[27] The Roland KC 110 has three channels, each with independent volume control and two channels which offer stereo line inputs. There are onboard effects, and stereo reverb. The dual-power design (15W + 15W) enables for stereo multi-band chorus. The KC 110 has a tilt back mode which allows for flexibility in placement and projection of the sound (Roland KC-110 Keyboard Amplifier, 2012).

5.6.2.   Field Work

        The artist did preliminary location hunting independent of the researcher, but once potential sites were considered, the artist walked the researcher through the area and discussed his interests in the use of a particular woodland space within Stanley Park. As Thomson continued his field recordings, he had several cognitions that influenced his work. Within the experience of working in the field, the artist discussed that a connection to the actual natural landscape and place effected his decisions regarding his artistic process. I present some of Thomson's thoughts from his field notes.

June 28, 2011: Trying to open up to whatever sounds occur rather than having preconceptions about how I want things to sound.

June 30, 2011: I played around with some different processing techniques on it [ambient sounds], and discovered that I feel the need to actually do the compositional work in the woods at the site.

July 4, 2011: Went to site today…I found I had no way to proceed compositionally without the guidance of the space itself and its particular soundscape…I am finding that sounds not from around the performance space seem out of place. We can hear sounds which are not native to a particular space any day. This is a chance to create a site-specific soundscape composition.

        Because of the re-orientation of the artist's typical practice paradigm; it is natural that the artist preferred working in a studio setting and that, decisions were influenced regarding use of particular sounds and how to process them. Shedding typical practice habits associated with indoor environment became a consideration.

July 4, 2011: What I am struggling with now is which sounds to use and how to transform them. I have been using digital resonance on some of the sounds to good effect, but least because it turns some of the traffic and other broadband noises into musical pitches. This is both conceptually poetic (turning traffic into music via technology made to be used in natural spaces) and somewhat musically satisfying. I have also been using granulation to stretch some of the sounds in time.

        The artist's sense of connection to the woodland place and sense of how to process the sounds from that specific natural environment knowing that the finished composition would be played back in that space are reflected in the following comments:

July 4, 2011: I feel an increasing need for this; composing for a natural space… has me want to compose in the natural space and use the natural soundscape of the space itself as a guide to all aspects of the composition.

July 6, 2011: Was fiddling with some sounds in the studio again and again felt the urge to go back to the site of the performance.

July 6, 2011: …transforming my entire working method and moving away from the habit of working in the studio. The habit is more durable than I anticipated.

In his book *Acoustic Communication* (1984), Barry Truax informs us that, "Soundscape mediates relationships between the individual and the environment," (p.12). It is often referred to as a "sonic environment" and is generated with electronic equipment and therefore called, Electro-acoustic[28] music, which is both theoretical and experimental (Truax, 1984, p. 10). Acoustic theory and technology has been developed as a human science and also involves computer engineering (Tohyama, et al., 1995, p. 1). What is important to soundscape design is that its structure includes elements from the "sound environment," which in turn represent relationships, but also, a context. It is within the context of the sound environment that soundscape can be "interpreted" and ultimately depends upon people and their listening habits (Truax, 1984, p. 47 and 75) Truax further states that:

The essential difference between an electroacoustic composition that uses prerecorded environmental sound as its source material, and a work that can be called a soundscape composition, is that in the former, the sound identity is frequently lost through extensive manipulation it has undergone, and the listener cannot recognize the source unless so informed by the composer. In the soundscape composition, on the other hand, it is precisely the environmental context that is preserved, enhanced, and exploited by the composer. The listener's past experience, associations, and patterns of *soundscape perception are called upon by the composer and thereby integrated within the compositional strategy (p. 207).* [29]

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[28] The term is used as "the application of electrical and electronic technology to the processing or synthesizing of sound, the latter being the electronic generation of sound without an original acoustic source" (Truax, 1984, p. 7).

[29] For a deeper understanding, I encourage readers who are not familiar with electro-acoustic music and soundscape composition, to read various works of Barry Truax or R. Murray Schafer, for example.

Figure 5.17. Fork-in-the-road, Phil Thomson Soundwalk Stanley Park

5.6.3. Spectator Experience Soundwalk and Electro-acoustic Composition

It was a clear, warm summer evening. Twelve spectators assembled at Lost Lagoon at the entrance to Stanley Park. The artist described the sound walk listening process[30] and guided spectators through it as he slowly led them through a pedestrian tunnel, over a bridge, and on a cement walkway at the entrance of the park, eventually ending up at the "Painter's Circle." From this area, the spectators arrived at a fork in the path. As a symbolic offering, after leaving the urban setting, spectators were brought to a fork in the road as seen in Figure 5.18.

At the fork in the path, the artist used the existing acoustic sounds of the natural landscape to evoke a sense of a combinatory approach to aural engagement. The spectator/listener was given the opportunity to sense the change of sound and oscillate between urban and natural environments. Thomson chose a particular direction at the

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[30] The artist explained that they were to listen and not talk amongst themselves as he walked them up to the woodland site. As they walked, the artist drew their attention to specific sounds of the city, vehicles, horns honking, distant sounds of the seaplane airport, for example.

fork where the gravel path became slightly inclined, gradually changing into a more rustic and "wilder" woodland area. The volume and types of urban sounds started to change noticeably and became less pronounced at times. The path became surrounded by natural indigenous trees and plant life, which buffered the urban sounds. While on this path, there was a sense that one was no longer in a city environment, but perhaps in a forest. When the group reached the woodland staging site, the artist led the spectator's silently into its contours. They were invited to sit on a fallen tree, and listen to his sound composition. While they listened, several spontaneous sound phenomena occurred, which became part of the sound layer of the natural setting; a runner ran past, pounding and crunching the gravel underfoot, sea planes took off and landed in the water, there were sound of dogs barking, and the sounds of people yelling in the distance.

5.6.4. Overview of Post-event Interview Artist

The post-event interview was conducted via e-mail with Thomson through a series of questions. I draw upon the written conversation. When asked how the experience made him feel Thomson indicated he enjoyed the challenge to his usual working methods, because he felt that his creative technique was expanded by the experience, but that he also gained a new awareness of the relationship between natural and urban spaces. Further, the artist indicated he felt an "expanded sense of connection to the natural environment."

In discussing the process of making the woodland composition, Thomson indicated he wanted to create a "sonic context," which would "accompany" the sounds of the natural soundscape, which enabled the listener to hear that there was a "sonic connection of the sound composition to the natural soundscape." The artist explained this connection as the use of auto-convolution. Thomson indicated he wore headphones while recording. This increased his sense of immersion to the natural environment of the woodland space and thus enhanced his sense of connection with it stating that was a nice experience. When asked specifically how the re-orientation process of the research made him feel, in regard to his practice paradigm, and whether he would incorporate such a concept of re-positioning soundscape composition back into the original setting from which the sounds were recorded, the artist responded.

Thomson: '…re-orienting' was a logical extension to my practice; whereas soundscape composition generally uses environmental sound and places it in an electro-acoustic musical context, this work extended that paradigm by further placing the electro-acoustic musical context back into the original setting from which the source sounds derived. I appreciate this cyclical aspect of the piece and its working process. I can see how this cyclical-reorientation could be a fruitful approach to my creation process, and may use it again in other projects.

