

Mappings:

Setting, Memory, and Decay

by

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ABSTRACT

Mappings is an interactive wall-drawing installation that was on display in the West Hall Gallery of Rensselaer Polytechnic Institute on the tenth, eleventh, and thirteenth of April, 2015. The piece is visually composed of an incomplete trail map of Mount Greylock State Park traced directly onto the wall in grease pencil. The State Park map serves as a spacial framework for over fifty field recordings that can be activated and navigated through touch.

The purpose of this paper is to expose some of the key components that drove the creation and conceptualization of *Mappings* by contextualizing the work in four ways. Chapter One will explore how a number of influential site-specific works use space as a medium for communication. This will function as a preface to Chapter Two, which will analyze how *Mappings* uses physical space to expose an autobiographical composition about memory and decay. Chapter Three will focus on the technical aspects of the installation, and finally, a brief conclusion will reflect on the work and clue towards future development.

INTRODUCTION

I. Defining *Mappings*



Figure 1 - Wide shot of interaction, April 2015 installation of *Mappings*

Mappings is an interactive wall-drawing installation that was on display in the West Hall Gallery of Rensselaer Polytechnic Institute on the tenth, eleventh, and thirteenth of April, 2015. The piece is visually composed of an incomplete trail map of Mount Greylock State Park traced directly onto the wall in grease pencil. The State Park map serves as a spacial framework for over fifty field recordings that can be activated and navigated through touch. While certain transitions and compositional motives can only be exposed by tracing the lines on the wall, users are free to wander off the drawn path and create their own trajectory. While interacting with the work, participants are capable of a broad

range of expression. If a user moves quickly over the map, they hear a somewhat impressionistic sonic gesture. If the user is more focused, moves slowly, and even remains stationary at specific points, more detailed sounds are exposed that otherwise would not be heard. Over the course of the exhibition, the sonic materials are transformed by interaction. As sections of the grease pencil outline become worn-out over the twenty-five hour duration of the installation, the sounds at those locations pan to high up hidden speakers and ethereal clouds of synthesized tones emerge.

II. Overview

The purpose of this paper is to expose some of the key components that drove the creation and conceptualization of *Mappings* by contextualizing the work in four ways. Chapter One will explore how a number of influential site-specific works use space as a medium for communication. This will function as a preface to Chapter Two, which will analyze how *Mappings* uses physical space to present an autobiographical composition about memory and decay. Chapter Three will focus on the technical aspects of the installation, and finally, a brief conclusion will reflect on the work and clue towards future development.

CHAPTER ONE: SETTING ART

I. Framing Site

The practice of site-specific art has been framed in a countless number of ways since its rise in the mid-sixties. At first, site-specific art was seen as a category of works that alter or heighten a viewer's perception of the physical space in which an art object exists.¹ "Emerging out of the lessons of minimalism, site-specific art was initially based in a phenomenological or experimental understanding of the site, defined primarily as an agglomeration of the actual physical attributes of a physical location."² Although the meaning of site-specific has been greatly expanded and challenged over time, some contemporary definitions still recognize the immediate space as the primary focus of the art. The Guggenheim Museum's website states: "No matter which approach an artist takes, Site-specific art is meant to become part of its locale, and to restructure the viewer's conceptual and perceptual experience of that locale through the artist's intervention."³ Sculptor Richard Serra would certainly argue that a direct connection between a site-specific art work and its physical space is imperative. Commenting on the public debate and legal action over the removal of his 1981

¹ It should be noted that I will occasionally use the words "place," "setting," "site," "locale," and "location" in exchange for the word "space" for contextual reasons. I am referring to essentially the same thing in all instances.

² Miwon Kwon, *One Place After Another: Site Specific Art and Locational Identity* (Cambridge: MIT Press, 2004), 3.

³ "Movements > Site-specific art/Environmental art," Guggenheim Online, accessed October 25, 2014, <http://www.guggenheim.org/new-york/collections/collection-online/movements/195235/description>.

piece *Tilted Arc*, Serra stated “To move the work is to destroy the work.”⁴ Critic Rosalyn Deutsche provided her own definition of site-specificity when arguing that the interruptive nature of *Tilted Arc* is key to its place in the genre of site-specific art, as such art emerged from the imperative to interrupt space, rather than the creation of harmonious spatial tonalities.⁵ The extent to which an artwork must interact with, be inspired by, interrupt, or have any meaningful connection with a space to be considered “site-specific” has been debated for some time. Fittingly, a number of relatively recent writings have strived to re-interpret the idea of space in site-specific art.

In *Site-Specific Art: Performance, Place, and Documentation* published in 2000 by Routledge, London, author Nick Kaye challenges the concept of space in site-specific art by introducing anthropologist Marc Augé’s concept of “non-place.”⁶ He questions the meaning of location in a world of nearly constant movement and investigates the re-writing of perceived space through performance and documentation.⁷ The introduction of performance theories is crucial to Kaye’s definition of site-specific art. “This book proposes a site-specificity linked to the incursion of performance into visual art and architecture, in strategies which work against the assumptions and stabilities of site and location.”⁸ In other words, according to Kaye, site-specific art works against a

⁴ Nick Kaye, *Site Specific Art: Performance, Place and Documentation* (London: Routledge, 2000), 2.

⁵ Kwon, *One Place After Another*, 73.

⁶ Kaye, *Site Specific Art*, 9.

⁷ Kaye, *Site Specific Art*, 1-220.

⁸ Kaye, *Site Specific Art*, 3.

final or definitive location, and rather, speculates toward the performance of its places.⁹

In *One Place After Another: Site-Specific Art and Locational Identity* published in 2004 by the MIT Press, author Miwon Kwon frames site-specific art in the context of spatial politics.¹⁰ She begins by offering a brief history of site-specific work, from minimalism to institutional critique, from networked sites to a nomadic model where permanence and immobility give way to impermanence and transience.¹¹ She then focuses on public intervention and community-specific art, only to return to the nomadic model in questioning what site-specific art means for the contemporary human condition.¹² “It seems historically inevitable that we will leave behind the nostalgic notion of site and identity as essentially bound to the physical actualities of place. Such a notion, if not ideologically suspect, is at least out of sync with the prevalent description of contemporary life as a network of unanchored flows.”¹³ Thus, Kwon believes that site-specific art is beginning to move away from the fixed physical locale, as it is no longer relevant to our contemporary human condition.

Given the variety of definitions and framings of site-specific art reviewed thus far, and considering that this in no way represents a comprehensive list, one can imagine the vastness of the subject. Particularly since the early 2000s

⁹ Kaye, *Site Specific Art*, 220.

¹⁰ Kwon, *One Place After Another*, 2.

¹¹ Kwon, *One Place After Another*, 11-55.

¹² Kwon, *One Place After Another*, 56-166.

¹³ Kwon, *One Place After Another*, 164.

there has been an effort to try and frame site-specific art in a number of new ways.¹⁴ “Site-determined, site-oriented, site-referenced, site-conscious, site-responsive, site-related. These are some new terms that have emerged in recent years among many artists and critics to account for the various permutations of site-specific art in the present.”¹⁵ With that said, I intend to focus this chapter on a new framing inspired by site-specific art that I will define henceforth, not simply due to the recent popularity of re-defining site-specific art, but rather in an attempt to fill a hole that I believe exists within the site-specific research area while expanding the very notion of site-specificity itself. I will name this framing with a new term, not to add to the superfluous list of words relating to site-specific art, but rather for the sake of clarity. I hope that this new framing, in conjunction with the subsequent chapter, will make explicit the respect to which I view my own work as site-specific.