5.6.5.   Overview of Post- event Interview Spectators

The spectators were interviewed after the composition ended while they were still seated on the log within the woodland alcove. One person however chose to sit on the ground the entire time leaning against the fallen log. Of the eleven spectators, seven were research participants, and one of these had previously experienced the video projection installations discussed in Section 5.4 (Pignon) and Section 5.5 (Kozinuk). One of the spectators to Thomson's artist event was artist Kozinuk.

There was a diverse range of personal descriptions regarding the phenomenological experiences. One person described his experience in terms of connecting with the technology through the drones of the composition, indicating he felt, "no sense of the natural environment. In fact the whole experience wasn't that for me." Interestingly, he stated that the trance state of the musical composition had a "state of consciousness, it felt that it activated this region as kind of fantasy space made the forest kind of theatrical." It is worth noting that the background of this particular spectator includes the practice of electro-acoustic composition and performance.

On the other hand, another individual indicated that she found herself, "going into the natural environment very, very easily, and completely and utterly forgetting about the crust of civilization which is pretty predominant because it is obviously there." This individual experienced both visual and aural new media works in the natural setting and is documented commenting upon those experiences. I further point out, that she is a practitioner of the Wiccan religion, which she described as spirituality that embraces the natural realm -- the earth, plants and animals. At first hearing of this spiritual belief, I made the assumption she would be the least positive about the use of technology in natural environment. However, the opposite occurred. She, more than anyone, felt an emotional connection. Another spectator indicated that no matter how deep the forest life

became, that the city was always present and "it didn't leave us by any stretch and even there, it was a sublime moment." It is also worth noting that this spectator was also present at the Pignon and Kozinuk installation works. Another person described her experience of Thomson's composition as follows:

Female Spectator A: I noticed this tiny, tiny, little spider that was in the plant, whose movement was in tandem with the sound. And then, suddenly, there were some leaves on this chestnut to my right, that a small branch started vibrating at sort of this similar place, so there were just these little things that would capture my eye and pull me in. Same with the helicopter and then another time when a plane went….I'd go back and there were these frequencies… had a beautiful synchronicity of lining up. So there was a visual as well as other sounds, that were happening. It felt connected.

Agreeing with her, another spectator commented:

Female Spectator B: I found that for me it was the interweaving with nature and built technology. Because when we would be walking in the silence, there would be times we'd be on the asphalt and our footfall was very quiet, then there was the couple walked by with two dogs and suddenly there would be this rattling of chains and yapping of the dogs and then it would be quiet again and then we turned on to this gravel path so suddenly there would be crunching, this crunching going on so I was hyper aware of how many airplanes and things of aerial flying around, so when we were sitting here [in the woodland space] exactly as you said, I kind of went micro and then I would go macro, I was so aware of the crows and seagulls, then suddenly there was this ambulance, drowned out all the life, like this human emergency, drowned out all the natural sound. Which for me was very metaphorical for me, you know, this raging environmentalist. This was a symbol. And then the ambulance would fade off in the distance, and then I could hear the birds again. Then, this kid came jogging by and he was percussive, and he was running very rhythmically, BOOM-BOOM-BOOM and I was thinking man, get your drum bass going on. [Laughter] So, I enjoyed the tapestry and interweaving. I had the similar reaction that we don't really escape our urban environment even when we believe we are communing with nature, I guess unless we are really back-packing into the wilderness. I enjoyed having your music in the background, feeling that it added that third element in addition to nature and our built environment.

The interview was shortened because it was getting dark. However conversation continued amongst all the participants informally during the outdoor dinner that followed. The menu consisted of dill and lemon baked wild salmon, fresh fruit salad consisting of raspberries, blueberries, blackberries, mango and pineapple, fresh green salad, crackers, cheeses, Italian orange and lemon Pellegrino orange sodas, sparkling water, and chocolate truffles. The table was positioned so that half of the spectators saw the lights of the city, which were very pronounced, and the other half saw the darkness of the woodland and cedar trees. The sense of oscillating between built civilization, and

what could be imagined to appear as a forest that did not exist in the urban environment, became a portion of the conversation during the meal. It was further commented on by a few of the participants, one who is an exhibiting artist, that the feature of outdoor summer evening meal, coupled with the experience of a new media work in natural setting was an "exhibition method" that was very enjoyable and should be repeated and done more often.

5.6.6. Researcher Interpretation

The artist was asked to re-orient the performance of an electro-acoustic sound work into the actual place from where the sounds were recorded. This is not typical practice within the soundscape concert community. The methods ascribed to the practice and exhibition paradigm of electro-acoustic composition are recognized within a global community, and thus reflects an established tradition. From the challenges that assessment and re-assessment offers the practitioner pre-conceived notions change. Thus, the creative act becomes a new perspective altogether. From this new perspective, "what we are coming to know remains dwarfed by what we don't" (Sullivan, 2010, p. 130).

The repositioning and reversal of typical exhibition practice paradigms interests me because the re-orientation informs and leads to empirical realizations about differences and challenge, but also about realizing new perspectives. These realizations are particular to the individual's perception, yet, they also provide multiple boundaries of experience. I turn to Truax to define what I mean by "boundaries," as he informs that acoustic ecology of the soundscape holds a "coherent identity" which subsequently allows it to be defined as an "acoustic community" (Truax, 1984, p. 57). Acoustic community can be defined as any "soundscape in which acoustic information plays a pervasive role in the lives of the inhabitants……therefore *the boundary* of the community is arbitrary, "further meaning that the boundary may be as small as a room of people as in a gallery setting, or as a home or building. Truax also adds that the boundary could be as large as an "urban community…it is any system where acoustic information is exchanged" (p. 58) or as in the case of this thesis, such as an outdoor urban natural setting. Truax also points out that soundscapes may have music value, because they can leave "strong imprint" on the mind, which in turn is an embodiment of the context of

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the "community" in its entirety. This is where soundscapes acquire their significance (p. 61).

Further, the results of the Thomson artist-event, indicates that both artist and several spectators conveyed they had a definable sense of interconnectedness between natural setting and the experience of digital technology being used in the setting. This occurred for some individuals despite the close proximity to human-built environment. It is interesting to note that several individuals indicated it was the oscillation from human-built and natural environment that gave them added awareness of natural place and the import of technology into it. However, these senses and interpretations were highly personal and seemingly associated within each individual's background, social and environmental awareness. It is also worth noting that when feelings were re-articulated using words and language, and, coupled with emotional concerns about the ecological and environmental crisis humans now face, symbolic metaphor emerged.

5.7. Artist-Project Dave Leith

On August 28, 2011 sound and visual artist Dave Leith performed a 20-minute live sound composition at Iona Beach in Richmond, British Columbia, for eight spectators who consented to participate in the research, and two non-research spectators, which included artist Pignon.

Figure 5.18 & 5.19.   Left: View of horizon at Iona Beach location;
Right: Site of Dave Leith sound performance at Iona Beach

Leith indicated he chose Iona Beach because the site provided a sense of spatial expanse, and the sounds of the commercial jets departing from the Vancouver International Airport were of interest to him. Leith conveyed to me that he was attracted to the vast openness of Iona Beach, which offers a visually stimulating scene. Depending on the focal point of the spectator, the water appears paralleled to the sky across the horizon, which is often interrupted by clouds and sunsets, or distant mountains and open blue sky as seen in Figure 5.19 and 5.20. Robert Ulrich states in his essay *Biophilia, Biophobia and Natural Landscape, (1993),* that there may have been a corresponding predisposition for "adaptive biophobic" responses to natural stimuli. Ulrich considers this "biologically prepared learning: as those visual depth/spaciousness characteristics, which are risk-related factors.[31] These factors include the prime aspect for survival, that of surveillance, which gave early humans the ability to see hidden threats and opportunities for fleeing to safety (p. 81). From the evolution of biophobic

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[31]   I remind the reader that in the area of extended research of Wilson's biophilia hypothesis, there is speculation that the reason humans have positive responses to natural landscape is due in part genetics and evolution. Early humans had a predisposition for responding to both the rewards and dangers associated with natural settings, and this ability was critical to survival. It is apparent also in that survival favoured those individuals who readily learned and remembered over time the various adaptive responses to natural conditions. This adaptive behaviour included the ability to respond to various survival related threats, which Ulrich conceptualized as "both positive/approach (biophilic) and negative/avoidance (biophobic) (Ulrich, 1993, pp. 74, 75).
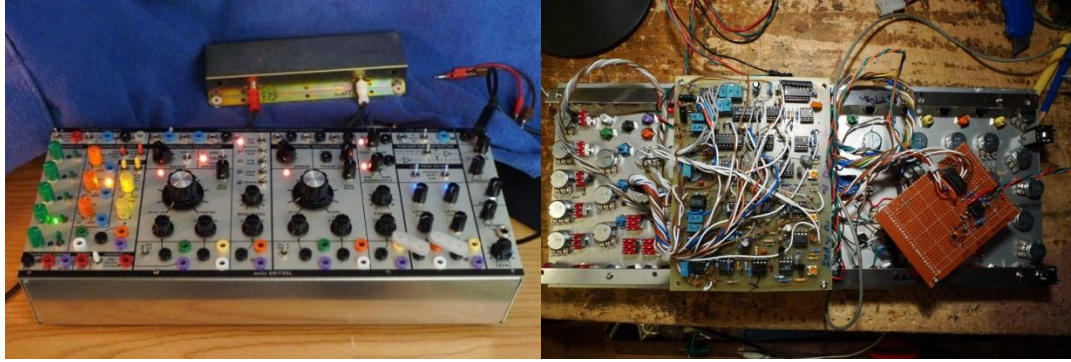
***Figure 5.20.   Serge Modulator synthesizer built by Dave Leith and used during
the Iona Beach project. Photos: Dave Leith***

responses, modern humans have retained the tendency to like or visually prefer natural settings having "savannah or park like properties such as spatial openness, scatter trees or small groupings of trees and relatively grassing ground surfaces" (p. 89).

The artist-event included a live sound performance using synthesizers the artist designed and built. Unlike Thomson, Leith chose to use an array of equipment and, manipulated pre-recorded sounds from the Iona Beach environment into his composition as well as existing sounds from the environment of the site. Because Leith presented his sound art composition as a live recital, he chose to incorporate real-time sounds as they exist in the Iona Beach site. These background sounds included commercial jet planes taking off at YVR airport and other unintentional sounds made by people and dogs walking by on the beach, which infiltrated the site and therefore became part of the soundscape. Leith expressed keen interest to have the intermittent distant roaring engine sounds of the YVR jets, which crescendo and decrescendo, as part of his composition. Leith incorporated much of his own equipment, some of which is custom designed and built:

- Serge Modular Synthesizer custom built by Dave Leith
- Clone of Buchla Music Easel with 259
- Animal TKB panels
- Waveform Generator
- Eventide PitchFactor
- Eventide DelayFactor
- Mackie 802 Mixer
- Ampex 620 Amplifier Speakers
- Edirol R-09

Figure 5.21. Dave Leith during recital of his live soundscape composition at Iona Beach, British Columbia and detail of Ampex 620 Amplifier speaker suitcase system. Photos: Wynn Palmer, Andrew Hawryshkewich

The artist used his own high performance microphones and recording unit, but utilized LocoMotoArt's 300 Watt Nautilus battery and 1 Samlex America Pure Sine Wave inverter to run his Ampex 620 Amplifier with 8-inch JBL speakers and other analog electronics as seen in Figure 5.22, Right. As an additional stereophonic speaker system to the Roland KC 110 Amplifier, Leith had these two sound playback units positioned within the site. It is worth noting that the Ampex 620 Amplifier suitcase speaker system was first developed in the 1950's by JBL with John B. Lansing, sound pioneer and inventor. The original 620's were designed for open air to be acoustically flat ranging at 60hz to 10khz, and also extends down to an the 60 to 80HZ region. The 620's were designed to hook up to vinyl record players and reel-to-reel tape units of that era, most specifically, Ampex products (The Vinyl Tourist, 2012).

There were various sound techniques that Leith employed during the creation and performance of the Iona Beach composition. According to Leith, the piece had a form, "but also evolved as improvisation." He further stated that: "The signal flow for a pre-amp-external signal (the recording) is the generation of an envelope from the envelope follower circuit. The signal would also be processed by an envelope follower." Additionally, Leith's self-built synthesizers were designed on the Buchla Music Easel, but with a different oscillator design, the Buchla 259. Leith added octave switching and removed auto tune and remote to his "Easel synthesizer clone." Leith states: "The Easel

balanced modulator shows up as the top switch in the oscillator modulation switch. The switch selects the following: 1) pre-amp only, 2) balanced modulator with complex and modulation as sources, and 3) pre-amp with balanced modulator/mod osc" (Leith, 2011). Leith used a Serge TKB in lieu of the touch sensitive keyboard that comes with the original Easel.

5.7.1.   Pre-event Interview Artist and Biases

There were no biases that emerged with this artist. Significantly, when compared to the other artists, Leith was the most keen to work in a natural environment. He did not find the concept of working, performing or bringing equipment into the natural environment to be a challenge nor impractical. Of all the artists, he was the most interested in using the extended power system and planned his artist-project event with that intent. However, the natural soundscape did become a challenge, in that he had been encouraged by the sounds of planes taking off at "YVR" (Vancouver International airport) during our field visits, which he desired to incorporate into the work. However, since the event occurred on a Sunday evening, the prevailing sound of the jets was diminished by the fact not to many planes departed during the performance. What occurred was the unexpected phenomenon of a helicopter flying overhead. Leith manipulated his synthesizer sounds with the sound of the helicopter, which essentially became another layer in the sound composition. The helicopter sound became pronounced momentarily, which added the challenge of unpredictability, randomness, and inherent co-existence with human-made sounds.