Rather than focusing directly on how site-specific artworks interact with or perform the spaces in which they exist, I propose to focus on how space may be used as a medium to convey themes and messages that go beyond the locale itself. Of course, such interaction with space is necessary for a location to be used as a medium, so while the details of art’s interaction with space will not be the focus of this text, they will not be entirely overlooked. Like the Kay and Kwon texts, I will investigate my framing through the analysis of a number of case studies. I will explore significant artworks where space is used as a medium in a

¹⁴ Note the dates of the Kaye and Kwon texts, 2000 and 2004 respectively. The Kaye was also republished in 2010 but I have not been able to find this edition.

¹⁵ Kwon, *One Place After Another*, 1.

framing that I will refer to as “setting art,” inspired by the concept of setting in works of fiction, where space is a crucial component, yet typically not the primary focus. In the following chapter, I will analyze *Mappings*, in the same manner: framing it as setting art to expose the ways in which I intend to use space as a medium to convey an autobiographical composition about memory and decay. Setting art is not a genre, but rather a lens through which to study work; a lens through which I have created my own work.

Bearing in mind that the origin of the name and idea of setting art was inspired by a concept in fictional writing practice, and considering the expanded notions of space outlined by Kaye and Kwon in the previously discussed texts, I propose to investigate the concept of setting art with an expanded notion of space that includes fictional and virtual spaces. This is particularly appropriate as my own work exists on the threshold between real and virtual spaces.¹⁶ In *Aesthetics of Interaction in Digital Art*, published in 2013 by the MIT Press, author Katja Kwastek defines space as an area with boundaries that can either be perceived or imagined.¹⁷ With such a rich body of recent research on virtual and digital spaces, a more open definition of space is necessary to push the boundaries of site-specific art.

Through deep analysis, one may find that many site-specific works can be framed as setting art in some way. The following list of case studies is

¹⁶ As outline in the introduction and to be expanded upon in later chapters, *Mappings* involved a number of digital recordings captured in the real world and rearranged (spatially and compositionally) onto an interactive map (part virtual part analogue) that could then be rearranged again by the user in time as they chose different areas to touch and travel to.

¹⁷ Katja Kwastek, *Aesthetics of Interaction in Digital Art* (Cambridge: MIT Press, 2013), 99.

therefore in no way comprehensive. Instead, I will touch on a few key works and concepts in the fields of fine and performing arts to frame them in the context of setting art. I will briefly investigate a number of written texts, artistic works, and artistic genres that I have found influential and are in some manner site-specific, but use the established space, be it virtual, real, or fictional, to communicate a message that goes beyond the space itself. It is my hope that this investigation will prove useful within a research area that I often believe is so concerned with redefining space, that the themes and messages of artworks are lost, as is the very practice of interpreting such messages.¹⁸ It is also my intention that analyzing these works and applying a similar analysis to my own work in Chapter Two will help expose a portion of my thought process in creating *Mappings*.

II. Case Studies

The Rings of Saturn by Winfried Georg Sebald is a novel first published by Eichborn Verlag, Frankfurt, 1995, and then translated into English by Michael Hulse and published by The Harvill Press - London, 1998, and subsequently by New Directions Paperbook - New York, 1999. It, in great part, inspired this chapter – the idea of setting as a medium in site-specific art, and the creation of my piece *Mappings* as a whole. It tells the story of a narrator, who may or may not be the author, recalling a walking tour of the eastern coast of England. As the

¹⁸ It is my opinion that the site-specific art research area is so concerned with space that it neglects to focus on the themes and messages, be them intended by the artist or interpreted by a viewer, that site-specific works often communicate or convey. This opinion is based on my research of site-specific art thus far, much of which is outlined in this chapter.

narrator slowly covers what seems to be a great distance, the places he encounters hardly serve as the focus of the book, but rather are used to trigger tangents that seem to quickly wander away from the original inspiration of place. Just as it is unclear whether the narrator is also the author and if these locations on the eastern coast of England are real or fictional, it is unclear whether these lengthy tangents, of which make up the majority of the text by far, are real or fictional. Throughout the narrator's journey, he ponders early anatomy lectures, World War Two dogfights, the court of King James II, the natural history of the herring, the demise of Chinese Emperor Hsien-feng, model making, the Temple of Jerusalem, the childhood home, and failed attempts at silk production in Germany. A physical place in one tangent often inspires yet another tangent, and as the narrator ponders all of this and a great deal more, themes of death and decay consistently emerge. The entire text is a meditation on death and decay, inspired by place, where place is the medium for the meditation. Specifically, there is a focus on the speed at which natural and human-made things decay. The reader gets a sense that natural things decay rapidly, like the burning of the Brazilian Rainforest while things made by humankind decay slowly, like a town slowly eroding into the sea. The narrator elegantly weaves in subtopics of humankind's desire to control nature, to create, as their creations slowly decay, scarring this Earth.¹⁹ This can be framed as a political message, especially as material production and climate change challenge the human race. On the subject of death, it is difficult to interpret exactly what the narrator is trying to

¹⁹ W.G. Sebald, *The Rings of Saturn*, trans. Michael Hulse (New York: New Directions Paperbook, 1999).

convey, but perhaps the narrator – or author – is struggling with their own mortality, forcing the reader to face their own.

The Rings of Saturn is a story about place. It is about the East Coast of England and the locations that the narrator encounters, yet it is not about place at all. The places in the novel only serve to convey a greater message entirely, yet in that, are completely necessary.²⁰ The sense of space weaves the text together – gives it a sense of structure in what would otherwise be a seemingly random rambling of anecdotes. While my brief summary of the text does not nearly do it justice in how elegantly it uses place to convey these complex topics, the broader messages of *The Rings of Saturn* truly become clear when analyzed through the lens of setting art. While many works of literature can be framed in a similar way, I use *The Rings of Saturn* as a case study specifically due to its influence on my work and how I think about site-specific art.

The Rings of Saturn's wandering narrative and writing style is reminiscent of *dérive*, the Situationist practice of wandering through space in order to alter or heighten awareness. “The Theory of the *Dérive*” is an article by Guy Debord, originally published in *Les Lèvres Nues* #9 in 1956. It has since been reprinted in other forms and after being translated by Ken Knabb, currently exists on the *Situationist International Online* site. As the title suggests, the article describes the Situationist practice of *dérive* and the parameters that make *dérive* most successful. Debord reveals that *dérives* are concerned with movement,

²⁰ When I refer to a “greater message,” I am speaking of a theme or message that a site-specific art work conveys beyond its relationship to its site, through the use of the site as a medium. Such is the definition of setting art. See page six.

boundaries, guiding influences, and the ecology of spaces. He defines the two main goals of *dérive* as the study of urban terrain and the emotional disorientation of the participant.²¹ At first, much of the article seems unclear. What is important about a heightened awareness of an urban terrain or understanding its ecology?²² What are the Situationist's attempting to convey about boundaries, guiding influences, and emotional disorientation? The practice of *dérive* truly becomes clear when framed as an institutional critique of capitalism and the structured time that capitalism creates.²³ Particularly in the urban environment, structured time is very evident. The author describes crowds of people moving from place to place at very specific times of the day, every day, moving only where they are directed to go. The heightened awareness of *dérive* is about realizing this mode of structured time and breaking through the invisible boundaries and guiding influences that the capitalist condition and urban terrain – which is the landscape of the capitalist condition – create. It is about observing the flows of people and the ecology of the space in order to escape. The only thing that is left unclear in this interpretation is the concept of emotional disorientation. Is the participant of *dérive* emotionally disoriented because she wanders throughout a city, breaking the conventions and flows that are ingrained in her every day life or is the every day person already emotionally disoriented,

²¹ Guy Debord, "Theory of the *Dérive*," Situationist International Online, accessed October 26, 2014, <http://www.cddc.vt.edu/sionline/si/theory.html>.

²² I am reminded of the early definition of site-specific art, mentioned at the beginning of this chapter, where the primary focus was to alter or heighten a viewer's perception of the physical space.