5.7.2.   Field Work

There were two field site visits. The first included Leith, the researcher, artist Bobbi Kozinuk and Shawn Chapelle, who was using the video camera to document the site visit. The purpose was to view the site. For the second site visit, the artist and the researcher were in attendance. Leith picked a specific location on the beachhead at Iona Beach and set up his microphone and recording equipment as seen in Figure 5.23. He began recording the sounds from that particular site within the natural landscape which he intended to incorporate in his live performance. Additionally, he indicated at that time, that the beachhead was the site he wanted to perform in.

5.7.3.   Spectator Experience Iona Beach Sound Installation

Spectators arrived and enjoyed an outdoor meal before the performance as seen in Figure 5.24 and Figure 5.26. A meal has been part of each artist events, as the social aspects stimulate conversation and a sense of connection to the site. Through the experience of gathering at a table for food and conversation, spectators have an extended period of time to experience the sights, sounds, and smells of the site and be in the company of the artist. The duration of time also provides not only extended observation opportunities, but provides time for the spectator to immerse and get a sense of being *in situ*. After the meal, the spectators were asked to walk a short distance

Figure 5.22. Leith recording sounds at performance site at Iona Beach.

to the area of the site the artist chose to stage his live sound performance. There were several tree logs lying on the beach, which presented a natural sitting area.

The spectators were surrounded by contrasting expansive vistas. The diversity of each "landscape" ranged from large looming mountains in the background, to grassland fields opening up to wide blue sky with clouds and clusters of trees and eventually ending with the view of the horizon of the water touching the sky.

The various vistas gave the sense of a wide-open and expansive space, and it was a clear sunny day. The artist requested that the spectators walk around during the performance, which several did, thereby changing their perspectives of the space both visually and aurally. This was the intent of the artist.

5.7.4.   Overview of Post-event Interview Spectators

There were eight spectators present for this event including artist Pignon. The contrast between the visual and aural stimulation of Leith's soundscape in the natural setting provided an immediate sense of juxtaposition.

When asked, "What did you experience here today? What is it that you think you heard or saw?" the responses of spectators were as diverse as the landscape within which their experienced had unfolded.

Spectator #2: Confusion of not being able to tell if something was recorded or natural. There was a point about five minutes into the piece where there was drumming, and I kept thinking was this, a natural sound or man-made sound, and eventually you get to see the actual helicopter go overhead. But it resonated with me because I like the fact of

Figure 5.23   Leith dinner community. Photo: Wynn Palmer.

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that confusion because it says to me that it blended beautifully. Then all-the-other natural sounds of the birds and water, etc. Then I started looking for other indicators of, were the sounds taken from nature influencing the nature they were in? For example I started noticing the behaviour of the birds at some point, it could just be me, but at some point I started thinking that they are around us because of the sound, or because we are human and they think we have food, or is it their natural pattern to be swooping like that.

Researcher: If you look at them now, they are still doing it.

Spectator #2: Exactly! There is the confusion. The fact that you have life sound and handled by human and re-integrated to the environment, does that mean that man is closer to nature because of technology or doesn't it?

Researcher: That is the question.

Spectator #2: I love the question!

Spectator #7: I don't know if I have the vocabulary to really describe my feelings. Like the juxtaposition, is what made this performance, special. You have the artificial. It is artificial; he used the machines to shape the sound to his will with the natural around us and I found myself drawn ping ponging back and forth almost like I was on a frequency going between what Dave was doing and the natural world is doing around us it is all about frequency, it is all this range of frequency. Dave is tweaking the frequency, we have the frequency of the, the waves, the erosion of the mountains, the birds flying all around. I just became more heightened in my awareness of what both man was doing and the people were recording using their technical devices to capture the moments. Yeah the juxtaposition is what made this special for me.

5.7.5. Overview of Post-event Interview Artist

Prior to this research study, Leith was already highly motivated to present works in natural setting and therefore also showed very little bias towards the equipment being placed outdoors. Of all the artists, who are self-described as "experimental;" Leith appeared to be the only one who was the least biased about using the LocoMotoArt equipment. However, Kozinuk was also un-biased about using the system, but I remind the reader that she did not have the opportunity to create a project or use the LocoMotoArt system to explore the use of digital technology in natural setting, even though she was quite keen to do so.

Leith further indicated that he thoroughly enjoyed the opportunity to have an independent power source that was portable and suitable in powering his equipment while in natural setting. Leith did not consider that bringing the equipment into natural

setting was a hindrance, rather he was very positive and indicated he will continue to do so. This artist wants to continue using the LocoMotoArt Module 2 enhanced power system in the future to continue to expand his arts practice and experiences.

5.7.6. Researcher Interpretation

At the conclusion of the sound performance, I immediately gathered all of the spectators and sat them along one of the logs and collectively interviewed them. They were asked to comment on what they had experienced in terms of what they heard and saw. Two spectators indicated they had "pleasant" feelings. One of the spectators indicated a change from her original notion mentioned during pre-event interview, about her notion that nature and technology are separate from each other, and humans cannot experience a sense of interconnectedness or the HTN triad-relationship. During post-interview, she changed her mind and indicated she felt such a connection. She further emphasized her changed notion by defending the existence of the HTN triad-relationship against comments of other spectators who stated they did not sense it.

Similar to other artist-projects, unexpected phenomena occurred during the performance that contributed to the overall experience. First, a large grouping of swallows flew around, diving, swooping rapidly in all directions as they fed on insects. This had not happened during the other two site visits to Iona. Second, three of the research spectators pulled out their own cameras and chose to experience the work through ocular instrumentation. As they experienced the aural event they also walked

Figure 5.24.
Spectators at Leith performance using digital technology
during the performance.

around the performance site more actively than other spectators. These three spectators continued to use the visual technology throughout most of the 20-minute performance.

At post-interview, none of the spectators who picked up their cameras spoke of their experience of Leith's composition in visual terms. I find this interesting because despite having used a digital artefact, their cameras, throughout the majority of the aural event, they did not refer to or describe their experience in terms of the effects of using visual instrumentation. I consider that this is distinguished. I consider this a phenomenon that interjects itself as an HTN triad-relationship. I am arguing that, because digital artefact is so commonplace, the use of them has become seamless and invisible, in that that some people instinctively gravitate towards combining experiences and that such combining feels natural to do so, so natural, they don't recall that kind of experience as being different, but rather a part of their normal behaviour. However, it further demonstrates that certain individuals do not consider digital technology to be separate from human beingness, but rather as extensions of self. When blended into the experience of the natural realm, they are experiencing that moment of the HTN triad-relationship.

Results from this event further indicate that sensing of natural realm through technology is becoming common place to some individuals. And, through the pleasure and excitement, which is enhancing and enjoyable, people commit to the interaction. I find this of particular interest for several reasons: (a) it epitomizes the occurrence of a potentially new lexicon, a new way of storytelling through enhanced perception; b) it is a practice of enhanced connection to the natural setting, one that is seamless, and therefore, goes unnoticed by the person using the equipment, thus holistic; and c) that as a spectator or audience member, the emancipated status of becoming free to move about the environment, and become immersed in it, or watch others doing it, enables one to find or locate a triad or trifocal sense of interconnectedness between digital technology, landscape, or natural realm.

6.   Thesis Conclusion

In my thesis, I outlined the various problematic aspects of our current human-nature relationship, and provided background on our former sense of interconnectedness to the natural realm. I also projected that it is necessary to look at other ways of engaging in the day-to-day use of digital technologies, in other words, accepting the fact that our digital symbiotic relationships do not need negatively impact behaviour, time, or the brain. I discussed how I chose a combinatorial approach to study digital technology experiences when linked to experiences in natural settings. I conducted one prototype artist study, a focus group study with sixteen individuals, and five artist-event projects in natural setting attended by twenty-four spectators as detailed in Chapter 5 - *Five Artist-Projects*. All of these studies were facilitated by LocoMotoArt, a creative field system using independent power sources and providing the artist the capacity to make and display new media work in natural setting. I further discussed that the purpose of my study and the methods utilized were for the aim to understand how new digital relationships can be forged. Additionally, I described the motivation behind my research aim, which is the necessity for humans to reconnect to the natural world and regain that desensitized portion of our brain, which formerly had innate knowledge and symbiosis to nature. From this motivation, I agreed that it is important that humans obtain a renewed sense of nature despite our techno-symbiosis, but challenged current perceptions that technology cannot mediate what is also perceived as an unrealizable abstraction. I identified a lacuna, or gap, in the concept of using digital technology to mediate[32] a relationship with natural setting. Also, within the claim that the intensive use of digital technologies may be a cause for our disconnection to natural realm, and then also claiming that digital technologies can be used to reconnect to nature, is in itself a contradiction, which I confronted. To forward my hypothesis, I presented background history on the human sense of interconnectedness to nature by turning to the writings of

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[32]   See Section 2.9.

Mithen regarding prehistory of humans and his theory of cultural explosion. I then discussed history briefly and the unfolding of those cultural influences that changed our human-nature relationship.

I presented that is necessary to depart from Deep Ecology dogma and the romantic ideal of nature and consider that the contradictions apparent in my proposition can be reconciled. I turned first to artists and constructed a large taxonomy to provide a picture of the current state of digital technologies and the expression of artworks using an eco-aesthetic. I included research regarding the inherent cognitive benefits of interacting with nature. I further borrowed from Wilson and his concept of biophilia to point out that certain aspects to our relationship with the natural environment can be used as a method of enhancing our relationship to digital technologies. I further presented that by changing our relationship to digital technology, we have an opportunity to stimulate those areas of the brain that are desensitized and thus estranged us from our interconnected sense the natural realm. I emphasized that by way of the reorientation of our repetitious relationship to digital artefact, humans can restore direct-attention as opposed to being under stress during *continuous partial attention* as described by Small and Vorgan (2011) [Emphasis Small & Vorgan]. Although the hypothesis I have presented herein is seemingly incongruous and contradictory to claims of Abram, that is, that intensive interaction with digital technology is a possible cause of our alienation with natural realm; I questioned that notion.

By embracing a seemingly contradictory claim of using digital technology to reconnect us to nature, I poised my research within the two streams. One grounded in human-nature interaction and the other exploring human-technology relationships. From these two streams, I initiated technology mediated experiences in nature to determine whether the lacunosity can be shortened, or closed. I approached this task by incorporating artists as experts using LocoMotoArt in the field. From these studies, I analyzed the field data and noted the similarities, patterns, and dissimilarities of five-artists' projects. I questioned spectators whether it is possible for an individual to experience an awareness of interconnectedness with the natural world by way of digital technology. I analyzed the transcripts to determine if anyone described the existence of a sense of interconnectedness, which I term as the HTN triad-relationship (See Introduction on page 3 and in Section 2.9 *Hypothesis*). In Chapter 5 - *Five Artist-*

Projects, I presented generalized summaries of the results from these five projects as conclusions (See Sections 5.3.8-*Bunker and Koesters*; 5.4.7-*Pignon*; 5.5.7-*Kozinuk*; 5.6.6-*Thomson* and 5.7.6-*Leith*). I present below a summary of these generalizations.

6.1. Researcher Interpretation

Despite the initial biases and scepticism of some of the artists and the spectators, results of my research indicate a new appreciation of digital technology as a means in sensing interconnectivity to nature and natural settings (Coles & Pasquier, 2011b, p. 4). A review of the various artist-projects further indicates the following: First, of the twenty-four spectators, there were four who began the study as highly sceptical. These four individuals conveyed definitions of nature and technology that indicated they considered digital artefact as separate from humans. Further, they described them as mere objects and not a part of nature. One of the four had emphasized during pre-event interview, that the computer was a tool, an object. Her opinion emphasized that digital technologies are nothing without power, i.e. electrical energy, and required human intervention for their functionality. Of these four, she maintained her bias that digital technologies were objects and "dead" without the activity of human intervention during post-event interview, however; she agreed that the artist had expertly used digital artefact in natural setting. In opposition to this viewpoint, the other three spectators indicated they had changed their perspective from absolute denial of the possibility of the notion of HTN triad-relationship, to full acknowledgement.

Results lie within the statements of the three spectators during post-event interviewing. Despite earlier providing negative statements, they reverted and stated that their technology mediated experience in natural setting, "felt nice," "symbiotic" "peaceful" or "pleasant." However, within these three responses, there were two dramatic changes in perspective. They are worth reiterating because I conclude they are the primary evidence that answers my research question. I turn first to the responses of the non-

digital spectator[33] from the Bunker and Koesters project. The nineteen-year-old male expressed anger towards digital technology and complained of the dehumanizing effects such technology has on society. He was educated in a private school which purposefully did not introduce children to the use of digital technology. I suggest that by being in such an educational environment that voids the use and prevents the relationship to digital technology, he was influenced to have a misunderstanding of the benefits associated with such technologies. It is axiomatic that he responded as a child to what he is told, and regurgitated out school and parental Neo-Luddite concerns. Now that he is a young adult, and had a technologically mediated experience, perhaps as he matures he will have continued changed notions. It would be interesting to see if, say ten-years from now, whether he had introduced digital artefacts into his life and whether he ever fully integrates with them. The second dramatic change occurred during the Leith project. One of the Leith project spectators eagerly defended her changed notion during a post-interview when another spectator said he did not feel that there was a sense of interconnection, but rather that he experienced an awareness of the separation of human-built, artificiality of the analog and the *in situ* positioning in natural setting. Ironically, this spectator had agreed to the possibility of the HTN triad-relationship during pre-interview. He further stated that he did not believe that the overall experience "would work with digital technology."[34] However, in contrast, Thomson did use digital technology in natural setting, and spectators from that study did indicate a sense of interconnectedness. The remaining twenty spectators' indicated during pre-interview that they believed the notion of HTN was possible, however, some indicated they were not sure how they would come to know it. Yet, during post-interview the majority of the remaining twenty spectators agreed they had sensed an interconnection with nature within the technology mediated experience. Also, some spectator's expressed that the artist had achieved the creation of that sense, through artistic expertise. This was stated emphatically at the conclusion of Pignon's *Water Words*. Several spectator's from Thomson's project remarked that the oscillation between human-built world and natural realm influenced their perceptions of natural landscape, while one spectator indicated he

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[33]   I termed this spectator "non-digital spectator" as seen in Section 5.3.1, because he was raised and educated in an environment that emphasized a non-digital environment, i.e. void of interaction with digital devices.