²³ Mary Anne Staniszewski, interviewed by author, November 13, 2014.

detached from reality as they are guided by the invisible hand? This uncertainty aside, the Situationist practice of *dérive* can be framed as a practice of setting art. The urban environment is used as a medium to wander through and observe the implications of the capitalist condition. Moreover, the specifically curated space is used as a medium to rebel against the tendencies of the capitalist condition and its structured time – a goal far beyond a simple observation or interaction with the space it self.

Situationist ideas of movement have influenced subsequent bodies of work that may also be framed as setting art. Lev Manovich addresses movement in space in his book, *The Language of New Media*, published in 2002 by the MIT Press. In *The Language of New Media*, Manovich attempts to define new media, first by breaking it down into five principle parts: numerical representation, modularity, automation, variability, and transcoding. He then goes on to discuss the interface, cinema, the database and how new media applies to what he calls “navigable space.” Manovich defines navigable space as a type of wandering through the virtual world, enabled by systems like the database, the internet, and video games. He argues that an emphasis of navigable space in our every day lives has led to the rise in popularity of data visualization, a practice that he is very involved with today.²⁴ In many ways, navigable space is not unlike Situationist ideas of *dérive*. The concept that linear narrative is de-emphasized by the emphasis of navigable space in contemporary culture brings the theory even closer to Situationist practices, which suggest something more complex

²⁴ Lev Manovich, *The Language of New Media* (Cambridge: MIT Press, 2002), 212-253.

than narrative structure.²⁵ In the case of many internet artworks, game artworks, and data visualizations – all of which deal with and create digital navigable spaces and can thus be framed as virtual site-specific works – virtual spaces are used as a medium to communicate some greater message. With data visualization for instance, a two or three dimensional space is created, but simply to communicate a data set beyond the digital space itself. In many internet and game artworks, there is often a goal beyond a meditation of virtual space. For instance, the online game *The Artist is Present*, created by Marina Abramović and based on her performance at the MoMA in 2010, takes place at a virtual MoMA. There, the player waits on a virtual line with the hope of getting a chance to experience the one-on-one performance before the museum closes. In this game, the virtual space of the MoMA, along with the virtual circumstances, act as a critique of Marina Abramović's own performance, where most of the user's experience consists of frustratingly waiting in a queue.²⁶ Thus the virtual navigable space facilitates a message otherwise set apart from the place itself.²⁷ To communicate any message in the first place, digital works must create their own virtual spaces – they must become site-specific, and for this reason, a plethora of digital artworks may be analyzed through the lens of setting art, especially when framed in the context of navigable space. Doing so

²⁵ Manovich, *The Language of New Media*, 86.

²⁶ Marina Abramović and Pippin Barr, "The Artist Is Present," Pippin Barr Online, accessed October 26, 2014, <http://www.pippinbarr.com/games/theartistispresent/TheArtistIsPresent.html>.

²⁷ A generally common mechanism in video games, especially non-narrative and indy games. Game theory, however, is beyond the scope of this paper.

helps uncover the purpose of each artwork and how the virtual space helps communicate that purpose.

Inuksuit by John Luther Adams is a real-world example of music composition framed by navigable space.²⁸ First premiered at the Banff Center in Alberta, Canada, *Inuksuit* is a piece for nine to ninety-nine percussionists performing outdoors. Since its 2009 debut, *Inuksuit* has been played at the Ojai Music Festival in California, Make Music New York in Morningside Park, in the forest surrounding Gilford, Vermont, and elsewhere.²⁹ Listeners are asked to navigate a vast outdoor space with performers placed throughout. Sounds of the immediate environment blend and interact with the sounds of percussion, potentially leading to a heightened listening experience. Adams admits that his use of outdoor space is, in part, an institutional critique of the concert hall, but as in a great deal of his work, there are also environmentalist undertones.³⁰ He notes: “This work is haunted by the vision of the melting of the polar ice, the rising of the seas, and what may remain of humanity’s presence after the waters recede.”³¹ Adams hopes that humanity’s relationship with the environment can

²⁸ The term “real-world” is used here to denote non-digital, non-virtual space.

²⁹ Anthony Tommasini, “At a Concert, Even the Birds Chime In,” *New York Times*, June 8, 2012, <http://www.nytimes.com/2012/06/09/arts/music/john-luther-adamss-inuksuit-at-ojai-music-festival.html>.

Allan Kozinn, “Inuksuit,” *New York Times*, June 26, 2011, http://www.nytimes.com/2011/06/27/arts/music/inuksuit.html?_r=0.

“Inuksuit,” *Bang on a Can Online*, accessed November 24, 2014, <http://bangonacan.org/store/music/inuksuit>.

³⁰ John Luther Adams, interviewed by author, November 26, 2014.

³¹ Alex Ross, “Video: John Luther Adams’s ‘Inuksuit’,” *The New Yorker*, September 2, 2009, <http://www.newyorker.com/news/news-desk/video-john-luther-adamss-inuksuit>.

be improved through music and the practice of listening; however, this work may be expressing that it is too late to avoid the repercussions of humankind's irresponsible actions. *Inuksuit* uses vast outdoor spaces as mediums in an attempt to communicate messages of ecological awareness, institutional critique, and climate change. The extent to which the work succeeds in communicating these topics is truly up to the participant, who, as in many works involving navigable space, is given a great deal of agency. However, Adam's work is usually well received in this respect.

Like *Inuksuit*, Nam June Paik's *Random Access Music* combines compositional practice with concepts of navigable space. Premiered in Wuppertal, Germany at Paik's first solo exhibition in 1963, *Random Access Music* is a particularly early example of an artwork that explores real and virtual spaces. The work consists of roughly fifty strips of audiotape glued on to a gallery wall. The participant, equipped with a magnetic playhead, is able to freely explore the contents of the tape at any speed or in any order.³² Thus, the composition, in many respects, is defined by different layers of space: the space in which the audio was recorded, the artist's arrangement of tape to create a virtual space, and the user's interaction with space as they explore the contents of the tape. Paik does this to "decontextualize the technical apparatus of the tape recorder."³³ The playhead, which is normally fixed in space on an

³² Jon Ippolito, "Random Access," New York Digital Salon, accessed April 22, 2015, <http://www.nydigitalsalon.org/10/artwork.php?artwork=13#>.

³³ Karmen Franinović and Stefania Serafin, *Sonic Interaction Design* (Cambridge: MIT Press, 2013), 45.

assembled tape machine, is transformed from an automatic mechanism into an expressive tool. In *Random Access Music*, Paik creates a virtual space to communicate the contents of a musical composition while redefining a common technology. He breaks apart an automated system to question the very concept of fixed media. For these reasons, *Random Access Music* is a very early and somewhat groundbreaking example of an electronic artwork that is fittingly analyzed through the lens of setting art.

Much like *Random Access Music*, *Rider Spoke* exists at the intersection between real and virtual navigable spaces. The work, created by artist group Blast Theory, involves mixed-reality spaces in urban environments. It was first presented at the Barbican in London in October 2007 and subsequently presented in Athens, Brighton, Budapest, Sydney, Adelaide, and elsewhere. The piece requires participants to ride around a city on a bicycle, find a hiding spot, and record their answer to a question about their personal past on a provided electronic device. They then can search for other participant's hidden recorded memories, which are only accessible electronically in specific GPS locations.³⁴ Here the group Blast Theory curates a large site – a city – to be used as a medium for the piece as a whole while the participants curate smaller sites – hiding spots – to serve as mediums for their sound memories. *Rider Spoke* is in part about place and exploring a city in a matter not unrelated to *dérive*, yet the city is also used as a medium to explore “hybrid social spaces in which the

³⁴ “Rider Spoke,” Blast Theory Online, accessed November 24, 2014, <http://www.blasttheory.co.uk/projects/rider-spoke/>.

private and the public are intertwined.”³⁵ Recording personal memories in publicly accessible hiding places, the work uses space to question digital culture, where public and private life often collide. Like John Luther Adam’s *Inuksuit*, *Rider Spoke* uses space in an attempt to encourage social dialogue about contemporary issues – issues that are exposed through the context of setting art.