[34]   Leith's custom built synthesizers are analog.

did not think the urban woodland was natural and further questioned whether the woodland could be considered "natural" at all.

Within the artist study group, three out of six participant artists were highly sceptical to the notion of HTN triad-relationship during pre-interview.[35] These artists were Anne F. Bunker, Gerald "Chuck" Koesters, and Dinka Pignon. However, these artists indicated marked change in perspective at the conclusion of participating in the research study. Bunker and Koester's expressed a new sense of embodiment and spatiality, as well as a new sense of how well the elements of performance, digital technology and natural setting fused together. Bunker and Koesters believed they sensed an interconnection and was "surprised" by it. For Pignon, I conclude that her experience of repositioning and re-orientating of her typical media practice from indoor setting to natural setting changed her perspective. She initially exclaimed the projectors to be "mere toys" and humorously scoffed at them. She questioned the technological limitations of the Aaxa P1 Jr. Projector. She indicated concerns of whether she would get anything of quality, which would meet her artistic standards, much less have display capability for an expansive outdoor setting. Yet, at completion of her project, she admitted she experienced a sense that her installation felt as if it was "absorbed" into landscape, where previously, she was uncertain whether this perceptual task would be possible given the technological limitation of the Aaxa P1 Jr.

To answer challenges to this final thesis conclusion, I turn to David Bohm, who informs of "rational insight." He reminds us that "a moment of understanding" occurs when things are taking place and is revealed in both "imagination (new mental images) and in the appearance of new lines of discursive reasoning which are free of the contradiction and confusion that was previously present" (Bohm, 1996 pp. 61-62). Thus, within re-thinking our use of digital technology, while we accept that such devices are interwoven in our daily life, the concepts of disassociation can be addressed and possibly replaced with fresh meanings gained from new experiences of interrelatedness to nature -- the rational insight of the HTN triad-relationship. Within the blending of digital artefact, human use, human interaction with natural realm, the tool, the artefact fits, as

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[35] I remind the reader that Bunker and Koesters collaborated on an artist-event project, so that there are five projects, but six individual participant artists.

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an act of *artramovement* (Bohm, 1996).[36] From rational insight, we now have the question of how the lacuna was bridged, how can digital technology mediate a relationship between humans and nature? I answer this question in my final statement.

6.1.1. *Research Significance*

I chose to implement pico projection through artistic practice in natural setting. I discovered limited research publication on the outdoor use of pico projection, specifically in artistic practices, as well as its use in the natural landscape. My study contributes to the discussion of human, technology and nature relationships. By blending or combining certain aspects of our technological symbiotic relationship with aspects of our deeper relationship to the natural realm, I discovered through the comments made by several individuals, that they expressed marked feelings of interconnectedness to natural realm by way of digital technology. The information gathered from my study, perhaps advances claims made by Kahn, et al. (2009) in their studies of technological nature versus real nature.

Also, I find my research to be suggestive of an original way of thinking that may lead to new understandings and considerations regarding our behavioural relationship to digital technologies. The fact that certain individuals markedly changed their attitudes, suggests that this change in thinking is important. Information gained from the random, unexpected, phenomenological events that occurred while in the field also is research significant. Several individuals informed that the experience of seeing visual projections onto rocks in urban natural setting gave them feelings of "excitement," and "intense curiosity" about new media installation works and technology being used in natural setting. But, most importantly, these random comments emphasized that it was a new way of "storytelling," and something "that should happen more."

The following constructs occurred:

1) An increased awareness of the importance that natural landscape provides an exciting exhibition paradigm for environmental electronic art works;

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[36] See Section 2.4 Human Interconnectedness to Nature.

2) The fact that the repositioning and reorientation of the traditional exhibition paradigm augments the representations and aesthetic appreciation of nature and is thus transformative;

3) That an individual can use digital technology through arts and education applications, to inform students that such technology can be utilized positively and in other modalities than constant social networking schemas.

Further, the sense of alienation from the natural realm can be overcome through digitally enhanced immersive nature experiences. These three constructs above are not discussed in great detail in this thesis due to space and time constraints and is part of my future research interests and writing.

6.1.2. Future Frameworks: Adapting LocoMotoArt

The LocoMotoArt system can be adapted for future studies. LocoMotoArt provides evidence that such independently powered field systems are practical, plausible, and warrant expanded and continued field use. The results of this initial study, gives suitable insight that the continued use of independent powered mobile digital technology systems for field work is important not only to sustainable arts practice. The study further suggests that LocoMotoArt can be implemented in outdoor education settings, eco-psychology therapy, as well as providing enhanced ubiquitous electronic environmental art experiences. The study also assists in understanding the ever changing dynamics of the human relationship to digital technology.

I suggest that future implementation of LocoMotoArt be based in a bottom-up strategy approach, because personal engagement is a strong vehicle for environmental awareness. The more affordable, ease in portability, and repeated field use of the LocoMotoArt system, say in mobile classroom scenarios for example, the practice begins to appear commonplace and then is more easily adoptable by others. LocoMotoArt suggests a conduit for tapping into traditional ecological knowledge and consequently offers a catalyst to new forms of education theory and curriculum implementation. Additionally, the continued use of independently powered field systems contributes to rearticulate mobile technological devices from communication tools to mobile pedagogical platforms, that is, as resources for community and experiential

learning. Such digital based learning experiences may lend themselves as a means to inform environmental stewardship for example.

Mobile devices can transform learning experiences and provide new avenues for engagement when focused on opportunities for new meaning-making. Further, as we face the crisis of climate change, humans must establish a more connective relationship to nature and engage a greater sense of reciprocity to natural realm (Abram, 1996 & 2010). LocoMotoArt provides for sustainable power to run digital devices while in remote or rural areas. In terms of informing environmental stewardship, continued study of the use of digital technology in natural setting is a necessary component to our understanding and meaning-making. From this perspective, the exchange of artistic technologically mediated experiences and expressions, results in transformed knowledge and shared information. Finally, I present that:

a) As an independent sustainable creative field system, LocoMotoArt offers a user a means of implementing electronic arts practice in natural setting with sustainable and practical energy options,

b) LocoMotoArt demonstrates potential to rearticulate mobile devices to facilitate education and health treatment scenarios, in natural setting; and

c) LocoMotoArt offers a doorway into establishing a new genre that I coin as *Eco-Futurism,* as noted in the introductory paragraphs of Chapter 3, which is differentiated from definitions of eco-arts, environmental art, because it incorporates an eco-aesthetic as advanced by Araeen (2009). I also conceive the term *Eco-Futurism*, in its totality, as a new "cultural explosion" (Mithen, 1996), because of potential evolutionary considerations regarding digital technology changing the human brain. But this topic is the subject of future papers.

6.1.3.   The HTN Triad-Relationship

It is only when the contents of a medium are transposed onto a different medium that the original medium becomes perceptible, in the sense that we are aware of the parameters of the original medium when a different medium brings them into focus. (Chakravorty 2010 p. 5)

My academic and field research supports my claim for the existence of the HTN triad-relationship in the following ways because:

1) The results dispel concerns of human-nature alienation because the phenomena of technological mediation bridges the conflict and narrows the "lacuna" as discussed in Sections 2.6 *Motivation* and 2.11 *Related Research*: *Projection, Sound and Interactive Systems* and represented in Figure 2.1;

2) When we have digital technology mediated experiences in natural setting, a form of consciousness awakens the desensitized "biophilia" coding advanced by Wilson, 1984; Ulrich, 1993; and Orr, 1993, among others.

These two understandings provide a vehicle for new frameworks of thinking and acting because by reconfiguring and reorienting the human-technology-nature relationship, as done in this research, I find that through mediation, a form of consciousness awakens the desensitized "biophilia" coding (Wilson, 1984). Perhaps while arguably illusionary or spawned from suggestion and the human imagination, this re-awakening is based in the activity of using digital artefact, i.e. tools. It is in a new and unusual atypical manner of use that momentarily the invisibility inherent in the mediation phenomena is erased. Suddenly, through the blending of the three ingredients to the mediated experience, (humans, technology and nature) that there is a momentary presence that fills the gap, the lacuna. Because the HTN triad-relationship is not a long term presence that can be kept in place for lengths of time, but rather, within an instance of experience, does not discount its existence. But, rather, defines the moment that it does appear and is sensed and understood by the participant.

6.2. Future Work, Artist Contribution Jamie Griffiths

The original intent of this research was to conduct it solely in wilderness setting, so that artists and spectators were free of human-built influences as much as possible. I define "wilderness" as those places on the planet that are undeveloped, remote, and have life threatening conditions such as predatory animals or extreme terrain, that is, "wild" and uncontrolled. I could not go into wilderness setting due to budget and time constraints. The impression of the need to go in wilderness is evident in that two of the

spectators from my study indicated they felt that the new media experience could be further enhanced if positioned in wilderness setting. Several of the participants of my current LocoMotoArt study expressed an interest in participating in a wilderness exhibition endeavour in the future. Therefore, I will be seeking grant funding to conduct an extensive wilderness exhibition that reproduces the research plan or find others to collaborate with. Also, the LocoMotoArt research warrants larger study, one that broadens the scope towards incorporating both scientific and quantitative methodology to further triangulate the validity of my claim that the use of mobile digital technologies by artists in natural setting can offer an enhanced experience of interconnection with nature (See Section 2.7) and thus alter cultural notions of technology as antithetical to nature in support of the benefits of the HTN triad-relationship. Further, the research plan warrants a larger participant pool in order to determine quantitatively how many individuals would actually have marked changes in perspective and whether or not the artistic expertise had much to do about such changes. Finally, the inclusion of more spectators who have little experience or interest in nature and lean more towards heavy use of digital devices and computers for example would provide contrasting points-of-view that can further inform this study.

An interesting opportunity presented itself during the late stages of this thesis. British interactive and electronic artist Jamie Griffiths, whose work is exhibited internationally, attended the focus group session associated with my research. She was attracted to the workshop presentation on solar and independent power sources given by Graham Morfitt of Modern Outpost, Ltd. for artists Pignon, Leith, Thomson and Kozinuk. Griffiths was preparing for her residency with the *Calanoa Amazonas* Riverboat Project, in collaboration with artists Diego and Marlene Samper whose project goal is to provide environmental education in remote areas along the Amazon. After a few discussions, Griffiths agreed to test LocoMotoArt in the Amazon and share her field notes with me. Module 3 (See Section 4.1) of the LocoMotoArt portable system was assembled for Griffiths specifically to support her power needs and testing of the Aaxa P4 80 lumen pico-projectors in the wild. Griffiths also included her own photographic equipment and battery systems. She used the following equipment in conjunction to Module 3:

Figure 6.1 & 6.2. *(Left) Jamie Griffiths in the Amazon Rain Forest. Photo: Diego Samper 2012; (Center/Right) LocoMotoArt Module 3 solar panels during field test in Amazon. Photos: Jamie Griffiths*

Capture:

Camera Equipment

- Canon 7D DSLR body for stills & HD video, with 3 lenses
- Canon 7D Accessory grip handles & LCD viewfinder for HD video
- GoPro waterproof camera, and boom pole
- Gitzu Carbon Tripod with ball-socket head

Sound:

- Sennheiser hotshoe shotgun stereo microphone
- Zoom H4 Stereo audio field recorder

Power:

- Brunton Battery charged up from the LocoMotArt solar panels via 12v cable head adaptor, with switchable output for 12v, 16v or 19v power to charge or run electrical devices.

- Power Invertor 12 volt to 110 AC to power an external 3 TB eSata hard drive for storage of media files. The following items were recharged or powered via the Brunton battery via 12v cable adaptors**.**
- AA, AAA battery charger
- Apple MacBook 16v/19v Power adaptor
- Canon 7D camera batteries
- Video Projection Equipment

Display:

- Two Aaxa Pico P4 (80 lumen projectors)

Griffiths also had an interest to test video projection in remote wild environments and to power equipment absent the use of fossil fuel. This is one motivation for her to agree to share her notes with me. She reports:

I had misgivings when first invited by Laura Lee Coles to take part in 'Loco Moto Art', a research project that was exploring outdoor video projection experiments using solar powered equipment. A vision arose in my mind of media artists bringing consumer-priced new technologies into remote natural areas to set up their art experiments, with a

*well-meaning audience trekking along behind them into the woods for an evening of artistic entertainment... a new category of nocturnal outdoor activity... '**eco-cinema**'... but perhaps in reality being an objectification of the natural environment for the sake of entertainment, transforming natural woodlands and delicate ecosystems into theatres, cinemas and temporary galleries. However, as a performance film artist and researcher of new projection technologies with a strong interest in ecology, the lure of testing out untethered solar powered video projection in deep nature, was very strong.* (Griffiths, 2012; Emphasis Griffiths)

Griffiths faced meteorological and environmental challenges such as inclement weather, which interrupted the ability of the solar panels to absorb power quickly enough and thus she had to resort to using a gas fuelled power generation engine. Because of time and space constraints of this thesis, detailed analysis of Griffiths' study and report must be the subject of future papers. It is also worth noting however, that Griffiths is a technologist/artist who has a strong concern for the ethics of using technology in nature. As part of her arts practice, she has concerns as to how her use of projection in deep wilderness affects the ecology of that natural system and has questions regarding the ethics behind such actions.

Griffiths further provided an artist perspective of making and creating work in a deeper wilderness setting that was absent from the works I studied, which were *in situ* urban natural settings and thus influenced by the oscillation of the human-built world. Her comments support my future goal to continue my research in wilderness settings. One stark reminder of the power of the wild is reflected in Griffiths' notes when discussing the Aaxa P4 pico projector test in the Amazon forest:

The brightness is not enough for use other than after dark. Even dusk was too bright for good results. This was the biggest problem for my projection experiments. I had not anticipated how difficult it would be to work outdoors after nightfall. The mosquitoes were voracious at that time, and even when I braved it myself, no-one else was willing to brave it with me to watch the projections! Other safety reasons were also mentioned to me, such as the prevalence of snakes and spiders at that time. Further from base camp would also risk nocturnal caymans (alligators) and jaguars. I was even hit directly in the face by a bat that mistook my headlight for a florescent mushroom, (according to the local medicine man). For all these reasons my video projection experiments in the Amazon were more brief and infrequent than I would have liked. However from an aesthetic and creative standpoint, I was extremely impressed by the possibilities and plan to continue these experiments in less difficult and dangerous outdoor environments, including planning for an outdoor performance/installation at the Camley Street Natural Park in Kings Cross, London in the UK, this September. (Griffiths 2012).