Merging elements from *Inuksuit*, *Random Access Music*, and *Rider Spoke*, Frances White’s *Resonant Landscape* combines compositional practice with real and virtual navigable spaces to investigate themes of memory. Displayed at Princeton University in 1990 and later at the Kelvingrove Art Galleries in Glasgow, *Resonant Landscape* lets participants explore a composed sonic environment using a desktop computer-mouse.³⁶ A computer screen displays a map of an imaginary place as users traverse a rich landscape of recorded, processed, unprocessed, and synthesized audio. Sounds enter, exit, change volume and stereo panning according to the user’s location and movement.³⁷ The displayed environment – both sonic and visual – is a virtual navigable space, while a number of field recordings of outdoor landscapes serve as virtual representations of real space. The work, however, is not intended to simulate a true sonic environment. White notes: “Although I was inspired by my

³⁵ “Rider Spoke.”

³⁶ Frances White, “Resonant Landscape,” Frances White Music, accessed April 24, 2015, <http://rosewhitemusic.com/resonant.html>.

James Eugene Wierzbicki, *Music, Sound and Filmmakers: Sonic Style in Cinema* (London: Routledge, 2012), 86.

³⁷ White, Frances.

walks in the woods around Princeton, the intent of the piece is not to imitate any real experience or particular place, but rather to communicate to the listener my sense of the natural landscape: my memory and imagination of it.”³⁸ Thus, *Resonant Landscape* is a kind of memory map, creating a sonic environment from an archive of real and perceived memories. The work uses space, not to communicate a clear and objective message, but rather to convey a more complex autobiographical, non-linear narrative about the artist’s relationship with the local landscape. Like Winfried Georg Sebald’s novel *The Rings of Saturn*, a space is created to ponder a variety of subjects relating to memory and personal association. In many respects, as will be made evident in the next chapter, I try to do the very same in *Mappings* – my own attempt at setting art.

III. Framing *Mappings*

Since the mid-sixties, site-specific art has been framed in a countless number of ways. Setting art, my own framing of site-specific art, looks to works of writing, performance, installation, and large artistic practices, to investigate how they use fictional, virtual, and real spaces as mediums to convey themes and messages that go beyond the spaces themselves. The framing is flexible and rich. It can be used to analyze anything from single artworks, to large categories of art practice. It applies neatly to a number of site-specific practices beyond the scope of this analysis, like uncommissioned public art, graffiti, protest art, and games. The benefit of analyzing site-specific works through the frame of

³⁸ White, Frances.

setting art, is that it shifts the focus towards an investigation of the meaning of the art works, be them intended by the artist or interpreted. Crucially, the very concept of setting art has influenced my own art practice. The case studies outlined in this chapter have informed the use of space in my interactive artwork, *Mappings*. The greater portion of the following chapter will be dedicated to analyzing *Mappings* in a matter not unlike my analysis of case studies. I will refer to a number of these case studies to expose how they influenced my use of space in *Mappings* to convey an autobiographical interactive composition about personal memory and decay.



Figure 2 - Close up of interaction, April 2015 installation of *Mappings*

CHAPTER TWO: SPACE AND AUTOBIOGRAPHY

I. Levels of Space

When I first began working on *Mappings* in the Autumn of 2014, I researched a number of artworks for inspiration. Influenced by *Random Access Memory*, *Rider Spoke*, and *Resonant Landscape*, I sought to create an installation involving multiple layers of space. Framing my own work as setting art, I decided to use each space as a medium in an attempt to communicate a number of different ideas. *Mappings* takes advantage of discrete but interconnected spaces. The most immediately evident space is the gallery. The map, drawn on the wall, exists in the gallery space, but also represents the trails of Mount Greylock State Park in western Massachusetts, and serves as a framework for the virtual space created by the composition of *Mappings*. The interactive composition exists in digital space, but includes a number of field recordings captured in real space. Each space serves its own purpose in *Mappings* and each space is navigable. This chapter will focus on the spaces in *Mappings* and analyze how each space is used in the context of setting art. I intend for this analysis to not only uncover some of the mechanics of the work, but also to expose the autobiographical nature of *Mappings*.

II. The Gallery Space

Mappings was premiered in the West Hall Gallery at Rensselaer Polytechnic Institute on April tenth, eleventh, and thirteenth, 2015. The West Hall Gallery allowed me the unique opportunity to work in close proximity to a

geographic region that has been extremely influential in my life. In the late 1970's my grandfather built a cabin in Williamstown, Massachusetts, on the outskirts of Mount Greylock State Park. Up until his, and my grandmother's death in October 2013, this cabin served as a significant gathering place for my family. If an observer stands in the West Hall Gallery and faces the east wall, they are directed precisely at the cabin built by my grandfather – twenty-five miles in a straight line.³⁹ Following the same trajectory and just beyond the cabin is Mount Greylock State Park, a landscape that I know well from my childhood. This spacial relation made the West Hall Gallery a significant location to host *Mappings*, a work that is very much about my life and my memories of places and people of importance to me. Although the spacial relationship between the West Hall Gallery and my grandparents' cabin may not have been effectively communicated to the audience by the gallery layout alone, a handful of participants realized the significance of the local region by hearing identifiable sounds while exploring the interactive map. Sound, however, will be examined more in depth in subsequent sections of this chapter.



Figure 3 - Trajectory from gallery wall to cabin. Imagery ©2015 Google. Map data ©2015 Google.

³⁹ 24.65 miles to be precise. Calculated using the “measure distance” tool on Google Maps.

“Google Maps,” *Google*, accessed April 21, 2015, maps.google.com.

The aspects of the work that I attempted to explicitly communicate to participants through use of the gallery space were primarily instructive.⁴⁰ I attempted to promote interaction using the visual layout of the gallery space. The map, drawn on the far wall, stood out as being one of the only truly distinguishable features in a nearly empty space. Unfortunately, for technical reasons, speakers, speaker stands, a sensing array, and a very small amount of wire were required to be visible in proximity to the wall drawing. Apart from the speakers, speaker stands, structural elements of the space, and the small amount of visible wire, the grease pencil map was the only dark colored element in the all white space. The map was centered on the far wall, lit, and framed on either side by perpendicular white walls. The sensing bar, placed directly above the wall-drawn map, was made to look as unobtrusive as possible without negatively affecting its technological function in the interactive work. The map was the only fluid visual element in the space, characterized by curves. Most other elements in the space were more angular in nature.

A line drawing, executed in a similar style to the grease pencil map of Mount Greylock State Park, was drawn onto the door of the gallery. This was done with the goal of communicating the main visual focus upon entrance. Shortly after the installation began, an observer noted that the drawing on the door did not look exceptionally similar to the State Park map, so with the help of my collaborator Ronald Sardarian, I decided to have the door illustration redrawn.

⁴⁰ I realize that using spacial cues to communicate instruction is similar to the idea of affordance in game theory, but, once again, game theory lies outside of the scope of this paper.

A few hours after the exhibition started, I decided to hang two small informational sheets, each with the following text. “Mappings is an interactive wall drawing that blurs the lines between instrument and composition. Using over fifty field recordings, the work explores ideas of memory, place, and transience. Please feel free to touch the wall; create your own path or follow the one provided to you.” At the bottom of the text there were a number of thank you notes to people who had helped in the creation of the work. At the end of this section I revealed the influence my grandparents had on this piece. Each informational sheet was placed beside the entrance to the gallery, one on the inside of the gallery and one on the outside.

Although I wanted to communicate interaction with space alone, I felt that it was necessary to hang these pages due to the tradition of using wall text in gallery exhibitions, and the expectation within an academic setting created by this tradition. The small, easy to miss texts proved successful. For those who missed it, the spacial cues seemed to be enough to promote touch and interaction.⁴¹ For those who sought more instruction, I was able to point them to the wall text.

III. The Map

Just as the gallery’s geographic location holds strong ties to my personal narrative, the trail map of Mount Greylock State Park also bears a significant

⁴¹ A single group of three was bewildered, walked into the room, and immediately walked out. There were more than one-hundred visitors total during the twenty-five hour exhibition. Approximately half of them read the wall text. All others either knew what to do out of familiarity with my work, or figured it out due to spacial cues.

place in my past. My last memory of my grandfather in good health is of him studying a map of Mount Greylock State Park on the porch of the Williamstown cabin. This image of him, informed by the concepts addressed in *The Rings of Saturn*, *Rider Spoke*, and *Resonant Landscape*, inspired me to create a work about my perceived memory of the people and places that have influenced me – particularly my grandparents, the places they introduced me to and the things that they have left behind. The grease pencil outline in the gallery is the same trail map my grandfather was studying in the Summer of 2013, transposed directly onto the wall.

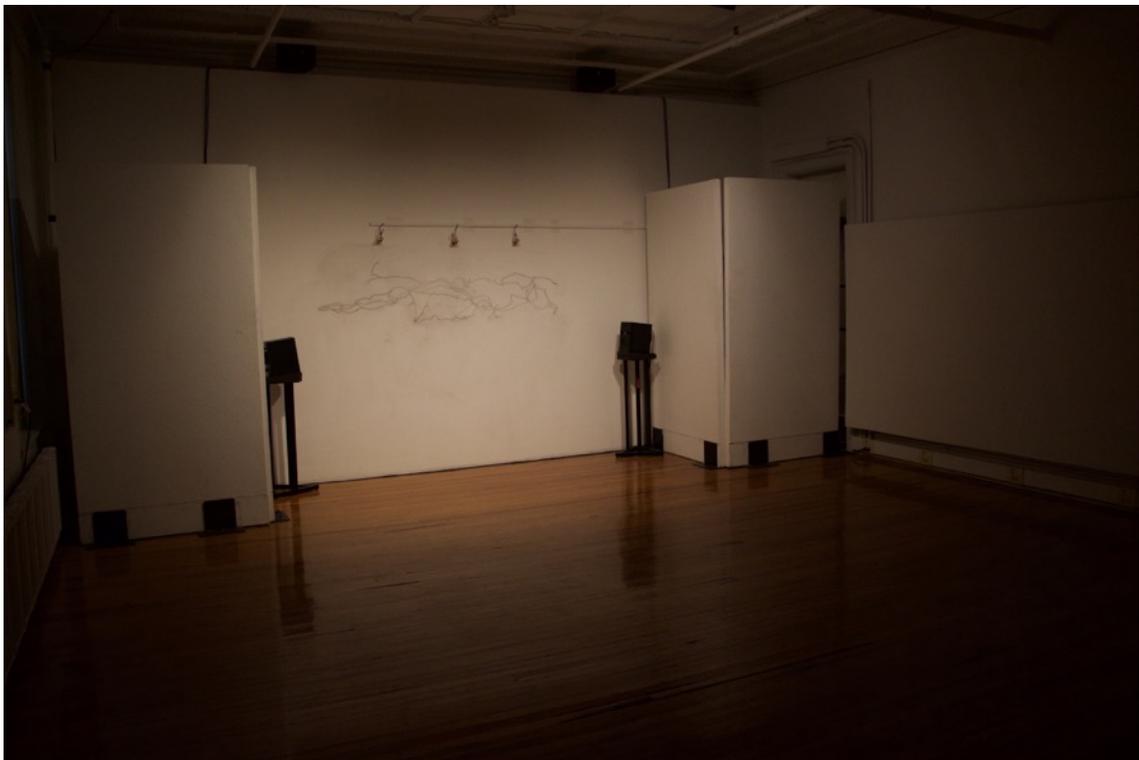


Figure 4 - Wide shot of unoccupied space, April 2015 installation of *Mappings*

Just as the gallery space was arranged to promote interaction, the visual characteristics of the wall map were molded to encourage the observer to touch the wall. Rather than having a clean appearance, the grease pencil map was smudged to show evidence of past interaction. Before the installation opened, this was done purposefully to promote touch. As *Mappings* ran, user interaction smudged the grease pencil outline further, making the effect more pronounced but also more sincere. Of course, for some, the somewhat messy looking wall detracted from a desire to interact, but this was not an overly common case.

The decay of the grease pencil trails also played a programmatic role in the work. Hiking trails rely on the contrast between the presence and absence of life. While backpacking in Mount Greylock State Park, the most apparent visual indicator of a hiking trail's trajectory is the absence of plant life; a dirt path surrounded by vegetation, insect, and animal habitats. Any plant that attempts to grow on a highly trafficked trail is swiftly trampled and decayed. Inspired by the narrators obsession with decay in *The Rings of Saturn* and seeking my own way to cope with mortality and escaping memory, I composed a long term interactive element in *Mappings*. As users trace their hands over the wall-drawn map during the longterm duration of the piece, well traveled sections of the map begin to rub off and decay. The field recordings in the decayed areas of the map begin to move into speakers placed high above the user's head and are eventually replaced by microtonal synthesized tones. The desire paths created by user trajectories make the sounds along these paths ever the more fleeting, like a fading memory. For participants who revisited the installation, the decay of the

map was apparent. It is my hope that the long term changes in the visual and virtual spaces communicated a meditation on decay, escaping memory, and mortality.

IV. The Virtual, Composed Space

The process of composing *Mappings* involved capturing approximately eighty field recordings, choosing approximately fifty field recordings, editing each recording, setting a number of granular playback parameters to make each field recording navigable, and then placing each recording into a virtual space. The process also involved spatializing the sound in the quadraphonic speaker array and creating clouds of microtonal synthesized tones to emerge over time. Like the works *Inuksuit*, *Random Access Music* and *Resonant Landscape* I was interested in combining compositional practice with navigable space.

Some observers have noticed a possible connection between the wall drawing, my composition, and the practice of abstract graphic notation. While aspects of *Mappings* do relate to the post World War Two aesthetic of compositional collaboration between the composer and performer (who in this case, is also the observer), *Mappings* was more influenced by concepts of navigable space than by graphic notation.⁴² Unless otherwise specified by written instruction, participants often have a great deal of sonic freedom while interacting with an abstract graphic notation. They can most often use any sound or style of sound they please: any instrument, voice, octave, timbre, genre, etc.

⁴² Kevin D. Lewis, *A Historical And Analytical Examination Of Graphic Systems Of Notation In Twentieth-Century Music* (Akron: University Of Akron, 2010), 30.

While interacting with *Mappings*, the participant also has a great deal of expressive freedom, but is confined to interact with only the sounds that I curate. *Mappings* can be played like an instrument, or even a score in some respects, but truly it is more of an exploded composition: a composition mapped into a navigable space. In discussing navigable art works, renown artist and theorist David Rokeby states: “While the constraining structure subtly expresses itself, the interactors’ ability to navigate the system gives them a sense of freedom.”⁴³ *Mappings* is at times predictable – susceptible to virtuosity – and at times solely returns the unexpected. There are meticulous sonic gestures hidden by layers of depth, but also tensions that challenge the participant. With *Mappings*, I use navigable space in conjunction with expressive constraints to promote an oscillation between the reflexive and reflective states of mind, as author Katja Kwastek might suggest, in an attempt to achieve an aesthetic experience.⁴⁴

In *The Language of New Media*, Lev Manovich suggests that an emphasis of navigable space de-emphasizes linear narrative.⁴⁵ In *Mappings* this certainly holds true. Although there are some very specific narrative ideas – an autobiographical exploration of sound associated with memory, people, places, and decay – the spacial layout of the composition inhibits any chance of a definitive linear structure. There is no start, no middle, no end. Every participant

⁴³ David Rokeby, “Transforming Mirrors: Navigable Structures,” in *Critical Issues in Electronic Media*, ed. Simon Penny (Albany: SUNY Press, 1995), 140-141.