Finally, the *Griffiths Amazon River Study of Video Projections in Remote Environments*, as I call it here, provided insight on artists using digital technology in natural setting on several levels. First, her notes expand the scope of my enquiry by informing from a wilderness environment perspective. On another level, her study provides a lens of understanding of the practicality of employing independent energy creative field systems and advances the discourse of the iterative dynamics of environment, equipment and user behaviour while under extreme environmental conditions. Further, Griffiths' interaction with indigenous peoples, their reaction to digital technology and their keen interest in possessing such technology to learn to operate it also warrants further study and comment in the future.

6.3. Final Statement

Within this thesis, I concerned myself with the diversity of individual and personal truths about being human and immersed in the use of digital communication and technological devices. I also related the assumption that we can solicit a reconnection to the natural realm through digital technologies. But overall I am speaking about the human desire for wholeness, despite the fragmented systems-oriented way of being that our current digital technology offers. If our brains are evolving and changing because of these, it is necessary to include them in any vision we may have of a sustainable future – a future which is also determined by the state and condition of our life-giving environment.

My research supports my claim that through engaging the notion of the HTN triad-relationship, personal understandings can evolve so that the individual can incorporate digital technologies into their relationship with the material world, or nature, in more sensitive and inclusive ways, and rearticulate them in everyday life. The lacuna is broken by activity, by action, or as Heidegger stated, "Everything depends on our manipulating technology in the proper manner and means" (Heideger, 1977, p. 5). It is in the causality or the "holding sway" (p. 8) that digital technologies "fit" (*artramovement*) as discussed in Section 2.4 *Human Interconnectedness to Nature*. By artists rearticulating the form of engagement and the place of engagement through the HTN triad-relationship, the technologically mediated experience shifts from that of separation

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between nature and technology, to one of interconnectedness by way of technology. I propose that contemporary users of digital technologies must be willing to shed any preconceived notions about an inherent separation of technology and nature. Such users should accept that the HTN triad-relationship is one that is a form of technological symbiosis that is positive in that ultimately it is a beneficial relationship between humans, technology and the natural realm; because experiencing such relationships stimulates ecological awareness in a multi-dimensional way.

Artists are faced with a conundrum when they create and display electronic works in natural settings. Not only are they faced with the rigours associated with being outdoors, such as weather and other environmental conditions, and natural barriers such as moisture and temperature, but they are also restricted by the necessity to power and transport the gear. LocoMotoArt confronts these challenges and facilitates exploration into new areas by interacting with the natural environment through the exhibition of new media. Similar to the conceptual context of LocoMotoArt and this thesis, Burtner insists that pursuing the impractical methodology of going outdoors with electronic equipment is a way to "break away from this pattern." I emphasize that this "impractical methodology" is in fact practical and governed by choice, behaviour and values about whether technology is a necessary component of our ever-changing relationship to the natural realm.

As artists continue their exploration of "place" as a fundamental method of working with digital technologies, the art experience is changed from being a contemplative one to one that is a living experience, a story alive, perhaps even biologically, within and without us. Marshall McLuhan perceived the future cultural effects of technology on art and nature:

> *I expect to see the coming decades transform the planet into an art form; the new man, linked in a cosmic harmony that transcends time and space, will sensuously caress and mold and pattern every facet of the terrestrial artefact, as if it were a work of art, and man himself will become an organic art form . . .we have begun the journey…the story begins only when the book closes. (McLuhan, E. Zingrone, F., (Eds.) 1998, pp 268 – 269, Playboy Interview, 1969)*

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Appendix A.

Background of Artists

Anne F. Bunker is a choreographer and director of Bunker and Koesters, a multi-media aerial dance company. The company founded in 1985 has a rich history of works in modern dance and site-specific in origin, generally exploring native and natural influences and environments. Since 1991, the company incorporated aerial single-trapeze and developed an aesthetic by merging Modern and Aerial Dance into a unique form that has captivated audiences worldwide. The company has toured nationally and internationally in Ireland, Russia, Mexico, Central and South America.

Gerald Chuck Koesters is a musician and multi-media designer whose work has been the primary artist for music, lighting and video aesthetic for the OTO Dance company. Koesters is also a photographer. His music and video works with the company have been presented nationally and internationally in Ireland, Russia, Mexico, Central and South America.

Dinka Pignon has an extensive background as a media artist, with curatorial, and production background. Dinka's artistic practice involves working deeply within the genre of perceptual visual art and she explores projecting onto unusual surfaces or any kind of object as a screening surface. She is a recipient of Canada Council grants and other awards. Her work has exhibited internationally. Dinka Pignon has worked extensively as a performer at the internationally famous Fylkingen Society in Sweden which was founded in 1933, which is devoted to experimental and un-established forms of contemporary arts including electro-acoustic music. She also was the operations and education coordinator at Vivo Media Arts Centre, in Vancouver, British Columbia from 2001 - 2012.

Bobbi Kozinuk is a media artist, technician, curator and the electronics studio technician at the Emily Carr University of Art and Design in Vancouver, British Columbia. Additionally, Bobbi taught "electronics for artists" at the University of British Columbia. Bobbi has exhibited media installation works in both in Canada and internationally. Bobbi is published in *Radio Rethink* (produced by the Banff Centre for the Arts) and Echo Locations (Audio Art CD produced by Co-op Radio). Formerly the Media Director at the Western Front, in

Vancouver, British Columbia, Bobbi has also worked on a board level with the Independent Media Arts Alliance (Montreal), Co-op Radio, Grunt Gallery and Video In (Vancouver) and has traveled extensively across Canada producing workshops at artist run centres on the subject of low powered FM transmission. Additionally, Bobbi has an engineering background.

Phil Thomson, BFA and MFA from Simon Fraser University, British Columbia, is a digital audio artist and computer music composer whose compositions have been incorporated into performances by dancers and choreographers. Additionally, his works have been presented at sound festivals in Canada, such as the Sonic Boom Festival and the Vancouver New Music Festival at various artist centres and the United States at the NWEAMO Festival. He is interested in the development of sound processing techniques such as resonators, convolution and granulation.

Dave Leith is a multi-disciplinary artist and has an extensive background in

photography, digital art and video, sound art and music, including recording and performing. His photography, digital art and video work been exhibited in Canada, Korea, and Sweden; his sound and music performed at numerous festivals such as Signal + Noise, Western Front, and numerous collaborative artist projects has been heard in Canada, United States, and New Zealand. In addition, he has a teaching background, in both music and visual arts.

All of the above biographical information has been extrapolated from each individual artist's *Curricula Vitae* provided as part of this research.