⁴⁴ Kwastek, *Aesthetics of Interaction in Digital Art*, 160-163.

⁴⁵ Manovich, *The Language of New Media*, 86.



Figure 5 - Unique interaction, April 2015 installation of *Mappings*

approached the map differently and in ways that I could have never imagined. Some users played with large, sweeping gestures, others with meticulous, small movements. A few participants used only one finger to interact while others used their entire hands. Some users poked and prodded the wall, while others held still for minutes at a time. A surprising number of participants activated the map with their face, nose, feet, and other extremities. Everyone was invited to play and form a connection with the piece, no matter their point of view or ability. Many users, even with no previous knowledge of my work, uncovered many of the autobiographical and narrative components, despite the lack of linear structure. In that sense *Mappings* can be considered a success in the context of setting art, as it used space and content alone to communicate programmatic intent. As David Rokeby states, the reward of navigable art is “the unfolding

experience of exploration and discovery, the collection of points of view resulting in a personal reading of the work.”⁴⁶ I recognize that the piece was not entirely successful at communicating my personal narrative goals to every observer, but I am accepting of this. I wanted to give each user the freedom to interpret the work and bring their own perspective – to connect and project their memories onto my own. My openness may be attributed to the fact that I come from a music composition background and I recognize the abstract nature of non-linguistic sound. *Mappings* is very much so a programmatic composition, inspired by certain ideas, possessing a certain emotion and atmosphere, but open to interpretation.

V. The Recorded Space

As mentioned in the previous section, a crucial part of the compositional process of *Mappings* involved capturing field recordings. These field recordings are digital representations of real spaces that exist inside the virtual framework of the composition. While creating *Mappings*, I considered these field recordings to be captured sound memories, as many of them have a strong relationship to the piece’s autobiographical narrative. This concept was greatly influenced by works that use audio recordings to confront memory, like *Rider Spoke* and *Resonant Landscape*. In this section, I will briefly examine a handful of the approximately fifty navigable field recordings used in the piece to expose their significant characteristics in respect to the autobiographical characteristics of the work.

⁴⁶ Rokeby, “Transforming Mirrors: Navigable Structures,” 139.

Many of the recordings were captured from objects passed down to me. The mechanics of three different thirty-five millimeter film cameras are sounded throughout the wall-drawn map. Two of the cameras were from my maternal grandfather, who was an amateur photographer and taught me most of what I know about photography. The third camera had belonged to my paternal grandmother, who had passed away before I was born. While interacting with the map, users are able to isolate specific mechanical sounds of each camera by navigating through each field recording individually. The components that were recorded on each camera were primarily dials and shutters at different settings.

An Appalachian dulcimer, given to me by my paternal grandmother, is located at a number of endpoints on the map. Placing this recording at endpoints was primarily a compositional decision. The quality of the dulcimer recordings differs slightly in pitch and timbre at each point. The instrument, which has four strings and is played on a musician's lap, was built by my paternal grandfather and given to his wife, my grandmother. The sound of a cologne bottle, a music box, and other items given to me also make appearances on the map.

A number of sounds that I associate specifically with place are also included. The sounds of Long Island Railroad trains that passed my maternal grandparents' house in southern New York are juxtaposed with the sounds of trains from upstate New York and Western Massachusetts. The different sounds of air traffic in each location are treated in similar manners. Recordings of hikes

in Mount Greylock State Park, the brook that passes my grandparent's cabin, the creaky pull-down stairs leading to the second floor of the cabin, and the handmade desk that sits in the corner of the second floor all make their way into *Mappings*. Transitional sounds from my childhood home of indistinguishable voices of friends, and from my current place of residence – only a few miles away from my grandparents' cabin – are also used.

Sounds that I will always associate with memories of the people, places, and occasions that have played a significant role in my life make up a large portion of the content in *Mappings*. It is difficult to explain how the acoustics of a space, the specific altitude of a plane heard time and time again, can grip so tightly to the memories and feelings of a place. It is like the vivid memory that hits when you smell something strong. Although I do not expect for anyone to have as powerful a connection to the sounds used in *Mappings* as myself, it is my hope that these very significant sounds laid out compositionally will help the memories of my past connect with the memories of the participant.

VI. The Compositional Process

The process of composing *Mappings* began in late November, 2014 with a study created for a Rensselaer Arts Department Open Studio event. In a continuation of my past work, I decided to transform a wall into an interactive instrument. In the years leading up to this study, I had developed mallet devices that allowed percussionists to transform nearly any surface into a MIDI interface. Pushing this idea even further, I sought to create an instrument that anyone

could interact with. The use of a wall for this project was an obvious choice for me. Walls give the participant complete control over scale and detail.

Participants could view and interact with small detailed sections of the wall, or view the piece as a whole. A table top does afford similar possibilities, but a table makes it more difficult for a user to get nearly as close to all parts of the surface with which they are interacting. This attention to scale and detail would inform my compositional practice in later studies.

My preference to create an interactive installation rather than a musical performance was ultimately a compositional decision. As revealed earlier in this chapter, I sought to create a nonlinear composition mapped into a navigable space. Not only would this be a unique compositional challenge, but it would also serve as a method for applying the concepts of setting art into my own work.

By November I had already begun using hacked laser keyboards and custom software to transform surfaces into multitouch musical instruments as a personal project. I decided to apply this technology for the creation of the wall installation study. The hacked laser keyboards would eventually develop into custom sensing units, as described in the subsequent chapter, and into other independent projects outside of the scope of this paper.

Seeking a simple visual framework for the study, I decided to use a small trail map of Mount Greylock State Park for its personal significance. At this point, I was well aware that this study would be the start of my thesis installation work. I was also certain that I wanted to tackle personal issues with my thesis.

However, the content of this first study lacked any major personal significance. The map was comprised of primarily synthesized sounds. Sounds could only be activated at nodal points, and the transformation of each sound – the detail within each sound – was lacking. There were only two navigable field recordings used: one recording of the train that passed my maternal grandparents' house, and the other of my childhood backyard. Although the synthesized sounds and their interaction with the field recordings were quite beautiful, the synthesized sounds somehow felt shallow. It was obvious that the two personally significant field recordings revealed more about my memories and past than all of the synthesized tones combine.

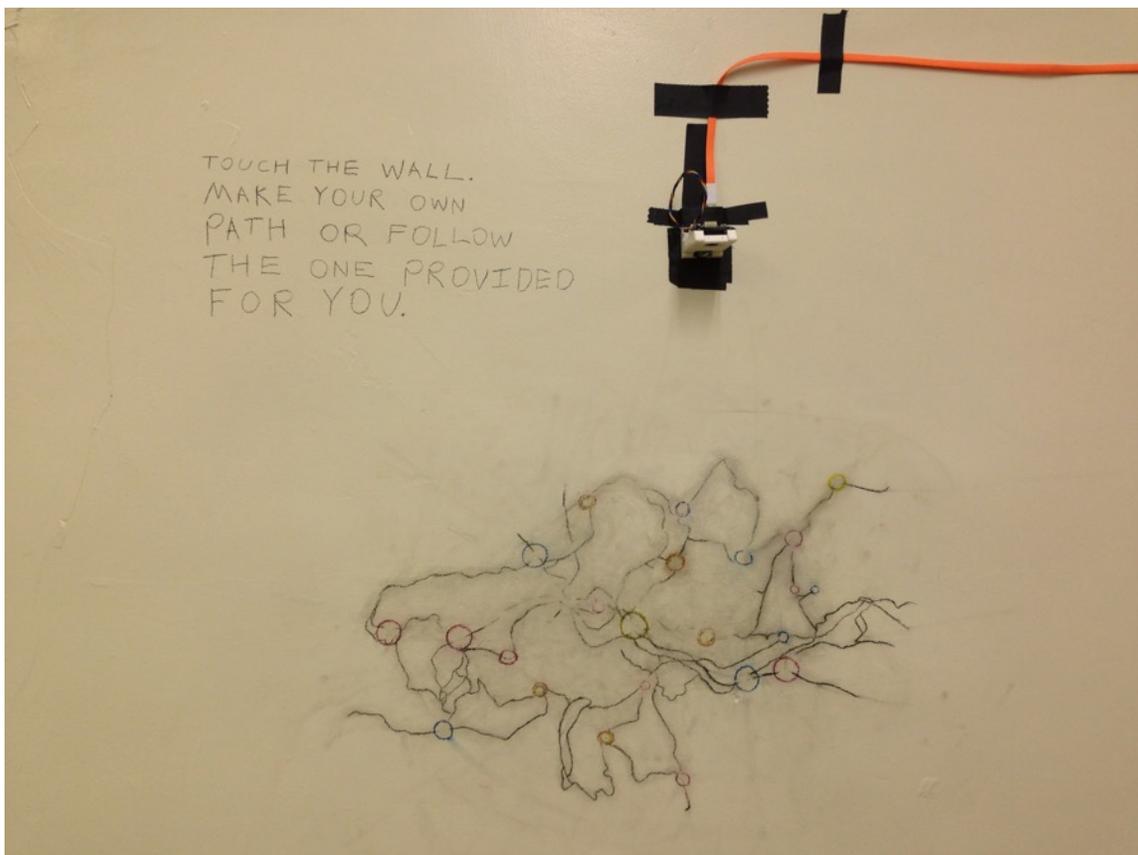


Figure 6 - Study at the December 2014 RPI Arts Department Open Studio

I decided to focus my efforts over the next few studies on composing with only field recordings. First, I created a technical framework, which would allow me to use dozens of field recordings at a time, each independently navigable through touch and movement along drawn lines. From there on it would just be a matter of collecting more field recordings, narrowing them down, editing the recordings, and deciding how I wanted to arrange them spatially. I started with small networks of lines and only a few field recordings at a time. I established that the most satisfying way to create the piece would be by grouping related sounds together in small “neighborhoods.” This would enable for smooth, almost melodic transitions when the user followed their finger(s) along each line. It also gave the participant the power to jump to other parts of the map with one or more fingers and create more intense and abrupt transitions, rhythms, and layers of sound. Composing the map became about the transitions and relationships between sounds in an attempt to create melodic structure with timbre. To keep things compositionally interesting, hidden abrupt sounds, both loud and soft, would occasionally be tucked away in even the most seemingly consistent parts of the map.

Associations between sounds became very important. Two or more sounds that may have often originated from entirely different sources might work well together, and would be placed on the studies in such a way to emphasize this – either next to each other to very blatantly expose the relationship, or far apart so that the user could find the relationship with the correct set of fingers in the correct locations. The sounds of leaves blowing in the wind would harmonize

with the sounds of camera shutters, or the sounds of thumbtacks dropping would compliment the sound of a stream.

I made sure to compose the studies in such a way that small, slow movements exposed details and hidden sounds within each navigable field recording, while large scale gestures gave the participant a less focused sonic result. Once the map was back up on the wall, the user would be able to get very close, exploring the intricacies and details of each individual recording, or step further away to interact with the larger piece as a whole.

The last major step was to take what I learned from the numerous studies and apply it to the large map for the April 2015 installation of *Mappings*. The final piece is truly a natural evolution born out of the handful of studies I conducted between November 2014 and March 2015. After the field recordings were arranged and composed in the manner outlined above, I decided to add very quiet synthesized tones that would work with the decay parameter of the piece and emerge over time to compliment the field recordings. This was inspired by the beautiful interplay between synthesis and field recordings discovered in the very first study.

VII. The Personal Process

I could not have decided to undertake an MFA at a worse time. Only a month into the program, both of my maternal grandparents, my only living grandparents, passed away within a week of each other, each of separate illnesses. It was devastating for me. I had never experienced such a loss in my

adult life. I had decided early on in the program that I wanted to create some sort of tribute to my memory of them and others who have played a significant role in my personal life. I was never certain of how to approach this task. In reality, *Mappings* is only an attempt at achieving this task – an attempt at creating a tribute to my memory of them. I have felt like I have wanted to express something but have never wanted to truly let it go. *Mappings* represents my struggle in communicating emotion. The distance between the real space and the recorded spaces, between the map and the real place, the decayed sound and the original, and the distance for the participant from these seemingly strange and unfamiliar memories represent my distance in disbelief, my own distance from my own memory, and the distance I feel between expectation of emotion and emotion. The difficulty I have had with expression has led to my use of the outlined field recordings. I was unsure how to express myself, albeit create such a complex tribute, so I decided to use sounds that are close to my memory, and close to my heart – sounds with expressive meaning to me, constructed specifically in a way that allows for the expression of others.

VIII. Setting *Mappings*

Interacting with *Mappings* is, as theorist Nick Kaye would state, a performance of place. As Kaye's theory suggests, *Mappings*' use of real, virtual, and recorded places works against a fixed physical locale.⁴⁷ Miwon Kwon attributes the decontextualization of location in site-specific art to the

⁴⁷ Kaye, *Site Specific Art*, 220.

contemporary human condition.⁴⁸ I attribute it, in my own work, to the condition of memory.

The early definition of site-specific art declares that the purpose of such work is to heighten or alter the observer's perception of the space in which the art object exists.⁴⁹ *Mappings* uses site-specificity in a very different way. The purpose of *Mappings* is to develop an awareness of a memory space. It is a composition that peers into my personal memory and uses space in an attempt to facilitate a meaningful interaction with the user. Inspired by the concept of setting art, *Mappings* is an attempt to create a personal experience with composition, both on the level of content and interaction.



Figure 7 - More close up of interaction, April 2015 installation of *Mappings*

⁴⁸ Kwon, *One Place After Another*, 164.

⁴⁹ Kwon, *One Place After Another*, 3.

CHAPTER THREE: THE TECHNOLOGY OF *MAPPINGS*

I. Technological Overview

This chapter will provide a brief overview of how *Mappings* functions on a technical level. The goal of this chapter is primarily documentary.

II. Parallel Systems

There are three parallel, functionally identical, technical systems at work in *Mappings*. Each system is responsible for a section of the map. This is done in order to make large spaces interactive. The installation is also designed in this manner in order to make the work incredibly stable and easily scalable. With more resources available, there could be four, five, or theoretically any number of parallel systems involved, allowing for the possibility of an even larger interactive space. While technically the systems are functionally identical, each system is responsible for a different set of sounds mapped uniquely in space. Instead of stitching together the active areas of each system in some sort of computationally heavy manner, the active areas created by each system are simply aligned to overlap. Therefore, sounds between two systems can easily be placed so that they too overlap, enabling smooth transitions and a seamless experience.

III. Sensing Units



Figure 8- Close up of sensing array, April 2015 installation of *Mappings*

Input to each system starts with a sensing unit.⁵⁰ Each sensing unit, mounted on the wall just above the active area (map), consists of two major hardware components: an infrared emitter and a camera. The emitter shines a plane of near-infrared light just above and substantially parallel to the wall. When this infrared plane is broken by a user's finger, the light is reflected back to the camera. The camera has an infrared bandpass filter placed between the image sensor and the lens. This prevents most other wavelengths of light from being detected, allowing for the camera to only see the reflected light from its associated emitter. To prevent interference between cameras, the middle

⁵⁰ Note that the sensing units were created outside of the scope of this project. They were developed independently from RPI and adapted by myself and Ronald Sardarian for artistic use in *Mappings*.

sensing unit was constructed with an infrared bandpass filter and emitter of a different wavelength than the two outer cameras. A video feed from each camera is then sent to a corresponding Apple computer, where a computer vision program written by Ronald Sardarian analyzes the reflected light.

IV. Computer Vision

Three computers, each connected to an associated sensing unit, all run a computer vision program, written and developed under my direction by Rensselaer Computer Science undergraduate and collaborator Ronald Sardarian. The program grabs a video feed from each sensing unit using Apple's AVFoundation backend. Each video feed, corresponding to a separate section of the wall-drawn map, is then processed with Ronald's software using the OpenCV library. Bright reflections are translated into binary blobs which are then tracked in two dimensional space. The scaled coordinates of each reflected point, representing the location of each of the user's fingers on the wall, are then calculated. The advanced software allows for a theoretically infinite amount of points to be tracked in a two dimensional space. This means that any number of users can interact with *Mappings*, using each of their ten fingers to effect sounds individually. A number of custom data and image processing algorithms are used to achieve this. The scaled coordinates are formatted as the x and y location of each finger within the sensing area of each unit. The y location is mathematically processed according to the angle of the camera, the distance of the camera away from the wall, and the location of the reflected light on the

image sensor of the camera to estimate depth. A high vertical resolution is required to achieve this successfully and prevent jumps in the data while detecting long range blobs. The scaled x/y data is then sent via OSC to individual Max Patches, running on each of the three computers.

V. Trigger Areas

When the x/y data for each finger is received in Max, it is compared to the location of a number of movable trigger areas placed on a graphic user interface. Fingers are measured in respect to whether or not they fall within a given trigger area and subsequently by the distance and azimuth from the center of each trigger area. Fingers are able to activate a number of trigger areas simultaneously. Each trigger area reads data from the closest finger to its center that falls within its bounds. Each trigger area is associated with a sound that is processed with granular synthesis. The data calculated from the distance and azimuth of each finger to a number of corresponding nodes allows for sounds to be processed in a rich variety of ways. The field recordings are each granularly navigable, with grain location, size, rate, accuracy, and panning all changing dynamically via finger location. Smooth cross fades between audio are enabled by accurate distance measurements while responsive attack times are enabled by the rapid camera and optimized system. Four channel audio is sent out of each of the three computers and then mixed into a quadraphonic speaker setup.

VI. Decay

The spacial decay of the wall-drawn map is measured by keeping an additive record of each participant's movement over the map during the duration of the piece. Like every other technical aspect of the work, this is done separately for each section of the map, processed on each corresponding computer. When each user interacts with the map, they draw their path into three separate buffers, one on each computer. The line they draw gets darker when it overlaps with user's past trajectories. Since darker lines on the computer represent increasingly trafficked sections of the digital map, the dark lines are a good indicator of decayed areas on the physical map. The processing of sound takes these lines into consideration. The darker the line in a certain area, the more the field recordings in that area move from the stereo speakers placed beside the user and up to the stereo speakers near the ceiling. The field recordings become fleeting and are eventually overwhelmed by microtonal synthesized tones, controlled using very similar distance, azimuth, and trigger area rules as the field recordings. In the case of the synthesized tones, the direct



Figure 9 - Stitched decay buffers from three computers on final day of April installation

interaction effects pitch and timbre, as opposed to grain parameters. The polyphonic synthesizer was designed from the ground up in collaboration with Rensselaer PhD Acoustics student Nikhil Deshpande, who helped program warm signal processing algorithms and a lush reverb to route the synthesized tones through. The synthesizer code was made primarily in the Gen programming environment.

VII. Technical Challenges

During the April 2015 installation of *Mappings*, I faced a number of technical challenges that ultimately forced me to postpone the opening of the piece. The lighting in the West Hall Gallery was the first issue. The permanently installed lights outputted so much near-infrared light that my sensing units were almost unusable. I have had more success using the sensing units in direct sunlight than under the lighting conditions in the West Hall Gallery. It wasn't until late into the installation setup that I discovered the severity of this problem. I was then required to wait until a day after the piece was originally scheduled to open to gain access to efficient LED lighting kits. Once I received the new lighting fixtures, I immediately mounted them on the ceiling of the gallery to replace the existing lighting. Another challenge was a last-minute error in the depth calculations. Gratefully, my collaborator Ronald Sardarian was able to fix this issue. After those problems were solved, one of the camera units stopped functioning. Again, gratefully, a good friend who happened to own the same camera units let me borrow his.

The installation, which originally was planned to be open Monday through Saturday, was ultimately shown on the following Friday, Saturday, and on the subsequent Monday with extended hours. Although, at the time of postponement I faced a number of technical issues, I was also driven to push the piece to the weekend due to the almost unbearable noise level experienced in the space during weekdays and weeknights, typically attributed to rehearsals and academic activity.

Even when the piece opened, I found it difficult to create a good audio mix for the space. I continued to adjust the sound levels over the course of the first day until I eventually settled on a satisfactory mix. The decay measurement described in the previous section also had to be reset after the first day, as the sensitivity was initially set too high. Despite all of the challenges, *Mappings* was technologically successful. The computers and software functioned brilliantly and stably for two ten-hour showings and one five-hour showing. The modular system that Ronald, Nikhil, and I had created allowed us to make crucial adjustments right up until the opening.

CONCLUSION



Figure 10 - Group interaction, April 2015 installation of *Mappings*

I. Reflection

During the twenty-five hour duration of the piece, over one-hundred people visited and interacted with *Mappings*. Some spent only a few minutes, many spent several. Some visitors only showed up once, but a great deal returned to experience *Mappings* again and observe how it had changed. I struck up conversation with a number participants. Some were interested to hear more about the inspirations for the piece while others were more interested in the technology. I was happy to share as much information as requested. Many discussed the personal and autobiographical implications of *Mappings* and were

keen to learn about my personal history. Some commented on the visual presentation of the piece, an aspect I would like to develop further in the future.

II. Future Development

Moving forward, I am interested in using a more fleshed out visual design to help communicate the personal and autobiographical implications of *Mappings*. Continuing to develop in the context of setting art, the presentation space would be transformed into an active navigable space, filled with artifacts that compliment the sound memories of the work. One of the many benefits of my sensing units is that they can be used on nearly any surface with out being obtrusive. I can imagine a set – a personal archive with sound objects and sound maps throughout. A memory space that escapes the bounds of the walls.

As Ronald Sardarian and I continue to develop devices similar to the aforementioned sensing units, we are beginning to implement them as a live performance tool. We have already developed a number of new features beyond what was shown during the April 2015 installation of *Mappings* – features that allow us to use the sensing units in a large range of environments and with greater expression. For instance, we can now reliably calculate the velocity at which the user strikes the surface. I plan to perform with these sensing units both in traditional and non-traditional concert settings. An attractive feature of the sensing units is that they can be used to expressively play an electronic instrument in a concert setting, or to spontaneously transform a brick wall or any other into an instrument.

III. Final Words

When framed in the context of setting art, my intentions for *Mappings* truly become clear. *Mappings* uses space to peer into my personal past and investigate ideas of memory, mortality, and decay. Inspired by works like *The Rings of Saturn*, *Inuksuit*, *Random Access Music*, *Rider Spoke*, and *Resonant Landscape*, *Mappings* uses space as a medium to construct a composition, encourage interaction, and convey programmatic intent. This use of space has had a great influence and profound implications for the process, format, and content of my work. However, the most crucial aspect of the work – the aspect that must not be forgotten – are those who must not be forgotten. *Mappings* is a tribute to my grandparents and the beautiful people I have been fortunate to know. I am forever grateful for their time and my memory of them.

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